IIASA Policy Brief

Global Development: Science and Policies for the Future

A summary of the IIASA Conference '07 by environmental journalist Fred Pearce

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At its thirty-fifth anniversary, in November 2007, IIASA brought together a star-studded cast of scientists, policymakers and thinkers to discuss Global Development: Science and Policies for the Future. The aim was a wide-ranging discussion of what a sustainable and equitable future might look like, and how to get there. Foremost in everybody's minds were research priorities and how an interdisciplinary institution dedicated to systems analysis on a global scale might contribute.

Key Points

- The world faces two fundamental challenges in the twenty-first century. One is to root out the persistent and entrenched poverty of the "bottom billion" of humanity. The other is to prevent economic growth from overwhelming the global commons—the atmosphere, oceans, water cycle, and biodiversity.
- Both, while often still seen as secondary to the goal of worldwide economic growth, have the potential to destroy that growth and undermine the well-being of all. The first through triggering conflicts; the second by wrecking the ecosystem services, including a stable climate, on which economic activity and livelihoods depend.
- But there was disagreement about whether these goals can best be secured through better management of the existing political and economic systems, or whether more fundamental changes were needed. Put simply, can continued economic growth be made sustainable or not?
- There was antipathy between the two sides on this. Those who favored fixing the existing system accused those demanding fundamental change of diverting the world's attention from practical solutions. They in turn accused the fixers of ignoring fundamental problems, particularly of over-consumption.
- Agendas for improving human and social capital and for maintaining natural capital were laid out. But there was a lack of integration between the two—suggesting an important focus for future systems research. Likewise the competing threats of over-consumption and over-population were often discussed rhetorically rather than analytically.
- Competing demands for land and water resources threaten future supplies of the "3Fs": food, fiber, and fuel. The boom in biofuels amplified the risks.
- More positively, there was discussion of potential no-regrets solutions that addressed both social and environmental problems. Finding alternatives to burning fossil fuels, for instance, addressed human health problems from smog and climate change. And the benefits of good governance in solving problems were illustrated.
- But there was much pessimism. One speaker concluded: "Do we know what to do? Probably yes. Will we do it? Probably not."

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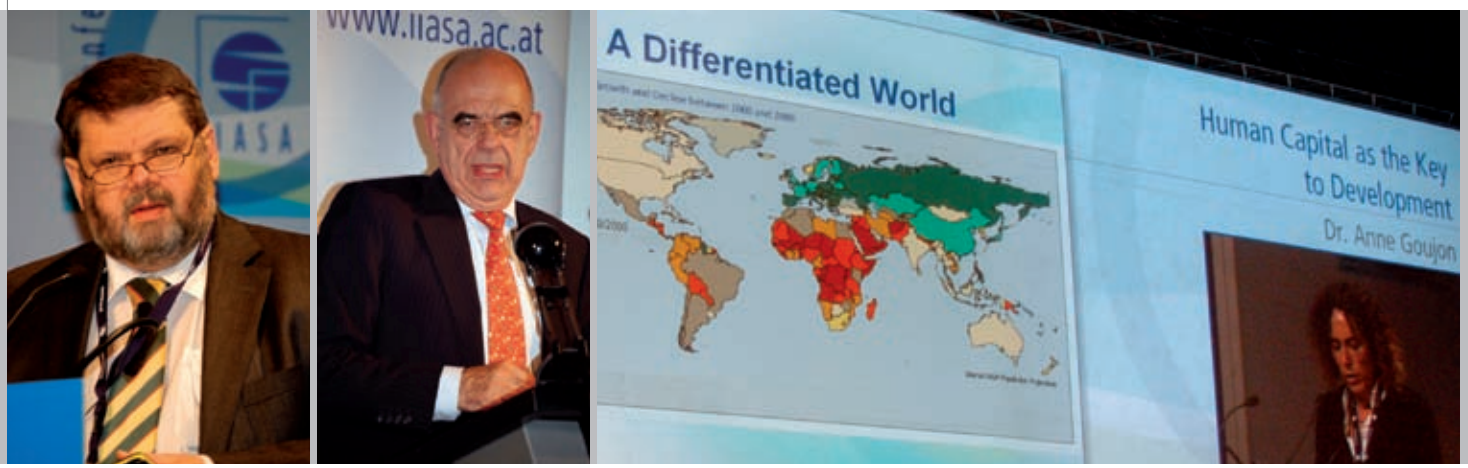


Focused Fixers or Paradigm Shifters

Few at the meeting doubted that there were serious challenges. In particular, how to spread wealth and well-being to the billion or so people (15 percent of humanity) who see little or no benefit from globalized economic growth, and how to prevent escalating environmental problems from undermining that growth and damaging the wealth and well-being of all.

But there was clear disagreement on how to achieve this. Jeffrey Sachs, director of Columbia University's Earth Institute, led the "focused fixers". They defended the current market economy as being good at what it does—delivering growth. "The system has not stumbled. But there are things that do not get handled," Sachs said. Such as protecting the poorest and "global commons" like the oceans, atmosphere, water supplies, and biodiversity. Sachs called the latter "our biggest failure. If ecosystems collapse on a wide scale they will undo economic growth. No doubt about it."

The world needed global cooperation and targeted interventions, not a hair shirt. Priorities, he said, were shutting off population growth, breaking the poverty trap, decoupling greenhouse gas emissions from economic growth, more intensive agriculture, and greening our cities. These were big challenges, but they were do-able, and Sachs saw no reason to turn back on the road. "My optimism arises because these are new problems we haven't had to solve before."

On the other side stood the "paradigm shifters" who felt the world had taken a wrong direction and needed to turn back. Most eloquent was Manfred Max-Neef, the leading economist and former presidential candidate in Chile. He argued that the world went wrong when it chose Machiavelli and not Francis of Assisi, Galileo and not Goethe, and more recently by replacing Keynesian economics with neo-liberalism. Result: "global poverty, over-exploitation of resources, destruction of ecosystems and the accumulation of wealth in ever fewer hands." This was a root and branch failure.

"Development has not delivered sustainable use or poverty reduction," agreed Andy White of the Rights and Resources Initiative in Washington DC. "It has made the rich richer and the poor poorer." "We can't all achieve well-being in the way we are trying to achieve it," said Allister McGregor of the University of Bath in England.

What were needed were cuts in consumption and a reordering of priorities from the economic to other measures, like well-being. Some charged the paradigm-shifters with indulging in "the luxury of pessimism", of wishing for another world. Sachs said their idealism was counter-productive: "These problems won't be solved by talking about cuts in consumption. We don't need heroism; we need problem-solving. There are many technological options on the table and the cost of implementing them will turn out to be shockingly small."

Industrialists backed him up. Jorma Ollila, who is chairman of both Royal Dutch Shell and Nokia, insisted that "the corporate sector is part of the solution" and could fix climate change and other problems if governments provided market incentives.

"I'm an optimist," he said. "We know the problem. Technological solutions are on the way." Frank Dottori, a Canadian businessman, asked: "Why did the Stone Age end? Not because they ran out of stones. But because technology changed." And so it would be with the fossil fuel age, he said—if governments acted.

But the legacy of the current age may take centuries to fix. IIASA's Ulf Dieckmann explained how commercial fishing practices not only reduce the number of fish but also damage the fish gene pool that may prevent recovery of fish stocks. He warned significant evolutionary decline in fish can occur within ten to twenty years, but take two to three centuries to reverse.

Saving the Bottom Billion

The "bottom billion", the World Bank's director for social development Steen Lau Jorgensen called them. Those who, unambiguously, have been failed by globalization and neo-liberal economics; a festering boil on the planet's body politic. "It is intolerable that diarrhea and measles and other preventable diseases kill tens of millions of children a year," said UN under-secretary-general Kiyotaka Akasaka. "Why have scientists and policymakers failed to end these terrible diseases of poverty?"

Their plight was not simply a humanitarian atrocity but also a source of conflict and instability, said Jan Pronk, former Dutch environment minister, international climate negotiator and head of the UN mission in Darfur. "Poverty is not decreasing; the number of people without the possibility of going to the toilet is getting higher. Globalization is leading to more and more inequality. The conflicts related to this are obvious. Khartoum is booming on oil, but not a dinar is being spent on water or health care in Darfur."

Sachs denied that absolute poverty was growing, but admitted that the plight of the poorest was a shaming lapse in the economic system. Perhaps a billion people, he said, "are trapped in a downward spiral." But it was fixable, he said. It only required will and policy.

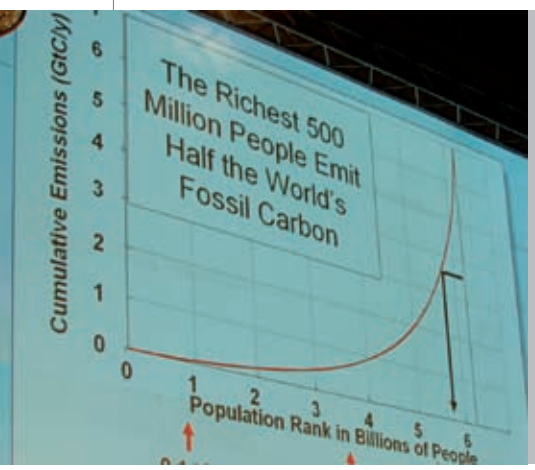
For Pronk, however, the bottom billion represented a more profound problem. "In the past the rich believed they needed the poor for labor and as a market for goods. Now their labor is no longer needed and cheap transportation in the globalized market means goods can be sold elsewhere." The poorest were simply surplus to requirements. He spoke of "global apartheid."

For Pronk, fairer shares were essential to prevent conflict. "There is no sustainable development if there is poverty. We have to talk about over-consumption and inequality." Mafa Chipeta, head of the Ethiopian office of the UN Food and Agriculture Organization spoke of the "filthy rich" who were "setting a bad example" and dictating the development agenda in ways that they "find most convenient".

But for Sachs the need is not to take from the rich but to give to the poor. The world has ample wealth to solve the problems of poverty, and is generating more all the time. "It is not a zero-sum game," he insisted.

Wisdom and Wealth

This central argument played out elsewhere. On climate change, one side saw the priority as developing technology so we can switch to low-carbon fuels. "That does not mean using less energy", said Sachs. The other said that technological fixes would always be overwhelmed by rising demand. IIASA's Nebojsa Nakicenovic warned that since 1800 energy use has grown at the square of population growth. He forecast continued rising energy demand which, without a change in technological direction, would probably



be increasingly supplied from burning coal. The primary need, the paradigm-shifters said, was to cut energy consumption and adopt more frugal lifestyles.

Several speakers asked what the true drivers of development were. This was not resolved. Most saw improved educational institutions as a key. But some emphasized the bottom-up synergies between improved primary education, health and wealth, while others emphasized the top-down gains from establishing better universities in poor countries. "Africa has to think itself to development," said Berit Olsson from the Swedish International Development Cooperation Agency (SIDA). "We need wisdom," argued Khotso Mokhele, former president of the National Research Foundation in South Africa, who said the shackling of its universities by government was a major reason for the continent's continued under-development. Others such as Wolfgang Lutz of IIASA highlighted the key role secondary education of broad segments of the population plays in a country's economic growth.

How should progress be measured? Some argued that conventional economic indicators such as GDP remained the best guide. For others that was profoundly wrong. GDP goes up if you put more people in prison or hospital; but that is an indicator of failure, not success.

The Human Development Index—based on education, life expectancy and income—was applauded. But what about a well-being index, suggested McGregor. "I argue against seeing financial poverty as the framework to understand the poor," he said. In the real world, people constantly balanced income with other needs—"autonomy with the ability to feed yourself or get shelter," for instance. "The point of economic growth is to provide the conditions for well-being, but it doesn't automatically deliver it."

For some over-population was a fundamental issue for sustainability. The fixers mostly gave this high priority. Others, mostly the paradigm-shifters, saw over-consumption as the greater problem. Worse, they said, an emphasis on combating population growth—largely, these days, a characteristic of the poorest countries—was a way for the rich world to blame the poor for global problems, and to impose perhaps painful solutions some way from their own doorsteps.

Whatever the morality, did that make practical sense? Stephen Pacala, director of the Princeton Environmental Institute,

suggested otherwise in his analysis of who was to blame for climate change. The richest half-billion in the world (7 percent of humanity) were responsible for half the world's CO_2 emissions, he said. The poorest 50 percent were responsible for just 7 percent of emissions. So, he implied, if the lifestyles of the richest half-billion could be reined in tomorrow, the rest of us could carry on with our lives untroubled by climate change nightmares. And "the development of the desperately poor is not in conflict with solving the greenhouse gas problem." Fairness mattered not just to make a fairer world, but because it was often the route to effective problem solving.

But it was clear that demographics are about much more than inequality issues. IIASA's Anne Goujon underlined the growing uncertainty about future population trends, with predictions for the world total in 2100 ranging from 5.5 billion to 12 billion. And with presumptions about a future stabilization trajectory now undermined by below-replacement fertility in 60 countries, there is now an 85–90 percent chance that world population will be declining by the century's end. But, whatever the uncertainty about future numbers, there is little doubt now that "the 21st century will be the century of ageing." The proportion of the population over 60 years old will go from 10 percent to between 25 and 40 percent. That much is almost certain.

Choices

Grand overviews were only part of the debate, of course. One argument concerned whether, in any master plan for the future, a touchstone should be that there are no master plans. Just myriad choices. Max-Neef's seemingly abstract observation at the start that we needed to think about "choices made and choices not made" came into focus. How to handle AIDS? There were "agonizing choices", said IIASA's Landis MacKellar, between investing in saving lives sooner through treatment, and saving many more lives later by investing the same funds in prevention. He favored the latter. "Are institutions up to that choice? I doubt it," he said.

But if there are agonizing choices, there are also no-regrets solutions waiting to be found. Many wondered how to reconcile economic development in China with the global imperative to curb CO_2 emissions. But, said IIASA's Fabian Wagner, a systems analysis saw the solution in the choking smogs of China's mega cities. China's air pollution will be lowering life expectancy by four years by 2020. Replacing fossil fuels with renewable energy technologies would save lives and improve health as well as curbing climate change. In fact, the cost would be almost entirely recouped by the savings in health bills.

Cross-cutting analysis was also to the fore in IIASA deputy director Sten Nilsson's analysis of the "3Fs": food, fiber, and fuel. Usually analyzed separately, they were coming together in a battle for diminishing land and water resources. In a cartographic strip-tease, he pointed out how most of the land theoretically available for growing biofuels as a substitute for fossil fuels, was already either protected or in use for growing crops, raising livestock or supplying fiber.

Were there technical fixes? Chipeta had called for a new focus on improving agricultural productivity. But for now, said Nilsson, yields were flattening out in most of the world. Meanwhile, he said with some incredulity, despite growing threat from climate change "global food models don't include water as a constraint. If we don't integrate analysis of these issues, there will be serious conflicts ahead and the poor will suffer most."

Hidden Hands

Language dictates more than we imagine. Max-Neef complained of the "disastrous effects" of the dominance of the language of modern economics in public discourse. Even an innocuous word like underdevelopment—invented, he said "by Harry Truman in 1949" —effectively defined and constrained the rich world's attitude to most of the planet. "Before underdevelopment we had diversity; all of a sudden that diversity ended and we all needed the same recipe—development." The development paradigm, he said, also implied that progress was something to be imported rather than developed indigenously. "The damage has been immense."

Much too hung on the way data are collected and aggregated. Conventionally we assemble global data by nations. But hotspots of social and economic deprivation and wealth easily disappear within national statistics—especially with income disparities growing faster within nations than between them.

Pacala's analysis showed this is not just a problem for social data. CO_2 emissions are dominated by a small number of rich people who

"are increasingly distributed around the world." But, by setting emissions targets nation-by-nation, the Kyoto Protocol wasn't catching them. If we aggregated data differently, would our policies change? Or do our political predilections determine how data are collected—making data more political weapons than unbiased resources for policymaking?

Governance

Governments remain, even in a globalized economy, the primary units for regulation and decision-making. Governance is still crucial for social welfare and environmental protection, but its precise role is sometimes controversial. There was an interesting side-debate about whether the catastrophe of Darfur was primarily a failure of governance (as Pronk argued) or of resource degradation and desertification (which Sachs highlighted).

But nobody doubted Carlos Manuel Rodriguez, former environment minister of Costa Rica, when he contended—"let me pollute your spirit with optimism", he teased—that his country's unique success in protecting its rainforests was a result of sustained good governance. Forest communities gained from payments for "ecosystem services", such as watershed protection, while the nation recouped from tourist revenues. Social, economic, and environmental goals were reconciled. The contrast with the pessimistic take of Rosalía Arteaga Serrano, former president of Ecuador, on the future of the Amazon rainforest was marked.

The military world made only sporadic appearances in the discussions, even though military might, as wielded by governments, is a crucial factor in all our future—not least in Darfur. But few issues galvanized the meeting as much as the contributions on nuclear weapons from Nobel-prizewinning economist Tom Schelling and Yegor Gaidar, director of the Institute for the Economy in Transition in Moscow, who scrapped his prepared address to respond. They took us back to a world half a century ago when nothing was more important than the cold war and the threat that if it turned hot, the world would be consumed in a massive nuclear exchange.

Schelling said it was a miracle that the world had prevented the spread of nuclear weapons and placed a taboo of their use. But Gaidar suggested this was more down to good luck. He warned that soldiers playing with nuclear weapons always risked disaster. In Cuba, during the missile crisis of 1962, Russian nuclear warheads on the island "were not controlled by Moscow. It was for a three-star general to decide whether to use them in the event of a [US] invasion." The reason? US missile silos were so close that there would not be time—8 minutes isn't long—to refer back to Moscow if someone feared that had been launched.

NATO weapons in Poland today would be able to reach Moscow in four minutes, he said. They pose a similar risk. US reassurances that the weapons were not aimed at Russia would not help. "The military are trained not to trust." Accidents will happen.

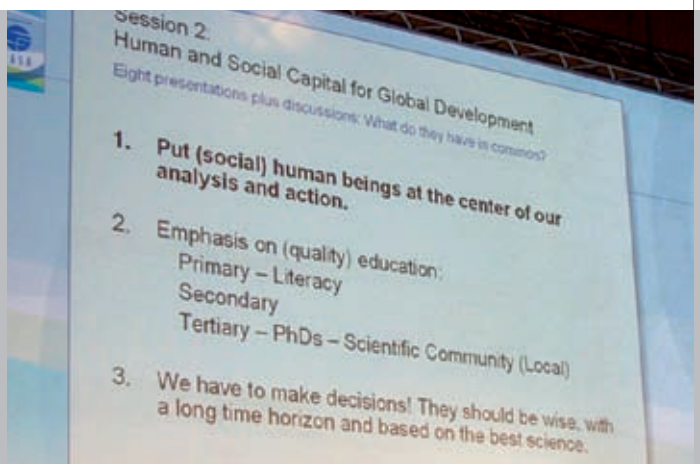
Seeing the Future

Even the best laid plans require sound information, but the world is constantly at risk from the unanticipated. Forecasts are often foggy at best. Credible forecasts for the population of sub-Saharan Africa in 2100 currently ranged from 3.3 billion to 1.1 billion, showed Anne Goujon of IIASA.

How to respond in the face of such uncertainty? One strategy, said IIASA's Arnulf Grübler, was to hedge your bets. "Diversification of energy technology reduces your risk in both the market and climate change." Powerful too could be the virtual brainstorming allowed by games. Jane McGonigal of the Institute for the Future at Palo Alto in California, brought to the meeting her "world without oil", an online game moderated by experts but largely informed by the online community in a series of scenarios, narratives and hunches. "Play it before you live it," was the sales pitch. That, in the end, was what the entire conference was trying to do.

But in the end there is no substitute for research. It always turns up surprises. Tony Patt of IIASA came up with an interesting instance. He said that detailed questioning of African farmers had revealed the surprising news that they had little use for El Niño forecasts in reducing their vulnerability to drought. They were already highly skilled at doing that. But the forecasts were invaluable in helping them take advantage of expected good rains in non-El Niño years, to plant high-yielding crops that required wetter conditions. Nobody had thought of that. The outside world saw the farmers as victims; they saw themselves as entrepreneurs. Only diligent research uncovered the misconception.


UN Photo/Sean Sprague

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It's Us, Stupid

"We are," said Ged Davis, co-president of IIASA's Global Energy Assessment Council, "at a bifurcation point between collapse and renewal." "Do we know what to do? Probably yes," mused Bo Ekman, chairman of the Tällberg Foundation in Sweden. "Will we do it? Probably not."

Others, especially among the paradigm shifters, took a similar gloomy view. But maybe that was too much of a top-down assessment. Maybe the solutions lie elsewhere: among ordinary people in field and favelas, suburbs and soukhs across the world. They are practical fixers, but also dreamers. They might not know a paradigm if it hit them in the face; but if their perceptions change, the world changes.

The key to unlocking this was to investigate social capital: the networks, family links, clans, non-governmental institutions, and all the other glue that holds societies together. Governments and international bodies failed to engage with these institutions, often indeed undermined them. "After decades of addressing development, there is still abject poverty," said Linda Yueh, an economist at the University of Oxford. "I think a lot of the problem is institutional." Formal government systems had often crowded out informal, indigenous networks, kinships and cultures, she said, even though they may be best equipped to solve problems.

"Social capital is the key," she said. China had succeeded by better combining the formal and informal. And social capital is everywhere, waiting to be built on rather than by-passed. "We need to mobilize the extremely poor," said Percy Barnevik, chairman of the NGO Hand in Hand International, who related a hugely successful effort in using micro-credit to create thousands of small enterprises in rural India. "They need livelihoods, not roads," he said, taking a sideswipe at most top-down aid programs. Real development was about enabling and capacity building, not hand-outs.

White took a similar view. The world is not organized to deal with the problems of the twenty-first century, he said. "But we can't wait on governments or the private sector or international institutions. So what is left? You are left," he told the meeting. "You are going to make the change, or rather civil society is. There is a strengthening civil society in the developing world. We need to put our trust in it. IIASA has an intellectual and moral duty to shine a light on this. We have to listen and learn from local people."

And he ended the final session with something nobody had touched on before: religion. Many people, he said, had thought that religion would shrivel away in the modern world. It hasn't. "Modernity doesn't make religion less relevant. We have to figure out how to include that in our thinking." It could turn out to be the most enduring social capital of all.

The Way Forward

Science can help address the problems raised, especially of the integrated analysis approach as performed by IIASA over the past thirty five years. For example, agendas for improving human and social capital and for maintaining natural capital were laid out. But there was a lack of integration between the two—suggesting an important focus for future systems research. Likewise the competing threats of over-consumption and over-population were often discussed rhetorically rather than analytically.

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Many questions arose in the discussions that could be addressed by imaginative and ambitious systems analysts. These included:

- Can we better understand the key drivers and synergies in economic and human development?
- Are the poorest getting poorer, absolutely or relatively or not at all? Or is it true (as at least one speaker said) that it is the middle income people who have, relatively, done worst from globalization—and if so why?
- How far can "good governance" solve the world's problems?
- Can neo-liberal economics help the "bottom billion"? Why are they "trapped in a downward spiral"?
- African conflicts in Darfur, Rwanda, and elsewhere are often described as being essentially either political or environmental in nature. But which is it? Clearly both contribute, but can researchers disentangle them in a way that would be useful for peace-makers?
- Can we define a term like "global apartheid" and test whether it describes the relationship between the rich and poor worlds? To what extent do rich- and poor-world definitions of development differ?
- Does the phrase "global carrying capacity" have any meaning in a world of fast technological change? And if so, have we passed it? Are there meaningful "limits to growth"?
- Which indicators of educational progress best correlate with development?
- Which is worse: over-population or over-consumption? And what determines this?
- Would a declining world population in the second half of the century create more problems than it solves?
- How can international agreements on greenhouse gas emissions better target the individuals with the largest carbon footprints? Some, including Angela Merkel, suggest the world should aim for international parity in per capita emissions of greenhouse gases. How could this be done? What would it look like? Is the "contraction and convergence" model the only approach? What other "equitable" solutions to climate change are possible?
- Under what circumstances are the resource and pollution benefits of efficiency gains in technology wiped out by increased usage?
- What are the key "no regrets" solutions to climate change, and what barriers are there to implementing them?
- How far can induced technological change cut the costs of fighting climate change?
- What are the potential knock-on effects of growing commercial biofuels for land use, conservation, water supplies, food security and prices and the natural carbon cycle (draining peat bogs; clearing rainforests)?
- How much rainforest can the world afford to save—or afford to lose, come to that?
- What are the constraints on improving global agricultural productivity? Why are yield increases faltering in many regions?
- Is national aggregation of social and environmental data outdated? What could replace it?

Further Information

The information contained in this brief is drawn from IIASA's Conference, Global Development: Science and Policies for the Future, held at Vienna from 14–15 November 2007. Here, scientists, policymakers, diplomats, and business people met to rethink the current trends in global development. More information, including speeches and videos of presentations, at www.iiasa.ac.at/iiasa35.

The brief was written by award winning environmental journalist Fred Pearce.

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