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## Getting through the bottleneck

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The truth about sustainable development is not to be found in the camps of either the pure optimists or the disaster mongers. Four positive trends and three negative ones must be taken into account.

**T**he first positive trend is the slowing of global population growth. There is a significant shift in global fertility that will enable us at least to think about moving to a world of near stable populations within a century, maybe sooner. Fertility in about 40 per cent of the world's countries is now below the replacement rate. Another 40 per cent are experiencing continued downward movement of fertility rates. This important global shift is unlikely to be reversed.

The second is the increasing proportion of the world's population that lives in urban areas. We have not yet figured out how to make our urban environments as comfortable as they need to be, especially in the poor megacities. But there are tremendous advantages in providing basic services, infrastructure, access to health, education, sanitation, water, technology and science to an increasingly urbanized world.

### **Technological advance**

Third, and most positive of all, is the continuing explosion of scientific and technological knowledge. We continue to accelerate our capacity to mobilize scientific knowledge in useful technologies. The story of economic development in its narrower sense over the last two centuries is overwhelmingly one of technological advances.

And the fourth positive trend is the clear evidence that those technologies are diffusing widely in the world. The clearest case is China which, with more

than 20 per cent of the world's population, has had perhaps an eight to tenfold increase in properly measured per capita gross national product since its economy was opened in 1978.

Those who hold that globalization is a disaster for the poor are factually wrong. The living standards of perhaps 3 billion or more people have been increasing over the past 25 years and it is the diffusion of knowledge and technologies that has allowed for this.

On the other hand, there are the three deep negative trends. There is no doubt that there is profound and dangerous ecological stress at every scale of our human society. Significant places in the world face ecological collapse. There is no doubt also that, at the global scale, we are pushing limits of profound risk, whether over anthropogenic climate change, depletion of global fisheries, or loss of biodiversity.

Second, those who would parade the triumphs of globalization should also be honest enough to explain that a quarter of the world remains in desperate poverty and perhaps a fifth remains stuck in the most horrific and dire poverty trap. There are perhaps 1 billion such people in this world, the poorest of the poor.

For them, the underlying mechanisms through which knowledge, technology, science and material improvement diffuse are not operating. The forces of globalization are almost not at work except to draw out the best minds in an international brain drain that globalization itself has intensified, leaving countries in a downward spiral of disease, violence, impoverishment, unpayable debt and ecological catastrophe.

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Finally the third negative factor is the point that – while globalization creates incredibly powerful positive forces, mainly the diffusion of knowledge – it also creates powerful negative ones. When you are together in a network, the ills can be transmitted through it just like the benefits. The ills of terrorism are networked globally in this way. The international networks have no doubt also accelerated the transmission of HIV/AIDS around the world. Mass migration, refugee movements, violence, drug trafficking, criminality, money laundering, disease transmission, also readily diffuse over international networks.

### Shaping the future

The future is not to be predicted but to be shaped. It is not a matter of running our models and deciding which scenario is the most likely, but one of mobilizing human agency to address the ills and to champion the positive tendencies. There will be two huge issues of profound significance for our future. The first is the role of science and technology. I believe that the problems of human impact on the local and global environment, the challenges of raising living standards in ecologically stressed regions, the challenges of pandemic disease, will first and foremost be met technologically. The question is whether science can preserve the social space that it has had for the past two centuries. We have seen some wonderful international science in recent years showing how, despite incredibly intense political pressures, the directness and honesty that characterizes good science can prevail. Despite huge pressures from some of the biggest companies in the world and big political pressures from the most powerful country in the world, the climate scientists of the [Intergovernmental Panel on Climate Change](#) have been able to hold their ground and produce a flow of documentation in a new science of high uncertainty that is rigorous, apolitical, and stands the test of the deepest and most aggressive scrutiny. This role for science is by no means assured, but it is critical for the future.

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The second factor involves the possibilities for global governance. Global-scale problems require global institutions and unprecedented levels of global cooperation. We are groping towards serious global institutions that are capable of addressing global-scale challenges of the kind that we have not recognized or had to face in the past.

But our ability to solve these problems will depend on an effective set of global institutions.

Can science and technology and global institutions do what they need to do? We are passing through a bottleneck, but not going over a cliff. We can find marvellous answers to the ecological, health and energy challenges with the positive trends at hand: with the power of science and technology; with the technologies of carbon sequestration and clean energy, of desalinization and improved management of clean water; with the increasing ingenuity in new material sciences and especially in the biological sciences. We are not that far away as it is. We will also arrive, I believe, at more stable human populations, and more urban-based populations where basic human services can be delivered.

But getting from here to there is going to be a treacherous and dangerous course. We have decades to make our way and decades of profound risks.

There are four main challenges to getting through this bottleneck quickly and safely.

### Breaking the poverty trap

First, breaking the poverty traps of the world's poorest people – something so easily within the reach of the richest countries. My own, and many other, studies have shown that very modest income transfers, just fractions of 1 per cent of gross national product

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from the rich to the poor, could enable massive expansions of health services, access to essential medicines, universal primary and secondary education, and financing for the research and development in agricultural technologies to enhance nutritional intake and agricultural productivity.

Second, succeeding in urbanization: making our urban spaces inhabitable areas. We know it can be done. Proof of this is in existence all over the world, though it has not been done in many of the poorest megacities.

Third, strengthening the United Nations and other institutions of global governance, and making sure that we do not destroy our ecosystems.

And fourth, adapting our energy systems to head off the dire risks of highly unpredictable and perhaps disastrously non-linear responses of the global ecosystems to the increasing forcings of the greenhouse gases in the atmosphere ■

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