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GLOBAL CRISIS AND THE UNCERTAIN FUTURE

JOÃO MANUEL BERNARDO
University of Evora
Department of Landscape, Environment and Planning
7000 Évora, Portugal
Email: jmb@uevora.pt

Summary

This paper contains a reflection on the current state of the world and the multiple dimensions of its main problems. Perhaps in no other period of the recent human history such a coincidence of crisis took place. Mankind faces today a difficult situation at all levels which will predictably aggravate in the future: environment, energy, economy, raw materials exhaustion, food, social inequity, population growth, governance. Business-as-usual is not an option and the optimism of the cornucopians based on the faith on technological solutions seems unconvincing. We live today a turning point in the modern history which was built on ideas of development, growth and material progress. The economic growth and the consumption society lead to an unsustainable situation. The decarbonisation targets, the gradual exhaustion of fossil fuels and raw materials, and the demographic issues will strongly shape our future. In the western societies the material life conditions reached recently a maximum level and are now decreasing. The need to re-think our lifestyle in a disaccelerating economy is becoming increasingly clear. More difficult life conditions and less welfare state are expected. For the first time, generations will face more difficult times than their parents. The optimism of the Modern is over.

1. Progress and optimism

The idea of Progress is central to the modern thinking. Since the 17th century, and mostly with the 18th century enlightenment era, a more secular and rational worldview emerges. Scientific developments lead to a different perspective of nature, man and society and progress seems inevitable. A long tradition of western thinkers reveals an undeniable faith in human destiny and social transformations. Bacon, Descartes, Voltaire, Hume, Rousseau, Adam Smith, Saint-Simon or Marx, though with different ideas of human nature and society, they all shared an optimistic view of the future.

The modern thinking values the idea of belonging to a collective entity. This allowed important aspects of our current life - civil rights, participation in the government of society, generalization of education, health services, social security, welfare - and today all citizens expect society to perform these roles. But it also strongly values the idea of individuality and self-determination (each person as a protagonist, with his own ideas) and individualism (the fulfilment of one's desires, acting without or even against the others). The modern citizen relies much less on collective structures and equipments but, as much as possible, owns his own and sees it as a form of proud self-sufficiency and empowerment - from phone to private transportation. Modern times are the era of individualism.

The new industrial production with its increasing efficiency, mass production, more generalized diffusion of technology products, market capitalism, modern banking, the emergence of the middle class, individual access to credit and consumption-driven economy, all this shaped the modern era and its consumer society. Better life conditions in general and more access to goods are two aspects that are strongly related to the idea of progress in the mind of the modern citizen.

Throughout the 20th century and especially after the World War II, the idea of an optimistic future with increasing prosperity and well-being gained expression. The scientific and technological progress, automatization of industrial production, modern farming techniques and the use of intelligent robots in production activities and in everyday life would reduce the number of daily working hours, the hard labor and monotonous jobs would eventually disappear and retirement would come earlier. The idea of progress was intimately related to better living conditions than those of the previous generations, comfort, access to commodities and services, including the nonessential ones, some degree of hedonism, and no concern about the future. The welfare state would provide in case of need. In this dreamed future, most people would work in science and technology, arts or liberal professions. In short, more leisure time, gratifying activities, a life of increasing well-being, personal fulfillment and granted happiness: the optimism of the Modern. In fact, since late 19th century the number of working hours progressively decreased, together with a decreasing number of working days per week and an earlier retirement. The expectations of further steps in this direction seemed natural and inherent to the idea of inevitable progress. Based on an undeniable faith on human skills to solve problems through science and technology, the time of the utopias-come-true seemed close. The grand future was taken for granted.

However, today, most people perceive that the expected bright future will not be a reality. The perspectives of a better life related to confidence on the social welfare and role of the state in general has faded away. In the West, the maximum standard of living was reached and populations are facing today more difficult times which will get worse in the future.

2. Crisis

Perhaps in no other period of human history, mankind faced such a coincidence of crisis events as today: the energy crisis, environmental degradation and climate change, progressive depletion of resources and over-exploitation of the renewable ones, food insecurity, poverty and hunger, social crisis with inequity in all its dimensions, and the recent financial and economic crisis.

2.1. Energy

With successive crisis events since the 1970's, energy is definitely a major problem for the developed countries. The energy crisis situations are related to the increasing prices on the markets, but also to oil availability in a context of international conflicts and insecurity. Fossil fuels are non renewable resources which means their exploitation will end in the future. Under the current decarbonisation process, lower use of oil is positive but the issue is: will we find alternative clean solutions in time?

How many years will oil last is a matter of controversy. The proven oil reserves have increased, but some argue that the world is rapidly approaching or has already reached the point where the rate of oil depletion overtakes the growth in new supplies (e.g. Bartlett, 1994; Deffeyes, 2001, 2005, 2006). In fact, it has been argued that the oil peak (maximum production) was reached during the 2000's and from now on oil availability will inevitably decline toward zero (Deffeyes 2006). In 100 years, mankind used about half of all the existing oil on earth. Studies indicate that the proven reserves are 1.3-1.4 x 10^{12} barrels (BP, 2009; USEIA, 2009). Global demand for oil is now about 85 million barrels per day (ASPO, 2009), so, in terms of 'time left', at the current consumption rates there would be oil for another 40-45 years.

The most optimistic oil supply analysts estimate the total oil reserves at about 10 trillion barrels of which only 2 trillion were so far discovered. This means there are still 8 trillion barrels to be extracted, of which, with the current technology, only 2.5 trillion barrels can be produced (Lynch, 2009). For Maugeri (2004, 2009) there are no reasons to fear an oil shortage in a near future because (i) only one third of our planet has been sufficiently explored, and since the total amount of oil resources is unknown, it is impossible to calculate the curve of future supply; (ii) unconventional oil resources (including ultra-heavy oils, tar sands, shale oils, etc.) may equal the amount of conventional ones, thus doubling the proven reserves; (iii) new technologies will allow to extract more oil than currently assumed.

But even for the moderately optimistic analists, the risk of a peak before 2030 needs to be given serious consideration (UK ERC, 2009). For the pessimists, the inevitable oil shortage will not be replaced on time and the oil price will continue to increase as a consequence of the gradual exhaustion. Civilization, as we know it, is coming to an end soon (Leggett, 2005): collapse of industrial civilization and decrease of the world population caused by environmental degradation, critical life conditions, disease, famine, and warfare (in fact, the oilwars already started). Or a return to a 19th century

style of life with far fewer people with much lower energy needs (see web sites of numerous discussion groups and organizations dealing with this issue: www.lifeaftertheoilcrash.net/, www.oilcrisis.com/, www.hubbertpeak.com/, www.peakoil.net/, www.peak-oil-crisis/).

2.2. Environment

The world focuses now on global warming and decarbonisation. Climate change, involving climatic irregularities, extreme droughts and floods, and violent tornados, affects many regions and is unquestionably an important problem, even if the carbon emissions of the human activities are not the major cause.

Peak fossil fuels will have strong positive implications on climate. It may even make obsolete the policy measures to enforce the Kyoto (or post Copenhagen) protocol targets . The decreasing supply of fossil fuels coupled with a contracting economy will have positive effects on CO_2 emissions. Though not consensual, the atmospheric concentration would stabilize in the 450-550 ppm range by 2020 (Brecha, 2008; De Sousa and Mearns, 2008; Kharecha and Hansen, 2008; Garcia, 2009; Nel and Cooper, 2009).

The strong emphasis on climate change reduced the perception on the importance of other environmental issues. However, many other environmental problems are relevant: pollution of air, soil and water including eutrophication of water bodies with consequences on human health, soil erosion, salinisation and desertification, acid rain, ozone depletion, degradation or loss of ecosystems, deforestation, urban sprawl, habitat destruction and fragmentation, and species extinction.

The Millenium Ecosystem Assessment, in his comprehensive survey of the ecological state of the planet, concluded that man has caused severe and irreversible changes that are degrading the ecological processes that support life on earth (MA, 2005):

- 60 percent of world ecosystem services have been degraded,
- Of twenty four evaluated ecosystems, fifteen are being damaged,
- Species extinction rates are now 100-1000 times above the background rate,
- Man uses 40 to 50 percent of all the available running water; water withdrawals doubled over the last forty years; 70 percent of water use is for agriculture,
- More than half of all the synthetic nitrogen fertilizers ever used were applied during the last 20 years; intensification of N and P use as fertilizers has resulted in water eutrophication and dead zones in the coastal waters.

Over the past fifty years, the human population changed ecosystems more extensively than in any other comparable period in human history. This resulted in a substantial and largely irreversible loss in biodiversity. While these environmental changes contributed to economic growth and more well-being for a part of the world population, the degradation of ecosystems and its consequences on losses of

ecosystem services dramatically affected the poor populations, who suffered a further degradation of their life conditions.

2.3. Water

Water is a crucial resource for direct human consumption and for most human activities including food production. As mentioned, natural water bodies are under intense pressure and climate change will exacerbate both water availability and quality. The subtropics and mid-latitudes, where much of the world's poorest populations live, are expected to become substantially drier (IPCC, 2007). Water availability and quality will be the main issue for societies and the environment under climate change (IPCC, 2007).

For many poor people in the third world, water is a matter of life and death. Over one billion people have no other option than to drink from sources contaminated with human waste, and insufficient supplies to water crops or to spur industrial development condemn them to poverty. Water is the world's forgotten crisis (Aldhous, 2003). A United Nations report stresses the implications of governance on the water crisis stating that "water insufficiency is often due to mismanagement, corruption, lack of appropriate institutions, bureaucratic inertia and a shortage of investment in both human capacity and physical infrastructure" (WWAP, 2006).

2.4. Food

Over 75 percent of the world's fish stocks are either fully exploited or depleted (FAO, 2009a). More than half of the world's fish stocks are now fully exploited and their catches are close to 'maximum sustainable limits'.

The increasing demand for fish and fish products is leading to fish prices that increase faster than those of meat. As a consequence, investments in fisheries are very attractive, to the detriment of small-scale fishing all over the world. During the last decade, fish populations of cod, haddock, hake and flounder in the north Atlantic have fallen by 95 percent (FAO, 2009a). Measures are urgent and there are even recommendations for zero catches to allow the regeneration of stocks. The increasing use of destructive fishing techniques is affecting other groups of noncommercial marine animals and the benthic communities.

Food security is one of the biggest challenges of the century (OECD-FAO, 2009). The issue deserves increasing attention and several recent international summits discussed it. Main topics are the capacity of the world agriculture to meet now and in the future the demand for food, the possibility to extend the cultivated area without destroying valuable ecosystems, the need to increase productivity but in an environmentally sustainable way, the water availability and the water use efficiency, and the effects of climate change. For the rising food demand, the global production needs to increase by more than 40 percent by 2030 and by 70 percent by 2050 (FAO, 2006; Bruinsma, 2009). If this does not happen, the impact on availability and prices

will be dramatic. The consequences of rising food prices on throwing more of the world's population into poverty and hunger are today of major concern (OECD-FAO, 2009).

Studies using agro-ecological modelling estimate there are still large areas available to expand rain fed crop production (Fischer et al., 2002). However, these are optimistic estimations, since they do not take into account that part of these areas have already been allocated to forests, urban areas, or protected areas. Land degradation was not taken into account as well.

The higher incomes of part of the population in developing countries (e.g. China, India) will increase the consumption of meat. This means more pasture land and less land for crop production. The increasing demand for bio-fuel will limit the food production as well. Furthermore, the carbon markets will also compete for land and during the coming years a fast expansion of this new business area is expected. The effects on the actual reduction of carbon emissions are uncertain, but it seems almost inevitable that more people will be thrown into hunger.

2.5. Population

All the resource shortages and the pressure on the natural systems are enhanced by the increasing human population. In fact, all crisis events are related to the dimension of the world's population. The human population growth of the last century has been truly phenomenal. It took only 40 years after 1950 to double the population from 2.5 billion to 5 billion. Before the end of the 20th century the population passed 6 billion. Present estimates forecast a world population of about 9 billion between 2040 and 2050. Before the end of the 21st century, the population may reach 12 billion (UN, 2009a). Population growth rates vary widely across social class and cultural stage. Low-income countries show a 112 percent increase in population since 1980. In contrast, middle-income countries experienced a 52 percent increase during this same period and high-income countries only 23 percent (UN, 2009a).

2.6. Social

Extreme poverty affects many people in the developing countries. In Sub-Saharan Africa 51% of people live in extreme poverty (on less than $1.25/day) and in Southern Asia this figure is 39%. The number of people living in extreme poverty in 2009 is expected to be 55 million to 90 million higher than the anticipated before the global economic crisis (UN, 2009). Nearly half of the world population, about 3000 million people, live on less than $2.5/day (World Bank, 2008). Poverty reflects on hunger, access to essential resources, disease susceptibility and life expectancy.

World hunger reached a historic peak in 2009, affecting 1 020 million people (FAO, 2009b), more than any time before since 1970, the earliest year for which comparable statistics are available. Hunger and malnutrition have dramatic effects on mortality. Undernutrition contributes to 53 percent of the 9.7 million deaths of children under

five each year in developing countries. This means that one child dies every six seconds from malnutrition and related causes (UNICEF, 2007).

Hunger, related illness and HIV are responsible for the very low life expectancy in Sub-Saharan Africa. In 44% of the countries, life expectancy is lower than 50 years, and in one case even below 40 years; in 28% of the countries, life expectancy is 50-55 years and in 21%, 55-60 years (UN, 2008a). In the most heavily affected countries, HIV slows down economic growth, and deepens household poverty. In Sub-Saharan Africa alone, the epidemic has orphaned nearly 12 million children under 18 years (UN, 2008b), a number that is expected to rise to 18 million in 2010 (FAO, 2008).

The social level gap between rich and poor widened in more than three-quarters of OECD countries over the past two decades (OECD, 2008). The economic growth of the recent decades benefited the rich more than the poor (OECD, 2008). Changes in the labour markets are responsible for the largest part of the increase in inequality. Wages improved for those who were already well paid. While the elites benefited of the growing economy, the middle class income remained stagnant or decreased in relative values. Social mobility is generally higher in countries where income inequalities are relatively low. In countries with high income inequalities, by contrast, social mobility tends to be lower (OECD, 2008). But even young people with a university degree face today a difficult situation because of unemployment or underemployment and in many countries are forced to emigrate. Young adults are now 25% more likely to be poor than the population as a whole (OECD, 2008).

At the political level, citizens do not feel represented by the elected administrations. We live times of rising stress for communities and individuals and the disillusion with governments grows. The perception of bad governance, mediocrity of political life, dishonesty, corruption, and poisoned relationships between administrations and economic interests, all contributed to a lack of faith on the democratic institutions. This promotes the depoliticization of public life and the absence of active, engaged citizenship. This dangerous situation favors demagogical populists and self appointed saviors.

2.7. Crisis as opportunity

As never before, the world faces today a difficult situation that results from an extraordinary confluence of events — economic collapse, overwhelming environmental challenges, and resources exhaustion. For many people, the extent and diversity of problems justify an increasing alarmism and catastrophism. It seems obvious to most people that inevitably the quality of life will decrease. The general perception is that future will be worse than the present.

A crisis is a situation in which action is urgent and indifference is not an option. It is the time to engage in a serious reflection on the recent history of mankind, our economy, the consumption society, the idea of quality of life, our goals and our

system of values. Things have to change. Crisis should be seen as an opportunity, an opportunity for change. The recent economic crisis offers a unique window of opportunity to address the economic and the ecological sustainability in an integrated way.

3. Sustainability, ecological footprint, steady-state economy

3.1. Sustainability, a difficult concept

The words 'sustainable' and 'sustainability' appear in the political, technical and popular lexicon in the 1980s with the increasing awareness of the global dimension of problems such as overpopulation, poverty, hunger, and environmental degradation. Actually, these themes were already brought up of during the early 1970s, e.g. in 'Limits to Growth' (Meadows et al., 1972). But it was with the Brundtland Report (WCED, 1987) that these concepts gained more impact.

The definition of sustainability from the Brundtland Report remains the most often-quoted: 'Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED, 1987). This definition, coupled with the statement of the need to 'sustain human progress into the distant future' (WCED, 1987), is crucial to understand 'sustainable development'.

In view of the dimension of poverty in the developing world, the report states that a new era of economic growth is needed - a socially and environmentally sustainable growth. The concept of sustainable development involves three types of sustainability: environmental, economic, and sociopolitical.

The wide support for 'sustainable development' is related to its rather vague character - development is not distinguished from growth in the Brundtland Report. Some may argue that development is different from growth and that the word 'growth' was intentionally avoided. However, the idea of growth is inevitably behind the concept of development and the character of the report supports it. This was politically wise as the authors managed to put on the international agenda a concept whose implications were too radical for consensus at that time (Daly and Cobb, 1989).

The words 'sustainable' and 'sustainability' became popular and are frequently used in relation to ideas, policies and actions which are as a rule environmentally laudable. For most people, a sincere concern for the future of the planet and mankind is certainly behind these concepts. But for the common citizen, businessmen, entrepreneurs and most decision-makers of the western democracies, this does not translate into the appropriate actions. Actions and measures (apart from those intended just to produce political effects or greening the corporate images) that necessitate an engagement with effort, costs or restrictions are politically unattractive. Therefore sustainable development looks like a matter of faith, as if

good intentions were enough. Ideas but not compromises and the concept remains rather magical - as if repeating the words would make things happen. But environmentally aware people fear that we are living the end of a rather careless era and that drastic actions and measures at local, national and planetary levels are most urgent.

An important question behind the idea of sustainable development is: how to have growth without increasing the use of resources, especially the non-renewable ones, and production of wastes?. The idea of sustainability has vast implications because of the finite dimension of ecosystems and resources, in a planet of limited carrying capacity. When applied to material things, the term 'sustainable growth' is an oxymoron, i.e. it combines two contradictory ideas. In fact 'sustainable development' may only be possible if materials are recycled to the maximum degree possible, and if there is no growth in the 'throughput' (i.e. flows of matter and energy from the first stage of production to the last stage of consumption) of the economy (Daly, 1991,1996). Otherwise, and as the idea of 'sustainability' involves an indefinite time scale, growth will eventually have to stop.

'Sustainability' is not an easy concept. The statement '...needs of the present without compromising the ability of future generations to meet their own needs' (WCED, 1987) rises also another question: how to distribute in an equitable way the non-renewable resources among the present and all the future generations? For the renewable resources, the answer is exploit them at a rate that does not exceed the natural turnover. But how to quantify the share of our generations in the distribution of the finite resources among these and (supposedly) an infinite number of upcoming generations? Recycling, if feasible, is a possible solution to deal with this issue. But this is only true if all waste is recycled with a 100% efficiency. As this is impossible, the issue remains.

Regarding the problems of increasing demand and the gradual exhaustion of non-resources, the world relies on the present or future capacity to find new solutions, new materials, new products. Or just live without them. The issue further complicates when the human population growth is brought into the equation. More people means more consumption and more waste. Population growth cannot be sustained forever, and the larger the population, the more difficult it will be to achieve sustainability.

3.2. Ecological Footprint

Rethinking our way of life and re-designing the future in a sustainable way means that considerable changes are necessary to alleviate the ecological footprint of citizens in developed countries. The ecological footprint is the assessment of the biological capacity of the planet which is used by a human being or population. The ecological footprint measures the area of biologically productive land and water used to produce the consumed resources and to absorb the wastes with today’s technology and resource management practices.

Based on a 2006 assessment, 1.8 global hectares is the average productive area available for each person on the planet, i.e., the biocapacity. However, the global footprint was 2.6 global hectares per person, a 2.5-fold increase since 1961 (Ewing et al., 2009). The gap between supply (biocapacity) and demand (footprint) provides a measure of the unsustainability of the current human life style. As expected, the ecological footprint of most OECD countries exceeds the world average biocapacity per person in 2006; in contrast, the footprints of most African and Asian countries are lower than the biocapacity level (Ewing et al., 2009). High-income countries (per person gross national income of $10066 or more, World Bank classification) show a consistent increase in the average footprint per person, which is now 6.4 global hectares (Ewing et al., 2009).

In short: we are too many if we maintain the life style of the populations in the developed countries. The current increases in population, economy and consumption are not sustainable. Stabilization of the world population is urgently needed, the consumerism of the modern societies cannot persist, and economies, in general, should reach a low throughput level.

3.3. Steady State Economy

As mentioned above, the steady state economy (SSE) is implicit in the concept of sustainability. A SSE is a stable economy or with slight fluctuations, with constant stocks of people and artifacts, maintained at some desired, sufficient levels by low 'throughput' rates. This state can be reached after a growth phase gradually stabilizing or after a correction process of downsizing, which is called degrowth. Usually the SSE concept is applied in a rather abstract way and without equity or ethical considerations.

SSE is not a new invention of environmentalists, critical economists or environmental economists. The history of the steady state concept in economy goes back to the 18th century.

Adam Smith (1723-1790) in The Wealth of Nations (Smith, 1776) recognized economic growth has a limit. He wrote that population growth would eventually stabilize as natural resources become increasingly scarce and after economic growth, stability would follow.

John Stuart Mill (1806-1873) described the necessity of a transition from a growing economy to a 'stationary state of capital and wealth' which does not imply a 'stationary state of human improvement' (Mill, 1848). In his own words, 'there would be as much scope as ever for all kinds of mental culture, and moral and social progress; as much room for improving the Art of Living and much more likelihood of its being improved, when minds cease to be engrossed by the art of getting on' (Mill, 1848).

The most influential twentieth-century economist, J. Maynard Keynes (1883-1946), also predicted a day would come when the 'economic problem' would be solved and 'we prefer to devote our further energies to non-economic purposes' (Keynes, 1930). 'The day is not far off when the economic problem will take the back seat where it belongs, and the arena of the heart and the head will be occupied or reoccupied by our real problems – the problems of life and of human relations' (Keynes, 1930).

E. F. Schumacher (1911-1977), a non-orthodox economist and one of the most important post World War II thinkers, with his famous book 'Small is Beautiful' (Schumacher, 1973) set up a humanistic economics movement, involving a holistic approach far transcending the science of economy obsessed with statistics and GNPs. He wrote about a new economy, alternative to the classical growth paradigm, asking 'how much further "growth" will be possible, since infinite growth in a finite environment is an obvious impossibility' (Schumacher, 1973).

Herman Daly (1938-), who gained a wide reputation among environmentalists, proposed a model he called steady state economics based on the ecological principles, limits-to-growth ideas, theories of welfare economics and the concept of sustainable development (Daly, 1991, 1996). He is one of the founders of the ecological economics that integrates the environmental and the social issues. For Daly, the economy is a subsystem of the ecosphere that has its own rules to determine success, or at least to limit feasibility. The current capitalist economic theories that aim at unlimited growth are not only destructive to the environmental resource base upon which the economy depends, but also morally indifferent to unwanted side effects such as the unequal distribution of wealth (Daly, 1996). For Daly (2009), the concept of stewardship, common to most religions, is related to the principles of sustainable development.

They all stress that the goals of the economic activity should be in line with humanistic values and contribute to people's well-being, rather than economic growth at any costs and obsession of profit.

4. About the future (that started already)

4.1. Growth, no-growth and capitalism

Growth seems like a necessary condition for a healthy modern economy. It justified the freedom granted to the financial sector and is partly responsible for the 2008-2009 global economic crisis. The expansion of credit during the last decades was used to stimulate consumption and fuel the economy. Growth seems necessary to maintain economic stability and when growth decreases, companies close, people lose their jobs, politicians are accused of failure, and the fear of recession, collapse and crash returns. However, continuous growth is just not possible. It is economically, as well as ecologically unsustainable. It is now becoming widely accepted that it is not possible to pursue economic growth on a planet with finite

resources and succeed in preserving or restoring environmental quality and ecological services. Furthermore, economic growth is not defensible in social terms since it failed to improve real welfare for most people (Jackson, 2009). Douthwaite's (1992) book title makes the perfect synthesis - *The Growth Illu$ion: how economic growth has enriched the few, impoverished the many and endangered the planet.*

The link between economic growth and wealth goes far beyond the needs of companies. It is built into the very structure of the capitalist economies. Growth is needed by the current financial system, strongly based on commercial credit (loans with interest rates). So, paraphrasing Jackson (2009), is *Prosperity without Growth possible?*

The current global recession should be the perfect occasion to forge a new socially and environmentally concerned economic system equipped to avoid the shocks and negative impacts associated with growth (Jackson, 2009). Jackson's report contains a reflection on what is wrong in the western societies and a view of the desired, necessary and allegedly possible future. It is about how the world should be, but not so much on how that could be achieved. How a steady state economy can work and how it is politically feasible remains to be seen. A new model is needed making economy, consumption and sustainability, compatible.

Capitalism has shown that nothing is permanent. Capitalism is inventive and expansive. Anything can be turned into a commodity and be bought and sold, from genoma, health, drugs, children and sex, to emotions, culture, solidarity and faith; anything, even climate. In fact, global warming is undoubtedly one of the most extraordinary business opportunities for the clean technologies and the extremely profitable multi-million carbon market which will rapidly enrich the new class of carbon businessmen (and the 'scientific business' with vast sums of money spent on climate change-related research).

4.2. Economic interests versus environment

In general, environmentalism opposes to the economic activities with impacts on the natural values and environmental quality (externalities). The economic system is seen as the cause of the environmental problems the world faces today and of the social problems as well. Therefore, typically, environmentalism, green or ecological movements are politically positioned at left. Environment is part of the left(ist) ideological package of the soft causes (minorities, women, soft drugs legalization, animal rights,...) which is opposed to the logic of dominance (masculine, dominant class) (Bernardo, 2009). Traditionally, economic interests are opposed to environment and environmentalism; they are considered by important stakeholders (e.g. industry, urban development, resource exploration) as an obstacle to development. For many environmentalists, the 2008-2009 economic turmoil is an auspicious sign of inevitable changes, in economy and, by extension, in society and environment. Capitalism and environment are considered as incompatible. The supposed foretold death of capitalism is welcomed as an opening to a more equitable

and sustainable world. But, with capitalism the environmental sustainability is simply impossible?

4.3. Capitalism, after capitalism, green capitalism

For some people, the 2008-2009 economic crisis shows the fragility of capitalism. The crisis seems to supports the theory of capitalism's self-destruction (the classical Marxist theory that capitalism dynamics weakens the conditions of its own reproducibility, making it more fragile and in the long run unsustainable), thus opening the possibility to a new economic system and a hypothetically different society.

The era of transition may be disruptive. *What will come next?* is the obvious question which may be formulated on a more radical way (reviving a political debate which is more than a century old) *What will come after capitalism?* or, alternatively, *Can capitalism be retooled to deliver healthier economy, society and environment, i.e. a sustainable future?*

The end of capitalism and what the future could be in a post-capitalism era are issues of recent political reflections (e.g. Korten, 2000, 2009; Albert, 2006; Mulgan, 2009). Unfortunately not much information was provided on how those visions might be realized.

Recent think tank studies deal with the compatibility of development strategies with environment. They analyze the unsustainability of the present economic model and the western life style. They stress the need to act ethically in order to build a viable future (e.g. Porrit, 2007; Jackson, 2009; NEF, 2009). Jackson (2009) suggests that the current economic crisis could be the perfect occasion to discuss alternative models.

Many of those working towards a more sustainable future see capitalism as the problem or at least a big part of it. But Porrit (2007) believes that capitalism and the free market can be directed towards sustainability: the only way to save the world from energy shortages, global warming and environmental catastrophe is to embrace urgently a new type of capitalism.

Some argue that a green capitalism is possible (Elkington and Burke, 1987), seeking business opportunities in the growing market of green solutions, and that a Green New Deal (Green New Deal Group, 2008) is urgently needed and achievable. Clean energies, and all the technological solutions, products and services related to energy saving and waste treatment represent important business opportunities. The carbon market offers huge business opportunities: in 2008, 4.9 billion tonnes of carbon dioxide equivalent (CO_2e) emission reductions were traded on the global carbon markets. Overall, carbon trading increased by 83% in just one year and its value was $125 billion (Environmentalleader, 2009). Environmental protection is also of particular interest for the business strategies of the most advanced companies in

competitive markets: companies better able to meet environmental standards have competitive advantages. So, for less polluting companies, more demanding standards are welcome. The dynamics of the market economy may be seen as a positive element in relation to the fast development of suitable technologies.

Big corporations are obviously more interested in profit than in contributing to a better environment. The so-called 'green products' or 'earth-friendly products' are a business strategy for the more environmentally concerned consumers. As for the 'fair trade' labeled products, the actual implication are questionable: many green products and initiatives have adverse environmental effects. From the companies' perspective, the main purpose of the green products is to keep people consuming - consuming green instead of consuming less. Green capitalism is the new adaptive form of capitalism, taking advantages of new business opportunities and new competitive strategies. But greening the business may simply be a greenwashing of the corporate image, a makeup to please or lure the more ethical customers with no other consequences - just a marketing strategy that is worth millions in consultancy.

4.4. Is ethics the answer? Ethics in a world without ethics

'Ethics' is presented as a key concept in relation to the urgent changes. The rediscovered 'ethics' joins 'sustainable' as the most repeated leitmotifs in all reflections on environmental, and social-economic issues. The design of a new economy and society should be supposedly based on ethics (cf. Jackson, 2009). We live in a world dominated by greed, violence and injustice, i.e. a hugely immoral world. Probably we live today one of the most unethical periods of human history since in the western societies even the ethics of the interpersonal relationships are fading away. It is hard to believe that ethics (at individual, corporative, national and global scales) might be the driver of change that will shape a future and better world. Sadly, our society is highly competitive and increasingly dominated by selfishness. It seems difficult to believe that an economy focused on competitiveness and profit may integrate ethical and socially concerned dimensions. Greening the business seems possible; humanizing it and turning it more socially sustainable, does not.

Within the existing financial system and market economy no one sees how a world of global equity, ecological as well as social can be achieved. Changes inspired by ethical ideas resulting from actions by national governments or other institutions are unlikely to happen. At the individual level, minor changes on consumption behaviour and life style may contribute to sustainability but the world will not change with generous ideas of justice and equity, and faith on individual moral behaviour.

4.5. Growth restrictions, questions and impossibilities

How is it possible to realise more sustainability within the existing financial system and market economy? What is the possible evolution of the economic system under the conditions of energy restriction, more expensive raw materials and products, and lower consumption levels? How can the market and capitalist system (based on

loans, credit, competitiveness and profit) evolve in a post-consumerism economy? Is it possible to establish an economy that does not obsessively focus on increasing (and unevenly distributed) wealth? It is hard to believe that human nature and the existing economical interests allow this on a wide scale. Furthermore, for governments no major changes in the political agenda are expected as they respond to short time scales (till the next election) and do not want to implement drastic measures that cause loss of votes. The deceleration of economy is not a popular issue and governments are always hold responsible for the bad economic performances and rankings. Economic growth is an usual government target, especially in times of economic crisis. Low economic growth will never be presented by a government as a desired goal. The growth fetishism culture still dominates and the public opinion relates low growth to recession, unemployment, poverty and social crisis.

The urgent need of a steady-state economy is seen by developing countries as a westerncentric view they do not share. On one hand, the poorer nations stand in urgent need of economic development and poor people in developing countries expect their life conditions may improve in a growing economy. On the other hand, in the emergent economies of BRIC and other Asian countries, a new class of entrepreneurs and businessmen rises and is now enjoying the gains of the fast expanding economy, in many cases profiting from half slave labour (as in the growing European economies during the 19th - early 20th centuries), merging the worse of capitalism and communism (China), or appropriating the spoils of the fallen empire (Russia). A highly paid elite and a numerous emergent middle-class strongly oppose to any idea of SSE as well. In such a situation it is not easy to build an agenda for the 21st century on economy and development. The general principle that *those who already have are conservationists, and those who do not have are developmentalists,* applies.

A global and strong regulation appears as the only solution though no agreement seems possible now or in a near future. The position of China and other developing countries on carbon emissions before the Copenhagen Climate Conference (2009) is the perfect illustration. China, at the peak of its economic development and the biggest carbon emitter in the world, does not accept restrictions on carbon emissions. For the Chinese government, the real intention of the developed nations behind the emission restrictions is not the global temperature increase, but the restriction of the economic development of the developing countries, and to keep their own advantageous positions (Energy Tribune, 2009). Emission rights are development rights. India and other developing nations also reject any new climate treaty which will limit their economic growth. If for the carbon emissions no agreement is possible, it will certainly not be possible for the economic and development issues.

Only global institutions could lead the process of growth regulation at the planetary level, however the necessary consensus will be very difficult, if not impossible, to reach. The mandatory character of measures would be perceived as a threat to the sovereignty of nation-states. In fact, Jackson's (2009) considerations on reaching

prosperity without growth, based on ethical principles, seem to suggest that the world is in urgent need of an omnipotent benevolent despot.

4.6. The low throughput economy

The idea of a no-growth economy is usually associated with decreasing consumption, decreasing production, bankrupt companies, unemployment, collapse and depression.

A sustainable steady state economy is a low throughput economy which uses less resources and produces less waste. Low material products or immaterial products the dot com era made possible (like films, music, e-books) and services may fuel a low throughput sustainable economy. Besides culture and entertainment, outdoor and creative activities, well being, general services and sharing systems are also compatible with a low throughput. In a time when production and private consumption of goods are expected to decrease, more services will be needed. Sharing systems will become more important in the future. An example of a product-service-system (PSS) in the future are car-share systems: supplying small electric vehicles in cities (widely distributed and available for personal use) as an alternative to private transport, or to the conventional collective transport. This intermediate solution for transportation in cities with limited and costly parking is an example of a business opportunity that is compatible with modern urban life and an appropriate response to lower levels of consumption in a low throughput economy. Many other PSS are possible. These solutions represent an inverse process to what happened with the modern era (less collective and more personal equipments as a form of autonomy and empowerment).

Many products consumed in the West travel huge distances from the production location to the final consumer and frequently with some intermediate steps which further increase the total distance. Europe imports food from Oceania, Africa, North and South America. Industrial products originate often from countries in SE Asia or other developing countries. Industries are frequently delocalised to distant cheap labour countries. In a time of energy restrictions, this strategy needs a reassessment (though Europe and USA may see this as a cheap price for exporting problems - environmental degradation, pollution, carbon emissions, water consumption, health and social problems). In the future, the goals of a low throughput economy involve a much more local or regional production, with high added social value. The economies of scale and quality will have to be taken in to account. Heavy industry does not make sense at a local or a regional scale, but food and many other everyday products do.

4.7. Consumption, consumerism, individual behaviour changes

Besides the macro-economic issues, sustainability has also to do with consumers' behaviour. Global affluence has risen dramatically over the last century and this resulted in more consumption of goods and services. The Gross Domestic Product per capita has increased by 400 percent since the eve of World War I. Even in Africa,

the poorest region of the world, individual consumption has more than doubled over this period and in the affluent western countries consumption has risen more than six-fold (Ewing et al., 2009).

The amount spent on goods and services by private consumption reached more than $\$20 \times 10^{12}$ in 2000, a four-fold increase over four decades (Worldwatch, 2005). About 1.7 billion people, one quarter of the humanity, belong now to the "consumer class" having adopted the lifestyles that were once mostly limited to the rich countries. Growing numbers of these new consumers are from China, India, and other developing countries and are expected to continue increasing in the future. However, the affluent western societies - North America and Western Europe, 12 percent of the world population - still represent the largest fraction of the private consumption: 60 percent (Worldwatch, 2005).

Consumption plays multiple roles in people's lives. The most obvious ones are purely functional and have to do with satisfaction of basic needs of subsistence and protection: food, physical comfort, shelter. But material things also play significant social and psychological roles. Material goods have strong symbolic meanings related to status exhibition and social identity, and unquestionably shape our social world. They are symbols of achievement, success, wealth and power. The origin of consumerism, as mentioned before, is intrinsically related to the Modern era and to the increasing importance of the middle class - the consumer class. Consumerism is the product of industrialization and mass production, modern banking and credit availability, social mobility and increasing income. But it also has to do with the secularization of the western societies. With the decreasing role of religion, human beings do not live any more according to the promise of another life, a better one that will compensate for moderation and restrictions in the terrestrial one. In the new secular society, the dominant idea is that life should be fully enjoyed now and that there is no reason to limit it in the name of other co-existing human beings, of the future generations, or of some hypothetical after-life. Faith in a future rewarding life is limited and the existential 'deferred gratification' shifted to the modern 'instant gratification'. The 'here and now' culture dominates and justifies the lack of ethics of the social life and the modern hedonism (the 'I, me and myself' and 'we only live once' models).

Consumers feel empowered by the exercise of free choice but in fact they are mostly manipulated by advertisement campaigns and easy credit. Brainwashing campaigns promise smell of success, irresistible look, sex and conquest, the perfect happiness. Consumers are lured and trapped.

Consumption is a complex process. Consumerism is related to passion- or pathos-driven behaviour and by its compulsory nature ends up as a form of addiction. Through the consumption of goods and services, consumers feel that their lifes get a purpose - consumption is a reason or a reward, something to be achieved. Consumption is also a response to anxiety, a replacement for love and gratifying personal relationships, a compensation for loss, suffering, loneliness, frustration and

boredom. Consumption seems to fill the void of an existence without causes. It may be also the desire to live the future, enjoying the continuously improving technological products.

Both consumption and individualism were intensely and intentionally nurtured during the past decades. Consumers will not easily restrict consumption, give up obsessive individualism and adopt a different life style, less materialistic and more healthy, meaningful and fulfilling. This will be particularly the case of the young generations raised in the model of consumerism (from clothing and footware, playstations, sound-systems, mp3,4,5,x, cellular phones, to pdas, computers and all the electronic paraphernalia of gadgets of the modern urban life).

Sustainability is not compatible with huge footprint related to consumerism and careless waste of resources. All consumers' behaviours that decrease the ecological footprint contribute to a more sustainable world. In practical terms sustainability means decreasing consumption, using products for longer periods, saving, reusing, self-producing, sharing. What will make consumers change behaviours, adopt a different life style, decreasing their footprint and contributing to sustainability? Ethical reasons? Environmental concern?

People's attitudes regarding change strongly depend on the consumption/action type and the involved effort:

- Saving water and energy means saving money, though for many people the increasing prices are not yet causing behavioural changes;
- Using public rather than private transport is a difficult issue: fighting individualism, comfort and sense of freedom is not an easy task. The increasing prices of fuel will be a decisive factor;
- Separating paper/metal/plastics/glass for recycling is done by an increasingly larger number of people: no saving but no costs and the voluntary action is seen as a positive contribution;
- Changing the food regime towards a less meat diet (lower footprint) will be a slow process; fighting food habits is not easy but the increasing price of meat will modify consumers' behaviour over time;
- 'Edible gardens' for self-production of vegetables are expanding but still involve just a small part of the population; it is easier for those who live in more rural areas or still have a strong rural memory;
- Consuming locally does not seem to be perceived as important yet (possible exception is related to some form of consumers' patriotism - consuming the national products means less money going abroad and creation of more employment in the country);
- For clothing, footwear and other personal items, the individual confidence related to the 'social image' and pleasure/attractiveness is involved and for this reason this type of consumption will not change easily;
- Holidays in remote destinations will be difficult to disencourage now that low-cost companies made them economically accessible and distant tourism (mainly tropics) is increasingly popular; more expensive tickets as a result of

increasing taxes, higher fuel prices and international insecurity may contribute to moderate this consumption.

The most obvious reason to change behaviour is saving money, especially in a situation of less income and higher prices. Consuming less goods and services which reflect on the individual pleasure or with symbolic meaning in the social play, i.e. non-functional consumption, is much more difficult. The overwhelming majority of consumers in the West are not concerned with sustainability issues. The general attitude towards consumption and life style goes from 'things are not yet that serious', and 'we will see in the future', to 'something will come up' and 'don't bother - we'll be dead by then'. In the mean time, the more concerned people feel they are doing their part separating some wastes for recycling and buying compact energy-saving fluorescent light bulbs. (Green Capitalism needs a Green Consumerism?). The end of consumerism will not result from consumers' rational or moral decisions. For the young generations, the difficult conditions of the next decades will promote radical changes - economic restrictions are stronger than voluntary actions.

4.8. Resources, income, welfare state, population and social issues

The transition from the current situation to a non consumption driven economy is expected to have social consequences. The critical issue is how to decouple economy, resource use and employment. Part of the social dimension of the 2008-2009 crisis was caused by a consumption drop which caused increasing unemployment and companies' closure.

A low throughput economy does not necessarily mean going back to pre-WWII economic conditions. More efficient production, low resource products or immaterial products, and a wide array of services will keep the economy functioning. But inevitably, at least during the transition phase, the economy cooling means less jobs, part-time work and wage decrease. People will live with less income. Predictably, the price of the manufactured products will increase as a result of (i) higher prices of energy and raw materials caused by gradual depletion, (ii) improvement of the workers' wages and working conditions in Asia, (iii) higher costs of production caused by more stringent environmental regulations. Higher efficiency of the industrial production will probably compensate part of these raising costs.

Living with less money means consuming less and using products for longer periods. Slower economic growth or no-growth, less consumption and lower wages mean also less tax income. This economy will provide less financial resources for the social policies (education, health, social security, retirement pensions). In fact, the welfare state is already dying (and not only because of the neo-liberal policies): less unemployment protection, reduced pensions, less free or subsidized medical care and education, and less support for home loans. A less caring state (mainly concerned with enforcing restrictive regulations - carbon, energy, wastes,...) means that the individual citizens will have to rely much more on themselves and much less on the state.

Population growth is relevant in society and economy. While the developed countries face a decreasing population (demographic transition completed), the developing ones still show a growing phase. Low standard of living, poverty and hunger are usually seen as consequences of high birth rates and population growth. But in fact, when life conditions improve, both birth and mortality rates decrease and population growth strongly declines. This means that the demographic transition is concluded. During the demographic transition, the difference between birth and death rates results in a high growth rate. High population growth is a cause as well as an effect of low standards of living and the developing countries experience serious difficulties to abandon this poverty-high birth cycle. China aims to break this cycle with the one-child policy.

If the high population growth in the developing countries (mainly Sub-Saharan Africa and SE Asia) is an obstacle to better living conditions, in the industrialized developed countries the population decline is starting to cause social problems. European countries, including the Russian Federation, and Japan are expected to decrease in population size over the next 50 years (UN, 2009a). With longer life expectancy and lower birth rate, these countries are undergoing a rapid ageing process. With the declining ratio of economically active to inactive, negative social consequences are expected: more aged beneficiaries of assistance and health care, and higher numbers of retirement pensions, supported by a less funded social security. Raising taxes on the active population to fund the social security is the more obvious solution but this means a further contributive pressure affecting part of the population already living on less income. Later retirement, adjusted to the increased life expectancy, is also inevitable to reduce the pressure on the active population. Immigrants to replace the population losses in the developed countries could be, at least partially, a solution. But most national policies restrict immigration instead of promoting it.

The decreasing population of the industrialized countries might be a positive element in a contracting economy with less jobs. In general, the stabilization or decline of the world population decreases the global footprint, including carbon emissions. This is why some organizations sustain climate change should be addressed through birth control. For Wire (2009) family planning is one of the primary methods of emissions reduction as contraception is almost five times cheaper than conventional green technologies as a means to combat climate change. Consequently, family planning programmes in poorer countries should be treated as legitimate candidates for climate change funding.

The transition phase with declining populations will have huge effects on the generations who will have to support an unbalanced system. Rich countries have the financial resources to support the social costs of the transition, making it less disruptive. In the others, the population will have to bear the costs and find the solutions to live within limited means.

As mentioned before, in many countries, people in their 20s and 30s face proletarization and underemployment. The university degrees of this generation - the most educated and technologically sophisticated to date - did not translate into the promised opportunities. Their hopes are frustrated by changes on the job market, the law of supply and demand in a neo-liberal decelerating economy, and the opportunity for employers to exploit workers in a fragile situation. For them there are no illusions. The so-called middle class seems condemned to fade away and social inequality to aggravate. The wealth accumulated by the previous generations will soften the transition but not for all and not forever.

5. Final notes: difficult times and some signs of hope

Population decrease, less income, and less accessible resources will contribute to sustainability. Restrictions will be the driver of change rather than life style corrections, courageous policies and international agreements. The end of consumerism will not result from ethical positions or from the wish of a more healthy and meaningful life, but from money restrictions. The western societies reached the maximum level of material life conditions which is now decreasing. For the first time, the new generations will face more difficult times than their parents. The time of optimism and faith on progress is over.

Resources and manufactured products will become more expensive. Making last, repairing, sharing, saving will be the key words in a world which will consume less and more locally. Moving factories to SE Asia or Eastern Europe for cheap labor will eventually end. Local economies instead of global economies promise a better future for human societies. Schumacher (1973) already proposed in the context of his anti-globalization ideas that 'production from local resources for local needs is the most rational way of economic life'.

The time of cheap food is over. For a population that face difficulties, part of the fresh vegetables will come from self-production. Urban agriculture on private or public land will supply food to the population of cities (Garnett, 1996; UNDP, 1996; Bakker et al., 2000; van Veenhuizen, 2006). The urban agriculture movement in Europe and in the USA, with a high number of urban food growing projects is a sign of things to come and an interesting example of how people can be actively engaged in the community life. Several organizations like Sustain (www.sustainweb.org) or Transition (www.transitionnetwork.org, www.transitiontowns.org) deal with the multiple dimensions of community life in a new (post-peak oil) era. They show the vitality of these initiatives and how activities like food production may promote the building of communities.

These movements promote a new active citizenship, that revitalizes the communities and turns them into vibrant entities. This return to communities is a sign of hope. Other difficult periods in human history lead to cooperative behaviours and stronger

communities. The failure of the representative democracies means that a more engaged participation of the populations is needed.

The new citizenship is local as well as global. Another note of hope regards the increasing power of a growing digital democracy made possible by the internet. The future will reveal its full potential as the driver of new forms of active participation at local, national and global levels. A global culture of disinterested sharing is emerging through the internet, contributing to build a 'collective intelligence' able to tackle difficult times.

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