

01 Education for sustainability

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The prevailing production and consumption patterns of industrialised societies cannot be maintained without seriously deteriorating the planet's resources. As a result, such an unsustainable model cannot be extrapolated to all of the countries on Earth which aspire to improve their quality of life. For this reason, ideas in support of sustainable development have been gaining ground since the end of the last century.

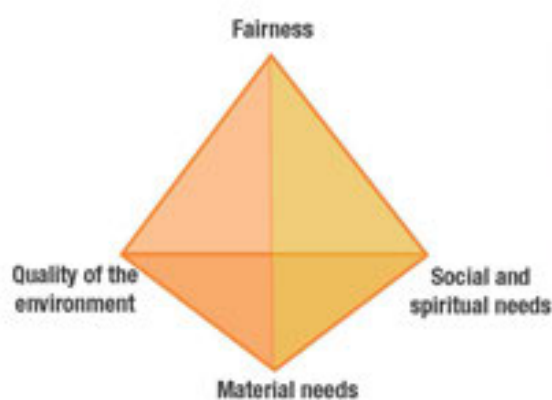
Sustainability and quality of life

We must however recognise, nevertheless, that although growing awareness has had a certain influence on production systems, the new lifestyles, principally within industrialised countries, have driven the new unsustainable patterns of relentless increases in consumption. It is increasingly clear that many of the social, economic and environmental problems are interrelated and constitute problems to development.

Sustainable development essentially deals with the relations between people and between people and their natural environment. It is therefore linked to the models of social and economic development in which the **human element** is essential. Hence, both the social and economic relations between societies and their subsequent relationship with natural resources is what will facilitate or hinder the process towards sustainability.

The now classic definition made public in 1987 by the World Commission on Environment and Development identifies sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". However, the document *Caring for the Earth: A Strategy*

01 Quality of life parameters



It is very often difficult to exactly define the idea of sustainable development. One way of defining it might be to identify the needs that justify a certain project, analysing the possible responses. These needs could be:

Material: food, physical security, housing and, in general, the physical resources which ensure the quality of life.

Social and spiritual: individual and social aspirations like health, education, freedom, love or recognition.

Environmental quality: access to a healthy environment and sustainable ecosystems, without forgetting that it is the source of renewable and non-renewable resources.

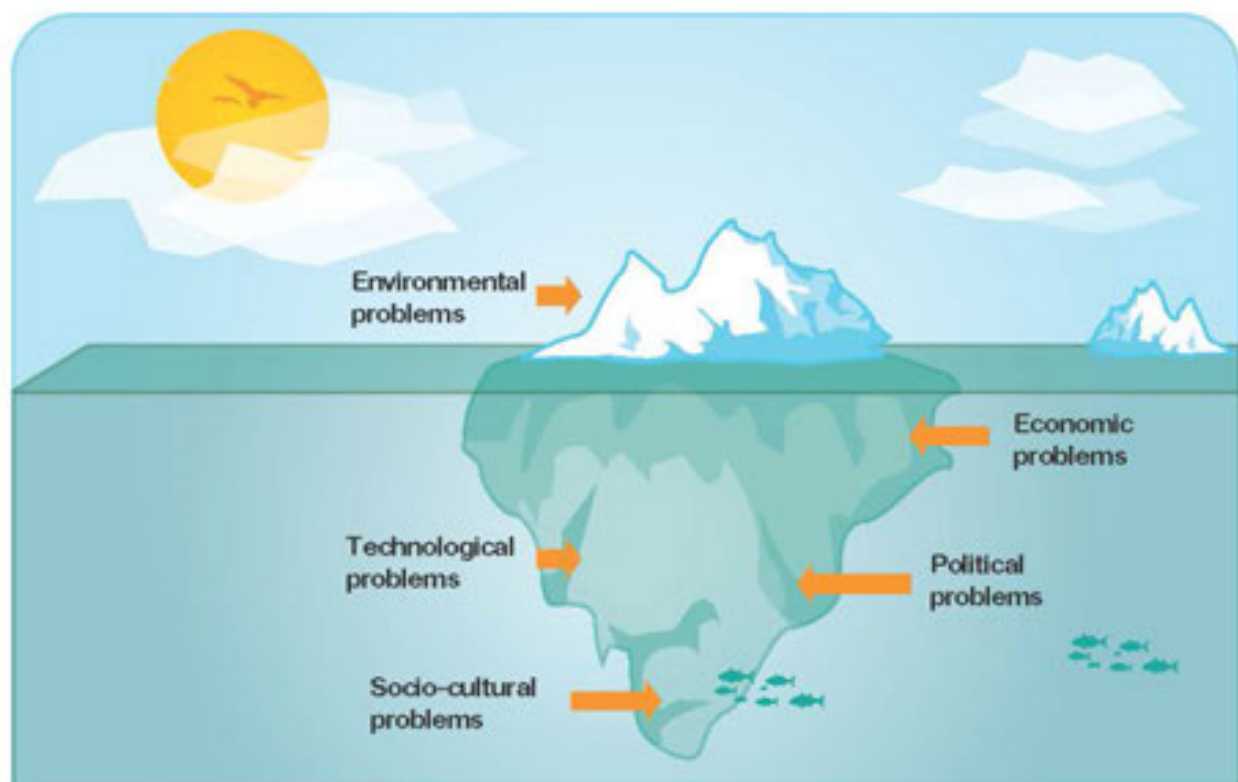
Equity: offer all individuals in the society, both present and future, the opportunity to share in the well-being.

[><] Source: Vileneuve, 1997

for *Sustainable Living* –published in 1993 by IUCN, UNEP and WWF– defines it as "improving the quality of human life while living within the carrying capacity of supporting ecosystems".

In short, sustainable development is closely linked to a quality of life which respects the environmental limits, responds to the economic and social needs, and promotes equity (see figure 1).

02 Complexity of the development problems



There are various underlying problems relating to development (economic, technological, environmental, socio-cultural and political), which also interact with each other. Sometimes we see the "tip of the iceberg" but we can not really tackle the problems

without dealing with the original causes. Education for sustainability helps us to understand the relationship between the elements of sustainable development, and to consider this complexity both in the diagnosis and in the proposal for solutions.

[><] Source: Solano, 2008

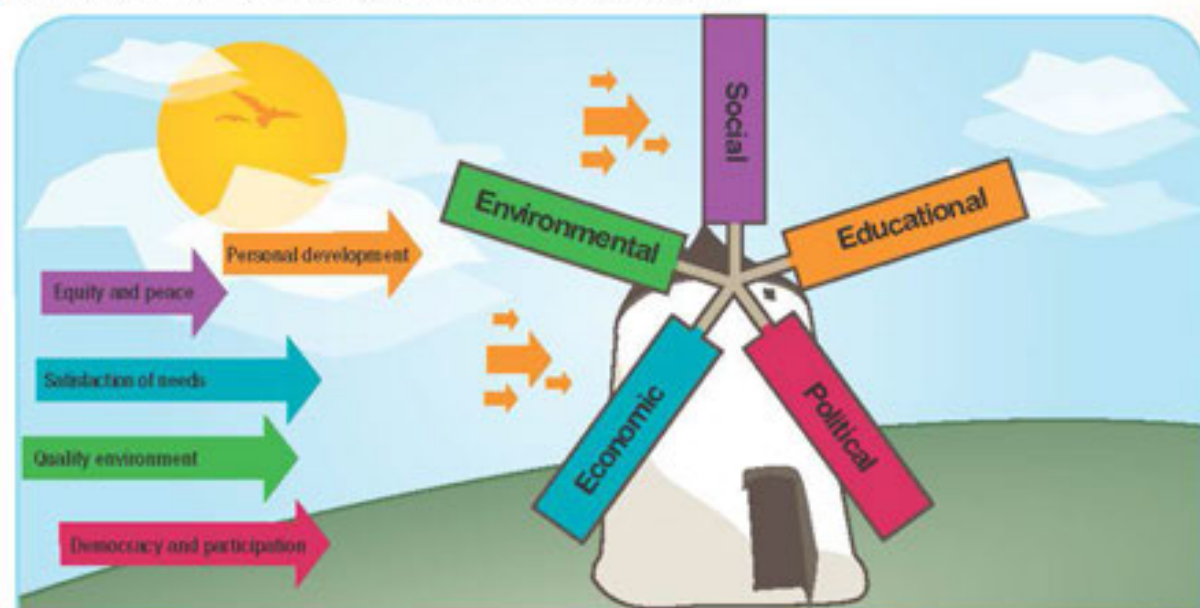
Linking education to sustainability

Sustainable development is considered a **process**, rather than a goal to be achieved. For this reason, making progress is not achieved solely through the application of techniques and programmes. Like every social process it depends on the value and forms of human behaviour. This situation means that education, and more specifically education for sustainability, is a strategic function. In effect, the necessary "reconversion" of education towards sustainable development can and must be a strategic factor which has an impact on the established development model so as to redirect it towards sustainability and equality. This is in short what is sought by the "United Nations Decade of Education for Sustainable Development" (2005-2014), which has as its global objective to "integrate the principles, values, and practices of sustainable development into all aspects of education and learning which will encourage changes in behaviour that will create a more sustainable future in terms of environmental integrity, economic viability, and a just society for present and future generations."

Education for sustainability is an international thought and action movement which promotes respect and care for people –including the present and future generations–,

for diversity, for the environment and for the planet's resources. Education allows us to understand ourselves and others, and also to understand our relationship with the natural and social environments. This provides us with an excellent base upon which to build values that support the notions of respect and care. As a result, education for sustainability trains us to develop behaviour and practices which allow all human beings to satisfy their basic needs, and to live a full life. As such, the educational process must promote innovative learning, characterised by anticipation and participation, that not only allows us to comprehend but also to get involved in what we are trying to understand.

Clearly the quest for sustainability does not exclusively depend in education. There are many other factors which influence the development of values and processes which promote sustainability: governance, the relations between genders, the economic organisation, participation in decision making, etc. We must take into account that education is simultaneously a social product and an instrument for transforming society itself. If the other social agents do not act for change, it is very unlikely that education can by itself transform the complex framework upon which the socioeconomic structures, production relations, consumer guidelines, and, in short,



[><] Source: Own preparation

the established development model are founded. It is therefore impossible to promote sustainable development without modifying those structures (see figure 2).

Learning spaces

Education for sustainability is for everybody regardless of age. It is developed from a lifetime learning perspective and uses all forms of learning: formal, non-formal and informal.

Education for sustainability reflects the concern for high quality education which helps people understand what is happening (**to know**), to feel part of the society in which they live (**know how to be**) and to know how they can participate in the development processes (**know-how**). However, it must also develop the capacity to **learn how to learn**.

It is quite common to focus on the school as the learning "HQ" despite the fact that we know that more is learnt in a lifetime outside of the school system in daily interactions, in the family, at work, watching TV, using the computer, observing, experimenting and learning from mistakes. We must be aware of the fact that sustainable knowledge and practices that are initially learnt, may or may not become incorporated into individual and collective habits by many small decisions and daily activities. Thus, when we plan educational programmes or strategies, we must take this into account and recognise that education for sustainability is taught, but above all is **learnt and modelled** through norms, sometimes subconscious, of life and relations. In fact, it would be better to talk about **learning for sustainability**, as the emphasis is on the person who is learning.

On the other hand, the learning must not be limited to the individual sphere but should also develop the capacity to collaborate with other people to induce a change in the institutions and social structures. It must encourage personal and group participation in the quest for organisation guidelines and experimenting with social changes, in an effort to find the

most suitable mechanisms and structures for progressing towards sustainability.

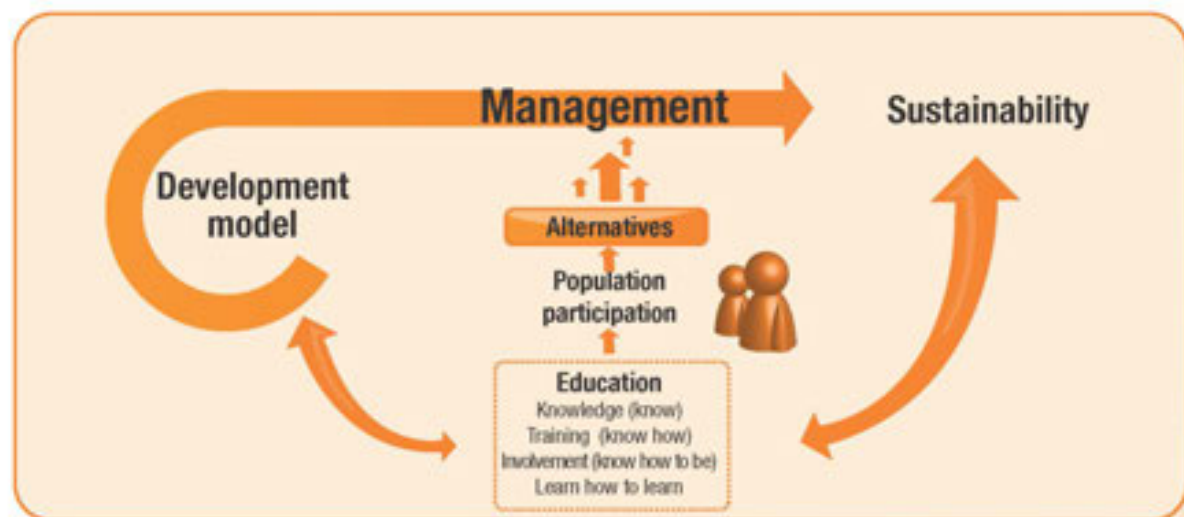
Characteristics of education for sustainability

Education for sustainability must share the features of all quality educational experiences, incorporating the values of sustainable development into the teaching-learning process (see figure 3). We should therefore stress that:

- It is **based on values**, whereby they are explained, discussed and those most appropriate for sustainable development can be selected.
- It develops **critical thought**, tackles dilemmas and prepares people to look for solutions to the problems.
- It is **orientated towards action**. Awareness alone does not lead to change. Beyond awareness, education for sustainability must promote commitment.
- Accepts **participation in the decision-making**, including the decisions relating to the environment and the learning method.
- Adopts an **interdisciplinary** and holistic approach.
- Uses **multiple channels** and didactic resources (the word, plastic arts, drama, debates, experiences, etc.) to jointly construct the knowledge, thereby going beyond the mere transfer of knowledge.
- It is **significant** for those who are learning and for the community, integrating the didactic experiences into the personal and professional life.
- Considers both the **local and the global scale** when considering the problems of development.

Integrate education and management

The spirit which must prevail over the design and application of education for sustainability programmes



[>] Source: Solano, 2008

must encourage participation in the planning and management of sustainable development. As such, the education must be related to the problems and the use of the resources in each place, and also linked to the local and regional development. This involvement is furthermore a form of action which has great educational power as what we learn essentially results from participation in "significant contexts".

The **participation** of the different social agents, the citizens, in the decisions and actions which model the type of development is not a luxury or an option: it is a requirement and a condition. A democratic requirement based on the citizens' right to consultation, to initiative and to transparency in public administration; and an essential condition so that these actions are effective and sustainable.

Only the strategies and plans which are reached in consensus with the affected population will be successful, and to a large extent this depends on its knowledge of the proposals, on its evaluation and on its subsequent involvement in them. In short, the adopted decisions depend on the dominant values in the community. As such the solutions must be based

on democratic and responsible decisions which take into account the interests of future generations and guarantee real participation of the present generations.

The goal of involving the population in the development planning and management involves accepting sustainable development's undeniable role of social mobilisation, grouping it together with other socioeconomic elements into development management. As such, the social instruments, of which education plays a part, are tools for a new management focus aimed towards sustainability, seeking complicity with the good practice.

Education and management are therefore interdependent variables. On the one hand, education is a powerful instrument in the service of proper management. On the other hand, the best way of changing mentalities is to perform suitable management as this promotes habits and actions which in the end define a certain culture. Thus, just like the education programmes have to take into account the management that is carried out, the management projects must consider educational aspects. There must be integration and mutual influence (see figure 4). <

bibliography and references:

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- > Vileneuve, C.: Módulo de educación ambiental y desarrollo sostenible. International Environmental Education Program, UNESCO-UNEP. Bilbao: Los Libros de la Catarata-Gobierno Vasco, 1997.
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- > Education, International Union for Conservation of Nature: www.iucn.org/what/issues/education/
- > Education, UNESCO: www.unesco.org/education
- > Open Training Platform: <http://opentraining.unesco-cl.org>

02 It is possible!

Successful experiences and good practices

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It is, in fact, possible to advance towards sustainability, and educational processes are going to help and accompany us on this journey.

In the following chapters we are going to reflect, one-by-one, on the various aspects of education and sustainability. But it is very important that we understand that these issues are not isolated, and are very much interrelated and constitute life itself, forming part of the realities known to us and in which we live. None of these are independent, as each issue and each one of us form part of a vital and complex system.

Every human being, every living being and every expression of Nature is part of a system made up of different interacting elements, which vibrate and feel. Our responsibilities, our knowledge and our feelings can move us towards an integrated vision which will provide us with guidelines for a different and marvellous future.

What characteristics should the educational processes, life experiences or community processes have in order to be considered "successful" so that we can put them on a list of "good practices"?

Firstly, we must adopt an **integrating and participative vision**. We must consider that we are part of a whole and that we must therefore act with respect towards the planet of which we are a part, with human solidarity, and elicit the cooperation of many energies, forces and visions.

They must also be **innovative**, in other words, offer and deliver proposals which differ from those of the past, and should not be considered satisfactory if they include ideas and models that have previously failed to achieve the results they set out to provide.

Another characteristic is related to **building the future**. The key lies in being imaginative and progressing towards our collective dream, so that changes can be proposed and performed, aimed at generous, prudent and expectant improvement.

To ensure success, each and every one of us must play a direct or indirect part of this experience: men, women, youths, children; local communities, government sectors, companies, civil organisations etc. as well as all other groups which exert political or economic influence, whether they are in charge or

whether they form part of the grassroots; those who form part of the realities and have a direct link to the visions and decisions which must be taken in order to build that new future.

Consideration of the issues of **good practice** is related to the various points mentioned above, including: participation, inter-sector relations, interculturality, liaison between the natural and social aspects, school-community articulation, art, research, innovation and others.

The following information includes some interesting experiences about people in four very different countries –Brazil, Spain, Mexico and Peru– who have made an effort to progress towards sustainability and have proposed and carried out actions aimed at achieving a better future, no doubt with their difficulties, but relying on the force of the collective spirit. It is, without doubt, in this dynamism where the success of good practice lies.

Selecting these experiences has not been an easy task, because throughout the world, and particularly in Latin America, there are many examples of marvellous efforts which could happily have been presented here. However, attention will focus on these four due to their presence in four very different countries and because they deal with innovative issues: art, conservation, research and interculturality.



Photo: UNHCR/N. Ng

I. Art, environment and sustainability

Which country? BRAZIL

What is the experience called?

Projecto Educando of the EMCANTAR Association and the Algar Institute of Uberlândia in Minas Gerais.

What do they do and what is their aim?

EMCANTAR's actions are aimed at achieving a way of life which is based on enchantment with the world, cooperation between people and on a responsible relationship with the environment. Its mission is to embark on individual and social transformation actions, promoting artistic/cultural experiences, continuous training activities and socio-environmental practices.

Through education for art and socio-environmental education, the aim is to seek to promote effective and systematic performance in constructing educational good practices which contribute towards responsible attitudes.

The pedagogical approach proposes a circular methodology which allows for viewpoints to come together and democratic participation, as well as the construction of shared artistic experiences and socio-environmental positions. This takes place in a process which seeks to reinvent educational practice in a group - thinking and rethinking the world.

Who participates and how?

The Educando project is delivered thanks to the Algar



Institute and EMCANTAR, with the support of the Municipal Secretary for Education, the National Teaching Inspectorate and the participation of 300 public school educators and 360 basic education students.

Amongst its cultural activities, some musical assignments are developed which mix tradition and creativity, like the musical performances with a choir group, accompanied by instruments. There are also cartoon workshops, recordings with songs about the environment, nature, society and its responsibilities, and many other activities which manifest a close link between environmental issues and artistic expression.

Have they received recognition?

EMCANTAR has received various awards:

- **The Great Othello Prize for Culture**, granted by the Municipal Chamber of Uberlândia (2007).
- **Brazil's National Prize for Excellence in Education** in 2006 and 2007 amongst others.

Would you like to find out more about this experience?

EMCANTAR Association: www.emcantar.org/ ◀

II. Research, education and participation

Which country? SPAIN

What is the experience called?

Ecocentros (Ecocentres): An educational research project in Extremadura, from the Regional Government of Extremadura.

What do they do and what is their aim?

This is a school-based environmental education programme which seeks to integrate educational work with a transversal and inter-sectoral approach. It is also an education research project which aims to encourage experiences which improve and enrich the teaching/learning process from environmentally friendly education premises. The purpose is to make the centre and curriculum "greener" and therefore the locality. The objectives are:

- Achieve the involvement of the various school communities and council sectors in environmental improvement, both in regards to personal habits and in relation to the functioning of the centre, managing to extend the work into family lifestyles and even the lifestyle of the locality.
- Achieve genuine incorporation of environmental education into the curriculum, essentially through action and participation.



Who participates and how?

The Regional Government of Extremadura, through the Department of Agriculture and the Environment and the Department of Education, Science and Technology, and the University of Extremadura.

13 infant and primary schools in Extremadura took part in the experimental phase, which was subsequently extended to more schools, including secondary schools, professional training centres and special education colleges. In the process:

- An environmental commission or forum is set up in each school, made up of a group of people responsible for promoting the project, with representatives from the teaching staff, body of students, parents, members of the administrative staff and representatives from the town council.

- A work group or seminar is created with teachers from the school who are in charge of these issues so as to implement their incorporation on all levels: the Centre's Educational Project, the Centre's Curricular Project, central management, etc.
 - Training seminars are held where guidelines are given about the project, guiding the work of the commission and the teachers' work groups.
- Environmental assessment or diagnosis is carried out at the initial stage and an action plan is prepared with a monitoring and evaluation plan

for the participating sectors and groups, within a participative research-action strategy.

Would you like to find out more about this experience?

Extremadura Network of Ecocentros: www.extremambiente.es/index.php?option=com_content&view=article&id=313&Itemid=202

García, J. and Sampedro, Y.: *Un viaje por la educación ambiental en España*. Madrid: Ministerio de Medio Ambiente. OAPN. 2006. Available at: www.mma.es/portal/secciones/formacion_educacion/recursos/rec_documentos/viaje_ea_espana.htm ◀

III. Conservation, education and sustainability

Which country? MEXICO

What is the experience called?

Environmental Education within the framework of the Mexico Bat Conservation Programme (PCMM in Spanish) carried out by the NGO Bioconciencia.

What do they do and what is their aim?

With the initial purpose of conserving the country's bat population, a programme was started with three areas of work: Research, Conservation and Communication, Environmental Education and Community Work.

Because bats are often loathed and feared by the population, the work focused on two areas: information about the species' natural history, emphasising the types of food and the benefits for human activities; and the emotional and cultural link that it should have with the population.

A central focus of the process was to connect with the sustainable development of the different population groups in the areas inhabited by bats.

Who participates and how?

This method of 'integration study' by the Mexico Bat Conservation Programme (PCMM) has been adopted and used in various Latin American countries like Bolivia, Venezuela, Costa Rica and Guatemala. They currently work in 14 States in the Mexican Republic and in 7 of the 12 priority caves. It has 39 communities organising study

groups in which 6,500 children have participated, with 47,000 people visiting specialised exhibitions, and 70,000 participants at various events like workshops, conferences and local development activities.

Work has been carried out with people from, amongst others, livestock and agricultural workers, and industrial and educational sectors. Another important activity has been promoting eco-tourism to the bat caves, collaborating with guide management and training plans.

Of particular interest is the work which has been carried out in the Xoxafi caves in Hidalgo State, where the conservation, education and sustainable development of the area's population has been complemented with an alternative and future proposal.

Have they received recognition?

The coordinator of the Environmental Education Programme has received the following awards:

- **Overbrook Fellowship** grant to prepare a book on the relationship between bats and the pre-Hispanic cultures (2007).
- **Conservation Hero Award** from the Disney Wildlife Conservation Fund (2006).
- **Educator of the Year Award** from Bat Conservation International (2001).

Would you like to find out more about this experience?

Bioconciencia: www.bioconciencia.org.mx

Xoxafi caves: www.grutasxoxafi.com.mx/intro.htm ◀



IV. Interculturality, environment, education and future

Which country? PERU

What is the experience called?

Los Niños del Bosque (Children of the Forest) project: Promotion of interethnic tolerance and appropriate use of the Amazon's natural resources by the Pirámide cultural association, the German International Cooperation Agency (GTZ) and the Peruvian Jungle Interethnic Development Association (AIDSESP).

What do they do and what is their aim?

This is an intercultural, environmental experience which involves young people of between 13 and 15 years old and seeks to construct and consolidate intercultural links and conserve the natural resources amongst native communities from the Peruvian mountain and jungle, based on comprehension, dialogue and respect between cultures. It also seeks to:

- Increase the potential of the natural resources as well as the knowledge of the respective communities.
- Provide experiences which bring the Andean and Amazonian cultures closer together in order to deepen their mutual knowledge, achieve greater communication and better coexistence and understanding, so that future actions can be supported.
- Generate elements of sustainability which afford continuity to the established relations and actions and allows for the identification of possible future relations and development.
- Prepare a working model, with an intercultural perspective, towards the proper use of the Amazonian natural resources which can be transferred into other physical and cultural spaces.

Who participates and how?

Different regions of the country and groups participated: 9 Amazon communities; 8 schools in the jungle; 15 schools in the mountain; 170 teachers and parents in mountain areas; 240 students in mountain areas; 244 students in jungle areas; as well as 100 people from native and educational communities. In the process:

- Two culturally and geographically different work areas were chosen: the mountain and the jungle.
- A series of preparatory activities were performed in both areas to identify the cultural identity, natural links,

intercultural links and environmental education, through training and creativity workshops for teenagers aged between 13 and 15, their teachers and parents.

- Intercultural experience meetings were set up in one of the geographic areas, encouraging the preparation of youth projects relating to interculturality, environment and sustainability.
- They advised and started various local sustainable development youth projects with the support of their respective local community and schools.

The aim was to direct groups of young people who could with their proposals for interculturality and environmental projects generate local, inter-institutional and community dynamics, thereby opening the door to new sustainability alternatives and reinforcing local identity, and the recovery of knowledge.

Have they received recognition?

- The project received the **Cambie Award** for Environmental Education in Peru (2006).
- Honourable Mention in the Andrés Bello's **Somos Patrimonio Contest** (2007).

Would you like to find out more about this experience?

Los Niños del Bosque project: www.piramide.org.pe <



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- > Good Practices in Education for Sustainable Development: www.unec.org/en/esd/GoodPractices/index.html
- > International Network of Development Education and Popular Education: www.webpolygone.net
- > Resources for Human Development, Global Education and Citizen Participation: www.banaba.ihu.es
- > Tunza, United Nations Environment Programme for Youth: www.unep.org/tunza/youth/
- > United Nations Decade of Education for Sustainable Development: http://portal.unesco.org/education/en/ev.php-URL_ID=27234&URL_D0=D0_TOPIC&URL_SECTION=201.html



03 Climate change

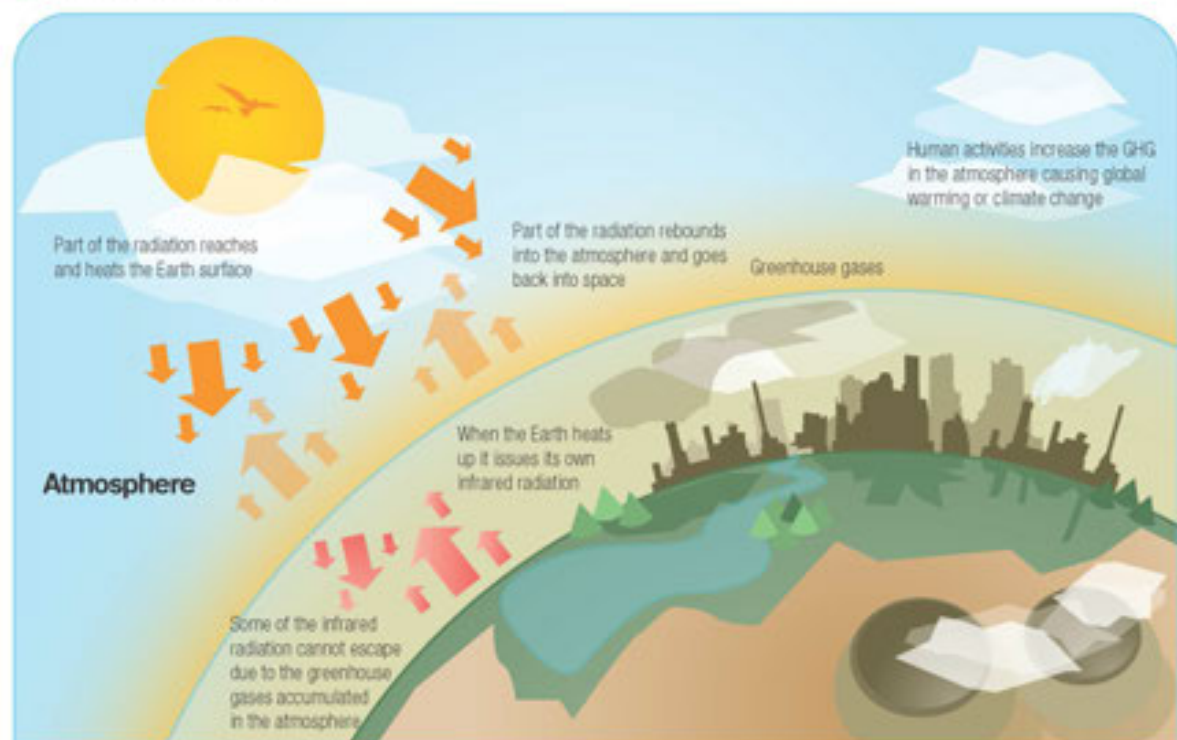
[Mar Asunción Higuera]
WWF/Adena



The greenhouse effect is a natural phenomenon which allows life on Earth. It is caused by a series of gases in the atmosphere which trap part of the sun's heat reflected by our planet. This results in the average global temperature of +15°C, instead of -18°C (see figure 1).

However, more than two decades ago the world scientific community began to alert us to the fact that the Earth was heating up at an unprecedented rate. The climate has always been variable, but the problem with current climate change is that over the last two centuries the rate of these variations has increased significantly. Such acceleration will become exponential if measures are not adopted. When investigating the reason behind this acceleration, a direct link between global warming and the rising emissions of **greenhouse gases** (GHGs) from industrialised human societies is found.

01 Greenhouse effect



[>>] Source: UNEP

The main GHG emitted into the atmosphere by human beings is carbon dioxide (CO₂) which comes from burning fossil fuels (coal, oil and gas), used to produce energy and for transport. Other GHGs are methane (CH₄), nitrous oxide (N₂O), chlorofluorocarbons (CFCs) and perfluorated compounds. The concentration of CO₂ eq.¹ in 2005, 397 ppm, is far greater than any concentration over the last 650,000 years. This is principally due to the burning of fossil fuels and, to a lesser extent, land use (see figure 2).

Impacts of climate change

The Fourth Report of the Intergovernmental Panel on Climate Change presented at the end of 2007 concludes that climate change is real and is advancing at a much greater speed and intensity than envisaged.

Amongst the most relevant impacts, the Report highlights rising sea levels which pose a risk to those living in coastal cities, the salinization of aquifers, diminishing icecaps and the resulting risk for water supply to the populations who depend on the rivers fed by them, the extinction of species (up to 30%), a greater risk of heat waves and droughts in some areas, and torrential rains in others (see figure 3).

The most affected regions will be the Arctic, Sub-Saharan Africa, the Asian deltas or the small, low-lying archipelagos, like the Tuvalu archipelago whose inhabitants have already asked New Zealand for refuge in the event that the sea floods their country.

The sea level is already rising and 100 million people who live at less than one metre above sea level are at risk of losing their homes and ways of life. Reduced harvests caused by climate change could result in famines in Africa, India and China, and hundreds of millions of people live under the threat of diminishing freshwater supplies. Poor countries, which are less responsible for the problem, are those who will suffer most and furthermore, lack the resources to tackle the consequences.

The Mediterranean Basin is also seriously affected by lost harvests due to increased droughts and heat waves, as well as floods caused by intensified rainfall over very short periods of time.

Because of its geographical and socioeconomic characteristics, Spain is very vulnerable to climate

change. Over the last century the average temperature has increased by 1.5°C, double the world average. The sea level is rising by 1-15mm per year on the Cantabrian and Atlantic coasts and 0.7mm in the Mediterranean. The Pyrenean glaciers have shrunk by 75% over the last century.

For this century, the models forecast for Spain a greater risk of heat waves, fires and floods. This includes 3-4°C warming in winter and 5-7°C in summer, with more pronounced effects in the interior of the peninsula than on the coasts. The frequency of maximum temperatures will become more common. The quantity of the water resources will drop and their seasonality will change. There will be less rainfall and hydrological resources, with potential decreases of over 20%, especially in the South. Floods in the inland basins and Mediterranean basins will also become more irregular and more erosion is anticipated, which will aggravate existing desertification. The sea level is forecast to rise by 10 to 68cm which will lead to the disappearance of the river deltas. There will also be a significantly higher risk of forest fires.

The energy model and climate change relationship

The production and consumption of energy from fossil fuels has a direct impact on climate change and the existing energy model must therefore change in order to reduce CO₂ emissions. Combating climate change requires a shift towards a model of sustainable development based on efficiency and equity, as well as a commitment to renewable energy. This is not easy as it requires a technological and sociological change, although, having said that, the habit of continuing business as usual is just not sustainable.

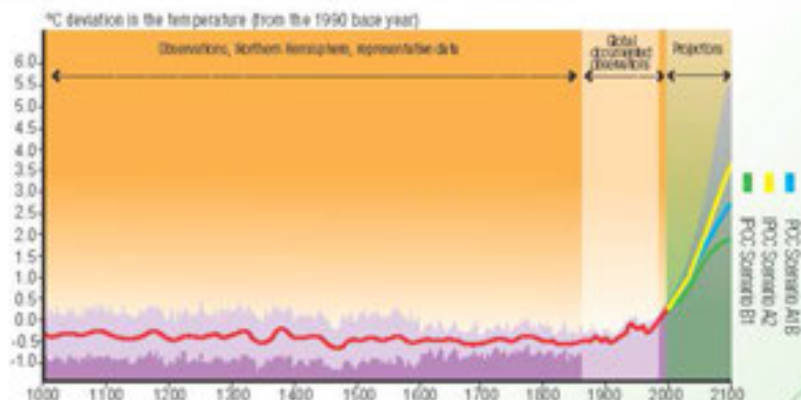
Climate change is a challenge, but it could also provide the opportunity needed in order to commit to real sustainable development. The saving and efficiency measures, as well as the renewable energies, will promote autochthonous development and reduce external dependence.

It is also essential that there is financial flow and technological transfer from the industrialised countries to the developing countries so that they do not have to base

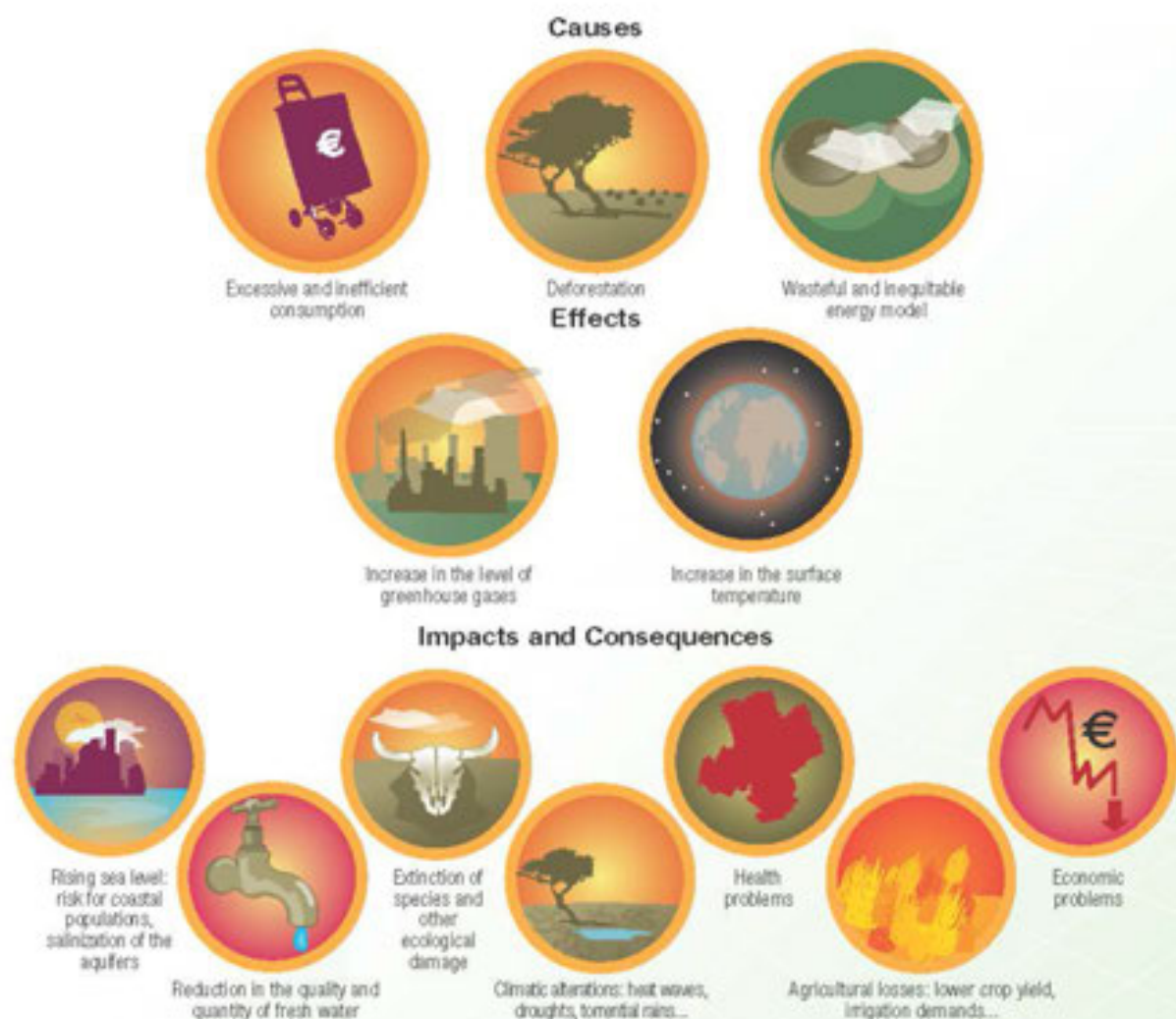
02 Variations to the Earth's surface temperature between the year 1000 and 2100

The future will depend on the decisions made today. According to the Human Development Report 2007/2008, we will be coming close to dangerous climate change when the Earth's temperature increases by more than 2°C over preindustrial levels.

[> <] Source: 2001 IPCC Third Assessment Report



¹GHG concentration is measured in parts per million (ppm) of equivalent carbon dioxide (CO₂ eq.).



[> <] Source: UNDP and Peace Child

their development on environmentally aggressive energy sources.

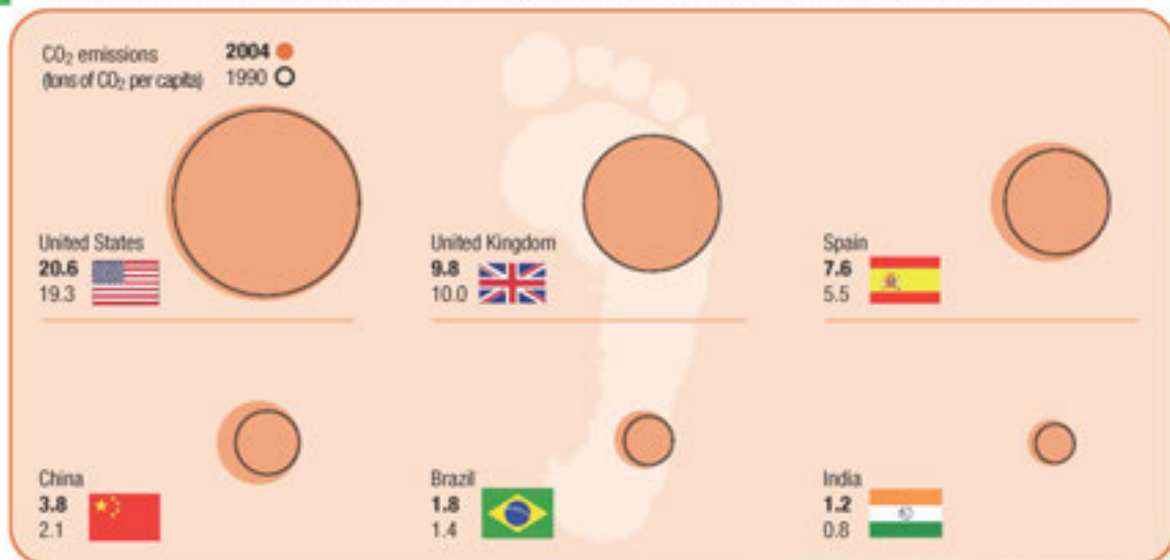
All of this involves a change to the consumption model; a shift from the wasteful and consumerist lifestyles by the minority to sustainable development for the entire world is needed. Awareness and education play an essential role in destroying the myth that consumption and quality of life are directly proportional.

We must act now

Climate change is here but its intensity and impact will depend on the actions we start now to control and reduce the greenhouse effect emissions. The scientific community warns that it is very important that throughout this century the 2°C global temperature increase threshold over preindustrial levels is not exceeded. For this to be achieved, the CO₂ eq. concentration must remain lower than 450 ppm which means that developed countries will have to reduce their emissions by between 25-40% by 2020, and 80% by 2050 as regards to 1990. The

emissions also tend to persist in the atmosphere which means that in order to ensure that we do not cross the **2°C danger threshold**, world emissions will have to stabilise and start to drop in the next 15 years at the very latest.

Combating climate change is a shared but differentiated responsibility (see figure 4). The development model of industrialised countries is based on high energy consumption from principally fossil fuels, those which have historically contributed towards increasing the atmospheric CO₂ levels. These countries also have the financial and technological resources to make the transition to a sustainable energy model based on energy saving and efficiency, and on renewable energies. The developing countries, particularly the fast-growing economies like China, India and Brazil, are rapidly increasing their total energy consumption, although their energy consumption and emissions per capita are still much lower than those of industrialised countries. These countries demand more and more energy, just the same as the two billion people without access to electricity, and it is up to industrialised



[> <] Source: Human Development Report 2007/2008 (UNDP)

countries to provide them with clean technology. Of course, developing countries will have to contribute insofar as they can to making efficient use of energy and implementing sustainable practices which limit the growth in emissions, like avoiding deforestation. In this manner, we would all benefit from limiting the total worldwide CO₂ emissions.

The report prepared by the prestigious economist Stern for the British Government at the end of 2006 shows that the cost of the impact of climate change due to the failure to act against it would lead to a 5-20% decrease in the annual global Gross Domestic Product, being 1% if we act now.

Everybody's responsibility

Climate change is such an enormous problem that many people may feel impotent when it comes to acting, and think that the solution concerns exclusively governments and companies. It is undeniable that these agents have a crucial responsibility on the issue, but it is

also essential that citizens are aware of how our lifestyle influences GHG emissions, and are willing to save and use the energy in a more efficient manner. Citizens must also exert pressure so that administrations and companies do their part.

If we start to pay more attention to wasteful uses of energy used in lighting, heating refrigeration, transport, etc. and become more discerning when we purchase products, i.e. asking ourselves whether we really need them and, if we do, buying the most efficient goods produced under fair conditions, then we will without doubt transmit our principles to society and the decision makers. Individual change by many is the catalyst for social change.

Currently a large part of the population associates "quality of life" with "high levels of consumption" of both energy and products. In order to combat climate change the link between these parameters must be broken. The Earth is telling us that we cannot continue with this model. If we do not pay attention to the symptoms and act accordingly, we will suffer the consequences. We still have time but **we must be prepared to change.** <

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- > WWF Spain, Green Office Campaign: www.officiazulcero.org

04 Water resources

[Gonzalo Marín Pacheco]
Engineering without Borders

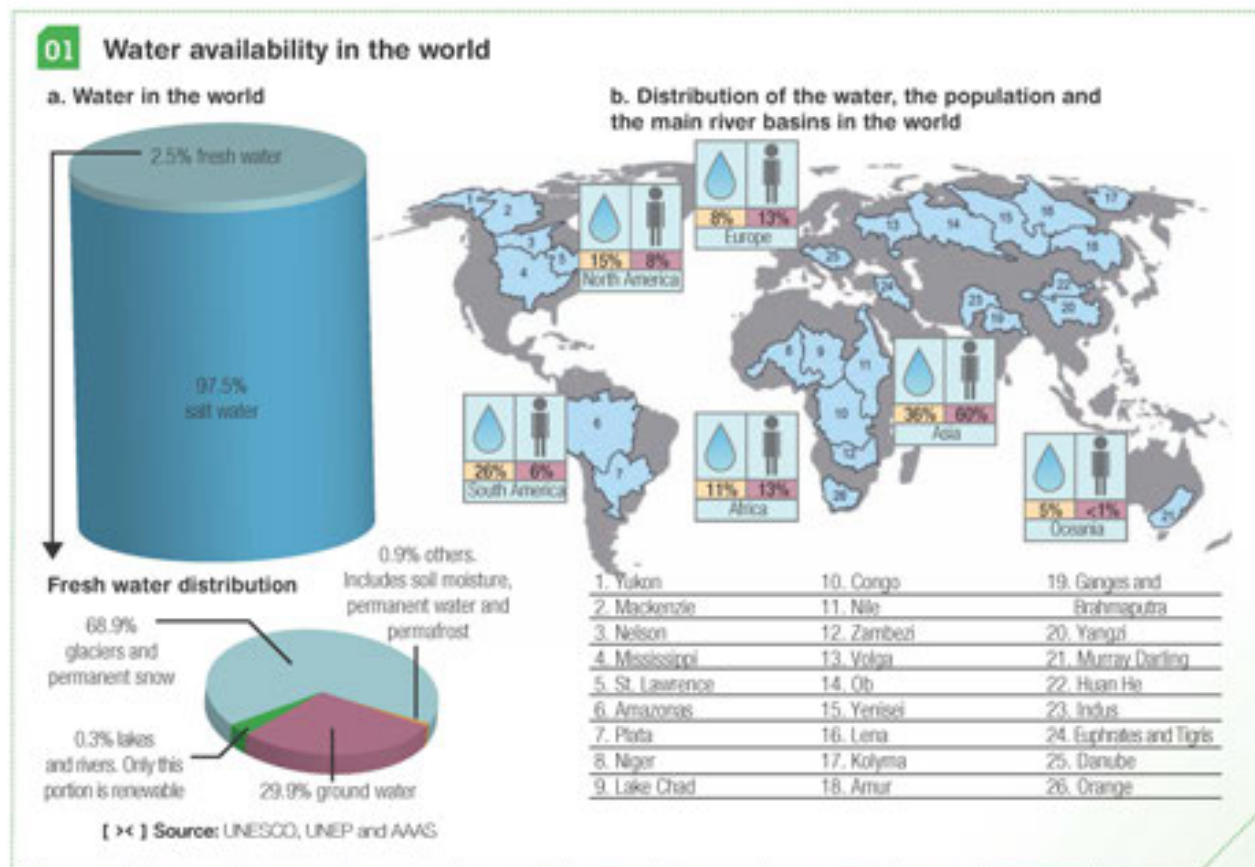


Availability of the resource

The principle characteristic of water resources is that they are unevenly distributed over space and time – both year-on-year and seasonally. This means that there are river basins and geographic areas with water shortages, both as a result of physical scarcity and due to the lack of sufficient infrastructure to satisfy water demand. The total volume of water on the planet is 1.3 billion km³, of which 97.5% is saltwater. Only a very small part – less than 0.01% or 104,590 km³ – can be used directly by humans to satisfy their living requirements, their production activities and for the activities associated with the ecosystems which rely on it (see figure 1a).

The surface runoff, in other words the water that flows in rivers and is collected in natural and artificial lakes throughout the Earth, is estimated at 42,784 km³/year and is considered **renewable** as it derives from the phenomena of precipitation, evaporation, infiltration, siltation and runoff – produced annually in the natural water cycle –.

Asia and South America are the geographic areas with most surface water, since they are the areas with the planet's most important rivers (see figure 1b), while Europe and Oceania are the areas with the lowest annual volume of resources – between them both, they only have about 40% of Asia's resources. Africa, on the other hand, has around 10% of the total, despite the fact that it has



the Congo –the river with the second highest flow after the Amazon–, the Niger and the Nile rivers, which are amongst the most important in the world.

South America is the region with the highest availability of resources per territorial unit, principally due to those associated with the Amazon, Orinoco and Paraná rivers. With the exception of Africa, which has an annual availability per square kilometre one-fifth of that in South America, the other regions have values in the same order of magnitude, which are approximately 50% of the above.

As well as the spatial variability, the temporal variability is also significant and is manifested both within a year, as well as on a year-on-year basis and, in the latter case, may lead to annual differences of around 5,000 km³, while the seasonal differences vary substantially according to the region and also correspond to the dry and wet seasons.

Groundwater resources

The World-wide Hydrogeological Mapping and Assessment Programme was set up in 2000 to territorially assess and characterise groundwater, or aquifers. On the basis of the three-yearly World Water Assessment Programme (WWAP) reports (2003, 2006 and 2009), it is estimated that between 1.5 and 3

billion people throughout the world obtain supplies through groundwater sources, and that 40% of industrial consumption and 20% of crop irrigation are dependent on them. Groundwater makes up 70% of the water used in the European Union and is often the only source to supply arid areas. For example, it represents 100% in Saudi Arabia, 95% in Tunisia and 75% in Morocco. Aquifers generally lie beneath various States and therefore require harmonised management mechanisms so as to avoid conflicts and to avoid contamination or overexploitation by any one of the parties.

Water uses

Many uses are associated with water, and they all have very different characteristics and different priorities in their satisfaction. Since these uses are in competition with each other, resources must be managed by taking into account ethical considerations involving different values, rights and priorities.

The spectacular population explosion over the last century, the improved standard of living, increased industrial demand and the equally well-known expansion in crop irrigation, have all led to the demands on water increasing sevenfold and which continue to rise. This increase is associated with agricultural uses, particularly in developing countries and, above all, in Asia.

In the developed world, industry consumes almost 60% of the water, as opposed to only 10% in developing countries which use almost all of the water –82%– for agriculture. These figures are, however, distorted if we take into account that in a globalised world like ours, just like there are global flows of people and goods, there are also flows of water in the form of products; this is known as **virtual water**. This concept shows us the **water footprint (see figure 2)** for a specific person, country or product.

The increase in demand is shaping a scenario whereby a third of the world population currently live in countries which suffer between moderate and high levels of water stress, which occurs when the water demand is higher than the available amount during a certain period or when its use is restricted by low quality. This situation is particularly worrying in Africa and western Asia where water shortage is restricting human, industrial and socioeconomic development. According to the United Nations, if current trends in water consumption continue, by 2025 two thirds of the population will be living under conditions of water stress. The shortage must not be exclusively attributed to a lack of water, but is in fact largely due to inadequate management, whether as a result of overexploitation or contamination of the resource.

Historically, water resources have not been exploited very efficiently, which is shown by the differences between the volumes extracted and those actually used. In 1900, the ratio between consumption and extraction was 71%. In spite of the fact that more efficient technology has been incorporated, particularly in agriculture and industry in developed countries, this ratio dropped to 66% in 1940, 60% in 2000 and is further forecast to drop to 55% by 2025. Reversing this trend poses a significant challenge which can be achieved by introducing efficient management of the planet's water resources, most particularly in the agrarian sector of developing countries.

02 Virtual water and the water footprint

How much water is needed to produce...?

1 apple



70
litres

1 hamburger



2,400
litres

Virtual water is the total volume of fresh water used to produce goods and services, in other words, the water that a product, whether agricultural or industrial, "contains".

The **water footprint** derives from this concept, and is the total amount of virtual water in the products consumed.

Spain's water footprint is 2,325 m³/year per capita. About 36% of this water footprint comes from abroad.

Consumers and society in general can play an important role in managing water resources, thereby reducing our water footprint.

[><] Source: FAO-Water

The lack of water and sanitation produces interrelated and multiplying effects which have an impact on human development.

In the long-term it may chronically limit the progress of groups, peoples and countries.

The crisis of the poorest

They pay 3 times more for water in the poor neighbourhoods of Dakar (Senegal) than in the rich neighbourhoods. While the latter are connected to the mains, the former have to buy water from peddlers or obtain it from unregulated wells or springs. This is an example of what occurs in the developing world, where the poor have less water and pay more for it.

Photo: UNHCR/ S.Kritsanavatin



The need to continue working

Access to water and sanitation is massive progress towards overcoming the poverty cycle, improving health, guaranteeing people's means of support and reducing the gender gap. Investment in sanitation is highly profitable. For every dollar invested between 3 to 34 dollars are saved in health, education, social and economic development, thereby providing a long-term boost to the most disadvantaged economies.

Photo: FAO/ Bizzari



[><] Source: Own preparation

The technological solutions must, however, be complemented with education and training measures, as well as shared management involving the participation of all of the actors concerned, with the aim of streamlining water consumption. These measures, together with recognition and respect for the sustainable limits of aquatic ecosystems, are known as **demand management**. This is a model which has shown to be viable, as opposed to traditional policies to promote the resource by constructing large-scale infrastructure, which has led to social and environmental devastation, particularly in developing countries.

The world water crisis

Given that the different uses analysed above – industrial, agricultural, human, etc. – are in competition with each other, adequate management must be guaranteed. Thus, consumption required for the survival of living beings takes priority over all other uses and is recognised as a human right since 2002. Together with **supply** – the water necessary for life – we must also ensure adequate **sanitation**, which is basic to avoid disease, ensure human dignity and to avoid contamination of the environment and in particular the water sources.

Both aspects are accepted as being key to human development and the fight against poverty, due to the fact that these are the main deficiencies affecting developing countries and above all the poorest sectors (see figure 3).

These facts have been confirmed by the concerns of the international community since the 1977 United Nations Water Conference, held in Mar del Plata, when it took on the challenge to achieve universal access to water supply and sanitation during the 1980s.

Almost ten years after the 2000 Millennium Summit – where the commitment was undertaken to halve, by 2015, the proportion of people who in 1990 lacked these services – it is calculated that close to 1 billion people still have no access to drinking water and over 2.5 billion lack adequate sanitation systems. Despite this, it is estimated that commitments relating to supply will be fulfilled worldwide, but those relating to sanitation are seriously compromised. The critical regions are Sub-Saharan Africa and Oceania, where the established objectives are not going to be achieved. Furthermore, the differences between urban and rural areas in many countries are stark – with rural areas reaching figures of 34% for the sanitation and 18% for the supply – and this is where the emphasis must be placed in order to achieve the international commitments.

We should stress that access to water and sanitation inevitably conditions each and every one of the other Millennium Goals. The increasing lack of progress in this area could threaten that progress already achieved (see figure 4).

Climate change

Climate change is causing a global increase in temperatures which will modify the spatial and temporal distribution of rainfall, generating a notable impact on the water cycle, affecting rivers and their associated ecosystems. Extreme phenomena – droughts and floods – are forecast to become more frequent and will particularly affect Asia and Sub-Saharan Africa, as well as significant areas of South America.

Water availability will also be compromised by the foreseeable degradation in quality due to changes in its temperature and the seasonal distribution of the volumes of flow. Furthermore, the rising sea level threatens to salinise the coastal aquifers, which will have serious supply consequences for those populations dependent on them.



04 Water and the Millennium Development Goals



The MDG were agreed at the 2000 Millennium Summit by the Member States of the United Nations. One of the targets that was agreed is to halve by 2015 the percentage of people who lack sustainable access to safe drinking water and basic sanitation services.

Fulfilling this target is essential for people's health and in the fight against poverty, hunger, infant mortality and gender inequality. It is also a basic element for attaining human rights and dignity for all human beings. As such, access to water must be a necessary and transversal condition for achieving all of the MDGs.

[> <] Source: Millennium Campaign

These circumstances, which are presently only characterised on a global scale, must be taken into account when it comes to managing water under the precautionary principle and using transparent and participative policies.

The future water-related keys

Insofar as water is a limited natural resource and a public asset with a multitude of associated functions and uses all competing with each other, its management must be dealt with by taking ethical considerations into account. Within this context, recognising and implementing the human right to drinking water and sanitation is a challenge which is conditioning the policies in the sector to the extent

that it recognises access to water as a right and not as a commodity, and that its management must be tackled from the political sphere without the interference of profit expectations.

Achievement of the Millennium Development Goals sits within the process to implement the human right to water; political and financial support must be ensured for such purpose, which must, in any event, be realised within the framework of integrated, efficient, participative and democratic management of water resources. This approach, together with strengthening public institutions with water-related competences, will ensure that any potential conflicts which may arise are settled through negotiation and cooperation between the interested parties. <

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05 Biodiversity

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Human beings do not live in isolation from the environment: we depend on the environment for our food, to breathe and to enjoy our free time. The environment offers us all these services, thanks to biodiversity.

What is biodiversity?

Biodiversity is a fundamental characteristic of life. The world is inhabited by millions of living beings, all different, and it is thanks to these differences that we stay alive.

Biodiversity can be defined as a variation which takes place in living beings. In order for that variation to take place, the Earth has needed 4 billion years. As living beings, we have had to adapt to different situations throughout the Earth's history in order to feed ourselves, communicate, reproduce, etc. Every living being has evolved in distinct forms throughout each environment, and this is what has led to the differences.

In order to find out about and measure biodiversity we have to classify the living beings. The smallest classification unit is the species. The species contains individuals which have similar characteristics and which can reproduce with other members of the same species.

We only know about 10% of all of the species that currently survive. It is estimated that there are between 10 and 30 million plant and animal species in the world today, although if we were to consider the bacteria, fungi and microorganisms the number of species would rise to 100 million (see figure 1). The smallest species are the most unknown and also the most numerous.

Biodiversity can be measured on many levels

When it comes to analysing biodiversity, we can measure it on different levels:

Genetic biodiversity: this measures the level of diversity in the genetic information inherent in each living being. This variation ensures the survival of the species faced with environmental changes.

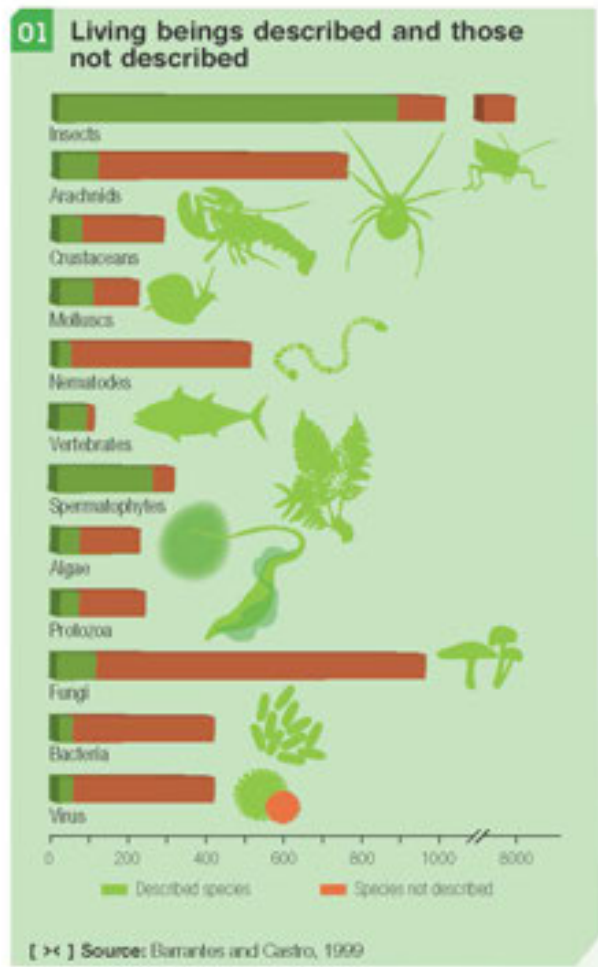
Genetic diversity is also seen in agriculture. Agrarian biodiversity

is the result of the interaction between human selection and nature. This is how the most adequate species have been developed for each environment.

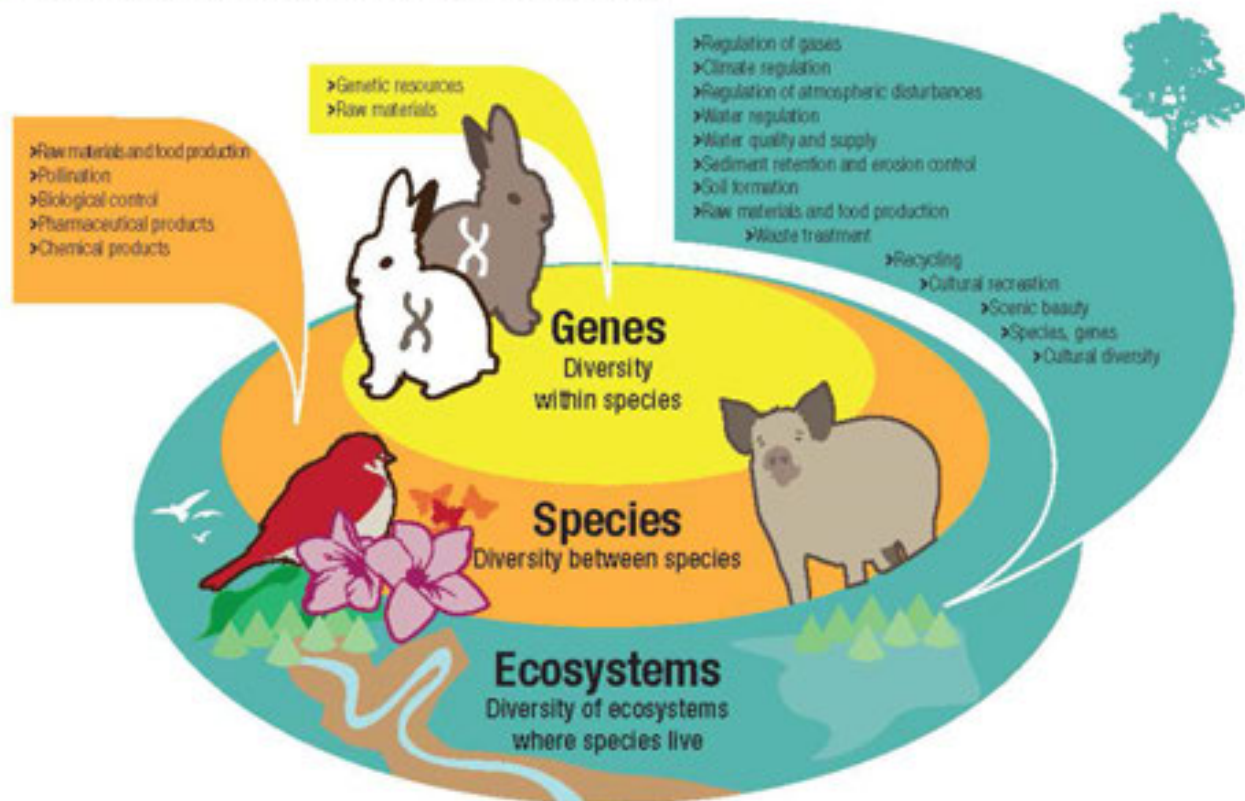
Specific biodiversity: this measures the diversity of the species living in a territory. It is often measured as the amount of species in a territory.

Taxonomic diversity measures the level of affinity between species. If the affinity between the species in an area is very low, the diversity will be high.

The endemic species, in other words, those species limited to a very small part of the world, are also important. If the individuals



02 Some goods and services provided by biodiversity



[> <] Source: Barantes, G., Castro, E. 1999

in that area disappear, then the entire species will also disappear.

Some species play an essential role in maintaining the ecosystem. These species must be identified and particularly looked after so that the ecosystem can be maintained.

Ecological biodiversity and the diversity of the ecosystems:

this is more difficult to measure than those mentioned above. It measures the variation between the ecosystems. The ecosystem is a dynamic and relatively autonomous system made up of a natural community and its physical environment. In this system, energy and material are exchanged between the living beings.

Why is biodiversity important?

Many of our daily activities would not be possible without biodiversity. Thanks to biodiversity, we obtain different services from nature (see figure 2):

Provisioning services: thanks to the ecosystems we obtain, amongst other elements, food and fibre, fuel, genetic resources, biochemical products, natural remedies, medicines and water.

For example: throughout history humans have grown 7,000 plant species as food.

Medicines to treat many human ailments are extracted from plants and animals.

Regulation services: ecosystems keep the air that we breathe clean, have the capacity to regulate the climate, control floods and the spread of disease. They are also essential for soil maintenance, plant pollination, purifying water, etc.

For example: forests fix CO_2 and produce O_2 . Roots hold the land together, maintain the soil, and also filters water that passes through it.

Support services: these services form the basis of all of the others. These include the food cycles of the ecosystems, the land formation, etc.

For example: the ground contains different bacterium which decompose leaves that fall on the ground, dead animals, etc., and turn them into food which can be used by living beings. Were this invisible function not to exist, plants would not be able to extract minerals from the ground, and herbivores would have no grass to eat.

Cultural services: different cultures in the world are, to a large extent, the result of the different ecosystems specifically developed in each place in relation to its living conditions. In many cultures, animals and plants found in nature take on a special religious value.

Where is the biodiversity?

We can find components of biodiversity anywhere. Following are a few examples (see figure 3):

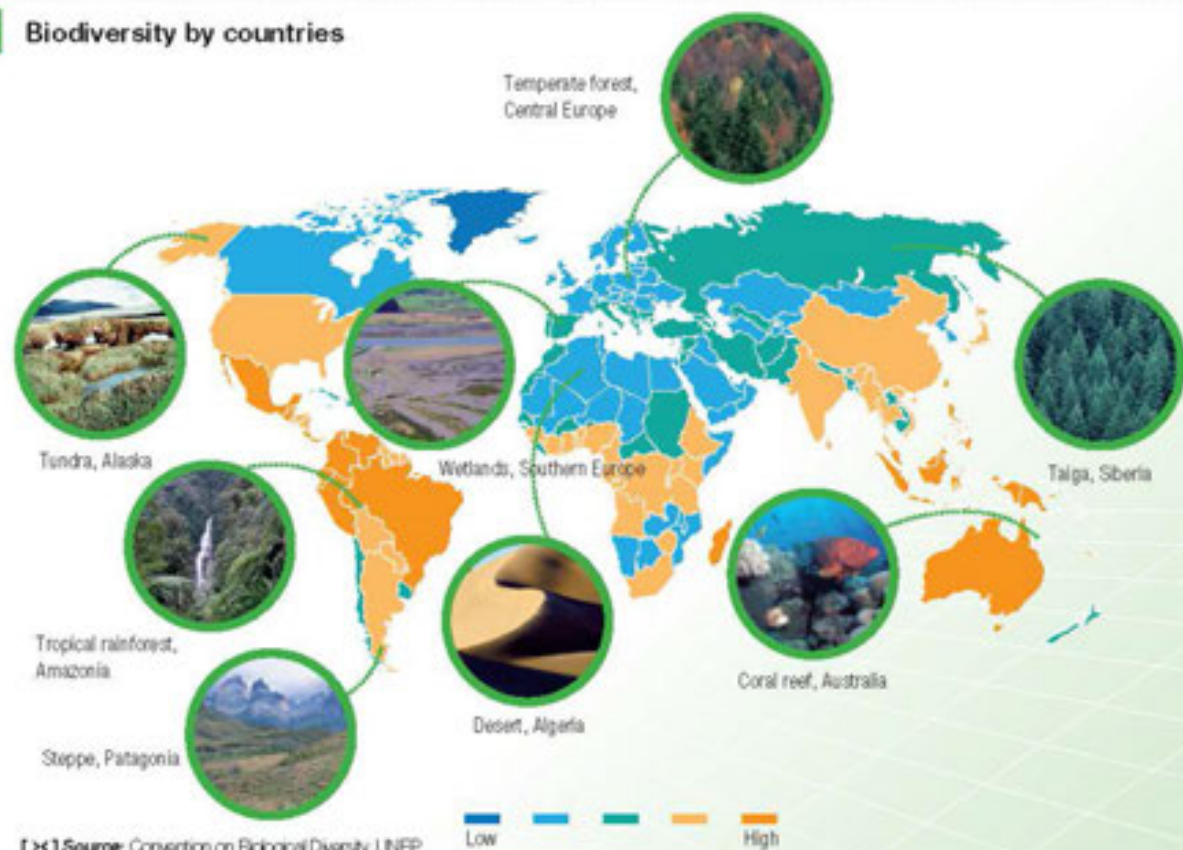
Wetlands: these may form close to the sea or inland. In general, these are areas of shallow water. They are usually particularly rich areas and are also areas where migratory birds choose to rest.

Aquatic habitats: these include freshwater and saltwater fauna and flora.

Terrestrial habitats: these include different types of ecosystems, conditioned by the climate and local use:

- Deciduous forests in temperate climates.
- Taiga.
- Tundra.
- Pasture land.
- Chaparral.
- Desert.
- Tropical rain forest.

03 Biodiversity by countries



Environments arising from human activity: these do not appear in the normal ecosystem classifications, but are an important part of current world biodiversity.

- **Rural areas:** there is biodiversity in the rural land farmed by human beings. It results from years of interrelation between human beings and nature, obtaining some species which have adapted to different environments.
- **Urban areas:** despite the fact that cities take up only 2% of the land surface, they consume 75% of the resources. City lifestyle has a direct influence on the biodiversity. There is also life on different places of the cities.

What is happening?

Over the last 540 million years there have been five very well-documented mass extinctions, particularly amongst marine plants and animals, and between 75 and 95% of these species have been lost. The reason behind these extinctions is not clear in most cases (see figure 4).

According to the most optimistic forecasts 27,000 species are currently lost every year due to human activity. In the past, without human interference, only about one species per thousand was lost per year. The current situation is that over a very short period, 12% of plants, 11% of birds and 25% of mammals have become extinct or have become endangered species. It is extremely clear that we are facing one of the most significant periods of destruction in geological history.

The hot spot of this problem is found in the tropical jungle: between 50 and 90% of species live in tropical jungles. Nevertheless, 17 million hectares of jungle are lost every year

and if clearance continues at this pace it is estimated by experts that 20% of all species would become extinct within the next 30 years.

Currently, there are very few basic agricultural species. Out of all of the species sown throughout history, only 30 of them monopolise 90% of our food with 50% of our diet consisting of wheat, rice and corn. This drop in the use of species has contributed to the loss of many species and varieties.

Biodiversity is very important in order to maintain farming production. High diversity reduces the negative impact of pesticides and pathogens on crops, and keeps the door open, so that farming communities can deal with future climate and environmental changes and market fluctuations. At the same time, plants may be sown in the future which could be found in the remaining natural ecosystems.

Between 20 and 50% of the ecosystems have been transformed for human use. Infrastructure, urban areas, etc. related to human activities take up increasingly more land.

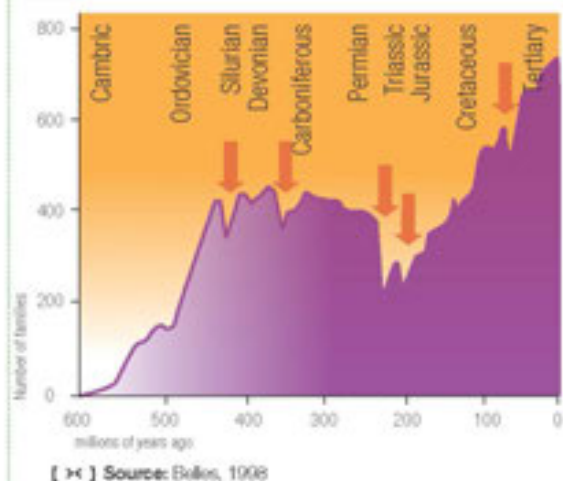
There is excessive fishing and, as a result, anchovy, hake and other marine species, which are a regular part of our diet, are at risk of disappearing.

We transfer plants, animals and virus from their places of origin. Some of those animals and plants become invasive species and displace the autochthonous species. Transferring virus can, at the same time, spread diseases.

Changes in the distribution of species have been observed as a result of climate change caused by human beings. For example, storks used to emigrate in autumn from the Iberian Peninsula to Africa where they would spend the winter. They now, however, spend the entire year on the peninsula. All these added changes



04 Large extinctions



increase a species' risk of extinction.

The loss of biodiversity, and the resulting loss of services, has an influence on human health and living standards. For example, many shrimps come from the lakes in Asia which used to be mangrove swamps. Due to the disappearance of the mangrove swamps, the natural protection against flooding and marine aggressions is lost. Furthermore, the local fishermen cannot continue fishing in these areas and cannot eat the shrimps because of the price. This shows that the failure to respect biodiversity can also lead to situations of social injustice.

The loss of biodiversity has a negative impact on human health. Diseases like malaria and dengue are caused due to the deforestation of tropical jungle, and cholera, on the other hand, is due to the lack of water hygiene. It is forecast that these three diseases, which are caused by failure to maintain natural biodiversity, are likely to increase in the future.

What is going to happen?

We are witnessing a situation where places which have lost mangrove swamps and coral reefs have become increasingly affected by floods and tsunamis, with increasingly worsening consequences. The tsunami at the end of 2004 in Southeast Asia would not have had such fatal consequences if the coastal mangrove swamps had not been turned into lakes for breeding shrimp. Mangrove swamps are nature's defence against this type of phenomena.

The extensive use of transgenic species may lead to the disappearance of the autochthonous species which in turn will

lead to a future reduction in agrarian resources.

It is forecast that the forests, and particularly the tropical jungles, may be lost. The principle cause is the change of land use (turning forests into rural areas, rural areas into urban areas, etc.). The foreseeable loss of biodiversity will lead to a water shortage, particularly in developing countries, and increasingly poor water quality. As we can see, the failure to look after nature invariably leads to heightened injustice.

At the same time, taking into account the importance of forests in fixing CO₂ and the influence that the quantity of CO₂ has on climate change, we can only come to the conclusion that climate change will continue increasing.

Many fish are on the brink of disappearing in many rivers and seas. Fishing is currently an important part of our food cycle, but what will happen in the future? Perhaps there just won't be enough to go round.

What can we do?

In spite of the fact that the panorama is not very bright, biodiversity is beautiful and there is still plenty of it for us to look after. We still have time to take certain measures:

Responsible consumption: we have to use the resources offered by biodiversity, but we must use them in a moderate and efficient manner. For example, we should only consume those products which we need, avoid purchasing products just because they are in fashion or cheap, purchase local farm produce in order to guarantee that we maintain the diversity of autochthonous rural species, and remember that we consume a lot of raw materials unnecessarily by purchasing highly packaged goods.

Looking after local biodiversity: respect nature. Don't throw litter, don't break the plants etc. Leave them the way you found them so that others can also enjoy them.

How much space do we want to take up?: we currently occupy a large part of the Earth for urban areas, roads and infrastructure, leaving no room for many plants and animals. We must leave some areas of our topography intact so that a minimum biodiversity can be maintained. This is the role played by nature reserves.

Control of invasive species: we must find them and help to eliminate them. They steal space from the autochthonous species and hinder the development of local biodiversity.

Look after the oldest trees in order to ensure their future existence: look after the fungi, lichen, birds, etc. which live on or in the oldest trees.

Ultimately, every day, we must look after living beings wherever they are. <

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06 Energy

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Energy use has been constant throughout the history of mankind. Nevertheless, increasing consumption is currently posing extremely serious problems. We must therefore give serious thought to our behaviour and decisions must be taken which help us to act in a more responsible and supportive manner.

How much energy is consumed? Do we all consume the same?

Lifestyle changes have greatly increased consumption due to evolving population habits. Basic functions, such as eating, have hardly doubled the energy consumption since primitive times. However, the introduction of new lifestyles during the industrial revolution and the present technological revolution, have drastically increased consumption during our times and it is forecast that this situation will continue in the future.

Notwithstanding this, energy consumption and human development are very unevenly distributed. There are areas with values far below the world average: large parts of Africa –particularly in the Sub-Saharan area–, Southeast Asia and the Pacific and large areas of Latin America and the Caribbean, in other words, the so-called developing countries. Other areas have enormous consumption levels, in particular the USA, Canada and Norway –the latter countries’ consumption is attributed to large gas and oil extraction industries in comparison to their scant population–. This situation leads us to think about what would happen in regards to energy consumption if the desired economic and social development of developing nations is achieved following the same criteria seen to date.

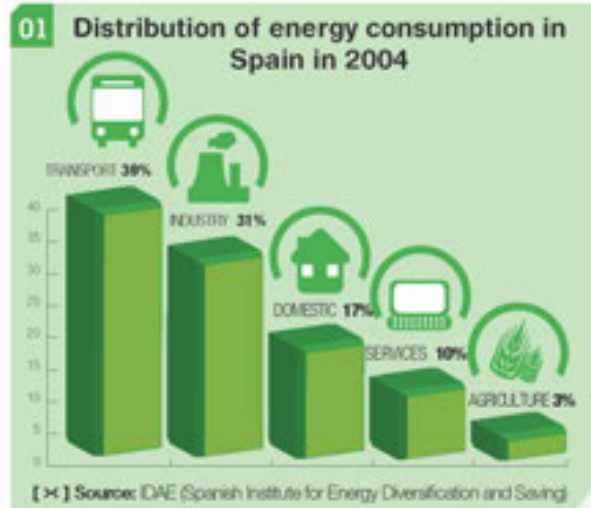
Insofar as the use given to energy, **figure 1** shows the percentages devoted to each sector in Spain. The

worldwide distribution varies from country to country as it is clearly linked to their standard of living and development, and predominant type of economy. Each sector has to be studied in order to adopt suitable energy saving and efficiency measures.

Energy sources and environmental consequences

Before we look at the different sources currently used to obtain energy, a distinction must be made between **primary energy** and **final** or **secondary energy**.

Primary energy is that which has not been subject to any conversion. **Final energy** is that which is available for use because it has been suitably converted and transported, a good example is electricity obtained from fossil fuels. Apart from the continuous increase, it is a fact that the consumption of primary energy is clearly higher than the final energy consumption which provides indisputable evidence that the conversion processes are only relatively efficient. Work must therefore be done to improve the technology of these conversion processes, searching for more efficient processes which generate the least possible amount of contaminating agents.





[><] Source: Own preparation

The energy sources currently available are summarised in figure 2 which shows the distinction between non-renewable sources and alternative or renewable sources, as well as the evolution in worldwide consumption and the forecasts for the near future. At present, fossil fuels represent around 80% of the total, nuclear about 6-7% and renewable sources, including hydroelectric, no more than approximately 10%.

The analysis of the environmental problems caused by energy consumption must therefore consider:

- Fossil fuel combustion processes.
- Nuclear energy.
- Renewable and alternative energies.

The main problems caused by the different by-products deriving from the combustion processes are: increase of the greenhouse effect and its subsequent impact on climate change, photochemical or dry smog, damp smog, acid rain, particles, and health problems due to the chemical compounds.

These are all important, but at present perhaps the main concern on a worldwide scale is global warming due to the greenhouse effect produced as a result of human activities which increase atmospheric CO_2 and CH_4 (see chapter 3 of this manual).

The discussions about nuclear fission energy are

essentially the risk of accidents and waste generation. The former can be minimized through adequate policies and technical actions, for example 3rd and 4th generation reactors and additional measures.

As far as waste is concerned, there are two main groups: low and medium activity, and high activity. The latter, mainly deriving from fuel used at nuclear power plants, has long half-life and high heat and α , β and γ radiation emissions, which makes it dangerous for hundreds of years. The big issue to be resolved is the waste elimination, although there is serious research being conducted into both storage and processing.

Alternative and renewable energies are inexhaustible sources of energy or those which can be regenerated over a short period of time. They are characterised by their low contaminating potential, although their full lifecycle must however be analysed in order to assess their real contribution to sustainable development.

Energy consumption and living standards. What's the link?

This is a fundamental issue as it seems accepted that energy consumption is an indisputable indicator of

Alternative and renewable

h generators

power plants

energy from the tides
energy from the waves
energy from the thermal

from differences in

f Solar
Thermal: direct use of solar panels for heating/refrigeration
Thermoelectric: power plants
Photovoltaic: semiconductors to produce electricity in power plants or for individual use

g Geothermal
Use of the thermal flow inside the Earth's crust

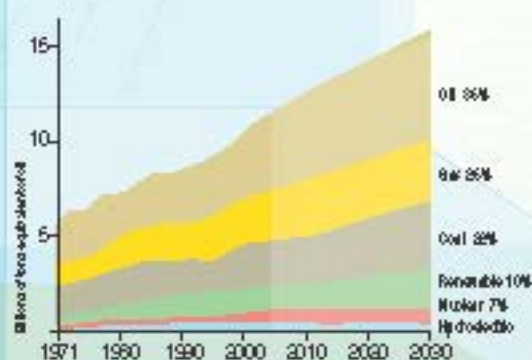
h Biomass
Direct use as fuel and production of biofuel
Biogas

i Urban and industrial waste
Waste with high calorific value

j Hydrogen



Primary energy demand forecasts



[X] Source: IEA, World Energy Outlook 2005

living standards. High consumption would be linked to a high GDP (Gross Domestic Product) and could be interpreted as a way of gauging the population's welfare; this interpretation is not however entirely correct. The GDP is not the only standard of living indicator. Energy consumption does, up to a certain point, indicate a country's level of development but once we reach certain minimums, there is no direct relationship between both concepts. Measuring the level of development requires the use of indicators which more precisely consider aspects over and above the merely economic. One of the most commonly used is the Human Development Index (HDI) which takes three indicators into account: life expectancy, access to education and GDP per capita. Figure 3 compares the HDI values for different countries with their corresponding energy consumption and shows that energy consumption is important for human development, although there is no direct correlation between energy consumption and the level of human development. Thus it can be affirmed that suitable measures need to be adopted in order to achieve society's sustainable development, reducing the consumption and promoting initiatives like those set out in the next section.

Towards a sustainable future: saving, efficiency and alternative energies

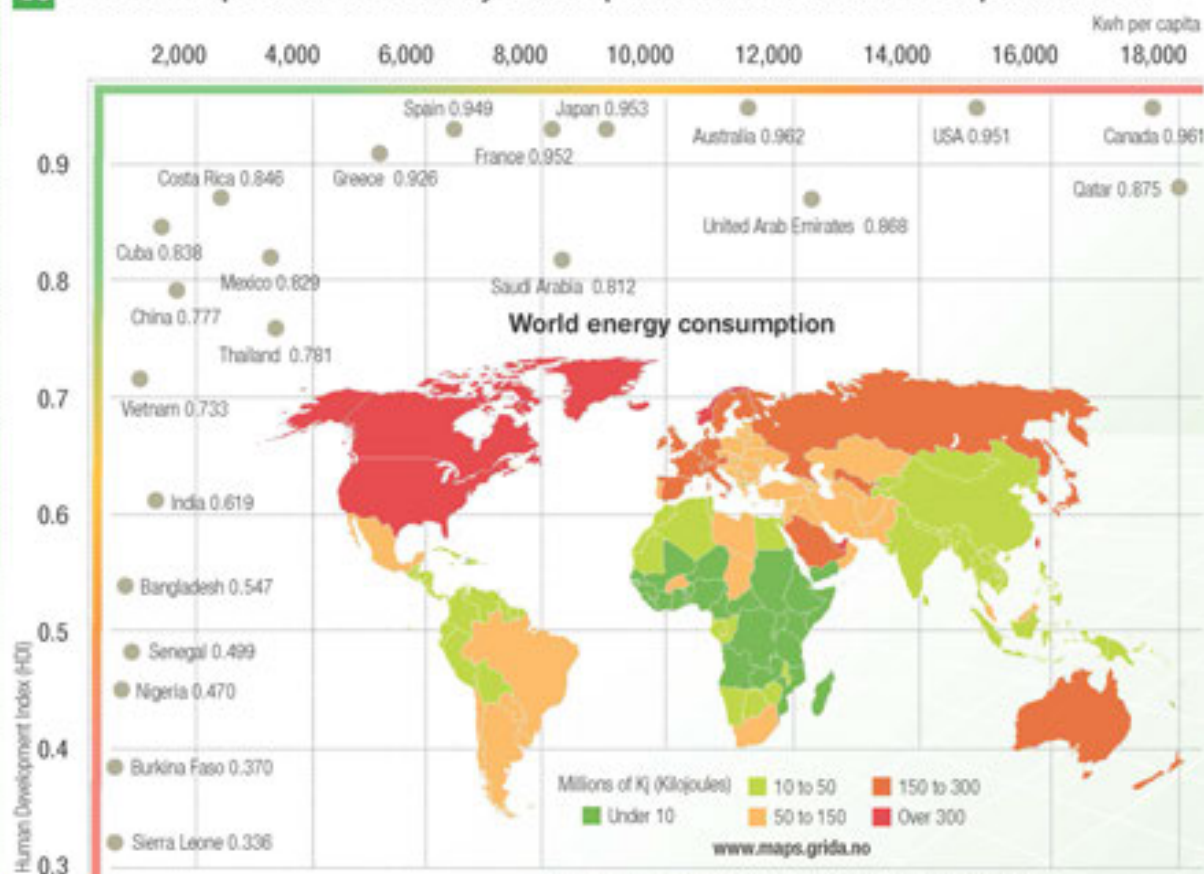
What measures can be adopted to rationalise energy consumption without reducing the standard of living? This poses two challenges:

- We must analyse energy-saving and efficiency measures capable of maintaining the same level of well-being and production, while reducing energy consumption.
- We must consider substituting more contaminating energy sources for others with less impact, in other words, increasing the consumption of alternative energy.

These challenges require an analysis of the measures to be taken and a decision on whom must perform the corresponding actions. There are of course different levels of action and responsibility. Thus, for example:

- The international institutions prepare and apply agreements between states, setting good practices and granting aid.
- The governments enact and apply laws, establish tax and subsidy policies, regulate the behaviour of companies and individuals, and define and apply market regulations.

03 Relationship between electricity consumption and the Human Development Index



There are countries with very similar HDI, at around 0.95, and very different energy consumption, even differences of over 100%.

[> <] Source: UNDP

- Industry offers certain goods and services, promotes innovation and technological change, and complies with legislation.
- Individuals use energy, choose the type and quantity of the goods and services that they consume, and contribute towards establishing social rules of conduct. Different action must therefore be implemented in a combined and simultaneous manner, such as:
 - Technological solutions: combined cycle power stations, energy cogeneration and trigeneration, liquefaction and gasification of carbon, sequestration and carbon storage techniques.
 - Domestic, industrial and institutional energy saving in their various activities: transport, green building, heating,

refrigeration, lighting, etc.

- Increase in the use of alternative energies:
 1. Free of greenhouse gas emissions: solar, wind, marine, geothermic, hydrogen.
 2. Greenhouse gas emitting: direct biomass use, production of biogas, use of biofuels in transport, use of waste products.

Only by adequately adopting all of these measures can we achieve sustainable development in the production and consumption of energy. People can and must directly influence this dynamic by adopting attitudes and behaviour which lead to the efficient and rational use of energy, and indirectly by influencing international, national and even corporate policies by applying democratic mechanisms. <

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07 Soil and soil degradation

[Juan José Ibáñez Martí]
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Unlike the atmosphere, geosphere, hydrosphere, biosphere and cryosphere, the edaphosphere continues to be practically unknown by most citizens. The edaphosphere refers to the vast regions of surfaced land of the planet covered by soils. This soil is essential in order to maintain the biosphere and climate regulation. For example, soil sustains farming production and stores various times more carbon than the atmosphere.

The soil resource

The ingredients of soil

Soil is not a simple mixture of different size rock fragments, organic material deriving from decomposed biological waste and the biological communities of small organisms living in the soil. Soil is a structure with very special qualities which forms a border between the atmosphere, the hydrosphere, the geosphere, and at times the cryosphere. All of these natural resources intermingle at the same time in a thin layer of only a few metres which can be thought of as the "Earth's skin". Due to the large amount of biomass that these store, as well as plant roots, some people consider the edaphosphere as a biomantle, or a "living being". Others say that it is a porous and heterogeneous layer which acts as the lithosphere's geomembrane (see figure 1).

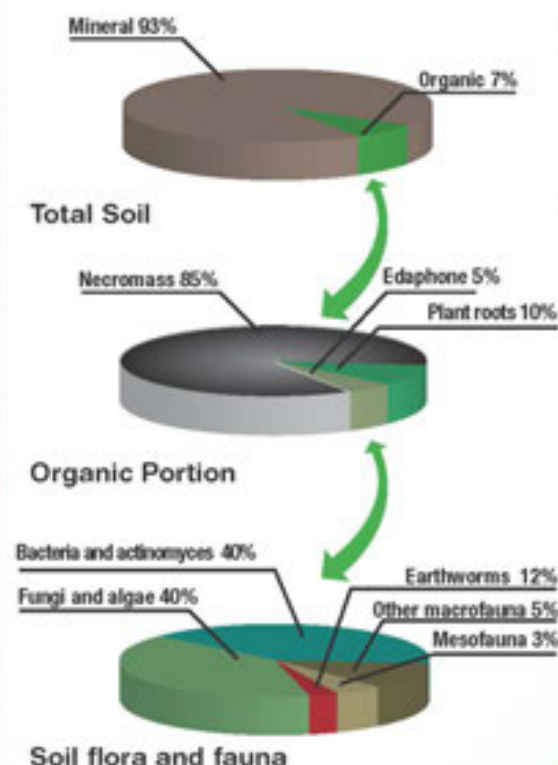
What is soil?

Rock is compact, dense and quite homogenous in its composition with very few porous spaces. Soil, on the other hand, is very heterogeneous in its constituent elements, and also houses an extremely large number of pores. Hence, when a rock or sediment is transformed into soil, it swells up and acts like a "sponge".

The soil particles are not usually dispersed, but tend to group together in **aggregates**. These bind together such particles through two main groups of polymeric molecules, which behave as gels, which we call **clays and humic acids**. The latter are a product of the decomposition of dead biomass, or **necromass**.

It is these two gels, with cement-like properties, which give the soil its sponge-like properties, not only

01 Soil Composition



The organic matter is found in much less proportion than the mineral portion, its role, however, is essential for soil evolution and its properties.

[>>] Source: University of Granada

when it comes to retaining water but also by extending its large useful space –much greater than the rocks–, increasing its catalytic activity –reactions which accelerate the recycling of trophic chain nutrients–, storing the chemical elements essential for the growth of vegetation, and expanding the storage capacity of the biomass and biodiversity responsible for such recycling. One square metre measured on the surface has up to 100 times that area inside –internal area vastly greater than that of a rock–. Thanks to these characteristics the roots can explore large areas in "a small space" in the search for water and nutrients. This is also why soil is considered as an "immense bioreactor".

As the soil evolves over time it forms many different layers called **horizons** (see figure 2).

The services of the soil

Soil is essential for both the biosphere and people due to the services and functions that it performs.

Ecological services

- Production of biomass: food, fibre and energy.
- Medium which filters, regulates and transforms the matter that reaches it, protecting the water, the food chain and human beings from environmental contamination.
- Biological habitat and genetic reserve for many plants,

animals and organisms.

Services relating to human activities

- Physical medium which serves as a support for industrial and technical structures, as well as socioeconomic activities.
- Source of raw materials: water, clay, sand, gravel, minerals, etc.
- Element of our cultural heritage, which contains essential paleontological and archaeological remains for understanding the history of the earth and humanity.

Degradation and loss of soil resources

Soil is not a resource which can be renewed by humans. Its regeneration requires hundreds or even thousands of years. A distinction must be made between soil **degradation** and soil **loss**. The former means that the resource is not lost, rather it deteriorates and loses part of its properties which affects its functions or "services" as referred to above. The latter signifies that the soil disappears.

Soil loss

If soil is not used by humans with care and wisdom it is lost, as in extreme cases where the underlying rock surface is exposed through erosion, or when it is buried under cement or asphalt in the case of sealing.

Soil **erosion** can be caused by water, wind, ice or gravity. In these terms this refers to hydrological, eolic, glacier - periglacial and mechanical erosion respectively. In all of these cases, the external factor which exerts the most influence on erosion is the total or partial loss of vegetation cover which protects it from water droplets that would otherwise fall on it and destroy its aggregates, thereby deteriorating its sponge-like properties. Equally, the plant root networks help to retain the soil thereby slowing down the erosion process.

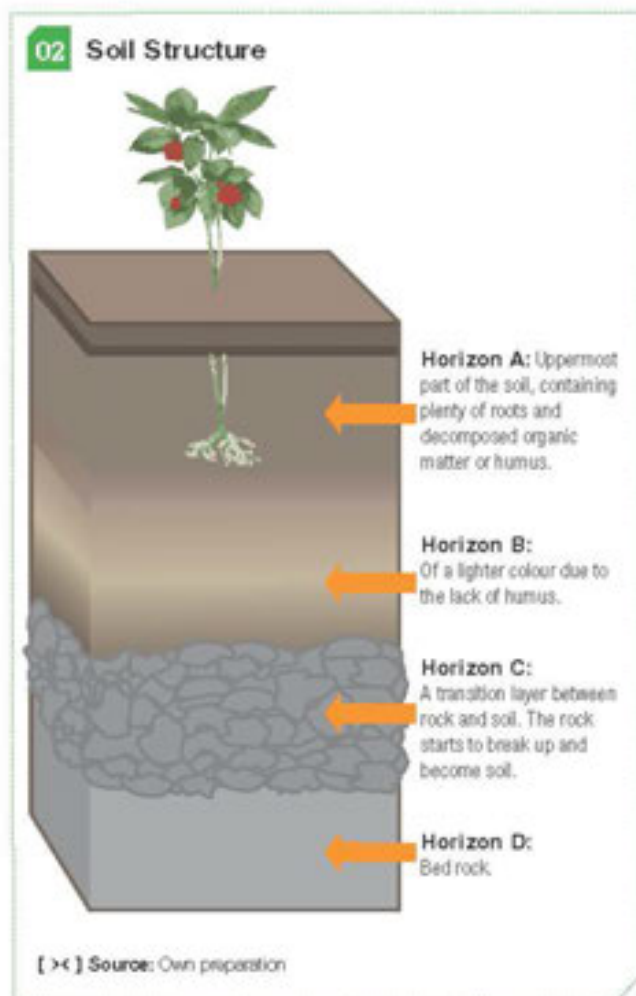
Sealing has only started to become a serious problem now that the number of the world's inhabitants has risen exponentially, and with it the increase in housing, industry and infrastructure (reservoirs, roads, airports, etc.) required to build and maintain them. At present, millions and millions of hectares are buried under asphalt and cement, and in some countries this situation occurs in more than 20% of their territory. But the fundamental problem lies in the fact that these man-made works are usually carried out on the most fertile and productive soils –river banks, meadows, coastal plains, deltas, etc.–, competing with and displacing agriculture and natural ecosystems.

Soil degradation

In general, soil degradation processes are attributed to poor use of edaphic resources by humans. There are many such processes and the most important of these are detailed below:

Loss of organic material: When land is farmed and the organic material which is lost is not replaced, the soil aggregates end up disintegrating into their constituent particles, deteriorating their structure and therefore, the edaphic properties.

Salinization and sodification: This refers to the processes which tend to increase the potassium and sodium salt



03 Factors contributing to soil contamination



[><] Source: Own preparation

content of the soil, to the detriment of other cations, like calcium, which are vital for plant nutrition. Under these circumstances, the soil pH rises excessively high –above 8.5–, generating erratic uptake of the nutrients required by plants. Frequent practices which lead to soil salinization are irrigation with relatively brackish water in climates with water deficits, improper fertilising, etc.

Acidification: Acidification is also a process which upsets the balance of nutrients. Most of the nutrients are leached out and are substituted by hydrogen or worse still aluminium. In this case, the soil pH drops below 4.5 –very acidic– whereby nutrients become very impoverished. When the aluminium ion ends up dominating, the pH potentially drops to 4, leading to problems of toxicity. Practices and phenomena which lead to soil acidification are, amongst others: acid rain, incorrect fertilising, restocking with acidifying forest species –for example conifers–, draining of semi-aquatic coastal soils which sustain mangrove swamp vegetation, etc.

Compression: This is the loss of the soil structure, in other words, the sponge-like properties mentioned above. Independently of the loss of organic material, plant cover or sodification which affect the surface compression, there are other factors which affect the deeper horizons, such as the use of excessively heavy farming machinery.

Contamination: Soil contamination is a very serious process which spreads like a plague throughout the edaphosphere (see figure 3). A distinction should be drawn between contamination and pollution. We use the






term pollution when an element which appears normally in the soil in moderate quantities reaches exaggerated and harmful levels. On the other hand, the term contamination should be reserved for those processes which lead to the accumulation of elements or compounds in the soil which are alien to it, such as insecticides, other synthetic compounds, and even radioactive substances.

The contamination and pollution processes can be divided into **local** and **widespread**. The former refers to a large accumulation of contaminating elements in relatively small areas, called contaminated sites, whether due to uncontrolled dumping, accidents at chemical industry and nuclear plants, etc. Widespread contamination on the other hand, contains less contaminating or polluting substances, although over a very large area. An example would be the excessive use of fertilizers and insecticides in agrarian landscapes.

Although the contamination/pollution may appear to be a local process it may have global repercussions. The edaphic medium amasses a certain capacity to absorb contaminants and/or pollutants, and if the threshold is exceeded, it allows them to pass from the soil into the water and/or plants, and from there into herbivores and then to carnivores and human beings. The World Health Organisation considers contamination/pollution to be the direct or indirect cause which leads to the most number of deaths in developing countries.

The generalised abusive use of agrarian chemicals is one of the main causes of soil and water contamination. The contaminant-rich waters in turn flow into the sea and poison the marine trophic chain.

04 Links between changes in land use and human wellbeing

Change in land use	Environmental impact	Human health and security	Socioeconomic aspects
 <p>Agricultural intensification</p>	<p>Loss of habitats. Exhaustion of nutrients. Eutrophication. Increased erosion.</p>	<p>Exposure to agrochemicals. Greater risk of flooding, landslides...</p>	<p>Social changes. Water conflicts.</p>
 <p>Loss of habitats</p>	<p>Alteration of biological cycles and food chains. Loss of capacity to regulate water and store CO₂.</p>	<p>Loss of ecosystem services and resources, including potential medicinal products. Greater risk of flooding, landslides...</p>	<p>Drop in resource quantity and variety. Loss of cultural values and traditional lifestyles.</p>
 <p>Urban expansion</p>	<p>Alteration of natural cycles. Loss of habitats and biodiversity. Concentration of pollutants and solid and liquid waste.</p>	<p>Diseases related to environmental pollution. Danger of flooding due to soil sealing and occupation of land at risk of flooding.</p>	<p>Increased opportunities for social and economic interaction, and access to services. Loss of identity.</p>
 <p>Soil degradation</p>	<p>Land and water contamination. Soil impoverishment. Loss of ecological functions.</p>	<p>Risk of water and food contamination. Food insecurity.</p>	<p>Low agricultural productivity. Damages to infrastructure. Increased land recovery costs.</p>
 <p>Desertification</p>	<p>Loss of habitats. Water shortages. Increased soil erosion, dust storms and sand intrusion.</p>	<p>Malnutrition. Respiratory illnesses and problems.</p>	<p>Poverty. Marginalisation. Population movements.</p>

[>] Source: GEO-4, Global Environmental Outlook, UNEP

Desertification

Desertification is the degradation and loss of soil in arid, semi-arid and dry/barren environments, i.e. in those with scarce water resources. It is not therefore a process per se, but rather the phenomenological manifestation of many other processes under certain environmental conditions. Under these conditions the landscape becomes arid, losing plant cover and biomass, and a drop in the organic material and biological activity in the soil.

Soil and climate change

The Earth's climate has undergone constant changes since its origin, with climate variation being the norm, rather than the exception. Having said that, when discussing global warming or climate change it is within the context of the alteration of the climate as a

result of human activities.

Even at present, when considerable expanses of the Earth have lost a lot of organic material due to agricultural and livestock activities, the amount of CO₂ stored in the edaphosphere is far greater than that in the atmosphere. If all of the CO₂ and CH₄ contained in the soil were to be mineralised and emitted into the atmosphere, the resulting climate change would lead to the collapse of modern civilisation as we know it. Hence, the soil can be a CO₂ source or sink, depending on how we manage it.

However, human beings are not only exerting an influence on the carbon cycle, we are also affecting many of the other cycles in the biosphere (see figure 4). One of the most seriously affected is the nitrogen cycle. If we do not look after our soil then we will be unable to look after the biosphere; because their persistence and health depends on us. <

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08 Demographic growth and development

[Carmen Sanz López and Adolfo Torres Rodríguez]
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Economic development as a factor in demographic changes

The first expansive phase of modern population growth started at the end of the 18th century on the European continent when the global mortality rates consistently dropped as a result of improvements to working conditions, food, health and public hygiene. The intensity and duration of this process did not occur in the same way in all countries. Hence the growth rates varied from 0.6% in France to the highest which was 1.7% in Poland. The population growth continued for 100 years.

Overpopulation ended with the successive waves of migration which colonised new lands –the high point was reached in 1910 with 2 million migrants–. But it was not only people who migrated, with them followed capital, new technologies, commercial exchanges and business know-how which, deployed in the vast open spaces of North America and Australia, led to the creation of new industrial powers. For this reason, these nations must also be included in the first stage of demographic growth, although

due to their specific characteristics –young population and very accentuated gender imbalance– it took place after 1920. The emigration also led to economic improvements in the countries of origin due to increased family income.

From 1850 to 1950 the world population grew by 1.3 billion people. This massive population rise brought great success and was directly related to the scientific, technological, economic and social progress derived from industrialisation. In all areas the demographic growth was synonymous with development and prosperity, and the most prosperous countries were those which grew the most and imposed their policies.

Demographic decline as a development factor: the population threat

The second expansive phase took place in a geopolitical and economic context inherited from the Second World War: the division between ideological and economic blocks, the arms race, the end of colonial emancipation –which plunged many new countries into military conflicts

01 Mass migrations and displacements

Mass migrations and displacements are still having a massive impact on the population in many parts of the world. There are many reasons for this: armed conflict, socioeconomic problems, environmental degradation, etc. According to various predictions, displacements due to environmental degradation will become increasingly significant in the future. The United Nations University Institute for Environment and Human Security estimates, for example, that in 2010 there will be 50 million "environmentally displaced persons", most of them women and children.



As a result of famine, since 2006 over 30,000 people have been displaced in Somalia and Ethiopia.

[>>] Source: IFRC/ICRC (International Federation of Red Cross and Red Crescent Societies) Photo: UNHCR/J. Björngvinnson

02 Relationship between poverty and demographic growth



[><] Source: Redefining Progress

encouraged or maintained by the superpowers— and the inauguration of International Forums —like the United Nations in 1945—. Conflict between economic and ideological interests conditioned the possibilities of economic development and brought technological progress to a halt —with the exception of some types of vaccines— in the new and emerging countries, just when a sharp increase in natural population growth was starting, known as the **demographic explosion**.

In regards to migration (see figure 1), the greatest flows took place within the continents; known as **horizontal migrations** —continental and regional—. There are very high economic profits, but these are considered vague and limited in use for economic and social development due to their clandestine nature in most of the companies. The fact that these movements are illegal makes civil and health protection impossible. On the other hand, the seasonal nature and variations in the directions of flow prevent schooling for children. This huge migratory movement has, however, had a negative impact on population growth for two main reasons: firstly as a vector for the propagation of difficult to control epidemics, including HIV/AIDS; and the other is the "feminisation" of the illegal migration —it is calculated at 70% in Asia and 47% in Africa—. All of these result in an increase in adult mortality, a drop in children surviving birth and survival rates during the first five years of life. The high growth rates —from 2.5 to 4%— lasted for an average of 15 years.

The United Nations Population Division was set up in 1946 to promote censuses being carried out throughout the world as well

as to provide unified technical criteria. Despite the Division's interest in obtaining reliable data, at the First Conference on Population and Development (ICPD) held in Rome in 1954, linear estimations and projections were presented based, for many countries, on surveys about tribal birth rates which failed to consider very common contingencies like the demographic consequences of wars or the subhuman conditions of the refugees. These first estimations, perhaps excessively inflated, placed the world population at 2.5 billion people in 1950 and, forecast growth of between 500 million and 1 billion by 1980. These figures alarmed the major powers and the Neomalthusians saw to it that they were spread. As a result a new theoretical approach was considered necessary between population and economy.

If, up until then, all of the research agreed in considering that economic development was the decisive factor in lowering mortality and birth rate, the drop in the latter now became an unavoidable condition for development. The rapid population growth meant —under such suppositions— a hindrance to the accumulation of capital prior to industrialisation, as seen by the link between poverty and prevailing demographic growth (see figure 2). Taking this reasoning, the birth rate contention strategies and policies became, in international forums and in bilateral relations, the key which opened the door to certain development aid programmes, including USAID programmes (United States Agency for International Development).

03 The role of women



[><] Source: Own preparation Photo: Alboen

Both the Millennium Development Goals and the successive International Conferences on Population and Development have emphasised women's rights, including sexual and reproductive rights. Empowering women is essential in order to advance towards eradicating poverty, to achieve social justice and to stabilize the world population.

At present, population growth rates are constant or decreasing, but the existing population base will mean that world population continues to grow. Thus, although the population growth will be slower in the 21st century than during the previous century, 2.6 billion people will be added over the next 45 years and, according to the forecasts of the United Nations Population Fund (UNFPA), in 2060 the planet will have 9.1 billion inhabitants.

All of this notwithstanding the backdrop of unequal wealth distribution and increasing environmental problems. The developing regions are currently home to 5.3 billion inhabitants which will become 7.8 billion in the next 45 years. In the richer countries however, there are presently 1.2 billion which, according to the predictions, will not increase significantly. We must remember that population is a factor which has an impact on the environment, not only due to the number of inhabitants, but also due to their consumption habits which is much greater in rich countries, where the ecological footprint is much greater (consult file 15. Responsible consumption).

Towards equalitarian criteria in the demographic policies

Within the framework of the International Conferences on Population and Development (ICPD), held every ten years, the concept of birth control as a basic requirement for development has been losing ground.

In the 1994 Cairo Conference, there was a radical change in the content of the objectives and strategies in relation to population and development. The first significant change is related to respect for national sovereignty to decide on these issues provided that they are based on Human Rights. The second new issue was the recognition of women's central role in family planning. According to these new objectives,

inalienable rights were vindicated, such as access to education and reproduction health –half a million women die every year due to birth-related problems, particularly in Africa–, or the right to legal and employment equality vis-à-vis men, given that women play a very prominent role in the family economy (see figure 3).

In the year 2000, the Millennium Development Goals reinforced the proposals of the ICPD to combat gender discrimination insofar as women are twice as affected by all of the urgent problems –hunger, illiteracy, infectious diseases, etc.–, since they suffer from higher degrees of marginalisation and discrimination.

These agreements emphasise that population and economy are not merely two factors which may have a reciprocal influence on each other, but that they are also closely connected through their link to gender equality, which affects social, economic and environmental sustainability.

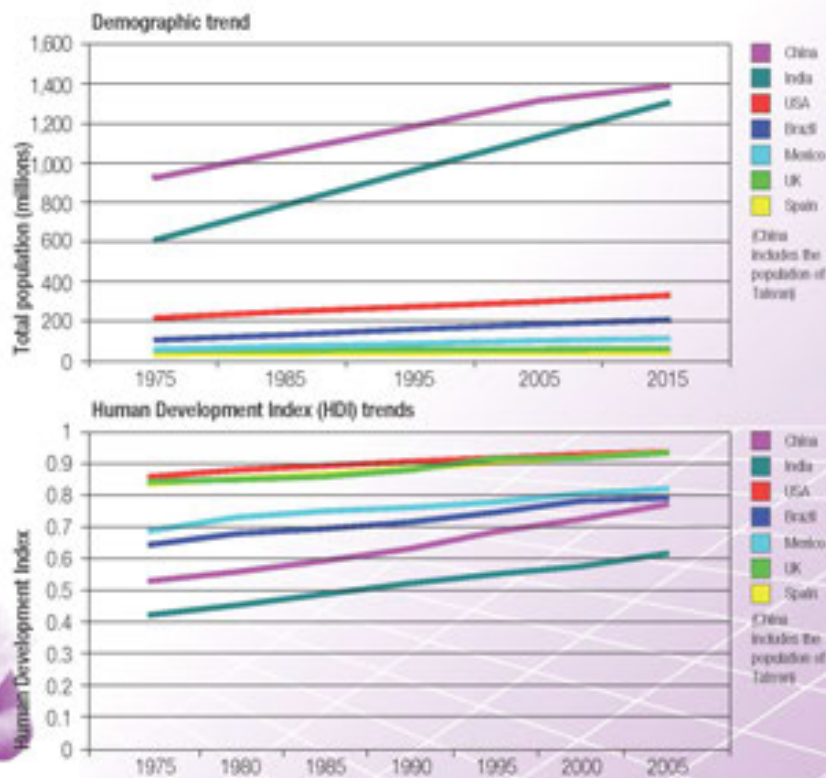
The case of the emerging countries

The so-called emerging countries are those which are undergoing an unprecedented economic boom backed by the economic changes deriving from globalisation –company relocations and low salaries–, new communication technologies, commercial flexibility and adaptation, tourism, etc. However, one of the most compelling reasons to encourage foreign investment is the degree of security or absence of conflicts. Hence, China comes out on top due to the duality advocated by its government: economic opening and intolerant political regime.

These are also large powers and their influence will be decisive in building a healthy, prosperous and environmentally sustainable platform for future generations. Having said that, one common characteristic of the emerging countries is that

04 Trends: demography and Human Development Index

Although there is a mutual influence between demography and human development, this relationship is not a determining factor.



[34] Source: Own preparation

they maintain and, even intensify, the social imbalances –rural/city; coast/inland– and above all, in relation to gender.

Amongst the emerging countries, Mexico, Brazil, China and India were the first to implement –from 1960 to 1970– birth control policies. The latter two were more radical and, almost fifty years on, their success in the control of population growth is notable, but it has also created serious social discrimination against women, which even starts before birth, as in the case of female feticides. The immediate demographic result –particularly throughout Asian countries– is the disproportion between the numbers of men and women: in China and India, 120 boys are born to every 100 girls and it is estimated that by 2030 there

will be a shortfall of over 20 million women aged between 20 and 49 years old. Far from being more socially valued as a result, the discrimination is even greater: gender-based violence, women trafficking, higher mortality rates and, even less health cover. The large migratory waves –continuous throughout history– is another very significant factor leading to the decrease in demographic growth in all of these countries.

As mentioned above, these countries have achieved significant economic growth, though they still face considerable challenges. For example, the Human Development Index (2007-2008) places Mexico in 52nd place, Brazil 70th, China 81st and India in 128th place. **Figure 4** shows the trends for both population and for the Human Development Index. <

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09 Cultural diversity

[Javier Malagón Terrón and Emilia Robles Bohórquez]
Proconal Foundation



Cultural diversity and everyday life

We could quite safely state that in our society everybody deals on a daily basis with people from different origins and cultures. In our neighbourhoods, places of work and study, and even in our families, there are people who come from different continents, who speak different languages, practise their own customs and profess different religions.

At the same time, we share and interact in the same environment which has many common values and norms, and we all act similarly in everyday events –like going to school or work, going for a walk, playing sports, shopping at the supermarket or watching television–.

Cultural diversity contains great potential for educational and personal development as it allows for mutual enrichment, thanks to those factors that **differentiate us** –languages, customs, historic

memories, beliefs, etc.–. This mutual enrichment is often made possible due to those factors that **unit us** –common values and norms of coexistence in everyday situations–.

We live in a plural society where cultural diversity exists and is manifest on many levels: the autochthonous population is diverse and the immigrant population is made up of many sociologically and culturally different groups. Although common aspects are shared, there is also diversity within these groups as no person is exactly the same as another. This diversity is manifest in many different cultural expressions which form part of human heritage (see figure 1).

«We must learn to observe the subtle differences in order to combat stereotypes, prejudices and the reductionist ideas which conceal the reality.»

01 Cultural expressions and heritage



Athens Acropolis, Greece (Tangible Cultural Heritage)



Kun Qu Opera, China (Masterpiece of the Oral and Intangible Heritage of Humanity)

Cultural expressions are those manifestations of the creativity of people, groups and societies: music, dance, the arts, language, works of art, etc. Some of these manifestations are designated by UNESCO as Masterpieces of the Oral and Intangible Heritage of Humanity. On the other

[>>] Source: Own preparation

hand, some material and natural assets are declared World Heritage.

The conservation and transmission of heritage allows us to understand and find out about history and cultures, thereby building people's collective memory and identity.

02 Main regulatory instruments in favour of cultural diversity

Photo: UNESCO/Ricco



Photo: UNESCO/Ravaessard



Photo: UNESCO/Anis

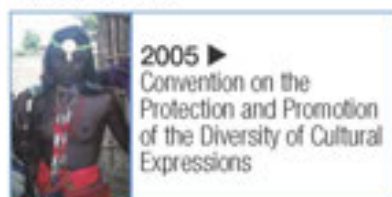


Photo: UNESCO/Breuer



Photo: UNESCO/Ravaessard

Cultural diversity refers to the many forms in which the cultures of groups and societies are expressed.

Interculturality refers to the equitable presence and interaction of different cultures and the possibility of generating shared cultural expressions, acquired through dialogue and an attitude of mutual respect.

Photo: UNESCO/Masardo

[><] Source: Own preparation

Furthermore, in changing societies like ours, people, depending on their background, may behave differently and we can also evolve due to the fact that we change, our values change, our vision of the world changes and our conduct changes.

Cultural diversity in History

Nowadays, culturally uniform societies are very rare and find it very difficult to ensure their continuity in an interdependent and globalised world. Cultural diversity is not however a new phenomena. To a greater or lesser extent, and in different ways, the coexistence and interaction of culturally diverse people and human groups have been habitual in the history of many societies.

Mesopotamia, Egypt, China, India, the Mayan and Azteca Empires, Greece and Rome, territories under the influence of Christianity, Islam or Buddhism, were all large cultural areas which were never static or homogenous, even though they had majority or hegemonic cultural expression, or the fact that the changes may have occurred more quickly in some and slower in others. The importance achieved by these civilisations is easier to understand if we take into account their capacity to assimilate cultural contributions from different origins.

We must therefore realise that:

- Culture change and cultural diversity are opposite sides of the same coin. **Open societies are at the same time dynamic and culturally diverse.**
- Cultural diversity is a habitual fact of our daily life and **forms an indissoluble part of the world in which new generations will have to live.**
- Such cultural diversity is however a relative phenomena, **as it is set in a global culture where many ways of feeling, thinking and acting are shared.**

The principle regulatory instruments which directly or indirectly favour cultural diversity are set out in **figure 2**.

Interdependence and critical autonomy

Educational processes can help people remain open to socio-cultural changes and adapt to different environments and circumstances. **We cannot live in isolation as humans, in fact any form of life is only possible with interdependent relationships.**

If we can make our social relations positive and varied, then this will facilitate the development of communication competences and social skills thereby increasing the possibilities to choose, without necessarily falling into individualist and unsupportive attitudes.

03 Linguistic diversity

Map of the languages of Mexico, Guatemala and Belize



[> <] Source: AMARALINA-UNESCO Etxea

Over 50% of the 6,700 languages in the world are at serious risk and it is possible that they may be lost over the next 1 to 4 generations.

96% of the world languages are spoken by 4% of the world population.

The incorporation of immigration languages is a phenomenon caused by globalisation which also enriches the linguistic diversity of the recipient countries. For example, in the Basque Country it was discovered that by 2007 the foreign people had brought with them over 100 languages.

-The world is a mosaic of visions and each vision is embodied in a language. Whenever a language dies, a vision of the world disappears.-

David Crystal (linguist)

However, we are also obliged to provide elements so that learners develop **judicious autonomy** regarding different cultural possibilities, contributions or creations operating in our society. In short, although opening up to and valuing cultural diversity are values which must be encouraged, it is obvious that they cannot and must not be considered absolute values. In other words, respect for cultural diversity is only possible within a broader development framework of **human rights** and **democratic coexistence**, so as to progress towards fairer societies, regarding both the extension of civil and citizen rights and the distribution of wealth.

Between conservation and change

The conservation of linguistic roots helps us to understand peoples' traditions, sayings, stories and myths. The trend towards recovering the roots must be combined with the capacity to communicate in a globalised society in which the knowledge and use of other languages is essential, and favours intercultural links and relations, without overlooking the fact that **linguistic diversity** is a very important value in itself (see figure 3).

Conserving and/or recovering certain cultural aspects may be as important for social cohesion and sustainability as their transformation or substitution for others. **We should neither advocate the myth that all change and everything new is positive nor defend the opposite.**

School and all learning centres cannot be merely reproductive structures of a culturally homogenous order, but rather must become **workshops and experimentation laboratories**, where one learns how to critically conserve,

produce and transform culture. This means empowering pupils, providing them with resources so that they can deal consciously, critically and responsibly with their lifestyles.

We should move on from those approaches that put too high a value on novelty and change, and from those that seek to leave everything the way it is. Societies' continuity and progress depends both on cultural conservation and transmission dynamics –endoculturation–, on the capacity to inspire creativity and adapt to new situations and the ability to open up to different contributions.

The value of little things in the global context

According to Bauman, globalization is being considered as "the naturalisation of the direction in which the world is changing". One value to foster in this highly uncertain and complex context is that of **participation** in the public sphere, from one's own identity –understood as a process of continuous construction–, and from the sense of belonging –neighbourhoods, associations, etc.–, in relation to the broader processes.

One example that shows the value of little things would be **education for sustainability** related to cultural diversity. We should encourage sustainable attitudes and practices in the personal sphere, at home, in the neighbourhood, in the groups to which we belong, while at the same time providing feedback and connecting with broader experiences. Thereby, responsibility for a global vision which is not limited to monitoring the local effects of the actions, but rather seeks to see their possible consequences on the planet, is assumed.

On the other hand, knowledge about other cultures' ecological practices may help us improve our relationship with nature, concerning the use of water, waste recycling and energy efficiency, amongst other things (see figure 4).

Basic competencies and skills

We can learn from each other, encouraging a pedagogical perspective which places value on cultural exchange, not only between people of different geographic origin, but also between people from different generations.

Amongst the many ideas that could be cited about the basic competencies and skills to be developed in a context of cultural diversity, apart from those mentioned above, we could emphasize the following:

- **Learn to live with risk and uncertainty.** We must force ourselves to understand the complexity involved in social and cultural diversity and to accept that coexistence involves risks and uncertainties, which are not always a threat and can present opportunities.
- **Handle different codes.** In the context of change and diversity it is important to acquire competence in the handling of different cultural codes and to develop communication skills so that they can be adequately used in different situations. The new generations will have to control various languages fluently and learn how to evaluate and adapt themselves to different human relations and communication situations.
- **Cultivate a broad spectrum of viewpoints.** Today's world cannot be explained only from the perspective of a single society or culture. It is necessary to know the history of different societies, their philosophical and religious schools of thought, their moral rules and behavioural criteria, their contributions to the knowledge of nature and technological development.
- **Promote intergenerational communication.** Today's diversity does not only refer to ethnic groups, languages and religions. In order to advance towards a more habitable world, we must work on our intergenerational comprehension and communication, from the perspective of fostering a spirit of solidarity amongst the present generations towards future generations.
- **Connect local and global.** It is important that we make contact with the most immediate situation and thus be connected with the territory in which we live,

04 Cultural diversity and sustainability



Photo: Basque Government/J. Maguregi

Some cultures and societies have maintained a balanced relationship with their environment over time. It is important to maintain and recover traditional uses and practices as this allows us to conserve the biological and landscape diversity, without renouncing people's economic development and quality of life.

[> <] Source: Own preparation

with the people who form part of our everyday life, with the closest institutions and mediators and, from there, connect with other experiences and situations. We must not forget that the experience of diversity begins, although it does not end, in everyday life. In other words, "local" and "global" are not opposites but are in fact complementary. These are the opposite of strict localism and dissolution globalism.

It is very important that people, particularly in the educational sphere, achieve an understanding of the current sustainability crisis and its causes and consequences. It is equally important that we understand the vision and hope for a better world is possible, in which we can live in peace, with social justice, democratically and in harmony with nature. <

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10 Health and quality of life

[Alberto Gómez Elípe]
Doctors of the World

Health: concept and determining features

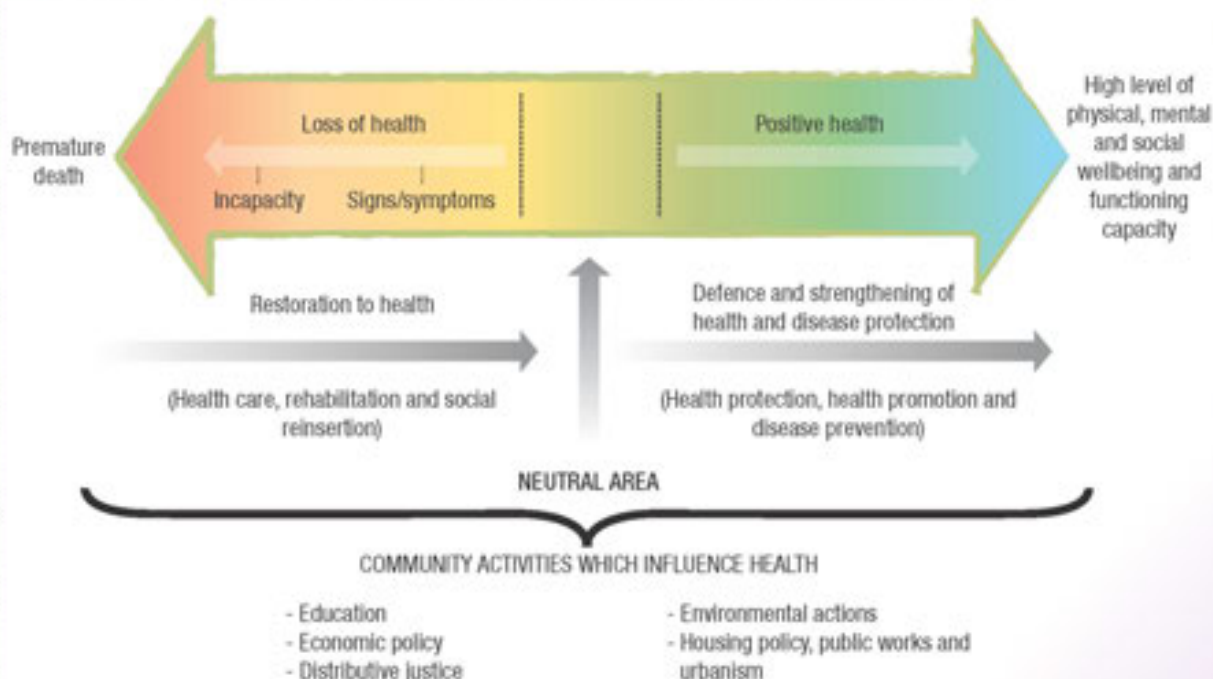
Defining health is an arduous task due to the fact that this term includes social, cultural, anthropological and biological dimensions. Everybody will have their own answer to the question: "What does feeling healthy mean to you?", although most of us would calmly respond "to be OK, to feel fine and not be ill". Starting with more simple concepts, in 1946 the World Health Organisation (WHO) launched its own definition of health: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity".

Subsequently, in 1980, Milton Terris removed the

term "complete" and added the ability to function, in other words the ability to work, study, enjoy life, etc. This author established the concept of the **health to disease continuum** with two poles, one positive and one negative, each with its own extremes: respectively, optimum state of health and death. In the centre there is a neutral zone where the normal and pathological coexist. When applying the health-disease continuum to the community (see figure 1) the extremes are substituted by the "high degree of well-being and functioning" and "premature death".

The concept of health can also be approached by identifying its determining factors. Thus, in 1974 the Canadian Health Minister, Marc Lalonde, in *A New Perspective on the Health of Canadians* established

01 Health to disease continuum in the community and determining factors



[><] Source: Own preparation

02 Horwitz Cycle



[><] Source: Own preparation

that health is conditioned by four main groups of determining factors, namely:

- Human biology: constitution, genetic load, development and ageing.
- Environment: physical, chemical, biological, psychosocial and sociocultural contamination.
- Lifestyles and healthy behaviour: drugs, sedentary lifestyle, food, stress, violence, dangerous driving, poor use of healthcare services.
- Healthcare organisation: poor use of resources, adverse events caused by the healthcare service, long waiting lists, bureaucratisation of the service.

Some authors have revised this classification due to the fact that, at times, certain lifestyle habits influence our environment. Furthermore, the environment into which we are born and live, to a large extent determines our healthy or risky behavioural guidelines, like, for example, the consumption of addictive drugs and dangerous driving.

Both health and disease are highly influenced by social, cultural, economic and environmental factors so that all of them have a positive or negative effect on the continuum's neutral zone, causing evolution towards health or towards disease according to their good or poor quality.

Health and development: implications

At the end of the 18th century Johan Peter Frank highlighted the principle role of poverty on becoming ill when he affirmed that "the peoples' misery is the cause of disease". Three hundred years later, in 1969, Abraham Horwitz, made a similar affirmation in his description of the poverty-disease-poverty cycle (see figure 2), when he indicated that "the lack of culture and poverty are the main causes of disease".

Horwitz's poverty-disease-poverty cycle forms a feedback loop with increasingly adverse consequences. Underdevelopment, poverty and disease are very interrelated and represent a shocking vicious cycle, with the only way out being through "suitable" socioeconomic development, in other words, with the participation of all social sectors, in its fulfilment and in the benefits obtained.

Poverty: the root of all evil

This condition results in all of the obstacles to health and therefore to development. It is poor people and communities who more than any others live in dangerous environments, lack the basic needs, work, if at all, in unhealthy and dangerous jobs, are forced to seek refuge, displacement and immigration, and are isolated from sources of information, opportunities and stimulus. Furthermore, poverty is intrinsically alienating and degrading.

In all of the countries in which the relationship between social class and poor health have been studied, it has been found that poor people have the highest mortality and disability rates, and this is also the case in countries where healthcare is financed by the State.

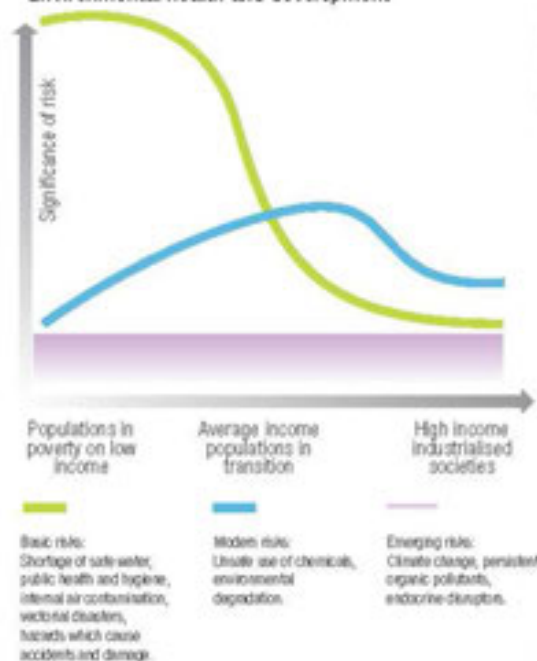
If we link these focuses to the concept of health and the factors which have a determining effect on health, we can ask ourselves if in fact it is the environment, the surroundings we are born and live in, that influences the health situation of a community. Indeed, if the environment is inadequate then the elements relating to human biology, lifestyle and the healthcare system will be inadequate.

Contribution of environmental degradation on the increase and impact of disease

Throughout the world it is calculated that 24% of the morbidity rate –lost healthy years of life– and

03 Health and the environment

Environmental health and development



In Europe, the main causes for concern about health related to environmental factors are air pollution, poor water quality and chemical products. Amongst the health effects are respiratory and cardiovascular diseases, cancer, asthma and allergies, and reproductive and neurological development disorders.



ATMOSPHERIC POLLUTION

The European Directive on ambient air quality assessment and management (96/62/EC) seeks to maintain and improve the air quality through control, and is compulsory in agglomerations with more than 250,000 inhabitants. The measures include city traffic restrictions when the pollution limits are exceeded.



CHEMICAL PRODUCTS

There are currently over 100,000 chemical products and their health effects are still unknown. The REACH Regulation seeks to improve human health and environmental protection by identifying and controlling the chemical substances.

[> <] Source: GEO-4 and European Commission

approximately 23% of all deaths (premature mortality) are attributable to environmental factors. In children between 0 and 14 years old up to 36% of the deaths can be attributed to the environment. It is clear that harmful environments have an influence on health and therefore on the lack of development of communities.

The 2006 WHO report *Healthy Environments and Disease Prevention* estimates the morbidity attributable to the environment for different diseases throughout the world. Amongst the diseases with the biggest rate of disease attributable to modifiable environmental factors are: diarrhoea –94% associated to environmental risk factors–, respiratory infections (42%), accidental injuries (44%) and malaria (42%).

The biggest morbidity rate caused by environmental factors is concentrated in African countries, showing that the lack of development and poverty substantially contribute to the occurrence of diseases (see figure 3).

HIV and AIDS: Africa's growing burden

A new virus has had a devastating impact on the world's health over the last two decades: the Human Immunodeficiency Virus, HIV. Although its origins are still confusing in relation to infections from apes in Africa, it spread to the human species. In just two decades the disease has managed to become the main cause of death for all age groups in Africa, which is the continent suffering the most from this pandemic and is also the most impotent in preventative and welfare resources to mitigate it.

The population living with HIV infection throughout the

world is growing (see figure 4). Most of the infected persons are in countries which cannot purchase the antiretroviral medicines and as such are condemned to progress towards AIDS –Acquired Immune Deficiency Syndrome– and an unavoidable death in their prime years, sometimes during childhood.

A terrible blend of the law of silence, dominated by the fear of dying and traditional taboo, exacerbated by the majority religions which limit access to condoms or speaking openly about sexual relations, has for some years left the road wide open for the pandemic's destructive effects.

On the other hand, the international patent laws only allow access to medicines to a minority of patients in rich countries. At the beginning of this new millennium, the NGOs and groups of infected persons mobilised to fight for access for economically marginalised populations to the antiretroviral drugs, particularly in Sub-Saharan Africa, and achieved milestones with some countries following South Africa's example of importing antiretroviral drugs manufactured under compulsory licence –an exception clause covered by international patent law–.

These preventative and therapeutic limitations make AIDS an expanding pandemic with tragic consequences on health and on all social dimensions in the poorest –or most impoverished– parts of the world. In some southern African countries the epidemic has wrecked unprecedented havoc in the history of humanity, like, for example, the drop in life expectancy in Botswana to 42 years of age.

However, the impact does not only strike those who are infected and the global health indicators: millions of



04 The AIDS Challenge

HIV/AIDS in figures, in the world and in Sub-Saharan Africa

● World ○ Sub-Saharan Africa

Estimate of the number of people infected with HIV in 2007



Estimate of the number of new cases of HIV infection in 2007



Estimated number of deaths due to HIV in 2007



Estimated number of orphans due to AIDS since the beginning of the pandemic



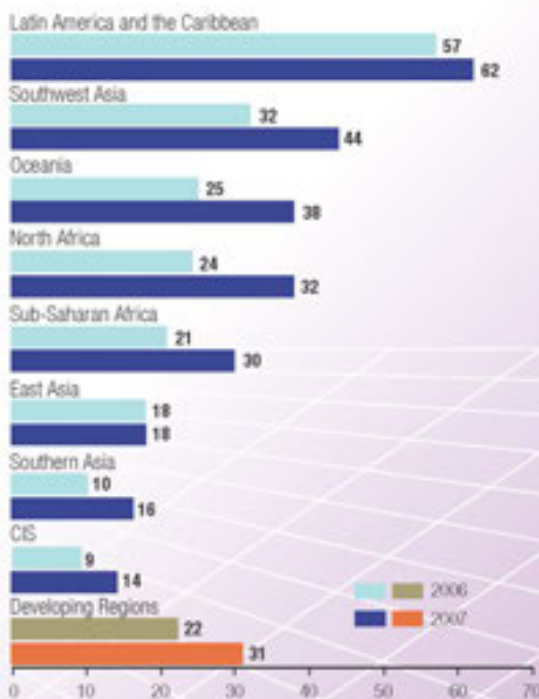
* In brackets the range of the estimation.

Sub-Saharan Africa is the region most affected by HIV/AIDS.

Antiviral drugs increase life expectancy, but the treatment requirements continue to exceed the available offer.

Towards the end of 2007, only 3 million of the 9.7 million people who needed treatment for AIDS in developing countries received it.

Percentage of the population with HIV who need treatment and who receive retroviral treatment.



[><] Source: UNAIDS 2008 Report and the 2008 Millennium Development Goals Report

orphans are facing the most uncertain future imaginable, entire families are left without any source of income, communities are witnessing their active population drop so much that their very survival is at risk; and above all, the pace of mortality may even place the very existence of many areas in central and southern Africa in danger.

The response lies in tasks like community mobilisation at all levels, the principles of palliative care and home treatment, the responsibility of governments –following

the example of Uganda, the first country in Sub-Saharan Africa which registered a drop in the national number of adults infected by HIV– and of ecclesiastic hierarchies, or the international denunciation on how the profits under the patent laws come at a high cost in human lives.

AIDS is a challenge like none other in history, and the challenge is to find a balance between the self-interest incentives for progress –profits for research–, and the vital needs of the most disadvantaged. <

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11 Human rights

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The emergence of the idea of human rights

Clear and universal awareness of what are now known as human rights is a modern trend which arose and became consolidated basically after the 18th century, following the American and French revolutions. It is only after then that we can properly talk about the existence of human rights. However, the fundamental vindication expressed by the idea of human rights goes way back in history throughout different cultures and civilisations.

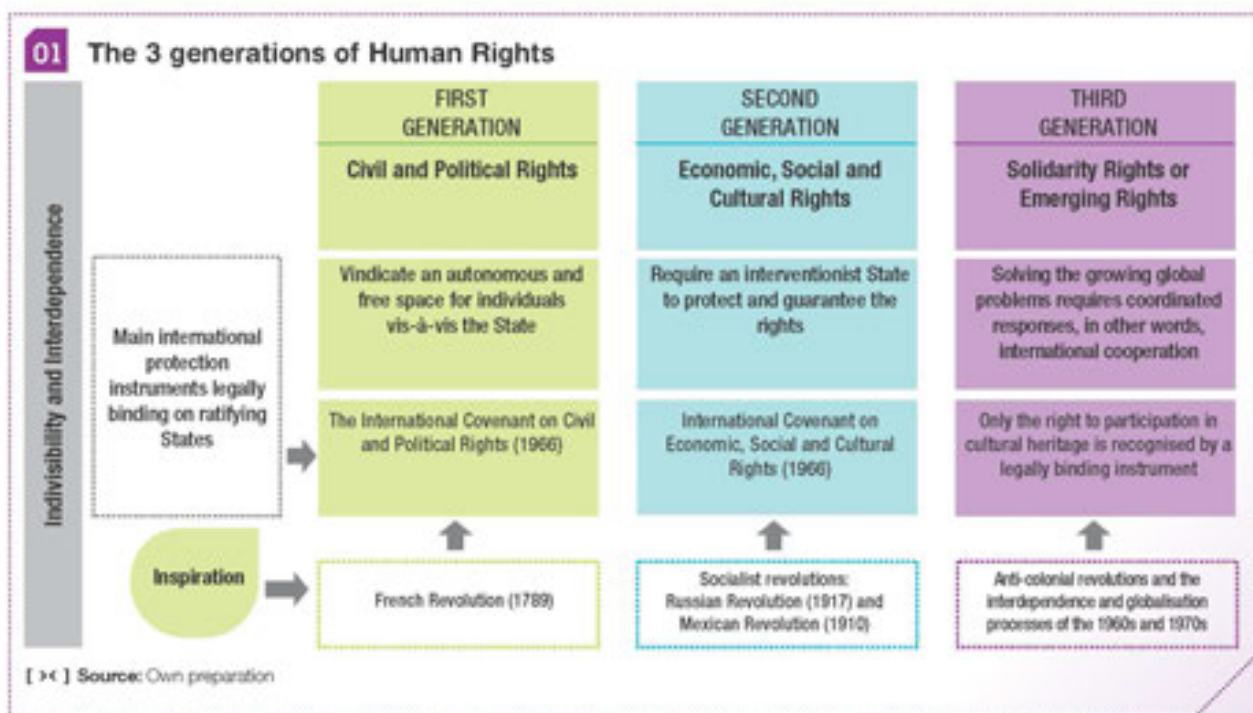
When we refer to human rights we have to take into consideration the fundamental ideas which underlie this phenomenon:

- The first idea is the inherent human dignity whereby human rights seek to defend said dignity.

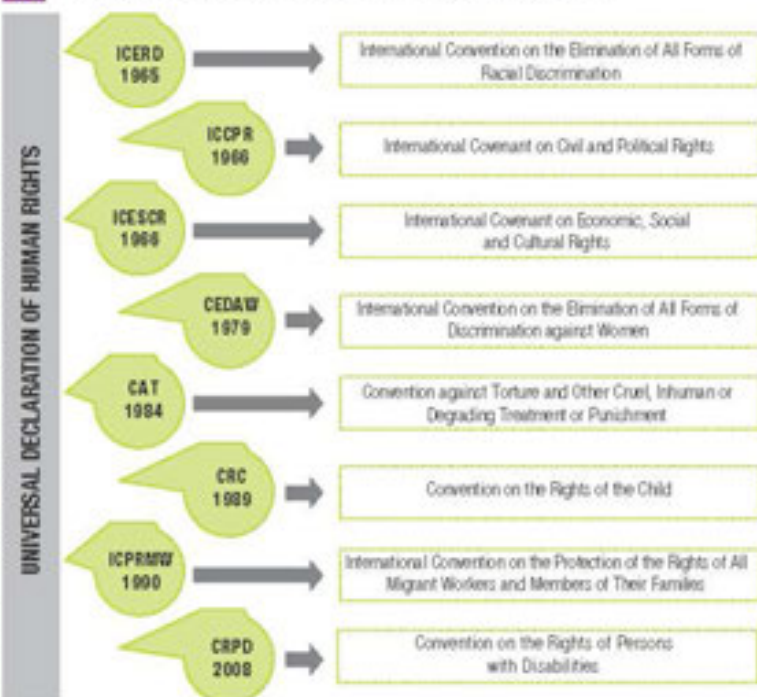
- The second idea refers to setting limits on power whereby human rights are one of the traditional limits on the omnipresent power of States.

Human rights from the French Revolution up to now

The human rights which arose from the French revolution are what we call the first generation rights or the **civil and political rights**. These rights give prevalence above all to the vindication of an autonomous and free space vis-à-vis the State. These human rights consider that States should not intervene in the life of the citizens. Notwithstanding this, over time it became clear that these civil and political rights were not enough and that they had to be complemented. It was not until the end of the 19th century and the beginning of the 20th century when, due to the rise in the workers' movement

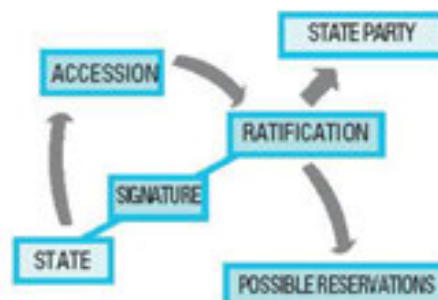


02 Main International Human Rights Treaties



[><] Source: Own preparation

How does a State form part of an international treaty?



International legally binding protection instrument: once a State voluntarily adheres to a treaty (ratification), the State acquires the relevant legal obligations.

and the appearance of socialist parties, that civil and political rights started to be classified as mere "formal freedoms", in the Marxist sense, if they do not in turn guarantee other types of rights, **the economic, social and cultural rights**. The view is held that human dignity relies both on the recognition of the civil and political rights and on the recognition of the economic, social and cultural rights. This second generation of human rights received an important boost with the triumph of the Russian and Mexican revolutions which sought to effectively implement these rights. This new generation of human rights are not satisfied with the purely passive role of the State, but rather demand a positive attitude by the State towards guaranteeing these rights. Hence we witness the advent of the Interventionist State backed by Keynesian economics. From then on the citizens started to demand State intervention in order to protect and guarantee rights like access to health care, housing, education, the right to work, etc.

Despite the historical existence and appearance of the two generations of human rights mentioned above, they are not placed in watertight compartments or two completely autonomous categories, but are in fact deeply interrelated. This is known as the **indivisibility and interdependence** of the two generations of human rights (see figure 1).

The internationalization of human rights

Following the end of World War II in 1945 and the discovery of the horrors of the concentration camps and the genocide of the Jews, human rights became one of

the United Nations' principle objectives. The document which constituted the new organisation, the Charter of the United Nations, was to echo this renewed interest in human rights and proclaims in its Preamble its "faith in fundamental human rights".

At any rate, the fact is that from the very beginning of the new International Organisation, human rights became one more weapon employed by the superpowers which were by then immersed in the Cold War which would last from the end of the Second World War up to the beginning of the nineties. Human rights have been completely politicised and influenced by external factors rather than concentrating on the essence and *raison d'être* of the human rights: the defence of human dignity.

The Universal Declaration of Human Rights

Such politicization was present through the preparatory process of the Universal Declaration of Human Rights, with very conflicting positions between the Soviet Bloc and the Capitalist Bloc. Finally, on the 10th of December 1948, the Universal Declaration of Human Rights was passed by the United Nations General Assembly (see figure 2). The final vote at the General Assembly reveals where the main problems lay in passing the Universal Declaration. At this point we should point out that the Declaration had 48 votes in favour, 8 abstentions and no votes against it, which was a triumph. This enabled it to become humanity's essential reference on the issue of human rights.

The 1966 International Human Rights Covenants

Another important step adopted by the United Nations in order to advance the human rights' internationalisation process was the passing of the International Human Rights Covenants in 1966 – the International Covenant on Civil and Political Rights (ICCPR) and the International Covenant on Economic, Social and Cultural Rights (ICESCR). The passing of these two Covenants was an essential complement to the 1948 Universal Declaration of Human Rights. The problem facing the 1948 Declaration was that it was passed by a Resolution of the General Assembly of the United Nations, and Resolutions, as we know, merely constitute non-legally binding recommendations for States. It was therefore of paramount importance to pass fully legal human rights instruments which could bind the States ratifying them. However, as had occurred when the Universal Declaration of Human Rights was passed, it was an enormously difficult task. To give us some sort of idea, initially only one human rights covenant was to be passed which would contain all of the fundamental rights and freedoms, although in the end, due to the conflict between the Western Bloc and the Socialist Bloc, two human rights covenants were passed.

As such, we now have in the international ambit the Universal Declaration, the two Human Rights Covenants and a whole range of international Conventions aimed at protecting human rights in specific areas (see figure 3).

The emergence of third generation human rights

Since the 1970s a set of new human rights have appeared which seek to respond to the most urgent challenges facing the international community. These include the following: the rights to development; the right to peace; the right to a healthy environment; the right to participation in cultural heritage or the right to humanitarian aid.

There are different factors which have led, and continue to lead, to the appearance of these new human rights. First of all, the decolonisation process during the 1960s revolutionised international society and the legal order called to regulate it, namely International Law. This change has also influenced the theory of human rights which is increasingly positioned towards the problems and needs of the new category of countries which have appeared on the international scene; the developing countries. If, as we have seen, the Bourgeois and Socialist revolutions led respectively to the first and second generation human rights, it is this anti-colonialist revolution which gives rise to the appearance of the third generation human rights.

Another factor which has had a notable impact on the emergence of these solidarity rights is the

03 Universal Declaration of Human Rights



Eleanor Roosevelt, Chairperson of the Commission entrusted with drafting the Universal Declaration of Human Rights.

Preamble of the Universal Declaration of Human Rights:

"The General Assembly proclaims this Universal Declaration Of Human Rights as a common standard of achievement for all peoples and all nations, to the end that every individual and every organ of society, keeping this Declaration constantly in mind, shall strive by teaching and education to promote respect for these rights and freedoms and by progressive measures, national and international, to secure their universal and effective recognition and observance, both among the peoples of Member States themselves and among the peoples of territories under their jurisdiction."

interdependence and globalisation of international society since the 1970s. States are increasingly aware of the fact that there are global problems which require a coordinated response and require, in short, international coordination processes. As a result of this global change, the third generation rights are rights which emphasise the need for international cooperation aimed basically at improving the collective aspects of said rights.

Having said that, this new generation of human rights has not been accepted lying down, either by the international law doctrine or by the States, and has been the subject of fierce debate. With the exception of the right to participation in cultural heritage, none of the other rights have been recognised by an international treaty which binds ratifying States.

Current human rights challenges

The main human rights challenges currently identified by human rights academics are the following:

- **To establish a broad and all-encompassing concept of human rights.** In order for human rights to be properly understood we need to protect civil and political rights, economic, social and cultural rights, and the third generation rights.
- **To achieve a truly universal concept of human rights.** This is one of the main problems currently facing human rights. The road towards

04 Some examples of human rights violations

01 Forced disappearances, Argentina – Spain

The Madres de la Plaza de Mayo in Argentina and the Historical Memory Act in Spain, seek to clear up, respectively, the cases of disappearances during the Argentinian dictatorship and the Spanish Civil War.



02 Spiritual and religious repression, China

Millions of people are prevented from freely practicing their religion outside of the State-authorized channels.



03 Illegal detentions, USA

Between 2002 and 2009 over 500 foreigners have been illegally detained at the Guantanamo military base.



04 Salary differences, Europe

According to the European Commission, women earn on average 15% less than men.

05 Indigenous people, Guatemala

Various referendums have been held against mining activities, within the framework of the Convention concerning Indigenous and Tribal Peoples in Independent Countries, which have not been respected by the Government.



06 Environmental refugees, Papua New Guinea

The inhabitants of the Carteret Islands had to abandon their homes in 2005. It is expected that these islands will be completely submerged by 2015.



Photo: FOE



07 Basic education, African continent

By 2015, three out of every four children who do not attend school will be African.

Photo: UNICEF/YHQ2008-0991/Kavanagh



08 Access to water and sanitation, Gujarat State

The construction of large dams has led to forced displacement and the lack of access to basic water and sanitation services for a large part of the Adivasi population.

Photo: ALBOAN

[><] Source: Own preparation

universality must inexorably include intercultural, open and sincere dialogue without prejudice and which progressively brings diverging positions together.

- **The influence of globalisation on human rights.** Globalisation is one of the signs of the times and is exerting increasingly more influence on the enjoyment of human rights in significant areas of the planet.
- **Improve the human rights protection mechanisms both nationally and internationally.** Now that regulatory development in the field of human rights has become very significant, with

the United Nations playing a crucial role, the next task is to perfect the human rights protection system, giving the citizens the power to access authorities which can effectively protect their rights, both in the national and the international arenas.

Finally we must stress the responsibility on each and every one of us to protect and promote human rights. The people, civil society, the human rights NGOs, etc. must all share their responsibility over an issue of such magnitude; human rights. Human rights are too important to be exclusively left in the hands of the governments (see figure 4). <

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12 Economy and sustainability

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Photo: UNESCO

What is the economy?

One of the oldest and surprisingly up-to-date definitions of economy comes from Ancient Greece and more specifically from Aristotle. According to Aristotle, *oikonomy* -*oikos* for household and *nomos* for management- means the "art of living and living well". We should therefore manage our household so as to achieve greater individual and collective wellbeing. The same concept appears in current economics manuals when the objectives of the economy are defined as "maximising the satisfaction of human needs using scarce resources". As such, the central objective of the economy, understood as a medium and not an end in itself, is to satisfy human needs and not production for the sake of production or accumulation of money.

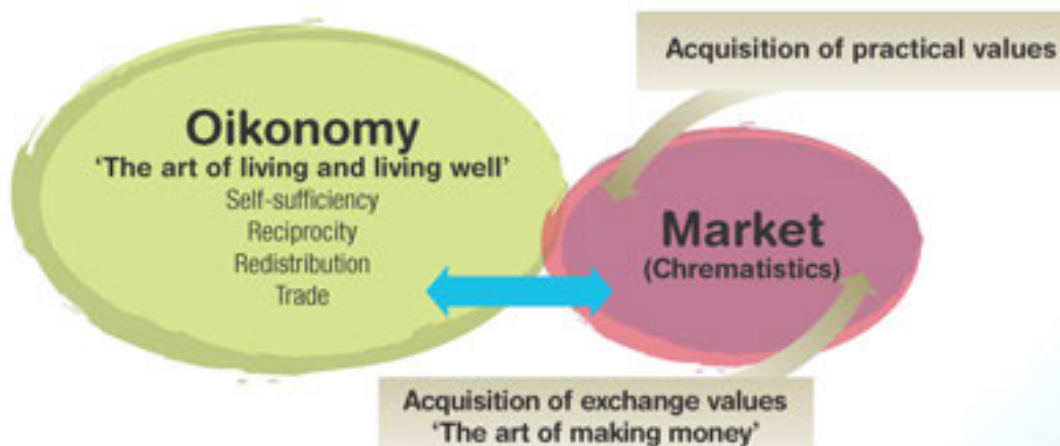
Aristotle cites agriculture, mining, management, politics and technology as all forming part of the economy insofar as they permit human beings to (re)produce practical values in order to ensure their wellbeing. Commerce, called **chrematistics** or art of acquisition, was considered as just another tool of the economy, insofar as it allows access to internally,

scarce, practical values in exchange for those produced in abundance. However, commerce subordinated, not to the acquisition of practical values through exchange but rather to enrichment, was seen by Aristotle as something external to and not related to "living well" and, as it is based on abstract logic without limits -the incessant accumulation of exchange values-, as somewhat unnatural.

Furthermore, to the extent that the satisfaction obtained from consuming particular goods or services derives, not because of the object per se, but rather due to the relationship that we establish with it, the reflection about **ethics** -individual and collective values- and **aesthetics** -relationship/balance in the relations of a system- were also seen as central elements of *oikonomy*.

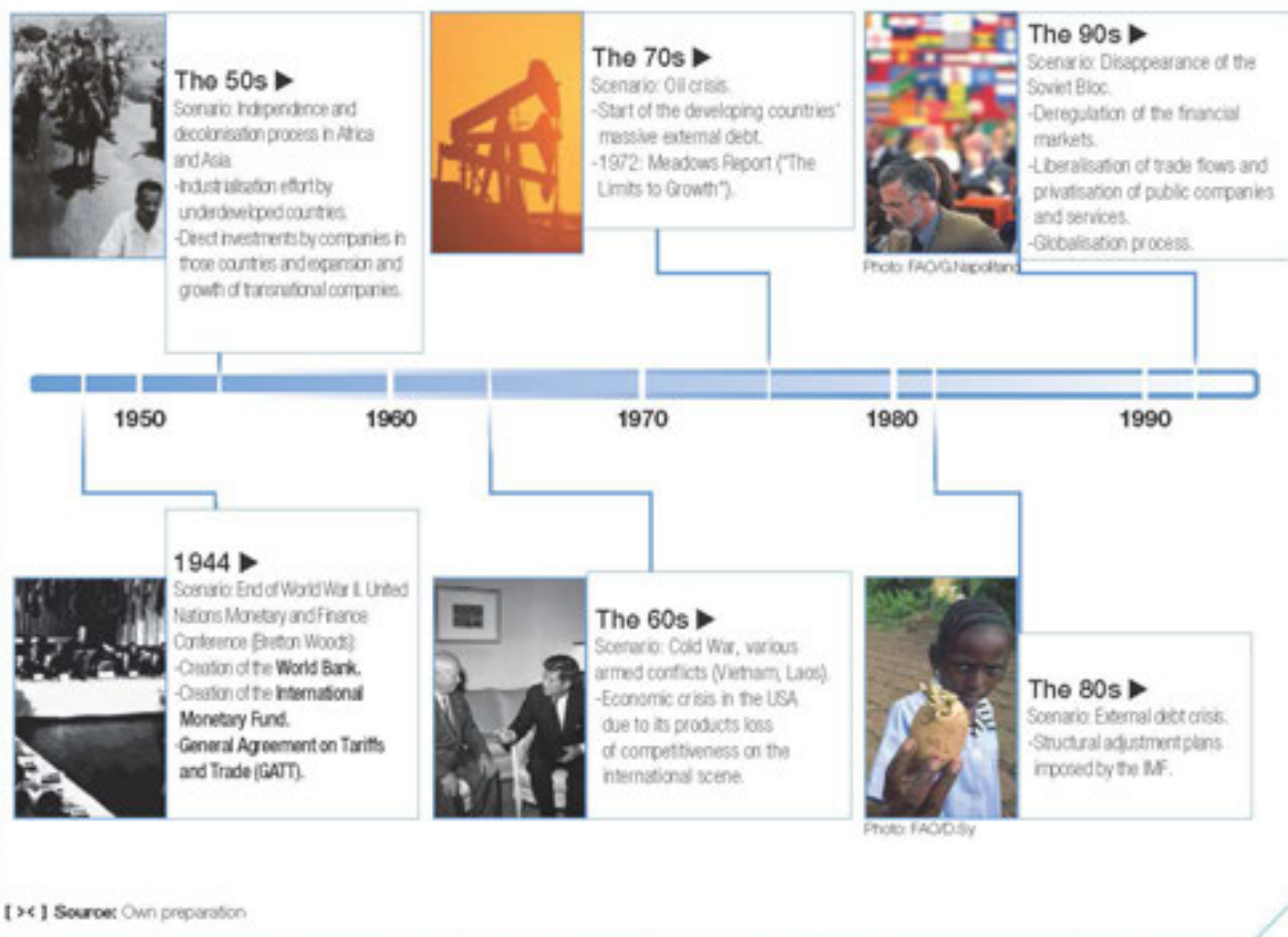
Along these same lines, Karl Polanyi identified four basic ways in which different societies organise and orientate their activity for the purposes of (re)producing and distributing the different practical values necessary for their existence: self-sufficiency, reciprocity, redistribution and commerce. Of the four, the first three forms of social organisation for the production and distribution of practical values do not involve chrematistics and only in commerce

01 The economy according to Karl Polanyi



[><] Source: Own preparation

02 Milestones in 20th century economic development



does the logic of exchange value intervene, the logic inherent in sale and purchase relations (see figure 1).

Economic liberalism

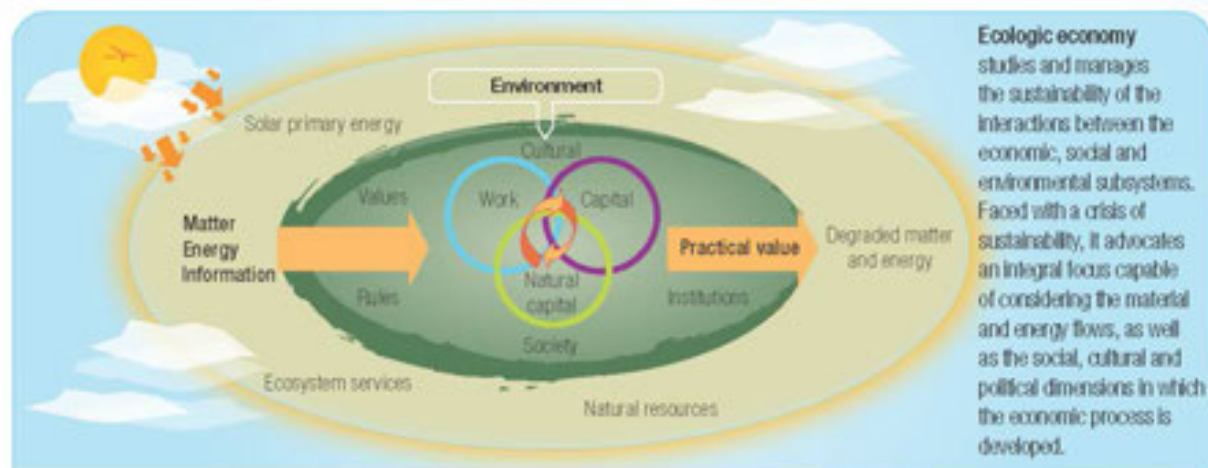
Polanyi points out that the market as such has existed since the Stone Age when bartering and later the use of currencies like shells, stones and metals were used by the different social groups to exchange the surplus part of their produce. These were, however, always accessories and restricted to certain products and amounts as the vast majority of the production was for self-sufficiency and, distribution was via reciprocal relations –as seen today in family and community relations, or relations between friends– or social redistribution of the product –as seen today in the social policies of governments and charitable organisations–. The same occurred during the Middle Ages and during the Mercantilist Period when a series of cultural values and political restrictions limited its scope, subordinating chrematistics to the broader social and individual acumen or *oikonomy*. This is also why, at least up until the end of the 18th century, the **market** referred to a physical area where people exchanged goods and services, and not to an abstract institution capable of regulating and orientating socioeconomic activity. It was only with the emergence of **capitalism** and, on

an ideological level, economic liberalism, when the notion of a self-governing economy operating solely on the buying and selling operations and performed by formally free individuals and not on the basis of wider ethical criteria in the market, appeared.

From his philosophically moral perspective, Adam Smith, the father of economic liberalism, faced a difficult task: How can the economic and social aspects of life be organised without any type of ethical or moral guidelines? How can we justify this profound historic inversion which took place at a time when, instead of chrematistics being subordinated to the *oikonomy* logic, the latter became subordinated to the former? How can we justify the possibility that chrematistics, left to its own devices, can lead to collective wellbeing and achieve the qualitative objectives of the "art of living and living well"?

Faced with these issues, which clashed with the classic conception of economy and, amongst others, with medieval Christian ethics, Adam Smith evoked the famous image of the **invisible hand**, a supra-human and supra-institutional mechanism capable of converting private competition into collective collaboration, and private egocentrism into public virtue. Smith thereby established the notion that we should not be worried about setting ethical principles to regulate social relations and our relations with the environment, and that all

03 The economic process from a systemic perspective



Ecologic economy studies and manages the sustainability of the interactions between the economic, social and environmental subsystems. Faced with a crisis of sustainability, it advocates an integral focus capable of considering the material and energy flows, as well as the social, cultural and political dimensions in which the economic process is developed.

[>] Source: Own preparation

that is required is merely to create the institutional conditions so that chrematistic competition between the different "economic agents" can come into its element. The most beneficial development for everybody concerned emerges, as if by art and magic, through the invisible hand resulting from this competition.

Should we leave everything in the hands of the market?

Smith never based this principle of the invisible hand on logical and/or historical terms. He presented it by generalising on some examples, where the interest in personal benefit brought face to face with market competition, could be seen as generating collective benefit: the baker who gets up early in the morning to make the bread or the vine-grower who seeks to produce a good wine which can be sold better. He omitted, however, the cases where the opposite occurs, namely the search for chrematistic efficiency by the individual which generates collective costs or those cases where an individual seeks to appropriate collective resources in his/her own interest and to the detriment of the community. In contemporary economic theory this is referred to as **externalising costs and internalising benefits**.

The economy's political and ideological dimension

As such the **free market**, in its pure state, is a fictitious reality because, as stated by Polanyi, "To allow the market mechanism to be the sole director of the fate of human beings and their natural environment, indeed, even of the amount and use of their purchasing power, would result in the demolition of society". However, most of the theoretical economic models start with the assumption that the said free market exists, as well as other restrictive assumptions, which allow the non-chrematistic models to be defined as exogenous –and that they do not therefore have an associated market value–. It is for this reason that, rather

than their scientific dimension, we must understand the said models in their political and ideological dimension. This is so given the fact that, as well as an objective description of reality, what they do is set regulatory rules and legitimise greater market liberalisation, insofar as the mathematical results from such abstract models usually point to maximum efficiency –chrematistic– under free competition conditions.

The modern economy was, at the beginning, called **political economy**. Political in the sense that it was understood that in a society made up of different social classes there is a distributive political conflict between conflicting class interests. That means that there is an intrinsic political dimension to the dynamics of economic development relating to fundamental variables like the real salary value, property rights, access to natural resources and the limits on market competition which always have a historic component determined according to cultural criteria –values– and political criteria –relationship of force between the different actors– (see figure 2).

Furthermore, the relations established in the market are not relations between equals. The free market benefits some more than others. The free market is of particular interest to the strongest and most efficient producers or consumers in chrematistic terms. For a party which has accumulated exchange values, their capacity to convert them into wellbeing, consumption and power is directly proportional to the size of the market and, as such, the amount of practical values available for sale. In other words, when the value of money is based on a social convention, the power of the money holder is directly proportional to the size of the markets where this currency is recognised and can be used. Similarly, a more efficient company in chrematistic terms will be more profitable under free competition conditions. This is why, as we can see in all of the debates about the specific economic policies, every country and every social group usually advocates free trade in the sectors where they are more efficient in chrematistic terms, and restrictions where they are not.

04 Alternatives for a fairer economy



Ethical banking

This is a type of financial institution which seeks to combine social and environmental benefits with the economic yield of the conventional financial institutions.



Photo: Alboan

Microcredits

These are small loans made to people who are too poor to be granted a loan by a traditional bank.



Environmental taxation

Taxes (ecotaxes) on contaminating activities and tax incentives/subsidies for promoting sustainable activities.



Tobin tax

This is the suggested tax on all cross-border currency transaction promoted by the ATTAC movement and other NGOs.

[><] Source: Own preparation

What can we do? Towards sustainable human development

Faced with this situation and the sustainability crisis of the current development model, we must recover a complex, multidimensional and dynamic vision of the economic process, beyond the prevailing chrematistic reductionism.

Figure 3 shows how every development process is devoted to and stems from the resources obtained from our natural environment, according to the values, rules and social institutions which differentiate the different societies and cultures, with the view to (re)producing practical values necessary so that the humans can "live and live well". From the physical point of view, the Earth can be considered a closed system in material terms and partially open from the energy point of view. In the case of the human species, as cultural and political beings, the comprehension of our social power, values, rules, institutions and relations are essential in order to understand the type of relations that we establish between ourselves and with our environment. Ignoring these elements or excluding them from economic and political development

models, is to promote development which is blind to our reality and places our destiny in the supposed sanctioning virtues of the market's invisible hand, as if it could guide everything along the right road.

A virtuous development model is that which is consistent with its ultimate purpose of existence, namely a means towards wellbeing and happiness. To achieve this, is not a matter of luck or a so-called invisible hand, but depends on decisions and conscious practice. It depends on our ability to recognise our true nature and the nature of our needs so that we can move on to finding a dynamic equilibrium that we perceive as wellbeing. Although this balance varies between people and situations, there exists in every case a balancing point, an equidistant point between two vices which Aristotle considered fundamental: the vice of excess and the vice of absence. As such, contrary to the inherited, conventional discourse of the chrematistic conception of economy, "live and live well" does not involve accumulation and infinite chrematistic growth, but in fact relies on setting limits, while at the same time seeking to stimulate and extend the aspects of autonomy, reciprocity and distributive justice where good living can flourish. <

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13 Wealth redistribution

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The need to redistribute in the face of globalisation which generates inequality

Concern about redistributing the world's wealth is relatively new. Until very recently the priority has been economic growth, and nobody mentioned inequality. However, rising inequality in many sectors, not only regarding income or revenue, and the need to tackle global problems from a solidarity perspective, has led to the inclusion of redistribution as an important point on the international agenda.

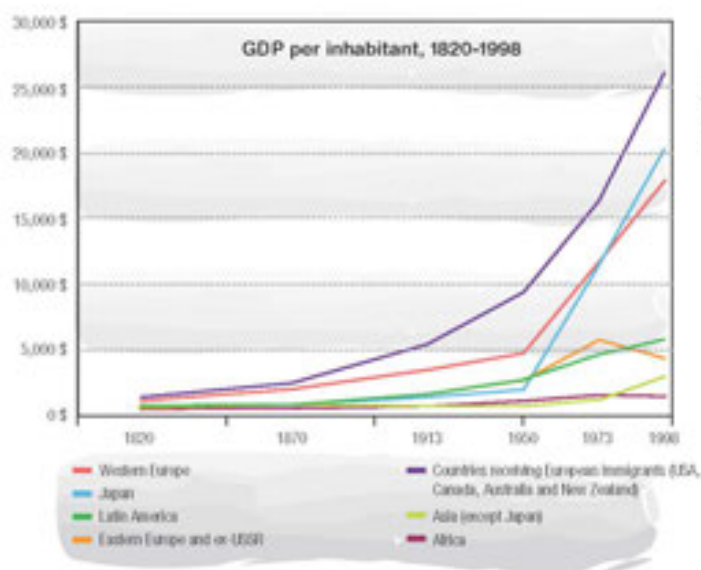
One of the clearest manifestations of inequality is found in how revenue is distributed amongst countries and people. Despite the fact that there has been great debate about whether the trend is one of convergence or inequality, recent data shows that our global society is increasingly uneven; never before in history has there been such inequality as now.

Inequality has grown during our time

It is essential that we bury the idea that the current differences are due to natural causes which have been inherited from the past. Although there have always been differences, they have become particularly accentuated in recent times. **Figure 1** shows how inequality evolves in relation to Gross Domestic Product per inhabitant –another way of referring to “per capita income”– over the last two hundred years. We can clearly see how inequality has risen dramatically, particularly since the 1970s when neoliberal globalisation was established.

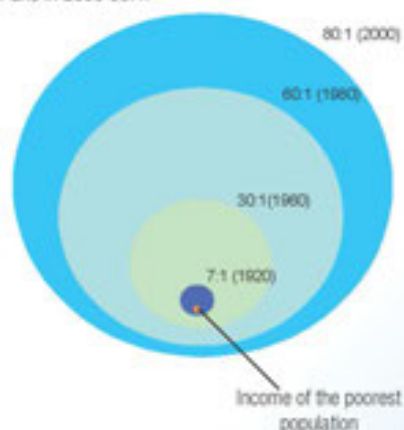
The inequality is not a matter of chance or due to factors imposed by nature; to the contrary, it is the result of the established processes and rules of the game. Globalisation has led to growing interdependence, but has also increased international inequality. This occurs because the world economy is not played on

01 The evolution of equality



Income ratio between the world's richest 20% and the poorest 20%

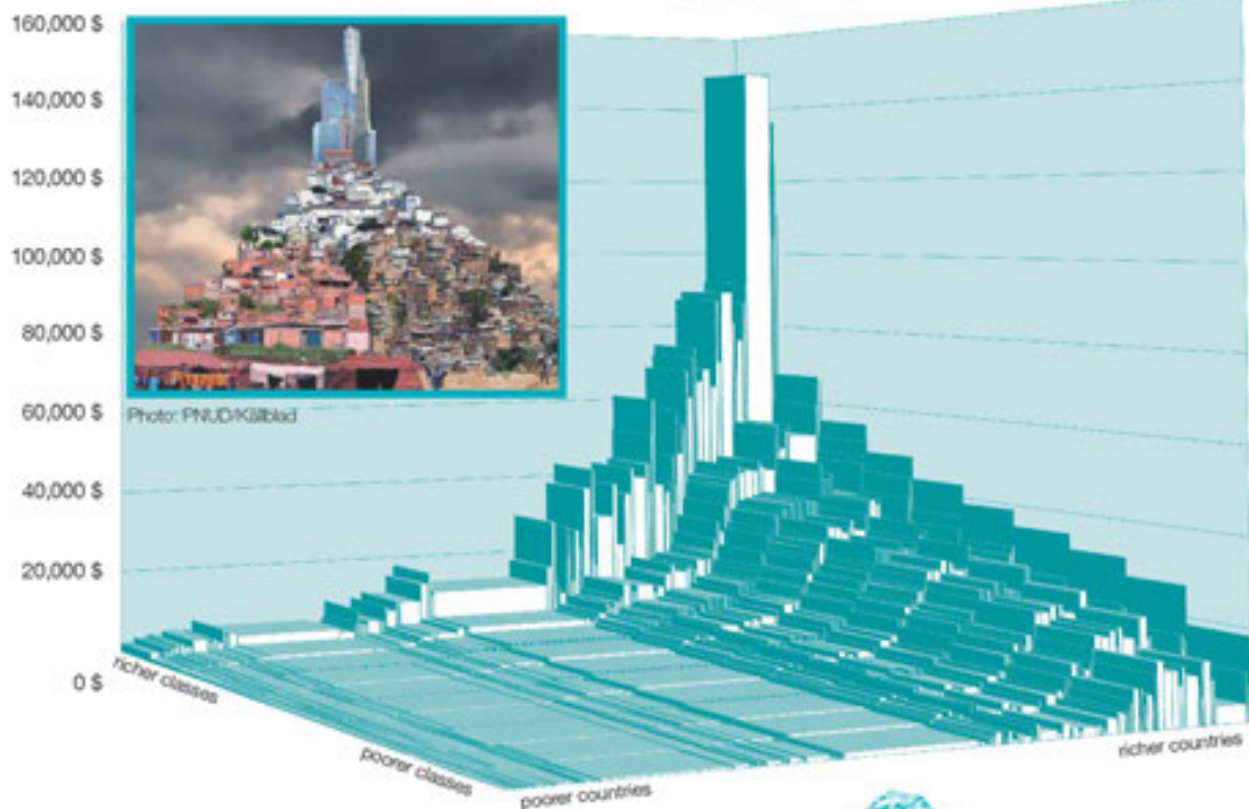
In 1920 the income ratio between the world's richest 20% and the poorest 20% was 7:1; in 1960 30:1; in 1980 60:1 and in 2000 80:1.



[>>] Source: Own preparation based on Maddison and Latouche

02 Graphic vision of the income disparity

Income per head by country and income group (\$ppp, 2005)

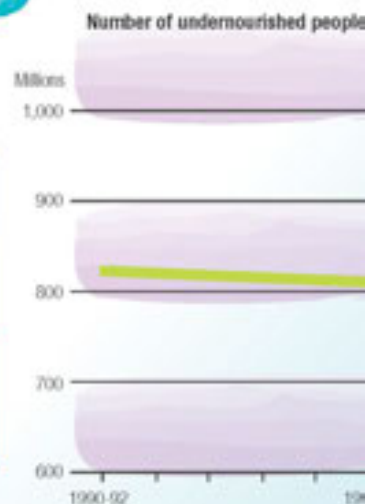
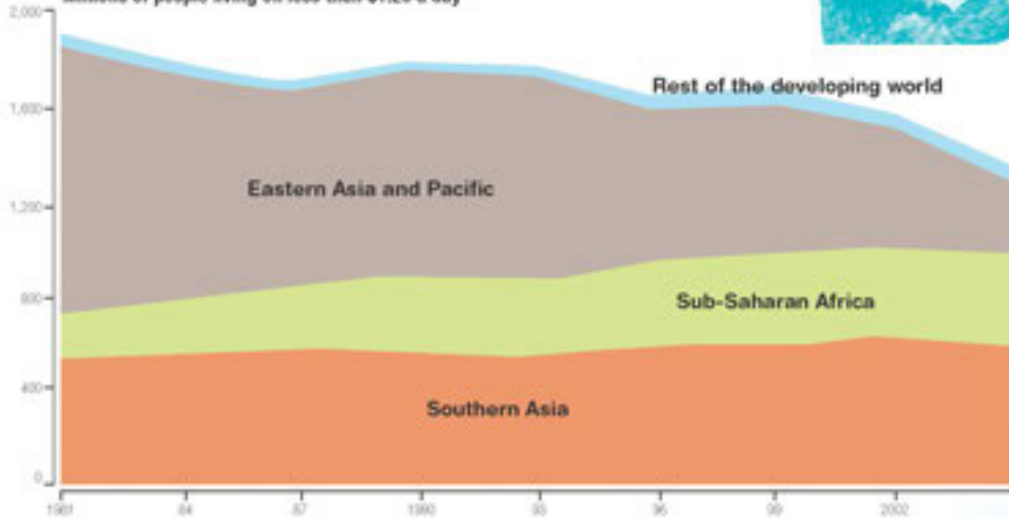


Source: Prepared by Bob Sutcliffe



03 Poverty rates in the developing world, 1981-2005

Millions of people living on less than \$1.25 a day



Source: World Bank 2008 and FAO

a level playing field; the playing field is biased in favour of the richest countries. The serious inequality in income distribution derives from the liberalisation of the markets, which has concentrated the capital and commerce in the most powerful countries and has closed the doors to development to a significant group of countries.

A graphic vision of the current disparity in income

For a visual impression of the current world income distribution refer to the following chart, which covers the entire population according to their income. Taking statistical data from over one hundred countries, Bob Sutcliffe has created the graph shown in **figure 2**, with the richest countries shown on the right and the poorest on the left. The richest population sectors in each country are at the back and the poorest are those closest to the observer. It clearly shows how the poorest sectors in the richest countries have higher incomes than most of the richest sectors in the poorest countries.

A more visual interpretation of this same graph is offered by the United Nations Development Programme (UNDP) in the same figure, which somewhat corresponds with this reality. As inhabitants of the richest countries we would live in the upper quarters, while the vast majority of the population would live in the outer suburbs, with massive differences between the two.

The biased distribution of income is particularly significant when we consider the differences between men and women. The redistribution of wealth must not only be approached as greater equality between countries and people, but also between men and women.

There are also other significant inequalities, like the disparities between rural and urban populations, which are

now substantial in an increasingly urbanised world. The rural areas contain three quarters of those living in poverty and a similar proportion of the world population suffers from malnutrition.

Poverty

The fact that there is still so much poverty is a flagrant injustice, and a clear manifestation of the current inequality. How can we explain that there are hundreds of millions of people in poverty and malnourished when the world as a whole has multiplied its resources? Being poor means that a person lacks access to the most basic resources needed for a decent life. The concept of poverty depends on how we define a decent life. The international organisations currently consider a person to be poor if they have less than 1.25 dollars, about 1 euro, a day. Can we really affirm if he/she has more than 1.25 dollars a day, then the person has sufficient resources for a decent life as a human being?

The evolution of the number of people in the world suffering from malnutrition rings alarm bells about the need to redistribute wealth. In spite of the fact that one of the main commitments of the Millennium Development Goals is to halve the number of poor and malnourished people by 2015, this target will not be reached in many countries. It is shocking that during these first few years of the 21st century the number of malnourished people has actually increased in the developing world, particularly in Sub Saharan Africa, after having fallen at the end of the last century (see **figure 3**).

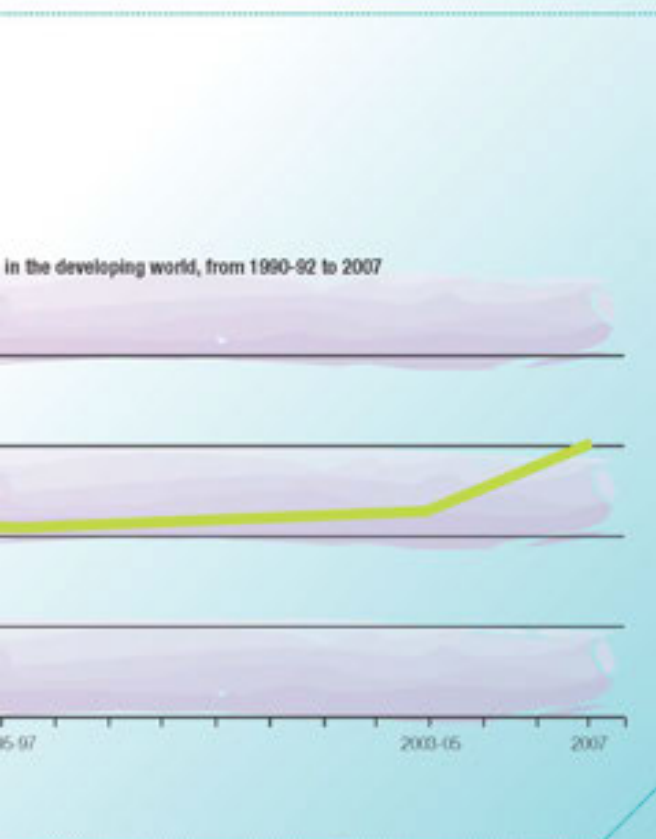
Environment, poverty and inequality

Tackling climate change forces us to consider redistributing the world's wealth. There is no doubt that climate change has become the global challenge that the world is most concerned about. It is, however, often presented as if it will affect all people and all countries in the same way. The truth is that the poorer countries are more vulnerable and this must be taken into account in the strategy to combat climate change if we are to avoid accentuating existing inequalities.

Climate change will increase inequality

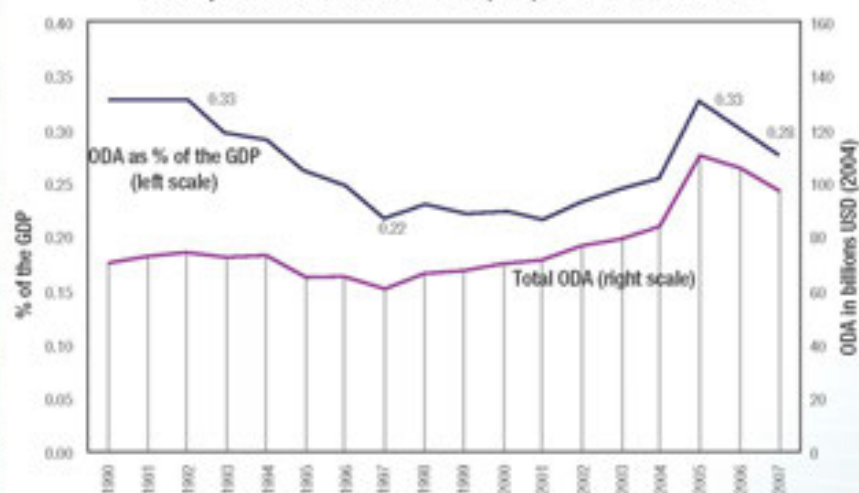
The UNDP *2007-2008 Human Development Report* highlights the specific and very serious consequences of climate change on the poorest countries. Unless decisive steps are taken in favour of the poor countries, involving wealth redistribution, the world's poor will be abandoned to their own fate, while the developed countries manage to protect their citizens within powerful fortresses protected against the climate. An agreement to reduce contaminating emissions which binds all countries will only be possible if rich countries transfer the necessary resources and technology so that poor countries can truly develop.

The resources consumed by Europe and the United States during their growth process is unrepeatable. The resources which allowed the current level of development in the rich countries are no longer available in the world. The 19th century utopias are not realisable in the 21st century. Nowadays, any economic growth must take



04 The old 0.7 objective

Official Development Aid (ODA) of the countries on the Development Assistance Committee (DAC) between 1990 and 2007



Source: OECD

Amongst the measures considered by social and international organisations so that all countries achieve the Millennium Development Goals in 2015 are to resolve the foreign debt problem and to increase the Official Development Aid. In most countries the volume of ODA is well below the old objective of 0.7% of the GDP, promoted by the United Nations since the 1970s and ratified through the 2002 Monterrey Consensus.

Apart from ensuring the mobilisation of funds, the new guidance must also be applied for development cooperation from the Paris Declaration (2005) which advocates greater mutual appropriation, collaboration and responsibility between donors and recipients.

into account the limitations on the resources which are therefore incompatible with the transmitted production and consumption models.

Global social justice

The need for global justice is finally being recognised at the beginning of the 21st century. This concept is based on considering that humanity has a collective duty to find ways of living and cooperating so that all human beings can have a decent life. The universality of human dignity has become the reference when considering the wellbeing of the global society. The world is more than a collection of States, it is a community of people whereby everybody is entitled to justice, and whereby everybody must act fairly towards the others.

What ideal of equity?

Equity questions the concept of desirable equality and fairness or, looking at it the other way, what is intolerable inequality and unfairness; it is the ethical and moral dimension of the differences which make them positive and fair, or negative and unfair. The idea is that desirable

equality or renounceable inequality is not provided by any external rule, but is left to the decision of each society, which would consider results from historical processes, shared values, the economic situation and social relations and institutions. There are societies more intolerant than others regarding inequality; these ideals of equality in a society evolve and can be more demanding in one moment and later diminish. Egalitarian ideals are not conquered once and for all but must in fact be reaffirmed daily.

Equity means that a society which seeks justice must seek optimum distribution of the resources so that people are able to lead a decent life (see figure 4). It cannot be said that our current globalisation comes to us as a predetermined package, and it cannot be defended that it is the only possible way forward. The International Labour Organisation's report, *A Fair Globalization* says that "The results of globalization are what we make of it. They depend on the policies, rules and institutions which govern its course; the values which inspire its actors; and their capacity to influence the process". The question "what criteria of justice works in today's global scenario?" is therefore crucial for those who seek a fairer world. <

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14 Agriculture and food sovereignty

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Introduction

A world organised on the basis of price competition, quantitative growth and unbridled consumption of fossil fuels is not sustainable.

The world crisis which started in 2006 and exploded in 2007 serves as a warning. The growing energy demand from emerging countries and the lack of foresight from the developed world led to a rise in oil prices and a resulting reaction to seek alternatives like biofuel which in turn led to an increase in the price of cereals and other agricultural raw materials.

These factors are causing increasing social inequality, hunger and poverty, as well as accelerated environmental deterioration. This situation is specifically and very seriously affecting countries' agricultural and cattle raising policies and therefore the various facets of peoples' food sovereignty (see figure 1).

Definitions

Agriculture includes all practices performed by human beings to obtain consumer goods –food, fabric, energy,

etc.– from cultivating and exploiting the land surface using the animal and vegetable genetic resources available to them. This activity, which started in the Neolithic period with the domestication of wild species, has been performed nonstop right up until now and is the basis of our productive system, albeit on the economic level the sectors linked to transformation –industrial– and management –services– have become more relevant over the last century.

According to the FAO (United Nations Food and Agricultural Organisation), **food security** is when all people at all times have both physical and economic access to the sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.

Food sovereignty is the right of peoples to decide and implement their own agrarian and food policies in accordance with food security and sustainable development criteria. If, as envisaged, the world population reaches 8.3 billion by 2030, the Earth will have to feed a further 2 billion people, 90% of whom will be in developing countries (see figure 2).

01 Principle exporters and importers of agricultural produce

The prices are the instrument through which the wealth is distributed in a market economy. The prices are, however, distorted by subsidies - the North American and European markets, for example, have protectionist barriers. The main beneficiaries of the subsidies –which are paid by the citizens– are the large agribusinesses which purchase their products on the international market. Hence, the price of basic agricultural products reduces or increases food costs.



Exporters

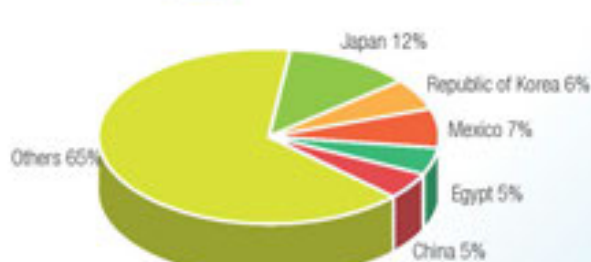


[>>] Source: FAO

USA 41%



Importers

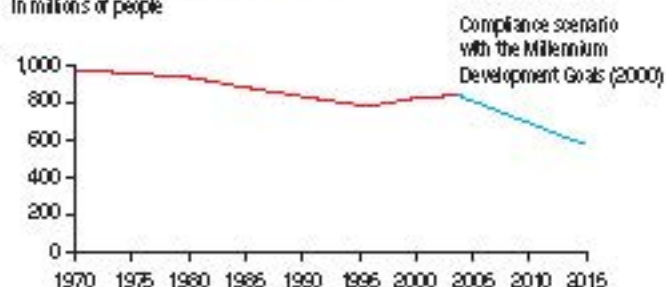


02 The hunger map

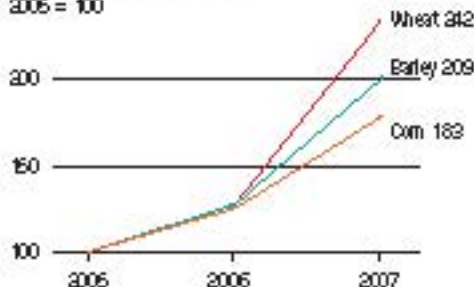
Undernourished population
Percentage of the population with insufficient nutrition according to the FAO



Undernourishment
in developing countries
in millions of people



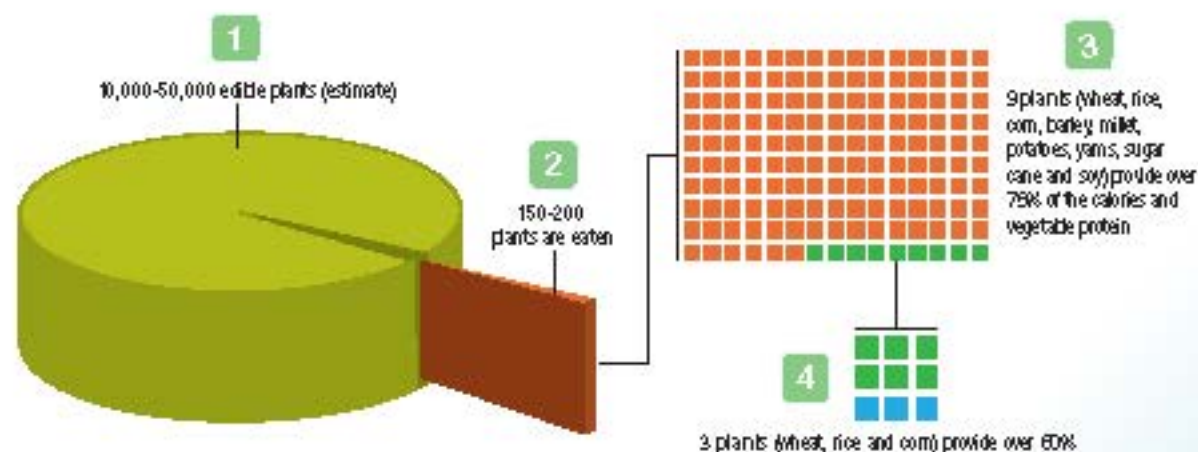
Evolution of food prices
2005 = 100



[X] Source: FAO and IMF

03 Proportion of known plant species used in human food

Most of humanity survives on 12 plant species and 5 animal species providing over 70% of the food.



This concentration is making us more vulnerable. Furthermore, many of the traditional varieties of these plants are being lost. The FAO estimates that 75% of the genetic diversity of plants grown and eaten by humans has been lost over the last 100 years.

[X] Source: FAO

Sustainable development on the other hand involves the capacity for economic and social growth using the available production base –workable land– and genetic resources without altering the system's ecological and social balance and thereby ensuring that they are available for future generations.

This of course clashes with the fundamental concepts of globalization understood as a new economic world order, facilitating the free movement of goods and capital between countries, with the intention to favour growth and the generation of wealth, without taking into account its fair distribution or the effects that such growth may have on medium and long-term sustainability, or of course its repercussions on peoples' food sovereignty.

Agriculture and food sovereignty in developed countries

The highly economically and socially developed countries, like USA, Canada, the European Union, Australia and other well-organised countries like Costa Rica and Chile, have largely reached the first two stages of food sovereignty, namely that the vast majority of the population manages to eat enough and sufficiently healthily, which is all down to two factors:

- Well developed production capacity due to good policy of research, innovation and transfer to the sector.
- Excellent levels of social justice which means that everybody has access to purchasing food.

The above may lead us to the conclusion that the work has been well done, and indeed it has. The Common Agricultural Policy (CAP) has, in barely 40 years, managed to convert the depressed post-war European farming world into an excellent production system. Something similar took place in the other countries mentioned above.

Have we, however, fulfilled our food sovereignty objectives? The answer is no. In the current globalised world farming production in developed countries is not "competitive" because it is not possible to "compete" in the production of raw materials with developing countries. In 2008 the minimum wage in developed countries stood at around 600 euros while it does not exceed 200 in developing countries. Land prices are three or four times higher in developed countries than in the emerging countries. Without subsidies, there are only two ways to "compete":

- Technological development. The rich countries' greater investment capacity in Research, Development and Innovation means that they can compensate with technology, at least partially, the lower production costs in poorer countries. This is leading developed countries to specialise in the production of high value added primary goods like seeds and animals genetically improved by biotechnological methods –transgenic– or other methods; they are also concentrating the production in large units, which are very contaminating and erosive on the ecosystem, and results in the transculturation of the agricultural workers with the loss of traditions and culture.

- The protection of traditional products. Concepts have emerged to protect some produce which is very closely related to the cultural heritage of certain regions, like the Protected Geographical Indications and the Designations of Origin. These systems have allowed some local markets to be restricted to very specific goods with high added value thereby protecting them from globalisation. Other protectionist systems like organic food and quality labels also perform a similar function, and to a large extent favour the survival of traditional and sustainable production systems.

The progress achieved in the industrialised countries in terms of eradicating hunger has come at a very high environmental and cultural cost.

Most cultivable land has been overexploited leading to high levels of degradation and in some cases desertification. In many territories the excessive extraction of groundwater has resulted in the salinization of the groundwater which then requires a lot of energy to make it fit for human consumption.

The chemical and biological contamination of the surface water is currently a serious problem; although states enact laws and prepare measures to protect said water the economic criteria take precedence over the environmental concerns.

Industrial agriculture has concentrated on using very few genotypes with high productive capacity leading to a loss of local varieties adapted to different situations. The countries' animal and vegetable genetic wealth has been squandered (see figure 3). As such, the slow reaction of laws in the face of this scientific advancement is concerning. Although very aggressive biotechnological techniques like cloning exist, the legislators have still not classified such important issues like crimes against genetic heritage, the ownership of genes of agrarian or livestock interest, or the use of the new technologies. This time lag leaves local communities and citizens totally defenceless against the large economic powers.

One must not overlook the fact that in the developed world the active population dedicated to the primary sector is very low and has little political representation. Even in the most advanced democracies the agrarian population is subject to the interests of the voters belonging to more powerful sectors like industry or services. Food sovereignty implies, amongst other values, sustainability, tradition, culture and social justice, which are all at serious risk in the developed world.

Agriculture and food sovereignty in the developing countries

All of the stages of food sovereignty are compromised in the poor countries. First of all, there is hunger and poverty due to poor wealth distribution. Exporter countries like Brazil exhibit paradoxes like the fact that it is world's largest beef exporter, the second largest pig and poultry exporter and amongst the main soya and cereal exporter, although a third of its population suffers from hunger and malnutrition.

In addition, what they do eat is of low quality as all of the food quality control efforts are focused on the exports with very little internal control. Furthermore, the difficulty in accessing food means that a large part of the population does not enjoy a balanced diet.

04 Local markets and products



Local products and markets are vitally important in order to maintain traditional local production systems and genetic resources.



Photo: Alboan

[> <] Source: Own preparation

Lastly, national policies which favour "farming business" and exports mean that traditional foods, local production systems and native genetic resources have to compete without any protection against the industrialised products. This is not sustainable and the result is that peasants are losing their heritage, migrating to the cities and generally losing their self-esteem (see figure 4).

In poor countries, it is traditional to talk about the injustice of the protectionist subsidies for the products from rich countries and the tariff barriers put on the products from the poor countries. It could be considered a contradiction in terms to oppose this situation while being against globalisation, as the latter seeks to remove all trade barriers and promote the free circulation of products and capital.

It is a contradiction but it has an explanation. The participants in the free trade negotiations are, on the one hand, the rich countries representing the services and industrial sectors with agriculture assuming a merely symbolic role; and on the other hand the poor countries representing farming-industrial interests. The agreements favour the neoliberal agricultural model and neither respect nor even take into account social justice or environmental protection aspects which are essential in order to preserve the cultural, genetic and environmental heritage. None of this is possible unless all of the actors can participate under equal conditions. Otherwise, how is it possible in a world with 854 million starving people that it is the Chicago Cereals Market that fixes the crop prices for the next 5 years?

Sovereignty is based on respect for individuals' and peoples' rights and freedoms. Food sovereignty therefore involves the population's right to food and the freedom to feed themselves according to their culture and tradition.

Conclusions

- Globalization is causing a generalised loss of food sovereignty in both developing and developed countries. Some sacrifice their traditional food production in favour of exportable goods, while others abandon agrarian production in favour of more profitable sectors like services and industry.
- The agrarian production of protected high value-added food is a channel for sustainable development available to poor and rich countries as it favours quality employment, self-esteem, settlement, and a social and ecological balance.
- To combat hunger, organisational solutions must be sought –birth control, regional balances, disaster warnings, etc.–, and distributive solutions –dismantling customs barriers in exchange for social measures, income balancing, etc.– and not only those solutions focusing on productivity. Farming traditions probably hold the key to unlocking many of the problems.
- 21st century agriculture must become integrated into a new world order based on social justice, respect for the environment and, of course, the correct distribution and use of resources, which must break from the current continuous growth which is absolutely unsustainable. <

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15 Responsible consumption

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In the great educational task towards the new cosmivision of a sustainable world, special weight is given to responsible consumption as there is a broad consensus on the role of consumerism or consumption as a lifestyle as the main driving force behind our unsustainable economies and cultures.

Introduction

Apart from the fact that we are numerous, human beings consume in excess and in a very inequitable manner. One fifth of the world population consumes three times more than the rest of the planet and 16 times more than the poorest fifth, all with production technologies which are very wasteful with resources (see figure 1).

Mass consumption, consumerism or consumption as a lifestyle has impregnated most social classes. It has been formed and forged during a very specific period and in very specific places of the capitalist system, which is due to the exponential growth in productivity. It has led to warehouses and shelves packed with consumer items.

Hardly a century after this race started, the consumer classes have increased (1,700 million) and have spread to other parts of the world –the proportion of those who have access to the consumer model in “developing” countries like China and India is growing at an unprecedented rate–. However, the role of consumer classes continues being the same: to constantly increase the volume and movement of goods so as to allow for greater return on the invested capital. This model serves as the vehicle and the fuel used to boost global financial power. Between 1960 and 2000 the world population has doubled, households have quadrupled their

01 Inequitable consumption



FADO/ho Bilderi



FADO/Djebel Sy

A **German family** spends \$500 a month on food 15% of its income; while the **average person in Madagascar** lives on less than \$1 a day and devotes 43% of their income to food.

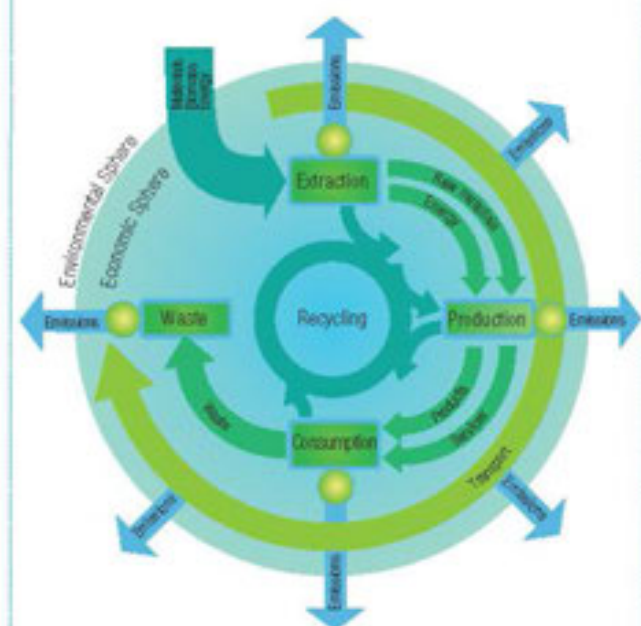
[><] Source: Own preparation

consumer spending, and it is currently estimated that the value of financial securities is about 15 times the total volume of the real economy.

This economic model, capable of producing vast volumes of low cost and low price goods, is based on the plundering of natural resources –where the real cost of extraction is not reflected– and on the labour exploitation of the workers in developing countries with salaries which often do not even guarantee subsistence.

However, this model is reaching a turning point for three reasons: the fact that the cheap and

02 Lifecycle of a product



[> <] Source: EEA-ETCRWM

apparently unlimited resources are running out, the social imbalances and the inadequate governance systems are causing increasing instability on all levels, and the balance between the natural systems, which support the economy and cultures as we know them, are at serious risk of suffering irreversible changes.

It is quite clear that a fifth of the world population must reduce its current consumption by between 80 and 90%. At the same time the remaining four fifths must ensure, on the one hand, levels and ways of accessing goods and services which allow for a decent life and, on the other hand, not falling into the same dynamic or applying the same economic and social development models as currently applied.

Some people, social groups and institutions are devoted to this complex task and work to define and make responsible consumption possible with the help of **sustainable consumption and production policies**.

Responsible consumption

Responsible consumption emerged and is developed by a minority in the opulent societies of the industrialised countries as a conscious, critical and transforming response to the dominant culture of mass consumption, insatiable consumerism as a "lifestyle" and the "disposable" society.

The term responsible consumption has been shaped by the grassroots social movements –rooted in the protest movements and alternative cultures of the 1960s–, and subsequently by important links to international development aid and solidarity associations –fair-trade–.

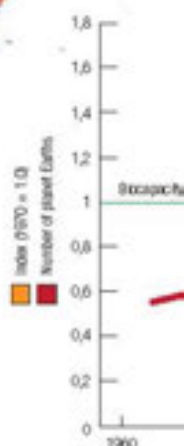
03 Ecological footprint



Global distribution of the footprint, 2003

The total national footprint in proportion to the global footprint is represented by the size of the country. The national footprints per capita are colour coded

- > 5.4 global hectares per person
- 3.6—5.4 global hectares per person
- 1.8 – 3.6 global hectares per person
- 0.9 – 1.8 global hectares per person
- < 0.9 global hectares per person
- Insufficient data

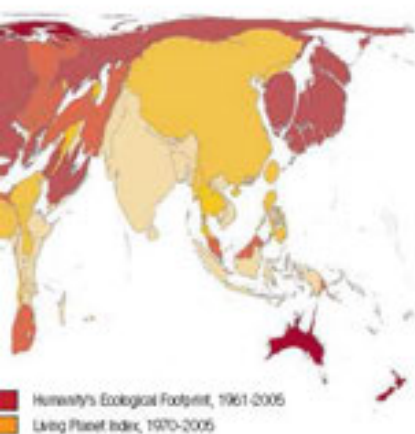


[> <] Source: Living Planet Report 2006, WWF

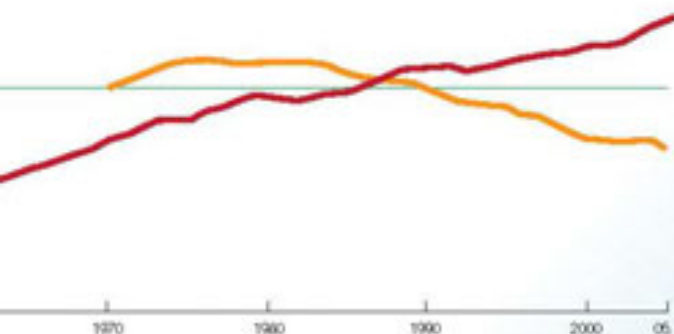
Responsible consumption is having a conscientious attitude and behaving in a responsible way in response to the multiple implications and repercussions resulting from the personal and collective styles of consumption on many of the problems of our local and global world: the environmental, socioeconomic and cultural crisis both at home, and further afield and therefore out of sight.

Responsibility in consumption involves, apart from critical awareness, **ethical valuation** and an **active stance** in favour of the principles of justice, global solidarity and respect towards nature, and against companies with practices and products which subvert and contravene these values. The behaviour resulting from these attitudes leads to voluntary austerity as regards to superfluous materialistic wishes and whims, finding satisfaction and fulfilment from social relations, the arts, nature and being involved in building a universe which does not revolve around utilitarianism.

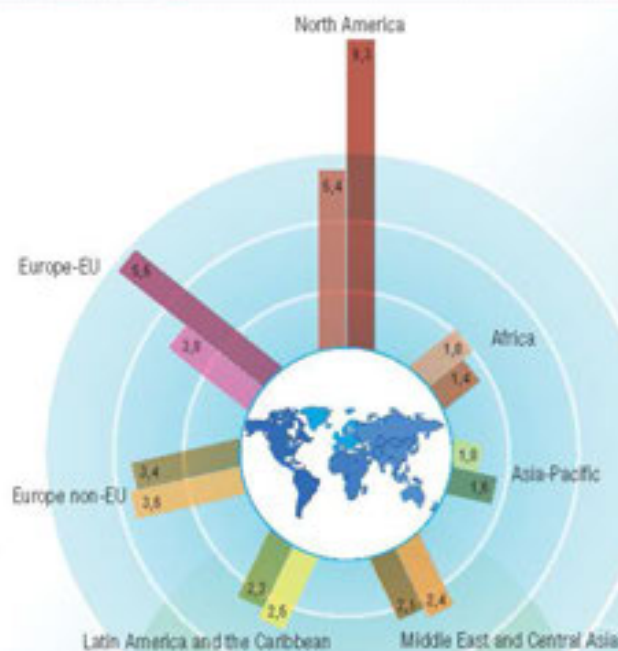
Involvement and constructive participation in reclaiming lost spaces –like reviving local markets where the producer sells directly to the consumer– and conquering new areas –like the creation of sustainable communities and villages, collaboration with a fair-trade association, etc.–, together with a personal commitment to these endeavours are all signs of identity for the people and groups which practice responsible consumption.



■ Human's Ecological Footprint, 1961-2005
■ Living Planet Index, 1970-2005



The Living Planet Index reflects the state of the world's ecosystems, while the Ecological Footprint reflects the human pressure on these ecosystems. Both graphs show us how closely the two are related.



Comparing the years 1961 (lighter colour) and 2005 (darker colour), we see how the ecological footprint per person has increased over time for those in developed countries. In regions like Africa, however, their footprint has decreased.

The conceptual and vital universe of responsible consumption is sufficiency, as seen by the teaching of M. Gandhi, who appealed for people to "Live simply, that others might simply live".

Sustainable consumption and production

The concepts of **sustainable consumption and production** were internationally coined by the World Conference on Environment and Development, also known as the **Earth Summit** (Rio de Janeiro, 1992). These concepts are directly related to the need for the world's most opulent classes to change their consumption and lifestyle habits.

Many scientific bodies are decisively contributing towards preparing both concepts and tools for the implementation of programmes, action plans and specific measures such as ecological fiscal reform, energy efficiency regulations for electrical appliances, the Integrated Products Policy, or labelling regulations.

The main focus is on **integrating** all of the social agents involved in the **production chain** in order that they can agree on how to manage the entire **lifecycle**

of products and services (see figure 2). This new approach and the assembly between representatives of companies – mining, energy and supplier companies and manufacturers of consumer items –, consumer and environmental associations, educators and waste managers, is due to the gradual recognition in administrative circles of the importance and usefulness of concepts, tools and systematic methods to tackle complex situations like current world production and consumption, in which the production chain draws from global resources.

Sustainable consumption and production involves integrated and effective management, as well as **efficiency** in the use of resources and **management of the demand**. Political intervention is needed in order to eliminate the obstacles which hinder any change of behavioural models towards sustainable consumption.

Useful indicators

We can use the indicators illustrated below in order to calculate and communicate the use and degradation of natural resources in relation to human consumption. The common denominator of these tools is their capacity to indicate and calibrate the **limits** of the planet's biophysical systems.

04 Ecological rucksack



[><] Source: Seppo Leinonen

"The world will no longer be divided by the ideologies of 'left' and 'right', but by those who accept ecological limits and those who don't"
Wolfgang Sachs, Wuppertal Institute, 2003.

Ecological footprint

The ecological footprint is a tool used to estimate the impact of a population's different styles of consumption and production on natural systems. It calculates the virtual occupied area expressed in global hectares (gha) (see figure 3). A global hectare is a hectare of biologically productive land with the capacity to secure resources and assimilate waste in accordance with the world statistical average. This is an average with a high aggregate value which can, however, be broken down to the level of a generic product –coffee and tea, juice and wine, sugar, margarine, wooden furniture, electronic equipment, etc.–.

The ecological footprint allows for the impact of consumption to be calculated in relation to the corresponding available resources on different scales –global, regional, country, city, individual consumption–. According to data from *The Living Planet Report* (WWF) and *Redefining Progress*, two of the main references in spreading this concept, on a global scale we are currently 25% above the **biocapacity** –ability to regenerate resources and assimilate waste– of the planet's ecosystems.

According to W. Rees, co-inventor together with M. Wackernagel of the ecological footprint concept, the

root of many situations of extreme poverty, social instability and environmental degradation in the poor countries is the appropriation of the biocapacity by the prosperous countries. "The colonial regime, with its direct appropriation of extraterritorial carrying capacity, may have ended; but many of the established flows of resources nowadays continue in the form of international trade".

Faced with the challenge of the planet's limits and the inequality between rich and poor, the option of "reduce and share" is gathering momentum and asks the rich to make an effort to decrease their total consumption of resources by a factor of 10 (90%), making the development of the poor possible without exceeding the physical limits through the transfer of efficient technology.

Total Material Requirement and Ecological Rucksack

These indicators are parameters which sum and express the physical base of economies, measuring **all of the material resources extracted from the ecosphere** –minerals, crops, water, etc.– used to be transformed into goods and services. Apart from the raw materials with market value –grain for the food industry, oil for the refineries, metals for manufacturing goods, tree trunks for the sawmills, etc.–, the **Hidden Material Flow** and/or the **Ecological Rucksack** are also accounted, although these never features in the accounting books as it "lacks" economic value. These are the "wounds and scars" which leave the land contaminated, eroded and cleared by mining, agriculture and large infrastructure on the face of the Earth.

The **ecological rucksack** represents, in the accounting ambit, part of the damage to the biophysical systems caused by our forms of production and consumption and is the basis for being able to establish corrective mechanisms –like ecological fiscal reform so that the market prices include the "real ecological value"–. This indicator is highly didactic as it is capable of showing and breaking down the weight and the content of this hidden flow behind our daily products, as well as how we use them. Thus, for example, a mobile phone weighing 80 grams has an "ecological rucksack" of over 70 kg –900 times its own weight–, a one-minute phone call involves using resources of 200 grams, and a gold ring 2,000 kg (see figure 4). <

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- > The Ecological Footprint for Educators, Redefining Progress: www.progress.org/education/footprint_education.htm
- > UNEP/Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production: www.scp-centre.org
- > Youth for a sustainable lifestyle, UNEP: www.youth4change.net



16 Peace and security

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Traditionally peace has been considered as the absence of direct violence or war. This notion has its origin in the double dimension of *pax romana*, on the one hand imposing internal order and on the other hand an external military deterrent summarised in the maxim "if you want peace prepare for war".

Dimensions of peace

In the sixties peace research appeared as a discipline, and some academics, researchers and activists advanced towards a broader concept of peace related to social justice, equality and dialogue. As opposed to **negative peace**,

understood as the absence of violence, **positive peace** was proposed as a complex, medium and long-term process linked to human rights, development and respect for the environment (see figure 1). **Conflict** is considered as an element present in every society produced in situations where people or social groups seek or perceive opposing goals, assert conflicting values or have differing interests. Conflict is not in itself positive or negative, what is important is the way in which these disagreements are regulated or transformed; whether in a destructive or a constructive manner. Throughout history conflicts have been one of the driving forces behind social change and an essential creative element in human relations. Peace is a process aimed at promoting constructive forms of conflict resolution.

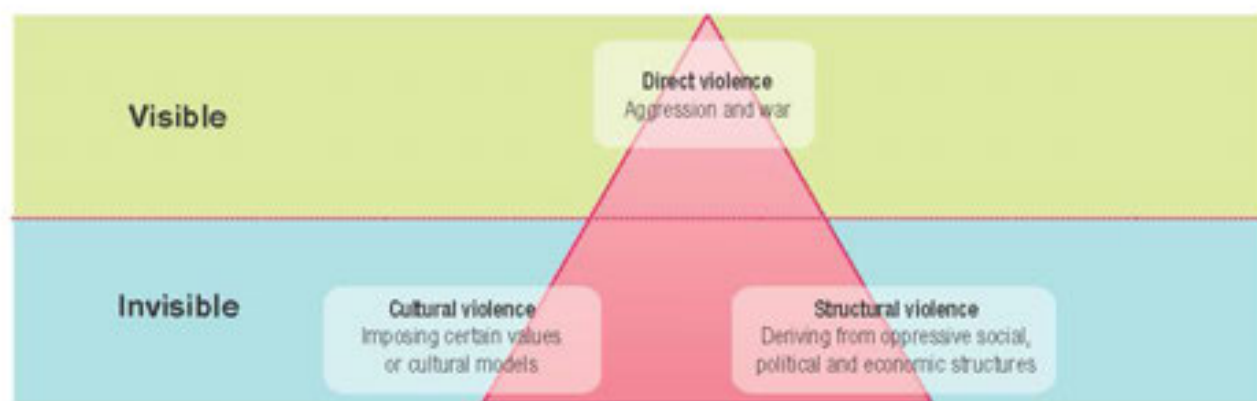
The notion of positive peace has been slowly consolidated and one of the most relevant contributions was from Johan Galtung (in

01 Positive peace and negative peace

	Negative Peace	Positive Peace
Goal	Avoid armed conflict.	Achieve social harmony, justice and equality, as well as the elimination of structural violence.
Characteristics	Absence of war or direct violence. Established between States and requires military hardware to guarantee peace.	Absence of direct, structural and cultural violence. Reduction in the level of direct violence and higher levels of justice.
Strategies	"Pacific war" is accepted by imposing economic sanctions, commercial boycotts, etc.	Peace is a process rather than an end in itself. It does not involve rejecting conflict. We must learn how to deal with conflicts and to settle them in a pacific and fair manner.

[>>] Source: Own preparation according to Galtung

02 Analysis of types of violence



[><] Source: Own preparation according to Galtung

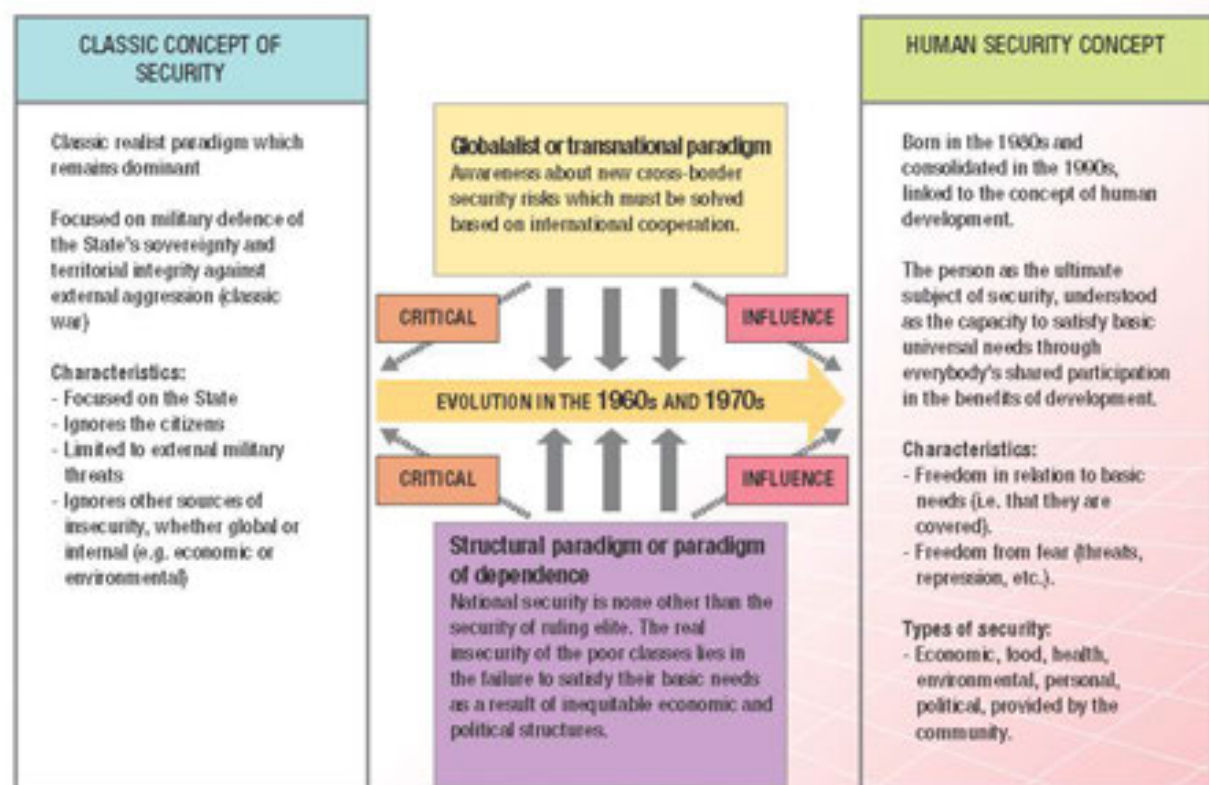
1969) with his concepts of direct violence, structural violence and cultural violence (see figure 2). **Direct violence** is linked to aggression and has its maximum expression in war; **Structural violence** is that which derives from oppressive social, political and economic structures which prevent people from fully realising their development potential: for example poverty, hunger, lack of access to education or health are all forms of violence. **Cultural violence** comes from imposing cultural values or criteria, denying cultural diversity and legitimising the use of force as a method of conflict resolution. As such, peace is a process aimed at reducing all of these forms of violence, whether direct, structural or cultural. This notion of positive peace has considerably broadened the scope of action of researchers, educators and the peace movement itself. It has also been enhanced over the years with new contributions from authors like Martínez-Guzmán, who consider that there may be different ways to "make peace". Or the concept of the "imperfect peace" of Muñoz and López which treats peace as a complex process which is difficult to achieve and is recognised and constructed on a daily basis. For Fisas, peace is a process to consolidate a new way of seeing, understanding and living in the world, starting with oneself and continuing with others, horizontally, forming a network to provide confidence, security and authority to people and societies, promoting mutual exchanges, overcoming distrust and differences from a local and a global perspective.

Some institutions, particularly UNESCO and its Director General Federico Mayor Zaragoza (1987-1999), have significantly boosted the Culture of Peace in all ambits, both internationally, at government level and within civil society. In 1999 the United Nations General Assembly passed the Declaration and Action Programme to Promote a Culture of Peace which was an important step in promoting peace and transforming conflicts in all areas, particularly in regards to education.

Peace is related to human rights and the human right to peace has been one of the main focuses in recent years for many organisations and bodies. These organisations advocate peace being recognised as a right which is denied to many societies as a result of, amongst other factors, poverty, the lack of freedom or internal wars, as indicated in the Lluçman Declaration (2007).

Human security

Peace and security are two concepts which are intrinsically linked. Like the concept of peace, the notion of **security** has been changing and evolving (see figure 3). The classic concept of security, the so-called "national security", is focused on the military defence of the State's sovereignty and territorial integrity against external aggression. However, since the seventies this focus has been questioned as it is now accepted that there are new transnational security risks which cannot be tackled by focusing on the military defence of the national borders: some of the threats identified in this period are environmental threats, organised crime or human rights violations. Various initiatives, like the Palme Commission with its 1982 report titled *Common Security: a Programme for Disarmament*, the *Our Common Future* report prepared in 1987 by the World Commission on Environment and Development and the Peace Programme from the United Nations Secretary General Boutros Ghali in 1992, were all important contributions towards extending the notion of security. Finally, in 1994, the United Nations Development Programme (UNDP) set out the notion of human security focused on the people instead of the States. **Human security** means that everybody is capable of satisfying their basic needs, particularly those who live in extreme vulnerability, whether in the contexts of war or marginalisation, where the institutions are obliged to



[><] Source: Own preparation

provide protection and ensure their survival. The notion of human security was a great step forward in how security is understood and in its relationship with sustainable human development (see figure 4).

The threats to people have been changing according to the political, social and economic contexts, and human security requires a multidisciplinary analysis capable of identifying these potential threats. In 2004, the United Nations High-level Group on threats, challenges and change published its report titled: *A more secure world: Our shared responsibility*, which mentions six clusters of threats which are of global concern as they do not respect national borders, are interrelated, and must be tackled on a global, regional and national level, as no State, however powerful it may be, is immune from them. These are:







- Inter-State conflict.
- Internal conflict, including civil war, genocide and other large-scale atrocities.
- Economic and social threats, including poverty, infectious disease and environmental degradation.
- Nuclear, radiological, chemical and biological weapons.
- Terrorism.
- Transnational organised crime.

Threat of environmental degradation

Amongst these threats it is probably those related to environmental degradation, scarcity of resources and climate change which have had the most impact on public opinion. The race to control and exploit the energy resources is very noticeable and is a matter of concern for numerous governments and societies. Some of the recent wars and conflicts are directly related to access to gas and oil reserves, as is the case of the Persian Gulf and Central Asia. Conflicts and tension related to water supply or navigation rights are also frequent, particularly if we take into account that there are 250 river systems shared between two or more States, many of which still have unsettled disputes. Various reports and studies have also come to the conclusion that climate change will have a particular affect on the poorest countries so their existing tensions will be heightened which will further hinder the possibility of reaching an understanding. Global warming will lead to resources becoming even scarcer, particularly food, and some poor countries will be extremely vulnerable as a result. It will also become more difficult for them to deal with the massive population displacements caused by rising sea



04 Types of human security and their threats

Types of human security	Characteristics	Threats/Indicators
 Economic security	Availability of basic income from work, the State or from the family or community.	Rising unemployment, drop in real salaries, rising inflation, loss of production assets, rising income gap between rich and poor.
 Food security	Availability of food and resources to access it.	Consumption deterioration, exhaustion of the food reserves, drop in food production and increased dependency on imports.
 Health security	Healthy body, healthy environment, health care cover.	Rising instability, propagation of epidemics, deterioration of the health system and access to drinking water.
 Environmental security	Ecological balance, sustainable development.	Deterioration of the local and world ecosystems, exhaustion of the resources.
 Personal security	Absence of physical violence.	Increase in different types of physical violence (political repression, attacks on foreigners, ethnic or religious conflicts, delinquency, gender violence) drug trafficking, etc.
 Political security	Respect for individual's fundamental rights, democratic guarantees.	Increase in political violence, human rights violations and authoritarianism; break-down of the nation State due to reality.

[><] Source: HEGOA and UNDP

levels, especially in the Pacific and Caribbean islands. Frequency and intensity of natural disasters like cyclones, droughts and flooding, will have a greater affect on the poorest countries. This situation will have very serious implications for human security.

At the same time some environmental issues may provide useful elements in the conflict transformation and peace construction processes. The environmental problems, due to their global nature and the interdependence of the ecosystems, force conflicting parties to cooperate if they want to obtain greater benefits.

This is the case of water management or the fight against pollution. Environmental issues also require local participation and common sense. When this cooperation is achieved on environmental issues, new areas will be created for negotiating other issues which due to political reasons, ethnic differences or historical grievances, have become impossible to resolve. Thus, new scenarios for dialogue will be opened which allow disputes to be resolved via negotiation. This is how environmental problems can make an important contribution to the construction of peace. <

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17 Democracy and participation



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It could appear as though little interest is displayed in talking about democracy and participation given that the channels through which citizens take part in democratic political systems are clear.

Indeed, if we limit ourselves to considering democracy as a representative system of government where what is important is that there is plurality and competition between differentiated political options, that citizens with the right to vote choose their representatives for a limited period of time, and that it is possible to change political forces and leaders for others, then participation would be the same as voting and, in some cases, forming part of a political party or candidacy and presenting themselves at the elections. Nevertheless, lately we hear of participatory democracy and of the direct presence of citizens in those public decisions which have the most affect on them.

Why is merely voting not enough? What sort of participation are we talking about?

Traditional democratic government is currently facing growing problems in effectively reacting to an increasingly more complex, uncertain and dynamic environment. The **democratic legitimacy** of the public institutions is deteriorating before citizens who are more and more reflexive and critical and have new values which cannot be satisfied with the merely technocratic provision of public services. Deep down, we are not dealing with problems of democratic legality. Nobody doubts the legality of the decisions which are taken or the representativeness of the institutions taking such decisions. The problem is one of legitimacy. Minorities are not always well represented and are therefore not able to make their voice heard.

The electoral and political support obtained by the governing majority at the time of the elections does not always last unscathed and without alterations throughout the term of office. This type of problem is not new, but they have now become particularly important due to the large number of decisions taken by the representative institutions and their administrations, their increasing complexity and the high level of information and awareness which certain issues have on public opinion.

One of the concepts most used in order to try to describe the new forms of collective decision making is the term **governance**. Despite the term's ambiguity, we could say that it refers to a collective capacity to generate government or decision-making capacity faced with public challenges and dilemmas (see figure 1). Its essential characteristics are:

- It is not based on authority and sanction, and therefore avoids hierarchical approaches. On the other hand it attributes a role to the public authorities based on their capacity to mobilise resources, generate incentives and perform leadership.
- It is formulated through horizontal interdependent relations between multiple actors: state institutions, companies, NGOs, etc. These actors share resources and make up relatively autonomous, stable and often informal networks.
- It resorts to shared formulas based both on cooperation and competition between actors which sometimes blur the dividing line between the public and private spheres, appealing for social confidence and the idea of society's self-responsibility.

Faced with the problems of traditional government, the new concepts of governance and networked government implies recognising, accepting and integrating complexity as an intrinsic element in the political process; a system of government through the participation of different actors within a framework of plural networks; a new approach by the public authorities towards government processes, the adoption of new roles and the use of

01 Cases of good governance

TERRITORIAL GOVERNANCE

The right to collective land ownership in Colombia, established in the 1991 Political Constitution, recognises the collective ownership of the region to indigenous people and to those of African origin. This seeks to achieve greater autonomy over their issues, contributing to sustainable development with identity and improving access to the natural resources. It is not a right to a plot or lot, but rather to a territory which includes the environment, ecosystems and the public and cultural relations with the space in order to develop the governance.



Meeting at a Colombian indigenous community.



Participative budgets preparation process in Málaga.

PARTICIPATIVE BUDGETS

These are participation and management tools for the city, whereby the citizens can propose and decide about the use of part of the municipal resources. The main objective is to establish the city's principle daily requirements in a participative manner.

Since 1989 when the first initiatives were set up in the Brazilian city of Porto Alegre, participative budgets have gained ground in Latin American and in Europe.

[><] Source: Own preparation

new instruments. A new manner of government is sought which treats the people as informed actors and not as the mere subjects of third party decisions. Participation is not merely limited to voting. Advancing participation indicates progress towards a new way of doing things. There are not however many examples of this, although, there is a broad consensus that the traditional forms of government are becoming obsolete.

Democratic hostility and the participatory alternative

One often hears about the growing distance between society and politics. What some refer to as "democratic hostility" has been nourished by apathy and a degree of inherent alienation vis-à-vis the representative democratic system. This is reinforced by the inability to deal with the emergencies which arise on a daily basis as a result of new and old problems. Thus it seems that the authoritarian or technocratic alternatives cannot really solve these problems and actually aggravate many of them. We must commit to reinforcing representative democracy with new forms of representative democracy. A participatory rapprochement may help to progress towards resolving the problems facing local communities, and in particular in relation to those issues which have become blocked like those which are expressed through the "Not in my back yard syndrome" (NIMBY) or "not here" (see figure 2).

What is the benefit of participation? Is it not enough for the elected politicians and technicians to take decisions?

Behind the idea of participation lies the idea that if we do not share problems and responsibilities between public authorities and other organisations, bodies, groups and people then there will be no progress in improving everybody's living conditions. This involves recognising, conciliating and reconciling interests, balancing preferences and constructing collective governance commitments, which involves deciding between values and priorities, in other words, **politics**.

The traditional vision considers that it is a contradiction in terms to talk at the same time about social participation and efficiency or effectiveness, but this is not necessarily the case. In fact, the evolution of contemporary societies seems to show otherwise. We are increasingly facing more global and interrelated problems which are therefore difficult to define into categories and tackle through the specialisations that have been established over time. The current problems have very little in common with the decision and administrative structures designed for different times and for another type and magnitude of problems.

It is becoming increasingly clear that having the best technical alternatives is not sufficient in order to make a project viable. Other problems appear when we apply

02 From 'not here' to 'like that'



An airport is an example of infrastructure which may be rejected by the society living and working in the area.

The expression "Not in my back yard" (NIMBY) is used to express the idea that people do not want installations which, although they may be necessary from a collective point of view (dumps, prisons, new roads, hospitals, etc.), are rejected by the people, groups and entities closest to them. However, there are ways of intervening in the territory which respect the powers and roles of the public authorities, as well as the ideas, values and feeling of the actors in the territory. Finding ways of citizen participation and involvement from diagnosis right up to the decision making, means finding ways to unblock the process. People may accept decisions which go against their own interests if they consider that the decision-making process has been properly carried out.

[><] Source: Own preparation

this technically orientated logic: Who controls these techniques? Whose responsibility are they? And equally important, how can a possible consensus in the technical arena be extended to the social sphere? Every day that goes by provides us with new evidence or proof that what in certain technical circles may be "common sense" or "universally recognised doctrine" clashes with all types of misunderstandings when it is transferred to the social ambit. We also see that in many cases such technical unanimity does not even exist as there are always alternatives, viable to a greater or lesser extent, which differ from those considered up until then.

The situations identified as type 1, where there is a technical and social consensus (see figure 3), are becoming increasingly scarce. It is not necessary to enter into too much detail on the segmentation, the social fragmentation and the increase in the number of actors, or about the proliferation of contradicting studies on the same issues, in order to understand that we are almost continuously facing situations where consensus of some sort is lacking. It could even be said that we are finding ourselves more and more in quadrant 4. It is in this field where politics and the democratic and participatory channels for conflict resolution take on their full potential,

03 Technical and social consensus



[><] Source: Own preparation

04 Cases of participation in water management



Photo: Europerio-Spain

EUROPEAN WATER FRAMEWORK DIRECTIVE

The European Water Framework Directive has opened a stage for debate, with the participation of government and administrative representatives, user groups, universities, research centres and other social organisations. It has opened a area of dialogue and is forcing deliberative processes and consensus strategies. A very significant issue is the incorporation of the sustainability logic amongst its strategies. All of this in the long-term will facilitate more environmentally-friendly water.

More information: www.water.europa.eu/participate/

WATER DIALOGUES, SOUTH AFRICA

This is a dialogue process, and also a research project, which analyses the role of the public and private sectors in providing universal access to water and sanitation in the country. It is part of the International Water Dialogues initiative.

South Africa is offering the opportunity to establish a constructive dialogue, identifying, analysing and evaluating different approaches to improve the service. The aim is to achieve universal access to safe water and sanitation.

More information: www.waterdialogues.org



Photo: CBD

[><] Source: Own preparation

and where the need for participation and dialogue between opposing, non-coinciding, scientific and social rationalities becomes clear. It is precisely in this type of situation where "some" –experts– and "others" –social agents– can more freely –and more pedagogically– debate their different visions of the problem. **Figure 4** includes two cases of areas created to achieve consensus between different actors in water management.

We must not make the mistake of confusing or mixing technical feasibility with social feasibility and work must be performed in both areas in order to deal with the problems where consensus is lacking, even as regards to whether a problem exists and, if so, the type of problem we are dealing with. We do not think that we need to insist much

further, given the evolution of the environmental issues in Spain over recent years, in order to emphasise how important it is to take these participatory dynamics into account.

The issue does not lie in the ability to "sell" solutions, but rather in the ability to share definitions of problems so as to increase the legitimacy of the path that goes from this shared definition to a solution considered by all involved as an improvement. The participatory dynamics can help to significantly improve policies in general and in particular those relating to the environment and sustainability. Each and every one of us is responsible for our communities' social and environmental sustainability and we are called to participate in the decisions affecting such sustainability. <

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18 Urbanization and land use planning

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Urban order and nature's order

Since our first cities were created many centuries ago, three main systems have coexisted more or less harmoniously and pacifically. The first of these is nature which provides a base for the others. The second is agriculture –livestock farming, forestry, mining and marine resources– as the primary form of exploiting this nature. Finally, the city systems, true human conglomerations which enclose –literally– very small portions of the territory, interlinked by significant land or river networks, allowing them to function in an interconnected manner.

Cities are characterised by the establishment of a limit. In the Etruscan rituals to found a city, the establishment of this limit was a sacred act, the *limitatio*. For example, when Romulus wished to remove the limits of the city of Rome, he was bound to kill his brother Remo. The territory was limited so that it could be controlled, so that a different order could be established other than the natural order. This is the essence of urban

development. Of course, no city is self-sufficient and to maintain urban order requires resources that cannot be found within the city walls.

There are only two ways to maintain urban order: the first, whereby either additional contributions of energy are obtained or, through the use of part of the energy that is used to achieve the "natural order". The second, is known in ecological literature as "transferring positive entropy to the environment" for example, Bettini said that "an open system –a city– can therefore maintain itself in an ordered state, transferring positive entropy to the surrounding environment –in other words, disordering it– in the form of heat and degraded chemical substances, while at the same time, collecting negative entropy". Something similar occurred with the so-called "country", albeit less intensely.

The fragmented city

As a result of these, two ways of life became consolidated which have characterised our territory

01 The European Landscape Convention

"Landscape means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors".

The landscape constitutes an "open area" which reflects both the territorial regulation and the activities developed in it. It does not only cover the natural environment, but also cultural and social components which model and interact with the environment.

The European Landscape Convention establishes that it must be protected, managed and regulated.

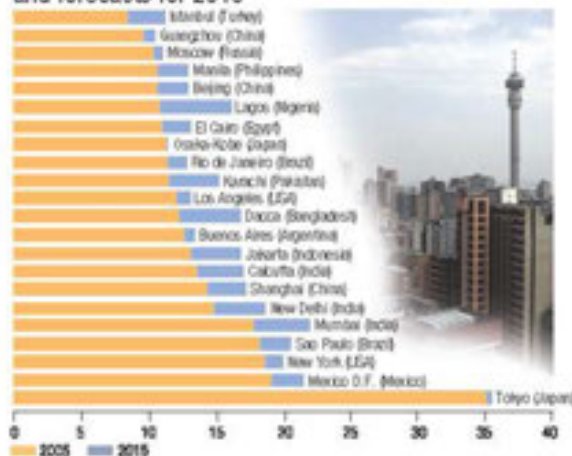
Atlantic countryside landscape
Photo: Basque Government/ J. Magurel

[>>] Source: Own preparation



During the second half of the 20th century, the migrations from the country to the city have occurred at an extraordinary pace. The lack of planning has led to a proliferation of human settlements around the cities causing intense environmental pressure, and above all on people's health and quality of life.

Populations of the megacities in 2005 and forecasts for 2015



Currently half of humanity lives in cities and approximately ten percent in a megacity.

[><] Source: UNPOP

Urban settlements



Slum in Nairobi, Kenya

Photo: de warrat

Uncontrolled outlying urbanisation, seen in many cities in developing countries, means that people occupy the scarce low land resources, flood areas and steep hillsides.

for many years: on the one hand, the urban way of life and on the other, the rural way of life, which have worked as a shock-absorber between nature and the city. The urbanite has nearly always considered the rural dwellers as having an idyllic form of life and as having a certain relationship with that natural paradise, one that they lost by taking refuge in the city. That is what happened at the beginning: rural society –despite everything– as the supportive society and urban society as the alienated society. However, all of this changed in the middle of the 20th century.

One of cities' most significant deficiencies has, obviously, been the lack of contact with nature. This problem has been specifically overcome by one of the forms invented by town planners: the **garden city**. This orientation, sufficiently well-known and used up until now by many planners, has some peculiar characteristics: low densities, decentralisation and the separation of functions. These trends, which started in the last quarter of the 19th century and at the beginning of the 20th century, were taken to the limit and conveniently distorted due to the possibilities brought with private car mobility in the most developed parts of the world and have led to what many authors call, **the diffused city, fragmented city** or simply, **anti-city**.

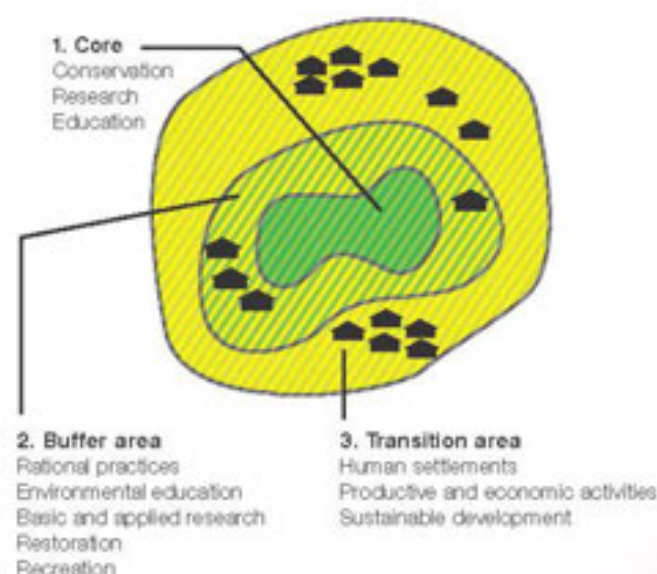
Up until now, cities had been limited to occupying more or less concentrated areas and, beyond the last blocks or the furthest suburbs, lay that which is known generically as the "country". In this new and perverse modality, cities tend to absorb everything, supported by their infrastructure, and survival is based on the **mobility** brought by the automobile. As mentioned above, this

started to occur significantly with important territorial implications, as with the Second World War.

The predicted trend is to live in small residential communities, separated from each other and, all inhabited by people of a similar socioeconomic status, who work in large specialised centres or, in the centre of the traditional city, do their weekend shopping in large shopping centres where they can also go to the cinema, dance or have dinner at more, or less, expensive restaurants. Thus, the city is divided into small parts, taking up areas of the country, and leaving free, areas between these parts. But this progressive break-up of the cities into smaller parts does not lead to more supportive areas like the old villages because each small part does not contain all of the vital functions and, in fact, the opposite occurs whereby separation becomes even more apparent: between functions, between social classes and even, between spaces.

Of course, these rapid changes have also affected life in the **rural areas**. On the one hand, mechanisation has arrived. Even certain tasks which require very specialised and expensive machinery, like harvesting or pesticide spraying using light-aircraft, are now often performed by companies contracted by the farmers, which is increasingly converting farmers into businesspeople. The traditional concept of village is therefore unravelling and villages are increasingly resembling the urban islands mentioned above, following the evolution of the cities. In this way, cities and villages are coming together and are becoming increasingly similar, with the village becoming one more fragment of the city, albeit the

General zoning plan



[><] Source: UNESCO Man and Biosphere Programme (MAB)

The case of the Green Belt of the city of Sao Paulo



Amongst the reasons which led to the declaration of the Green Belt of the city of Sao Paulo as Biosphere Reserve was the fact that this Reserve surrounds one of the largest cities in the world, with 10% of the population of Brazil, and with a very low green area ratio per inhabitant.

Some of the most significant benefits are:

- It houses the springs which supply the city.
- It stabilises the climate, reducing the effects of the heat islands.
- It filters the atmospheric pollution.
- It houses vast biodiversity.
- It protects the ground in vulnerable areas.

village inhabitants are dedicated to agriculture or livestock farming. All of this has had significant repercussions on the landscape as we see it (see figure 1).

All of the territory for the city

If we look at the relationship between urban planning and the territory, we see that the old cities –the traditional cities– appeared as a kind of cyst on the territory. They were clearly separated from the country by walls, fences or ditches and were a type of anomaly vis-à-vis the rural world, which was much more integrated with nature. However, since the middle of the 19th century, the walls have been systematically knocked down, the fences removed and the ditches filled in. A century later, the appearance of the automobile has allowed urban developments to extend without limitation and the city is literally spilling out in a centrifugal manner into the surrounding areas, taking over the villages, crops, dumps, pig and poultry farms, the natural areas, the stables etc. This has scarred the few remaining non-anthropogenic areas.

The situation has been inverted and now everything is urban land or land suitable for development –even legally– except for specifically reserved land. We even have to fence in and provide security systems for those islands of nature, in the middle of urban territory or pending development, so that they are not taken over by the urbanites.

But, what has happened to the entropic relations between urbanisation and nature? It is clear that the 'natural order' has been losing ground to the 'urban order'. This increase cannot, however, continue in an unlimited manner. The 'urban order' must dump its excess entropy somewhere. Up until now, the 'natural order' has been absorbing it as

best it can and, the city has had to gather its resources and get rid of its waste further and further away. We are now at the limit. Since the middle of the nineteen-eighties, the ecological footprint is greater than the Earth's biocapacity and, this disparity continues to increase. This means that we are consuming all of the savings accumulated over thousands of years, in the form of fossil fuels or contamination drains.

Rich cities and poor cities

This situation is occurring in the world's most developed areas. In the less developed areas, the population is abandoning rural areas en masse and crowding into the suburbs of the large cities (see figure 2). The practical absence of small and medium-size cities is making the problem worse, whereby hundreds of thousands of people are occupying hectares and hectares of subhuman housing, under zero urbanisation and high density conditions. The problem in this case, is not the ecological footprint. The ecological footprint of any of these cities is, of course, much smaller than that of any city in a developed country. Their contribution to the planet's exhaustion is low. The problem is one of survival and **inter-territorial justice**.

This century's urbanisation challenge lies in reducing the ecological footprints of the inefficient rich cities, so that the less rich and those that are barely surviving can increase theirs. There are only three ways to achieve this, reduce the world population –the fewer we are the more of the planet for each of us–, decrease and share the consumption, or invent. The latter corresponds to land use planning (see figure 3). We must make our cities and territories more and more efficient, so that they can perform the same

04 Urbanism towards sustainability

Streets, squares, transport and parks must be designed so that their use is pleasant and also environmentally friendly. The planning must therefore consider sustainability criteria, as seen in the following examples:



Sustainable urbanism aims to be socially, ecologically and economically sustainable. It pays particular attention to mobility, energy and water savings, waste management, acoustic impact and the creation of a pleasant environment by using a functional network of green spaces. The Vauban neighbourhood in Friburg and the Hammarby neighbourhood in Stockholm (in the photo) are models of eco-neighbourhoods.

Bioclimatic architecture consists in designing buildings taking into account the climatic conditions and the conditions of the environment, using the resources available –sun, vegetation, rain, wind– to minimise the energy expenditure and environmental impact.

The housing in BedZED in London (in the photo) has been built using recycled materials under bioclimatic criteria.



Sustainable mobility refers to the group of actions aimed at achieving the rational use of the means of transport, which consume fewer resources and produce less environmental impact. Some of these actions are: pedestrian zones, cycle paths, urban toll roads, dissuasive parking, car sharing, etc. Cities like London and Stockholm have been precursor cities in taking these measurements.

[><] Source: Own preparation

functions but with less consumption and contamination. What is done with the savings achieved is more of an ideological and ethical problem. Having said that, it will very probably be impossible, regardless of how much we improve their efficiency, to solve this real challenge of the 21st century without reducing consumption. And this will involve changes in the value system, habits and social custom.

However, what can be done to make our cities and territories more efficient? There is at present a certain degree of consensus amongst specialists. Amongst the principle measures we could, for example, mention: controlling agricultural and livestock practices; encouraging reforestation; changing towards more

sustainable tourism; leaving large territorial areas without use; controlling land consumption; encouraging rented housing; avoiding dispersion; making the mobility model more sustainable; making urbanised areas more complex; renovating, rebuilding, reusing; controlling standards and densities; designing with bioclimatic criteria (see figure 4). There are many studies and a lot of work on all of these issues which indicate the right way forward. If we stand there doing nothing, the system will adjust itself. The problem is that the "collateral damage" could be truly devastating for humanity. This is why, more than ever, we must continue the work, we must invent –which is one of the most important human capacities– and, we must not ignore the evidence staring us in the face. <

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19 Local-global sustainable communities

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Global-local relations

The world is no longer a collection of more or less independent societies, and has now become a fully articulated **system**, in which everything and everyone is interrelated. The different countries, peoples and communities function as subsystems of that global system through complex and reciprocal mechanisms. Today's planet is the common heritage of all living beings, a habitat of **interdependent** people, which has, whether we like it or not, a collective destiny.

Migration, travel, commercial exchanges, etc. mean that what happens in one part of the world has repercussions in faraway places and, very significantly, modifies the system as a whole. Thus, a crisis in parts of the planet –economic, food, energy, etc.– ends up affecting the whole planet.

This is particularly true on the ecological level. The biosphere functions as a large system in

which problems like climate change show the importance of local actions –the emission of greenhouse gases– on the Earth as a whole. Other problems, like acid rain, clearly show how contamination produced in one part of the world ends up affecting others, even faraway places.

How do local actions influence a global world?

Without a shadow of doubt our everyday actions have wider repercussions than we think. Our daily acts, on a local level, leave an ecological footprint sometimes close to home, but also and very often, in faraway places –we consume food produced in other parts of the world; we import energy for our country's needs, etc.–.

A decision, whether to go to work in a private vehicle or by public transport, has a clear impact on CO₂ emissions and therefore on climate change. The same applies to the decision to turn on the air-conditioning or lights, and even

01 Local initiatives which change the world



The Earth Charter: change our village, change the world

The Earth Charter is a declaration of fundamental ethical principles, a universal code of conduct, which seeks to guide humanity towards sustainability. The Earth Charter provides an ideal framework to help local communities towards sustainable development, environmental protection and a culture of peace.

[><] Source: Own preparation

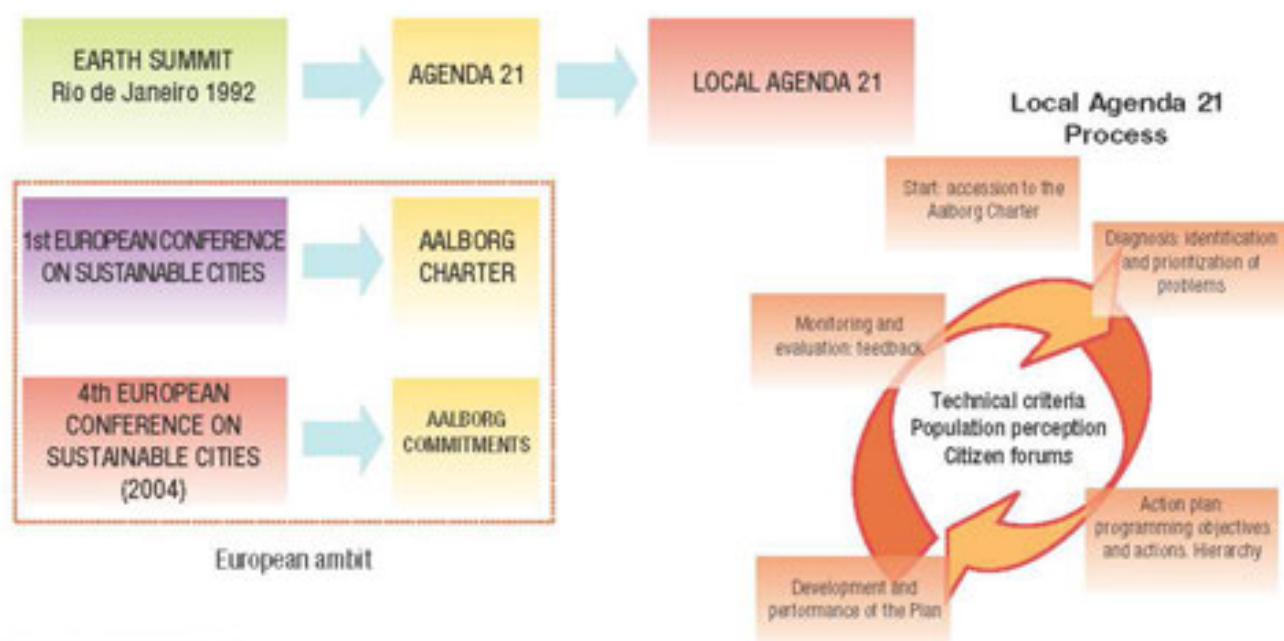


The Green Belt Movement (Kenya)

30 million trees have been planted. This activity has also provided work to about 80,000 women and has strengthened women's image on the African continent. It is led by Wangari Maathai, who won the 2004 Nobel Peace Prize for her contribution to sustainable development, democracy and peace.

02 Agenda 21 and Local Agenda 21

Agenda 21 is a programme promoted by the United Nations at the 1992 Rio Earth Summit to encourage sustainable development on the global, regional and local levels. Local Agenda 21 is an action programme characterised by institutional commitment and citizen participation in a continuous improvement process of the community.



[>] Source: Own preparation

how we eat. We are always consuming resources which are produced somewhere –energy, food, etc.– and these generally have to be transported in order to reach us.

To produce a kilogram of meat, for example, involves consuming over 10,000 litres of water –for irrigating pastures and feeding livestock– during a breeding process which generates large amounts of greenhouse gases. Our need for proteins, in a balanced diet, can be covered by a daily portion of 70 grams of meat, or an equivalent amount of fish or eggs. Could we eat better and with more moderation?

Setting the heat thermostat at 20°C instead of 22°C leads to notable energy savings, without losing any quality of life. All we have to do is wear a sweater at home in the winter. The same applies to air-conditioning. If we could be satisfied by being at 24°C, instead of insisting on being cold in summer, the energy consumption would again drop considerably.

These and other small gestures –how we dress, travel, shop, use our time etc.– repeated by millions of people have a large influence on the global environment (see figure 1).

How does globalization influence local environments?

The increasing importance of transnational companies in the world economy means that very

important economic decisions are being taken in very few centres of power which sometimes go over the heads of governments. For example, the relocation of productive activities means that factories are closed in places where there are very high environmental and social exigencies, and relocated to regions with low environmental standards and low salaries. The result is that when a company in New York or Tokyo decides to close a series of factories in one country and relocates them to another, a global decision is being taken which directly affects local communities.

This occurs in all spheres of life. What we buy, what we eat, the television we watch are often produced in faraway places, generally in a global manner, and reach us perfectly "packaged" for consumption. Economic globalisation has turned the world into a large single market, and its consequences have an impact on the world's smallest villages.

Sustainable communities

The current challenge facing citizens is to learn to be "glocal". This means thinking globally and acting locally and globally (see figure 2). Sustainable citizenship is therefore that which, without losing sight of global conditions and problems, seeks to boost the endogenous capacities of each community so as to increase their autonomy and reduce their



[> <] Source: Directorate-General for the Environment, European Commission

European Common Indicators

Main indicators (compulsory)

1. Citizen satisfaction with the local community.
2. Local contribution to global climate change.
3. Local mobility and passenger transport.
4. Existence of public parks and local services.
5. Air quality in the area.

Additional indicators (voluntary)

6. Children's travel between home and school.
7. Sustainable management by the local authorities and local businesses.
8. Sound pollution.
9. Sustainable land use.
10. Products which promote sustainability.

dependency. This does not mean closing relations with the exterior, but rather devising applied and contextualised solutions which make each community less vulnerable –e.g. through the use of renewable energy–.

A sustainable community is one which uses resources but is also aware of the **limits**; seeks to minimise its ecological footprint; encourages equity amongst its members, avoiding large disparities in access to resources; recycles, uses public transport and, in general, favours the use of social community resources as a complement to the private sector –e.g. in public health, public schooling, etc.– (see figure 3).

To find out whether a community is living within its ecological limits we compare its ecological footprint to its biocapacity i.e. its total surface area of biologically productive land. When a nation's ecological footprint exceeds its biocapacity, its economy is using up more forests, crops and resources than can be supplied by its own territory, and is demanding too much of the planet's global capacity to absorb the waste that it generates.

In general there are two indicators which can properly define a community's sustainability. These are its commitment to the small and to decentralisation. Considering "small" as the optimum size in each case –which changes from one community to another –and valuing decentralisation –urban development, administrative and cultural– as a commitment to a balanced development model.

Is unlimited economic growth possible?

A sustainable community cannot live under the false illusion of unlimited economic growth, for the simple reason that the Earth is a closed and finite system and a subsystem –economics– cannot grow indefinitely within it.

Can we maintain a good quality of life without growth?

Of course this is possible in the developed countries. All we have to do is change the priorities –for example, spend less on arms and divert these savings to increasing social spending–. The developing countries still need economic growth to create infrastructure –housing, hospitals, schools etc.– but it must be used for this purpose.

How much is enough?

Development is a legitimate goal for countries and people, but it must be subject to other greater goals.

To live "better" must not mean consuming more, but rather living more fully, without being exploited, and with the ability to choose reasonable leisure time and time to look after ourselves and those around us. Out-and-out productivity and overconsumption do not go hand in hand with happiness.

Can one be "neutral" in an interconnected world?

Our actions, whatever they are, are never neutral. Whether we dedicate ourselves to planning, management or education etc., or simply living as citizens, we must subject, even our apparently insignificant acts, to the values of a sustainable life, particularly to the **awareness of limits and**



04 Time Banks



A Time Bank is a system whereby services are exchanged for time. The unit of exchange is not monetary but rather a measurement of time. It is a services for services exchange system which encourages social relations and equality between different economic strata. It is a way of constructing social capital, generating reciprocity. In this way, confidence and civic commitments are automatically reproduced, constituting a tool to revitalise the life of the community.

[><] Source: Own preparation

moderation in the use of resources. Everything we do, the way in which we consume, the guidelines we use at work and play, all have local and global repercussions for which we are responsible.

Reasons to change

More is not always better

Growth for growth's sake does not in any way guarantee people's happiness. Nor does it guarantee the stability of institutions. Small is, in general, more

resistant than big, and also more resilient –it copes better in the event of disaster–. Big is, in general, more vulnerable. In nature, animals grow until they reach their optimum size and then they stop developing. This can be extrapolated as a guideline for life. Development does not necessarily mean constant growth.

Towards a culture of self-containment

We live in times of a global ecological crisis. The global change that the planet is undergoing, due to human manipulation, is clearly a warning. Climate change requires that we urgently adapt our behaviour. The same applies to the food and energy crises. We must "change the course" on the basis of self-containment in the use of resources. If we are incapable of this action, the likely result is that the biosphere will demand it in an abrupt manner, bringing with it irreversible problems.

From waste to sustainability

With everything that is wasted in the world's richest countries and sectors –food, energy, transport, etc.– the problem of world hunger could be solved. Expenditure by people in the North on slimming products, together with the expenditure on skin creams, perfumes, luxury cars, etc. amount to such vast sums that they could be successfully applied to achieving many of the Millennium Goals. The wasteful societies in the North, and the wasteful oligarchies in the South, must change towards sustainable life models. Not only for reasons of equity, but also due to the strategic imperatives of providing balance to a global society which is foundering on all levels.

The value of time and care

Time is an extremely valuable intangible which is becoming increasingly scarce in industrialised societies (see figure 4). Recouping time for life, for coexistence, for personal relations, leisure, care etc., are objectives of a sustainable existence. Traditionally, women have set a great example as carers –of families, sick people etc.–. We now need those care values to be generalised throughout society, whereby men and women can share the caring culture and reclaim valuable time, that is if we really want to live a life orientated towards local and global sustainability. <

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