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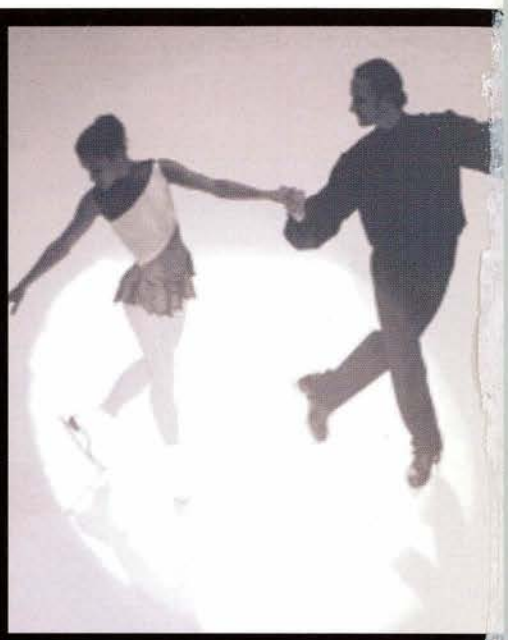

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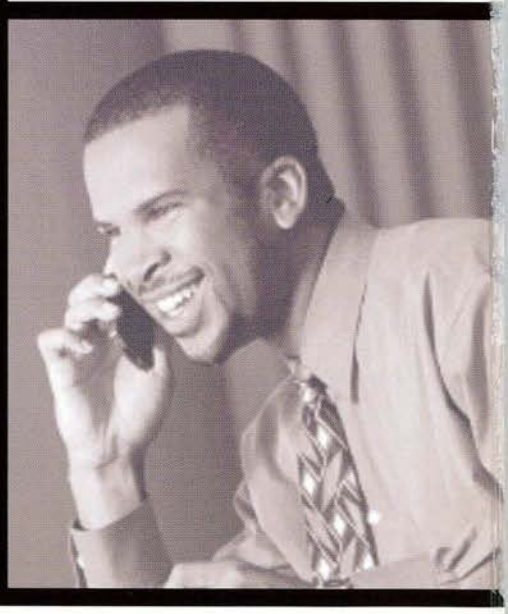

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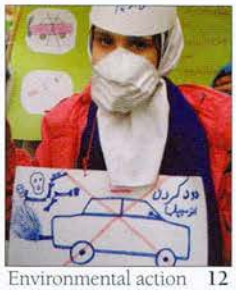

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New economics

Sir, OECD ministers were recently wondering about the quality and relevance of teaching, and your latest *OECD Observer* (No 225) takes up the matter rather thoroughly. The problem is of special interest as far as economics is concerned. A student movement for the reform of economics teaching started in France in May 2000 and has since spread throughout the world, particularly to Spain, the United Kingdom and the United States. The issues raised by the students focus mainly on the irrelevance of undergraduate and graduate economics teaching for understanding real economic problems. The open letter launched in June 2000 (see website) shows how "imaginary worlds" are imposed on the students. This we have called "autism", and it has led to the creation of the "post-autistic movement". We seek change in three main aspects of economics teaching.

First, the courses are usually devoid of any empirical data, be it statistics, case studies, historical illustrations or institutional considerations. The core of the course is made up of purely mathematical models. These models are called "evidence". This is the second point: students do not criticise the use of mathematics as a tool for understanding, but they do object to the mathematics becoming an end in itself. Unfortunately, this is frequently the case as cute models are cut off from real world concerns and taught as an independent worldview. Thirdly, there is no room left for theoretical and methodological pluralism. This is a shame when one considers the many controversies that occur in economics, and their social and political importance.

The picture I describe might seem exaggerated, and it is true that situations can vary across different universities and countries. Still, the problems raised above are present to some extent almost everywhere, since economics curricula have been standardised all over the world, mainly following the US model.

The debate has now been launched among economics teachers and those responsible for teaching the discipline. Specifically, in France the education minister, Jack Lang, has commissioned a report on the teaching of economics. The report is to be published by the end of June 2001. The report should present new recommendations for improving the economics curriculum.

The students themselves have made some proposals. First, the courses in economic theory should be organised around real problems, like development, and not merely based on macro or micro models that are largely taught for their own sake. At the very least, the application of economic theories should be carefully dealt with, notably how theory can influence economic policies. Second, the curriculum should include more descriptive economics, such as economic history, economic geography and the study of national and international institutions. This does not mean we are against theory but rather in favour of making the students aware of the empirical context of economic phenomena. Thirdly, the history of economic theories and a course in moral and political philosophy should foster a better understanding of the problems at stake in modern economics.

These proposals are just one way of making economics teaching more relevant to real world issues. They are issues which have to be addressed carefully. Today's global problems, like employment, migration, poverty and resource depletion are far too pressing for economics teaching to remain lost in its dreamworld.

Yours sincerely

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French Post-Autistic Movement

Sustainable planet: will the dance go on?

Donald J. Johnston, Secretary-General, OECD

The world is a living biological organism, not just a planetary rock with life somehow superimposed on it. This is the so-called *gaia* hypothesis developed by James Lovelock and Lynn Margulis. In a recent interview Mr Lovelock noted: "Life clearly does more than adapt to Earth. It changes Earth for its own purposes. Evolution is a tightly coupled dance, with life and the material environment as partners."

Since the industrial revolution, the rate of economic growth and the concomitant creation of wealth have been unprecedented. Sadly, the bulk of the benefits seem to have fallen to a privileged few. As we look about us in the material world of the OECD some might assume that we have attained nirvana. That would be understandable, but foolish. Not only does poverty continue to afflict large numbers of people in many OECD countries, it remains the plight of billions of our companions on planet earth.

Poverty is to my mind the major challenge on the path to sustainable development. Why? Because poverty is about need – it is a condition in which, to survive from day to day, individuals and families will exploit any available source of food and energy. Efficiency, conservation, the need to leave resources for future generations: these are "luxuries" which the poor often feel they cannot afford.

Of course as history in the OECD countries testifies, poverty is not the only cause of waste and despoliation of the environment and the planet's natural resources. Short-term gain, indiscipline, even willful ignorance of the consequences of our system of development, as well as a sorry lack of determination to take corrective action, are also culprits. The litany of our damaging practices is long: our poisoning of fresh water, our overfishing, our use of pesticides like DDT and our pollution of the atmosphere through dependence on fossil fuels only begin the list. In a sense, one could say that OECD countries have indeed sought short-term gain, the trade-off being long-term pain. So while our growth model has brought some of us remarkable benefits, in wealth and in health, we humans have dangerously altered the balance of life here on Earth, on what Carl Sagan described as our "pale blue dot". Poverty was not our excuse; nor is ignorance of the consequences really a convincing argument for a race that has walked on the moon, split an atom and mapped its own genome. We cannot get off the hook easily. *Homo sapiens* is a smart species, but we have generally failed to act.

For much of the developing world, however, there is no long term, only hunger and misery. Even exploitation of tropical rain forests is a matter of survival for many. These people cannot take into account that those forests contribute importantly to the world's capacity to absorb CO_2 emissions, a major contributor to global warming. Nor indeed can they see such forests as home to threatened varieties of plants and animals whose properties, as Professor E.O. Wilson warns us in this *Observer*, may even be life-saving.

Poverty is not the only challenge to sustainable development. After all, most forestry companies are not owned by poor people, but belong to OECD-based concerns aiming to satisfy demand in OECD markets. Most of the responsibility for deforestation and therefore for change must lie with us. Nevertheless, there is no way that this planet can be placed on a path of sustainability for humankind without addressing the plight of those who live in poverty and despair.

A global distribution of the benefits of economic growth that can be stimulated by the liberalisation of trade, as Mike Moore and Michel Camdessus argue in this edition, as well as investment, will address that challenge in the most effective way we know. Evidence of this is growing every day. That OECD development aid budgets have fallen (except in a handful of countries) hardly helps the development goal. But while trade and aid can alleviate poverty, we now know that growth cannot be pursued at the expense of our planet. The OECD countries have to act because we produce most of the pollution, but the share of emissions generated by poor countries is projected to rise. We must all break the link between economic expansion and despoilment, and development programmes too must decouple growth from the environment.

Sustainable development is not a political choice. We simply must make a serious effort. Perhaps polluter-pays policies or new technology will help; biotechnology may one day enable us to cut pesticide use and alternative energy sources may become more prevalent. But history will judge us harshly if we fail to use the opportunities that are so available and so visible to us to address poverty. If we do not, sustainable development of the planet will remain beyond reach. The *gaia* dance between Earth and life may well continue, though *homo sapiens* might not be there as partners. ■

Towards a sustainable future

Poul Nyrup Rasmussen, Prime Minister of Denmark

When we in government look at our collective record on global sustainable development at the start of the 21st century, it is difficult to feel a sense of satisfaction. For despite the progress in some areas, we have been unable to reverse the worrying trends in global development. Too many people still live in abject poverty and in many places exploitation of water, land and other natural resources is well above critical limits.

Improved energy and resource efficiency in the rich countries has often been more than outweighed by increased consumption. Private investments in the developing world have risen markedly, but to the benefit of only a handful of countries. Moreover, official development aid has decreased. The Heads of State meeting at the World Summit on Sustainable Development in South Africa in 2002 will undoubtedly agree that the record since the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992 is at best unsatisfactory. It is all the more vital therefore to revive the enthusiasm and political commitment manifested in Rio.

The OECD Ministerial Council which Denmark will chair has, to be blunt about it, an historical obligation to make recommendations that can guide action on sustainable development for years to come.

We do have reason to feel encouraged. Experience has shown that it is possible to achieve growth while ensuring sustainable development. There is a widespread understanding of the need for change: people acknowledge that the fight against poverty and social inequality must be based on sustainable management of natural resources and ecosystems and that we all have to decouple our resource consumption and environmental exploitation from the rate of economic expansion. We need more effective mechanisms to ensure a rapid spread of cleaner technology; and a partnership of trust has to be established between North and South in order to enhance economically, socially and environmentally sustainable development.

Everything indicates that world economic and population growth will continue to place a great strain on nature for many years to come. The environmental problems are manifold. Land degradation is a major problem in rich countries as well as in poor ones. Our seas and oceans continue to suffer from pollution and overfishing. Threats abound to the climate, the ozone layer and biological diversity. There is the spread of hazardous chemicals; deforestation; degradation of farmland; desertification and water shortages; and threats to human health from many sources.

How can we carry on at this rate, especially with the world's population expected to grow by 50% in the next 50 years? There is an urgent need to take global action to correct the unsustainable production and consumption patterns we have become used to.

Our concern for nature and the environment has to be integrated in industrial, agricultural and forestry policies, in the energy and transport sector, in urban policy and regional development strategies. The market must be made to work for sustainable development too. Internalisation of costs (making polluters pay), green taxes, the phasing-out of environmentally harmful subsidies and support for cleaner technology: all these must become important elements of our economic policies for the future.

The industrialised countries bear a heavy responsibility for the present state of our globe. That is why the OECD Ministerial Council on May 16-17, 2001 is so important. I am proud that it has fallen to Denmark to chair the meeting which, to be blunt about it, has an historical obligation to make recommendations that can guide our thinking and action on this important theme for years to come. We have to establish mutually supportive links between sustainable development and trade policies for instance, and in our policies towards technology and the new economy. Sustainable development affects so much of everything we do, as the public debates at OECD Forum 2001, which runs in conjunction with the Ministerial, will no doubt underline.

The OECD's work on sustainable development will help industrial nations to implement new policy frameworks and make the transition to sustainable development. For a start, we should seriously consider including sustainability in our

economic review process. For this purpose our countries should agree on a core set of indicators to measure progress in decoupling environmental and resource exploitation from economic growth. This would contribute significantly to make political headway up to the World Summit on Sustainable Development.

Our main challenge is to combine the fight against poverty and inequality with sustainable use of natural resources and ecosystems. We have to do this in a way that enables each country to develop and improve the welfare of its people without starting a headlong rush for resources. When trade and investment policies and environmental and social policies are mutually supportive, sustainable development is enhanced. OECD countries should reinforce this coherence, both domestically and in international negotiations. One key lesson from Denmark's national and international environmental experience is that true progress requires the active involvement of ordinary citizens. This is why Denmark is such a strong proponent of the 1998 UN-ECE Århus Convention on access to information, public participation in environmental decision-making and access to justice in environmental matters. Transparency and public involvement should be at the heart of our efforts to achieve sustainable development and balance the needs of man and nature.

Addressing the issue of sustainable development is like aiming at a moving target. It is not enough to adjust policies and recommendations to present day realities. We have to anticipate change and be ready to respond adequately to the challenges of tomorrow. It is my hope that the OECD ministerial council will reflect this ambition. ■

New governance for a new society

Michel Demazure, President, Cité des Sciences et de l'Industrie, Paris.*

The rise of the "knowledge society" is not only happening in the economic and professional spheres, but in the public domain as well. The way our fellow citizens look at scientific and technical questions is changing radically. Not that their interest in such questions has been dulled, quite the opposite, but they are now much less interested in simply knowing the facts, phenomena and theories, and much more attracted by shared contemplation of the impact that new knowledge and new technologies are having on their own lives.

Most of the questions people today are concerned about fall into three broad areas: biology, meaning health, food, genetics and so on; the global environment, with questions like climate change and resources; and new technologies, their impact on jobs, quality of work etc. In short, these questions concern people's private and professional lives, as well as their children's future. Remember that this more questioning attitude derives not only from a general shift in people's minds and in the way they see things, but also from the development of science (technoscience) itself, which is tackling increasingly complex, and hence debatable and uncertain issues. Indeed, within all this, science is now revealing its own uncertainty.

This shift in the relationship between science, technology and society has given rise to a new "profane knowledge". In the medical field, for example, there is an increasing tendency for illness to be jointly "managed" by patients and their families. It is not all positive, because this shift also implies a certain privatisation of knowledge and a decline in shared knowledge, meaning that the public domain is (paradoxically) shrinking. The way modern media work contributes to the lack of perspective and coherence. A new socio-cultural framework is being created in which all opinions are of equal merit, all interpretations are equally valid and all claims – even contradictory – are justified.

Our usual form of governance in democratic societies is becoming obsolete as a result, particularly where scientific and technical questions or emotive issues are concerned, like energy, waste, the environment and food. The role of the "experts" is being challenged. Areas of instability are appearing in the triangular relationship between decision-makers, the media and public opinion. Undoubtedly, the major challenge facing our societies, which claim to be both technically advanced, open and democratic, is to sacrifice neither progress nor democracy. And that means constructing a new form of governance for today's new society. A step in this direction is OECD's Forum 2001, in which politicians, the media and civil society from around the world will debate together the question of sustainable development and the new economy. Building a new governance will depend on public dialogues such as this. ■

**Cité des Sciences et de l'Industrie is the venue of OECD Forum 2001*

Development aid is untied

A high-level meeting of the OECD's Development Assistance Committee in April adopted a recommendation on untying aid to least developed countries. This means that loans and grants for a wide range of projects will no longer be dependent on the contracts being carried out by companies from the donor country.

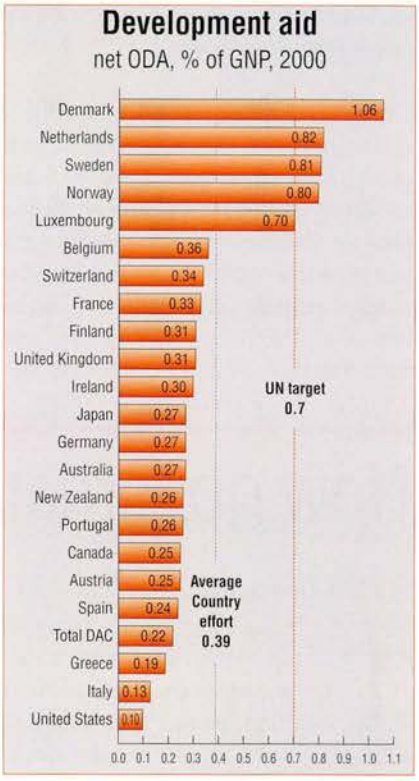
The agreement represents "a very concrete signal... of the DAC's commitment to the reform of aid practices", said DAC chairman Jean-Claude Faure.

The meeting also adopted a policy statement on poverty reduction, pledging to help developing countries meet the challenge of a comprehensive approach to development and poverty reduction; globalisation; the digital age; and diseases such as AIDS.

Figures released ahead of the meeting showed that Denmark's official development assistance (ODA) rose to a record 1.06% of gross national product (GNP) in 2000. The provisional figures also showed that Luxembourg boosted its aid to 0.7% of GNP from 0.66% in 1999, raising the number of countries reaching the UN target to five. The others are the Netherlands (0.82% of GNP), Norway (0.80%) and Sweden (0.81%).

Total DAC ODA fell in 2000 to 0.22% of GNP from 0.24% a year earlier. Aid in dollar terms fell to 53.1 billion dollars from 56.4 billion in 1999 but most of the drop was due to lower exchange rates for most currencies against the US dollar. Ten recipient countries also moved from the ODA list to the official aid list, so their aid was no longer included in the 2000 ODA totals. ■

- You can read documents from the meeting at: http://www.oecd.org/dac/
- See Spotlight on Development, OECD Observer No. 223 October 2000.



Agricultural trade needs more reform

The Uruguay Round Agreement on Agriculture (URAA) has had only a limited impact on world agricultural trade, with average bound tariffs on agricultural products still above 40%, ten times the level on manufactured goods, and the rates on some agricultural products exceeding 500%.

This is the conclusion of a series of seven OECD reports which also examine why achievements so far have been modest, and suggest areas where further reform is required. The reports were presented in Geneva where further agricultural trade negotiations are currently under way in the WTO.

"The challenge now facing WTO members is to build upon the foundation of the URAA to further reduce trade distortions," said the report evaluating implementation of the URAA in OECD countries. As well as implementation of the agreement, the reports cover the concerns of transition economies, export credits and export subsidies, and the role of state trading enterprises in agriculture and environmental issues. While the URAA was a major step forward because it was the first time agriculture had been included in a worldwide trade accord, its impact was "rather limited in practical terms", said Gerard Viatte, head of the OECD Agriculture Directorate. "We're still faced with important protectionism by OECD countries." (See Trade and Development section.)

When it comes to domestic support for farmers, three countries or regions in the OECD are chiefly responsible, with the European Union, Japan and the United States between them accounting for 90% of the total. ■

- The reports are available via a dedicated website: http://www.oecd.org/agr/News/geneva01.htm

Korea joins IEA

Korea became the 26th member of the International Energy Agency on April 20, the second new member this year after the Czech Republic joined in February. "We heartily welcome the Koreans," said IEA Executive Director Robert Priddle. "Their membership will strengthen the Agency presence and influence in the Pacific region."

Priddle also emphasised the leading role that Korea plays in the energy markets, as the world's sixth-largest consumer and third-largest importer of oil, as well as the second-largest importer of coal and liquid natural gas. It has built up emergency oil stocks equivalent to more than 90 days of oil imports, fulfilling a key requirement for all IEA members, and is in the process of liberalising and restructuring its very large energy sector. "I am impressed by the strong development of Korea's energy policies and programmes, " Priddle said. "I welcome their contribution to our collective energy security. " Korea, which joined the OECD in 1996, began talks on IEA membership in 1993. ■

• Visit the IEA website at: http://www.iea.org

Improving education

The knowledge society requires not only a higher level of basic education than in the past, but also new kinds of expertise and reliable means to measure them, OECD education ministers agreed at a two-day meeting in Paris in April. They urged the OECD to develop more educational indicators to measure such elements as how prepared young people are for adult life and progress in achieving the goal of lifelong learning. One key issue is the quality of teaching and the status of the teaching profession. "We have to be very careful not to overload teachers with expectations", and to ensure that they too "have better opportunities for lifelong learning", German Education Minister Edelgard Bulmahn, who chaired the meeting, told a news conference (below left). ■

Germany's Edelgard Bulmahn

• Read the final statement from the ministerial meeting on the education website at: http://www.oecd.org/els/education/

Clarifying tax battle

The OECD's effort to eliminate harmful tax practices is directed at "tax cheats" and is not intended to push countries into specific levels of tax, Secretary General Donald Johnston said. "There seem to be widespread misunderstandings as to what the project is all about," Johnston said in a letter to US Congressman Sam Johnson. "It has nothing to do with insisting that a jurisdiction use a particular tax structure or rate... What the project is aimed at is preventing non-compliance with the tax laws."

This is underscored by the fact that the OECD has welcomed commitments by Bermuda and the Cayman Islands to eliminate harmful tax practices, without requiring that they introduce an income tax. Johnston also noted that the fight against tax havens also concerns developing countries, not just the industrial world, citing a recent Oxfam report stating that developing countries are losing very large sums to tax havens. ■

• Learn more about the OECD's work on tax havens at: http://www.oecd.org/daf/fa/first_en.htm

Economy may recover in 2002

Economic growth in the OECD area has been weakening since the autumn of 2000, but the outlook could improve. Growth is now projected to drop to 2% in 2001, half last year's rate, before recovering next year to 2.5-3%. At the same time, OECD-wide unemployment is projected to stop falling. Slower growth and a fall in oil prices will help to keep inflation low.

Interest rate reductions, some fiscal easing and lower oil prices should help to spur demand. In addition, the sustained pace of productivity growth in the United States, which was so remarkable in the last half of the 1990s, may be emulated elsewhere. Finally, weak inflation pressures should give monetary policy in most countries the scope to support activity further, if needed.

There are downside risks: stock market corrections, US household indebtedness, Japanese indebtedness, and weaker business investment are among them. In the US economy, interest rate cuts by the Federal Reserve could lead to a rebound later this year. The Japanese economy could enter a downward spiral though. Monetary policy there has to remain easy and fiscal stimulus be maintained, though fiscal consolidation should commence in 2002.

Growth in the euro area is expected to remain satisfactory. Structural budget deficits in some larger countries may warrant action to restore balance. In some smaller EU countries, high inflation is a risk, though excess demand may be quelled by market forces. ■

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Why biodiversity matters*

Species extinction is accelerating at an ever-increasing pace – as many as 10,000 species are now lost annually by some counts. The effects are much more serious than many people think. Harvard University scientist, Professor E. O. Wilson, is stepping up efforts to raise public awareness of this issue and wants politicians and business to listen. A speaker at OECD Forum 2001, Professor Wilson spoke to Environmental Science and Technology's Kris Christen about the challenges.

Kris Christen: You have written that "the loss of genetic and species diversity... is the folly our descendants are least likely to forgive us." What will our descendants see that will lead them to place this happenstance highest on their list of unforgiven ills?
E.O. Wilson: We still haven't woken to the fact that while all the changes in the environment having to do with pollution, ozone depletion and global warming are vitally important, they can be reversed – while on the other hand species extinction, the loss of biodiversity, cannot be reversed. We are not deliberately trying to wipe out the Creation, but we are, by general agreement among experts on biodiversity, heading toward extinction of as many as 20% of species in the next 30 years.

Why do I and other ecologists consider that unforgivable? Because each species is a masterpiece of evolution and, depending on the species, has been evolving into its present state for some thousands to tens of millions of years. The average life span of a species before humanity came along was between half a million years in mammals and, in some groups like the insects, 10 million years. To wipe out species at the rate we are now inflicting has been to increase the extinction rate by between a hundred and a thousand times.

©Haji Othman, Sarawak Forestry Dept/Sara. Medichem

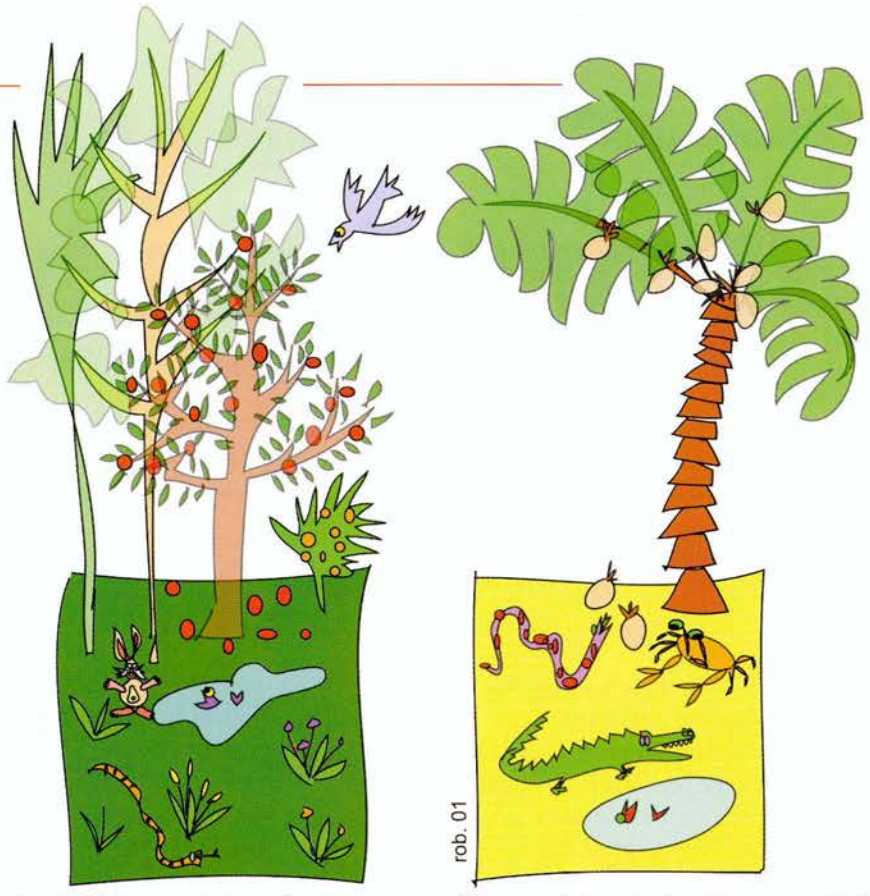
Life saver: a substance from this rare tree, Calophyllum lanigerum, has helped in the fight against AIDS.

By impoverishing the planet of life forms, we also reduce the productivity and stability of natural ecosystems.

What we lose in terms of natural products through the extinction of the species that uniquely produced them is extraordinary. A wondrous example of this is a substance discovered here at Harvard from a small tree collected in Sarawak, at the northern end of Borneo. Random screening of Calophyllum lanigerum revealed a substance that is completely effective against the AIDS virus. Upon closer study, the substance proved to be an inhibitor of reverse transcriptase, which stops reproduction of the AIDS virus in its tracks. When collectors were sent back to get more samples, the tree was gone; the forest around it had been cut over, and it took a long search to find other specimens of this rather rare tree. This substance never would have been discovered if the species had been extinguished completely, and it easily could have been extinguished before anyone did that survey.

What do you see as the most difficult environmental problems we face as we head into the new millennium?
That's easy. Land degradation and the loss of irreplaceable, non-renewable natural resources, including the natural environment, by the combination of continued population growth and the drive of people everywhere to increase their consumption and, with it, their quality of life.

At the present time, the ecological footprint – the amount of productive land used per capita for food production, water and waste management, habitation, transportation, and other necessities – for the United States is about 12 acres. In developing countries, it's about 1 acre. So, with 80% of the world's population in the developing countries and virtually all of the projected population growth over the next few decades occurring there, the pressures upon the earth's resources and its flora



and fauna are going to be enormous because these people are understandably anxious to increase their ecological footprint.

We need to identify the world's conservation hot spots and go all out to save them. Hot spots are those natural environments that have the largest number of plants and animals found nowhere else and are themselves endangered. Hawaii is one of the hottest spots in the world, with the highest rates of extinction as well as the greatest endangerment of plant and animal species. Other notorious hot spots include Madagascar, Ecuador's mountain forests, Brazil's Atlantic Forest, the Western Ghats of India, the forest on the southern slopes of the Himalayas, and now, increasingly, coral reefs. The magnitude of the catastrophe has been measured, and there's nothing to be gained anymore by just wringing one's hands. We have to devise a strategy for the next century that can pull us through the bottleneck and that will depend on the full engagement of the best we have to offer in science and technology. It's also going to have to involve a shift of world opinion away from purely econometric measures of success and progress, toward an environmental ethic that says what really counts is quality of life for all generations to come.

Do you have faith that the application of science and technology will prove an adequate remedy?
Yes. It's got to. The stakes are too high. Can we do it? There's a certain level of urgency, when one says "Yes, because we have no other choice", and that is truly our current circumstance.

What positive movement have you seen in biodiversity and in educating people as a solution to turning around species extinction?
Countries are now setting a few areas of the world aside – where forests and other habitats were being wiped out and large numbers of species along with them – particularly in the developing world where it's most needed. These countries signed on to the 1992 Earth Summit Convention on Biological Diversity. As a result of government intervention, the destruction is beginning to slow down – for example, in Brazil's Atlantic Forest. Also, in Brazil recently, a substantial amount of the Pantenal, the South American equivalent of the Everglades with a magnificently rich diversity of organisms, was purchased and set aside in a reserve. So bits and pieces around the world are being saved, but it's still far below what's needed – even below the 3% or 4% of the surface of the land composing the most important hot spots. As for education, it's still entirely inadequate worldwide, even in this country, where awareness of the biodiversity crisis has been slowly spreading.

Concerning preservation of biodiversity, is gene patenting part of the solution or part of the problem?
It's a potential problem, but it's certainly also, when handled right, a big part of the solution. Pharmaceutical companies have been slow to screen and make use of natural products because of fear of not being able to secure patent rights, because theoretically, or I should say legally, a natural product is not patentable. It takes an enormous amount of money to find, perfect, test, and market a new pharmaceutical. It's a risky venture economically. It would be unfortunate to depend solely on the synthesis of new pharmaceuticals from the ground up, because millions of organisms have been in an arms race with one another for hundreds of millions of years, slugging it out with bacteria and developing all sorts of anticancer materials and other defensive substances by Darwinian trial and error. Each one is a potential pharmacopoeia of materials waiting to be discovered. For example, insects, which are the dominant and most diverse creatures on the land around the world, are surely loaded with substances of this kind, yet they have scarcely been looked at by government or commercial laboratories.

What's your opinion about

biotechnological applications in the area of plant engineering as to their effect on biodiversity?
Here, I may run into trouble with some of my colleagues, but I'm all for biotechnology. We need all the science and technology we can get to sustain both humanity and the natural world. We need to push bioengineering to the limit in creating more productive crops, particularly crops that can live in already devastated, soil-impoverished environments, low-diversity saline environments, and other biologically marginal land where productivity can be increased to the maximum allowed by photosynthetic potential and with a minimal effect on biodiversity. We absolutely must increase the world food supply.

But is this technology something we might live to regret?
The risk involved, of course, is that new life forms can be created that penetrate and endanger natural ecosystems, or they may transfer their genes to natural species in ways that help lead to their extinction. But so far, there has been very little sign that this is a general risk. Intact, healthy, natural ecosystems are hard to penetrate, even by natural species introduced as invasive forms from other countries... The side effects are a risk, but I don't see them as a very large risk at this point. In any case, it's one worth taking, given the benefits and given our ability (and responsibility) to monitor each situation and regulate it.

What ethical considerations should we be pondering as this technology moves forward?
I think there's a very strong moral argument to be made for getting the maximum gains possible through bioengineering. But there is an equally strong moral argument to be made for protecting all the biodiversity we can. It seems to me that the research laboratories... should have as part of their standard practice a strong environmental programme. They should not just be satisfied with ensuring new biological strains are safe, but also take a proactive role in helping to preserve the natural environment... Corporate leaders, who will be judged accordingly, will want to play a prominent role.

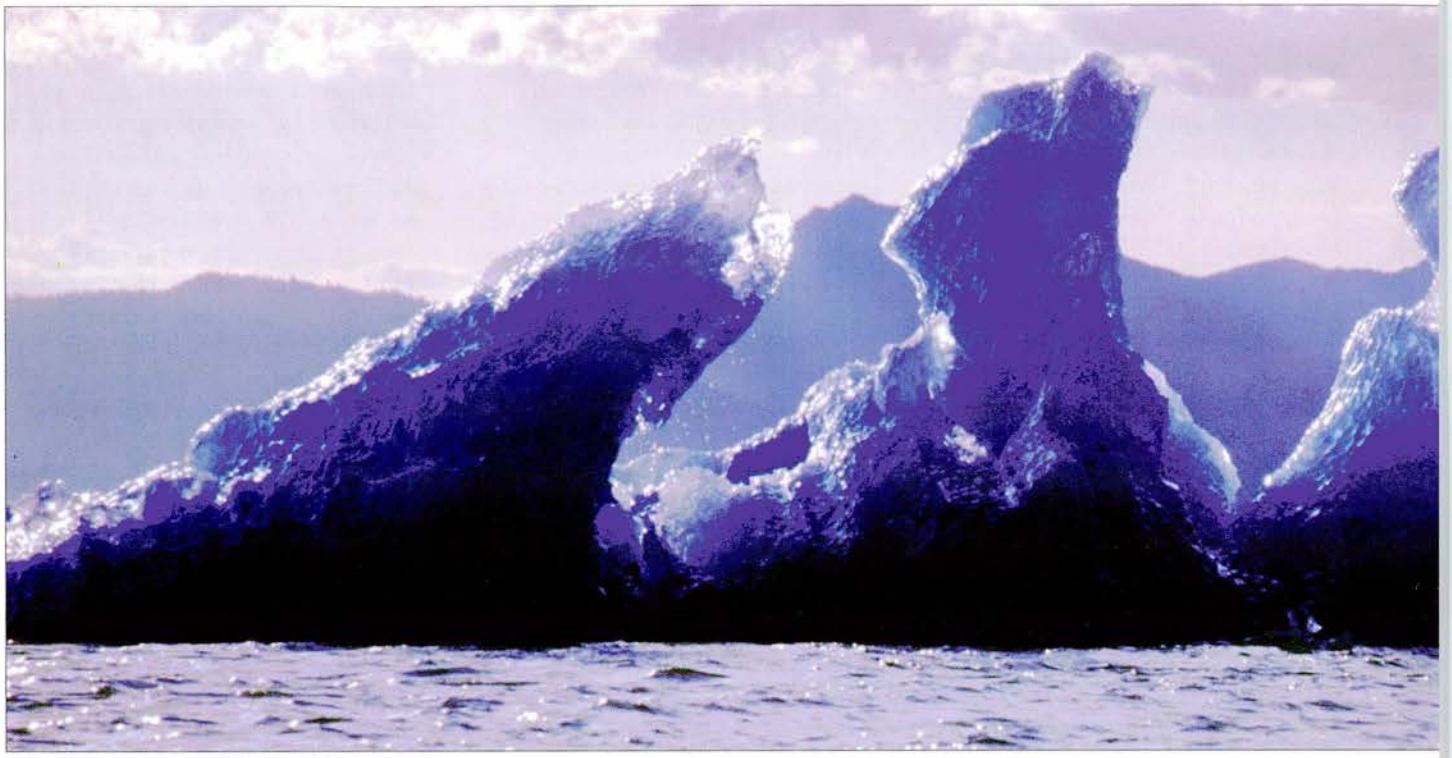
How big, in your opinion, do land and marine reserves need to be to preserve all the world's biodiversity?
As big as we can manage to make them. I'll tell you why. As you reduce the size of a reserve, or any habitat, you automatically reduce the number of species that can live sustainably on that reserve. The amount of reduction is roughly the following: A 90% reduction in area eventually results in a 50% decrease in the number of species. Although it may take a number of years, it still happens very rapidly in ecological time... Tragically, we'll always lose species. It's part of the mission of conservation biology to figure out the designs and exchange of fauna and flora, recovery and enlargement of natural reserves, to lose as few as possible, and to keep as much biodiversity as possible.

Tragically, we'll always lose species. It's part of the mission of conservation biology to lose as few as possible ... and we need to dramatise the real biodiversity issues of the world better because it's not getting across to Joe Sixpack as to why any of this matters.

In what ways might governments and citizens be persuaded to do more to protect biodiversity?
Education, education, education. To that end, what we need are more public philosophers, government advisors, and media people with a scientific background, or at least enough knowledge of biodiversity, so it comes into focus for them, and therefore for their audiences. This has been a major failure of the media in this country, particularly in presenting key scientific issues. It is scandalous in the case of biodiversity... How can you interest the public? Granted there's nothing duller than river pollution. But it's different with vanishing ecosystems and species. We need to dramatise the world's real biodiversity issues better because it's not getting across to Joe Sixpack as to why any of this matters.

In your book *Consilience*, you propose unifying all the major branches of knowledge. What does your ideal curriculum look like for students in the 21st century?
Let me say right away that I'm not exactly urging unification; I'm reporting that it is happening and urging that it be speeded up... The social sciences, by general agreement, are far weaker than they should be for the problems that they're supposed to solve. In my opinion, the major reason for that inadequacy is that they lack a foundation of the kind that biology has in chemistry and chemistry has in physics... The social sciences, in particular, are going to live in a dreamworld as far as the environment is concerned until they become linked more solidly to biology – not just the biology of the mind and a realistic view of the human condition, but biology that includes studies of the environment. In other words, the real world. ■

*This is an extract from an article that originally appeared in *Environmental Science and Technology* as "Biodiversity at the Crossroads". Reprinted with permission from EST, March 1, 2000/ Volume 34, Issue 5/ pp.123 A-128 A. Copyright 2000 American Chemical Society. The full version of the interview can be found at http://pubs.acs.org/hotartcl/est/00/mar/christen.html



The looming tip of the problem

The environment: From words to action

Joke Waller-Hunter, Director, OECD Environment Directorate

For too long, policymakers have been talking about the deterioration of the world's environment without taking sufficient action to address the problems. It is time to move from words to action before it is too late, particularly for the industrial countries that are the source of much of the damage.

It is true that OECD countries have made significant progress in tackling many important environmental problems over the past 20-30 years. They have virtually eliminated their emissions of ozone-depleting chlorofluorocarbons (CFCs) and of lead from gasoline, and have substantially increased the efficiency of their use of natural resources and energy.

But if you ask "have they done enough? Are they on track for achieving environmental sustainability?" the answer is unfortunately "no". Emissions of carbon dioxide (CO_2) in OECD countries, far from falling in line with the 1997 Kyoto international agreement on climate change, are in fact expected to increase by a third by 2020 if no major new policies are put in place, largely due to increased transport and energy use. Urban air quality is also expected to worsen, with accompanying impacts on human health. Continued losses in biodiversity and natural habitats are expected, along with growing pollution of groundwater reserves by nutrients and toxic chemicals.

Current consumption and production

Business as usual

What is most urgently needed is to stabilise concentrations of greenhouse gases in the atmosphere at an acceptable level.

patterns in OECD countries directly affect resources and ecosystems both in OECD and in non-OECD countries. For example, while most OECD countries have managed to stabilise or even increase their total forest coverage, deforestation continues at alarming rates in developing countries, often driven at least in part by demand for wood products from OECD consumers. Over-fishing of the world's oceans is another major environmental concern – with three-quarters of the world's fisheries fully fished, over-fished or recovering. (See article by Paul Wallis in this section.) OECD countries are home to less than 20% of the world's population, but are responsible for approximately half of global greenhouse gas emissions. They are vital in any effort to slow down or reverse environmental damage, even if most of the environmental damage that will result from changing climate systems falls in non-OECD countries. What can we do to reduce these pressures on the environment? The challenge is to maintain the integrity of the systems that support life on earth and to de-couple environmental degradation from economic development. If that challenge is not met, the risk of collapsing ecosystems will become imminent.

In an effort to address the problem, the OECD has prepared an *Environmental Outlook* that examines recent trends and develops future projections to 2020 for the main environmental problems facing OECD countries. OECD countries are now drawing up an Environmental Strategy based on these conclusions, which lays down concrete national actions to help tackle the most pressing problems they face. The Strategy will be presented to OECD environment ministers for adoption at a meeting in Paris on May 16, 2001.

The Environmental Strategy identifies key criteria for environmental sustainability and outlines the actions needed to reverse unsustainable trends in ecosystem degradation, focusing on biodiversity, the climate system and freshwater resources. To ensure that the regenerative and assimilative capacity of ecosystems is maintained,

to avoid irreversible effects such as species loss, and to avoid economic problems related to the lack of renewable resources, the strategy calls on OECD countries to promise action to protect these resources. This includes integrating these concerns into physical planning activities, to avoid habitat loss and fragmentation from land use changes, as well as the development of markets to ensure the sustainable use of natural resources. OECD countries are also asked to support non-member countries in the protection of global biodiversity.

This includes developing fair and equitable arrangements for sharing any benefits from the use of genetic resources, and developing capacity and transferring technologies to support ecosystem conservation. OECD countries can also support more sustainable use of resources in other countries through their consumption choices, for example through reducing demand for tropical timber products.

At the political level, what is most urgently needed is to stabilise concentrations of greenhouse gases in the atmosphere at an acceptable level. In order to achieve the emission reductions necessary, OECD countries will need to change their energy consumption and transport patterns. They will also have to reduce the carbon-intensity of the energy they do use, and change agricultural and land use practices to enhance so-called carbon sinks, such as forests, that can absorb carbon gases from the atmosphere. In short, the objective has to be to de-couple pressures on the environment from continued economic growth, to de-carbonise the economy and to significantly increase resource and energy productivity.

How to achieve all of this is the question. Appropriate incentives can

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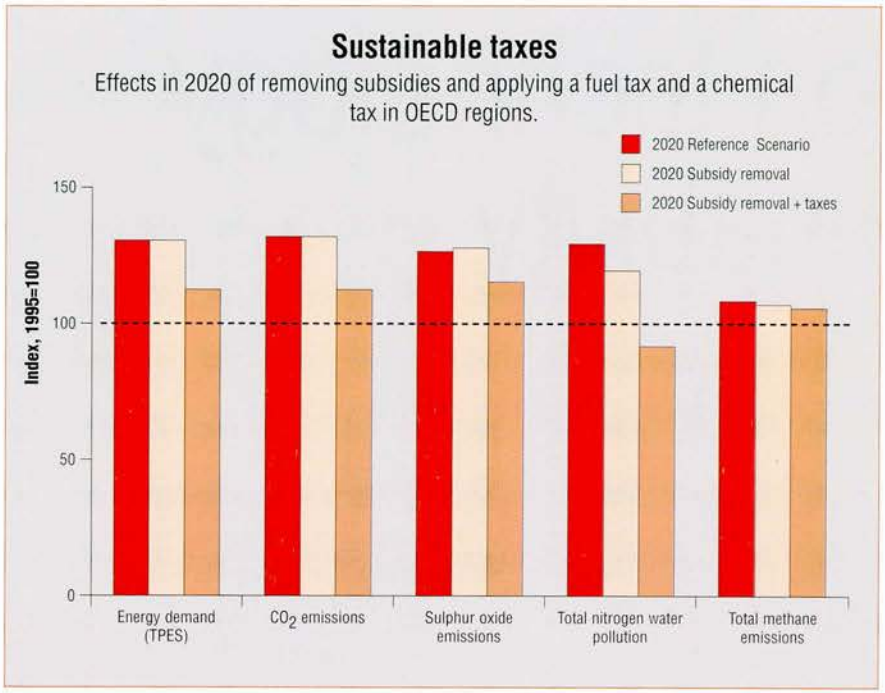
International language

be created, particularly through technological innovation such as the development of hydrogen fuel cells, through market-based instruments such as carbon taxes, and through the removal of subsidies to energy use or production and strong regulatory frameworks. The OECD *Environmental Outlook* shows that applying a value added tax on fuel use (increasing by between 1.2 and 2 percentage points per year) and removing all energy subsidies could reduce carbon dioxide emissions by 2020 to 25% lower for OECD countries and 11% lower worldwide than would otherwise be the case under a business-as-usual scenario. There would also be



impressive reductions in air pollution from energy and transport.

The Environmental Strategy also addresses the need to reduce agricultural run-off of nutrients and chemicals, one of the main sources of groundwater degradation, and to de-couple other pressures on the environment from increased agricultural production. Again, key policy instruments would be the removal of environmentally damaging agricultural subsidies and applying a tax on chemical use in the agriculture sector. The Outlook has shown that removing all subsidies in OECD economies, applying the fuel tax mentioned above, and introducing a tax on all chemicals use, rising at the rate of 2 percentage points per year, would result in significant environmental gains. In addition to the benefits from reduced carbon dioxide and air pollution emissions, nitrogen loading to waterways would be 30% lower in 2020 than under business-as-usual. With this policy package, the economic costs of achieving the environmental benefits were estimated to be very low, resulting in less than a 1% lower level of GDP for OECD regions overall in 2020 than under business-as-usual.

Implementing such policies is not easy, however. Massive protests in several OECD countries last year in reaction to increases in petrol prices were a stark reminder of this fact. Such concerns tend to block the adoption of cost-effective environmental policies or lead to exemptions for the most-polluting or energy-intensive industries. The OECD/EC Database of Environmentally Related Taxes already lists hundreds of environmental tax reductions or exemptions in OECD countries such as exemptions from fuel taxes for energy-intensive industries.

OECD countries have a special responsibility for addressing many global environmental problems as they are often the main contributors.

There is a fear in the business world that environmental policies will reduce the competitiveness of the sectors affected (e.g., energy intensive industries, agriculture, fisheries). Moreover, there is some concern that policies that raise petrol or water prices to discourage overuse may place an unfair burden on low-income households or farmers. Both barriers can be overcome. In general, increased analysis of the situation and increased international co-operation to ensure a level playing field across countries would help resolve the first one. The answer to concerns over placing too high or "unfair" burdens on low-income households is to establish policies that address the social concerns directly, such as increased income support, without encouraging environmentally damaging activities.

Most of the actions recommended in the Environmental Strategy are to be undertaken at national or local level. But the strategy also recognises the role of international co-operation in achieving changes such as reform of environmentally damaging subsidy and tax practices and in ensuring appropriate governance of global and regional resources. OECD countries have a special responsibility for addressing many global environmental problems not only as they are often the main contributors to the problems, but also because they have the resources available to tackle them. ■

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Information technology and sustainability

Bernard Vergnes
Chairman Emeritus, Microsoft Europe, Middle East and Africa

The emerging digital divide is, unfortunately, a new symptom of some of our oldest global problems – the persistent divides between illiteracy and knowledge, sickness and health, and poverty and wealth. While technology will not solve these basic problems, it can offer powerful digital dividends that enhance sustainable development.

For people living on $1 a day, as Bill Gates recently noted, Internet access is the least pressing of concerns. But information technology will make an important difference in peoples' lives if it can be used to create real jobs in new IT-based industries or to enhance the ability to deliver food, healthcare, or other vital services through IT-assisted development.

IT-based development

IT-based development involves building sustainable IT industries in developing countries where that kind of growth is at present a realistic possibility. A good example of this mode of development is the strong market for technology outsourcing from developed countries to developing countries. India's nearly $4 billion software industry claims a substantial fraction of that market, and the Philippines and China are also significant non-OECD players.

Persistent demand for IT skills drives the market for IT outsourcing. That demand should continue to create development opportunities, even in the context of slower growth in large US and European client markets, because Europe and the US still are not producing enough IT professionals to meet industry needs.

Skills shortages and the ability to reduce production costs make outsourcing a very attractive model, not just for software development or electronics manufacturing, but also for IT-intensive remote services such as insurance claims processing, credit card data processing, and technical support.

For the countries fortunate enough to have adequate educational and technological infrastructures, IT-based development can actually be better than sustainable. Knowledge is, in a sense, the ultimate renewable resource – it grows with exploitation. As the knowledge resource grows, opportunities expand.

IT-assisted development

While IT-based development can provide an attractive model for some countries, or particular regions within countries, we all recognise that a development model based on the IT sector simply is not realistic in many instances.

For areas locked in cycles of poverty, disease,

illiteracy and economic despair, the key role of information technology may be to assist ongoing efforts to address basic issues of education, health, and poverty.

In a good example of such IT-assisted development, the World Food Programme has recently started looking to information technology to enhance its work in famine-stricken areas.

With help and support from Microsoft, WFP is developing a handheld device to enable its teams to gather data directly in the field and transmit the data to a central computer using wireless technology. The new system, which undergoes its first field tests in Kenya next month, will allow faster and more efficient deliveries of relief and food – literally saving lives, and giving new meaning to the term "just in time" delivery.

There are many, many similar cases involving complex challenges in the areas of health, education, and the management of resources like crops, water, forests, and fisheries, to name a few. Through such efforts, experience is proving that information technology can play a vital role in understanding development problems and implementing better solutions.

Policy constraints

What can policymakers do to facilitate these forms of IT-related development? Discussions like those at OECD Forum 2001 are an excellent start. In terms of broader policy initiatives, at least four constraints presently limit the spread of IT-related benefits to all parts of the world.

- **Communications infrastructure.** The empirical link between the level of a country's investment in telecoms infrastructure and its level of development is well known. Despite some progress, more than a third of developing countries still have fewer than five phone lines for every 100 inhabitants.

- **Skills.** The IT skills shortage in Europe and the US opens a door to growth for developing countries capable of providing highly-skilled IT workers. Experience here in Europe shows that IT skills training is feasible outside of traditional educational settings, and even within disadvantaged communities, suggesting that more could be done worldwide.

- **Regulatory infrastructure.** The regulatory problems that can constrain IT-related development span everything from regulation of financial services and online transactions to issues of intellectual property enforcement, cybercrime, privacy, censorship and taxation. Developing countries need to deal with these issues in a credible way that is consistent with international norms for transparency, neutrality and the least possible restriction of trade.

- **Trade barriers.** One of the lessons of IT-related development is that much of it comes in the form of services and electronic deliveries. For that reason, more work is needed to lower trade barriers in the areas of services and e-commerce in both developed and developing countries.

The more we can do to eliminate these constraints, the greater the potential digital dividends. By using technology as a platform and a tool, we can better address our basic economic and social maladies, and thus increase the chances that the symptoms, including the digital divide, will gradually begin to disappear. ■

Sustainable solutions for radioactive waste

Jorge Lang-Lenton León, Director of Communication, ENRESA (Spain), **Cynthia Picot** and **Hans Riotte**, Nuclear Energy Agency (NEA)

Nuclear energy could help in the battle to reduce greenhouse gas emissions, but for many the production of nuclear waste outweighs this advantage. One important challenge is to convince an often reluctant public that with new waste disposal techniques, nuclear energy is worth a second look in the interests of sustainable development.

Nuclear power does not produce polluting combustion gases. So, like renewable energy sources, it could play a key role in helping to reduce global greenhouse gas emissions and in tackling global warming, especially as electricity demand rises in the years ahead. Public faith in nuclear energy took a knock from the accidents at Chernobyl and Three Mile Island, but as plant safety has improved such risks have greatly diminished. Currently, the perceived problem with nuclear energy from an environmental point of view is how to manage its radioactive waste. Solutions do exist, in particular the technique of burying the waste deep below the ground in engineered facilities, known as geological disposal. The challenge is to convince the public of its safety and reliability.

Radioactive waste is an inevitable by-product of the application of ionising radiation, whether it be in nuclear medicine (for diagnosis and treatment), industrial applications (for example, for finding new sources of petroleum or producing plastics), agricultural applications (notably for the conservation of foodstuffs), or of course the production of electricity. The radioactive waste produced by the latter represents less than 1% of the total toxic wastes generated in those countries that use nuclear energy to generate electricity, but at the same time this waste has the highest levels of radioactivity.

In most OECD countries, all short-lived, low- and intermediate-level nuclear wastes, whatever their source, are disposed of using surface or underground repositories that are safe for people and the environment during the time that these wastes maintain their radioactivity. These wastes, representing some 90% of total radioactive waste, are conditioned and stored in facilities isolated from the environment by specially engineered barriers. Long-lived and high-level waste, on the other hand, is first deposited in temporary storage facilities, under strict safety conditions, for several decades. It is then usually envisaged that the waste will be placed in a final disposal facility. There is no immediate economic, technical or environmental need to speed up the construction of final disposal facilities for radioactive waste. But from a sustainable development perspective – and if we do not want to pass the burden of finding a permanent solution on to future generations – temporary storage is clearly not a satisfactory solution.

The long-term solution currently preferred by specialists consists of placing the waste in a deep (500 metres below the surface) and stable geological setting, such as granite, clay, tuff and salt formations that have remained virtually unchanged for millions of years. The aim is to ensure that such wastes will remain undisturbed for the few thousand years needed for their levels of radioactivity to decline to the point where they no longer represent a danger to present or future generations. The concept of deep geological disposal is more than 40 years old, and the technology for building and operating such repositories is now mature enough for deployment. As a general rule, the natural security afforded by the chosen geological formation is enhanced by additional precautionary measures. The wastes are immobilised in an insoluble form, in blocks of glass for example, and then placed inside corrosion-resistant containers; spaces between waste packages are filled with highly pure, impermeable clay; and the repository may be strengthened by means of concrete structures. These successive barriers are mutually reinforcing and together ensure that wastes can be contained over the very long term. The waste can be recovered during the initial phase of the repository, and also during subsequent phases, albeit at increased cost. This

Image problem

Winning public confidence is not only a problem where nuclear waste is concerned. Here, protesters mark the arrival of a cargo ship in France for a Japanese nuclear power plant. Ships carrying waste face protests like this too, even to the point of being unable to dock.

©AP/Boomerang/Hiroto Kiryu, Greenpeace

provides freedom of choice to future generations to change waste management strategies if they wish.

Repositories are designed so that no radioactivity reaches the Earth's surface. Following the precautionary principle, environmental impact assessments spanning 10,000 years analyse worst-case scenarios, including geological and climate changes and inadvertent human intrusion. The assessments maintain that even under those conditions, the impact on the environment and mankind would be less than current regulatory limits, which in turn are lower than natural background radiation.

The safety of geological disposal has been demonstrated in nature. Until about two thousand million years ago a natural reactor moderated by natural currents of water operated intermittently for millions of years at a uranium ore deposit beneath Gabon in Africa. Throughout that time the material produced during the nuclear fission reaction hardly moved from its original location. The first man-made geological disposal facility for long-lived waste started operation in New Mexico, USA in March 1999 and will provide industrial experience. Another partial solution is to reduce the mass of long-lived, high-level waste using a technique known as partitioning and transmutation (P&T). This involves isolating the transuranic elements and long-lived radionuclides in the waste and aims at transforming most of them by neutron bombardment into other non-radioactive elements or into elements with shorter half-lives. Some countries are investigating this option but it has not yet been fully developed and it is not clear whether it will become available on an industrial scale. This is because in addition to being very costly, P&T makes fuel handling and reprocessing more difficult, with potential implications for safety.

From a sustainable development perspective, temporary storage of nuclear waste is clearly not a satisfactory solution.

Cost is an important issue in radioactive waste management as related to sustainable development. If the nuclear industry did not set aside adequate funds, a large financial burden associated with plant dismantling and radioactive waste disposal would be passed on. In OECD countries, the costs of dismantling nuclear power plants and of managing long-lived wastes are already included in electricity generating costs and billed to end consumers; in other words, they are internalised. Although quite high in absolute terms, these costs represent a small proportion – less than 5% – of the total cost of nuclear power generation.

Deep geological disposal allows present generations to progress without leaving burdens for those of the future, but a main weakness is that although the concept is technically sound, it is rarely socially or politically accepted. The issue is not so much about information provision as understanding the mechanisms that govern the social perceptions of risk. There are many factors that affect such perceptions, such as familiarity with the technology, the degree of uncertainty, the level of control, concern for the consequences, the degree of credibility of the institutions, the decision-making process and the ideas and values of the community in which people live.

Addressing the public's concerns and negotiating acceptable solutions is an important challenge. A decision-making process should be set up step by step, and all the affected groups should be allowed to participate. The role of governments will be crucial in defining this process, and they should act as a source of objective information. They also need to dedicate adequate resources for this purpose, so that public confidence may be won in the scientific solutions being proposed. ■

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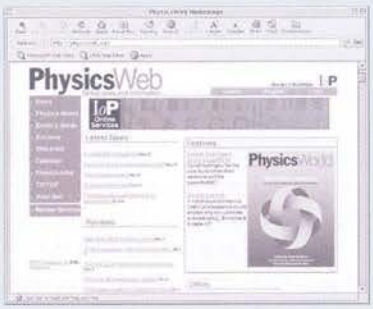

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Farming systems for sustainable agriculture

Wilfred Legg and **Gérard Viatte**, OECD Directorate of Food, Agriculture and Fisheries

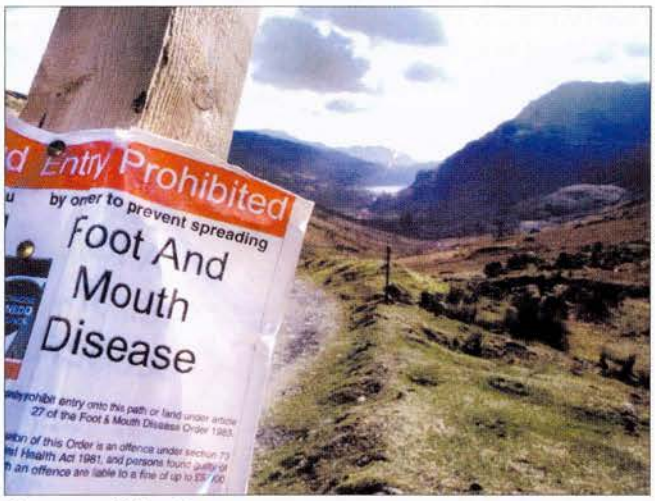
Agriculture is in the spotlight. Almost every day there are reports in the press concerning food-related health and environment scares. Outbreaks of foot and mouth disease are the latest crisis in Europe, quickly following "mad cow" disease and protests over the alleged impact of genetically modified crops on food safety and the environment.

Everywhere farmers are criticised for causing damage to the environment: letting their pesticides and livestock waste spill into the environment and their fertilisers run off into streams and groundwater; causing obnoxious odours; harming the welfare of animals; removing ancient stone walls and hedges; and allowing their soils to erode and destroying wildlife habitats.

Farmers retort that they are the "stewards of the countryside", providing landscapes and green spaces that benefit urban dwellers and tourists, and controlling the flow of water to avoid floods and droughts. It is clearly not in farmers' interest to destroy the resources on which their livelihoods depend, but they face a dilemma. On the one hand consumers demand cheap all-year-round food of consistent quality, while at the same time calling for food produced in environmentally and animal friendly ways, which can be more costly.

All this has led to some serious rethinking about the role of agriculture in our societies. What do we want from farming? How can we best feed the world while conserving natural resources? Should we be paying farmers to protect the environment? Are current farming practices sustainable? Will agricultural trade liberalisation help or hinder the pursuit of a more sustainable agriculture?

Sustainable agriculture seeks to achieve three main goals: economic efficiency, environmental quality and social responsibility. Economic efficiency means meeting an increasing global demand for food at the lowest cost, while responding to changing preferences for different foods and adjusting to structural change within the agro-food sector and in the overall economy. At the same time, sustainable



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Beware of the sheep

A wholesale switch to organic farming would require more land for cultivation and higher animal stocking rates to maintain current production levels. This could conflict with conservation.

agriculture requires farmers to satisfy the public's demand for improved environmental performance, by reducing pollution from agriculture, conserving the natural resource base, and generating environmental benefits. And agriculture must achieve all of this in socially acceptable ways, by increasing farmers' education and skills, taking account of animal welfare concerns and ensuring that working the land can provide an acceptable level of income.

The whole agro-food chain therefore has to increase productivity and be more efficient in its use of scarce resources, especially land and water. It has to reduce waste and the environmental damage that spills over to other sectors. But choices have to be made, which incur trade-offs. Efficient arable farms may need large fields to use high powered machines – which means that hedges, walls and trees have to be removed, destroying wildlife habitats. The

most environmentally friendly form of livestock production may require a reduction in output, leading to higher consumer prices. Essentially, farmers need to face the right signals from markets or policies such as taxes, payments or regulations, so that they provide the best combination of sustainability attributes that the public wants.

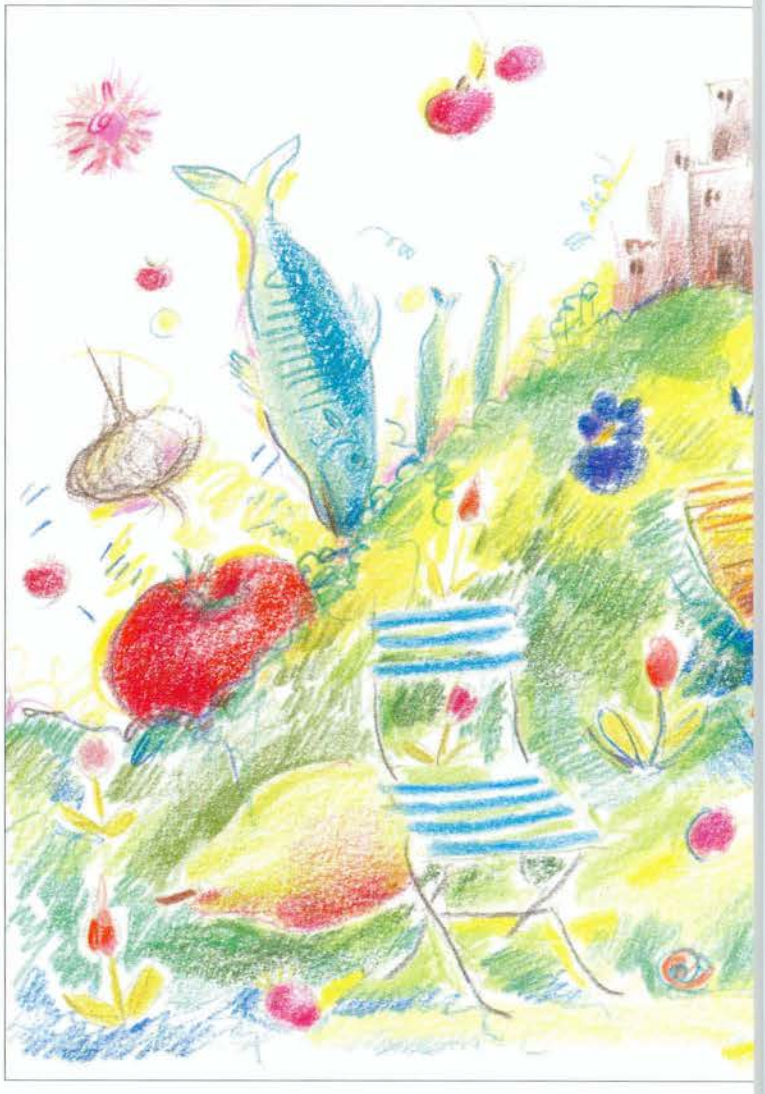
Agriculture has certainly registered steady output growth through productivity improvements. In general, over the last 15 years agricultural output in the OECD area as a whole has risen by 15%, on 1% less land and with 8% fewer workers. The price of food, adjusted for inflation, has fallen by around 1% annually. As a result, on average in the OECD area, the share of food in consumers' expenditure is around 12.5%, although only a small part of it actually goes to farmers.

But this increase in output has been boosted in many countries by costly government policies. In 2000, total support to agriculture in the OECD was US$327 billion, or around 1.3% of overall GDP. Support to farmers was estimated at about 34% of the value of farm receipts, but varied from around 1% in New Zealand and 6% in Australia to 20% in the United States, 38% in the European Union and to over 60% in Korea, Japan, Norway and Switzerland. And because most support policies protect domestic farmers through trade barriers, they raise food prices to consumers and penalise low cost competitors, including many developing countries. In short, sustaining production in one country has to an extent been at the expense of production in other, often much poorer, countries.

Agriculture has also incurred environmental costs. The absolute levels of nitrogen run-off are still very high in some countries, such as the Netherlands, or regions such as the East Coast of the United States. There are concerns about the effects of the toxicity of some pesticides on human health.

New agricultural practices to boost productivity, like more monoculture or reduced crop rotations, have also led to a decline in biodiversity and wildlife habitats. Agriculture is using more water and in countries like Australia where topsoil is thin, farming and removal of wetlands and trees has caused problems of soil salinity.

There have been some improvements. Since the mid-1980s, there has been a decrease of more than 10% in both nitrogen and pesticide use in many European countries and Japan, and an associated rise in water quality. Progress has been made in adopting farming practices that enhance environmental performance. Adoption of conservation soil tillage practices and increased soil cover, for instance, is helping to reduce CO_2 emissions and thereby enhance the



greenhouse sink function of agriculture. Other farming practices and systems are acting to reduce risks of flooding and provide wildlife habitat and landscape amenity benefits.

The challenge is clear. With the world population projected to increase from 6 billion to 7.5 billion by 2020, together with higher per capita incomes, producing enough food to meet the demand while preserving the environment and responding to public expectations will put enormous pressure on resources.

Part of the answer lies in the choice of farming systems countries adopt. In the OECD area there is an enormous variety of such systems, be they "intensive" or "extensive"; "conventional" or "organic"; "industrialised" or "traditional". These terms are often not well-defined and may mean different things in different countries.
The ever-increasing influence of technology and structural

changes in the agro-food chain also contributes to a complex picture. But the bulk of agricultural output (around 80-90%) in OECD countries is produced by a small number of farms (around 10-20%), most of which could be defined as using "conventional" systems. Organic farming, while on the increase, only accounts for a tiny fraction of output – between 1-10% of land area across Europe (see databank).

But is organic farming better than "conventional" farming systems as a way to ensure sustainability? At first glance, perhaps yes. Organic farming uses only organic-based fertilisers, like manure and vegetable-based compost and natural pesticides, like predator animal species. Antibiotics and other animal-health products are used only to cure sick animals and not to enhance yields. The main problem is that compared with conventional farms, organic yields on a given area of land tend to be variable and low, and the small farm size does not permit economies of scale. The focus is more on ensuring ecological balance rather than maximising output and growth.

Conventional farming tends to put productivity and economic performance first. But it uses inorganic fertilisers, chemical pesticides and yield-boosting antibiotics, as well as suffering from waste management problems, and is often accused of being an ecological enemy.

But the picture is not that simple. Because of its lower yields, a wholesale switch to organic farming would mean more land under cultivation and higher animal stocking rates to maintain current production levels. This could conflict with the conservation of biodiversity and habitats if additional "high nature value" lands, like woodland or wetlands, were brought into production. However, yields might be improved with a greater emphasis of public and private agricultural research expenditure on organic farming systems. This is happening, but is not yet very significant.

Many different farming systems can be sustainable if properly managed. Whether they are depends on farmers adopting appropriate technologies and practices in the specific agro-ecological conditions.

Moreover, in practice, many different farming systems can be sustainable if properly managed. Whether they are depends on farmers adopting appropriate technologies and practices in the specific agro-ecological conditions. And importantly, different systems can co-exist, though here again this requires a high level of farmer skills and management. In other words, human capital on the farm (and knowing how to stimulate that capital) is of primary importance.

In short, any comprehensive assessment of the value of different farming systems needs to take account of the relative economic, environmental and social costs and benefits of these systems in terms of varying yields, soil and water depletion, pollution, landscape, wildlife habitats, and animal and human health.

OECD countries know that agriculture needs to be made more sustainable. But it is not so clear how this can be achieved. If the environmental costs of organic systems are generally lower than conventional farming, but the economic costs are higher, what can be done to ensure that society gains? The OECD has started to throw some light on the way forward.

Golden droppings

A worker rakes pig excrement from water for drying in the sun before being sold as organic fertiliser at a farm in Ratchaburi, 130 kilometres south of Bangkok. Pig droppings, once reviled by locals, became a source of envy because they also provide valuable and odourless methane gas used for cooking and generating power. Since 1998 the state-run National Energy Policy Office has been encouraging more and more pig farms to participate in the "Golden Pig Droppings Programme" to install facilities that transform pig waste into energy for livestock farms.

A first place to look is new technologies and practices. In the past, the agricultural systems and the knowledge that went into them were largely directed at increasing the quantity of production, but they are now also responding to the demand for output of higher quality, produced in environmentally and animal friendly ways. But it is not always clear which technologies and farm practices will make farming systems more sustainable in the long term, and more work needs to be done to measure progress.

Some people argue that genetic modification of crops might be an answer, offering the opportunity to raise agricultural productivity, reduce production risks and increase food supply by making available crop varieties that are drought and pest resistant. However, there are potential risks to agricultural genetic diversity, in particular, by threatening landraces and adversely affecting other wild species. Biotechnology is a contentious technology, and more work needs to be done to assess risks and potential. Whether genetic crops really do require fewer pesticides over the long term has to be tested, for instance.

For now, much can be done to improve the signals from policies and markets that farmers receive. Many different combinations of market approaches, regulations, taxes and subsidies have been used across OECD countries. These help or hinder the development of sustainable agricultural systems. Only by reforming production and trade distorting support policies will market signals be able to guide farmers' decisions properly. After all, they have to be able to read the direction demand is moving in. Mechanisms have to be developed so that farmers pay for environmental damage they inflict on other sectors and are reimbursed for any extra costs of switching to providing environmental public goods.

But should governments be promoting one type of farming system that will best ensure sustainable agriculture? Only with restraint would be the answer. The market is already giving signals that the demand for organic food is rising – and farmers are responding. Many farmers employing conventional systems are finding that it is in their interest to develop integrated production methods. A valuable strategy for governments would be to provide a sound framework in which farmers could adopt sustainable farming systems – with the participation of farmers and other stakeholders. That would be the best way to meet the challenge of raising output with minimum ecological damage. ■

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Changing course to responsible fisheries

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In recent times it has been a case of "no news is good news" for world fisheries. Whenever fisheries make it into the press we are bombarded with tales of woe on the state of the world's fish stocks, the aquatic ecosystem and fishing communities. Fisheries are increasingly portrayed as a sector that is facing crisis in environmental, economic and social terms; a sustainable development problem child.

A good portion of this view is rhetoric. But there are enough seeds of truth in it to keep governments and fisheries stakeholders uncomfortable and itching for improvement. Many important fish stocks are overexploited and fishers and their communities are bearing the resulting economic and social fallout. Without stocks that are producing stable and sustainable yields, fishers and their communities struggle. More than 30 million people worldwide depend directly or indirectly on fisheries for employment and income. And fisheries provide nearly a fifth of all human consumption of animal protein.

What are the causes of the current problems and can the situation be turned around?

At first sight, it must seem strange in today's increasingly liberalised world that an important sector could find itself in a situation characterised by a weakened resource base and poor profitability, yet with excessive amounts of labour and capital. And if such is the case, then the solution is surely simple: leave the sector to adjust and the labour and capital will move to more profitable sectors. This should reduce pressure on fish resources and, voilà, problem solved.

If only this were so. But fisheries inhabit an unusually imperfect economic world. The resource base,

fish, is highly volatile and fragile, and can be weakened, potentially irreversibly. There can be a great deal of uncertainty due to variability in the productivity of stocks and natural conditions. Fishers' access to their fish resource is often not secure. In most countries fisheries have traditionally been open for use by everyone. Over the past two or three decades access rights of commercial fishers have gradually been put in place through permits and quotas.

But in most cases this does not alter the fundamental fact that fishers are only allowed access to the yields from part of a common property resource; the aquatic ecosystem. These access rights can – and have – been altered and attenuated by new management controls and changes, often without compensation.

There are other complicating features too. Fisheries tend to soak up subsidies to capital and labour that encourage investment in fishing capacity. And in some countries other government policies that aim at meeting regional development and food supply objectives come into play.


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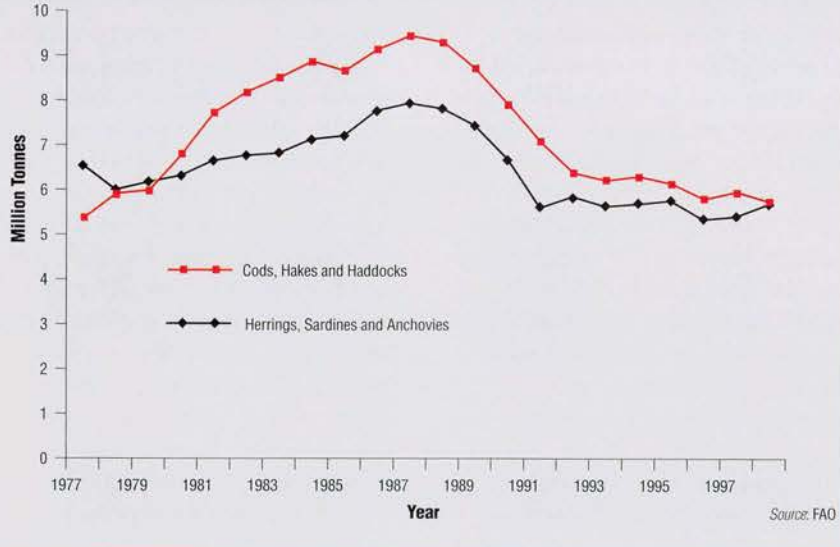
Fishy problem OECD Catch of Selected Species 1977 to 1998



Source: FAO

These imperfections created an economic climate where fishers were encouraged to harvest as much fish as they could as soon as possible, and to develop the fishing capacity to do so. This practice led to overfishing and declining production that was against the long-term interests of consumers and fishers alike. The figure (below left) illustrates this trend in the catches of important species like cod, haddock and herring. Between 1986 and 1998 the OECD's marine fisheries production fell by 23% to 22 million tonnes. But this is only part of the story: fishers are catching more small species (e.g., small pelagics) and fewer larger species (e.g., groundfish and larger pelagics). There is only so far we can fish down the aquatic food chain.

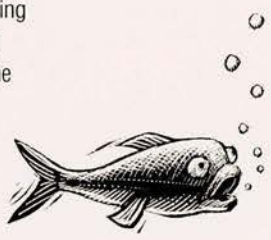
Redressing the situation is likely to require adjustment and relocation. First, catches should be reduced in overexploited fisheries. Many governments are reducing catch limits; the EU reduced the total allowable catch for cod by 35% between 1998 and 2000. Similarly, a moratorium has been placed on cod fishing in almost all areas covered by the Northwest Atlantic Fisheries Organisation (NAFO). Cuts in catches should aim to restore the productivity of stocks to maximum levels as soon as possible, so as to minimise adjustment pain.

Capital and labour should also be reduced in overexploited fisheries. Paying for the removal of vessels and buying access rights from fishers can reduce the amount of capital applied in a fishery. OECD countries spent about US$350 million on these sorts

Fish science

The introduction of factory trawlers and new techniques for fishing, freezing catches and so on demonstrate the extent to which technology has contributed to the development of fisheries worldwide.

But, by improving the efficiency of fishing methods and increasing investment in equipment, technology can increase the pressure on fish stocks in the absence of proper management of fishing programmes.



Fishing quotas are therefore key to preserving our marine resources. But it is not easy to measure marine productivity as it is impossible to count or to weigh all the fish from one stock directly – they move around, they can all look the same, there is often no tangible border between one stock and the rest. Yet, to make sure that marine resources are managed rationally we need to know the quantity of fish in an area and what makes this quantity vary.

We know that the environment influences the growth of fish: changes in climate, temperature, salinity etc. El Niño decimated the stock of anchovies in Peru in 1973. But other, less obvious factors also come into play, such as the level of maturity of individual fish, their density (the competition between species), genetic factors and seasonal growth. To better understand the dynamics of fishing, the Theory of Fishing was developed, based on mathematical models. These theories may be old (Gompertz's model dates from 1825), but they are still relevant today.

From demographic data on the fish stock (taken from fish caught or from scientific studies) we can calculate parameters such as the specific maximum size of the fish, its growth rate and when it joined the stock, etc, using the models by Ford (1933) and Walford (1946) or Gulland and Holt (1959), to give just a few examples. The most commonly used is Von Bertalanffy's equation (1938) which allows us to estimate how much the fish have grown in size. Weight increase (which is economically more relevant) is estimated from the length previously calculated.

There are three methods of tackling the theory of fish catches: the Canadian and English schools on the one hand, and the American on the other. The first two are analytical models which require thorough knowledge and study of the fisheries, as for the North Sea or New World fisheries; the American school follows a logistical model, more easily applicable when the fisheries are not so well known (e.g., the Pacific fisheries).

It is clear, though, that all these are based on estimates which are affected by the mathematical processes and by the intervals between samples taken. In addition, the real quantity of fish caught is not always declared and fish stocks are not always subject to rigorous scientific study, whether through lack of financial means or lack of interest.

New technologies could enable us to fill in the gaps in the theory of fishing, and provide those who manage fisheries with valuable tools; programmes that check position and speed by satellite have already been installed on vessels from some countries such as Norway, New Zealand and Canada. The data gathered from these will allow the authorities to ensure that the fishing regulations in force are respected. It is only a matter of time before communication technology allows the automatic recording and transmission of information on catches in real time. Moreover, progress in the technology of fishing equipment means that fishers will be able to improve the selectivity of their catches and thus reduce the risk of capturing endangered species like marine mammals.

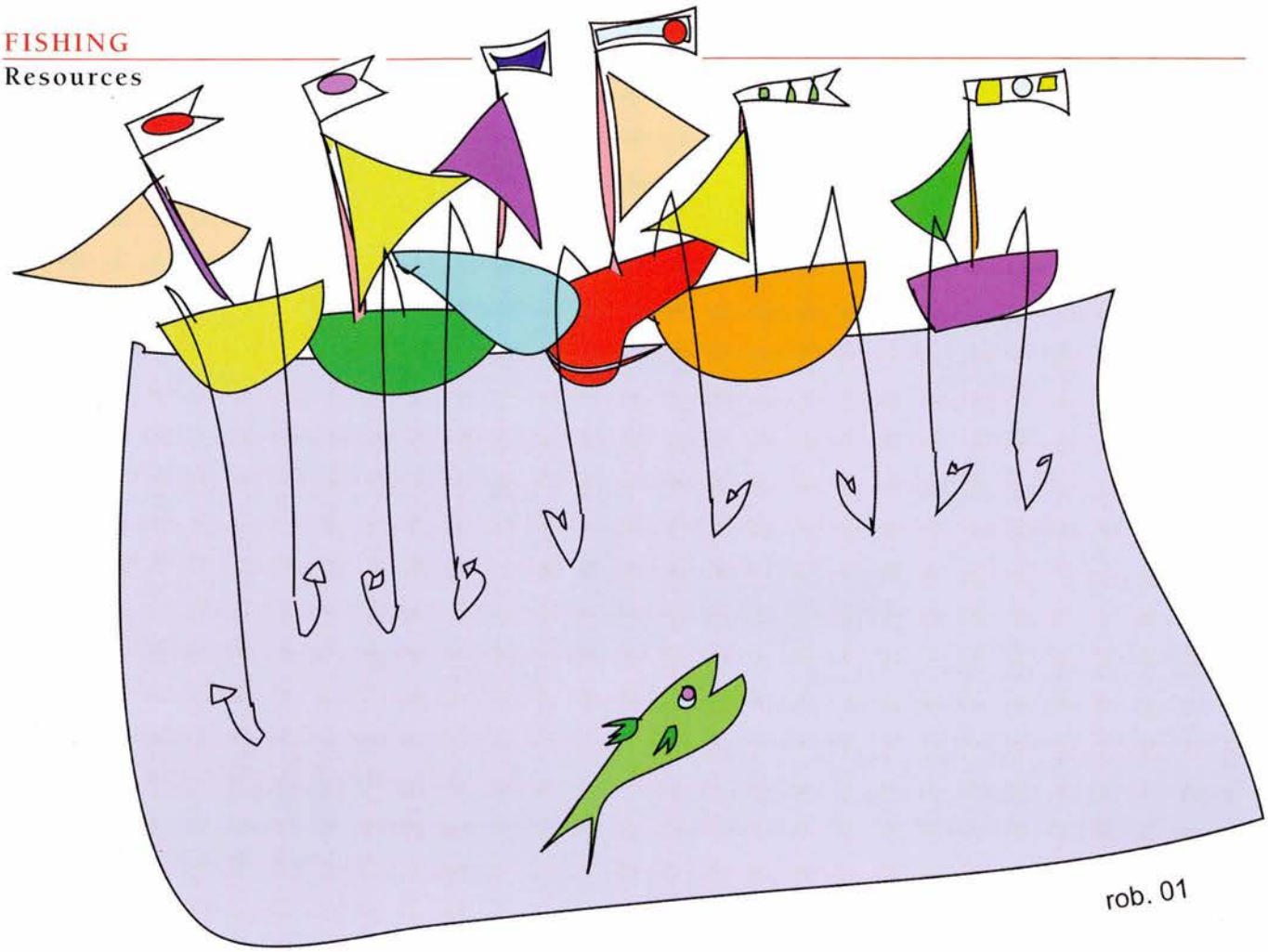
Despite these innovations, the study of fishing remains an "inexact science". One thing we are certain of, however, is that the state of the fish stock leaves a lot to be desired.

of programmes in 1997. Another way to reduce domestic capacity is to export it to other fisheries. These programmes need to be implemented carefully to make sure problems are not created in those fisheries.

Reducing labour is more difficult and painful. In addition to normal welfare provisions, retraining schemes and early retirement incentives have to be used. In Canada, US$390 million has been allocated to these sorts of programmes for the Pacific salmon and Atlantic groundfish fisheries.

Other policies should be monitored to make sure they do not attract vessels and fishers into the business or act to retain them. Subsidies for vessel construction and renewal (US$210 million in OECD countries) and fishers' income support and unemployment insurance (US$255 million) can fly in the face of policies to reduce capital and labour in the sector.

Helping fisheries to recover is an inexact science. Basically,



decision-makers control only a few variables that influence the health of a fish stock. Changes in water temperature, dominance of competing species and a host of other factors have prompted some commentators to recommend that fisheries policymakers move "beyond the fallacy of controllability". There are no guarantees that sensible policies will mean fishery recovery.

For fisheries that do recover, and for those that are producing maximum sustainable yields, policymakers can help by not repeating the mistakes of the past. They should avoid creating artificial incentives for fishing activity. Take fishery catch limits, for instance. Unless allocated to individual fishers, these can actually encourage a race for the fish. There is an incentive for boats to be brought in to catch as much of the overall limit as possible as fast as possible. Not for nothing is this method called the "Olympic" approach. A fishing season could be over in a month, leaving capital and labour idle and the market for fish at first glutted, but then empty.

Access rights of fishers are another delicate but essential point to get right. Much of this depends on the approach of fisheries authorities. The larger the insecurity of access rights, the smaller will be fishers' tendency to invest in the resource's sustainability and to develop a conservation ethic. Fisheries authorities can contribute to this insecurity through poorly-conceived policies. Good approaches can in contrast elevate the role of fishers in the management of the resource. In Japan, the Netherlands, New Zealand and Spain, fishers' organisations have the right to recommend or make management rules.

In short, maintaining the productivity of fish stocks depends on good management decisions. And these decisions need to be enforced. This is no easy task given the wide distribution of a country's fishing vessels and the routes they trawl. Imagine trying to enforce fisheries laws in an economic zone of 1.2 million nautical square miles, as is the case for New Zealand. OECD countries spend about US$2.2 billion each year on fisheries research, management and enforcement. This kind of spending is nonetheless a small price to pay for conserving our fisheries resource. Indeed, meaningful sustainable development strategy must have the sea at its heart.

As Arthur C. Clarke once said, how inappropriate to call this planet Earth when it is clearly Ocean. ■

The views in this article are not necessarily those of the New Zealand Ministry of Fisheries.

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Can Qatar pick up where Seattle left off?

Jean-Marie Metzger, Head of Trade Directorate, OECD

Eight rounds of global trade talks have still not reduced trade barriers enough. Developing countries' concerns about access to industrial markets must be met before a new round can even be launched, let alone succeed.

Dismantling trade barriers is hard and controversial work. That was clear during the World Trade Organization ministerial meeting in Seattle in 1999 that failed to launch a new round of world trade talks against a background of civil unrest. Subsequent meetings of the World Bank and the International Monetary Fund proved no easier. But it is also clear that greater openness has brought economic benefits to the world in recent years, and that further liberalisation would create more benefits, many of them accruing to the developing world.

That is why the fourth WTO ministerial meeting due to be held in Qatar in November will be a decisive point for the world trading system. Once again, ministers from 140 trading nations will decide the next steps for the global trading system. Some WTO members are convinced of the need for a new round, and are in the process of examining what its nature should be. Others, especially among non-OECD countries, remain to be swayed. A stalemate in Qatar is not an option.

OECD member countries have begun the long fight to win over the sceptics to a new round. They are engaging their public in ongoing debates on the costs and benefits of further trade liberalisation, including how best to improve working conditions and the state of the environment worldwide. The OECD countries have also been engaging developing countries in confidence-building discussions. These discussions have taken place in many fora, including the WTO, the World Bank, the IMF, and the OECD. The OECD Trade Committee also held consultations with non-governmental organisations before the Seattle meeting and in October last year, with further consultations planned before the Doha meeting. It is clear that the developing countries have much to gain. Worse, without new negotiations, they might lose out.

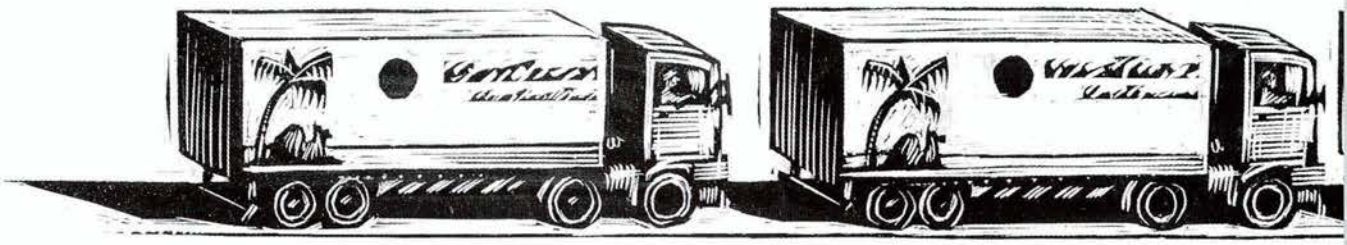
Despite all the rounds of negotiations, too many trade barriers remain ... which is why more talks are needed.

While one can debate the appropriate context for addressing the concerns of developing countries, there is no disagreement about the critical need to respond to them. Access to OECD markets for developing countries' exports is still the single most important trading issue between the two groups of countries. Despite all the rounds of negotiations, too many trade barriers remain – reducing them is one more reason why new multilateral trade negotiations are needed. Tariff peaks and tariff rate quotas in particular are difficult but necessary issues to tackle, along with trade facilitation questions such as the removal of "procedural barriers", for example in the field of customs clearance or automatic licensing of imports.

Research shows that there is still ample scope for benefits to accrue from multilateral tariff liberalisation. A recent OECD study estimated the potential gains from full tariff liberalisation by 2010 at US$1,200 billion in 1995 prices, equivalent to 3% of world gross domestic product that year. Developing countries as a group stand to gain more from multilateral tariff liberalisation than OECD countries, with aggregate gains amounting to nearly 5% of GDP in 2010.

Eliminating restrictions on exports of services from developing countries would also be likely to bring significant gains worldwide. Greater liberalisation would allow many more developing countries to "export" at least the significant labour component of services, particularly in industries such as construction, distribution, transportation and environmental services. This is particularly true of

"Access to OECD markets for developing countries' exports is still the single most important trading issue..."



what is dubbed "mode 4" trade, where expertise rather than equipment is exported; for example in the case of an Indian computer programmer who is asked to travel to the client's country to carry out a contract.

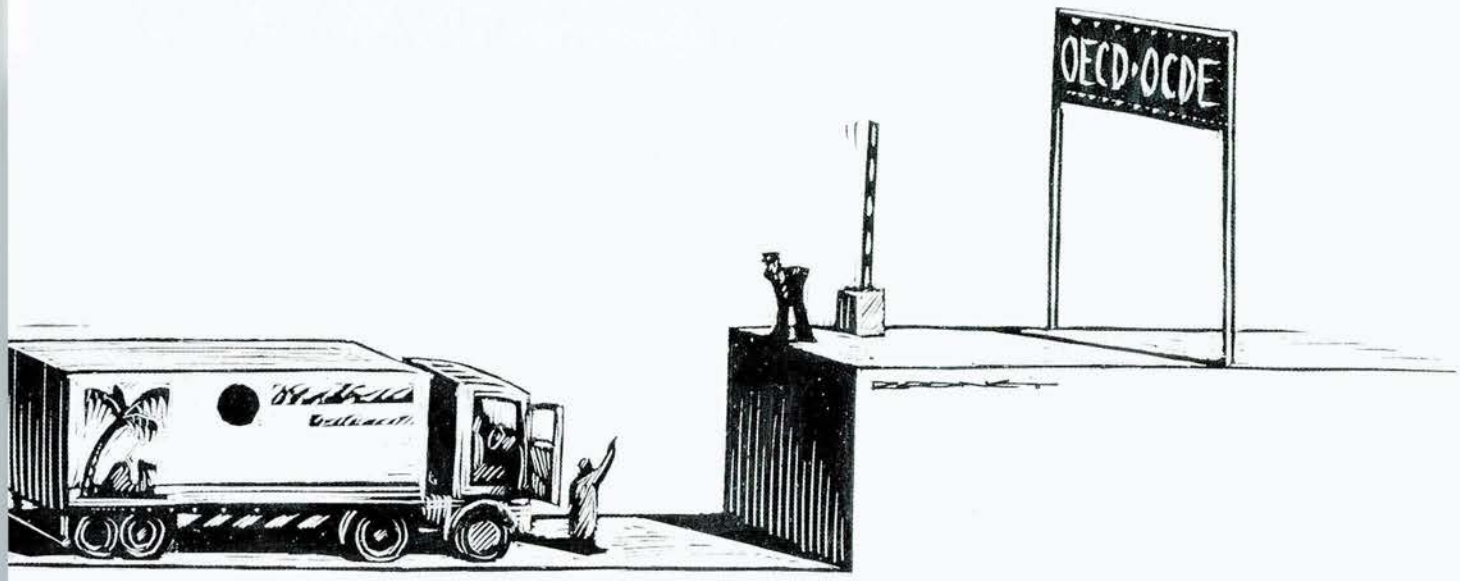
The key challenge is to find the best way to address all these concerns, and enable the multilateral trading system to evolve rather than to stall. It is clear that the larger the number of issues to be negotiated, the greater the possibility of achieving balanced results for each and every member. However, among the "new" issues proposed, such as investment, competition, environment, labour or social questions, a distinction should be made between those already embodied in existing WTO agreements, those which require new rules, and those which clearly do not belong to the multilateral trading system as defined and administered by the WTO.

So should there be a new round? Unfortunately the word "round", a heritage from the WTO's predecessor, the General Agreement on Tariffs and Trade (GATT), seems to evoke unpleasant memories of forced agreements or undue expectations. Certainly negotiations are needed, for all the reasons mentioned above, but isn't it time to recall that when the WTO was created at the end of the Uruguay Round in 1994, one of the definitions of this new organisation was as a "permanent forum of negotiations"? Indeed, a leaflet published by the WTO soon after its creation said, "No more rounds". The negotiating agenda should be permanently evolving, in line with the needs of the world and the concerns voiced by members. Unlike the GATT, the WTO has established a rule of regular meetings of ministers, and it should be their task to assess the results of these ongoing negotiations periodically. We should forget about "negotiating rounds" and replace them with "implementing rounds", drop the oft-cited mantra of "early harvest" and instead talk about "regular harvest." As any farmer would tell you, you can only harvest what is ripe. In WTO terms, this should mean that every single member must be satisfied that the results, even if they are partial, are balanced. But ministers must also be willing to implement, and periodically review, the outcome. This will certainly require a very strong political will, perhaps even stronger than that needed to take the plunge of launching another round of trade talks.

There is still the question of how far developing countries are committed to the multilateral trading system and to new negotiations. Developed countries should be clear among themselves not only about the subjects up for negotiation but also how far these negotiations should go. Developing countries do not wish to be dragged into an exercise that, in the end, might force them to approve open-ended commitments. To avoid this, some of the developed world's ambitions, and above all rhetoric, about a new round should be scaled down. The most important immediate question is how this is to be done.

Developing countries have much to gain from new trade talks and without new negotiations, they might lose out.

Finally, it seems important that if the industrial countries want developing countries to take them seriously from



the political, economic or even moral point of view, market access issues will have to be tackled in such a way that decisions evoke enthusiasm in the poorest countries, not suspicion or disappointment. Benefits and action should be immediate and not postponed to a remote future. The economic reality of the efforts made has to be taken seriously.

Developed countries have advocated the multilateral trading system and its openness as the way forward for a global world. But "global" means that the system must work for everyone.

In the prologue to Goethe's poetical drama, Faust, the figure of God sighs, "Man errs, till he has ceased to strive." The OECD must strive to make openness work. We want history to remember Seattle as a false start and Qatar as the way for the future. ■

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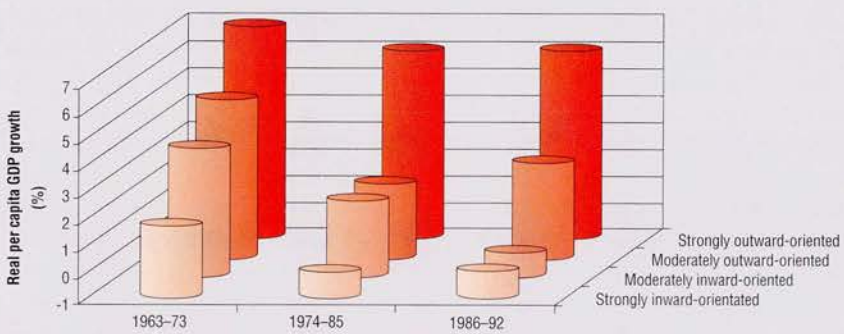
Trade and economic growth



Outward-oriented countries grow faster on average than inward-oriented countries. The graph is based on the records for 41 developing countries.

Degree of outward orientation: the World Bank provides the classification for the period 1963-73 whereas the IMF (building on the same WB criteria) provides the figures for the later two periods. The criteria used by the Bank and the IMF are:

- *Strongly outward-oriented*, where trade controls are either non-existent or very low
- *Moderately outward-oriented*, where the average rate of effective protection is relatively low and the range of effective protection rates relatively narrow
- *Moderately inward-oriented*, where the overall incentive structure favours production for the domestic market
- *Strongly inward-oriented*, where the overall incentive structure strongly favours production for the domestic market.

Why the world needs a new round of trade talks

Mike Moore, Director General, World Trade Organization

The prospect of a new round of multilateral trade talks being launched in November is brightening, though challenges remain.

The world, and in particular its poorest nations, needs a new round of multilateral trade negotiations. The World Trade Organization and the multilateral trading system will survive if we do not launch a round of talks at our Fourth Ministerial Conference in Doha, Qatar in November. But the new round is not for the WTO or for the sake of any institution. Rather, relaunching the talks will mean being able to avoid further delay in tackling the pressing problems that confront the global economy, and particularly the economies of the smallest and most vulnerable nations.

In the past year and a half, we have spent our time rebuilding confidence in a global trading system that has brought immense benefits to mankind. The confidence has grown. WTO member governments understand each other better and, just as importantly, they understand that no nation will achieve its goals inside the system unless all nations see benefits flowing to them from a new round of negotiations. Member governments understand too that progress is impossible unless all governments feel they have been part of the process.

But the age-old question about launching a round is: Do you do so in healthy or less-than-healthy economic conditions? Do you fix the roof when it is raining or when the sun is shining? Right now, the forecast is for drizzle and high winds. The economic slowdown that has gripped the United States and Japan threatens to spread to other countries that depend on those export markets for economic growth and development. The trouble is, as history tells us, economic deceleration has a nasty tendency to feed protectionist sentiment.

At such a time, it is important to send a signal that governments around the world are committed to trade liberalisation, particularly when it comes to products from the developing countries. A round would help the poor and weak countries more than anyone else. The big guys can fend for themselves. But without multilateral rules, the poor are subject to the law of the jungle. There are few economists today who would disagree with the notion that improved market access for poor country products is fundamental to efforts aimed at alleviating poverty. In rich country markets, developing country exports

Unshackling trade

face much higher trade barriers than products from developed countries. If trade in manufactured products were further liberalised, three-quarters of the benefits would flow to developing countries. Indeed, the economic benefits to the developing countries of eliminating agricultural subsidies in the rich countries would, according to the World Bank, be more than 3.5 times greater than all Official Development Assistance (ODA in 1999 came to US$56.4 billion).

But such benefits would flow not just to the poor. A study by the University of Michigan found that cutting barriers to trade in agriculture, services and manufactured goods would boost the world economy by $613 billion. That is the size of the Canadian economy. Removal of such

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Better market access for poor countries' products is fundamental to efforts aimed at alleviating poverty.

barriers would boost growth by nearly $1.9 trillion – that's two Chinas. The European Union (EU) and European Free Trade Association (EFTA) countries would see economic growth boosted by $169 billion, Mexico would see gains of $6.5 billion, the United States $177 billion and so on.

Can the 140 member governments of the WTO launch a round in Doha? The answer is, we don't know yet. But the odds are certainly better than they were at this time last year. We have made good progress in targeting areas of disagreement and governments have shown flexibility on their positions. In meetings we have had in the past several months, very few delegations have said they oppose a round. But, there remains wide disagreement over what the agenda of such a round should be. Differences remain over investment, competition, trade facilitation, the environment and cutting industrial tariffs. But the differences over these issues are narrowing, largely because delegations have been working together constructively and listening to the concerns of others.

There is really only one issue on which there is truly sharp disagreement – labour standards. Developing countries are more resistant than ever to including this on the WTO agenda. For them, this is not a line in the sand, it is a canyon.

While delegations debate these issues, we already have negotiations underway in agriculture, services and on the implementation of existing agreements, an issue a great many of our governments believe is of fundamental importance. We have held productive stocktaking meetings in agriculture and services, which have laid out the negotiating agenda for the next year. On implementation issues, we have made but modest progress and many developing countries would like to see us achieve more in this area. But it is quite clear to me that on all three of these issues – agriculture, services and implementation – substantial progress will be very difficult, if not impossible, outside a round.

So where does all of this leave us? It is widely accepted by governments that we must have the basic framework of an agreement in place by the end of July if we are to launch a round in Doha. The agenda has to be broad enough to have something for everyone. It must exclude issues on which we have no hope of achieving agreement. It should be detailed enough to be meaningful but not so detailed as to be a pre-negotiation. It must be 95% understood in July, and not leave 95% to do in November. Doha must not be another Seattle. Ministers from our governments will not tolerate it.

Can we do it? I think so, if governments show the necessary flexibility and willingness to compromise. We are clearly seeing evidence of that today, from many of the major players. It will not be easy, but achieving something of historical importance rarely is. ■

A trade round for development

Michel Camdessus, Council Chairman, Centre d'Etudes Prospectives et d'Informations Internationales (CEPII), France, and former Managing Director, IMF

The collapse of world trade talks in Seattle in 1999 conveyed some crucial messages over and above the protests about globalisation, not least that the approach to trade negotiations inherited from the General Agreement on Tariffs and Trade (GATT), with its concession bargaining and "green rooms", has had its day. Seattle also showed that trade ministers alone cannot resolve issues that go beyond the sphere of trade, and that the key systemic issues of the day cannot be reduced purely to their trade or financial dimensions. As it was so aptly put by Angel Gurria, Mexico's former Minister of Finance: "The ultimate systemic threat today is poverty." Developing countries know this, and that there can be no significant trade agreements without their participation and effective endorsement, so more than ever a trade round needs to be looked at from the viewpoint of a global development policy.

Had these lessons been taken on board, we would now be talking about a development policy based on open trade, instead of a "trade round with the focus on development". In any case, it is vital that the next round of talks lives up to expectations. This means fully gauging not just the importance of the developing countries and the scale of their problems, but also the financial and institutional efforts required for the talks to have any chance of success.

The importance of the developing countries in the next trade round stems from the success of the World Trade Organization (WTO), which now has 111 developing country members, compared with only 60 in the GATT two decades ago. These countries account for 25% of the world's output and exports, and 25% of all complaints lodged with the WTO. Yet they are by no means a uniform group. Apart from the poverty affecting major segments of their population, the least developed countries (LDCs) and the newly industrialising countries (NICs) have fewer and fewer characteristics or interests in common. Yet their people's aspirations are very similar. Whether the concern is social development, environmental protection or participatory democracy, the real enemy is poverty in all its forms. Rather than growth measured in purely quantitative terms, the goal has to be sustainable development.

Only if a new trade round is seen as a prerequisite for sustainable development in all developing countries will it have any chance of success. It does not require much argument now to demonstrate that open trade is vital for growth – 50 years of history are there to prove it. But if it is to win long-term public support, an open trade policy must be seen as an integral part of a growth policy focusing on poverty reduction. Such policies have to be defined by the developing countries themselves. But they will only work if the industrialised world does more than it is doing today,

The ultimate systemic threat today is poverty.

starting with a substantial increase in what is at present severely inadequate development assistance. As for the new trade round itself, the industrialised economies will have to be ready to go beyond the preferential treatment they have so far given the developing countries. They could accept different timetables for implementation, particularly for the

least developed countries, and be more flexible about the requirement to sign up to a whole package, which can push developing countries into making commitments in sectors where they have little or no capacity to manage implementation.

A few special commitments from the industrialised world could be of decisive importance. One notable idea is to allow the 50 or so LDCs, which account for only 0.5% of world trade, free access to industrialised country markets, their main outlets. However, a proposal to this effect put forward by the European Union and Japan would cover only customs barriers and would be limited to "most imports", when in fact other obstacles, in particular sanitary or technical barriers, have far more impact than duties. Then there is that vital WTO structure, the Dispute Settlement Body. Developing countries have already obtained satisfaction in some cases, and could be more active here if they were better prepared. United Nations Conference on Trade and Development (UNCTAD) initiatives to assist them would definitely gain from being stepped up. By the same token, simpler customs procedures would be of enormous benefit to the developing countries, whose capacity to shoulder administrative costs is extremely limited.

The European Union and Japan have grasped how important technical assistance and capacity-building are to furthering open trade, and they do offer some funding in that area, but this kind of effort needs to be shared by all the industrialised countries. It should also extend to all areas where rules to regulate globalisation, such as financial transparency, bank surveillance, accounting standards and codes of good conduct, place a very heavy burden on the poorer countries. The developing countries would certainly accept that adopting such standards can accelerate their development and heighten the benefits of open trade. But such progress needs to be brought within their reach and appropriate funding could contribute significantly to a balanced set of comprehensive negotiations. This is one area where the interests of the industrialised world and those of developing countries clearly converge.

All this leads us towards the idea of a far-reaching round of trade negotiations, since it has to demonstrate that the WTO mission to promote open trade is part of a credible, comprehensive drive to foster sustainable development. This in turn should lead to greater financial stability and the achievement of major commitments made over the past decade in areas such as education, health, the environment, core labour standards and greater regional security.

Nevertheless, this raises key institutional issues that are all too often overlooked. In the wake of the Asian crisis, the first steps to create a sounder monetary and financial architecture were taken under the aegis of the IMF. It is important that they continue. For the WTO, determining its sphere of competence and integrating the development objective are high on the agenda. How should WTO action on sustainable development tie in with that of the Bretton Woods institutions? Some useful agreements have been signed in this area. But what about the burning social and environmental issues? How could a round of WTO talks, focussed on trade concessions, further those goals? That is an open question. In my view, institutions should continue to specialise, even if it means tailoring them to suit their new responsibilities and finding ways of stating their mission more explicitly.

This brings us to three urgent issues that are all too seldom raised: Firstly, increasing the capacity of the International Labour Organization (ILO) to promote and verify the implementation of "core labour standards". Only at this price can risky negotiations on a hypothetical "social clause" be avoided. Secondly, the need to strengthen the United Nations' capacity to act on the environment, thereby lessening the chances of environmental concerns being used as an excuse for protectionism. And thirdly, the long-awaited adoption of a credible policy mechanism for inter-institutional co-ordination and arbitration, bringing all countries together in a small but legitimate structure. Former EU Commission President Jacques Delors once proposed setting up an "Economic Security Council" within the framework of the United Nations. As a step in that direction, I myself proposed that the G7/G8 should invite the Heads of State and Government of other countries on the Councils of the Bretton Woods institutions to meet on a two-yearly basis. It is only at their level that important decisions can be taken. There are alternative solutions, but the issue cannot be avoided for much longer.

Negotiations have to demonstrate that the WTO mission to promote open trade is part of a credible, comprehensive drive to foster sustainable development.

Clearly, there are links between trade, development and world governance. Globalisation is making those links more complex but at the same time more vital. Unfortunately, the full significance of the forthcoming trade round and its many institutional implications may not have been perceived by all. The work of the OECD will certainly help to facilitate the necessary consensus-building on some of the thornier issues. ■

Recycling for the future

Sustainable development through extended producer responsibility

The German Council of Environmental Advisors estimates that the drop in finite primary raw materials will significantly influence the price of products based, for instance, on crude oil from the year 2010. According to current prognoses by the Öko Institut in Darmstadt, the quantity of plastic waste produced in Germany will rise to around 6 million tonnes in 2005 due to the increased use of plastics in many branches (in 1995 it was just 3.7 million tonnes).

The recycling of materials and products will thus steadily become more important in the 21st century. Economic experts see closed material cycles as an ecologically – and economically – efficient way of simultaneously limiting the use of primary raw materials and assuring lasting economic development. The model for the closed-cycle economy which makes companies responsible for their products from cradle to grave has proved to be a viable solution in the past few years in Germany and Europe.

In an economic system like this, which conserves natural resources, packaging waste from households, trade and industry is returned to the production loop. This means that recycling will continue to be a key to sustainable development in the coming years.

Packaging recycling as pioneer work

In Germany, this concept was pioneered by the packaging sector, in which the idea of sustainable management took concrete shape as early as 1991 with the introduction of the German Packaging Ordinance.

In fact, the prototype of a functioning closed-cycle economy was created by Duales System Deutschland AG which organises the nationwide collection, sorting and recovery of used sales packaging on behalf of industry and under the control of the state.

The figures speak for themselves: In 2000, the Germans collected around 5.7 million tonnes of used sales packaging. This more or less corresponds to the previous year's result.

The per capita collection amounted to 78.3 kilogrammes in the year 2000 and, as such, was slightly higher than in 1999.

Organiser of modern resources management

In the course of the previous year, Duales System Deutschland AG set itself ambitious new targets. It intends to make the eco-efficiency with which packaging marked with the Green Dot is recycled completely transparent in future.

To this end, it has developed a new instrument – the resources balance, which clearly illustrates how packaging recycling can help to conserve natural resources. The resources balance for the year 2000 initially includes an energy efficiency analysis for plastic recycling within the framework of the Dual System.

The objective is to determine the average energy saving achieved as a result of the recycling of plastic packaging marked with the Green Dot. The analysis is consequently based on the amount of primary energy required to produce new goods which are replaced by recycled products.

Thanks to the recycling of 589,000 tonnes of plastic packaging, around 20 billion megajoules (MJ) of primary energy were saved in Germany in the year 2000: This is equivalent to 34.4 MJ per kilogramme! All 48 million mobile phone owners in Germany could telephone for twelve years without interruption with the electricity produced from this.

Another example: All private households in Berlin could be supplied with electricity for about 130 days per year with the energy saved in this way. The figures also show that the energy saving target of 40 MJ/kg the Dual System set itself in the medium term is a thoroughly realistic goal.

In future, the Dual System intends to include further ecological parameters and all packaging materials in the resources balance. For instance, the assessment will then include the CO_2 reduction potential in order to show how recycling contributes to climate protection.

The new guidelines also take account of recycling and recovery. Wolfram Brück, CEO of Duales System Deutschland AG, explains: "Our attitude to the ongoing development of collection and recovery channels for used packaging and consumer goods is open-minded

and unbiased. We support a mix of mechanical and feedstock recycling and energy recovery – in dependence on the ecological benefit."

In the plastic sector, the Dual System is promoting process and product innovations in order to lower costs while improving the ecological standards. What is decisive for the selection of a specific recovery channel is its ecological benefit. To this end, life cycle assessments document that recycling is far more environment-friendly than energetic disposal in waste incineration plants.

The Green Dot in Europe

The know-how and experience that have been accumulated in one decade of successful waste management are also being made available internationally. To date, twelve European countries are using the Green Dot trademark. Norway, Latvia and the Czech Republic were the first non-EU states to introduce the Green Dot in the year 2000. Hungary joined in April 2001.

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The most widely used trademark in the world, the Green Dot is meanwhile found on more than 460 billion pieces of packaging and, in addition, guarantees the free movement of trade in 170 countries thanks to trademark protection.

The awareness of the need for global conservation of resources is growing. Quite apart from the development of recycling in Europe, this is demonstrated by the resolutions of Agenda 21 which contain explicit demands for waste reduction and recycling. These appeals are in agreement with the maxim of the Dual System: Protecting nature safeguards man's basis of existence. And resource-conserving recycling makes a vital contribution to this.

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Rising to global development challenges

OECD Development Co-operation Directorate

Extreme poverty still ravages the lives of one in four people in the developing world and women and girls are the poorest, despite the remarkable economic and social progress of the past 30 years. Life expectancy is up from 41 to 62 years, infant mortality rates are down by 50%, and primary school enrolment has doubled.

Nonetheless, violent conflict and growing strain on the environment continue to threaten progress towards the international goal of halving extreme poverty by 2015.

The OECD has produced three sets of guidelines designed to provide practical orientations for aid agencies in the areas of poverty reduction, sustainable development and conflict prevention. The guidelines seek to enhance policy coherence in key areas such as debt relief, trade, investment, agriculture, environment, migration, health research, security and arms sales. They emphasise the role of good governance and sound economic policies that encourage stronger voices for the poor and marginalised, promoting participation and democracy, competitive markets, efficient institutions and prudent macro-economic management.

Key objectives are gender equality and "pro-poor" growth policies to benefit marginalised ethnic and social groups. Evaluation of programmes and dialogue with all stakeholders are also important for the guidelines to work, as are partnerships among donors, governments, business and NGOs.

The international community is converging strongly around the goal of **poverty reduction** in the developing world. The DAC *Guidelines on Poverty Reduction* signal progress among development co-operation agencies in a number of policy areas, such as agreement on common approaches and on the need to ensure that the recipients share ownership of development programmes.

Development agencies will increase efforts to co-ordinate aid within country-led sectoral frameworks. Priorities include capacity building, institutional reform and broad participation by local stakeholders. The guidelines call for policies that promote rapid and sustainable growth in which the poor can participate fully. This is crucial for poverty reduction, and requires such steps as better access to education, credit and land tenure, including for women and girls.

Sustainable development means integrating the economic, social and environmental objectives of society in ways that maximise the well-being of people living now, without compromising the ability of future generations to meet their needs.

The DAC *Strategies for Sustainable Development: Practical Guidelines for Development Co-operation* identify successful strategies that foster convergence among the different strategies in place within a country – essential to avoiding conflicts among various policy frameworks, duplication, and straining development capacity. This is the best way to monitor social, economic and environmental trends, define top policy objectives, set realistic targets and track progress – and this must involve marginalised communities and business. They also look at strategies that build on the mechanisms for sustainable development already in place in developing countries.

Work in war-torn areas is a major challenge for development co-operation. *Helping Prevent Violent Conflict: Orientations for External Partners* is a supplement to the 1997 DAC *Guidelines on Conflict, Peace and Development Co-operation on the Threshold of the 21st Century*, which looks at the fundamentals of preventing violent conflict. These include efforts to recognise the potential, but also the limits, of the international community's capacity to influence violent conflict situations, and use constructive engagement to promote peace and discourage violence.

It is fundamental to help societies grapple with the challenges of justice and reconciliation, and support peace processes. Partnership with civil society must also be encouraged. Business can make positive contributions to preventing violence and avoiding actions that feed it. The political economy of war, such as corruption, criminality and vested interests in sparking and perpetuating violent conflicts, must also be taken into account. ■

Durable flows, durable benefits

Helmut Reisen, OECD Development Centre

In a world of volatility, poorer countries should aim for equity inflows – portfolio equity and FDI – if they want growth to last.

The proponents of open capital markets are often criticised for offering more "banner-waving" than hard evidence on the benefits that developing countries can derive from free capital flows. Indeed, in contrast to the benefits of free trade in goods and services, the empirical evidence that economists have been able to establish on the costs and benefits of foreign savings has been very sketchy and contradictory.

This failure can easily be explained: a rigorous attempt to quantify the gains that countries have made from international capital mobility would require a fully articulated model in which the situation of no capital movements could be simulated for comparison. Moreover, the time series for private capital flows to developing countries, except for foreign direct investment (FDI), are not yet long enough to draw strong conclusions since the flows started in earnest only at the end of the 1980s. Finally, studies which focus on the absence or presence of capital controls cannot allow for varying degrees of intensity in the operation of capital-account restrictions.

A statement as common as it is trivial is that capital flows carry benefits as well as risks. But can we establish something close to a pecking order for the broad categories of capital flows in terms of their benefits and risks for the recipient countries? The answer is yes, although it requires looking at the channels through which these benefits and risks emerge.

Economic theory suggests that foreign savings can be beneficial in many ways. They stimulate capital accumulation by adding to domestic savings and they raise the recipient economy's efficiency (e.g., through improving resource allocation, instilling competition, improving human capital, deepening domestic financial markets and reducing local capital costs). At the same time, foreign savings lower consumption risks through enlarging choices for portfolio diversification and by sharing risks more evenly between capital exporters and importers.

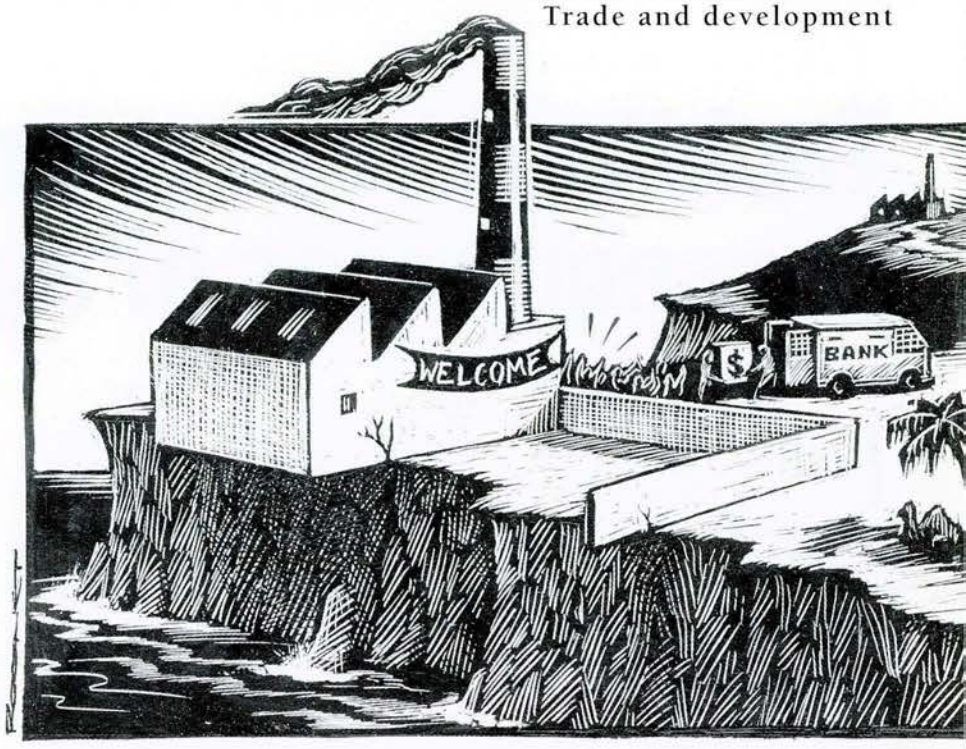
Risky flows

The inherent risks to specific types of capital flows are twofold. First, they can magnify welfare losses due to distorted consumption and production patterns; and second, they can lead to bankruptcies and output losses if capital suddenly flows back out again. In the former case, countries will be worse off if the foreign savings are attracted into protected sectors. While trade liberalisation and structural reform in most capital-importing countries have made this concern less relevant today, ill-regulated financial sectors have often created credit boom distortions that foreign flows have magnified.

As to the risk of sudden withdrawal, the bankers' adage that "it is not speed that hurts, but the sudden stop" was more than validated in the Asian crisis, with widespread bankruptcies, defunct local credit channels and obsolete human capital. The larger the real devaluation needed to accommodate swings in capital flows, the deeper will be the ensuing financial turmoil.

How then do these benefit and risk channels relate to specific types of capital flows? It is often maintained that distinguishing between types of flows generates little policy insight, for essentially two reasons. First, capital flows are said to be fungible. That would imply, for example, that we could not discern any difference between the impact of foreign direct investment or short-term debt flows on private or government consumption. Second, it has been argued that capital-flow labels have become meaningless in the presence of derivatives or efforts to circumvent capital controls. These claims, however, ignore the evidence that has been emerging.

It now appears that FDI, long-term bank lending (often long-term project loans in syndicated lending) and short-term trade credits are less reversible



than portfolio and short-term bank credit flows. Moreover, the more stable flows are mostly tied to particular investments and users, financing real assets. Short-term bank lending and portfolio flows, by contrast, constitute only an indirect link between foreign savings and domestic investment. In other words, these forms of financing can spill over into unsustainable consumer spending bubbles.

A recent study by Marcelo Soto at the OECD Development Centre explored the growth effect of various categories of private capital flows in a sample covering 44 developing countries over the period 1986-97. As expected and in line with earlier studies, the paper shows that foreign direct investment – with a lag of one year – significantly boosts per capita income growth in the recipient economy. In fact, a ten-percentage point rise in the FDI-GNP ratio would increase the long-run steady-state income level by 3% and short-term per capita income by 1%.

Perhaps surprisingly, the most important growth impact was found to flow from portfolio equity flows. The reasons are clear: these flows loosen the constraining effects of local financial conditions and can spur growth in dynamic industries. Equity flows also stimulate the liquidity of domestic stock markets, improving resource allocation and lowering capital cost to high-return activities.

Bonds, by contrast, did not produce any significant impact on growth in the study, and foreign bank lending – short-term and long-term – was found to undermine future per capita income growth in recipient countries, unless local banks were sufficiently capitalised.

This result confirms earlier hunches: under-capitalised banks tend to engage in excessive risk taking in a gamble to earn their way out of difficulties. And to stem the decline in risk-weighted capital ratios, banks will increase their exposure to government liabilities or other zero-risk weighted assets. But good risks, by contrast, remain under-financed and growth prospects under-mined. Foreign bank lending intensifies these two distortions. Which is why, in a downturn, the resulting misallocation of resources and weak bank balance sheets intensifies credit slumps and widespread bankruptcies.

The conclusion of all this has to be that authorities are right to encourage capital inflows. And equity investment and FDI are preferable to debt instruments. This does not mean that developing countries should raise fiscal and other incentives or lower their labour and environmental standards to attract FDI; the aim should rather be to encourage transparent and predictable rules, provide the necessary infra-structure and avoid macroeconomic extravagancies. Avoiding protracted import substitution, educating people and reducing distortions, in wealth distribution for instance, have been shown to maximise FDI's benefits. Moreover, FDI flows cannot easily be reversed in the short term.

How can these FDI and portfolio inflows be stimulated? Reforms, like abolishing foreign ownership limits and caps on voting rights, raising accounting and disclosure standards and providing instruments for hedging foreign exchange risks, would help, as would providing further liquidity in secondary markets to attract funds. Portfolio equity flows can drive up asset price inflation, and this may require more regulatory attention with respect to bank system exposure, corporate disclosure and accounting standards and liquidity requirements for market makers. Finally, foreign savings in the form of foreign bank lending will contribute to growth only if the banking system is well capitalised. Until that happens, lending will be drawn towards the "bad" risks, while the "good" risks that developing countries need for their long-term growth will be under-financed. ■

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Tackling the economic consequences of ageing

Ignazio Visco, Chief Economist, OECD

In 1930 – a period of numerous technical innovations – John Maynard Keynes wrote a thoughtful essay imagining the economy 100 years hence. He predicted substantial improvements in living standards stemming from capital accumulation and technical change. And he even concluded that mankind's adjustment to productivity increases will ultimately imply a need to work only a 15-hour week in order to meet economic needs!

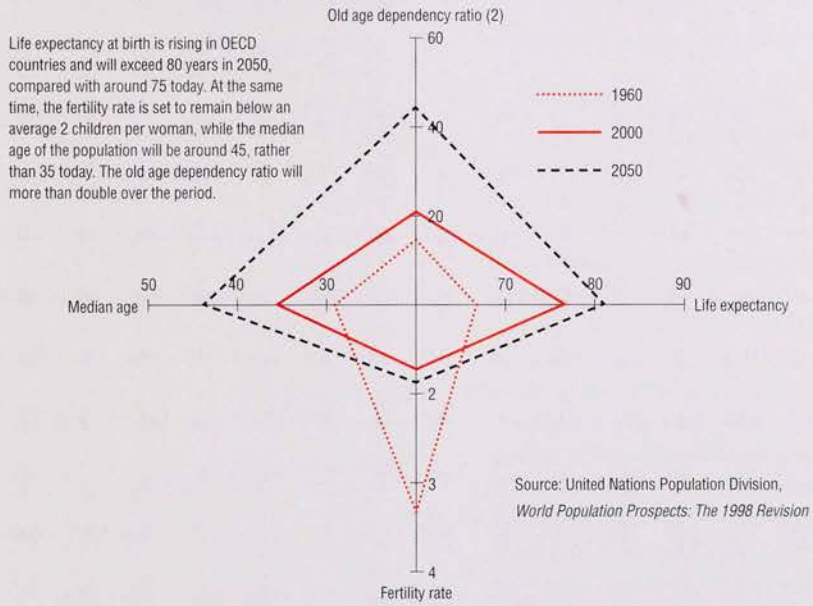
Today his essay would still be appropriate for a story on the new economy. And even if Keynes was correct on capital accumulation and technical innovations, as well as on the substantial improvements in our standard of living, his conclusion about the working week reminds us all how wide of the mark bold predictions can turn out to be. Nevertheless, my focus in this article is on the possible long-run implications of what appears to be a rather certain demographic prospect: the ageing of OECD populations.

Improvements in living standards, healthcare and nutrition have led to an increase in life expectancy. In 1960, average life expectancy in the OECD area was 66 years. Today it is 76. Moreover, an increasing number of years in retirement are disability-free and retirement income levels are enabling the elderly to enjoy their latter years more fully. Longer life expectancy and improved retirement incomes over the past 30-odd years are probably the largest such changes ever registered over any comparable period. And looking forward over the next 30 to 50 years, "new economy" innovations in biotechnology and microchips with medical applications, currently at an experimental phase, offer the prospect of extending life expectancy further, some say by 10 years or more.

But ageing populations are also linked to low fertility rates (see graph 1). On average each woman in the OECD area has 1.6 children and in countries such as Italy, Spain and the Czech republic the average is about 1.1-1.2 children; these are well below the 2.1 children required to maintain a stable population. Together, increased life expectancy and low fertility rates – even if the latter may recover to an extent in the years to come – will result in a smaller proportion of the population being of working age, particularly in the years after 2010. For the OECD area as a whole, the number of people aged 65 years and over relative to the number aged between 20 and 64 years – the dependency ratio – is expected to double in the next five decades to reach almost 50%. Considerably sharper increases are expected among some of the major European countries and Japan (see graph 2 overleaf).

While living longer and in good health is obviously a marvellous achievement, especially if one has the resources to enjoy it, a consequence of a contracting

Graph 1. **Demographic pressures in the OECD area**[1]



1. Weighted average of OECD countries, based on total population shares in each period.
2. Population aged 65 and over as a percentage of the population aged 20-64

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Who'll foot the ageing bill?

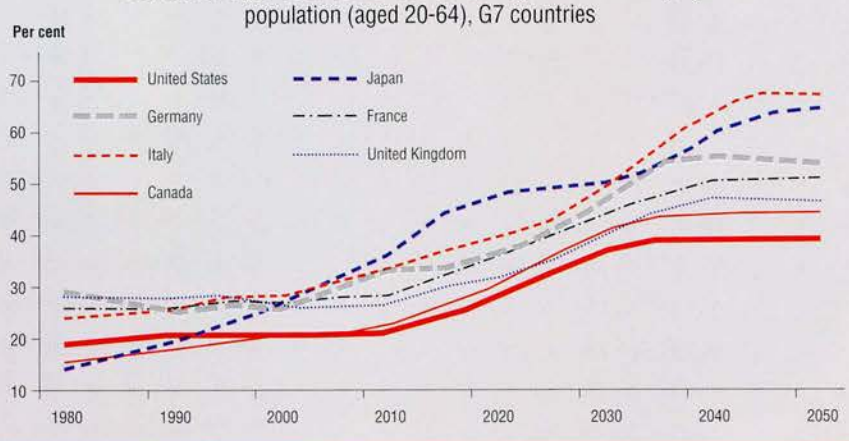
labour force (in particular associated with low fertility rates) might, all things being equal, be to undermine improvements in material living standards. Furthermore, under current institutional arrangements where public pensions are paid out of the contributions of today's workers, fewer workers supporting more and older retirees will put budgetary positions in OECD countries under increasing pressure. In particular, public pension payments will rise and absorb a growing proportion of total social outlays. Moreover, healthcare spending, an important component of public expenditure, is also likely to increase, especially since the share of the very old (80 years old and above) is expected to rise from less than 3% to more than 8% of the OECD population over the next 50 years, and this age group is one of the biggest users of healthcare services. A recent OECD study concluded that budgetary pressures from ageing populations in OECD countries could add on average some 6% of GDP to government outlays on the aged (for pensions and health care) between now and 2050. In my view this may turn out to be a conservative estimate, as it is based on relatively optimistic assumptions concerning dependency rates, productivity and labour market developments.

Adjustment to an older and slower-growing population is one of the major structural changes facing OECD economies. It raises a number of policy issues that will require imagination and courage to deal with, not least how public pensions and health care obligations will be paid for. The OECD has extensively analysed the forces behind ageing populations, their likely impacts on living standards and budgetary positions and the policy challenges caused by these structural shifts. Space is too short here to explain in detail, but one conclusion is clear: maintaining the status quo is not an option. Under no circumstances would this ensure an adequate retirement income for the aged and at the same time limit the burden on taxpayers. It is inevitable that as we live longer we will need to work longer (and therefore retire later). At the same time a rise in labour force participation rates, especially among elderly workers and females, which in certain countries are very low, will be needed. Such messages need to be broadly recognised and require policy responses. Otherwise, budgetary restraint could become necessary for an extended period to avoid spiralling levels of public debt, putting sustained pressure on other important areas of government expenditures or raising the tax burden, possibly compromising future growth prospects and therefore the material living standards of future generations.

However, no single policy initiative can redress the fiscal pressures of ageing

Graph 2. **Elderly dependency**

Population aged 65 and over as a percentage of the working-age population (aged 20-64), G7 countries



Source: Eurostat; United Nations Population Division, *World Population Prospects: The 1998 Revision.*

populations. The OECD emphasises the need for action on many fronts, cutting across traditional boundaries of economic, financial and social disciplines. Specifically, responses need to focus on achieving an increase in the average number of years individuals actively spend in the labour force. In this context financial incentives to early retirement or disincentives to later retirement, such as laws which forbid combining work with the receipt of old-age pension, should be removed and ways to enhance job opportunities for older workers and improve their skills and competencies should be found. Public pension benefits should be reduced, for given contributions, to ensure budgetary control and lower the public debt burdens caused by ageing populations. At the same time the sources of retirement income should be diversified, with a mix of tax-and-transfer systems, funded systems and private savings, which also demand strengthening of financial market infrastructures. Finally, efforts should be pursued to make health and long-term care more cost effective.

Such reforms require advance notice and gradual implementation to minimise their distributional impact. They should leave no room for complacency. Indeed this is a major challenge for policymakers, as they need to anticipate problems and build support for reforms, even though the effects are only likely to be seen one or two decades down the road. This is no easy task, as all options for reform bring different costs and benefits and have important distributional consequences, both within the current population and between generations. Nevertheless, some progress has been made, for instance, towards encouraging an increase in the average number of years worked. Improvements are, however, uneven across countries and in many cases more reforms are required.

It is sometimes argued that harnessing the "new economy" – higher output levels and faster productivity growth – would offer a substitute response and relax the need for difficult decisions now, as future generations will be richer and thus more able to pay the economic consequences of currently ageing populations. But as with the option for increased immigration into OECD countries, which is often advocated, higher growth would only provide a rather partial offset. To illustrate, under current institutional arrangements for a sample of OECD countries, which includes most of the large economies, 1% a year higher output growth over the next 50 years might ease the increase in the level of pension expenditures to GDP by only about three quarters of a percentage point. Hence, very substantial increases in economic growth (through higher productivity) would be needed to significantly offset the increased costs of ageing. The need for continuing on the politically difficult road of substantial reforms should therefore be reaffirmed. However, insofar as higher rates of economic growth imply an improvement in material living standards and increased government revenues, they will certainly help to increase the scope – as well as providing a window of opportunity – for major public pension reforms, while reducing their burden on the people at large.

Following the remarkable US performance of the last decade, opportunities for higher growth rates are certainly present in other OECD countries, though to realise them will still require important policy decisions and institutional changes. Thus, while possible higher output growth should not be seen as a reason for complacency about future pension obligations, it should still be pursued both on its own merits and to reduce the burden of necessary reforms. The historical record offers a rich testimony of mankind's ability to change when faced with the prospect of burdening future generations. Even if some of Keynes' specific predictions about the long-run future were evidently wrong, he was certainly correct to stress the adaptability of the human race. I share his optimism. ■

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Beyond the e-business revolution

Daniel Franklin
Editorial Director, Economist Intelligence Unit, London

E-businesses are not in decline, rather they are growing up. Governments should take note.

With astonishing speed, the mood on e-business has swung from hysteria to hangover. Pick up a newspaper these days, and you get a distinct sense that there is almost a gloating about the gloom. A randomly chosen issue of the *Financial Times* in March included a front-page story predicting a massive shakeout of business-to-business (B2B) exchanges; a report on a survey showing that e-commerce among US manufacturers is still tiny; and a column on the imminent closure of eToys, not so long ago a dot.com darling. Not to mention an article on the results of a major company whose profits had been held back by its Internet investments – its share price slipped on the news, whereas a year before (when web investments were all the rage) the same story would have produced exactly the opposite effect.

It would be tempting to conclude from such a barrage of dreary headlines that the e-business "revolution" is over before it even really got going. Tempting, but wrong. As in the currency markets, it seems, sentiment on e-business overshoots. Just as the initial hype

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was overdone, so is the current doom and gloom. The Internet still represents an enormous upheaval for business, but its impact will be felt in rather different ways, and perhaps at a different pace, than many people originally assumed.

What makes me so sure? For one thing, on closer inspection the message from the media is not quite as gloomy as it seems at first glance. A few of the fledgling B2B exchanges are likely to succeed, says that same *Financial Times* article, and will grow very fast. E-commerce may still represent a small share of business among US manufacturers, but their recent heavy investments suggest it could be about to surge. And the column on eToys argued that, although it would be harder work than before, there were still plenty of opportunities for smart investments in the new economy.

Next, there is the experience of my own company, which tells me that the e-business revolution is very real. Four years ago, the Economist Intelligence Unit sold well over 90% of its business information in print form, mostly in reports published to a quarterly rhythm. Now, more than half of the company's sales are electronic. Customers' expectations have changed dramatically, and so has our pace of analysis: we have introduced daily services, data services, e-mail alerts, an Online Store for instant delivery over the Internet, and even a website (www.ebusinessforum.com) entirely on the subject of global e-business. Under the impact of the Internet, every part of the company's operations, from editorial to marketing and sales, has undergone a radical transformation.

The dot.com crash does not get governments off the hook of having to provide a business environment suitable for the digital age.

Is my company's experience exceptional? Stories from other industries suggest it is not. E-business conferences, for example, though no longer full to overflowing as they were in the days of Internet fever, are still infused with a deep conviction about the sweeping scale of change that is under way. As the keynote speaker from a multinational company put it at one recent event, he remains an e-business "evangelist".

But the gospel being preached has changed, in several vital respects. First, it is no longer about dot.coms (this revolution, like others, is devouring its children). The real story is about the e-transformation of traditional businesses, from the big carmakers setting up B2B exchanges to the major retailers reorganising their supply chains and their distribution channels. If even a diversified industrial giant such as GE (General Electric Company) sees the Internet infusing every aspect of its business – to the extent of having managers from the chief executive downwards tested on their e-knowledge – then every company must reckon on becoming, to a significant extent, an e-business.

Secondly, the heady talk of brave new business models (let alone of new laws of economics) has faded. Instead, the focus is on how best to apply the potential of the Internet to existing operations. Intensified competition is compelling companies to examine afresh where their true strengths lie, and to see how these can be web-enhanced.

A third change is a return to the discipline of the bottom line and return on investment. Gone are the days of wild spending on Internet schemes with overly optimistic revenue assumptions. But that still leaves ample scope for investments whose benefits can be carefully calculated. Some of the clearest Internet-related benefits may come in cost savings rather than new revenues: as companies like Oracle and BT have shown, such savings can be huge.

The important point about these shifts in e-business thinking is that they do nothing to diminish the magnitude of the phenomenon. If anything, they merely make the challenge deeper and more pervasive. Governments should take note: as every business becomes an e-business, investment will flow to countries where such companies can flourish. The dot.com crash does not get governments off the hook of needing to provide a business environment suitable for the digital age. ■

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2000, the euro's *annus miserabilis*?

Vincent Koen, OECD Economics Department

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Standing by the euro: Wim Duisenberg, European Central Bank president

The euro makes its second grand entrance on January 1, 2002, when it physically replaces the currencies of 12 European countries. One of the puzzles during its "virtual" existence so far, however, has been its anaemic performance on the foreign exchange market.

On the eve of the euro's launch in January 1999, most analysts and market participants expected it to appreciate. Their chief fear was that an overly strong new European currency would exacerbate the slowdown in activity then underway in the euro area.

In the event, the currency weakened almost uninterruptedly through all of 1999 and most of 2000, boosting exports and helping make 2000 the best year for growth and employment in a decade. While for a time commentators welcomed the depreciation as a desirable cyclical adjustment, its persistence in 2000 sparked concerns about the implications for inflation. It was also increasingly felt that the exchange rate had lost touch with fundamentals.

Although many observers acknowledged after the event that the currency might have started from a relatively high level, its continued depreciation came as a surprise. The euro ended its second year at 93 US cents, 21% below its inaugural level. It depreciated somewhat less against other currencies, but even so, compared with exchange rate swings in the past, this was a large one.

Many theories have been put forward to explain the euro's anaemia, but no single version is fully convincing. One popular explanation relates the euro's fortunes to cyclical divergences. Over certain periods, the dollar/euro rate indeed mirrored the expected growth differential. But markets tended to react somewhat asymmetrically, seemingly giving more weight to US than to euro area news, be it positive or negative. Interest rate differentials, which are partly related to cyclical divergences, turned out to be only loosely correlated to the exchange rate.

An equally striking parallel, although one that has attracted less comment, can be drawn between the evolution of the euro exchange rate and the oil price. Production is nowadays far less oil-intensive than in the early 1970s but large oil price swings still have a direct impact on inflation, output and current accounts, and therefore on exchange rates. In

addition, the rising oil price led to increased euro/dollar conversions by euro area based buyers, putting more downward pressure on the euro. On the other side of the oil trade, oil producers likely exchanged only small proportions of their dollar proceeds into euros, therefore doing little to support Europe's currency.

Another set of theories has concentrated on equity markets. Higher US rates of return were said to draw investment out of the euro area, weakening the euro. But in 1999-2000, European stock markets outperformed US stock markets in own-currency terms. The relationship between stock prices and exchange rates is in any event hard to interpret since both react to interest rate movements.

One rationale for the large net capital outflows from the euro area has been "eurosclerosis". But while market rigidities and high tax levels have been more prominent in Europe than in the United States for a long time, there is little evidence that they have become relatively worse since the launch of the euro in 1999. Furthermore, the surge in foreign direct investment (FDI) outflows from the euro area in the late 1990s was accompanied by an equally spectacular rise in FDI inflows, and in 2000, FDI inflows almost matched FDI outflows. On the other hand, the surprisingly vigorous performance of the US economy until late last year prompted many analysts to raise their estimate of US potential growth, while such revisions have been more scattered and timid as regards the euro area. This may have weakened the perceived euro equilibrium exchange rate.

A completely different explanation for the euro's fall is poor communications. Statements in the early days from European Central Bank (ECB), national central bank and government officials were clearly insufficiently co-ordinated. Euro area finance ministers agreed during 1999 to exercise restraint in their comments about the exchange rate, and now generally base their pronouncements on language agreed in common, in co-operation with the ECB. In any event, while dissonant official messages may add to exchange rate volatility in the very short run, they are unlikely to drive exchange rate trends over longer time spans.

Finally, some analysts consider that the euro's depreciation was at least partly due to the herdlike behaviour of the market. The dollar's appreciation would thus be viewed as evidence of the strength of the US economy, while the focus as regards Europe would be on rigidities. These beliefs would reinforce the euro's depreciation, which in turn would consolidate those beliefs. The process could last for a while, as it did in the first half of the 1980s when the dollar's appreciation seemed unstoppable, until the credibility of the beliefs starts to be eroded by the widening discrepancy between fact and perception. A small trigger could then reverse the process, as the Plaza Agreement by the G5 countries seems to have done in 1985. In such a case, it is critical to try and ensure an orderly reversal of the previous misalignment, to avoid overshooting in the opposite direction.

As the euro kept falling, proponents of central bank intervention on the foreign exchange markets became more vocal, emboldened by the fact that at well over 250 billion euros, the reserves of the Eurosystem are among the highest in the world. During the first 20 months following the euro's launch, intervention was merely verbal, but on 22 September, 2000 the ECB announced a joint G7 intervention, citing "shared concern about the potential implications of recent movements in the euro exchange rate for the world economy". This was the first transatlantic co-ordinated intervention since 1995 and came as a surprise both because of its timing – ahead of, rather than after, a G7 meeting in Prague – and because of US participation in the run-up to presidential elections. Some 6 billion euros were bought. Within hours, the euro jumped from 85 to 90 US cents. It then settled at around 88 cents for about a week, but depreciation soon resumed and by mid-October the euro had dropped below its previous lows. A round of unilateral ECB interventions followed in early November, but this time the euro reacted less markedly.

Many theories have been put forward to explain the euro's anaemia, but no single version is fully convincing.

It is difficult to assess the effectiveness of these interventions, although they did succeed in instilling some uncertainty in market participants' minds, showing that the Eurosystem stood ready to intervene either multilaterally or bilaterally and without having to wait for specific government instructions. The euro has rebounded somewhat since last autumn, but given the external imbalances between the three major currency areas, it would seem to have ample room to appreciate further, although whether it will, and at what speed, remain anybody's guess. Among other things, this may depend on the impact of the introduction of cash euros at the beginning of 2002. ■

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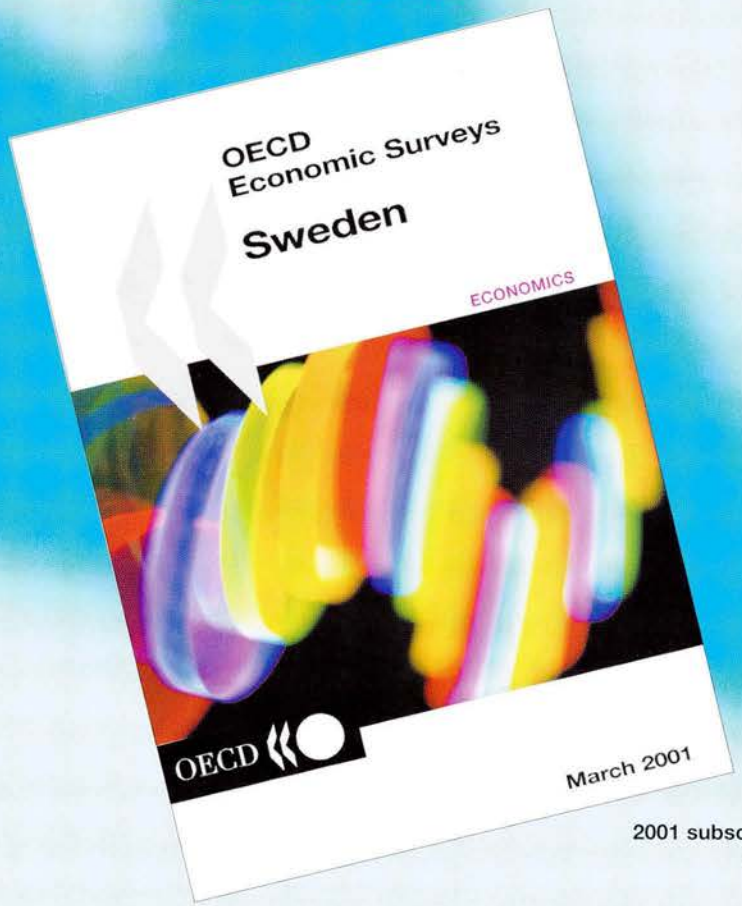

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Does team spirit make economic sense?

Simon Field, OECD Centre for Educational Research and Innovation (CERI)

Teamwork is as vital for successful companies as it is for successful football teams. But little attempt has been made to measure its contribution to the economy, or the cost of its absence. Perhaps it is time to pay more attention to this invisible asset.

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All for one

What makes for a successful football team – star players bought at huge cost perhaps, a tough and cunning manager, or an inspiring captain? All these are important, but success will also depend, critically, on less tangible factors such as team spirit and fluent communication between the players. Only then will a player know when and how to pass the ball, as well as shoot for the goal. A good firm also needs effective management, the right tools and equipment, and well-trained staff. But, like the football team, its success will also depend on mutual trust among the staff and shared objectives. More widely, in addition to a good product the firm depends for its success on the tacit understandings which bind the company to its customers and contractual partners – the trust that the firm will honour its delivery commitments, or that quality will be maintained.

Reliance on teamwork is so universal that it may pass unrecognised. Traditional economic theory allocates a place in production to physical capital, the quantity of labour, and increasingly also to the quality of labour – human capital. Yet "social capital" – made up of the networks and norms that underpin most types of economic and indeed social activity – is apparently ignored.

Reliance on teamwork is so universal that it may pass unrecognised.

Attention to social capital can suggest new policy solutions. For example, economists worry about markets failing when one of the parties to a transaction is better informed than the other. If someone tries to sell me a used car, how do I know if its curious rumble is a long-standing quirk, or an ominous and recent symptom? Traditional policy answers such as regulatory mechanisms (like trading standards) and investment in information (hiring a mechanic to look the car over) are costly. Social capital theory implies another simpler approach. In an atmosphere of trust, I can ask the vendor about the rumble, and rely on the answer. The honest vendor gains too, in that he or she has less need to discount prices to offset the buyer's uncertainty over quality. This may explain the common observation that used car sales frequently take place in workplaces, where trust, backed by potential informal sanctions, represents social capital. Generalising, higher levels of social capital should increase market efficiency and lead to higher output.

In recent years a stream of research has sought to define and measure the myriad ways in which established norms and social networks support and underpin social and economic activity. On the economic side, for example, the level of trust in Italian regions has been shown to be linked to the effective

use of credit while local social networks have been shown to play an important role in helping people to find jobs in many European countries.

Another strand of research connects social capital with non-economic outcomes, including better health, education, government and child welfare, and lower crime. A major US study argues that the physical health of someone who belongs to no social group and then joins one will improve so much that his risk of dying will be cut in half, while research in Sweden suggests that social connectedness reduces the risk of Alzheimer's disease. This apparently magical panacea for social ills has even been shown to be connected to happiness itself.

Despite enthusiasm for the concept of social capital in both academic, and increasingly in political, circles, the idea remains fraught with difficulty. The term is used to cover many different things, with some extending it to include institutions such as the legal system, although most would limit its application to informal norms and social networks. And despite tantalising indications, no one has yet been able to prove that social capital increases economic output. This could be because it has been difficult to agree on how social capital should be measured, but it might also be because economic dynamism sometimes requires, alongside teamwork, the kind of tough competition and radical innovation which threaten established networks and norms. There is little research, and little consensus, on how one might go about promoting social capital, particularly in "good" forms, like helpful neighbours, rather than "bad" forms, like organised crime. As the research field matures, some of the fog should lift, and it will become easier to see where the greatest policy returns can be realised from investment in research on social capital and its measurement.

So what makes for a successful society? Good people certainly, knowledge and resources, effective government, law and institutions. But also the teamwork – the social capital – that makes society more than the sum of its parts. ■

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- Read a summary of the report at www.oecd.org/els/pdfs/EDSMINDOCA003.pdf

CAPITALISING ON SOCIAL NETWORKS: The idea that people are as important as technology in an increasingly knowledge-based society has rapidly gained hold in recent years. But the jury is still out on the related issue of social capital. The forthcoming report, *The Well-being of Nations: The Role of Human and Social Capital*, examines the whole issue of social capital and its contribution to the knowledge economy. The evidence suggests that human and social capital can be of key importance in contributing to higher income, life satisfaction and social cohesion. There is limited scope for public policy to change the quality, stock and distribution of human and social capital in the short term. However, the authors, Tom Healy and Sylvain Côté, suggest that policymakers should be concerned for many reasons. First, there is robust evidence that human capital is an important determinant of economic growth, combining with technology to boost productivity. Social capital may be important too, for example, in areas like initiative and teamwork. Second, there is evidence that both human and social capital are associated with a wide range of non-economic benefits, including improvements in health and a greater sense of well-being. Third, human and social capital appear to be mutually reinforcing. Human and social capital enable individuals, communities, firms and societies to cope with rapid social and economic change. These represent a key resource for sustainable development. ■

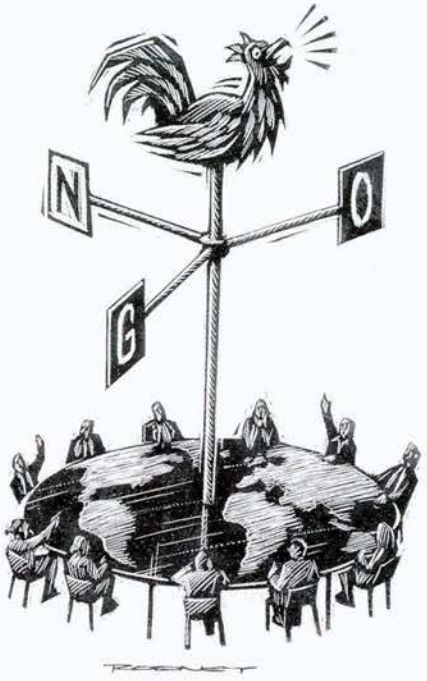
Crafting the agenda for the 21st century

Paul Hohnen, Special Advisor and Former Political Director of Greenpeace International*

Over the last decade in particular, there has been much talk about the role of non-governmental organisations and their influence on politics and policymaking, but also on business strategies. Are these NGOs "friend or foe"? The answer to that is largely up to governments.

Who is in charge, governments or corporations? And where are they taking us? One of the clear messages to emerge from the "anti-globalisation" protests over recent years has been a concern that elected governments have effectively abdicated to the private sector their responsibility for the welfare of both people and planet. With the gap growing between the rhetoric of globalisation – that the market would provide more wealth for more people – and the reality that there is more wealth for some people but deeper economic and environmental poverty, citizens' groups feel justified in asking whether their governments have got the policy balance right.

This concern has been amplified by confusion. How was the public supposed to react to Head of State commitments to environmentally-sustainable development at the Earth Summits of 1992 and 1997, while witnessing ministers at the World Trade Organization (WTO) and other key bodies apparently pursuing a contradictory "business as usual" agenda? Academics, NGOs and even businesses began to refer to the existence of a "democratic deficit" and a "governance gap". The perceived "democratic deficit" stems from the fact that there is no elected body overseeing the globalisation process. All intergovernmental organisations,



Time is up for the industrial economic model invented by the OECD. We simply do not have enough planets to sustain it. The OECD can secure its legacy by embracing the sustainability agenda.

including the UN General Assembly, are accountable only to officials representing them. The "governance gap" comprises an **information gap**, where governments appear either to ignore or to lack crucial information; a **policy gap**, where policies and institutions fail to address key problems effectively; and, perhaps most alarming, an **implementation gap**, where words – and even treaty commitments – are not matched by action.

NGOs are "non-government". They don't want to remove or replace government, but – like the public – they want it to work better. The public wants, and needs, governments to take the lead in making good decisions. This means not only that they set clear goals and consistent policies, but also that they ensure these are grounded in the concerns and challenges which we all face. The trouble is that governments are not seen to be responding effectively to pressing environmental and other global problems. Hence the exponential rise in both the number and energy levels of advocacy organisations during the 1990s. The Internet may well have helped to catalyse the civil society movement, but it did not cause it. Governments, or rather governments' failures, did.

NGOs tend to be not-for-profit advocacy groups. They play, variously, the roles of conscience, whistle-blower and weather vane in society. They exist mainly because there is a belief that important principles or information are being overlooked or ignored by governments. NGOs do not want to make decisions. That is government's role. But, in the important process of

democracy, they do want to help with decision-shaping and to be involved on terms at least as favourable as those extended (sometimes corruptly) to the business community. This, surely, would make a healthier body politic.

Fuzzy structure

Consider these questions:

- "Where are the important decisions on the long-term direction of the planet made? The G8? The United Nations? The World Bank? The WTO?"
- "Which international organisation is responsible for driving policy on clean energy, fresh water and re-forestation?"

Unfortunately, even an expert in public international law would be hard-pressed to respond briefly to these basic questions. The fact is that the current international policy-making structure is unclear. It resembles a computer-wiring diagram more than a highly functional piece of institutional architecture. Not only is it hard to know where decisions are taken, it's often difficult for experts to know who does what, and where. This is hardly a situation to instill public confidence, much less inspire creative civil society input.

The current international policy-making structure resembles a computer-wiring diagram more than a highly functional piece of institutional architecture.

Efficiency is one victim of this hotchpotch. Transparency is another. And it is not always the fault of the organisations. Over the past 50 years, governments have created a proliferation of taxpayer-funded bodies with often overlapping mandates. According to UN sources, there are more than 40 intergovernmental bodies with forest-related responsibilities, and nearly 20 international treaties concerning forests. While some coordination effects are now in train, such as the UN Forum on Forests (UNFF), the fact remains that the world's ancient forest cover and diversity is still declining at an alarming rate (see article by E.O. Wilson).

Coordination will not be enough without bold restructuring. If clean food, water, energy, habitat and transportation are among our chief goals, where are the organisations to realise them? How can civil society be better involved?

One major problem is history. Many of our most prominent international bodies – the UN and the OECD among them – were built on the rubble of the Second World War. While the ideals of these organisations remain sound, sometimes they suffer from "reality lag"; they deal with yesterday's problems today. They must bring their agendas up to date, as well as improve them.

On the environment, there is a sense that governments have lost their way. They seem unable or unwilling to move out of the "business as usual" approach to economics which is hampering progress to real sustainable development initiatives. Security from potentially catastrophic environmental threats is either inadequately funded or "left to the market".

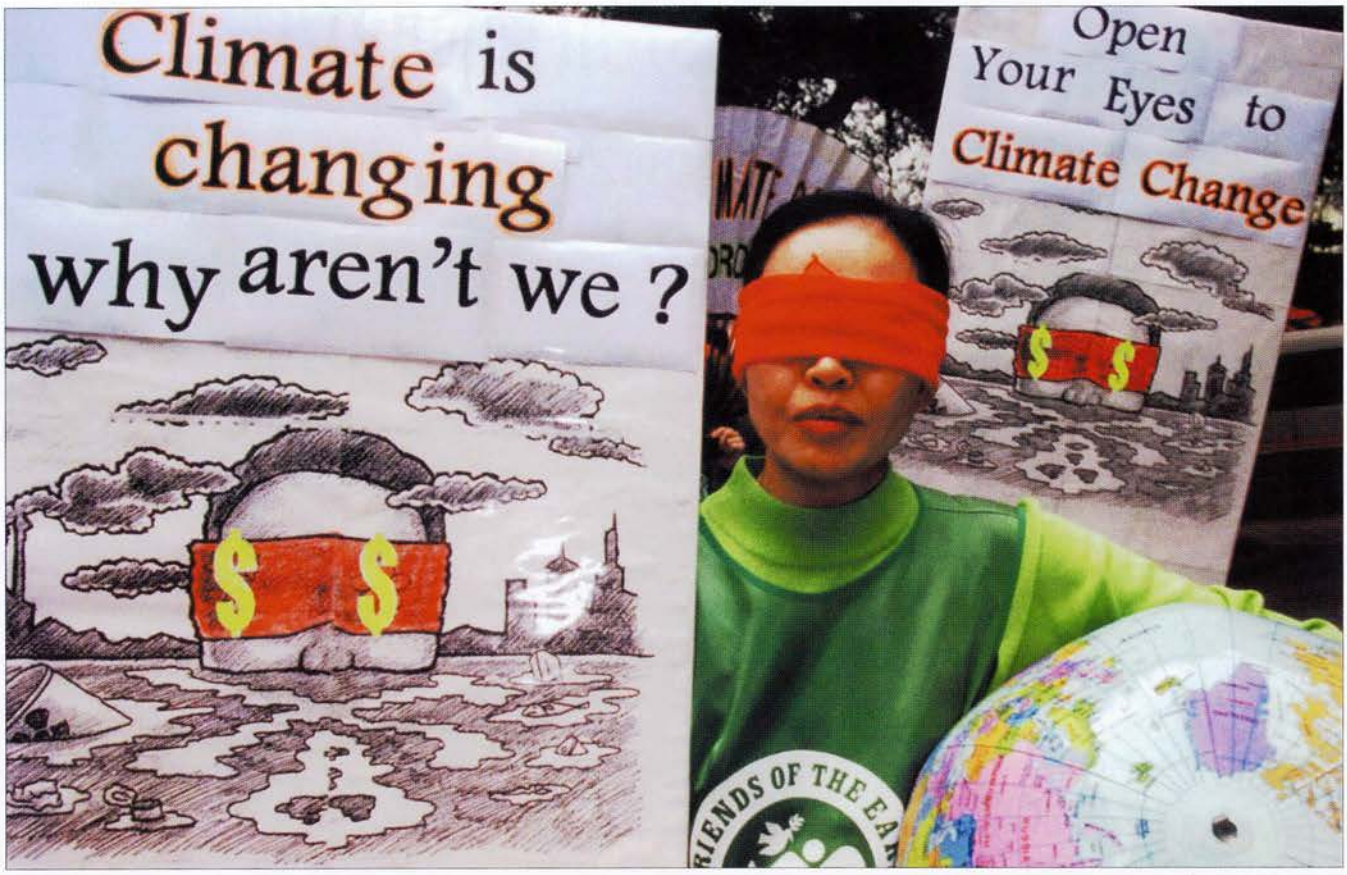
The OECD has a particular responsibility because it groups the richest countries together. In the run-up to the World Sustainable Development Summit in South Africa in 2002, there is increasing alarm that unless the OECD grasps the nettle of these problems, the summit will fizzle into waffle and meaningless rhetoric. Some groups are calling for a "New Global Deal", whose elements might include the OECD governments taking the initiative to:

- Meet outstanding pledges to increase flows of finance and technology to the South and to extend the cancellation of debt;
- Expand trade access for Southern producers to Northern markets (see article by Mike Moore);
- Increase the South's role in global governance (whether in the UN, international financial or trade institutions); and
- Implement existing domestic environmental commitments.

There is some cause for optimism. The OECD is working on policies to enhance sustainable development and is identifying many of the options, like tax reform and the elimination of subsidies that encourage pollution. This work could form the nucleus of a new and inspiring political commitment on sustainable development and could improve the chances of success at Johannesburg.

Problem solving

Most NGOs are formed to win clear goals. Problem identification is the first order of business. Some, like Greenpeace, have a history of offering policy and technological solutions. To many dialogue is still seen as the slippery slope to compromise. Increasingly, however, some NGOs have been behind the emergence of so-called "multi-stakeholder dialogues" and global public policy networks. These constructive bodies – well described in the book *Critical Choices – The United Nations, Networks, and the Future of*



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Global Governance – represent creative attempts by groupings of business, NGOs and sometimes governmental bodies to make progress on pressing issues. The recent World Economic Forum high-level meeting between the automobile industry, Greenpeace International, WWF and UNEP, the Global Reporting Initiative (GRI – see article) and the OECD's annual Forum reflect this trend.

Traditionally, international decision-shaping gatherings have been adversarial, useful for spotting problems, but not solutions. Multi-stakeholder processes, still relatively new, offer the opportunity of converting vicious circles into virtuous ones, by committing a wide field of expertise to finding solutions to specific challenges. Such processes could become cost-effective, innovative means of assisting governments. After all, business increasingly values multi-stakeholder approaches, as well as bilateral NGO contact.

One thing is sure. Non-economists (which means most of us) and, it seems, an increasing number of economists, are having trouble buying into the proposition that more economic growth is the answer to the challenge of greater welfare for all. Their scepticism cannot simply be brushed aside.

Whatever promise the "new" economy offers, the reality is that the "old" economy cannot assure a sustainable future. Put bluntly, time is up for the industrial economic model largely invented by the OECD. We simply do not have enough planets to sustain it and cannot export it further.

But in change there is opportunity. The world urgently needs a concerted, coordinated and credible set of policies that will deliver sustainability within a generation. The OECD must show that leadership, not least for its own survival and continued relevance. The OECD can secure its legacy in the 21st century by embracing the sustainability agenda. It can do so by changing, as it has done once before (from the OEEC). It is time for it to become the OCSD – the Organisation for Cooperation on Sustainable Development. ■

**Paul Hohnen is a former diplomat who worked for the Australian Department of Foreign Affairs and Trade and served in the Australian mission to the OECD.*

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Reporting on sustainability: a global initiative

Dr Robert Kinloch Massie, Chair of the Global Reporting Initiative (GRI)

An international coalition of companies, accountants, NGOs and trade unions is quietly changing the way companies report on sustainability issues.

"We now face an urgent need to secure the freedom of future generations to sustain their lives on this planet – and we are failing to do it. We have been plundering our children's heritage to pay for unsustainable practices. Changing this is a challenge for rich and poor countries alike." These words by Kofi Annan, the UN secretary-general, in his report to the United Nations Millennium Summit last September, could not have been more blunt.

He stressed that governments could not achieve sustainability alone: "The rapid pace of change today frequently exceeds the capacity of national and international institutions to adapt." Part of the solution, he suggested, could be found in the emergence of "global policy networks", which he characterised as "coalitions for change – which bring together international institutions, civil society and private sector organisations, and national governments, in pursuit of common goals." All partners would see their influence increase in such networks.

One such public policy network that has won wide praise is the Global Reporting Initiative (GRI). This three-year-old partnership among NGOs, businesses, accounting societies, labour and the United Nation's Environment Programme (UNEP) has been quietly pioneering the development of corporate reporting guidelines that go to the heart of the sustainability debate.

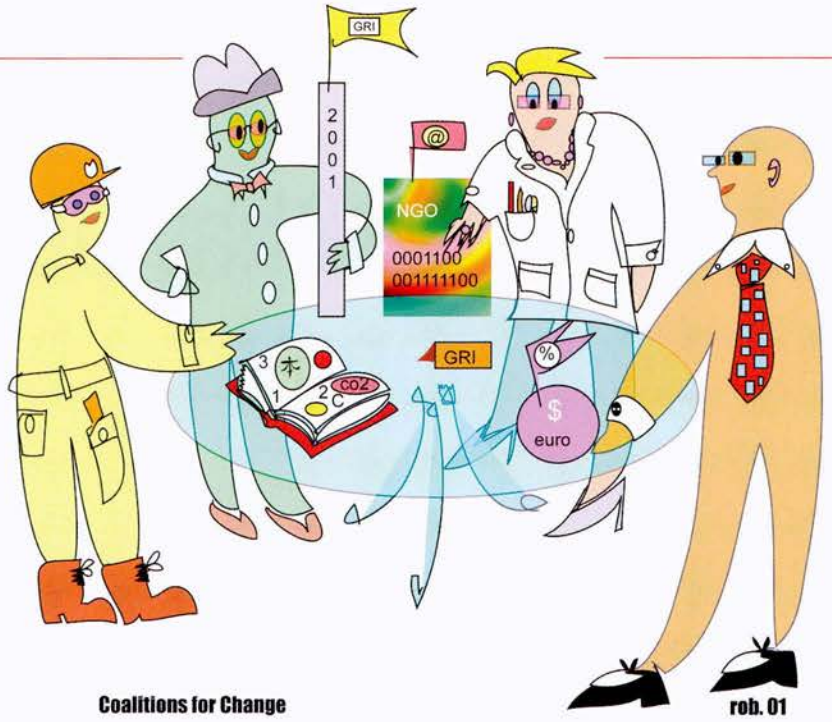
Originally convened by UNEP and the Coalition for Environmentally Responsible Economies (CERES), a powerful US coalition of businesses, investors, and advocacy groups, the GRI has already developed and disseminated two versions of its Sustainability Reporting Guidelines. The guidelines, initially released in draft form in March 1999, were revised and re-released in June 2000 after a period of extensive pilot testing by global companies.

Among the unique characteristics of the GRI is its multi-stakeholder composition. It has been able to bring together senior representatives from the business, labour and NGO communities – North and South – in crafting its voluntary reporting guidelines, and it has held a wide range of meetings in Asia, Europe and the Americas, with inputs from more than 50 countries, including 25 OECD members.

So what do the guidelines actually do? The GRI is built around a simple, but effective, notion. By providing a broadly agreed mechanism to measure environmental and social performance, the GRI aims to assist investors, governments, companies and the wider public to understand more clearly the progress being made towards sustainability, and – to this end – to improve related analysis and decision-making. Take energy, for instance. Firms using the guidelines would measure total energy usage (in joules) and indicate broadly the types (primary sources, for instance) and uses of that energy. They would describe any initiatives they have taken to move towards renewable energy sources and energy efficiency.

The GRI does not have any particular indicators for social expenditures, but under the "Workplace" category of the guidelines companies can provide information (in a form that is up to them) about quality of management, health and safety, wages and benefits, non-discrimination and training/education. There are many possible indicators for each of these categories, and through experience and working groups, "generally applicable" definitions will be devised for future revisions. However, the pressure to add new indicators will be counter-balanced by the need to ensure the reporting remains manageable.

The structure and content of the guidelines are both logical and practical, as can be seen on the website. Apart from advising on format and content, the guidelines advise on how to phase in the reporting system, and how to normalise and verify data. And leading accounting experts are adapting



By offering corporations a broadly agreed mechanism to measure their environmental and social performance, the GRI aims to assist governments, companies and the wider public to monitor the progress being made towards sustainability.

traditional accounting principles to this new form of reporting. Many well-known companies in the automotive, utility, consumer products, pharmaceuticals and chemical sectors have already published reports that adopted the GRI guidelines in some form. General Motors and Ford are publishing reports. Governments, too, have indicated interest in using the guidelines to improve mandated reporting standards. The UK government is exploring their application to its agencies, and the US and Japanese Environment Agencies have used the guidelines as a template for their own corporate disclosure programmes.

The GRI makes historical sense. Corporations recognise that they have a "social licence to operate", which requires greater transparency and accountability in relation to their environmental and social behaviour. Indeed this can improve their competitiveness and shareholder value.

Executives want clear-cut rules and tools with which to navigate complex stakeholder expectations. Investors and civil society organisations want solid, comparable information to enable them to reward leaders and discourage laggards. Accountants recognise that traditional financial measures do not capture critical but often hard to measure intangible assets, and want to improve their valuation of the new marketplace. For example, there is growing recognition in both national and international accounting societies that the failure to value patents, brands and other forms of intellectual capital on corporate balance sheets is leading to distortions in the financial markets. Similarly, the cautionary tales of Monsanto in the biotechnology and environment area or Nike in the labour arena have taught corporate leaders that in an Internet-driven spotlight they must learn to understand, measure, and manage their social and environmental impacts more diligently. Until now, there has been no accepted methodology for such assessment, which is why scores of international companies are experimenting with the GRI format.

With any new instrument there are pitfalls, dividing lines and trade-offs. Activists would like the GRI guidelines to become more detailed and searching; others worry that if the GRI becomes too complex smaller firms will find it difficult to follow. Some civil society groups would like the GRI format to be reinforced by government mandates and strict verification rules, whereas many companies would like the project to remain voluntary.

In time, a balance between these concerns will be struck. Rigorous technical work and careful consensus building should lead to the "general acceptance" now taken for granted in accounting. The GRI is a key partner in this effort to harness the shared concerns about sustainability, and to do its part to help governments and international organisations move forward.

The historic significance and impact of the GRI will probably only be fully discerned after five or ten years. In the short term, the next major step for the GRI will be the creation of a permanent secretariat. The target date for this is mid 2002, before the World Summit on Sustainable Development.

OECD governments can play an important role in the future development of the GRI. Providing high-level contact points, hosting or funding national or regional meetings, provision of feedback and ideas: all this can help. OECD countries are paying more attention to GRI. They have a key responsibility in crafting a new blueprint for development, which finally puts the leading industrialised countries on the path to sustainable development. ■

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- For further details on GRI, visit its website at http://www.globalreporting.org

Responsible corporate behaviour for sustainable development

Bill Witherell (Head) and **Maria Maher**, OECD Directorate for Financial, Fiscal and Enterprise Affairs

The private sector is a vital component of sustainable economic growth in a global economy. But the freedom multinational corporations have to operate internationally carries with it a responsibility to help ensure that the social and environmental costs of their business activities do not outweigh the benefits.

It may be fashionable to blame large private corporations for many of the ills done to our planet over the years. Those who are tempted to do so should not forget two things: first, the private sector will continue to be a major driver of economic growth in the years ahead; and second, sustainable development, which depends on growth, will not be achieved without the private sector. The key is for private enterprises to behave responsibly, both at home and abroad, so that growth can flourish without damaging the environment or social fabric of the countries where they operate.

In the past two decades, worldwide production and consumption of goods and services have become increasingly international. In the six years from 1993 to 1999, world foreign direct investment (FDI) flows increased from just over US$200 billion to around $800 billion, and they are estimated to have passed the US$1 trillion mark in 2000. It is a similar story with international trade.

International trade and investment are important for integrating developing countries into the global economy, transferring technology to those countries and helping them to expand. Trade and investment are not the root causes of environmental and social problems, but they can amplify such difficulties unless government policies and the practices of multinational enterprises (MNEs) act to avoid or offset possible harmful effects. The environment is a case in point. On the negative side, trade and investment liberalisation may lead to increased production and consumption of polluting goods or to an expansion in industrial activity. This can lead to over-exploitation of resources, rampant urbanisation, or damage to protected areas, posing problems for pollution control, ecological protection and public health.

But trade and investment flows can also bring new technologies that help ease pollution or reduce land-use pressures. Tighter environmental regulations at home give MNEs a strong incentive to innovate in areas that improve resource efficiency or reduce industrial waste, which firms can apply on a worldwide basis to benefit from economies of scale. FDI can also have positive spillover effects since domestic firms may imitate the technological practices of multinational corporations established in their market.

There are social impacts too, particularly on the labour market. While foreign firms create employment, the quality of that employment, and the way workers are treated, is sometimes questioned. When governments compete to attract FDI, some may be tempted to be less vigilant in enforcing laws that promote core labour standards. However, a number of recent studies suggest that fears about a lowering of core labour standards are probably exaggerated.

The risk of companies shifting their activities to countries with low environmental standards is rather small.

The private sector does not operate in a regulatory vacuum. Corporations evolve within a framework of rules, whether those of their home country,

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The new face of corporate responsibility

the host country, international standards, such as the OECD's MNE Guidelines and Principles of Corporate Governance, or their own codes of corporate conduct. Some governments could be tempted to relax their environmental standards, or at least not upgrade existing low standards, in order to attract certain types of investment. Some companies, too, may be reluctant to pay the higher costs of more stringent environmental standards in one country, preferring to go elsewhere where standards are easier and cheaper to meet. However, the evidence shows that the risk of companies shifting their activities to low standard countries is rather small. In fact, what multinational enterprises generally seek is consistent – rather than lax – environmental enforcement.

Corporations and governments have come under increasing public pressure to be seen to be making an effort. Multinational enterprises in particular have worked with trade unions, non-governmental organisations and governments in recent years in a number of voluntary initiatives aimed at promoting corporate responsibility and sustainable development. Many have issued codes of conduct and designed management systems to stimulate compliance with these commitments. These corporate codes lay down a firm's commitments in areas such as environmental management, human rights, labour standards, the fight against corruption, consumer protection, information disclosure, competition, and science and technology.

Their most common commitment is to assure compliance with relevant laws and regulations. More recently, steps have been taken to formulate standards for business reporting on non-financial performance. However, these initiatives are voluntary and significant divergences exist between companies as to what is included in their codes.

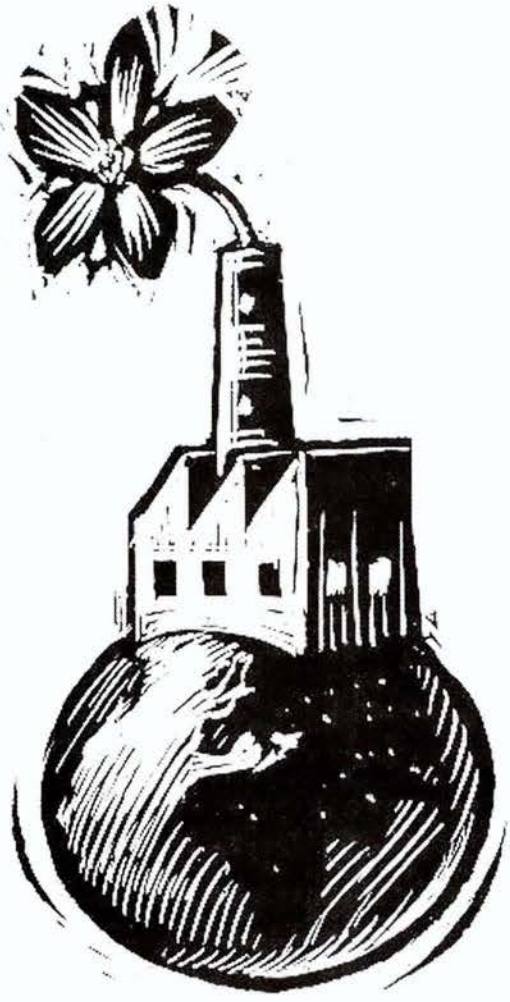
Many firms have developed management systems to implement their codes of conduct, particularly when it comes to the environment. An effective environmental management system (EMS) identifies and controls environment-related risks and increases cost savings through more efficient use of resources and energy. Some firms publish details of such efforts in order to boost the credibility of their environmental commitments. International standards have been developed which make it easier to compare performances.

But on the whole, such reporting by corporations is relatively uncommon and there are few widely accepted standards on what information should be included. As a result, high environmental impact firms differ markedly in what information they publish and how they present it.

These private initiatives often complement government-orchestrated initiatives, and they are increasingly integrated into regulatory or public enforcement strategy. This may eventually lead to greater consensus among businesses and other parts of civil society about the appropriate scope and nature of commitments in the various areas of business conduct, and about the management and reporting practices that are needed to support them.

OECD member countries have also launched several initiatives to promote responsible corporate behaviour in line with sustainable development, including the OECD Principles of Corporate Governance, the OECD Guidelines for Multinational Enterprises and the OECD Bribery Convention.

Apart from sustainable development objectives, good corporate



Good corporate governance regimes make good business sense, helping maintain investor confidence and to attract longer-term capital.

governance regimes make good business sense too. They help to maintain the confidence of investors – both foreign and domestic – and to attract longer-term capital, which is particularly important for developing countries. The OECD Principles of Corporate Governance advocate protection of shareholders' rights, including minority and foreign shareholders. They recognise the role that stakeholders play in contributing to the sustainability of financially sound enterprises, and that factors such as business ethics and corporate awareness of environmental and social concerns impact on the reputation and long-term success of a company.

The OECD Guidelines for Multinational Enterprises provide a government-backed standard of good corporate behaviour and help to level the playing field between competitors in the international market place. A review updated the Guidelines in 2000 so that they now encourage social and environmental accountability as well as improved environmental performance. They now cover all internationally recognised core labour standards and include recommendations on human rights, combating corruption and consumer protection. Though still voluntary, their implementation procedures were enhanced.

Sustainable development depends on fighting corruption too. Bribes can lead government officials to promote costly infrastructure projects and award contracts with scant regard for their environmental or social impact. The OECD Convention on Combating Bribery aims to stop bribery of foreign public officials in international business transactions.

These are all perhaps imperfect, but nonetheless invaluable, instruments for positively influencing corporate behaviour. As the economy goes global, so must the framework of rules to ensure truly sustainable development for all – and that means all stakeholders, whether business, government, labour and civil society, working together for the benefit of everyone, not just themselves. ■

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The genomics revolution

Stefan Michalowski, OECD Global Science Forum, and **Risaburo Nezu**, Head of OECD Science, Technology and Industry Directorate

What do worms, fruit flies and people have in common? In fact, humans have a great deal in common genetically with other organisms, even "primitive" ones. Apart from that, they share the distinction of being among the first DNA blueprints to have been mapped and published. But while the publication of the human genome holds great scientific and medical promise, serious challenges have to be faced, from research systems and costs to intellectual property regimes.

The human genome – that is, the sequence of some 3 billion pieces of information that constitute the physical recipe for making a human being – was published in February 2001 following years of effort by public and private research institutions. Innumerable commentators have pronounced this event to be a milestone in the history of science and medicine, and so it is. Humans now join that select company of two dozen or so species whose DNA blueprints are known. This is a decidedly motley group, including the worm *Caenorhabditis elegans*, the fruit fly *Drosophila melanogaster*, the cholera bacterium *Vibrio cholerae*, and the common weed *Arabidopsis thaliana*.

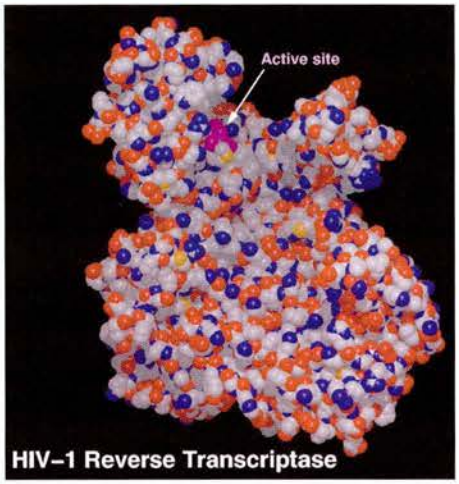
The human sequence can be useful in and of itself (it is a basis, for example, for studying genetic susceptibility to diseases) but a key message to policymakers is that sequencing is merely the beginning of a much bigger quest to determine the functions of the proteins whose composition is encoded by DNA. It is *functional* information about the immensely complex and finely balanced interactions of large protein molecules (and other components of living cells) that will produce the ultimate rewards of the genomics revolution: innovative medical tests, drugs, and therapies.

This new quest, sometimes known as "post-genomics", will require very large investments in infrastructure and training, and it will pose tricky ethical, legal, and political problems. Government officials, legislators, judges, academics and members of the public will all be called upon to wrestle with some difficult problems in the years ahead. A preview of these challenges and opportunities can be had by examining one of several new sub-fields of modern biology: "structural genomics". This was recently the subject of an intergovernmental consultation by the OECD Global Science Forum.

Knowledge of the three-dimensional physical structures of proteins is vitally important, since structure is closely linked to biological function. For example, knowledge of the atomic configuration of a key protein component of the HIV virus (the enzyme reverse transcriptase) has allowed scientists to design a small molecule that latches onto the protein and interferes with its function, thus slowing the progress of the disease.

The availability of complete genomes has inspired some scientists to propose that the corresponding

Knowledge of the atomic configuration of a protein component of the HIV virus has allowed scientists to design a small molecule that latches onto the protein and slows the disease.



structural information should be obtained for hundreds of thousands of proteins. Hence the term "structural genomics". Interestingly, structural genomics initiatives have arisen almost simultaneously in the academic and industrial communities. Since these undertakings would be very costly and time-consuming, the obvious questions arise: what are the most appropriate roles for the public and private sectors, and how should public money be spent to optimise desirable outcomes – advancing science, promoting economic growth, and delivering the fruits of research to the public.

Post-genomics may also be a major source of future industrial competitiveness and wealth creation. Not surprisingly, public authorities are concerned about getting left behind. US researchers, benefiting from generous government programmes, have built up a strong lead in the field, with their Japanese colleagues not far behind, while Europeans are searching for ways to advance via the right mix of national and EU-based programmes. Three aspects of structural genomics deserve the special attention of science policymakers: research infrastructure (facilities and equipment), the scope of the research, and intellectual property rights (IPR).

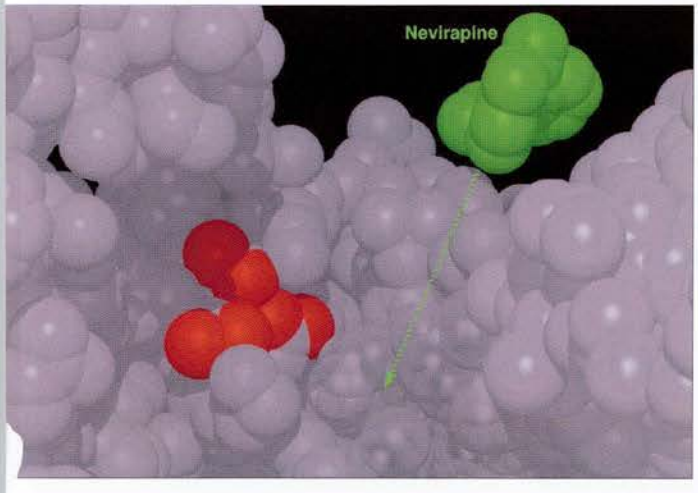
Take **research infrastructures** first. Structural analysis of proteins consists of a series of complex and difficult steps. It typically takes from several weeks to a few months to determine the structure of a single protein of medium size, starting from the simple knowledge of the corresponding gene sequence. The work must be done by a doctoral-level scientist, using sophisticated instrumentation and high-performance computers. To get an idea of the scale of the challenge posed by structural genomics, genomes of even simple organisms encode information for thousands of distinct proteins (for humans, this number probably exceeds 100,000). Two principal experimental methods are in use: X-ray crystallography, and nuclear magnetic resonance (NMR).

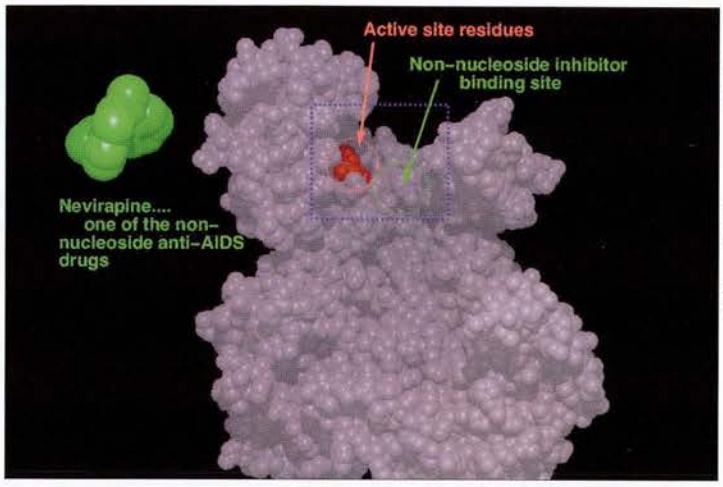
X-rays for structural measurements are generated in electron storage rings which can cost several hundred million dollars. They are built and operated by governments, and each machine can service dozens of experiments simultaneously. University-based scientists do not have to pay for X-rays if their work has been approved and funded by the appropriate government agency. Private companies can perform proprietary research at an X-ray facility, provided they pay a fair share of the operating cost . They may also finance the construction of special purpose equipment (a "beam line") for their own exclusive use.

But to what extent should governments use public funds to build large research infrastructures for use by private companies? During the next few years, policymakers and laboratory officials may be faced with difficult questions like this, about allocating X-ray sources between paying and non-paying users. In the long run, science and technology may provide a solution. "Free-electron lasers" are currently under development in several countries, which could generate X-ray beams with intensities several orders of magnitude higher than those from storage rings. That would provide more than enough X-rays to go around, although the facilities themselves would remain extremely expensive.

The second big challenge concerns the **scope of structural genomics**. Because structural analysis is so expensive and time-consuming, great care must be taken in choosing the right set of proteins for study. Industrial researchers are more likely to focus on molecules that are linked to diseases (for example, viral enzymes) since these may be promising "drug targets". Academic researchers may be more inclined to study proteins that provide insight into broader questions, like cellular metabolism or evolutionary theory. There is no clear dividing line between these lines of inquiry. Some co-ordinating mechanism, possibly involving all interested governments, may probably need to be established to promote exchange of information about which proteins are being analysed, and to avoid unnecessary duplication of effort.

The results of industrial R&D are not always published, and this can lead to peculiar effects. The genome of rice





was recently sequenced by a private company, but not made fully available to the scientific community. Therefore, a publicly-financed rice-sequencing project is proceeding (at great expense to the international taxpayer) with the goal of providing the public with the same information that already exists in a private data bank. Similar situations can be expected in the case of structural genomics. Private companies may, however, be moving in the direction of more openness and transparency. Discussions are currently under way towards the establishment of industrial consortia that will jointly undertake high-throughput structural work on very large numbers of proteins, and will publish most of the results. While this approach may seem to weaken the competitive advantage of each member of the consortium, it also protects all the partners from having a competitor stumble onto a major discovery without the others knowing. This is a safe business strategy, considering that structure-determination is just one of the long and costly steps involved in developing a drug and bringing it to market. Such arrangements could well involve partnerships with publicly-funded institutions.

Intellectual Property Rights (IPR) form the third key challenge. Questions surrounding the patentability of the results of genomic research are controversial and complex, and the courts will be busy for some time before a consistent set of rules emerges. The degree to which protein structures are themselves patentable is not fully resolved. Neither is the connection to any underlying patent on the genetic sequence of the same protein. To some extent, IPR represents an obstacle to the advance of structural genomics, since many researchers may be understandably reluctant to put potentially lucrative information into the public domain. It is not clear whether the standards agreed to by scientists and institutions that participated in the Human Genome Project (which put great emphasis on the rapid release of raw data) would be easily transferable to a publicly-funded structural genomics project. The differences between patent regulations in Europe, the United States and Japan, for example, with regard to the "grace period" that applies between releasing results and applying for patent protection, complicate matters still further.

Post-genomics may also be a major source of future industrial competitiveness and wealth creation. Not surprisingly, public authorities are concerned about getting left behind.

Interestingly, the advance in science itself may render obsolete some of the difficult questions that surround patentability of genes and protein structures. The granting of a patent is contingent on the "novelty" and "non-obviousness" of the discovery. Many scientists hope one day to be able to derive protein structures computationally from genomic sequences alone, thus saving enormous amounts of time, money and effort. Should this happen, structure determination would become routine and inexpensive. This would radically alter the legal environment within which modern biology is developing. So while the publishing of the human genome was a giant step, it was just the beginning. ■

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Digital earth: saving the environment

Daniel C. Esty, Yale University and INSEAD (Visiting Professor), France

At the height of the dot.com boom, brash Digital Age gurus declared with great fervour that "the Internet changes everything". Though their voices are quieter now, the revolutionary potential of information technology breakthroughs remains significant. The environment is one key area where the application of computer power and related innovations holds considerable unexplored promise.

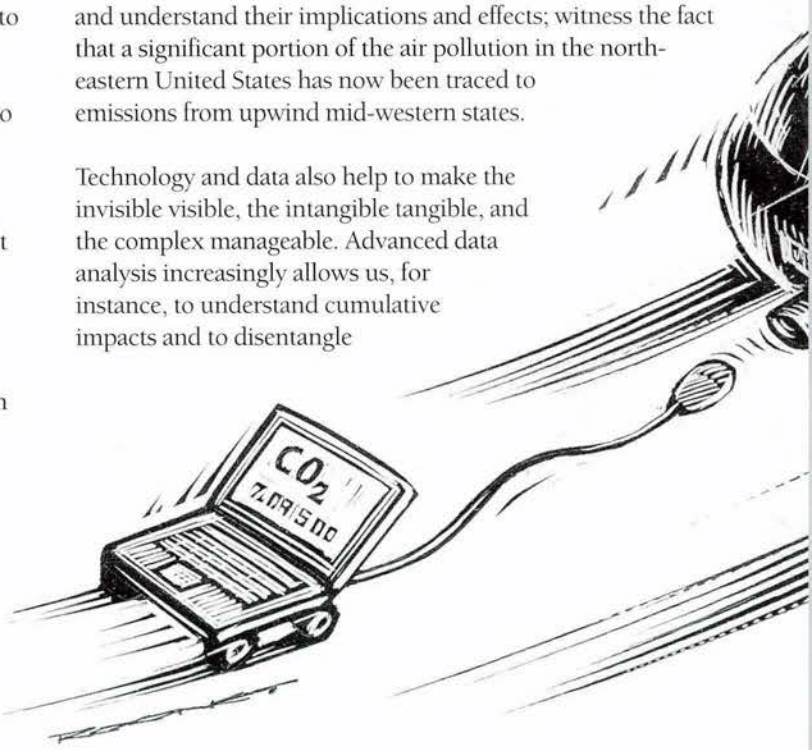
Environmental policymaking has long focused on the need to internalise "externalities" and to manage shared natural resources in a sustainable fashion. Factories pumping emissions out of their smokestacks, or fishermen hauling too many fish from the sea, are just two classic challenges. Elaborate governmental regimes have been designed to redress these market failures and the economic inefficiency, lost social welfare and ecological degradation they bring. But our efforts often fall short. One reason is a lack of information. Not knowing who holds the environmental rights, what are the sources of harm, or the "fate and transport" of emissions, makes policymaking difficult. Information gaps also plague efforts to understand effects on health, and how to value those effects.

Pollution may also arise from "waste", reflecting the use of unsophisticated technologies, ignorance, or mistakes. Polluters or resource users would often be willing to switch to less harmful production or consumption practices if they had information about better alternatives. People have now learned, for example, that they can replace their traditional incandescent bulbs with high-efficiency fluorescent lighting, reducing electricity use and cutting both pollution and costs.

Digital opportunity

Ignorance should not be a problem in the Information Age and indeed technological breakthroughs should help us to manage the environment better. The computer, with its extraordinary capacity to gather, sort, analyse, store and retrieve data represents a particularly important tool that has yet to be fully harnessed. And, beyond the extraordinary advances in information processing, progress is being made in related technologies such as sensors and telecommunications as well as in computer modelling and statistical analysis. These breakthroughs make it easier to spot environmental problems, assess their scope and seriousness, and understand their implications and effects; witness the fact that a significant portion of the air pollution in the north-eastern United States has now been traced to emissions from upwind mid-western states.

Technology and data also help to make the invisible visible, the intangible tangible, and the complex manageable. Advanced data analysis increasingly allows us, for instance, to understand cumulative impacts and to disentangle

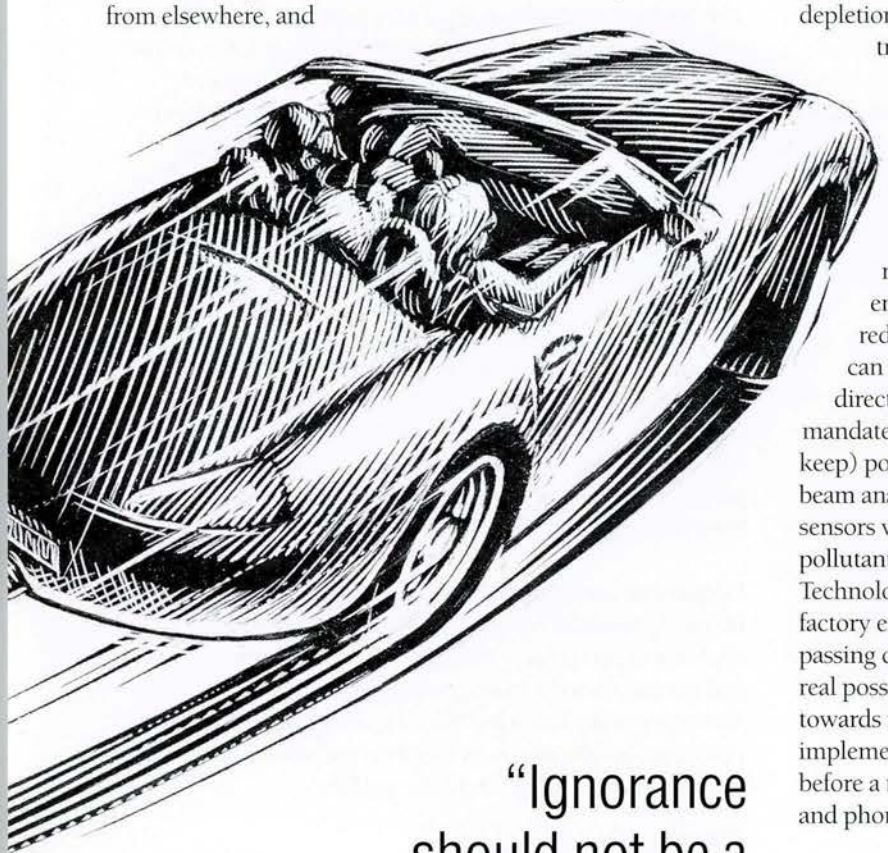


the interconnections among different environmental risks. It is thanks to advances like these that we now know that radon exposure represents a much greater threat to smokers than to those who do not smoke.

A more solid information base further promises to re-cast

debates in the environmental realm, which has often been dismissed as "soft". Rhetoric and emotion will increasingly be supplanted by a hard focus on key problems and the search for workable solutions. A heat wave does not make the case for global warming, but long-term temperature trends might. Facts, figures, and tracking data on key indicators can narrow the range of environmental disputes and reduce the polarisation that often marks policy debates today, whether about climate change or pollution of a local stream.

New technologies also make it easier to identify better response strategies. Both corporate and public decision-makers are today able to compare policy options quickly and cost-effectively, obtain detailed information on experiences from elsewhere, and determine which interventions have been most successful. In short, environmental decisions can now be made with more data-driven and analytically rigorous underpinnings.



"Ignorance should not be a problem in the Information Age and technological breakthroughs should help us to manage the environment better"

Virtual property

Information systems can transform our policy options as well. Just as property rights give farmers the incentive to manage their land on a sustainable basis, digital technologies can be deployed as "virtual barbed wire" to improve the management of shared resources and avoid their over-exploitation. Take fish stocks, for instance. The oceans were once seen as a limitless, open access resource, which any fisherman was free to exploit. But the result was inevitable: depletion of fish stocks (see article by Paul Wallis). Today's tracking and monitoring devices, however, make it possible to avoid a "tragedy of the commons" by allocating fishery shares and managing yields responsibly.

More generally, the Internet makes markets work more efficiently. Where environmental property rights can be defined and defended, a more robust environmental marketplace can thus be erected, reducing the intrusiveness of regulation. In fact, one can imagine the day when citizens will be compensated directly by polluters, rather than having the government mandate investments in emission control or collect (and keep) pollution fees. Remote sensing, laser technologies, ion beam analysis, nano-technologies and other small-scale sensors will soon make it possible for virtually every pollutant to be tracked, measured, and even price tagged. Technologies are already available that permit easy analysis of factory emissions, and even the exhaust from the tailpipe of a passing car. Full internalisation of such costs has become a real possibility. Regulation more generally can be shifted towards more use of economic incentives and implementation of the Polluter Pays Principle. Can it be long before a monthly pollution invoice arrives with the electricity and phone bills?

Customisation and optimal specificity

Environmental decision-making has traditionally been marked by deep uncertainties. Identifying individual sources of harm and connecting specific emissions to particular victims is expensive and hard to do. But the errors that arise from relying on gross averages and other over-generalisations also entail costs. Just ask an asthmatic who lives in a place where air pollution standards are set according to the needs of those with healthy lungs.

Low-cost and easily accessible data make it easier to improve the "optimal specificity" of regulation and permit customised emissions control. The potential to individually tailor pollution requirements and to respect diversity is already evident. Under the US acid rain control programme, for instance, "real-time" SO_2 smokestack monitors have been installed at power plants. These facilitate a strict allocation of pollution allowances and a trading regime that induces those best able to reduce their emissions to do so, while lowering overall costs on society.

Dematerialisation

Perhaps the greatest gains from the Digital Age will come from substituting bytes for atoms and advanced information systems for polluting activities. Computers have helped to refine product design and manufacturing, and in combination with progress in metallurgy and polymers, have reduced the material requirements for all kinds of products, from cars to soft-drink containers. In fact, a mid-sized car today weighs about 300 kilos (660 pounds) less than it did 25 years ago. New "smart" appliances, like computerised thermostats that turn down the heat when people are out of the house or asleep, are already helping to reduce environmental pressures. Biotechnology also holds great promise. Crops that do not require pesticides or fertilisers would be a boon to efforts to address water pollution and soil degradation. And the mapping of the human genome may make it possible to understand human susceptibility to various pollutants on an individualised basis.

Many polluters or resource users would shift to less harmful production or consumption practices if they had better information.

Information sharing

A data-rich world is also a more transparent one where comparisons are easy to make. No-one likes to be seen as a poor environmental performer. The recent outrage in Belgium at being ranked 79th in the World Economic Forum's Environmental Sustainability Index shows the power of comparative analysis and peer pressure. Having pollution levels and natural resource stocks tracked and reported highlights for environmental laggards – countries, communities, companies, and individuals – the opportunities that exist to adopt better practices and technologies. With data readily at hand, environmental groups, community organisations and the media can more easily prod governments and businesses into doing better. And greater transparency helps to smoke out cases where special interests are distorting policy choices.

Downsides

Technological advances and information-driven innovation present challenges as well as opportunities. Productivity advances and economic growth from digital technologies may fuel more consumption, resulting in more pollution. Whether emissions per car will fall fast enough to keep up with the growing number of cars is a serious question.

The Internet can facilitate the dissemination of bad ideas, as well as good ones. Moreover, the availability of information does not guarantee its proper use, and public choice distortions can still occur. Finding ways to diffuse information on best practices and technologies, while limiting information overload and disinformation, are important challenges. Overcoming inertia and the institutional obstacles to change will also require creativity. In particular, even if it is technologically possible to charge polluters, will the public support this internalisation of costs?

Another key issue is whether environmental information is a public good or a private (and strategic) one. Will new technologies and advances in processes be brought in more quickly if companies can profit from them? Or should we subsidise investments in environmental knowledge so as to maximise the dissemination of the benefits as quickly as possible?

Despite the downsides, the potential for environmental gains in the Information Age remains great. The process of applying digital power to the challenges of pollution control and natural resource management has just begun. Technology may not bring an end to environmental problems, but the advances that lie ahead could improve the chances of good policies actually working.

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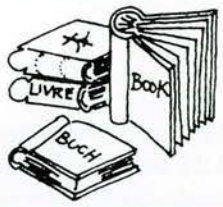

Which energy source?

Nuclear power today is an important part of the current energy mix, providing nearly a quarter of power generation. However, its future is uncertain, according to a new book published by the International Energy Agency, *Nuclear Power in the OECD Countries*, which reviews the status and prospects for nuclear power generation in OECD countries. In the immediate future, the only OECD countries where new nuclear plants are expected are Japan, Korea and possibly Finland. While existing nuclear power plants are generally in a sound economic position, their high capital costs together with today's relatively low fossil fuel prices mean that new plants face formidable competition from fossil fuel generation. Indeed, the IEA's *World Energy Outlook 2000* projects that by 2020, nuclear power's share of OECD electricity will fall to 14%, dwarfed by the contributions from coal-fired generation (36%) and natural gas-fired generation (31%) and will be only slightly larger than that of hydropower (12%). Renewable energy sources other than hydropower, including wind, solar and biomass are expected to double their share over the period, but these sources will account for only 4% of OECD power generation by 2020, and much of the increase will be stimulated by policy incentives.

Other considerations, like having a secure energy supply, have influenced the current mix of generating plants, such as in those countries that have developed nuclear power in the past but also, more recently, in those that favoured developing renewable energy sources. Environment and plant safety concerns have influenced decisions too: almost half of OECD countries have placed legal or policy restrictions on building new nuclear power plants. Disposal facilities for high level nuclear waste are under development, but face technical and political hurdles. Nonetheless, the future of nuclear power and renewable energy would improve if their capital costs fell or if fossil fuel prices climbed.

Chemically speaking

The chemicals industry is an important part of the world economy. With an estimated 1,500 billion US dollars in sales in 1998, it accounts for 7% of global income and 9% of global trade, and employs more than 10 million people worldwide. Chemicals produced by the chemicals industry are present in countless consumer products from pesticides and automobiles to toys and clothing. But there are also possible risks from exposure to chemical production and use. While the chemicals industry has made progress in reducing its overall environmental impact, chemicals can still have a negative impact on human health and the environment. *The OECD Environmental Outlook for the Chemicals Industry* gives an outlook to 2020 for production, use and consumption of chemicals in OECD countries and elsewhere, as well as their impact on the environment. It identifies key chemical safety issues for the future and policy options to address them, notably greater responsibility for industry in providing and assessing data, and more involvement of workers and the public in monitoring and contributing to discussions on chemical safety management.

- More information on OECD work related to chemical safety can be found at www.oecd.org/ehs and on environment at www.oecd.org/env

A 1000-year view

The world's population has risen 22-fold since the year 1000, while per capita gross domestic product has increased 13-fold and world GDP nearly 300-fold, with the biggest gains occurring in the rich countries of today (Western Europe, North America, Australasia and Japan). But in the year 1000, the rich countries of today were poorer than Asia and Africa. Angus Maddison looks at what influences the economic performance of nations over such long periods in a new book for the OECD Development Centre, *The World Economy: A Millennial Perspective*. The book seeks to

identify the forces that explain the success of the rich countries and explore the obstacles which hindered advance in regions which lagged behind. He also scrutinises the relationship between the rich countries and the rest of the world to assess the degree to which this relationship was exploitative. The book is to be published in June 2001; check www.oecd.org/bookshop/ for details.

A cheaper pint and cab home...

Further reform of the services and transport sector in Ireland would have several benefits. Making it cheaper to drink in pubs and cutting the cost of taking a taxi home are among them, the OECD says in a new report *Regulatory Reform in Ireland*. Limits on licenses granted to taxis and high entry costs led to frequent shortages of supply, with substantial queues and a knock-on effect on business activity. Regulations introduced in November 2000 lifted limits on the number of licences and could bring prices down, but the new regime is currently being tested in the courts. It is a similar story for pubs, where lifting restrictions on granting new licences would cut the cost of drinks for consumers and enable pubs to open in areas where there is most demand for them, the OECD said. Elsewhere in the economy, regulatory reform is helping to manage the consequences of the fast growth of the 1990s and to sustain expansion into the future.

...while telecoms in Italy could be reformed more

Italy's regulatory problems are more focused on the state sector, particularly gas and telecommunications, says the OECD's new report *Regulatory Reform in Italy*. The Italy of 2001 is far advanced compared to the Italy of 1990, but there is a substantial, urgent reform agenda still outstanding. The OECD recognised bold and innovative reforms in the gas sector, but said the two most important issues for further reform are reducing the market share of national gas operator ENI and further separation of its vertically integrated structure. In telecommunications, unbundling the local loop is a particular priority because of the almost total lack of an alternative infrastructure.

New publications May-June 2001

All publications available in paper and electronic book format. This is a selected list. For more titles, please consult www.oecd.org/bookshop

AGRICULTURE AND FOOD

OECD Agricultural Outlook, 2001/2006 2001 Edition
What is the role of government policies and how are they influencing farmers' decisions? What has been the effect of the Uruguay Round agreement in opening up markets? This Outlook provides valuable information on market trends and medium term prospects for the main agricultural products, shows how these are influenced by government policies, and highlights some of the risks and uncertainties that may influence the outlook, up to 2006. See review in this section.
OECD Code: 512001061P1
ISBN: 9264186328
May 2001, 150 pages
44 tables, 53 charts
€38 FF249 US$34 DM74 £23 ¥3,850

Multifunctionality: Towards an Analytical Framework
OECD Code: 512001041P1
ISBN: 9264186255
May 2001, 180 pages
12 tables, 27 charts
€42 FF276 US$37 DM82 £25 ¥4,005

Review of Agricultural Policies: Slovenia
OECD Code: 142001031P1
ISBN: 9264185933
April 2001, 186 pages
90 tables, 52 charts
€58 FF390 US$51 DM114 £35 ¥5,560

DEVELOPMENT AND AID

The World Economy, A Millennial Perspective
By Angus Maddison, see review in this section.
OECD Code: 412001011P1
ISBN: 9264186085
June 2001, 384 pages
179 tables, 12 charts
€29 FF190 US$26 DM57 £19 ¥2,900

Bond Market Development in Asia
OECD Code: 142001051P1 ISBN: 9264186298
April 2001, 452 pages
76 tables, 58 charts
€76 FF499 US$66 DM149 £46 ¥7,250

Aid Activities in Least Developed Countries, 1999
OECD Code: 432001543P1
ISBN: 9264086668
April 2001, 300 pages
Free, only available electronically

ECONOMICS

OECD Economic Outlook, no. 69
OECD Code: 122001691P1
ISBN: 9264191003
June 2001
€48 FF315 US$55 DM94 £32 ¥6,000

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May 2001, 103 pages
28 tables, 34 charts

Portugal 2000/2001
Special features: Reforming the Tax System, Structural Reform for Sustaining High Growth.
OECD Code: 102001231P1
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EDUCATION

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Higher Education Management, Volume 13 Issue 1
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ISBN: 9264186425
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€33 FF22 US$35 DM65 £23 ¥4,350

ENERGY

Nuclear Power in the OECD Countries
IEA publication, see review in this section.
OECD Code: 612001051P1; IEA publication.
ISBN: 9264185798
April 2001, 179 pages
€134 FF879 US$120 DM262 £82 ¥13,500

Gas Generation and Migration in Radioactive Waste Disposal: Safety-relevant Issues Workshop proceedings, June 2000
OECD Code: 662001051P1
ISBN: 9264186727
April 2001, 192 pages
€45 FF295 US$39 DM88 £27 ¥4,300

Energy Prices and Taxes
First Quarter 2001 Volume 2001 Issue 2
OECD Code: 622001021P1
ISBN: 9264190694
April 2001, 514 pages
€101 FF663 US$110 DM198 £67 ¥12,750

Oil, Gas, Coal and Electricity
Quarterly Statistics Fourth Quarter 2000
OECD Code: 602001013P1
ISBN: 9264090649
April 2001, 542 pages
820 tables, 10 charts
€102 FF669 US$110 DM200 £67 ¥12,800

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Policies to Enhance Sustainable Development
Sustainable development involves linking the economic, social and environmental objectives of societies in a balanced way. This report focuses particularly on how the use of the price system, reform of governments' decision-making processes, technology policies, and international trade and investment may each contribute to removing incentives to unsustainable resource depletion and environmental degradation.
OECD Code: 032001021P1
ISBN: 9264186611
May 2001, 70 pages
€20 FF131 US$19 DM39 £12 ¥1,900

OECD Environmental Outlook for the Chemicals Industry
OECD Code: 972001061P1 ISBN: 9264186557
June 2001, 130 pages
30 tables, 24 charts
Free, only available electronically

OECD Environmental Outlook
OECD Code: 972001011P1
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OECD Code: 972001021P1
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Iceland
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ISBN: 9264086277
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OECD Code: 142001091P1
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ISBN: 9264186603
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57 tables, 23 charts
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Editors: Richard Allen, Daniel Tommasi
OECD Code: 422001051P1
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TRADE

China's Agriculture in the International Trading System
Significant domestic policy reform and structural adjustment will be critical to enable China to realise its comparative advantage in agriculture and to redeploy an estimated 150 million redundant farmers. To sharpen understanding of the policy options, the OECD invited Chinese and international experts to reflect upon the likely impacts of freer trade on China's agricultural sector.
OECD Code: 142001111P1
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€60 FF394 US$52 DM117 £36 ¥5,700

TRANSPORT

Assessing the Benefits of Transport
This book discusses the full economic benefits and costs of transport infrastructure and explores ways to make good estimates of the full impact of planned investments on regional and national economies.
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April 2001, 216 pages
19 tables, 10 charts
€50 FF328 US$45 DM98 £31 ¥5,050

Emission impossible?

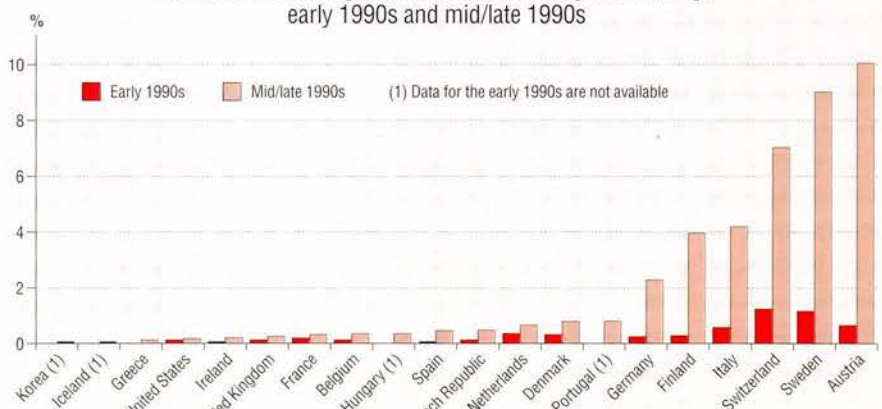
CO_2 emissions tonnes per capita, 1998

Source: OECD

The United States leads the industrial world when it comes to carbon dioxide emissions, at 20.1 tonnes per inhabitant in 1998, almost double the overall OECD level of 10.9 tonnes per head. The European Union, by contrast, produced less than half that amount, as did Japan. Among the G7 industrial countries, only Canada and the United States have emissions above the overall OECD level, while France claims the distinction of the lowest CO_2 emissions per head, at 6.4 tonnes. Turkey produces the least carbon dioxide per head in the OECD at just 2.9 tonnes. The OECD's newest member, the Slovak Republic, produces more CO_2 than France, at 6.9 tonnes per head, but less than Italy's 7.5 tonnes per head. Emissions of CO_2 in OECD countries, far from falling in line with the 1997 Kyoto international agreement on climate change, are in fact expected to increase by a third by 2020 if no major new policies are put in place. The cause is increased transport and energy use. Without action, urban air quality is expected to worsen, affecting human health. Biodiversity and natural habitats would deteriorate, and pollution of groundwater reserves by nutrients and toxic chemicals would increase. (See article by Joke Waller-Hunter.)

Organic growth

Share of the total agricultural area under organic farming: early 1990s and mid/late 1990s



Source: OECD

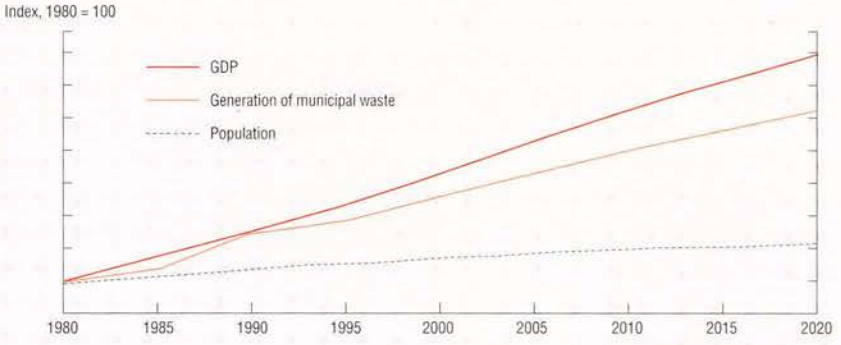
The share of agricultural land under organic farming has increased significantly over the past ten years. But while several countries actively encourage conversion to organic farming through subsidies, its coverage remains fairly small compared with agriculture under other farming systems. As the large empty spaces in our chart reflect, organic farming represents less than 1% of total farming area in most OECD countries. There has been some fast growth, in Austria and Sweden for instance; among the G7 countries, organic farming has risen the most in Germany and Italy. One attraction of organic farming is that it reduces some environmental pressures, notably from polluting chemicals. But if it is to match "conventional" production levels, a significant expansion of the organic farming area would be needed. This could reduce biodiversity if additional natural land were brought into production compared with current needs. On the other hand, productivity might improve (thus bringing down prices) if more research expenditure was shifted from conventional to organic farming systems. In short, deciding on the merits of one farming system over another, or indeed an integrated blend of the two types, depends on comparing their relative economic and environmental costs and benefits properly.

Bulging waste

More economic growth means more waste to get rid of, or at least that has been the case so far, with a 40% increase in municipal waste in OECD countries between 1980 and 1997 to some 500 kilos of it per person per year. A key environmental question for the future is therefore decoupling economic growth from the increase in waste, according to the latest *OECD Environmental Outlook*. True, the average growth rate of municipal waste production has slowed from about 3% per year in 1980 to about 1% in 1990, perhaps partly due to policies to minimise waste production. And the proportion of waste that is recycled is expected to almost double to 33% by 2020 from 18% in 1997. But if current trends continue, the total amount of municipal waste generated in OECD countries during that time is forecast to grow even faster, rising by a further 43% to 640 kilos per person (about the size of a small rhinoceros) or a total 770 million tonnes per year. And in non-OECD countries, municipal waste generation is expected to increase roughly at the same rate as GDP, which means that by 2020 it would be double the 1995 level, or around 1,300 million tonnes per year.

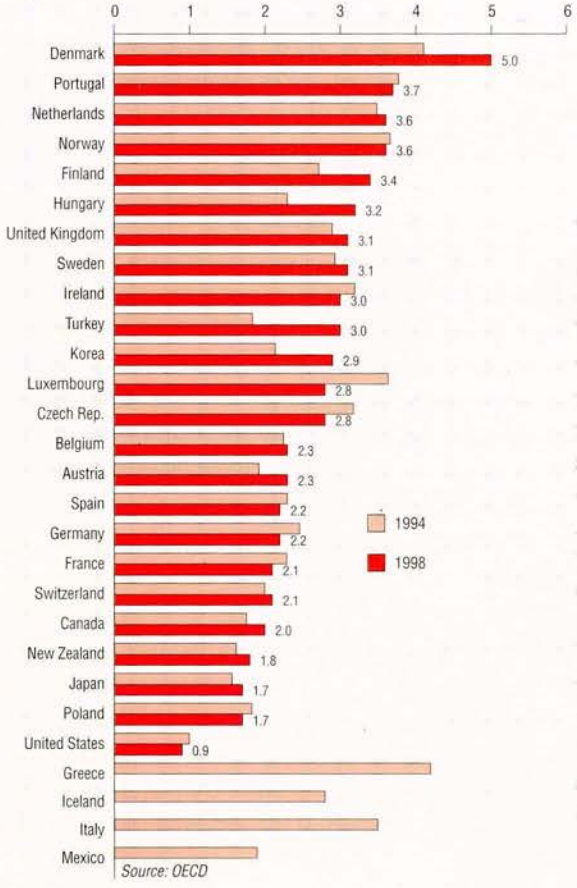
Throwaway culture

Municipal waste generation, GDP and population in OECD countries 1980-2020



Source: OECD Environmental Outlook

Green taxes % of GDP



Source: OECD

Green taxes

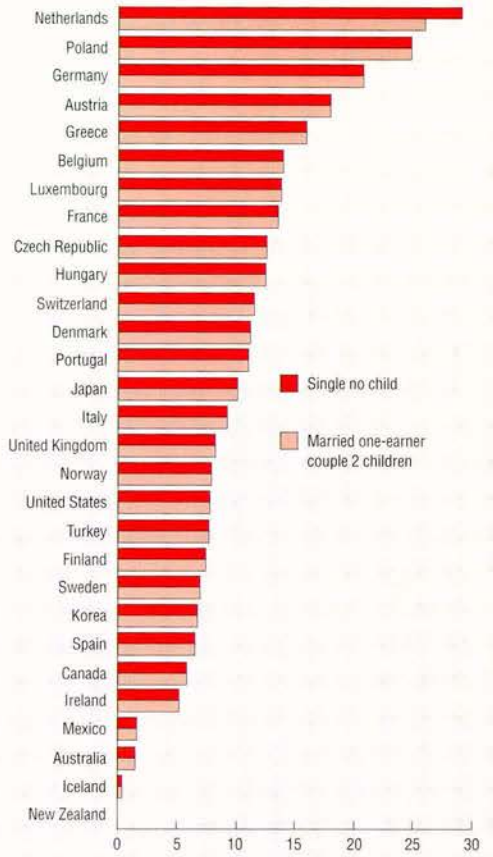
One way of keeping pollution down is to price it. Governments can establish a direct link between environmental degradation and those who cause it by imposing environmentally-related, or green, taxes, whether it be on fossil fuels to discourage their use or a landfill tax on waste disposal. Not all such taxes are deliberately green; raising VAT on petrol has an environmental effect, but the intention may simply be to raise revenue. Still, estimates suggest that a 10% increase in energy prices would reduce energy use by 5% in the long term. And the *OECD Environmental Outlook* indicates that applying a tax on fuel use and removing all energy subsidies could reduce carbon dioxide emissions by 25% by 2020 in OECD countries and 11% worldwide compared with a business-as-usual scenario. Denmark's "green" taxes accounted for 5% of GDP in 1998, up from little more than 4% in 1994, but while Turkey more than doubled its green tax level to more than 3% of GDP over the four years, the United States, Germany and France actually reduced their green tax ratio. On average, OECD environmentally-related taxes came to about 2.7% of GDP in 1998 and 7.2% of the total tax take.

Social charges

Workers in the Netherlands pay the highest social contributions among OECD countries, with 29.1% of the salary of a single worker and 26% of that of a couple with two children and one wage-earner in the family. The same worker in Iceland would lose just 0.2% of his wages in contributions, regardless of whether he or she was single or married and regardless of the number of children. But a single worker in Iceland would lose 24% of his wages in income tax, compared with 6.3% in the Netherlands. Estimates for 2000 show that for single persons with average earnings the average change in the burden between 1999 and 2000 was rarely more than 1 percentage point, according to *Taxing Wages*, 1999/2000, 2000 Edition. The exceptions were Australia, where it fell by 1.5 percentage points, and Turkey, where it rose by 6.4 points.

Who pays what

Employee contributions, by family-type (as % of gross wage), 1999



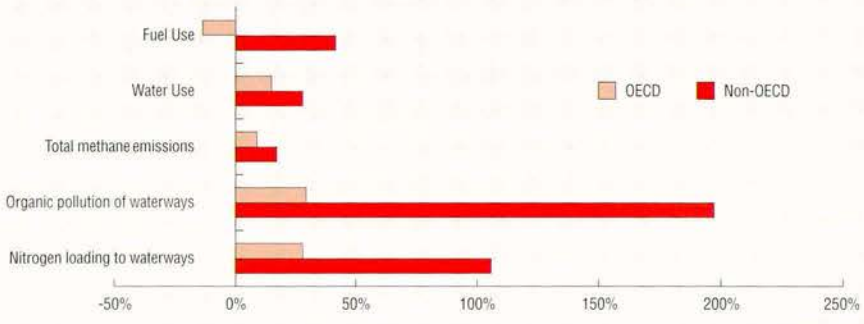
Source: OECD

Farm problems

Increased use of agrochemicals, irrigation and farm machinery in recent years in OECD countries has led to increased energy use, pollution of ground and surface water and in some places soil erosion. But agriculture can also have a beneficial effect on the environment, helping with land conservation, flood prevention and absorption of carbon dioxide from the air. OECD countries are forecast to cut fuel use for agriculture between 1995 and 2020, but this decrease will be more than offset by increased fuel use in non-OECD countries, according to *OECD Environmental Outlook*. Methane emissions, mainly from ruminant animals and handling of manure, are forecast to increase to 9% by 2020 in OECD countries and 22% worldwide, while organic pollution of waterways will soar to 200% in non-OECD countries and barely 30% in the OECD. But carbon dioxide emissions from agriculture account for only 1% of the total in OECD countries, and are expected to fall by 15% between 1995 and 2020 with further improvements in farm equipment efficiency.

Measuring pollution

Changes in environmental effects of agriculture, 1995-2020



Source: OECD Environmental Outlook

Databank

			% change from: previous period	% change from: previous year			level: current period	level: same period last year
Australia	Gross domestic product	Q4 00	-0.6	2.1	Current balance	Q4 00	-2.82	-5.28
	Leading indicator	Feb. 01	-0.2	-6.3	Unemployment rate	Feb. 01	6.9	6.7
	Consumer price index	Q4 00	0.3	5.8	Interest rate	Feb. 01	5.59	5.80
Austria	Gross domestic product	Q3 00	0.3	1.9	Current balance	Jan. 01	-0.27	-0.37
	Leading indicator	Feb. 01	-1.0	0.6	Unemployment rate	Feb. 01	3.7	4.0
	Consumer price index	Feb. 01	0.3	2.7	Interest rate*		..	..
Belgium	Gross domestic product	Q3 00	0.5	3.2	Current balance	Q4 00	2.23	3.58
	Leading indicator	Feb. 01	-3.1	-4.8	Unemployment rate	Feb. 01	6.8	7.4
	Consumer price index	Mar. 01	0.2	2.1	Interest rate*		..	..
Canada	Gross domestic product	Q4 00	0.3	4.0	Current balance	Q4 00	4.52	0.19
	Leading indicator	Feb. 01	-0.1	-5.4	Unemployment rate	Feb. 01	6.9	6.8
	Consumer price index	Feb. 01	0.4	2.9	Interest rate	Mar. 01	4.69	5.38
Czech Republic	Gross domestic product	Q4 00	..	3.9	Current balance	Q3 00	-0.51	-0.02
	Leading indicator		..	..	Unemployment rate	Q4 00	8.6	9.2
	Consumer price index	Feb. 01	0.0	4.1	Interest rate	Mar. 01	5.05	5.35
Denmark	Gross domestic product	Q4 00	0.6	2.3	Current balance	Jan. 01	0.26	-0.05
	Leading indicator	Feb. 01	-1.2	-1.1	Unemployment rate	Feb. 01	4.7	4.7
	Consumer price index	Feb. 01	0.7	2.4	Interest rate	Feb. 01	5.14	4.13
Finland	Gross domestic product	Q4 00	0.7	5.5	Current balance	Jan. 01	0.73	0.48
	Leading indicator	Oct. 00	-2.5	-1.6	Unemployment rate	Feb. 01	9.2	10.2
	Consumer price index	Feb. 01	0.6	3.1	Interest rate*		..	..
France	Gross domestic product	Q4 00	0.9	2.8	Current balance	Dec. 00	0.60	2.06
	Leading indicator	Feb. 01	-0.9	-4.0	Unemployment rate	Feb. 01	8.6	10.2
	Consumer price index	Feb. 01	0.3	1.4	Interest rate*		..	..
Germany	Gross domestic product	Q4 00	0.2	2.6	Current balance	Jan. 01	-4.93	-6.87
	Leading indicator	Feb. 01	-1.3	-2.1	Unemployment rate	Feb. 01	7.8	8.2
	Consumer price index	Feb. 01	0.6	2.6	Interest rate*		..	..
Greece	Gross domestic product	1999	..	3.4	Current balance	Dec. 00	-0.92	-0.60
	Leading indicator	Jan. 01	0.3	1.0	Unemployment rate		..	..
	Consumer price index	Feb. 01	-0.1	3.5	Interest rate	Dec. 00	5.20	9.80
Hungary	Gross domestic product	1999	..	4.4	Current balance	Jan. 01	-0.22	-0.08
	Leading indicator		..	..	Unemployment rate	Q4 00	6.3	6.9
	Consumer price index	Feb. 01	1.4	10.5	Interest rate	Jan. 01	11.50	12.20
Iceland	Gross domestic product	1999	..	4.3	Current balance	Q3 00	-0.15	-0.15
	Leading indicator		..	..	Unemployment rate	Jan. 01	1.3	1.5
	Consumer price index	Mar. 01	0.6	3.9	Interest rate	Jan. 01	11.50	10.48
Ireland	Gross domestic product	1999	..	9.8	Current balance	Q3 00	-0.59	0.11
	Leading indicator	Feb. 01	-0.9	0.4	Unemployment rate	Feb. 01	3.8	4.7
	Consumer price index	Feb. 01	0.9	5.3	Interest rate*		..	..
Italy	Gross domestic product	Q4 00	0.8	2.7	Current balance	Dec. 00	-1.05	-1.10
	Leading indicator	Feb. 01	-0.6	-2.6	Unemployment rate	Jan. 01	9.9	11.2
	Consumer price index	Mar. 01	0.1	2.8	Interest rate*		..	..
Japan	Gross domestic product	Q4 00	0.8	2.8	Current balance	Jan. 01	2.14	5.88
	Leading indicator	Feb. 01	-0.4	1.1	Unemployment rate	Feb. 01	4.7	4.8
	Consumer price index	Feb. 01	-0.3	-0.1	Interest rate	Feb. 01	0.42	0.10
Korea	Gross domestic product	Q4 00	-0.4	5.2	Current balance	Feb. 01	0.79	0.79
	Leading indicator		..	..	Unemployment rate	Feb. 01	4.2	4.4
	Consumer price index	Mar. 01	0.6	4.4	Interest rate	Feb. 01	5.70	7.10
Luxembourg	Gross domestic product	1999	..	7.5	Current balance		..	..
	Leading indicator	Feb. 01	-3.2	-4.2	Unemployment rate	Feb. 01	2.0	2.2
	Consumer price index	Feb. 01	1.3	2.9	Interest rate*		..	..

			% change from: previous period	% change from: previous year			level: current period	level: same period last year
Mexico	Gross domestic product	Q4 00	-0.2	5.3	Current balance	Q4 00	-5.67	-4.38
	Leading indicator	Jan. 01	4.0	4.4	Unemployment rate	Dec. 00	2.1	2.3
	Consumer price index	Feb. 01	-0.1	7.1	Interest rate	Mar. 01	16.47	14.46
Netherlands	Gross domestic product	Q4 00	1.2	3.4	Current balance	Q4 00	3.79	5.41
	Leading indicator	Feb. 01	-1.7	-1.1	Unemployment rate	Jan. 01	2.6	2.8
	Consumer price index	Feb. 01	0.7	4.5	Interest rate*		. .	. .
New Zealand	Gross domestic product	Q2 00	-0.9	4.6	Current balance	Q4 00	-0.76	-1.47
	Leading indicator		. .	. .	Unemployment rate	Q4 00	5.6	6.3
	Consumer price index	Q4 00	1.2	4.0	Interest rate	Mar. 01	6.27	6.26
Norway	Gross domestic product	Q4 00	0.1	0.9	Current balance	Q4 00	6.59	3.45
	Leading indicator	Jan. 01	-0.5	-2.1	Unemployment rate	Q4 00	3.5	3.7
	Consumer price index	Feb. 01	0.7	3.6	Interest rate	Feb. 01	7.32	5.89
Poland	Gross domestic product	1999	. .	4.0	Current balance	Nov. 00	-0.42	-1.02
	Leading indicator		. .	. .	Unemployment rate	Feb. 01	15.1	13.3
	Consumer price index	Feb. 01	0.1	6.7	Interest rate	Feb. 01	17.40	15.88
Portugal	Gross domestic product	Q3 00	1.2	3.4	Current balance	Q4 00	-2.81	-3.55
	Leading indicator	Jan. 01	-0.7	2.9	Unemployment rate	Feb. 01	4.5	4.3
	Consumer price index	Feb. 01	0.1	4.8	Interest rate*		. .	. .
Slovak Republic	Gross domestic product	Q4 00	. .	2.9	Current balance	Oct. 00	-0.13	-0.07
	Leading indicator		. .	. .	Unemployment rate	Q4 00	18.0	17.1
	Consumer price index	Jan. 01	1.8	7.7	Interest rate	Mar. 01	5.05	5.35
Spain	Gross domestic product	Q4 00	0.7	3.7	Current balance	Nov. 00	-0.85	-1.18
	Leading indicator	Jan. 01	-1.4	-0.8	Unemployment rate	Feb. 01	13.7	15.0
	Consumer price index	Feb. 01	0.3	3.8	Interest rate*		. .	. .
Sweden	Gross domestic product	Q4 00	0.0	2.3	Current balance	Dec. 00	0.16	0.42
	Leading indicator	Jan. 01	-0.9	-2.6	Unemployment rate	Feb. 01	5.3	6.6
	Consumer price index	Feb. 01	0.3	1.5	Interest rate	Feb. 01	4.10	3.90
Switzerland	Gross domestic product	Q4 00	0.5	2.6	Current balance	Q4 00	7.26	7.63
	Leading indicator	Feb. 01	-0.8	1.3	Unemployment rate	Feb. 01	1.7	2.2
	Consumer price index	Mar. 01	0.2	1.0	Interest rate	Feb. 01	3.41	2.26
Turkey	Gross domestic product	Q4 00	. .	8.3	Current balance	Q4 00	-3.02	-1.39
	Leading indicator		. .	. .	Unemployment rate	Q4 00	6.3	7.3
	Consumer price index	Mar. 01	6.1	37.5	Interest rate	Mar. 01	81.19	39.20
United Kingdom	Gross domestic product	Q4 00	0.4	2.6	Current balance	Q4 00	-5.35	-1.06
	Leading indicator	Feb. 01	-0.5	0.6	Unemployment rate	Dec. 00	5.2	6.0
	Consumer price index	Feb. 01	0.5	2.7	Interest rate	Mar. 01	5.46	6.15
United States	Gross domestic product	Q4 00	0.3	3.4	Current balance	Q4 00	-115.27	-96.22
	Leading indicator	Feb. 01	-0.5	-2.9	Unemployment rate	Feb. 01	4.2	4.1
	Consumer price index	Feb. 01	0.4	3.4	Interest rate	Mar. 01	4.89	6.14
Euro zone	Gross domestic product	Q4 00	0.7	3.0	Current balance	Dec. 00	-4.32	-3.95
	Leading indicator	Feb. 01	-1.1	-2.5	Unemployment rate	Feb. 01	8.7	9.5
	Consumer price index	Feb. 01	0.5	2.6	Interest rate	Mar. 01	4.71	3.75

Definitions and notes:

Gross domestic product: Volume series, seasonally adjusted except for Czech Republic, Slovak Republic and Turkey;
Leading indicator: A composite indicator, based on other indicators of economic activity (employment, sales, income etc.), which signals cyclical movements in industrial production from six to nine months in advance;
Consumer price index: Measures changes in average retail prices of a fixed basket of goods and services;
Current balance: $ billion; not seasonally adjusted except for Australia, the United Kingdom and the United States;
Unemployment rate: % of civilian labour force – standardised unemployment rate; national definitions for Iceland, Korea, Mexico, Poland, Switzerland and Turkey – seasonally adjusted apart from Slovak Republic and Turkey;
Interest rate: Three months, except for Turkey (overnight interbank rate);
. . not available;
* Refer to Euro zone.

Source: *Main Economic Indicators*, OECD Publications, Paris, April 2001; Quarterly National Accounts database.

Calendar of forthcoming events 2001

Please note that many of the meetings mentioned are not open to the public and are listed as a guide only. All meetings are in Paris unless otherwise stated. For further information, consult the OECD website at http://www.oecd.org/media/upcoming.htm, which is updated weekly.

MAY

14-16 **OECD Forum 2001: Sustainable Development in the New Economy.**

16 **OECD Environment Ministers** meeting.

16 **International Energy Agency** meeting at ministerial level.

16-17 **Annual OECD Council meeting at ministerial level.**

20-22 **Governance and Leadership of Higher Education,** seminar organised by the OECD Programme on Institutional Management in Higher Education in co-operation with the Czech authorities. Prague, Czech Republic.

21-22 **Electricity Deregulation,** conference organised by the Russia Programme of the Centre for Co-operation with Non-Members (CCNM), and the Directorate for Financial, Fiscal and Enterprise Affairs (DAF). Moscow, Russia.

22 **Russia – New Approaches for Foreign Direct Investment,** workshop organised in co-operation with the German government and the OECD Berlin Centre, to present the forthcoming OECD publication, *Investment Environment in the Russian Federation*. Berlin, Germany.

29 **European Conference of Ministers of Transport (ECMT),** meeting of the Council of Ministers.

29-30 **Informal Network on Conflict, Peace and Development Co-operation,** organised by the Development Assistance Committee (DAC).

JUNE

4-6 **Tax Administrations in an Electronic World,** global conference organised by the Directorate for Financial, Fiscal and Enterprise Affairs (DAF) and the Canadian authorities. Montreal, Canada.

4-8 **International Tax Evasion and Avoidance,** workshop organised by the Programme for Transition Economies of Europe and Central Asia of CCNM, and DAF. Ankara, Turkey.

5-6 **Transport and E-Commerce,** workshop organised by Directorate for Science, Technology and Industry (STI) and the ECMT.

5-6 **E-Learning in Post-Secondary Education: Trends, Issues and Policy Challenges Ahead,** OECD/Japan seminar organised by the Centre for Educational Research and Innovation, in co-operation with the Japanese Ministry of Education, Culture, Sports, Science and Technology. Tokyo, Japan.

5-7 **Agricultural and Environmental Statistical Applications in Rome,** conference organised by OECD, FAO, Eurostat, UN/ECE, ISI, NASS/USDA and hosted by ISTAT. Rome, Italy.

11-12 **International Mobility of Highly Skilled Workers:** From Statistical Analysis to the Formulation of Policies, seminar organised by STI and Directorate for Education, Employment, Labour and Social Affairs (ELS).

14-15 **Early Childhood Education and Care Policy,** conference co-organised by ELS and the Swedish Ministry of Education and Science. Stockholm, Sweden.

18 **Economic Outlook** no. 69, full version published.

18 **Agricultural Policies in OECD Countries: Monitoring and Evaluation** publication.

18-19 **Technology and Development,** International Forum on Asian Perspectives, organised by the Development Centre in co-operation with the Asian Development Bank.

20-22 **Financial Action Task Force on Money Laundering** (FATF), plenary meeting.

26-29 **Integrated Management of Safety, Health, Environment and Quality in the Context of Chemical Accidents,** workshop organised by the Environment Directorate. Seoul, Korea.

28-29 **Creating Conditions of Enterprise Development and Cross-Border Partnerships,** conference organised jointly by the Russia Programme of the CCNM, DAF, and the East-West Institute. St. Petersburg, Russia.

JULY

4-5 Council Working Party on **Shipbuilding**, organised by STI.

10-12 **New Biotechnology, Food and Crops: Science, Safety and Society,** conference organised by the UK government and STI. Bangkok, Thailand.

20-22 Summit meeting of Heads of State and Governments of the G8 countries. Genoa, Italy.

SEPTEMBER

6-7 **Financial Stability Forum.** London, UK.

20-21 **Regulatory Reform in International Air Cargo Transportation,** workshop organised by STI.

20-21 **Foreign Direct Investment – Mergers and Acquisitions in OECD Member Countries and China,** conference organised by the China Programme of the CCNM, and DAF.

27-28 **Practical Application of Treaties and Transfer Pricing,** global forum organised by DAF.

OCTOBER

25-26 **Regulation of Private Pensions in China,** workshop organised by the China Programme of the CCNM and DAF. Beijing, China.

NOVEMBER

5-7 **Measuring Up: Improving Health Systems Performance in OECD Countries,** international conference hosted by the Canadian Government and organised by ELS. Ottawa, Canada.

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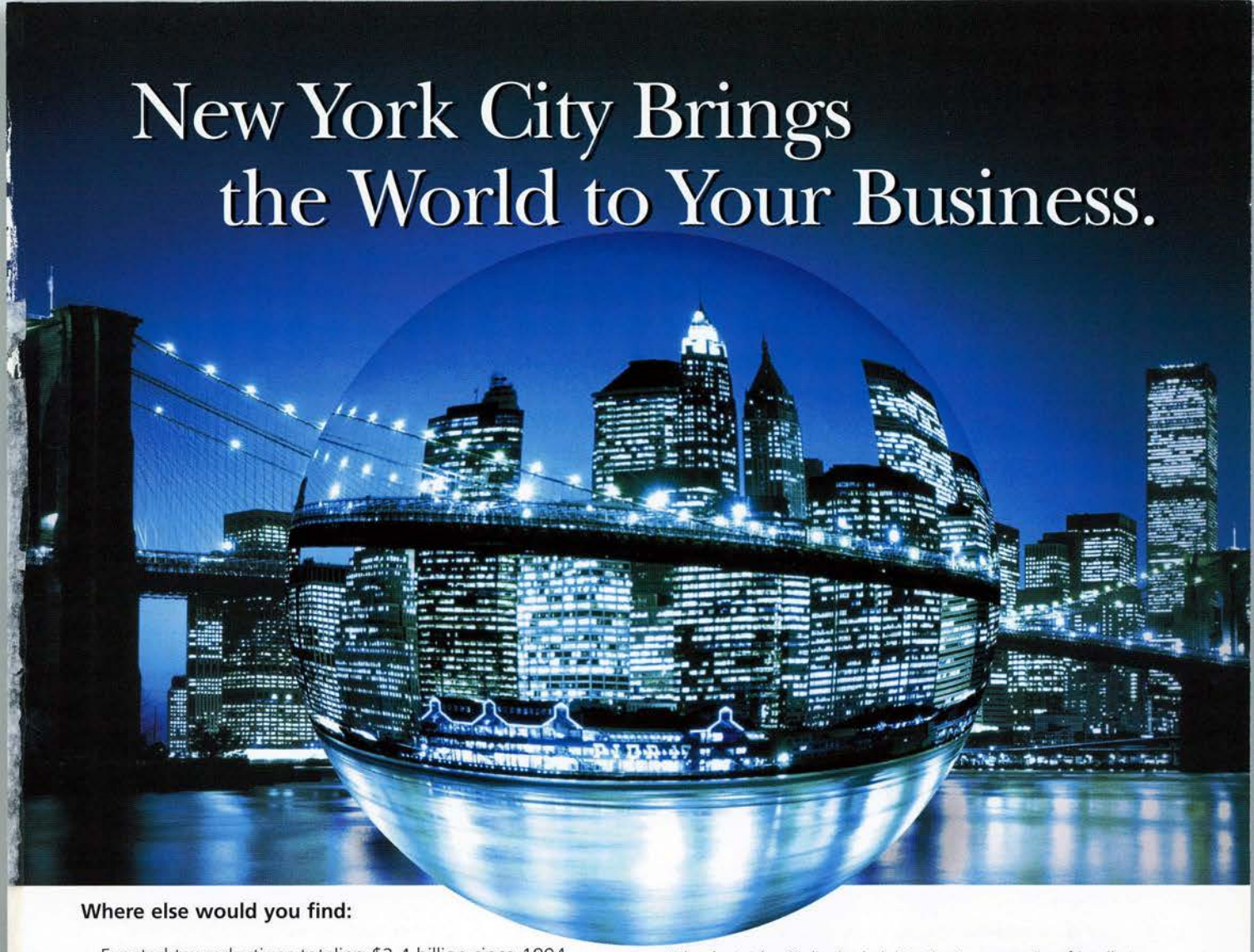

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