Many books, many words are written on the subject of sustainable development. Too many? Not necessarily. They bring many perspectives, concerns and solutions. But how do they connect with each other and with us?

This publication has few words because we want to use a different language. We present a graphical description of the critical links between the natural, the economic and the social dimensions of our world.

Sustainable Development requires a holistic approach. This is not easy with books and words only. The preparation of the 2002 World Summit on Sustainable Development has revealed one more time how difficult it is to integrate different agendas and create a coherent strategy that inspires collective action.

This publication is a map, a wiring diagram of the global challenges. Because the map is complex we take it in six layers, one at a time. The final complete picture will help you to understand how humanity… innovation, how production not only creates environmental degradation but also the social capacity for solutions…

This “learning” map was designed during a long conversation with three enthusiastic system thinkers. Dennis Meadows, Jørgen Randers and Khaled Saeed accepted an invitation by Dow Europe for a retreat at the... induces a decrease – or increase – of the connected variables. The minus or plus signs appear on each link in the map.

The commentary of the six layers avoids facts and statistics. But to bring words and facts back into the picture we refer to a list of major recent sources at the end of the publication.

This is not a map of specific solutions. There is not yet any proven route to achieve sus- tainable development. This map is a tool to start the journey. It indicates several rescue rings where connected innovation, actions and partnerships are needed.

Claude Fussler

Getting the picture...
The world population continues to grow. From the current 6.2 billion it will reach 8 billion in less than 25 years.

Capital Investment
The transformation of materials and distribution to the point of consumption require technology choices and a stream of financial investments to create and maintain the productive means of our economy.

Consumption
We will need more food and water, more housing, energy and all the goods and services that satisfy the needs of this growing population.

Material Input
This will draw more resources, fuels and minerals, wood, crops and fish from the earth. Our economy is material intensive. Just imagine how one cup of coffee with cream and sugar pulls a chain of supplies - packaging, transport, cultivation and land use, home appliances and dishes - that spans the globe.

Carrying Capacity
Many scientists therefore worry about the ability of our planet to carry this increased withdrawal and displacement of materials. Flows of many materials exceed the rate of natural replenishment and compete with the web of food chains that maintain the diversity of species in our ecosystem.

Production
We will occupy more space. Communities and cities, farms, factories and stores, roads and transport hubs will spread deeper into nature.

The population engine
Our economy lives on a finite stock of materials formed through geological times. This constitutes an almost closed system – except for the heat and light it receives from the sun and the ability of humans to combine materials and intelligence with ever growing creativity ...
Desire for more growth

Our economy is therefore programmed for growth. As long as we have a growing population, rising life expectancy, more information and more dreams we will continue to invest in the means to produce more and better goods. Politicians will stimulate consumption to pursue full employment policies, with a cautious eye on inflation and capital productivity.

Financial security

We also live longer beyond working age. Our financial security always relates to the wealth creation in the economy, whether it is through our family or other workers' social contributions while we retire, or through the appreciation of our pensions schemes and private bank savings.

Standard of living

Consumption mainly contributes to quality of life. Beyond the satisfaction of basic and essential needs we also consume to fulfill dreams. Rituals of shopping, collecting and giving help us to become who we would like to be in the world as we see it. We have a cultural bias for consumption.

Employment - Unemployment

Production also creates employment in the sectors with growing prospects. It therefore absorbs the continuous stream of people reaching working age. The pressure to get a job is critical. Except for rare isolated subsistence economies a job-related wage provides access to consumption and relative freedom from needs. Unemployment benefits are also related to other workers' ability to create enough value to redistribute a portion to those unable to get a job.

Surplus wealth

Investors, public and private, are prepared to place their money into productive capacity because it generates wealth – consumers pay more for the goods they need than it costs producers to conceive, make and distribute them. At the country level this added wealth is aggregated into the Gross Domestic Product, the principal indicator of economic health and activity. Wealth creation is a function of a chain of demand and supply signals constantly swapped in the market.

Hooked on growth

Hooked on growth

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Hooked on growth
The debate over the carrying capacity of the earth will continue but even though many limits are uncertain and the consequences of breaking them are not clear it is already apparent that production and consumption growth are draining our ecosystems.

Eco-efficiency

This strategy response designs waste and pollution out of the production-consumption cycle. The goal is to consume and produce differently to achieve the same standard of living with significantly less material input. The understanding of product life cycle impacts, innovation and design skills are essential to succeed in eco-efficiency. While it is the better approach it still eludes many sectors and producers.

Mitigation

A significant amount of capital must therefore be diverted from productive use to clean up and protect the environment. The polluter pays principle is enforced in countries with functioning institutions, a mobilized public opinion and enough wealth creation. Others are locked in predatory production-consumption cycles.

Running into limits
Economic growth is the measure of progress most widely accepted. It uses a comparison of wealth created (GDP), period after period, divided by the number of people in the economy. Whatever the statistical intricacies and data gathering limitations, GDP per capita tries to reflect what an economy is doing for its citizens and how they keep getting ahead.

Income inequality

While the world GDP trebled in the last 30 years the income inequalities between countries and within countries have increased. The Gini coefficient, a measure of inequality that ranges from 0 (completely equal) to 1 (completely unequal), shows that the world’s top 1% income share is about twice that of the bottom 50% of the world’s population. Inequality is also rising within countries. It is estimated that the richest 10% of the world’s population now earns as much as the poorest 50%.

Social tension

The world has therefore become a place where the richest 1% receives as much income as the bottom 50%. Inequality is rising within countries. It is estimated that the richest 10% of the world’s population now earns as much as the poorest 50%. Inequality is rising within countries. It is estimated that the richest 10% of the world’s population now earns as much as the poorest 50%.

Socio-economic structure

But averages by definition level all distortions. There are very poor people in rich economies and very rich people in poor economies. The degree of individual rights, gender bias, access to justice, health services and higher education, create a deep-seated inertia in the pattern of social and economic progress.

We can’t succeed unless we all do

Redistribution

This strategy reduces tensions and creates social security nets through economic transfers within an economy. At the global level emergency relief and development assistance is also provided from the richest to the poorest. Redistribution, although justified on the basis of solidarity, tends to attenuate social tensions rather than attacking and eliminating the root causes.

Social capital

In this strategy part of the wealth created by the local and global economies is reinvested in eliminating the barriers to human dignity and to social inclusion. It seeks to invest in the human capital of the societies of the world so that it becomes a driving engine of growth and development for a better world.

Surplus wealth

In the middle of the world economy the transactions are so large that we can’t really see the system in its entirety. As a consequence, surplus wealth accumulates in the financial system and affects the whole economy, challenging not only the economic but also the political and social order.
Education

Equips all people to be productive workers, informed consumers, confident households, empowered citizens and positive contributors to the community. To increase social capacity, one must invest in all forms of education and lifelong learning. Most important of all in the current context are health and environmental issues, systems thinking, and entrepreneurship. Educated households have higher income security and lower fertility rates.

Technology innovation

Creativity is the ability to combine existing knowledge, behaviors and materials in ways not tried before. Turning these ideas into useful, replicable methods to make and distribute goods is the essence of technology innovation.

Capital productivity

Only technology innovation can enhance capital productivity. This is essential to produce a wealth surplus that can be allocated to build social capacity and social security nets, environmental mitigation and eco-efficiency development. Capital productivity and labor productivity are essential to produce quality goods and services affordable by the poor.

Labor productivity

Educated labor has higher productivity - it produces more wealth per working hour. This can contribute to higher unemployment but it also contributes to more affordable goods and services.
New values

We have reached a state of global connections and information load where anxiety about environmental degradation, social tensions, long term financial security and standard of living are on top of the mind of many citizens.

It is a characteristic of system behavior that they reach “tipping” points when a number of drivers and feedback loops start to operate in the same direction. We may reach this phase where enough realize that our global economy is not going where we thought we were heading to, that its brilliant successes are only topping an immersed iceberg of difficult lives, exhausted nature, failed economies and institutions. Our way of life ... go hand in hand with global solidarity and global responsibilities. This means activating a couple of additional rescue rings in our system.

Institutional improvements

At this last element in the map we can appreciate that even this “easy” version describes sustainable development as a complex systemic challenge. A complex system, where no one is quite in charge, needs a new approach and governance. It needs on one hand more alliances and partnerships at all levels between key system participants and beneficiaries who can together manage improvements towards shared objectives. On the other hand it needs better local, national and global institutions where alignment of objectives and compliance with common interest rules is achieved.

Allocation of investments

We need to allocate yet more resources to eco-efficiency, environmental protection and technology innovation. We need to reduce impacts and live from the dividends of natural systems, not from depleting the reserves. This rescue ring is in the hand of every household, community, enterprise and region. It has very local, daily connections as well as global ones like greenhouse gases emissions.

Redesigning the system by values
Data sources and references


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Production

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