

Communications & Opinions



The battle for food, water, energy and the environment: A world race between demography, resources and technology*

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* People excellence in volatile environment - Conference

The subject of today's conference on volatility is vast. Should we talk of political, monetary, economic, food, energy, and social or climate volatility? All kinds of volatility impact on decision-making and outcomes by international institutions, governments, business, NGOs as well as people. I will limit myself to speak about trends and uncertainties with regard to today's overriding and interdependent challenges: food, and water, energy and environmental security. In all three areas, looming imbalances between demand and supply in the long run have been causing and will continue to cause greater volatility in the short term.

Before I deal with the three securities (food, energy and environment), or rather their potential lack of, let me recall the importance of our relatively stable regulatory environment thanks to the European Union. While EU lawmaking is inevitably slow (albeit often less than that of the US Congress, and more predictable), it provides a far greater stability than national regulations, which may otherwise simply change as a result of government change or electoral politics, and conflict with the regulations in neighbouring countries. In principle, EU regulations affect particularly intra-EU trade, which accounts for about three quarters of the external trade of EU members. But EU regulations affect also extra-EU trade because of the attractiveness of the EU market, the way EU regulations are compromises among various national views, and also because of business preference for cross border rules. Which means, the EU reduces volatility.

Let me now move to the key world challenges for today's discussion.

The Food and Water Challenge

The first world challenge is food security. Grain demand tends to exceed supply, which is under stress, notably in Australia, China, India (including its Punjab bread-basket), the United States (in particular the southern Great Plains and the South-West), and in a number of other countries such as Kazakhstan and Ukraine. World grain stockpiles have reached rock bottom. China's northern part "is literally drying out" (IBRD).

For the World Earth Institute the main reasons **why world food supply is tightening** are population explosion, and accelerated urbanization,¹ changes in life-styles, falling water tables and diversion of irrigated water towards the cities. All this leads to losses in soil availability, quality and use for food. Despite conservation efforts, North American farmers are still losing top soil at 1% a year, at a cost, according to a study by Science, of some \$44bn a year (Soil under Strain, FT 17 July 2008)

Grain demand is booming. The global population is growing by 220,000 people a day. Some 3 billion people are expected to be added to the world by 2050 (two thirds of whom in Asia and Africa),

¹ An estimated 40,000 ha of land are needed for basic living space for every 1 million people added.

with 4.7 billion people in 8 countries alone², most of whom (except the US and Brazil) have neither the climate, nor the soil or other conditions necessary to feed themselves in the future. Over the next decade China's per capita income should triple and its meat consumption, after doubling since 1990 reaching one third of world consumption, will increase even further. As to India, its economy is growing at 9% annually while the annual growth of its agricultural sector has been slowing from 4.7% in 1992-1997 to only 1.5% in 2002-2006, and meat consumption has shot up by 40% since 1990. It has been predicted by the UN that "Food shortages will affect millions." Dwindling food stocks, booming prices and growing food export restrictions have led to fears of interruptions in supplies. These have already triggered food riots in more than thirty countries. It has been said that "The dominant force today is security of food supplies".³

The F.A.O predicts continuing high food prices, and warns that low-income-food-deficit developing countries, whose food expenditure has more than doubled since 2000, are faced with a further "alarming" increase in food bills, cuts in food consumption, and increasing malnutrition, making it more difficult to reach the UN goals of hunger reduction. It blames soaring grain prices and a doubling of freight costs since 2006.⁴ Even when commodity production recovers and prices plummet, we cannot afford to ignore the negative trends. Actually, even small shifts in world production can have big price effects. The poor are the first hit.

Farm land is under stress. Do we need to be reminded that there are nearly 450 million farmers, who together with their families account for one third of the world's rural population, who live on land plots of less than 2 hectares? There is of course potential for new land, but currently cultivated land is diminishing fast. Deserts are expanding at the expense of mostly cropland and grassland with an annual loss of 700,000 hectares in China and Nigeria alone. Cropland is also lost to urbanization. Declining soil quality is the main reason why crop yield increases have halved from two to one per cent a year. It has been calculated that the addition of some 70 million people every year claims nearly 3 million hectares for housing, roads, highways and parking lots (Lester Brown).

According to the UN Report on Global Warming, "**Water shortages will affect millions.**"⁵ Up to 250 million will lack water in Africa alone. While individuals drink only two to four liters of water (in different forms) a day, it takes 2,000 liters of water to produce the food an individual consumes daily. In China a thousand tons of water can be used to produce 1 ton of wheat, worth at most \$200, or it can be used to expand industrial output by \$14,000 – 70 times as much. This may encourage China to import water by replacing domestic with imported food production. Agriculture, which currently uses 70% of the world's water, may become a residual claimant on the world's increasingly scarce supply of water. In California farmers have started selling their water rights to neighbouring towns. This means the end of farming on their land. Water shortages translate into food shortages.

For every additional Euro of income, poorer people can spend up to 70 cents on food as against 10 cents for richer people. Moreover, those moving up the income scale consume more meat, each kg of which requires 7 kg of feed. Growing wealth in China, India, Brazil and Russia and elsewhere is the biggest driver of food price increases. These are the reasons while the expected 50% populations increase by 2050 means an exponential increase in demand for grains. Even when food prices escalate, production may not build up accordingly, not just because of resource limitations, but also because of public policies aimed at insulating certain producing countries from the world market.

The situation is serious enough for the EU proposing to allocate €1bn of its CAP funds to where food shortages are most dramatic, and the World Bank launching a \$1.2bn fast-track funding facility to finance safety net programmes, supplying seeds and fertilizer and supporting small farmers ahead of the planting season. Robert Zoellick proposed a 10-point plan to tackle the global food crisis,

² India (1.5 bill, China (1.4 bill) USA (400 million), Indonesia and Pakistan (300-350 mill each) and Nigeria, Bangladesh and Brazil (with an average of 250 million each)

³ Joachim von Braun, Director of the Washington-based International Food Policy Research Institute (FT., 20 August 2008).

⁴ See the FAO biannual Food Outlook, November 2007.

⁵ UN Report on Global Warming (2007)

including a cut in subsidies and tariffs on biofuels. The latest collapse in food prices following a similar movement in oil prices should not let us believe that in the long run trends have reversed and lower our concern.

The eternal optimists remind us that there is also a positive side: the technology potential as a key factor and new cultivable land. A majority still believe that the market and technology will continue to prove British political economist Thomas Malthus wrong when he said at the beginning of the 19th century that population had the potential to grow much faster than food supply.

No doubt there is great technology potential, most notably biotechnology for enhanced, sustainable land productivity with the available resources. There is also good potential **new land for cultivation**, notably in Latin America, Africa and east Europe. However, new land is insufficient, and either inappropriate because of poor or polluted soils, or difficult to use for food production due to doubtful property rights and/or government mismanagement.⁶

As to **new technology**, it can of course help to increase sustainable food production. Without modern mechanized agriculture and the chemical revolution there would be widespread world famine and food wars today. However, gains in productivity have been at the expense of increasing energy use, greenhouse gas emissions and environmental degradation.⁷ There are many technologies such as traditional cross-breeding, hybrids with specific qualities (genotyping), and genetic modification via DNA, which can be of help. Low-till or no-till farming techniques help retain water, raise soil carbon content, reduce energy needed for cultivation, and combat wind and water erosion. Scientists are actually working to improve the efficiency of photosynthesis, carbon capture, nitrogen fixation and many other cellular processes that boost biomass yields. For instance, there are good prospects with genetically modified algae yielding up to 15,000 gallons an acre, a multiple of what other plants can do, and minimizing ecological damage (if grown in closed tanks).

Enzymes allow producing cellulosic ethanol from the inedible parts of crops such as straw stalks or from wood or food waste. It may become possible to plant crops in soils lost to salinisation, and to genetically produce plants that can grow in marginal or otherwise unusable farmland. Some potential products for biofuels have the advantage not to be grown on farmland, or deforested land, or to preserve the food component of plants, and not to add to pressure on food prices.

But, new technologies capable of raising land productivity are shrinking. Moreover, food productivity increases have been progressively diminishing, notably due to water scarcity and losses of top soil⁸, continuing over plowing and overgrazing, increasing biofuel production, and shrinking harvests with rising temperatures. Although crop yields in some areas in Europe and Asia will still increase, they will decrease in Africa and Latin America and may well be of diminishing help as yields of wheat, rice, and corn press against the ceiling ultimately imposed by the limits of photosynthetic efficiency.

⁶ For instance, an increase in Brazil's grain land and the creation of new rural settlements there would have negative consequences for the environment: domestic-soil sustainability, rainfall recycling, biodiversity and climate effects worldwide. In some countries, particularly in Africa, little can be achieved without agrarian reform and/or unpalatable pricing policies

"Africa's soils are the poorest in the world, and poor soils produce poor crops" (Kofi Annan). They are thin, laden with iron and often lacking nitrogen, potassium and zinc. They cannot hold much artificial or natural fertilizer, because their nutrient retention is very poor and most of it will be washed away. Africa loses about 8m tones of soil nutrients a year. Much of the land is degraded to the point that 95m hectares have seen productivity reduced.

⁷ In the first two decades of petrochemical farming after WWII, overall energy inputs in agriculture rose by 70%, whereas food production increased by only 30%.

⁸ Despite conservation efforts, North American farmers are still losing top soil at 1% or four billion tons a year, at a cost, according to a study by Science, of some \$44bn a year (Soil under Strain, FT 17 July 2008). Much of these losses come from high-tech farm practices such as monoculture, which make crops more vulnerable to insect pests. The resulting greater use of pesticides destroys fertility-maintaining organisms in the soil and weakens their structure.

Can one raise those ceilings? Perhaps, but soil and water quality would have to do better. I am aware that major producers of seed and agro-chemicals are much more confident about the food balance, notably pointing to biotech research. Without biotechnology food shortage would be far more dramatic indeed.

Besides, when new technologies come on stream there are no guarantees that they will be used properly. The global increase of crop production is being used mostly to feed animals with livestock quintupling since 1950. Technology regarding Plant Protection Products has contributed to environmental degradation. But beware from throwing out the baby with the bath water!⁹ The consequences could be far worse than the cure: collapse of food production, resistance to the smaller number of PPP active substances left, spread of plant illnesses etc.

One recent example of technology availability improperly applied is biofuel. The current agro-fuel fashion is totally irrational and short-sighted. There is too little awareness of the repercussions of extravagant agro-fuel subsidies on food availability and on the environment. Senseless subsidies for agro-fuels have led to the conversion of one third of the agricultural land from growing food grains for human consumption to growing feed grain for cattle and other livestock.¹⁰ EU legislation is in flux, advancing as it were towards an unknown destination. It is pushed by a targeting mania that has struck EU member Governments, and incidentally the US, in an effort to obtain green credentials with technological fixes. But the European Parliament has proposed to lower the 10% biofuel target by half. In Congress there are calls to abolish their own biofuel target, but I suspect that they are pushed by the oil industry, that is, for the wrong reasons.

There are of course those who say: come on, stop dramatizing, Malthus has proved wrong so far, and will be wrong again! Malthus did not attach a firm date to his prediction. He may well prove right in the end. We should therefore act with caution.

This time things appear different. In his last book “The Revenge of Gaya”, James Lovelock tells us that the self-regulating organism of the earth and its biosphere has become sick. He fears that gas emissions caused by human activity will cause the climate to “flip” into a different equilibrium state that will leave the tropics uninhabitable, force humanity to flee to the poles and threaten civilization. If the world does not take remedial action, Malthus may have the last laugh after all, unless we act more responsibly.

One can think of different **strategies** to deal with the **food problem**. For instance China is restricting its corn exports as well as the use of domestic corn for producing ethanol. China has a larger population than that of all the countries that industrialized in the past, and almost double that of the G7. China may wish to exploit agricultural land abroad. The scramble for food may indeed become a scramble for productive land. Several countries are exploring potential investments in food production in third countries with fertile soils such as Ethiopia, The Sudan or the Ukraine for the benefit of the investing country. But such a strategy is not without problems when the local population lacks food, local farmers have weak rights, or the international food balance worsens and international food prices rise. Farm modernization requires scale, whereas too many farmers are inefficient with small plots of land. Could they be driven off the land by large-scale agriculture in the name of food security, thereby

⁹ Before prohibiting their use from a fixed date one needs to reflect about the possible consequences. I doubt the European Commission has done so with its latest PPP proposal. In my view, no PPP should remain on the market when safer alternatives exist. But none should be banned unless this actually is the case, because food availability may suffer and possibly the environment as well.

¹⁰ Since 1950 world meat production increased nearly six times to 253 million tons. The Chinese have boosted their per capita beef consumption from 20 kg in 1985 to 50 kg to-day. To sustain the yearly beef requirement of an average American family of four (based on 65 pounds of beef per person per year) requires the consumption of more than 260 gallons of fossil fuel. When burned, that fuel releases 2.5 tons of CO₂ into the atmosphere – the same amount that the average car emits in 6 months normal operation. (From Lester Brown, *Outgrowing the Earth*).

accelerating urbanization and swelling urban slums? The rural and urban poor would be the losers yet again.

In sum, technology alone cannot be the only solution to food shortage allowing reaching the UN Millennium Target. I therefore believe with many others that, without a change in **food habits** foregoing heavy meat regimes combined with land reform in the Southern Hemisphere providing the poor with access to land for cultivation, and sustainable food and energy policies everywhere, it will be impossible to feed the world in the second part of this century at prices acceptable to the poor.

EP Agricultural Committee Chairman Neil Parish recently concluded an agricultural conference by saying: “We were sleep-walking on the food front and have woken up”. Commodities have indeed become strategic again.

The Energy Challenge: Agro-Fuels

By 2025 the **global energy demand** is forecast to increase by 50%, mainly driven by the rapid industrial growth of countries like China and India. If China were to use as much oil per capita as the US it would need to consume 81 million barrels of oil a day, or 10 million more barrels than the entire world oil production in 1997. The threat of energy scarcity and adverse environmental impact means we cannot rely solely on fossil fuels to meet the rising demand. Renewable energies are growing energy sources, notably transport fuels made from plant and animal matter, or agro-fuels. But the latter are a mixed blessing.

We are witnessing a mounting competition between food and fuel, and a structural shift in US and European agricultural markets with serious implications for environmental degradation (mainly in non-European countries). When oil costs more than \$60 to €100 a barrel, depending on whether we talk about Brazil, South East Asia, the US or Europe, as long as agro-fuel production is highly subsidized and protected from imports (in the US and EU) farmers have an incentive to convert sugar cane, palm oil, corn, wheat, soy beans, and/or rapeseed into fuel provided crop prices are attractive. FAO D.G. Jacques Diouf recently estimated that the transfer of 100 tons annually from cereal crops to agro fuels has been done at a cost of \$11-12bn in subsidies. The OECD rightly considers those subsidies and trade protection “irrational” and “wasteful”.

This has fed an increasingly heated debate over agro-fuels, which is often characterized more by emotion than reason.

Advocates of agro-fuels notably claim that cars would produce only carbon already absorbed by plants from the atmosphere; there would be fewer oil spills from tankers, less opportunities for blackmail from OPEC countries, and less oil-generated power politics in the Middle East.

Critics have advanced counterarguments undermining the biofuel economy. Enhanced biofuel production does not seem to help, and actually hinders efforts to balance food demand and supply, save energy and water, and preserve the environment. They hold that the net effect of biofuel production is negative compared to other options. “The bewildering array of incentives that have been created for agro-fuels “bear all the hallmarks of a popular bandwagon aided and abetted by vested interests” (Institute of Sustainable Development).

First-generation biofuels are not competitive (except Brazilian ethanol) without fiscal incentives and/or subsidies and/or border protection. They require a lot of water (about 1,000 liters of water for one liter of biodiesel), and good, irrigated agricultural land, both of which are finite and diminishing in practice; the growing demand of water may add it to the commodities traded on world markets.

Biofuel production reduces food and feed supplies.¹¹ It increases food prices and price volatility. Grain price changes have knock-on effects on livestock, poultry and pork prices because maize (corn), wheat and soybeans (soy meal) are used also as animal feed. Most biofuels have an unsubstantial and shaky record in reducing greenhouse gas emissions as compared to conventional diesel or petrol, except for sugarcane (with a near total emission reduction) and wheat (with half as much). The cost of eliminating a ton of carbon dioxide equivalent via biofuels is so high (between €100 and €5,000) that it is not justified by the marginal benefits of reducing one ton of emissions in this way.

Biofuel critics admit that second-generation technology may help reduce the negative impact on food prices, because, as agro-fuels become just a by-product of crop residues, the relevant crops will continue to provide food like before. But they doubt that second-generation agro-fuels will get clear of most of the draw-backs of the first generation and actually help reduce emissions.

Critics suspect that support for biofuel subsidies and strategies helps politicians (with the best intentions) to acquire green credentials, providing the illusion of an easy technological fix, and divert government attention from getting on with more important, less popular measures for saving the planet, such as energy conservation, more stringent energy-efficiency standards in production, a major boost in research on new non-polluting energy sources, technologies and decentralized energy production, and distribution systems (e.g. for renewable-energy-based hydrogen fuel cells).

A JRC study expressed doubts even about the merits of using plant waste such as straw, since transporting large quantities to biofuel factories itself requires fuel. Its conclusion is that “The costs of (the 10% fuel target) will almost certainly outweigh the benefits” and “the uncertainty is too great to say whether the EU 10% biofuel target will save greenhouse gas emissions or not”. It estimates that taxpayers will face a bill of €33bn-€65bn (up to \$9bn) between now and 2020 as a result. American rural sociology professor Michael Bell called ethanol “a wicked idea in terms of food and feed costs and soil erosion”. UN food security expert Jean Ziegler has affirmed that “the growing practice of converting food crops into biofuels amounts to a crime against humanity affecting millions of hungry people”. In his recent book “Heat” George Monbiot defined biofuel production “a formula not only for humanitarian disaster but also for environmental catastrophe...The decision by governments in Europe and North America to pursue the development of biofuels is, in environmental terms, the most damaging they have ever taken. Monbiot underlines that, with current technology, massive biofuel production in the world “would produce fuel for cars, not people. Moreover, markets do not choose the most appropriate, but the cheapest products, whatever their impact on the environment. At present the cheapest such product is palm oil, which causes deforestation. Monbiot concludes that “the biodiesel industry has accidentally invented the world’s most carbon-intensive fuel.”

There are also limits in diversifying renewable energy supplies. According to the IEA “The world faces a fossil energy future to 2030”, and General Electric CEO’s sober assessment is: “I don’t see a disruptive new technology that changes the game in the next 20-30 years. It is not the nature of this industry.

Support for agro-fuels tends to divert the policy focus away from fuel/energy saving measures, necessary changes in consumption patterns (notably regarding meat) and life-styles, carbon pricing and trading arrangements, open trade for biofuels, and catering for the special needs of the poorer countries and people, who cannot join the main stream of the global economy without domestic electricity and connectivity. Agro-fuels should not be used as certificates of good conscience providing excuses against more meaningful energy-producing and energy-saving action. Ethanol is no mechanism for decoupling an economy from its oil dependence. Any substantial shift from land conservation to agro-fuel production would carry a high opportunity cost.

The Environmental Challenge

¹¹ The World Bank noted that US use of corn for ethanol had consumed more than 75 per cent of the global increase in corn production in the past three years (FT, 30 may 2008)

Our lives are and will increasingly be affected by serious environmental problems, which are persuasively described in Jared Diamond's recent book "*Collapse*" (Penguin) on how societies choose to fail or succeed. Societies' survival depends on how they solve their ecological problems, most of which are caused by human activities moving them closer to ceilings on natural resources. The most recent problems concern: fossil fuels, photosynthetic ceilings on sunlight supply, toxic chemicals, and gases such as carbon dioxide or methane, which is 24 times as potent a greenhouse gas as carbon dioxide. All these problems are interlinked time bombs with fuses of one or two generations.

Let me just recall the situation of **Greenhouse gas emissions**, principally carbon dioxide and methane. On current emission trends, global temperatures are expected to rise up to 5.8 degrees Celsius during this century. A rise in temperatures of only 2.1 degrees would expose an estimated 2.3-3.0 billion people to the risk of water shortages and two billion poor people to food production losses. To maintain equilibrium the world must emit no more than 2.7 billion tons of carbon a year in 2030, as against current production of 7 billion. This means a reduction by 60%, and an average cut in industrialized countries of 90%. Even if this were technically feasible, it appears politically unlikely. But things are moving. The value of low carbon energy markets could be €340bn by 2050 and we see investor behaviour, notably pension funds accepting more and more lower returns for good causes such as climate change. Moreover legislation is being developed to require CO2 emissions to carry a fixed price. Whatever the timing of this, companies will tend to have an advantage over time if they internalize CO2 as a business cost, because the greater their CO2 emissions, the more they will be penalized. This is ultimately no ethical but a budgetary question for healthy business.

In turn, failure to tackle **environmental degradation jeopardizes the future of agriculture** and of the countryside. Several cultures, such as Easter Island, the Mayas, the Vikings, Haiti and Rwanda with its recent genocide collapsed because of environmental failure. Australia could be next. Diamond has defined it "the most unproductive continent".

Although the food and environmental challenges cannot be faced without a large combination of policies such as industrial, transportation, fiscal and research policies, in closing I will focus on the CAP and its future.

The Future of the CAP

The design of the **CAP reform** of 2003-2004, which promoted the greening of the CAP, was based on two strategic motives addressing the looming food and environmental challenges.

The **Fischler Reform** was recognition that the **market system** had proved **insufficient** to ensure a proper distribution of activities without appropriate public policy and corrective mechanisms. It stressed that agriculture, rural activities and spaces generated positive externalities (public goods) that had to be rewarded. It aimed at helping European farmers and the up- and downstream industry reconcile the needs of modernization and restructuring with the acknowledgement of their community function as providers of services to society. EU farmers will be called upon to strengthen their role in feeding the world. Even with high food prices, their obligation to provide enough food and to accomplish their other multifunctional tasks providing services to society that the market does not pay for, deserves adequate public support.

All agricultural policies in the world, the CAP included, are actually in need of reform and action, and measures should be taken as appropriate to each case, but with one and the same objective: feed the people over time in a sustainable way.

Our farmers' claims that they cannot compete with countries with more space, better climate and lower costs of production, although partly right, are no reason to stop the CAP reform process making our agriculture more competitive, preserving our countryside, and opening our food markets. If food prices are high and input costs come down during the next CAP reform discussions, Europe may try to reduce its CAP subsidies. But if it produces less food because of that, the poor will suffer higher food

prices; the net-food-importing developing countries will have to fight for supplies; in an effort to preempt domestic food strikes, they will resort to costly food subsidies and custom import tariff reductions with disastrous consequences for their public budgets.

Trade practices are changing. The international food market is in trouble. Countries such as Kazakhstan, Russia and the Ukraine try to expand their market shares via bilateral agreements. The latter are on the rise. To the extent that there is world food scarcity overall, we can anticipate less competition among staple food producers for access to world markets, and more likely competition among net-food-importing countries for access to supplies. If so, one can also anticipate import barriers being replaced by export taxes and limits. If Europe or other countries face a risk of internal food imbalance, they will tend to repeat what several other countries have already done in such a situation, particularly recently: impose export limits, let alone temporary export embargoes. In such an event, after being accused of dumping its food surpluses on world markets, one might well see the EU accused of withholding supplies from hungry people. If for whatever reason one country after another adopts a “starve-your-neighbour” policy, less of the world’s food production will be traded making prices even more volatile. The opportunity to open up agricultural trade has probably died in Geneva. It is unlikely to be revived any time soon without an agreement limit the impact of high prices on the poor.

If farm gate prices do not remain sufficiently attractive and Single Farm Payments, taking into account net revenues from crops and rural development support, go down, the consequence will not be – as some believe – farming extensification. It will be the opposite: according to the OECD, production intensity will go up, and incidentally land values may go down. We surely don’t want that.

Weakening, let alone **scrapping the CAP**, as a growing number of people advocate, would involve a number of **risks**, and actually mean throwing out the baby with the bath water. The risks include: production intensification with increased pollution, land abandonment with rural desertification (nature needs caring) and reduced farm output, accelerated urbanization with additional infrastructural and environmental costs, contradictory agricultural policies among member States hampering the smooth functioning of the internal market, higher world food prices with serious humanitarian, economic and political consequences, in particular for the poor at home and for the net-food-importing developing countries. Continuing, substantial public support for agriculture world wide (all countries have some form of agricultural policy) is probably essential in order to help tackle the environmental and the food scarcity challenges just described, but such subsidies need rethinking and reallocating in order to support the “global commons”.

Without adequate public support, lower for crops and beef, but higher for rural development, and without ways to reduce excessive fluctuations in farmers’ incomes as market rules prevail, there will be less sustainably produced food supply to satisfy growing demand at affordable prices.

As public funds will be scarce, private investment and philanthropy should attach greater interest to rural development. This is the very reason why the ELO, the FCS together with Franz Fischler and me created the **RISE Foundation** that I represent here. It is also a reason why RISE has launched a Task-Force to assess the ecosystem services produced by farmers, which are mostly not recognized by the market and will produce a report on this in view of the 2nd Forum on the Future of Agriculture of 18 March next.

Conclusion

Failure to grapple with the three challenges can have dire consequences. Rising food prices, the rationing of food and feed, water and energy as well as environmental degradation cause conflicts. Hunger and undernourishment are receptacles of terrorism and revolution. Food price inflation can feed domestic food strikes. Lack of energy is an obstacle to development and democracy. Environmental degradation eventually causes the disappearance of species, ruins the countryside and eventually leads to society’s collapse. International security, solidarity and peace depend on our capacity to face up to the various coming shortages I outlined, come to grips with them in a

sustainable and fair way, and avoiding to take measures that help tackle one shortage at the expense of the other.

Commentators have spoken about the biggest world economic crisis since the 1930s. There is no lack of pessimists about the future. Optimists claim *nihil sub sole novi*: capitalism has always had ups and downs. Most of the time, both optimists and pessimists eventually prove wrong to some extent.

But one conclusion is probably in order: **volatility and uncertainty** are **likely to stay** with us for a long time as population puts increasing pressure on supplies, and the human imprint on natural resources and emissions tends to climb exponentially. We cannot prevent others from catching up with western consumption styles. Our challenge is to radically reduce western emissions per capita and help others to limit their own future emissions to our hopefully reduced levels. This process is likely to have an **impact on capitalism** as we know it today. It may aggravate current strains between net-food or net-energy-exporting and importing countries, between haves and have nots, and between capital and labour. Volatility encourages speculation and speculation in turn enhances volatility. Capital tends to build up greater profits in order to better tackle volatility. Labour tends to complain that it has to bear the brunt of the consequences, particularly in the advanced industrial countries, and is frustrated by the growing weakness of the trade unions. Governments will tend to privilege capital over labour so as not to lose the hens with the golden eggs, but fear the insecurity that may result from the rage of the “maddening crowd”. As the BRICs and other emerging countries ask for a place at the international tables, the traditional powers will eventually let them in, albeit reluctantly. The rules of the game, notably in monetary and trade, but also regarding patents and other regulatory matters were established by the powers of the past in their interest. Emerging countries may try to change the game to their advantage so as to accelerate their catch-up process. Some people are not worried. Not just because changing the game requires an unlikely consensus. But also because they are confident that the working of the markets will produce the necessary adjustments via the price system and rebalance demand and supply. This is only true without serious consequences within limits. But beyond, there may be troubling and unsettling fallout, be it in terms of security, civil strife, ethnic cleansing or refugees. **The “new class”** of politicians, to use an expression Milovan Djilas referred to communist *apparatchiks*, has been mushrooming across the world. These are people that have lost the traditional sense of service to society, and are attached to their privileges, whose main scope is not to lose them by winning the next election. As their credibility suffers and popularity is lost, democracy weakens and dissatisfaction increases. If nothing is done to counter this trend, the working of democracy and the sense of powerlessness spreading among citizens of democratic countries becomes another element of political uncertainty and volatility.

The trouble is that governments tend to feel powerless to deal in isolation with key challenges that are of a global character. This can only be overcome with an overhaul of the main international institutions, starting with the UNGA and its agencies and the WTO. The difficulty here is that the major powers have become more numerous and diverse, and that the old ones do not want to recognize that they can no more act effectively alone, but must share sovereignty with new powerhouses with different political cultures and traditions. The biggest obstacle may be the vanity of the key leaders, who prefer the illusion of taking charge alone to a) the vagaries of cooperation with others and b) the humility of compromise. Exclusive national sovereignty is in many respects a thing of the past. Effective power today depends more often on exerting collective sovereignty with others to meet world challenges.

Also the **life of companies** has become **more difficult**. Policy issues such as food, energy and environmental security are now business problems. Economic globalization offers enormous opportunities for early movers to make big bucks, but enormous risks of sudden competition from late, but faster movers. Big companies are more often than not under attack for whatever reason: stratospheric top salaries, large profits increasing as jobs are cut, predatory tactics to eliminate competitors, over consumption of energy, pollution and other such ethical issues damaging to the environment.

What I said today would seem to suggest that companies try and minimize the risk of criticisms by **devoting greater attention to the world's challenges and public perceptions** even if this may dampen profits in the short term. Just like politicians with a vision, who do not seek immediate electoral benefits, business leaders with a vision need to convince the shareholders and the market that their long-term strategies deserve support. I am not a business man, and if I had been in business I might well have ended in bankruptcy by now. To-day's agro-businesses are well advised to take emissions seriously. They must notably try and factor in their strategy the internalization of CO2 as a business cost. They must enhance research in agriculture and rural development regarding the looming scarcities, in particular water resources. They must do more to help reverse the slow improvement in agronomics, which has dampened investment in the food sector. They should also look into the huge salary differential between top managers and workers. And they should devote a growing attention to corporate responsibility through philanthropy.

Meanwhile, let me thank you for your charitable listening.
