

“Changing Course in Time”.

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14.

Changing Course in Time

Happiness is the only thing which doubles if one shares it.
Albert Schweitzer (1875-1965)¹

Whilst driving in the mist towards the future we discern danger – but also opportunity. We know where we would like to go: towards other people’s wellbeing in freedom. We know the hazards: war, poverty, disease and great injustice.

A navigation system does not work in areas which have never been mapped before. It follows the Global Positioning System (GPS) of as yet fragile global ethics. The world’s population is growing steadily and traffic jams are growing longer. Many fields show disastrous trends. Our foggy path is full of refugees who should not be run over. Do we have enough fuel to reach our destination? Police, fire brigade and emergency services cannot meet the situation in many parts of the chaotic global city; they are mismanaged and divided among themselves. What to do? We cannot stop and return, because there is no time to be lost – the clock is ticking. Therefore: drive carefully, observe well, reflect keenly and take quick action where necessary. Do not panic and do not get confused by the stress.

Due to uncertainties, one can easily challenge the exploratory projections used in this book regarding population growth, hunger and poverty, the depletion of oil, gas and natural resources, as well as issues such as the proliferation of weapons of war and violence. Nonetheless, whether or not the explorations of risk and opportunity in these fields are 10 or 20 per cent off the mark hardly changes the tasks ahead. Belittling the severity of potential perils leads to a detrimental

¹ Tropical physician and theologian (1875-1965)

deferral in decision making. All addressed issues point in the same direction: there is a need for greater care, more frugality, keener priorities of policy, strengthening of national and international governance and enhanced efforts to provide basic human needs for a safe and free existence.

Yet, hazards should not be exaggerated. We need not fear that global population growth and its consumption, although enormous, will completely destroy nature itself; even a nuclear war cannot. Nature is so strong and multifaceted, it will gradually adjust. The risk is that humans, by destroying and depleting a portion of nature, are affecting their own food supplies and future. In effect, the human species threatens a part of itself, especially the billions of people at the bottom who are most vulnerable. Therefore, it is the enlightened self-interest of mankind as a species that calls for better policy, to limit the otherwise inevitable increasing suffering of masses of people from hunger, disease, climate change, and armed violence, issues which will probably intensify if old policies are simply continued.

To expect that all appropriate improvements suggested in previous chapters will actually soon be realized would be overly optimistic – while the opposite, despair and cynicism, would render daily life miserable. However, the longer a necessary adjustment of course is delayed, the harder the crash will be when a wall or ditch suddenly emerges from the mist.

The projections in this book are based on proven and economically deployable technology. The scheme is cautious. I do not consider us well off on account of some future technological or managerial breakthroughs which are not tangible or proven yet. Fine plans and hopeful projections abound, but nobody can live in a blueprint. If new, clean and economically usable sources of energy will be found, several major problems will be easier manageable than currently thought. *If*. The long awaited nuclear fusion has not yet been achieved, and nuclear fission, solar energy and many alternatives are still very costly. Many believe that ‘electricity’ can solve the high oil and gas consumption, but electricity must be generated by the same gas, the same oil, coal and nuclear power, or solar, wind, hydro, biomass and some other not yet promising form of energy, such as deep geothermal heat and electric power derived from fresh and salt water. Hitherto, these alternative, non-polluting sources render a very low percentage, partly because of the high cost involved and because the net energy benefit of most of these sources is modest. It is therefore advisable to invest heavily in researching clean energy while at the same time speedily reducing the use of polluting fossil fuels. Those who continue to increase consumption in the hope that a good solution will soon be found aggravate the climate crisis and

drive full speed on a foggy road towards a very insecure future (or great misfortune).

THE DEMAND FOR ENERGY AND TECHNOLOGICAL OPTIMISM

Worldwide, the average energy consumption calculated in kilograms of oil (or an equivalent thereof) per capita per year, per country, is still rising². Projections show that in 2035, energy consumption will have grown by almost 50 per cent. This increase largely takes place in developing countries with high economic growth such as China and India, where a strong average growth of 84 per cent will occur. The already rich OECD countries show a consumption increase of 14 per cent³. Energy consumption varies considerably between societies and is related to the standard of living, the level of technological development, the availability of energy sources and the impact of consumption on the environment. Both optimists and climate critics expect a great deal from new technological developments for the generation of economically utilizable energy. What, however, would be reservations concerning new technological developments, and which of them offer the best future prospects?

DIFFERENT TYPES OF FUEL

The world economy runs primarily on fossil fuels (oil, gas and coal), which are not renewable⁴. They provide 78 per cent of global energy consumption. Nuclear power accounts for 2.8 per cent and renewable energy sources, including hydropower, for a total of 19 per cent. A consequence of the increased demand for energy is a growing need to switch to alternative and sustainable energy. To tackle the climate issue, hopes are pinned on renewable energy and technological breakthroughs.

SUSTAINABLE ENERGY

Alternative energy is often seen as sustainable energy. However, not all alternatives are durable: bio-ethanol and bio-diesel are not entirely durable. Renewable energy is energy which is available to humankind for an indefinite period of time and does not harm the environment and limit future generations' possibilities. Examples of sustainable energy are solar power, wind energy, geothermal energy and energy from water; where the energy is derived from renewable, inexhaustible sources.

With **solar energy**, solar cells convert sunlight into electricity. There are also solar collectors, energy roofing, solar towers, photo-electrochemical cells and other forms of passive solar energy. Solar energy is also the basis for wind energy

² International Energy Agency (iea) Statistics Division, 2012. <http://omrpublic.iea.org/>

³ Energy Information Administration. (2010), *International Energy Outlook 2010*. Washington DC: U.S. Department of Energy, 2010. <http://www.stb.dot.gov/stb/docs/RETAC/2010/March/EIA%20AEO%202010.pdf>.

⁴ REN21. Renewables 2010 Global Status Report .Paris: REN21 Secretariat, 2010. http://www.ren21.net/Portals/97/documents/GSR/REN21_GSR_2010_full_revised%20Sept2010.pdf.

and the energy stored in biomass. Although the harvesting of **wind energy** is on the increase by 30 per cent every year, it only accounts for 1.3 per cent of global energy consumption; in Denmark, wind supplies nearly 20 per cent of the energy⁵. **Bio-power** is often used for the production of biofuel through the use of biological methods based on photosynthesis. Various types of rapidly growing plants that are suitable for incineration or fermentation can be used. But plants are not very efficient in capturing solar power. For example, 1 hectare of solar cells renders as much energy as 421 hectares of oilseed rape for biodiesel. It would require at least a surface the size of North-Holland to provide 10 per cent of the energy use in the Netherlands through biofuels. Thus, encouraging these biofuels would result in an enormous demand for arable land, and the large-scale production of biofuels would reduce Dutch CO₂ emissions by only 1 per cent, provided that no greenhouse gases are emitted in clearing the additional farmland⁶. On a global scale, this is not a viable solution, because in the future, much extra land and water will be needed to feed the world population. **Geothermal energy** is the extraction of heat from the earth, which oftentimes includes cold and heat storage in the soil. This technique is increasingly being utilized for heating or cooling. In addition, natural geothermal sources such as geysers, volcanoes and hot springs could be created by technological means, but this requires large investments. **Energy from water** is extracted by using of the force of water. Wave power can, for example, be used to produce electricity; or tidal energy, where the tides' differences in water levels are converted into electricity by turbines. 'Blue energy' can be won from the differing salt concentrations of seawater and fresh water. Hydro-electric energy is generated by using the height of water, usually a dam or a natural waterfall. A new technique, *otec* (Ocean Thermal Energy Conversion), uses the temperature variation between the surface and the deeper layers of the ocean to produce electricity. In addition, trials are conducted with underwater turbines that need no dam.

ALTERNATIVE ENERGY

Besides fully renewable energy, there has also been argued for alternative energy sources which can have adverse effects but are highly efficient. **Nuclear power** is generated by splitting atomic nuclei; the energy is released as heat, which is converted into electricity in a nuclear power plant. Nuclear energy has a low CO₂ emission and causes virtually no air pollution. On the other hand, critics assert that nuclear power creates health hazards and environmental damage through mining, processing and transporting uranium, the risk of nuclear proliferation or sabotage, and the long-term storage of radioactive waste. For decades, **nuclear fusion** has been researched because the raw materials can be extracted from sea water in an

⁵ Lars Kroldrup. "Gains in Global Wind Capacity Reported". *The New York Times*, 15 February 2010. <http://green.blogs.nytimes.com/2010/02/15/gains-in-global-wind-capacity-reported/>

⁶ Wiskerke, Willem and Jeroen Winckers. *Het verborgen klimaateffect van biobrandstoffen*. Utrecht: Stichting Natuur en Milieu, 2010.

http://www2.natuurenmilieu.nl/media/2039/100308_brochure_het_verborgen_klimaateffect_van_biobrandstoffen.pdf.

almost unlimited manner. In practice, however, generation of nuclear power is very difficult. A large input of energy is required before there is net energy production. The reactor itself must be of extremely strong material that can withstand high temperatures. Moreover, after use the material becomes radioactive itself, which poses a waste disposal problem – although its radioactivity decreases relatively rapidly. Hence, it only needs to be stored for limited periods of time. Materials that become less radioactive when exposed to radiation are being worked on.

A DURABLE FUTURE

In the future, developing countries will be using a larger share of the total energy production. Nearly always, energy generation requires an energy investment: drilling for oil costs energy, as does the construction of wind turbines. Fossil fuels are being depleted and the expenses incurred by production are going up. If the investment becomes higher than the yield, fossil fuels will no longer be profitable. At present, a large part of existing and conventional energy sources are not sufficiently economic to be used for energy production. If investment for winning and converting energy falls, new technologies could be a solution.

Weighing **the cost** per type of energy against the price of oil creates an interesting picture. Some varieties of renewable and unconventional energy exceed today's oil price and are only made possible with government grants – money that must first be earned and therefore also costs energy. The balance of energy yield varies by species; and there are more types of energy which are uncertain and beyond feasible limits.

Some countries still heavily subsidise fossil fuels. Global research shows that the cessation of these subsidies will increase the efficiency of energy production and decrease environmental damage. Governments can alter taxation, subsidies and trade barriers in favour of the environment and improved energy development. The **returns** of most renewable energy depend on **location** and **technological development**.

The yield of solar cells is of course highest in areas where sunshine is abundant. Oftentimes however, the expenses involved in **transportation** of energy are a limiting factor. Electricity is usually transported via an extensive network. While new energy sources are rarely discovered or made possible by new technology, the transportation thereof continues to evolve. For **storing** energy, several methods have been invented. The storage mechanism depends inter alia on the stability, ease of transport, ease of delivery and the ease with which the available energy can be converted from natural to stable form. The differing storage methods also affect the ability to make use of renewable energy. Electric cars use energy which is chemically stored in batteries. These batteries are charged via the electricity grid when the vehicle is not in use. If the used electricity is derived from fossil fuels, then electric cars are in effect not quite environment-friendly. But if renewable energy is used, then they are.

In addition, a lot of experiments are conducted. If techniques are developed

that are safe and inexpensive, environment-friendly, sustainable and suitable for large numbers of people, the energy problem might be resolved ⁷.

ENERGY AND POVERTY

As fossil fuels are running low and harm the environment on earth, focusing on sustainable energy appears the wisest course of action. Since all factors depend on location, it seems likely that a mix of technologies will be used. There are large differences between the western, developed world and developing countries. Because developing countries oftentimes lack suitable transport and storage methods, the use of solar energy is of great importance for local poverty alleviation.

It is due to current cost that solar cells are not put up everywhere. ‘Ordinary’ power is 50 per cent cheaper than solar energy (including tax and transportation expenses). In order to become competitive, solar power should become a factor three less expensive, and the yield of solar panels must improve. This might be done with nanotechnology. Perhaps in twenty years we will have a solar cell that can compete with other sources of durable energy, bearing in mind the prerequisites that it will have to be relatively cheap, that innovation and knowledge shall be made available to poor populations, and that people will be well trained in dealing with and the maintenance of new technology ⁸.

Just as with technological wishful thinking, caution is required when hopeful predictions are made about significant political or administrative improvements. If the European Union would get a strong, efficient leadership and the member states would make it a world player, and if all democracies, including India, would form a strong new Organization of Democratic States, and if that would help ensure that the UN would reform and become effective, then... But it is unrealistic to start out with heroic assumptions.

The same applies to reforming the global economic system. The crisis of 2008 did not lead to a genuine change in our economic system which has made the world so poignantly unequal and caused such much global injustice. Although some rules and controls are tightened, there are scarcely structural reforms that will stabilise world economy, render it sustainable and correct the highly unequal global distribution of income.

THE ECONOMY OF ‘PASSING ON THE DAMAGE’

⁷For examples of experimental research, see: www.logicalsscience.com.

⁸ Van der Meer, Barry. “Goedkope zonnecellen tegen de armoede”. *Kennislink.nl*, 21 September 2010. Amsterdam: Stichting Nationaal Centrum voor Wetenschap en Technologie (NCWT), 2010. <http://www.kennislink.nl/publicaties/goedkope-zonnecellen-tegen-de-armoede>.

In the 20th century, centrally planned communist models as applied in the Soviet Union, Mao's China and other related states did not lead to progress of the human species, but to the trampling of tens of millions of people. Now, the capitalist system seems to have triumphed. Many of its economic aspects have been adopted by China, Vietnam and other former communist states that are practicing state capitalism today. Under the title 'privatization', much of the community's property was transferred to crafty leaders of the former communist bureaucracy, politicians and security services. However, the great economic success of both western and neo-communist capitalism will only be temporary: it shows an upward trend in economic production and consumption until the model inevitably crashes. The damage is passed on to the future and the distribution of income in the world will become increasingly lopsided.

The present global economic system is not a stable and continuous one, because it affects future generations' rights and scope of usage. In this sense, the free market system of the West offers only temporary freedom. There should also be freedom for future generations. Sound policy and governance ought to improve basic provisions and fundamental human rights: the right to be safeguarded from threats to life and security, the right to express one's opinion, and the right to democracy, also for future generations. It is only for a minority, that the current economic system achieves Franklin Roosevelt's Four Freedoms (freedom of speech, freedom of religion, freedom from want and freedom from fear)⁹. All people, not only those in western countries or in the upper layer in fast-growing emerging economies, are entitled to these freedoms.

The western (and now also Asian) principle of economic freedom is not faulty – it is essential for political freedom –, but it is oversimplified and only oriented towards today's game of supply and demand. However, markets do not function properly without a strong government that, as a fair, non-corrupt market regulator, upholds the essential rules and institutions and corrects inequitable outcomes. Too far retreating governments and corruption have allowed for oversimplified market fundamentalism which in turn has become a hunting ground for companies and cunning investors who pay no heed to grossly unequal distribution of gains or to the excessive burdening of nature and environment.

Money-creation and high government deficits have stimulated overexploitation over the past fifty years. At the same time, government investments in civil engineering, especially infrastructure, have lagged behind in many countries. The free-for-all mentality and high remuneration for short-term

⁹Franklin D. Roosevelt's Address to the United States Congress of January 6, 1941:
<http://www.wwnorton.com/college/history/ralph/workbook/ralprs36b.htm>.
 In April 1945 the Four Freedoms were incorporated in the United Nations Charter.

profit has seen an additional acceleration because of electronic information technology, which has led to the rise of a 24-hour world economy on which national governments and international financial institutions have lost grip and supervision. Subsequently, a rapidly shifting global casino-capitalism, where also the ‘elite’ of non-democratic countries have managed to rapidly enrich themselves, has emerged¹⁰.

This economic system needs to be reformed. The present system only seems to benefit those who are born in affluent circles and who are well educated. But they are at the top of an economic cascade of passing-on, a waterfall of negative effects onto those in a lower position, the weaker people and animals that are exploited.

At the top, there are many leading financial experts, CEOs and directors of large companies, many top professionals and political leaders who know how to take advantage of the free system. Well educated and informed, cleverly capitalizing on every opportunity, utilizing the belief in the virtue of unbridled economic liberty, they amass large incomes and wealth; sometimes through opaque financial constructions that pulls the wool over the eyes of small investors, large pension funds and ‘expert’ government agencies and regulators.

The damage suffered in the 2008-2010 financial crisis was an approximate net 2.3 trillion dollars¹¹; damages which have been passed on *downwardly* to the population. Pension funds, private investors and manufacturing companies seek to gradually make up for their losses. In developing countries, economic growth fell sharply, especially among the poorest. In China and India, high growth has returned, but the structural poverty of hundreds of millions of people in these countries has not truly been addressed.

Wherever possible, economic setbacks are transferred to those who occupy a lower place in the economic order. These are the people who are economised on in order to repair losses: taxes and contributions are rising to absorb the cost of higher government expenditure and financial guarantees. International cooperation (aid to fight poverty) is kept at a minimum. In many countries, government deficits, public debt and guarantees to banks have gone up sharply. And the risks and interest cost thereof – again, they are passed on to future generations.

¹⁰ Prof. Arnoud Boot. ‘Van luchtbel naar lobbycratie’, *NRC Handelsblad*, boeken, 7 januari 2011.
<http://nrcboeken.vorige.nrc.nl/recensie/van-luchtbel-naar-lobbycratie>

¹¹ International Monetary Fund (IMF). “Global Financial Stability Report. Meeting New Challenges to Stability and Building a Safer System”. *World Economic and Financial Surveys*. Washington, DC: International Monetary Fund Publication Services, 2010.
<http://www.imf.org/external/pubs/ft/gfsr/2010/01/pdf/text.pdf>.

Necessary measures to protect nature and the environment and to efficiently manage energy, metals, minerals, land and fresh water are postponed. As a result, the expenses of the current generation are being passed on to future generations. The number of hungry people in our rich, technologically developed world has now risen to nearly one billion, with consequences such as high infant mortality, preventable diseases, and perpetuation of poverty in which the weakest groups are trapped.

The global passing-on-pyramid consists of specialized investors and bonus-bankers at the top, and the miners, farmers and landless poor in Africa, China, Russia and India at the bottom. This pyramid has developed progressively over the centuries. The economy is a power system in which a small percentage of people make decisions for the majority, and uses them.

From a technical and scientific point of view it is not difficult to provide every person with adequate food, drinking water, basic healthcare and education. But because of the inherent power structures in both democratic and autocratic political systems, things go wrong on an administrative level. To a large extent, political power structures reflect economic relations of power and the privileges of those born with prospects and opportunity in the world system, or of those who acquired these themselves through good education, hard work and adroit manoeuvring. The arbitrariness of 'birth right' still dominates: the most important factor that determines a person's life and welfare is the environment in which one is born: is it located along the Rhine, the Ganges or the Congo River?

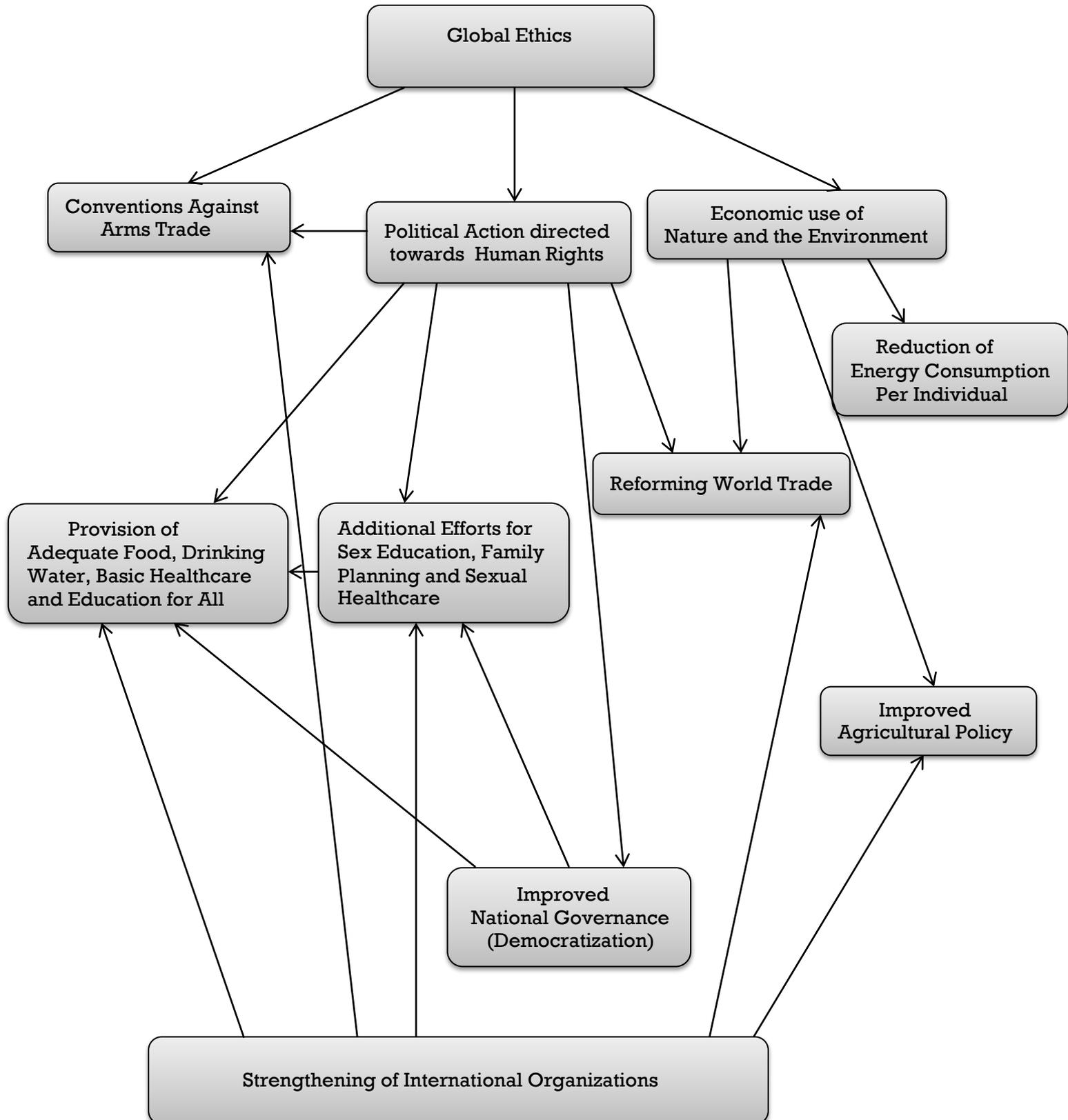
SUMMARY

In previous chapters, harmful interactions between nine global trends were discussed, including suggestions how these could be overcome. Fortunately, *solutions* also show a, positive, interaction: they too, reinforce each other, as Figure 14.1 shows.

Until 2050, the world population will continue to grow by approximately 2.3 billion people. The concentration of this growth will be in poorer countries where facilities are meagre, and among the most underprivileged groups in rich countries. An excessively high birth rate will also result in the deaths of huge numbers of children from hunger, disease and neglect. Annually, hundreds of thousands of young women die owing to poorly performed abortions, or during pregnancy or childbirth. A great additional effort is required for reproductive and sex education, family planning and sexual healthcare (Chapter 3). The costs involved are relatively low and the benefits high: a reduction of poverty and

disease, and greater social stability through a more balanced composition of the population.

Figure 14.1: Solutions and their interactive positive reinforcement



One in seven people has no access to adequate food and clean water supplies. Most of them are women and children. Thus, poverty, neglect and unproductivity of many poor people are exacerbated. The ignominy of chronic hunger in a rich, technologically developed world could be dealt with by improvements in agricultural policies, development cooperation, better governance and other action, as briefly described in Chapters 4-13 of this book. In order to tackle hunger and feed the growing world population, food production should increase by 70 per cent in the coming 40 years (Chapter 4). Agriculture-technically, this is possible. New forms of sustainable agriculture could feed the world population.

Billions of human beings are being threatened by diseases, scourges, and natural or humanly caused industrial or ecological disasters that can oftentimes be fought successfully or even prevented. Possibilities to do so are neglected because today's global economy and the administration of many states do not prioritize investment in human security. Expenditure on structural safety facilities presently focuses on the interests of high-consuming groups that have political and economic power. Instead, investing in disaster relief and prevention for the entire population stimulates the economy, creates meaningful employment and protects capital assets. Moreover, the technology to do so is well known.

Many post-colonial countries suffer from maladministration and internal colonialism. Reform of governance requires firm action in many fields in order to alleviate this suffering. This is primarily the responsibility of the leaders and opinion makers in these countries, even though much can be contributed to such improvements from the outside. Misgovernment, oppression of population groups, high unemployment of unskilled young men and religious and ethnically oriented delusions cause conflicts leading to armed violence. The uncontrolled spread of small and large arms fuel this, and half a million deaths plus numerous psychological and physical injuries every year are the result (Chapter 6). Conventions against trafficking small arms (which in fact have the effect of weapons of mass destruction) are particularly urgent, but they are blocked by the export-interests of stronger states. Joint action of global NGOs and progressive governments can break this resistivity, as proven by the Ottawa Treaty against small landmines and cluster munitions.

A large number of the goals the world should reach in 2015, as solemnly stipulated in the United Nations Millennium Agreement, will not be achieved. They must still be realized within the next decades. It is simply inaccurate that resources are too limited. There is sufficient wherewithal thereto: the 2008-2010 banking crisis shows how much space there was in the world economy for a variety of speculative investments. Then, the rich countries' governments

suddenly managed to organize 1.250 billion in loans and guarantees for failed banks and insurers. That is ten times the amount the rich countries annually spend in loans and grants on development cooperation. Of course, grants and guarantees to banks are not the same as projects to fight poverty. But the comparison demonstrates that in point of fact there is no lack of resources and that the main issue concerns priorities as to governments' distribution of these resources. Indeed, such amounts could also be mobilized in order to alleviate abject poverty and to restore nature, if they should find it truly important.

Many countries face armed conflict, and in others, they lie in wait. Because of dissension between member states, the United Nations recurrently hesitates for a long time whether to bring about peace. It is often argued that there is not enough military personnel available for the necessary peacekeeping operations, while only 0.75 per cent of the world's troop strength is deployed for this purpose¹². Accordingly, there are sufficient resources; it is a matter of good mandates, the right priorities in deployment and alliance with non-military peace-building (Chapter 11).

A strengthened international governance layer is conducive to properly address global issues. The European Union, NATO, the United Nations and a variety of regional organizations could get a better handle on problems if the member states allow them the needed authority and resources.

Free media are a constraint on the abuse of power, and they actively expose wrongs. The best export product of democratic states is free, reliable, high-quality journalism, for the stimulation of which there are good possibilities in many countries. Internet and television have changed the news supply, providing new opportunities, but also risks.

Bringing everything under a common denominator, it becomes clear that many political and economic ethics, as disseminated in various cultures and customs, religions, ideologies and political systems, are insufficient and sometimes counterproductive – especially the emphasis on progress by growth: growth of the economy, population growth, growth in our consumption of nature. An outline of a global ethics in Chapter 2 conveys the main principles for more effective action towards reducing inequitable outcomes. Those principles are: the principle of continuity – of sustainable survival –, of prevention, of equality, the principle of autonomy, of basic needs, of equal opportunity, of moderation and that of longevity – measures to increase life expectancy, QALYs, (Chapter 2).

The choice many people face is simple, but not easily made. It is simple, because mankind must relearn that it is only a part of nature. The human animal

¹² Voorhoeve, Joris. *From War to the Rule of Law*, Wetenschappelijke Raad voor het Regeringsbeleid, Verkenning 16. Amsterdam: Amsterdam University Press, 2008. Print.

may have a higher IQ than many other animals, but it suffers from two exaggerations that could be specified as social-psychological disorders: over-activity and a thirst for power over other creatures. Combined, these detrimental properties cause collective overconfidence (hubris) and threaten humankind.

The transition to a natural, quiet and frugal life is difficult to make, but with ‘doing’ less, it is possible to achieve more. The race for more and bigger was an enormous mistake. This is painful to admit and it is difficult to switch back.

The least we may demand of policy, administration and ourselves is the prevention of harm or collateral damage. Striving to live without causing adverse effects requires us to be careful in our dealings with others, and that we continually ask ourselves in our daily choices as consumers and producers of goods and services who and what, might be harmed, even if at great distance from our own surroundings. This implies buying fair-trade products with eco-certification, plant based if possible, to be mindful and economical in our use of fossil energy, to save and invest in companies that act in a socially and environmentally responsible manner. The ‘Do No Harm’-principle which was formulated long ago by Hippocrates (460-377 BC.) asks us to obtain our revenues from production which causes no damage, and that we do not support institutions that *are* guilty thereof.

Therefore, the first conclusion is straightforward: to prevent damage. The second conclusion is to actively reduce caused damage. Indeed, every person has minor or major opportunities to limit the harm and suffering of others by preventing, mitigating or curing (where this is as yet possible).

The nine scourges addressed in this book do not augur well for hundreds of millions of people in the 21st century, whose lives, despite hopeful technical progress, are liable to be marked by gruesome trajectories. One in seven people suffer from hunger every day; two in seven live in deep poverty. Every year, tens of millions of children die from preventable diseases. Great masses of people lead a hopeless existence as refugees. Half a million die annually from armed violence. Irrational hostility between peoples, cultures and beliefs blight the happiness of innumerable people.

To cause no harm and actively restrict it are two simple guidelines. Thinking on a global scale and acting on a local level are in practice two sides of the same coin. The examples in the text boxes of all preceding chapters indicate how one person who wants to change course can make a difference. The bounds of possibility for every individual are much wider than we might imagine at first, as seen in the text box on Toby Ord.

The global challenges addressed in this book call for action at four levels:

1. On that of international politics, especially regarding foreign and development policies, to reinforce international organizations. Anyone can make an effort by making the right choices when exercising voting rights in elections, and contributing to a responsible political party.
2. In national politics, especially in the field of financial, economic and environmental policies. This also implicates that each could support the party of their choice in word and deed.
3. In civil society organizations, especially charitable institutions that work internationally and also influence government policy. Those who commit themselves as donor, director or volunteer for these organisations can accomplish a lot, and support many victims of oppression and disaster.
4. On the level of municipal and provincial institutions, both the political and social, such as education and shelter of refugees.

The personal stories in the text boxes throughout this book prove that every person can be a hero in their own field and that they can inspire many others.

In the risky mists of the future, where the book started, hopeful outlines *can* be discerned. Propagation of the dual model of democracy based on free legal order provides chances of improving governance. Freedom of information, thorough background-journalism and electronic communication offer significant opportunities to inhibit abuses and misuse of power by publicly uncovering them. Reinforcement of functionalist international organizations such as the European Union, also in other regions of the global system, stimulates countries to jointly pursue their properly understood interests and values.

Well organized free societies can meet the challenges of the future. It is mainly the weakest states with the worst governments that will find themselves in gridlock. The poverty and injustice their populations suffer deserve the most attention. Science and technology can provide efficient, new energy systems. If the energy issue is resolved, great opportunities, particularly for the poorest population groups, can be deployed. Solar energy will be available for billions of years.



George Clooney (United States)

Information technology can help prevent serious crimes. When governments realize that the international media are watching over their shoulder while they mistreat their own population, they will reconsider before they marginalise, expel or even assassinate whole population groups. That was the thought of movie star George Clooney, who has committed to support the peoples in the Sudan. Along with Brad Pitt and Matt Damon, he supports *Not on Our Watch*, which has organized satellite observation over Sudan and raises money for displaced persons of the war in Darfur.

In January 2011, such action for the South of Sudan was launched. The population then voted in favour of independence, separation from the North. South Sudan is Christian and animist. The population has suffered greatly from decades of war with the North, which is Muslim. The Islamic government of Sudan is funded with international oil money and has always marginalized the black South Sudanese.

There are fears that after secession, South Sudan will face a difficult if not harsh future. There are no government facilities, there is virtually no money and food. Society is maintained mainly by relief from outside. *Not on Our Watch* intends to display the destruction of villages, the waves of refugees, and other evidence of war and oppression to the rest of the world by way of satellite observation. "Children behave properly in the presence of strangers" is an old adage; the presence of strangers via space in Khartoum may encourage propriety of conduct.

Not on Our Watch is an alliance of the UN, Harvard University, Google and actors¹³. Information and satellite technologies not only offer opportunities for intelligence services, but can also be utilised as alert system by individuals, NGOs and companies.

¹³ "Clooney, Google, U.N. watch Sudan using satellites". *Reuters*, 29 December 2010.
<http://www.reuters.com/article/2010/12/29/us-sudan-un-clooney-idUSTRE6BS00W20101229>