

2008

IIASA ANNUAL REPORT



International Institute for
Applied Systems Analysis
www.iiasa.ac.at

IIASA Mission

IIASA's mission is to conduct international and interdisciplinary scientific studies to provide timely and relevant information and options, addressing critical issues of global environmental, economic and social change, for the benefit of the public, the scientific community, and national and international institutions.

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Schloss Laxenburg, Austria—seat of IIASA

Contents

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From IIASA's Chairman and Director

That 2008 was a year of change is perhaps an understatement to those who are familiar with IIASA and its work. On 1 June 2008 IIASA's eighth director, Leen Hordijk, took up a new post in Italy after six years "on board." The rudder was placed in the capable hands of Acting Director, Sten Nilsson, and Acting Deputy Director, Nebojsa Nakicenovic, for the rest of 2008. Then IIASA's new Director, Detlof von Winterfeldt, took office on 1 January 2009 with Nebojsa Nakicenovic continuing as Deputy Director. At the same time, Peter Lemke took over as Chairman of the IIASA Council from Simon Levin, who had held this post for five years. The contributions of Leen Hordijk, Simon Levin, and Sten Nilsson to IIASA have been nothing short of exceptional; we offer them our deepest gratitude and wish them well in their future endeavors.

A great deal of preparation was put into ensuring a seamless transition during what would prove to be a pivotal year for IIASA from both the internal and international standpoints. Indeed, expansion of the Institute's income in 2008 and an increase in the number of person-years worked by scientists are testimony to the informed and inclusive planning conducted by IIASA's Council and Directorate.

These same qualities were visible, too, in the work to develop a new research strategy for IIASA. In this process, the world's most pressing social and environmental issues—together with the capacity of science in general and IIASA in particular to address them—were debated at meetings with staff, national member organizations, and external stakeholders. A formal IIASA Strategic Plan 2011–2020 will be published in late 2009.

As talks about IIASA's future direction progressed, many current projects were bearing fruit. Preparations took place throughout the year for the 14th Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) in Poznań, Poland, in December, with IIASA hosting or participating in many activities. And particularly pleasing was that IIASA researchers also carried on publishing prolifically with 109 journal articles published—more than ever before.

In 2008 IIASA continued to build its portfolio of data, model, and research tools, to assist policymakers confronted with difficult decisions on complex issues.

■ The Air Pollution and Economic Development Program developed a Web-based GHG Mitigation Efforts Calculator, which allows interactive comparison of mitigation efforts and costs among the Annex 1 Parties to the Kyoto Protocol and their likely effects in 2020. The Calculator may be instrumental in negotiations to elaborate a new Protocol at the 15th Conference of Parties to the United Nations Framework on Climate Change in Copenhagen in December 2009.



PETER LEMKE, CHAIRMAN

Peter Lemke

Former IIASA Chairman

SIMON LEVIN
CHAIRMAN OF THE IIASA COUNCIL
2003–2008



Simon Levin's leadership of the IIASA Council for the five-year period from 2003 through 2008 saw the Institute through a crucial period of growth and transition. Although he is stepping down as Chairman, he continues to serve on the Council as Vice Chair and Representative of the US National Academy of Sciences, offering his experience and expertise to benefit IIASA and strengthen the US membership in the Institute.

Simon took his IIASA duties very much to heart, despite a demanding academic schedule at Princeton University and numerous professional commitments around the world. His support went above and beyond the call of "official" duty and he was always there for the Institute, its Directorate, and staff. He took pains to know and understand the substance of IIASA's research programs, and promoted collaborations with IIASA in the USA and around the world. He worked closely with other Council members and with the IIASA Directorate in setting up IIASA's Science Advisory Committee, in strengthening IIASA's ties to academics and policy makers in NMO countries, particularly the USA, and in conducting the successful search for a strong leader to succeed Leen Hordijk as IIASA Director.

Simon's ability to provide this unstinting service drew on his personal energy and "can-do" attitude, coupled with a remarkable flair for organization. His great determination, coupled with his affinity for research in complex adaptive systems, that gave him unusual insight into the value of IIASA's work, made him the perfect IIASA Chairman: astute, approachable, thoughtful, and eminently likeable.

All of us at IIASA thank him for his support, wish him success with his future endeavors, and look forward to continuing collaboration with him.



DETLOF VON WINTERFELDT, DIRECTOR

Robtink

Former IIASA Acting Director



STEN NILSSON
ACTING DIRECTOR OF IIASA
MAY–DECEMBER 2008

Since his appointment at IIASA in 1986 as Principal Investigator of the Forest Study, Sten Nilsson has been known for his enthusiastic and dynamic work ethic—a quality that assured promotions to Head of the Forestry Project in 1992,

to Counsellor to the Director in 1998, to IIASA Deputy Director in 2002, and to IIASA Acting Director in 2008.

His prodigious research record covers an enormous range of topics from natural resources and their environment to industrial structures and strategies. And he has always endeavored to highlight the policy implementations of his research in many countries ranging from Sweden to Russia to India. Sometimes his research findings argued for change when powerful vested interests preferred none, but this never stopped Sten drawing attention to the inconvenient truths.

Sten's leadership record at IIASA is similarly impressive. Most recently as IIASA Acting Director, Sten seemed to redouble his efforts, initiating reviews of some Institute-wide administrative procedures, of two IIASA departments, and of the selection criteria for the Young Scientists Summer Program. His implementation of the new strategic planning process was also an inspiration to all.

The Institute is indebted to Sten for his unstinting devotion to the Institute's wellbeing and progress during 2008, and we thank him most profoundly for his engagement, not just in the latter part of the year, but throughout his career at IIASA.

■ The Land Use Change and Agriculture Program and the United Nations Food and Agriculture Organization released a new state-of-the-art Harmonized World Soil Database which will provide information for national and international policymakers seeking to achieve sustainable expansion of agricultural production leading to food security.

■ In 2008 the World Population Program published its third update of probabilistic world population projections for 13 world regions, with a focus on the expected speed of population aging rather than on population growth as in the past. The results were published in the journal *Nature*.

■ Representative Concentration Pathways with full spatial coverage of land-cover changes as well as pollutant emissions and greenhouse gases were developed by the Energy Program. These will provide an invaluable tool to the world's climate modeling teams as they prepare the climate change projections of the IPCC's Fifth Assessment Report.

IIASA continued to be an international meeting place for high-level scientists and policymakers.

■ A workshop on the vulnerability of methane hydrates, jointly organized by the Transitions to New Technologies Program and the Global Carbon Project in March, drew together eminent scientists from the energy field. The workshop findings featured in the journal *Science*.

■ The French Ambassador to the International Organizations in Vienna, Mr. Francois-Xavier Deniau, hosted ambassadors from the 27 member states of the European Union at IIASA in July for consultations with counterparts at the start of France's European Union Presidency.

■ In February the Risk and Vulnerability Program held a workshop on disaster risk in Madagascar, funded by the Provention Consortium and the World Bank. This was part of its program to cooperate with countries in Latin America, Asia, and Africa that are highly exposed to climate-change-related disasters.

■ In June 2008 the "Theorists meet Practitioners" workshop, organized by the Processes of International Negotiation Program, was attended by over 50 participants including 10 ambassadors, numerous military officials, NGO representatives, university professors, and students from all over the world.

■ In November IIASA welcomed the United Kingdom's Chief Scientific Advisor, Professor John Beddington, who delivered the annual Koopmans Lecture on "Science and Innovation in the 21st Century" to around 200 invited guests from Vienna's scientific and diplomatic community at the Albertina Museum.

These achievements and events have been selected from among many to show the significant reach and influence of IIASA research during the year, particularly in the policy area. Indeed, the role of the Institute as a policy advisory body was heightened in October 2008, with the agreement by United Nations Secretary-General Ban Ki-moon to accept regular policy briefings from IIASA on systems-oriented approaches to global change issues.

As the new Director and Council Chairman of IIASA, we look forward to emulating our predecessors' commendable achievements and to implementing an innovative and exciting new strategy to ensure IIASA's continued success during the next phase in its development.

IIASA Highlights 1972–2007

In October 1972 representatives of the Soviet Union, the United States, and ten other countries from the Eastern and Western blocs met in London to sign the charter establishing IIASA. It was the culmination of six years' effort on the part of both the US President Lyndon Johnson and the USSR Premier Alexey Kosygin. For IIASA it represented the start of a mission to use scientific cooperation to build a bridge across the Cold War divide and confront growing global problems on an international scale.

Over the following decades IIASA used systems analysis to conduct policy-oriented research into problems too large or too complex to be solved by a single country. And by building international multidisciplinary teams to study global challenges, IIASA also helped foster better relationships between nations.

When the Cold War ended, IIASA broadened its mandate from East–West to assume a truly global focus: the Institute's member countries now account for over half the world's population (51 percent) and include the world's four largest economies.

The pages that follow highlight IIASA's achievements from 1972 to 2007, and then focus on the Institute's work and accomplishments in 2008. IIASA's success stems from the following core characteristics: scientific excellence, an interdisciplinary approach, independence from both governments and countries, and the relevance of its research for policymakers. This combination makes IIASA a unique and truly international research institute.

More detailed information is available on the IIASA Web: www.iiasa.ac.at



1972

At the height of the Cold War, 12 nations from the East and West meet in London to sign the charter establishing IIASA in the neutral setting of Austria.

1974

George Dantzig, winner of the US National Medal of Science, is joined at IIASA by Nobel Prize laureates Tjalling Koopmans (USA) and Leonid Kantorovich (USSR) to expand IIASA's study of advanced systems science and methodology.

1975

A new research field, Adaptive Ecosystem Policy and Management, is founded at IIASA based on results of a study relating forest conditions to pest propagation that has implications for forest management policy throughout North America and Scandinavia.

1976

IIASA scientists warn the world about the dangers of climate change and suggest pioneering solutions such as capturing and storing carbon. IIASA was one of only two institutions worldwide that, by the mid-1970s, already had an established research program on climate change and policy.

1977

The first Young Scientists Summer Program is a huge success and during the next 30 years IIASA attracts over 1,400 talented young scientists to spend a summer working with scholars from other nations and disciplines. Many will go on to take senior posts in academia, business, and government.



1980

A chance conversation between IIASA colleagues brings unexpected results. James Vaupel, a US demographer, mentions a scientific problem to Soviet mathematician, Anatoli Yashin. "I think I can help," Yashin replies. The two go on to develop more reliable projections of population aging in developed countries.

1981

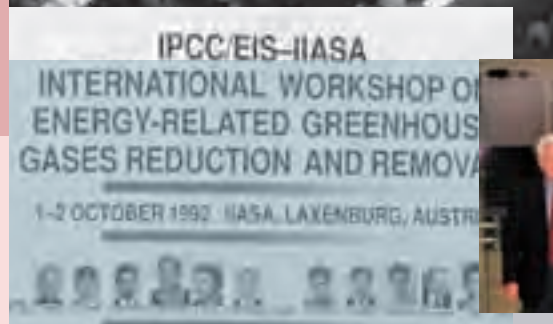
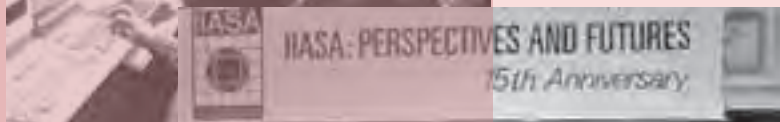
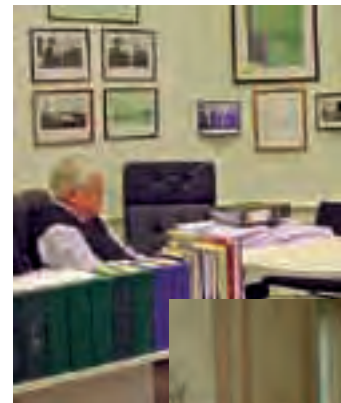
IIASA publishes the first comprehensive, truly global assessments of energy issues, resulting in the internationally acclaimed report, *Energy in a Finite World*.

1982

An IIASA research team of chemists, biologists, mathematicians, engineers, hydrologists, economists, computer specialists, and managers completes a study on eutrophication and management of Lake Balaton, central Europe's largest lake. Its findings influence water policy in Italy, Japan, the USA, and the USSR.

1983

Groundbreaking research by an IIASA scholar provides the intellectual underpinnings for the later US Department of Justice's antitrust case against Microsoft. The findings pioneered the modern approach to increasing returns which shows how powerful firms can exploit the particular nature of high-tech markets to the disadvantage of opponents who offer better products.



1986

IIASA scholars publish *Sustainable Development of the Biosphere*, which is quickly accepted by the science community as the core scientific text on sustainable development.

1988

In response to mounting tensions regarding global food issues, IIASA creates an unprecedented computer model that links national agricultural models. Named the Basic Linked System, it becomes a practical tool for determining the effectiveness of policies to eliminate hunger and the impacts of agricultural trade liberalization.

1989

IIASA's scientific model of Europe's acid rain problem is officially adopted by the 28 countries of the Geneva Convention on Transboundary Air Pollution as the main technical support for renegotiation of the treaty. This is the first time that all parties to a major international treaty agree to accept a single scientific model.

1991

IIASA researchers complete the first consistent continent-wide assessment of forest resources in Europe and the European regions of the former Soviet Union, revealing alarming consequences of air pollution for European forests.

1994

IIASA's Regional Acidification Information and Simulation (RAINS) model underpins the agreement of 33 European governments to reduce damaging emissions of sulfur dioxide.

1995

Five IIASA scientists are chosen to be Lead Authors of the Second Assessment Report of the Intergovernmental Panel on Climate Change. Since then, eleven IIASA scholars have played leading roles in the IPCC's third and fourth assessment reports, which provide the world with the most scientifically advanced, comprehensive, and rigorous analysis of the state of climate change.

1995

Funded by the World Bank and the Asian Development Bank, the RAINS model is extended to facilitate the analysis of sulfur dioxide pollution in Asia and is presented to energy planners and government officials in 18 Southeast Asian nations.

Scientific Excellence

IIASA's achievements are underpinned by high-quality science. In 2008 IIASA scientists published 109 peer-reviewed articles, made over 300 presentations, and held editorships of over 50 academic journals.

HIGHLY PUBLISHED AND CITED IIASA had its most successful year ever in terms of articles recognized by the renowned Institute of Scientific Information (ISI, known today as Thomson Scientific). In 2008 IIASA had a total of 109 journal articles recognized, which is considerably higher than its yearly average of 66 since 2000. In the 1990s, IIASA averaged 39 articles a year, in the 1980s, 44, and in the 1970s, 31. Citations of IIASA articles have increased even more rapidly (see chart).

PRESENTATIONS IIASA does not divide the world into academic disciplines, as many universities do, which is one reason why audiences are eager to hear lectures by IIASA researchers. In 2008 IIASA scientists gave over 300 presentations in nearly 40 countries. Audiences were diverse, ranging from academics at the Annual Science Conference of the International Council for the Exploration of the Sea in Canada, to negotiators at the United Nations Climate Change Conference in Poznań, Poland, and to East African Education Ministers in Nairobi, Kenya.

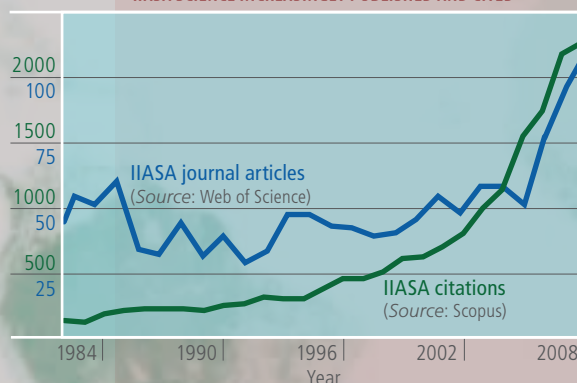
EDITORSHIPS Numerous IIASA scientists have been appointed to editorships of peer-reviewed academic journals. In 2008 IIASA researchers held editorships of 52 journals, ranging from *African and Asian Studies*, to *Global Environmental Change*, to *Climate Policy*.

BEST OF 2008 *Environmental Research Letters*, the open-access research journal for environmental science, selected the article "Learning from global emissions scenarios," by IIASA's O'Neill and Nakicenovic, as one of the best and most-read articles published in the journal in 2008.

Environmental Research Letters Vol. 3, No. 4 (October–December 2008) 045014 (9 pp.)



IIASA SCIENCE INCREASINGLY PUBLISHED AND CITED



THE DEMOGRAPHY OF EDUCATIONAL ATTAINMENT Research published by IIASA demographers Lutz, Cuaresma, and Sanderson proved unambiguously that education is a fundamental determinant not only of health, demographic trends, and individual income, but also of a country's aggregate level of economic growth.
Science Vol. 319, No. 5866 (22 February 2008), pp. 1047–1048



GLOBAL POPULATION AGING A *Nature* article by IIASA's Lutz, Sanderson, and Scherbov showed how populations will grow older at an accelerating pace, peaking in the decade 2020–2030 and then slowing down after 2030–2050. It also introduced new indicators of aging that assess the expected time to death instead of the traditional time since birth.
Nature Vol. 451, No. 7179 (7 February 2008), pp. 716–719



JOURNAL HIGHLIGHT OF 2008 *Nature Geoscience*, the new journal from *Nature* for the earth sciences, chose the article "How a century of ammonia synthesis changed the world," co-authored by IIASA's Winiwarter and Klimont, among others, as one of its 12 highlights of 2008.
Nature Geoscience Vol. 1, No. 10 (October 2008), pp. 636–639

NEW TOOLS FOR FISHERIES RESEARCH IIASA ecology experts developed an array of research tools to help understand how commercial fishing changes not only the abundance of fish, but also their traits. The new tools include a novel class of eco-genetic models, extensions to adaptive dynamics models, and new analysis of the maturation schedules of exploited fish stocks. The scientific results will be of high relevance to fisheries managers.

NEW METHODS FOR ANALYZING ENERGY TECHNOLOGIES IIASA mathematicians developed over 20 new methods to enable stakeholders to conduct multicriteria analysis of new energy technologies. In the field of large-scale dynamical systems, they also sought to develop a model to find the optimal distribution of investments between two differently performing economic sectors.

GLOBAL FOREST MAP IIASA forest researchers published a global forest map that provides, at half degree resolution, the world's forest growing stock and biomass. This enables researchers to estimate the extent to which deforestation contributes to greenhouse gas emissions (see map).

WORLD POPULATION PROJECTIONS IIASA and the Vienna Institute of Demography published the third update of probabilistic world population projections for 13 world regions.

NEW CLIMATE MODELING TOOL IIASA scientists developed new projections for land cover changes, pollutants, and greenhouse gas emissions, known as Representative Concentration Pathways (RCPs). The fine spatial resolution of the RCP scenarios will be an invaluable tool for the world's climate modeling teams as they prepare the climate change projections for the IPCC's Fifth Assessment Report.

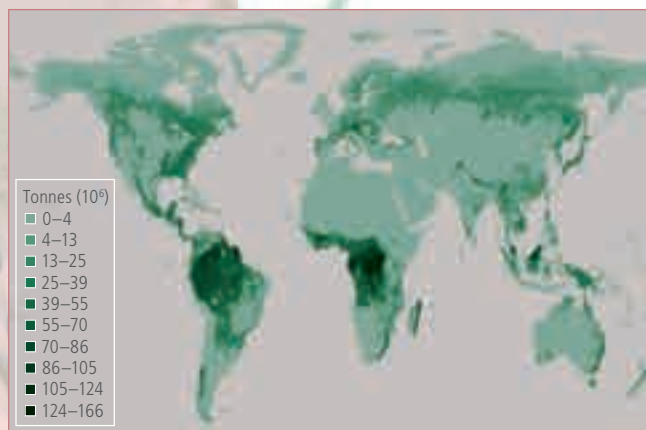
WORLD SOIL DATABASE IIASA and FAO agriculture specialists developed a comprehensive "Harmonized World Soil Database" (HWSD) from recently collected regional and national soil information updates. The HWSD will help national and international policymakers' efforts toward food security through the sustainable expansion of agriculture.

GAINS MODEL IIASA researchers and collaborators completed the new setup of the Greenhouse gas Air pollution Interactions and Synergies (GAINS) model. This modeling tool is used to advise countries on how to reduce air pollution and climate change simultaneously. The model integrates data for 18 pollutants, 1,300 types of economic activity, and 238 regions and countries; it is freely available online.

PET MODEL IIASA scholars developed a computable general equilibrium Population–Environment–Technology (PET) model with detail in the energy sector to analyze the effects of demographic change on future energy use and greenhouse gas emissions. Work in 2008 moved from country case studies (China, India, USA) to a global scenario analysis.

CATSIM MODEL In a DFID-funded project, IIASA scientists developed a local version of the CATastrophe SIMulation (CATSIM) model to assess the costs and benefits for disaster risk management and climate adaptation in northern India.

In collaboration with international partners, IIASA continued to build its portfolio of data, models, and research tools in 2008. IIASA often combines its mathematical and computational tools to develop integrated assessments that address complex, interwoven, and international issues.



THE WORLD'S FORESTS
The new map details, at half degree resolution, the world's forest growing stock and biomass.



International, Interdisciplinary Research

By building interdisciplinary teams of researchers from across the globe, IIASA is well equipped to investigate some of the most serious challenges facing governments: climate change, the forces and flaws of globalization, and the scramble for resources. Only research that studies these complex problems in an integrated way will identify truly long-lasting solutions.

social scientists 40%

Mathematicians

DISTRIBUTION OF IIASA RESEARCHERS

During 2008, scientists from 37 countries worked at IIASA:

■ Argentina ■ Australia ■ Austria ■ Brazil ■ Canada ■ China ■ Czech Republic ■ Finland ■ France ■ Germany ■ Greece ■ Hungary ■ India ■ Indonesia ■ Ireland ■ Italy ■ Japan ■ Republic of Korea ■ Mexico ■ Nepal ■ Netherlands ■ Nigeria ■ Norway ■ Pakistan ■ Philippines ■ Poland ■ Russia ■ Slovakia ■ South Africa ■ Spain ■ Sweden ■ Switzerland ■ Thailand ■ Ukraine ■ United Kingdom ■ USA ■ Vietnam

Of the scientists who worked at IIASA in 2008, 40 percent were social scientists, 36 percent were natural scientists and engineers, and 24 percent were mathematicians and others.



PARTNERS AND NETWORKS

IIASA strengthens its research by developing international networks and partnering with prestigious research organizations. The networks ensure that IIASA's scientific standing and policy impacts are far greater than the size of the Institute might suggest.

The networks and partners help collect and process local data for integration into IIASA's advanced scientific models. For example, over the last five years IIASA has developed a scientific tool, GAINS-Asia, to help China and India combat air pollution and climate change simultaneously. The model integrated both data and economic and environmental models developed by experts in China, India, Italy, and Switzerland.

These networks help IIASA scientists utilize knowledge and expertise from other leading researchers worldwide. For instance, IIASA is the center for a network of over 3,000 negotiation researchers who in 2008 conducted ongoing research into negotiating climate change, negotiating with terrorists, and negotiating over hazardous issues.

These networks also broaden the reach of IIASA's work. Nearly 4,000 researchers from 60 countries are IIASA alumni/ae: many retain close ties with the Institute and have an influential status in their own country or organization, as diplomats, government ministers, academics, and financiers.

Scientific workshops help to develop networks, and in 2008 IIASA held 82 such events. The journal *Science*, reporting on the IIASA workshop, "Vulnerability of Methane Hydrates," called for "more meetings like this." The event brought together scientists and industry representatives to discuss the potential of the methane trapped in Arctic permafrost as a contributor to climate change or as a vast and exotic energy resource.

Such collaboration also helps IIASA build bridges between countries through science.

Climate Change Policy

IIASA researches current world problems to provide countries with the evidence and tools they need to make better-informed, more cost-effective policy decisions. Highlights of IIASA's work to help countries tackle climate change are presented here.

Global Energy Assessment

IIASA and a host of international partners are leading the Global Energy Assessment (GEA). GEA's objective is to help decision makers address the challenges of providing energy services for sustainable development, while alleviating existing and emerging threats associated with: security of supply; access to modern forms of energy for development and poverty alleviation; local, regional, and global environmental impacts; and securing sufficient investment.

Cutting greenhouse gases by sparing tropical forests

A team of IIASA scientists collaborating with researchers in Brazil and the USA published a study demonstrating that paying landowners to reduce tropical deforestation is a cost-effective way of cutting greenhouse gas emissions compared with other current options, such as carbon capture and storage from coal power plants.

Reduced emissions from deforestation and degradation

IIASA researchers proposed policies to resolve two outstanding issues necessary to implement the initiative of Reduced Emissions from Deforestation and Degradation (REDD): first, creation of an international body to generate measurable, reportable, and verifiable REDD credits; and second, adoption of a type of Dutch auction mechanism for credits to maximize emission reductions and the social and ecological co-benefits that forests provide.

A Tool to combat air pollution and climate change simultaneously

An IIASA team has developed the GAINS-Asia model, now available online, to help China and India identify smart mixes of measures to simultaneously cut air pollution and greenhouse gas emissions.

Increasing

In 2008 IIASA research continued to help develop policies to increase the resilience of societies to the stresses imposed by climate change.

Mitigation

IIASA advises countries on the actions needed to reduce greenhouse gas emissions and enhance sinks to absorb carbon from emissions.

Predicting and

Population projections

Population growth is one of the main drivers of greenhouse gas emissions. In 2008 IIASA published its third update of probabilistic population projections for 13 world regions. New IIASA research also showed how demographic trends such as aging and urbanization are affecting energy and land use and their associated emissions.

Integrated Assessment Modeling Consortium

IIASA scientists are co-leaders of the Integrated Assessment Modeling Consortium. The Consortium will play a key role in developing a new set of integrated climate scenarios covering the full range of future greenhouse gas emissions for the Intergovernmental Panel on Climate Change. This research will inform much future climate change research.

Climate change: What role for insurance?

IIASA research shows how insurance, including novel public-private arrangements with international support can play a role in helping vulnerable countries finance the recovery from increasing weather variability and extreme weather events, which, according to experts, will result from global climate change.

Reducing vulnerability to disasters in South Asia

An IIASA team, in collaboration with local partners, assessed the challenges of and opportunities for disaster risk reduction in India, Nepal, and Pakistan, a region that will be particularly vulnerable to stresses from climate change.

Assessing vulnerability to global environmental change

An IIASA scientist analyzed how to bridge the gap between research on vulnerability of human populations to global environmental change, and practical applications in decision making and policy.

Climate change and food security

Climate change poses serious threats to food production. IIASA researchers assessed the impacts of climate change at regional levels, including Sub-Saharan Africa, and explored agronomic options for adapting to projected environmental changes.

Food and greenhouse gas emissions in China

IIASA scientists have modeled the impacts of increased nitrogen fertilizer use in China and suggested alternative policies to minimize the resulting environmental and health risks.

resilience

Advising negotiations

IIASA research advises those involved in international negotiations on climate change through publications, events, and research tools.

© IIASA/Earth Negotiations Bulletin

Deeper emission cuts by industrialized countries

IIASA researchers have developed a scientific tool, the GAINS Greenhouse Gas Mitigation Efforts Calculator, to help negotiators identify and agree on targets to reduce greenhouse gas emissions in developed countries—an integral part of future international agreements on climate change.

Climate change policy targets for 2050

IIASA research shows that mid-century climate conditions are crucial determinants of longer-term climate outcomes. For example, in order to preserve a 50 percent likelihood of keeping average global temperatures at less than 2 °C above pre-industrial levels by 2100, global greenhouse gas emissions must be reduced by about 20 percent or more below 2000 levels.

Intergovernmental Panel on Climate Change (IPCC)

An IIASA scientist served as a member of the core writing team of the Synthesis Report of the IPCC's Fourth Assessment Report, which was published at the beginning of 2008. The Synthesis Report integrates the main findings of the full assessment which was authored by over 800 scientists including 10 IIASA researchers.

Climate change negotiations conference

IIASA's negotiation experts, in collaboration with international partners, hosted a conference on negotiation in Warsaw, Poland, to coincide with COP14 to the UN Framework Convention on Climate Change at Poznań, Poland. The Warsaw event was a significant element of capacity building in a region that will need to learn how best to negotiate on climate change, either as individual states or groups of states.

monitoring emissions

IIASA continues to lead the way in developing research materials to monitor actual emissions of greenhouse gases and project future emissions.

Full greenhouse gas accounting

IIASA's researchers are developing a new method, known as full greenhouse gas accounting, which will provide more effective verification of countries' greenhouse gas emissions under the Kyoto Protocol. This will ensure that states' commitments to reducing such emissions are credibly met.

Uncertainty

IIASA research reassessed the mean greenhouse gas emissions from worldwide use of fossil fuels for 2000 to 2005. The figures are uncertain not by 4 percent—as reported by the IPCC in 2007—but between 5 percent and 11 percent. This range of uncertainty often exceeds the emission reductions agreed to by countries under the Kyoto Protocol.

Capacity Building

Three programs for young researchers at IIASA help build the research skills and potential of junior scientists from around the world.

YOUNG SCIENTISTS SUMMER PROGRAM

Forty-nine young scientists from 22 countries took part in IIASA's Young Scientists Summer Program (YSSP) in 2008.

The Program, established in 1977, lasts from June through August and provides gifted young researchers with an opportunity to research and produce a paper, for possible publication, on a theme related to IIASA's ongoing research on issues of global environmental, economic, and social change. Each young scientist joins an IIASA program and experiences at first hand the atmosphere of interdisciplinary cooperation in an international setting that typifies IIASA's work.

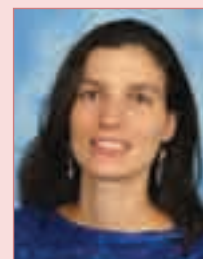
Many of the young researchers made impressive scientific advances during their 2008 stay. Most notable were **Flora Piasentin** of the Federal University of Brasilia, Brazil, and **Jan Ohlberger** of the Leibniz Institute of Freshwater Ecology and Inland Fisheries, Berlin, who were the respective recipients of the 2008 Peccei and Mikhalevich Awards, conferred annually for outstanding research by YSSP participants. The awards provide the young scientists with the opportunity to return to IIASA for an additional three months of research.

Commenting on the IIASA Young Scientists Summer Program, Nobel Laureate Thomas C. Schelling has said: "By bringing the world's most promising young scientists to spend a summer at IIASA, the Institute ensures the next generation of scientists is even better equipped to solve the world's problems."

For the complete list of IIASA YSSP participants 2008, see page 26.

www.iiasa.ac.at/YSSP

PECCEI AWARD WINNER Flora Piasentin



Flora Piasentin of the Federal University of Brasilia in Brazil was awarded the 2008 Peccei Scholarship for her work in IIASA's Land Use Change and Agriculture Program. During her three months at IIASA, she completed the first-known assessment of the potential for improving cacao productivity and sustainability in Bahia State in Northeast Brazil. Piasentin is a second year PhD student in Sustainable Development, with emphasis on Environmental Policy and Management.



MIKHALEVICH AWARD WINNER

Jan Ohlberger



Jan Ohlberger of the Leibniz Institute of Freshwater Ecology and Inland Fisheries in Berlin received the 2008 Mikhalevich Scholarship for his work in IIASA's Evolution and Ecology Program. Ohlberger assessed how fish diversity in Lake Stechlin in Germany might be affected by the inflow of warm water used in the cooling of a nearby nuclear power plant. His results suggest that fish have diversified in response to temperature gradients and temperature changes in the lake.

POSTDOCTORAL PROGRAM

Fourteen postdoctoral fellows carried out research at IIASA in 2008. IIASA postdoctoral fellowships offer research opportunities to talented individuals who have just received their doctorate to conduct one-to-two-years' research within one of IIASA's research programs or on special topics closely related to IIASA's agenda.

The experience allows postdoctoral candidates to develop their knowledge and experience, improve their network of contacts, and start building a reputation in research circles. IIASA benefits from the influence of these scientists with their up-to-the-minute knowledge and youthful enthusiasm.

Originally IIASA's postdoctoral fellowships were funded entirely by IIASA's National Member Organizations in Finland and the Netherlands, by the Kempe Foundation in Sweden, and also as part of projects funded by the European Commission. The fellowships have proved so successful that since 2006 IIASA has funded an additional two fellowships.

For the complete list of IIASA postdoctoral fellows 2008, see page 27.

www.iiasa.ac.at/pdocs

LUIS DONALDO COLOSIO FELLOWSHIP

Manuel Benjamin Ortiz-Moctezuma, the Colosio Fellow in 2008, worked on developing a model to explore the development of a country's transport infrastructure.

IIASA established the Colosio Fellowship in 1994 in memory of former IIASA scientist Luis Donaldo Colosio, who was assassinated on 23 March 1994 while campaigning in Tijuana for the office of President of Mexico.

Each year the Fellowship allows one young Mexican researcher to spend six to twelve months at IIASA, working with scientists of different nationalities and disciplines, as Colosio himself did, and pursuing Colosio's dream of harnessing the science of the industrialized North to address the problems of the developing South.

www.iiasa.ac.at/YSSP/scholar-fellow.html

COLOSIO FELLOW

Manuel Benjamin Ortiz-Moctezuma



Manuel Benjamin Ortiz-Moctezuma graduated from the National Polytechnic Institute of Mexico (IPN) in 2000; he received his MS in 2002 and his PhD in Automatic Control in 2005 from the Institute's Research and Advanced Studies Center (CINVESTAV-IPN). As Colosio Fellow in IIASA's Dynamic Systems (DYN) Program, he is working on the interdisciplinary development of models for transportation systems in the context of economic growth.

Environment and Natural Resources

Many of the biggest challenges shaping a country's future—food security, climate change, sustainable development—often need global, not just national, solutions. IIASA research addresses the complexity of global environmental challenges by studying the issues both in an integrated way and independently of national self-interest.

LAND USE CHANGE AND AGRICULTURE (LUC)

In 2008 LUC carried out scenario evaluation and policy analysis of food and agriculture at the national, regional, and global levels. LUC's research into the highly controversial and rapidly expanding area of liquid biofuels for transport is firmly anchored in two European Union-funded projects and a special report recently finalized on *"Biofuels and Food Security."* This assessment deals with the implications of accelerated biofuel production for food security and rural poverty, competition for land, and land conversion. Conclusions drawn in the report were that (1) implementing national biofuel targets for 2020 based on current first-generation technologies will put food security at risk without achieving a significant reduction in greenhouse gas emissions; (2) achieving a 10 percent global biofuel target by 2030 in a sustainable manner needs rapid deployment of second-generation conversion technologies; and (3) biofuel policies require a global scope and international development partnerships.

LUC and the Food and Agriculture Organization of the United Nations spearheaded a powerful consortium of applied soil science organizations to improve soil information worldwide. Version 1.0 of the Harmonized World Soil Database (HWSD) was released in July 2008. Developed specifically for LUC's Global Agro-ecological Assessment study, HWSD can contribute greatly in the context of the Climate Change Convention and the Kyoto Protocol.

A joint project with the Atmospheric Pollution and Economic Development Program under IIASA's Greenhouse Gas Initiative developed an integrated, spatially detailed framework for the analysis of environmental impacts related to nitrogen use and management and to potential abatement measures.

www.iiasa.ac.at/Research/LUC

EVOLUTION AND ECOLOGY (EEP)

In 2008 EEP continued to work to overcome a blind spot in the management of living aquatic resources, namely, that exploitation changes both the abundance of fish and their heritable traits. Researchers developed new methodological tools for analyzing, predicting, and managing fisheries-induced evolution, and applied these to case studies on Arctic charr, brook charr, Atlantic cod, plaice, northern pike, Atlantic salmon, chum salmon, and sockeye salmon. EEP co-organized the symposium "Evolving Fish, Changing Fisheries" at the American Fisheries Society's 2008 annual conference in Ottawa, attracting a wide range of fisheries scientists, managers, and stakeholders.

The Program continues to develop adaptive dynamics theory, an extension of classical evolutionary game theory, at the leading edge of international research. A comprehensive theoretical overview was presented in a new textbook, published by Princeton University Press, with a second book describing methods and applications forthcoming.

EEP's research on evolution of cooperation unravels conditions for avoiding the tragedy of the commons in the exploitation of natural resources and the safeguarding of public goods. Investigations in 2008 focused on the issue of enforcement of cooperation.

EEP contributes to understanding the underlying mechanisms of the emergence, maintenance, and loss of biodiversity, which pose major challenges for evolutionary ecology and conservation science. Research covered the evolutionary establishment and stability of food webs and the ecological and genetic conditions promoting biodiversity formation.

www.iiasa.ac.at/Research/EEP

Greenhouse gas mitigation measures

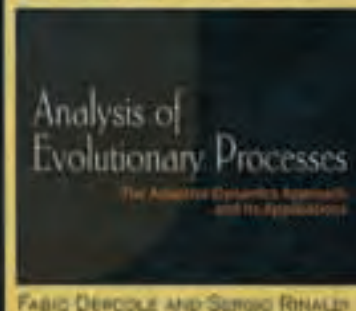
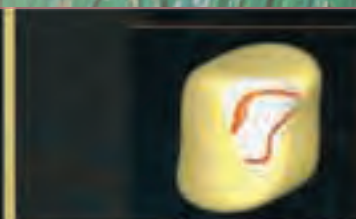
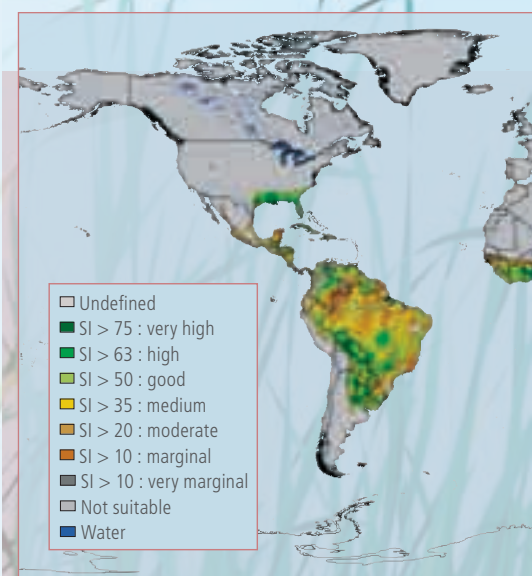
- Energy efficiency, households
- Energy efficiency, industry
- Co-generation of heat and power
- Electricity savings, renewable energy

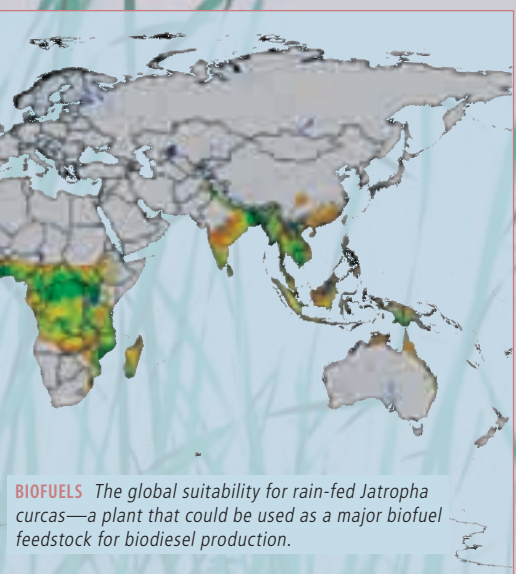
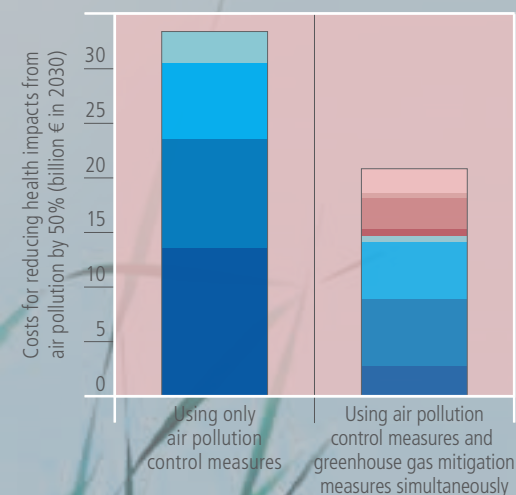
Air pollution control measures

- Households, PM controls
- Large plants, PM controls
- Large plants, NO_x controls
- Large plants, SO₂ controls

EMISSION CONTROL COSTS

China can dramatically save costs by adopting a smart mix of measures to reduce air pollution and greenhouse gas emissions simultaneously.





AIR POLLUTION AND ECONOMIC DEVELOPMENT (APD)

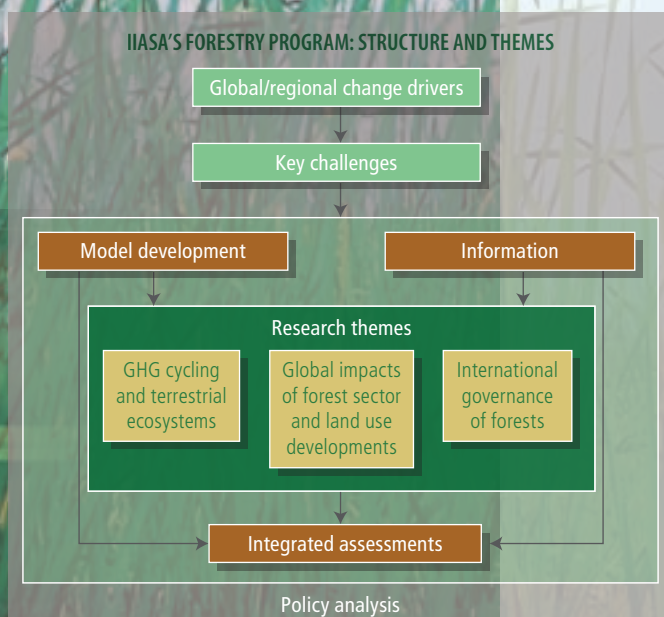
APD made the new setup of the GAINS model, which integrates quality-controlled data for 18 pollutants, 1,300 types of economic activity, and 238 regions/countries, freely accessible on the Internet. Using the recently completed aerosol emission components of GAINS, APD, with Chinese and Indian collaborators, produced an assessment of current and future emissions in Asia, which will improve health impacts assessment and add important information to global climate models.

With Chinese, Indian, and Pakistani collaborators, APD completed the GAINS implementation for Asia. GAINS also helped APD develop methodology for systematic comparison of greenhouse gas (GHG) mitigation efforts among different countries for the ongoing climate negotiations of the United Nations Framework Convention on Climate Change. GAINS analyses also provided quantitative information to the European Commission for negotiations on the European Union (EU) Climate and Energy Package, which aims for a 20 percent reduction in EU GHG emissions by 2020.

An APD report on the cost-effectiveness of emission controls from marine shipping contributed to the 2008 agreement within the International Maritime Organization on the global reduction of sulfur content of fuels and tighter standards for nitrogen oxide (NO_x) emissions. APD modeling underpinned negotiations to revise the Gothenburg multi-pollutant/multi-effect Protocol to the United Nations Convention on Long-range Transboundary Air Pollution.

APD collaborative research created considerable scientific interest by demonstrating that nitrous oxide (N₂O) emissions from agricultural biofuel production may more than compensate, in GHG emission terms, for reduced fossil fuel carbon dioxide (CO₂) emissions. APD collaborated with other IIASA programs on the macro-economic impacts of investments into clean air, integrated nitrogen management in China, and the impacts of urbanization on air pollution and health.

www.iiasa.ac.at/Research/APD



FORESTRY (FOR)

FOR attained notable progress in its core research themes and raised its profile in the scientific and policy communities through a number of ground-breaking achievements. Dissemination of FOR research on forest sector globalization and the land-use conflict between conventional forestry, bioenergy production, and food production were among the year's highlights.

A cluster of advanced FOR models proved vital to its own and international partners' work. New FOR research indicated that the full uncertainty of mean global fossil fuel emissions for 2000–2005 is not 4 percent, as reported by the Intergovernmental Panel on Climate Change in 2007, but between about 5 and 11 percent. A FOR scenario analysis showed 57 percent increased paper consumption—carrying a substantial environmental footprint—in China by 2015. A FOR team also found the top five countries by carbon sequestration potential and cost-competitiveness to be Brazil, Zaire, Indonesia, Bolivia, and Tanzania.

At the UN Climate Change Conference in Poznań, FOR organized a side event on Reducing Emissions from Deforestation and Ecosystem Degradation (REDD). FOR contributed to the "Eliasch Report," a comprehensive analysis of international REDD financing, led by the UK Office of Climate Change. A FOR publication in the PNAS Journal on "Global cost estimates of reducing carbon emissions through avoided deforestation" was widely acclaimed.

With TIFAC, the IIASA National Member Organization for India, FOR published in *The International Forestry Review* an integrated assessment of the Indian forest sector noting the constraints the sector must overcome to fully contribute to Indian socio-economic development.

www.iiasa.ac.at/Research/FOR

Population and Society

Population change is one of the key drivers of global change, as it increases the strains on global resources and society.

IIASA's work investigates not only demographic change, but also how societies can increase their resilience to the stresses posed by global change, in particular climate change.

LEARNING AND CLIMATE CHANGE

A special issue of *Climatic Change*, edited and written by PCC researchers, examines the implications of learning (or changes in uncertainty over time) for climate change policy.

DISASTER DEATHS, AND DEVELOPMENT

The graph compares the risk of being killed by climate-related disasters (floods, droughts, cyclones) with a country's development. The risk of death peaks in countries with medium levels of development.

WORLD POPULATION (POP)

In 2008 POP published its third update of probabilistic world population projections for 13 world regions in *Nature*, focusing on the expected speed of population aging rather than population growth, as in 2001. The projections, which reflect the most recent demographic trends to 2006, maintain POP's previous estimate of an 88 percent probability of the world population peaking before century end.

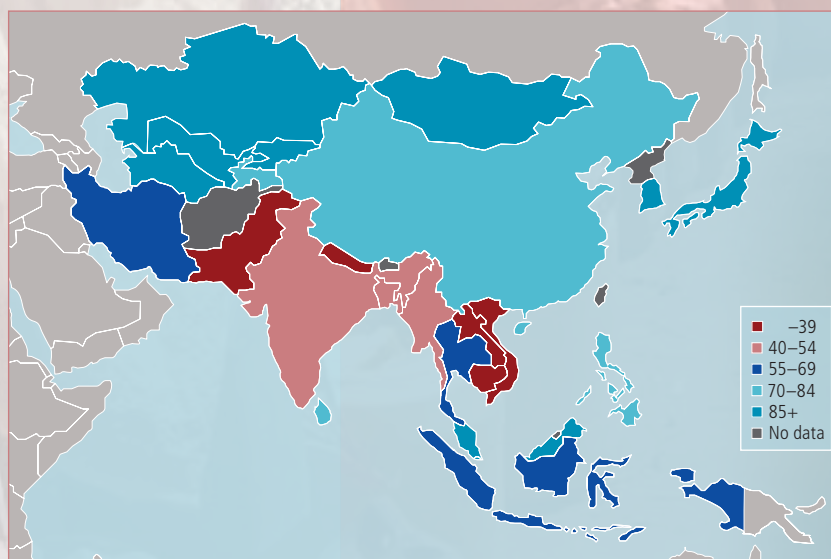
POP completed pioneering work which resulted in a redefinition of the concept of age—the expected time to death, rather than the traditional measure of time since birth (captured in such phrases as “40 is the new 30”).

With collaborators, POP published the “European Demographic Data Sheet 2008” and the “Asian Demographic and Human Capital Data Sheet 2008,” which presented important new demographic indicators in a consistent way for all countries. Both were widely distributed to researchers in these regions.

A POP Policy Forum in *Science* for the first time presented consistent statistical evidence that improvements in education, and thus human capital, have consistently positive effects on economic growth rates. The study finds that the current Millennium Development Goal of universal primary education should be complemented by the further goal of secondary education to provide the necessary push to bring countries out of poverty.

Wolfgang Lutz was awarded a prestigious personal grant by the European Research Council for a study on “Forecasting Societies' Adaptive Capacities to Climate Change,” to be conducted at IIASA over the coming five years.

www.iiasa.ac.at/Research/POP



ASIAN HUMAN CAPITAL Proportion of women aged 15–44 with at least secondary education in 2007.



POPULATION AND CLIMATE CHANGE (PCC)

One aspect of PCC's integrative work is to model links between demography, energy, and emissions. In 2008 the main focus moved from country case studies to a global scenario analysis of the potential effects of demographic change on future energy use and emissions. PCC's detailed analysis of energy and economic behaviors of individual households formed the basis of presentations to the Conference of the International Association for Energy Economics and a workshop, "Energy and Poverty: Clean Cooking Fuels and Technologies."

PCC examined the implications of learning (or changes in uncertainty over time) for climate change policy, to which research has yet to provide definitive answers. Two journal special issues on uncertainty were published based on papers resulting from a 2006 meeting on Learning and Climate Change and a 2007 meeting on Global Environmental Futures, co-organized with Brown University.

PCC undertook analyses of the uncertainty of the climate response to greenhouse gas forcing, particularly forcing due to sulfate aerosols, and began a study of how uncertainty has changed based on new data.

PCC also investigated options for climate policy strategies over the next 30–50 years that help link potential long-term climate change targets to short-term actions. PCC collaborated with GGI and ENE on a comprehensive analysis of emission reduction targets that would maintain the feasibility of various long-term climate change goals.

www.iiasa.ac.at/Research/PCC

RISK AND VULNERABILITY (RAV)

A major element of RAV's work—supporting pre-disaster insurance instruments as a partial alternative to post-disaster assistance—is now resonating in the climate community. The IIASA Policy Brief, "Climate Change: What Role for Insurance?" gained extensive media coverage at COP 14 to the UN Framework Convention on Climate Change in Poznań. The findings, building on work by RAV to support and advise developing-country governments, have a good chance of influencing outcomes on an adaptation strategy at COP 15 in Copenhagen.

A RAV-led work package of the ADAM project, supported by the European Union (EU), resulted in the first probability-based and spatially explicit disaster maps for Europe. The maps show the newest EU member states to be facing annualized flood damage of more than 1 percent of GDP. Using the CATSIM-micro model, RAV examined the exposure, risk, and vulnerability of a typical Uttar Pradesh household. The results, namely, that preventive measures can generate competitive economic returns, will be presented at a ministerial-level meeting in Delhi.

Advanced RAV research showed that vulnerability assessments delivering simple and easy-to-understand information are likelier to influence policy than aggregated indicators and metrics. RAV also demonstrated that socio-economic development in Mozambique would more than compensate for changing risk levels predicted by climate models.

RAV initiated an intriguing new research venture on the potential of large-scale solar facilities in Africa to provide electricity to Europe, and associated risks. RAV also explored perceptions and understanding of climate risk and micro-insurance products by small farmers in Africa, and the use of games for building this understanding.

www.iiasa.ac.at/Research/RAV

PROCESSES OF INTERNATIONAL NEGOTIATION (PIN)

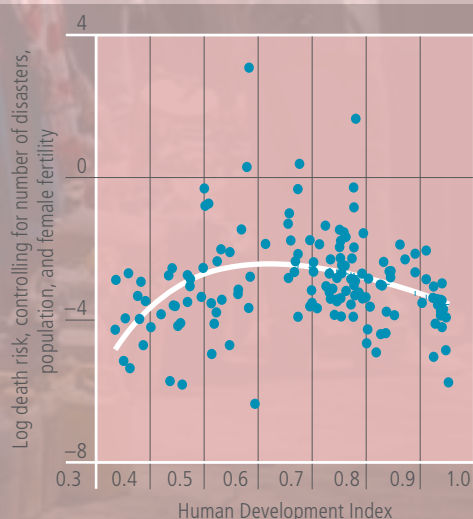
PIN worked to promote improved understanding and practice of the processes of international negotiation through publications, conferences, consultations, networks, and outreach.

Around 100 diplomats, researchers, representatives from international organizations and NGOs, and students, participated in the "Geneva Negotiation Day" on multilateral diplomacy, hosted by the Geneva Centre for Security Policy. A conference on negotiation, timed to coincide with COP 14 to the UN Framework Convention on Climate Change on 11 December 2008, was organized by PIN at the University of Warsaw as a capacity-building exercise ahead of the main 2009 climate-change negotiations.

Theorists and practitioners met for a one-day workshop at IIASA, organized by PIN, to discuss "both sides" of the negotiating process. Twelve ambassadors and 40 other diplomats and academics attended. The first editorial meeting on the 2008 book project, "External Efforts to Promote Negotiation and Prevent Genocide in Internal Identity Conflicts," was held at IIASA and funded by the Secretariat of the UN Special Adviser on the Prevention of Genocide. The project marks PIN's entry into the international policy stream at the highest level. Links were also forged for the first time in 2008 between PIN and CTBTO.

The third session of Caspiolog (The Caspian Dialog), initiated by PIN in 2006, took place in Kazakhstan. PIN members, environmental scientists from IIASA, and local experts took part. Caspiolog concluded with a policy recommendation to the Kazakh President.

www.iiasa.ac.at/Research/PIN



A NEW BOOK, edited by IIASA's PIN researchers, is acclaimed as "an indispensable tool for teaching, research, and practice in conflict resolution."

Energy and Technology

Energy and technology drive development. Energy and the provision of energy services are also interlinked with most of the key global challenges ranging from climate change to poverty to security. IIASA research improves our understanding of how the world can harness energy and technology to power our future while helping to alleviate other global issues.

DYNAMIC SYSTEMS (DYN)

In 2008 DYN research covered four areas: Assessment of Dynamical Systems (ADS), Driving Forces of Economic Growth (ECG), Fragility of Critical Infrastructures (FCI), and Environmental Applications (ENA). ADS extends DYN's earlier studies in methodology; it aims to develop methods for the analysis of large-scale dynamical systems and to use these methods to support research in the areas of ECG, FCI, and ENA.

ECG is based on DYN's earlier research on assessment of technological dynamics. Since 2007 ECG activities have pursued the goal of consolidating studies on critical aspects of economic development, carried out from different disciplinary perspectives across IIASA. In 2008 ECG-based research used theoretic and data-based analyses to characterize long-lasting feedbacks between economic growth and development of aggregate production factors such as useful work, transportation infrastructure, and health. An example of ECG-based research was the Simulation of Optimal Economic Growth Project. The project's results allow policymakers to assess the effectiveness of the country's capital-saving policy in the past and to understand when, in the future, the country's growth trajectory may experience a slowdown.

FCI was launched in 2007 to form the basis for a new IIASA cross-program initiative focusing on assessment and management of critically important infrastructures, such as those supporting flows of energy, transport, money, and information. FCI research began in 2008. ENA continues DYN's research in the areas of environmental management and ecology.

www.iiasa.ac.at/Research/DYN

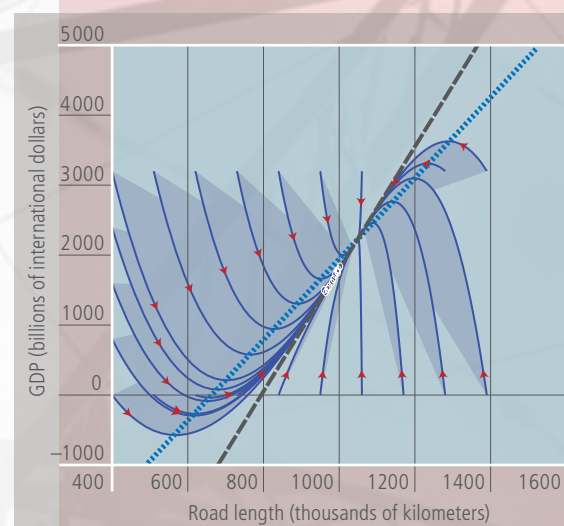
GLOBAL ENERGY ASSESSMENT (GEA)

A multi-year, multi-stakeholder activity, GEA aims to help decision makers address the challenges of providing energy services for global sustainable development. GEA participants are assessing and synthesizing an extensive range of energy research literature to identify the state of knowledge and key strategic gaps that need to be addressed to support long-term decision making in energy. In 2008 all topical "knowledge modules" of the Assessment were completed, culminating in completion of the "zero-order draft," designed to acquaint stakeholders with the key questions being investigated.

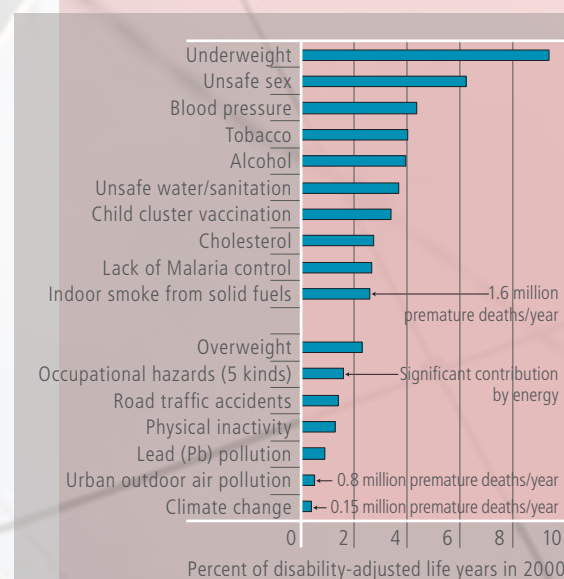
With consensus having emerged among GEA participants that energy and the provision of energy services can be linked directly with most key global challenges, the GEA will support the broader energy research agenda by contributing to a better understanding of the interlinkages across the range of energy-related challenges and by identifying areas where the prevalence of competing objectives may necessitate more sophisticated analytical approaches. Further, the GEA is facilitating exchange among energy experts and leading businesses, governments, and international organizations.

The GEA's preliminary findings detail the greatly differing challenges facing developed and developing countries. Stakeholder feedback indicates that GEA is not only timely, in terms of building on and leveraging findings from other recent assessments—such as the Millennium Ecosystems Assessment or the IPCC Fourth Assessment Report—but also in supporting other ongoing multilateral initiatives. The GEA is also relevant to ongoing policy dialogs such as international negotiations under the UN Framework Convention on Climate Change.

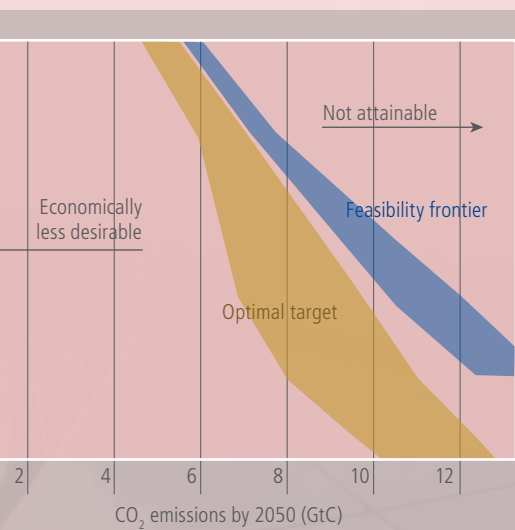
www.GlobalEnergyAssessment.org



ECONOMIC GROWTH AND TRANSPORT INFRASTRUCTURE IN FRANCE
The blue dotted line shows the critical combination of GDP and road capacity above which the road infrastructure cannot support GDP growth. The black dotted line shows the optimal combination, which coincides with real data for French GDP and road capacity from 1970 to 1994 (white circles).



FACTORS THAT INCREASE RISK OF DISEASE Inadequate provision of energy services is directly linked to several of these risks.



MID-CENTURY CLIMATE CHANGE TARGETS Experts argue that, to avoid dangerous climate change, global average temperatures should increase by less than 2°C by 2100. To achieve this goal, the combinations of CO₂ emissions in 2050 must remain to the left of the feasibility frontier (purple). The beige area marks combinations that minimize total mitigation costs.

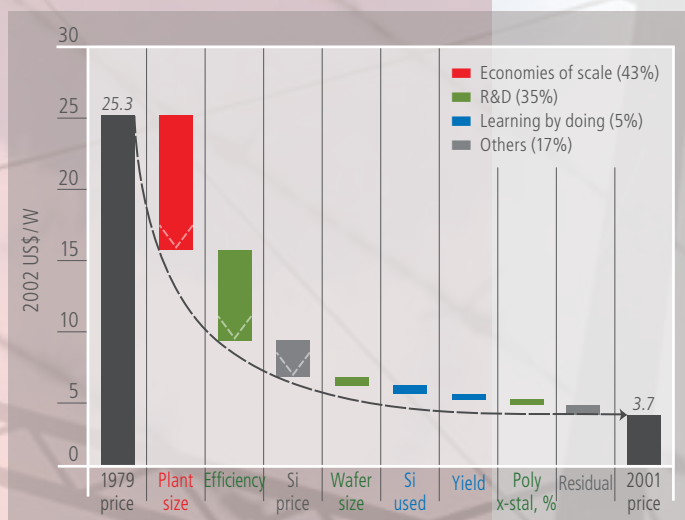
ENERGY (ENE)

The year 2008 was an important milestone for ENE's climate change research. An ENE scientist was part of the core writing team for the "Synthesis Report" of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, published in 2008. ENE was also actively involved in the multi-stakeholder process to shape the development of the next generation of IPCC scenarios. This included coordination of research activities across international climate research communities and the development of Representative Concentration Pathways (RCPs), spatially explicit emissions and land-cover-change projections, which will form the analytical backbone of the climate change projections of the IPCC's Fifth Assessment Report. The first of their kind, the RCPs have involved substantial collaborations across IIASA, including joint scenario development with LUC, FOR and APD and the development of a Web-based data repository with TNT. It is planned for the latter to serve as the data dissemination device of the IPCC projections, thus providing a unique service to the climate research community.

ENE worked to finalize the study of interim climate policy targets for the mid-century. The study, proposed as a way to guide policy over the next several decades in the absence of political agreement on a long-term goal, identifies critical mid-century thresholds for emissions and the energy system so that a range of long-term climate objectives can be preserved.

ENE core research topics with a methodological focus in 2008 were: (1) decision making under uncertainty; and (2) modeling of energy access and poverty eradication. The final results of these will be part of ENE's scientific contribution to the GEA.

www.iiasa.ac.at/Research/ENE



PHOTOVOLTAICS

The factors contributing to the cost reductions of US photovoltaics from US\$25.3 per watt in 1979 to US\$3.7 per watt in 2001. Source: Greg Nemet, 2008 (TNT-YSSP 2004)

TRANSITIONS TO NEW TECHNOLOGIES (TNT)

TNT co-organized two international workshops and launched two major international GEA activities. It also continued in-house research on agent-based models of technological complexity and spatial dimensions in the creation and diffusion of new technologies.

The first workshop, featured prominently in the journal *Science*, was on vulnerability of methane hydrates (natural gas trapped in the lattice structure of ice molecules), which are receiving increased attention for their critical role in past and future climates and as an exotic and potentially vast energy resource.

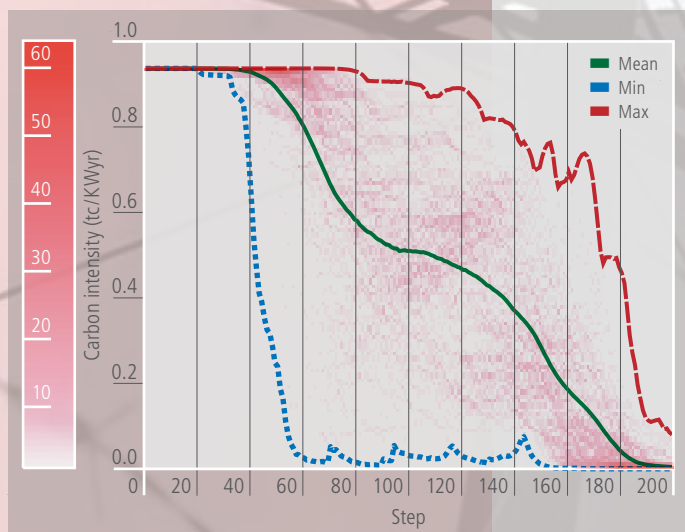
The second workshop was a preparatory meeting for a larger 2009 workshop on the economics of technologies to combat global warming. The workshops aim for a deeper understanding of climate-friendly technologies, their characteristics, and the policy mechanisms needed to develop and deploy them commercially.

TNT coordinated GEA work on two knowledge modules: urbanization and technology innovation policy. Significant progress was made on the organization of four GEA Lead Author meetings, two at IIASA and the others at the UN Development Programme and Harvard University.

TNT completed two papers on its novel agent-based model of technological complexity. These discuss the methodological underpinnings of this new evolutionary perspective on the long-term evolution of technological complexity and derive a number of robust policy-relevant conclusions from hundreds of model simulations performed.

Internal TNT research efforts in modeling of spatial phenomena intensified. An input to TNT assessments of technology diffusion potentials, these serve as a basis for developing spatially explicit scenarios of urbanization, air pollution, and health impact exposures developed jointly with other IIASA programs.

www.iiasa.ac.at/Research/TNT



CARBON EMISSIONS Evolution of the pollution intensity (carbon emissions per unit of energy) over 200 simulation time steps (years) and across 200 simulations (min/max, mean, and dispersion of simulation runs with density denoted by color shading) of an agent-based model of technological complexity.

Institute-Wide Research and Special Projects

We live in an interconnected world. The latest economic crisis has demonstrated the impossibility of “going it alone” in an era of increasing globalization. For many years, IIASA research has reflected the fact that cooperation and integration among scientific disciplines is the only viable route to achieving sustainability, human security, and ultimately, survival.



GREENHOUSE GAS INITIATIVE (GGI)

GGI is the largest inter-program collaborative research effort at IIASA, involving more than two dozen researchers from a number of programs. The main focus in 2008 was on regional climate change issues, with an emphasis on the near-term perspective, and on both mitigation and adaptation strategies for East Asia, particularly the south.

In a major GGI project a framework was developed that can be used to test scenarios affecting agricultural activities and their related greenhouse gas (GHG) and air pollutant emissions. This project, on integrated nitrogen management in China (INMIC), provides an assessment of the magnitude of environmental nitrogen loads, under alternative demographic and other socioeconomic scenarios, resulting from increased future demand for agricultural products in China. It also enables policy suggestions for mitigating or minimizing negative environmental and health risks from agriculture.

The ongoing GGI ADAPT project addresses two highly topical questions of climate-change adaptation, namely: What are robust options for adapting to climate change? and: How can adaptation be taken into account in integrated climate-change modeling? Focusing on Indian states bordering India and Nepal, these interrelated questions are being investigated for the agricultural sector, which already faces exposure to high risks from weather extremes.

Another GGI undertaking, the Human Development Index, Investments, and GHG emissions (HDI) project, examines how human development—measured through the UN Development Programme’s Human Development Index—could be progressed through alternative investments that cause less of an increase in GHG emissions.

In 2008 GGI hosted 17 events, some with a specific focus on the UN Climate Framework Convention on Climate Change (UNFCCC). Several GGI researchers participated actively at side events at COP 14 to the UNFCCC in Poznań in December.

www.iiasa.ac.at/Research/GGI

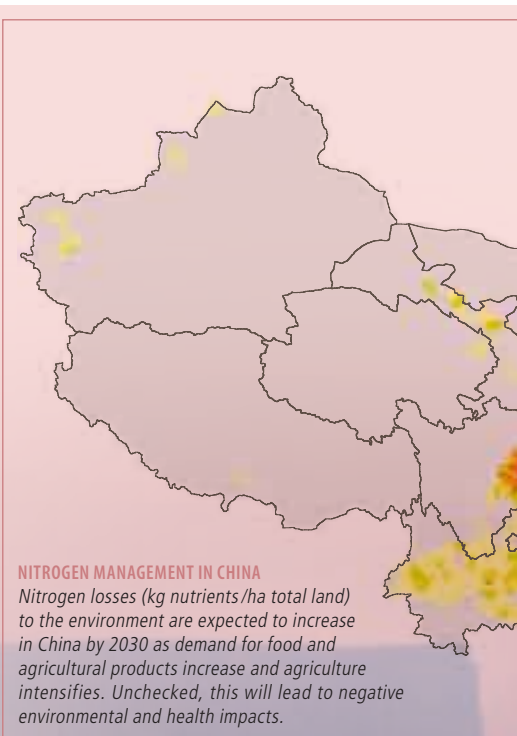
HEALTH AND GLOBAL CHANGE (HGC)

HGC aims to contribute to research and deepen international policy dialog related to health—a human dimension of global change. In 2008 HGC played a key role in the International Council for Science (ICSU) Planning Group on “Health and wellbeing in a changing urban environment,” hosting two meetings on urban health, at which six IIASA programs gave presentations, and chairing a third at ICSU headquarters in Paris.

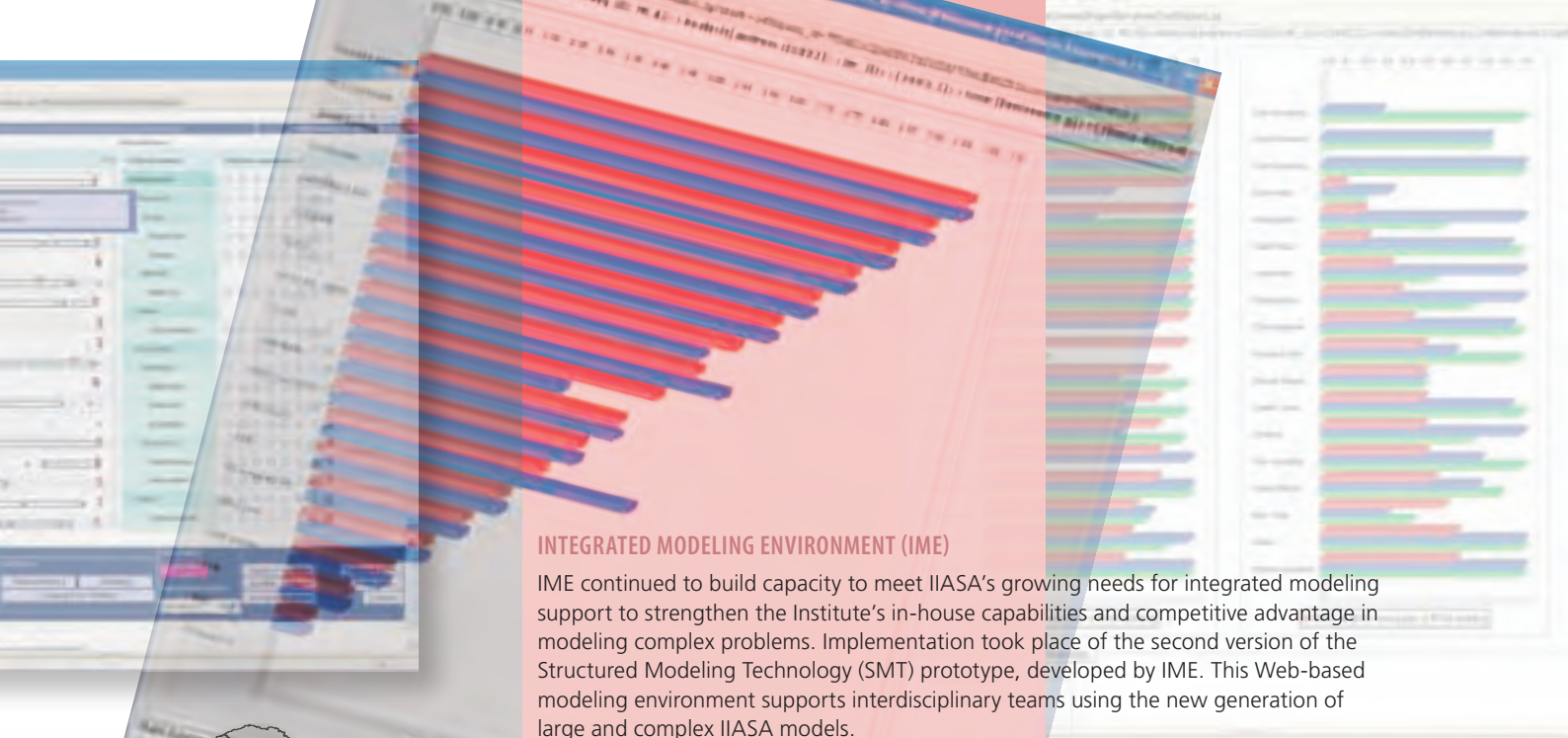
In November HGC participated in the symposium “Urbanization and Environment in China,” in Beijing, co-organized with Peking University’s Institute of Population Studies.

HGC policy advisory work was extensive in terms of scope and geographical reach. Research funded by the African Science Academy Development Initiative (ASADI) of the US National Academy of Sciences, was carried out on AIDS relief in Africa and blood safety in Nigeria, and food security mentoring in Cameroon. Short-term technical assistance was also rendered on pension reform in Armenia and contributions made to the Asian Development Bank project “Implementing pensions for the unorganized sector in India.” HGC led European Commission evaluations of development cooperation with Lao PDR, Vietnam, and the Association of Southeast Asian Nations (ASEAN); it led UN Development Programme evaluations of capacity building in Serbia, and provided expertise to the Environment, Food and Rural Affairs Committee of the European Parliament on child victims of human trafficking. HGC also provided expert assistance on environment and higher education for the European Commission evaluation of development cooperation with Thailand, Malaysia, and ASEAN.

www.iiasa.ac.at/Research/HGC

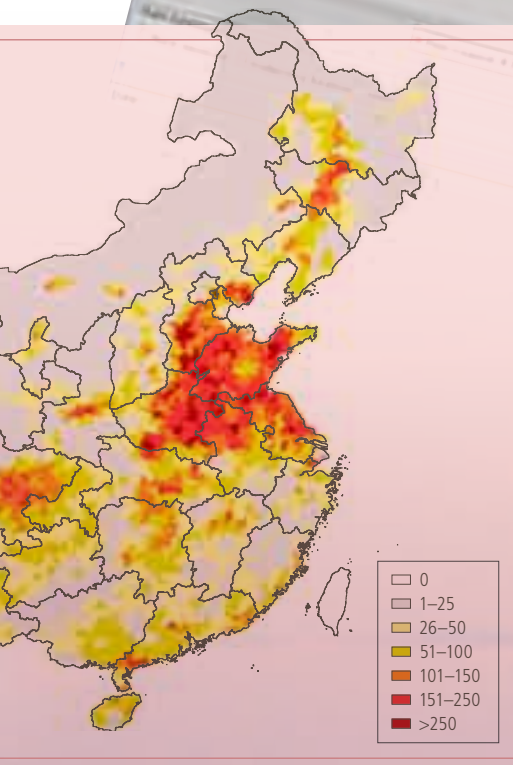


HIV VIRUS
© Sgame | Dreamstime.com



INTEGRATED MODELING ENVIRONMENT (IME)

IME continued to build capacity to meet IIASA's growing needs for integrated modeling support to strengthen the Institute's in-house capabilities and competitive advantage in modeling complex problems. Implementation took place of the second version of the Structured Modeling Technology (SMT) prototype, developed by IME. This Web-based modeling environment supports interdisciplinary teams using the new generation of large and complex IIASA models.



As a partner of the EU-funded Integrated Project, NEEDS, IME developed a Web site for multicriteria analysis of future energy technologies. The site, designed and implemented for users with few or no analytical skills, has been used by over 3000 stakeholders. It has a user-friendly interface and a dedicated multicriteria analysis method. To provide this method, IME and its collaborators have developed over 20 new methods for multicriteria analysis of discrete choice problems characterized by large numbers of criteria and alternatives; energy experts evaluated the new methods and selected the most suitable one.

IME research on coping with uncertainty focused on integrated modeling of robust decisions, including catastrophic risk management, where diversified knowledge relevant to the problem must be combined with scarce data to design a robust strategy which is sensitive to events that have never occurred. This research was conducted mainly in collaboration with the LUC and FOR programs, and with colleagues from collaborating institutions. Proceedings of the 2007 workshop, *Coping with Uncertainties: Robust Decisions*, included contributions from IIASA and research network colleagues.

www.iiasa.ac.at/Research/IME

WATER ACTIVITIES

Water researchers co-edited a special issue of the journal *Ecology and Society*, "New Methods for Adaptive Water Management," which included 11 papers reflecting the research findings of the EU-funded NeWater project. These papers help expand the scientific foundations of adaptive management and science of river basins.

IIASA provided expert analysis in support of a second Pan-European Panel of water experts and decision makers convened by the EU-funded SCENES project to develop scenarios of alternate futures for water quality and water quantity in Europe to 2050. RAV provided systems modeling to analyze causal patterns that influence water at different scale, while LUC provided data on drivers of water use in Europe and advice on their application in scenario development.

Another EU-funded project, Water and Global Change (WATCH) brought together more than 25 institutions in the hydrological, water resources, and climate communities to clarify the overall vulnerability of global water resources related to the main societal and economic sectors. LUC is providing global spatial data on key components of the water cycle from 1900 to 2100 regarding agricultural, industrial, and domestic uses.

RAV researchers ran a workshop at the Institute for Meteorology and Water Management in Krakow, Poland, for regional water managers from Poland and Hungary. System dynamics models of decisions by water managers and farmers in river floodplains were used to drive an interactive game for stakeholders. The game permitted participants to explore floodplain management options by role playing as different types of farmers and water managers. Such modeling applications are part of the cutting edge of knowledge elicitation that goes well beyond information available from questionnaires on how resource users and managers make decisions.

Water researchers from LUC contributed expertise to the Third Caspian Dialog in Almaty, Kazakhstan, in October.

www.iiasa.ac.at/Research/WAT

Young Scientists

Since 1977 through the Young Scientists Summer Program (YSSP), over 1,400 young researchers have become part of IIASA's international network of researchers



IIASA YSSP PARTICIPANTS 2008

1 Zachary Almquist, USA 2 Stefan Berecz, Austria 3 Roman Chechushkov, Russia 4 Jinsong Chen, China 5 Maria Kristina Difs, Sweden 6 Ekaterina Dolgova, Russia 7 Tommi Ekholm, Finland 8 Carolin Görzig, Germany 9 Ane Heggedal, Norway 10 Janne Helin, Finland 11 Paulina Hetman, Poland 12 Jung-Chen Huang, Chinese Taiwan 13 Sayaka Kanata, Japan 14 Minhho Kang, Republic of Korea 15 Adam Kiczko, Poland 16 Yingchun Li, China 17 Shuo Liu, China 18 James McNerney, USA 19 Leithen Mgonigle, Canada 20 Koichi Mikami, Japan 21 Michel Müller, Switzerland 22 Tahira Munir, Pakistan 23 Jan Ohlberger, Germany 24 Kenichi Okamoto, USA 25 Yulia Pavlova, Russia 26 Joshua Payne, USA 27 Flora Piasentin, Brazil 28 Yan Qin, China 29 Pushpendra Rana, India 30 Tatsuya Sasaki, Japan 31 Monika Sawhney, India 32 Johannes Schmidt, Austria 33 Yvonne Scholz, Germany 34 Pavlo Shevchuk, Ukraine 35 Jae Ho Shin, Republic of Korea 36 Ekundayo Shittu, Nigeria 37 Tamara Shulgina, Russia 38 Jacek Skoskiewicz, Poland 39 Win Trivitanurak, Thailand 40 Chisa Umemiya, Japan 41 Louise Van Schaik, Netherlands 42 Susanne Wagner, Germany 43 Saskia Werners, Netherlands 44 Charles Wilson, United Kingdom 45 Nancy Wozabal, India 46 Liangjie Xin, China 47 Syed Zaidi, Pakistan 48 Dongling Zhang, China 49 Wenji Zhou, China

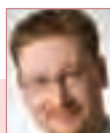
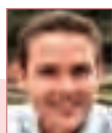
www.iiasa.ac.at/YSSP

Postdoctoral Research Fellows

In 2008 fourteen postdoctoral scholars gained hands-on research experience at IIASA, while enriching the Institute's intellectual environment

Dr. Jason J. Blackstock (Canada)

is focusing on evaluating the scientific, political, and economic implications of climate engineering (geoengineering) concepts aimed at limiting the negative consequences of climate change caused by greenhouse gas emissions.



Dr. Mats Bodin (Sweden)

is using adaptive dynamics techniques to study the evolutionary consequences of harvesting on maturation size and other heritable traits in fish. His research is also part of the European Research Training Network on Fisheries-induced Adaptive Changes in Exploited Stocks (FishACE).

Dr. Åke Brannstrom (Sweden)

is working on the evolutionary effects of harvesting on food webs as part of the European Research Training Network on Fisheries-induced Adaptive Changes in Exploited Stocks (FishACE).



Dr. Christopher Doll (United Kingdom)

is carrying out research on the production of socioeconomic datasets from night-time light satellite imagery and how they can be combined with other data to help answer fundamental questions concerning sustainable development and the human dimensions of global change.

Dr. Terence Fell (Sweden)

is carrying out research focusing on the institutional mismatch between formal natural resource management policies and the informal rules in use in local community contexts.



Dr. Jacob Johansson (Sweden)

is developing eco-evolutionary models for explaining fundamental patterns of variation in plant community structures. The project is part of an international collaborative effort to create a new generation of evolutionarily informed vegetation models for predicting responses to global climatic trends.

Dr. Erling Lundevalier (Sweden)

is focusing on methods for demographic projections, including micro-simulation where the life course of each individual is followed. This allows, inter alia, the spatial-temporal aspects of fertility and mortality to be analyzed, allowing the future composition of populations to be predicted.



Dr. Shuichi Matsumura (Japan)

is working on spatial modeling of interactions between anglers and fish populations as part of the Adaptive Dynamics and Management of Coupled Social-Ecological Recreational Fisheries (Adaptfish) project.

Dr. Rupert Mazzucco (Austria)

is working on computational models of non-allopatric speciation and biodiversity formation along environmental gradients as part of the Evolution and Mathematics project.



Dr. Johan Östergren (Sweden)

is looking into eco-genetic modeling of human-induced evolution (i.e., through dams and fisheries) in anadromous fish in general, with a particular interest in sea trout. His other research interests include fish ecology, fisheries management, and population genetics.

Dr. Katsumasa Tanaka (Japan)

is working on an inverse estimation of the global carbon cycle, atmospheric chemistry, and climate system. His particular interest is in climate sensitivity and learning to gain insights into uncertainty in future climate projections.

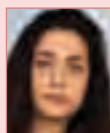
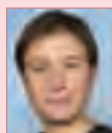


Dr. Edmar Teixeira (Brazil)

is focusing on the enhancement of the Agro-ecological Zones (AEZ) methodology developed by the UN Food and Agriculture Organization and IIASA.

Dr. Davnah Urbach (Switzerland)

is focusing on the evolution of mating traits in harvested fish populations. This work is being carried out as part of the European Research Training Network on Fisheries-induced Adaptive Changes in Exploited Stocks (FishACE).



Dr. Rebecca Whitlock (United Kingdom)

is working on the European Union FishACE project to develop and apply eco-genetic modeling approaches that account for anthropogenic evolution of sturgeon stocks in the Caspian Sea.

The IIASA Society membership in 2008 increased to nearly 900, with many Young Scientists Summer Program participants becoming new members. Plans for a 2009 "Alumni Day" are now under way.

There were more than 150 responses to a members' questionnaire on current and possible future services for the Society. Among suggestions were that the Society should be: a clearinghouse for alumni contact information, a communication platform for former IIASA staff to help them maintain contact, a source of information about IIASA's current work and future programs, and a partner to help organize and support alumni events. Members expressed willingness to act as resource persons for the Institute, and 46 are willing to take an active role in the Society. These positive responses ensure continuity for the Society.

In cooperation with Japanese YSSP alumni, the IIASA Society Web site now houses a new bulletin (in Japanese), written and produced by Japanese colleagues for alumni and other interested persons. The first bulletin was published in August 2008.

www.iiasa.ac.at/IIASA_Society

IIASA Alumni

The IIASA Society is
an independent association
of IIASA alumni

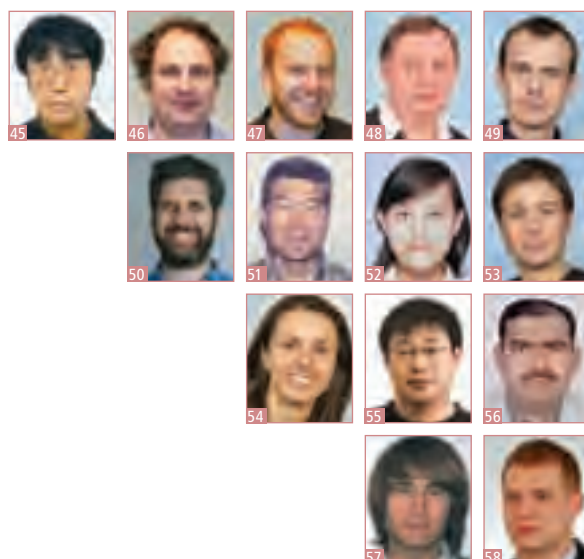
New and Returning Researchers

Fifty-eight researchers joined or returned to IIASA in 2008. They come from 29 countries and have backgrounds in a wide variety of disciplines ranging from computer science to economics. They joined the 145 researchers already at IIASA. IIASA's success owes much to the talent and commitment of its researchers and the staff that support them.



NEW AND RETURNING RESEARCHERS 2008

1 Roberto Aguilera, Canada 2 Dimitrios Ballas, Greece 3 Bilal Barakat, Germany
4 Patrick Bell, USA 5 Jason Blackstock, Canada 6 Mats Bodin, Sweden 7 Jens-Uwe Borken, Germany 8 Gergely Boza, Hungary 9 Andriy Bun, Ukraine 10 Vadim Chirkov, Russia 11 Cheol Hung Cho, Republic of Korea 12 Dorothy Dankel, USA 13 Daniel Falster, Australia 14 Brian Fath, USA 15 Terence Fell, Sweden 16 Sei Fujisawa, Japan 17 Alexei Gaivoronski, Norway 18 Khrystyna Hamal, Ukraine 19 David Horlacher, USA 20 Jacob Johansson, Sweden 21 Thomas Johansson, Sweden 22 Harvir Kalirai, United Kingdom 23 Nadejda Komendantova-Amann, Austria 24 Andrey Krasovskiy, Russia 25 Shuo Liu, China 26 Erling Lundevaller, Sweden 27 Tiejun Ma, China 28 Nikolay Melnikov, Russia 29 Fabian Mollet, Switzerland 30 Aline Mosnier, France 31 Liudmila Mukhortova, Russia 32 Karthikeyan Natarajan, India 33 Steven Ney, Germany 34 Binh Nguyen, Vietnam 35 Manuel Ortiz Motezuma, Mexico 36 Johan Östergren, Sweden 37 Tapio Palokangas, Finland 38 Ariel Macaspac Penetrante, Philippines 39 Denis Pivovarchuk, Russia 40 Huanqiang Qiu, China 41 Agnes Rettelbach, Germany 42 Belinda Reyers, South Africa 43 Andries Richter, Netherlands 44 Elena Rovenskaya, Russia 45 Tatsuya Sasaki, Japan 46 Niels Schulz, Germany 47 Daniel Steinberg, USA 48 Vladimir Stolbovoi, Russia 49 Marcin Stonawski, Poland 50 Pablo Suarez, Argentina 51 Kwang-Il Tak, Canada 52 Januarti Tjajadi, Indonesia 53 Davnah Urbach, Switzerland 54 Marta Vicarelli, Italy 55 Hao Wang, China 56 Muhammad Wazir, Pakistan 57 Keith Williges, USA 58 Jacek Wojciechowski, Poland



IIASA's Research Leaders

IIASA's research programs and projects are led by renowned international scholars.

ENVIRONMENT AND NATURAL RESOURCES

Atmospheric Pollution and Economic Development (APD)



Dr. Markus Amann
Austria
Program Leader

Evolution and Ecology (EEP)



Dr. Ulf Dieckmann
Germany
Program Leader

Forestry (FOR)



Prof. Sten Nilsson
Sweden
Program Leader (1 Jan—15 May)
Deputy Director, IIASA
(1 Jan—15 May)
Acting Director, IIASA
(16 May—31 Dec)



Prof. Anatoly Shvidenko
Russia
Acting Program Leader
(16 May—31 Dec)

Land Use Change and Agriculture (LUC)



Dipl. Ing. Günther Fischer
Austria
Program Leader

POPULATION AND SOCIETY

Population and Climate Change (PCC)



Dr. Brian O'Neill
USA
Program Leader

Risk and Vulnerability (RAV)



Dr. Joanne Linnerooth-Bayer
USA
Program Leader

World Population (POP)



Prof. Wolfgang Lutz
Austria
Program Leader

Processes of International Negotiation (PIN)



Steering Committee 1 Prof. Mark Anstey (South Africa)
2 Prof. Rudolf Avenhaus (Germany) 3 Dr. Franz Cede (Austria)
4 Prof. Guy Olivier Faure (France) 5 Prof. Victor Kremenyuk
(Russia) 6 Prof. Paul W. Meerts (Netherlands) 7 Prof. Gunnar
Sjöstedt (Sweden) 8 Prof. I. William Zartman (USA)

ENERGY AND TECHNOLOGY

Dynamic Systems (DYN)



Dr. Arkady Kryazhimski
Russia
Program Leader

Energy (ENE); Transitions to New Technologies (TNT)



Prof. Arnulf Grübler
Austria
Acting Program Leader, TNT
(16 May—31 Dec)



Prof. Nebojsa Nakicenovic
Austria
Program Leader, ENE (1 Jan—15 May)
Program Leader, TNT (1 Jan—15 May)
Acting Deputy Director, IIASA
(16 May—31 Dec)



Prof. Keywan Riahi
Austria
Acting Program Leader, ENE
(16 May—31 Dec)

SPECIAL PROJECTS

Health and Global Change (HGC)



Dr. Landis MacKellar
USA
Project Leader

Integrated Modeling Environment (IME)



Dr. Marek Makowski
Poland
Project Leader

In 2008 some 203 research scholars, research assistants, and postdoctoral research fellows from 34 different countries worked at IIASA. Together, these 203 scientists contributed 111 person-years to IIASA's research—an expansion from 104 person-years in 2007.

Mid-Career Researchers

IIASA offers mid-career researchers the chance to work alongside scientists from a wide range of countries and disciplines on real world problems.

In turn, these researchers contribute greatly to IIASA's work, as highlighted by the following four researchers.

Dr. Steffen Fritz (Germany) Researcher, Forestry (FOR)

It was the EU-funded project GEOBENE—the first integrated assessment of the economic, social, and environmental benefits of Global Earth Observations System of Systems—that brought Steffen Fritz back to IIASA in January 2007. Having worked for IIASA's Greenhouse Gas Initiative on global biomass mapping for three months in 2004, he now contributes his experience on remote sensing and geographic information systems to the GEOBENE team.

For GEOBENE, a three-year project led by FOR, Dr. Fritz assesses global land cover derived from satellite images, in particular how they differ from current global maps. One result was his discovery of the uncertainty surrounding the extent of global cropland. "A global coordinated effort is needed to reduce this uncertainty," he says. "The only way to accurately model the additional land area available to combat food insecurity now and in the future is by better mapping and estimation of land areas."

With IIASA's Ian McCallum and colleagues from the University of Applied Sciences Wiener Neustadt and the University of Freiburg, Dr. Fritz established the Google Earth-based "geo-wiki.org," a global network of volunteers committed to improving the quality of land cover maps. He feels his greatest achievement in 2008 was his disagreement analysis, on this Web site, of current estimations of global land cover and his proposed solutions.

Other research involves spatially explicit modeling of land use scenarios and climate change in Africa. This includes identification of potential future hunger hotspots and the appropriateness of remote sensing and geographic information systems as technologies for developing countries.

"The ability to research the big global questions, is why I enjoy being at IIASA," says Dr. Fritz.

Dr. Tiejun Ma (China) Research Scholar, Transitions to New Technologies (TNT)

Tiejun Ma could imagine spending his life as a researcher. A professor at the School of Business, East China University of Science and Technology, Shanghai, China since September 2008, he will continue to work at IIASA for several months each year.

In fall 2008, Tiejun Ma particularly enjoyed working with IIASA's "world-famous researchers" Arnulf Grübler, Nebojsa Nakicenovic, and W. Brian Arthur, with whom he was able to discuss his ideas and publish an IIASA Interim Report, "Technologies as Agents of Change: A Simulation Model of the Evolving Complexity of the Global Energy System." Using an evolutionary model of energy technological systems, Dr. Ma simulated the environmental uncertainty—carbon emissions and uncertain carbon taxes—influencing the technological selection environment. "As carbon emissions are endogenously calculated in our model," he says, "we illustrate both their uncertainty and their (uncertain) response to environmental regulation (modeled via an uncertain carbon tax): the generic pattern of initially increasing, peaking, and ultimately declining carbon intensity is unaffected by the different carbon tax levels, which is less intuitive."

Dr. Ma says working at IIASA allows him to focus totally on his research, with little disturbance from other issues: "At IIASA, there are a number of researchers working in research fields similar to mine, so it is a very beneficial atmosphere for sharing data, expertise, and opinions."





Dr. Shonali Pachauri (India)

Deputy Program Leader, Population and Climate Change (PCC);

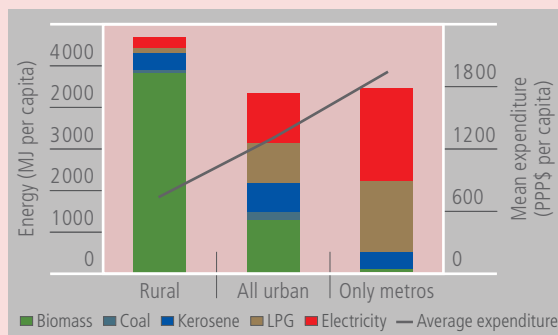
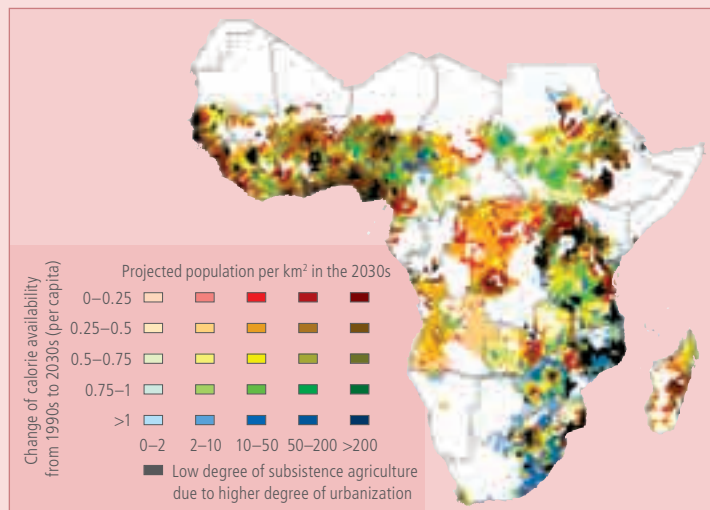
Co-Leader, Greenhouse Gas Initiative (GGI); Researcher, Global Energy Assessment (GEA)

One of the most important aims of Shonali Pachauri's career plan is to continue to do applied research that is of policy relevance to poor and emerging nations. The year 2008 brought her considerable fulfillment, her greatest achievements being a workshop which she co-organized in Istanbul on clean cooking fuels and technologies for the poor and a paper she co-authored with IIASA colleague Leiwen Jiang for *Energy Policy* which compares the household energy transition in China and India.

Her experience at IIASA is helping her hone her skills as a truly interdisciplinary applied researcher. She began work in 2008 on two cross-cutting GGI projects, one on adaptation strategies for extreme climate risks, the other on the effect of greenhouse gas emissions on policy pathways to human development. She was also invited to start contributing research to the GEA on rural energy access and consumption in poor and emerging economies and to develop policy scenarios for future access to modern energy services in those nations.

The bulk of her work, however, is with the young, dynamic PCC team where, on the micro level, she develops scenarios looking at the implications of changing demographic distributions on future energy use and, on the macro level, analyzes physical energy flows and balances, relating these to the economic flow of goods and services through national input-output accounts.

In 2008, Dr. Pachauri took on more administrative responsibility within PCC, although, as she says: "This has been a huge opportunity for me to get involved in the Internal Research Committee, the GGI, and other Institute-wide initiatives, such as strategic planning activities for IIASA."



ENERGY USE IN INDIA IN 2000

In 2008 Shonali Pachauri studied the household energy transition in India. The chart shows per capita energy consumption patterns across rural, urban, city, and metropolitan households.

THE HOTSPOTS OF FUTURE FOOD INSECURITY Recent work by Steffen Fritz explores the likely changes of per capita calorie availability from the 1990s to the 2030s in Africa and so identifies the hotspots of future food security. For change of per capita calorie availability, the legend 0–0.25 means a reduction of 100–75 percent, 0.25–0.5 means a reduction of 75–50 percent, 0.75–1 means a reduction between 25 and 0 percent, and more than one means that per capita calorie availability will increase.



Dr. Anthony Patt (USA)

Group Leader, Risk and Vulnerability (RAV); Co-Leader, Greenhouse Gas Initiative (GGI)

Since participating in YSSP 1997, Anthony Patt has packed a great deal of research into many different areas, but it was during a two-year fellowship at Germany's Potsdam Institute that his efforts began focusing on climate change. Winning a post at IIASA gave him a welcome chance to return to Europe to research "real decision making" for effective policymaking.

Dr. Patt has expertise in both adaptation and mitigation of climate change. In 2008 he also began investigating investment patterns into renewable energy, co-organizing a major workshop on this theme at IIASA. He presented the workshop results to the International Scientific Congress on Climate Change in Copenhagen in March—the findings on investments into solar and wind energy in North Africa for local distribution and transmission to Europe, generated huge media interest. Swamped with follow-up work, he says: "This is a hot-button issue and I'm delighted to be contributing."

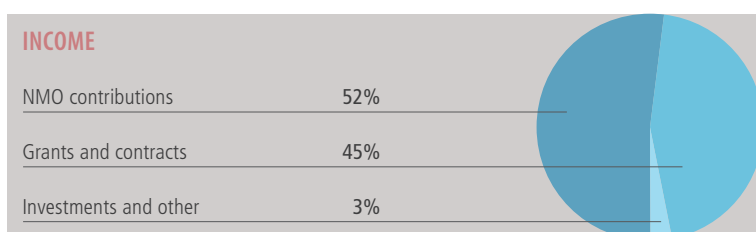
Although as a Professor at Boston University for six years, he was granted longer-term tenure and complete intellectual freedom, he likes the combination of fieldwork (his passion) and modeling work, as well as the policy relevance of his IIASA work, and hopes to build a career here.

His personal life is hectic too: restoring the historic house he and his wife bought on the forest edge at Perchtoldsdorf, welcoming a baby daughter to the family in 2008, teaching his small son to ski, participating in local community endeavors, and running to and from work each day are among the highlights of his life in Austria.

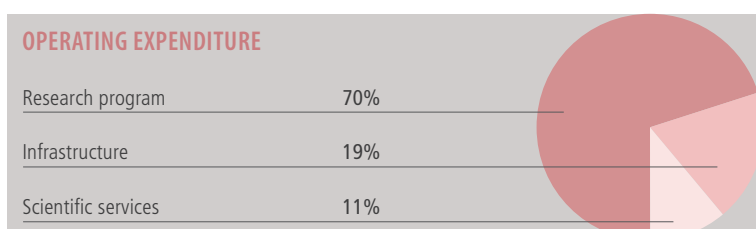
"IIASA is an exciting place," he says, "from a personal and professional perspective. And the conviction that my work really can make a difference is the best incentive I know."

International Funding for International Research

IIASA's main funding came from prestigious scientific institutions, National Member Organizations (NMOs), in 18 countries in Africa, the Americas, Asia, and Europe. Additional funding came from contracts, grants, and donations from governments, international organizations, academia, business, and individuals. These many diverse income sources enabled IIASA to perform research that is truly independent. IIASA would like to thank all those who have given their financial support in 2008.



In 2008 IIASA's income was €15.4 million, 52 percent of which came from National Member Organizations and 45 percent from contracts, grants, and donations.



In 2008 research represented 70 percent of total expenditure, with 19 percent being spent on infrastructure and only 11 percent on scientific services.

IIASA Endowment Fund

In order to cope with global change, we must first understand it.

IIASA research generates this understanding, helping to provide decision makers with effective policies to deal with its myriad effects.

The IIASA Endowment Fund (IEF) provides an opportunity to support this important undertaking. IIASA is very grateful to the individuals listed here for their contributions to the IEF, and for their belief in the goals and mission of this institution.

SUMMARY OF FINANCIAL ACTIVITIES

INCOME	2008 (€)	2007 (€)
NMO contributions	7,997,651	7,126,865
Contracts, grants, and donations	6,980,742	5,661,032
Other income	442,327	368,896
TOTAL	15,420,720	13,156,793
EXPENDITURE	2008 (€)	2007 (€)
Research	10,727,385	9,834,240
Infrastructure	2,984,942	2,727,199
Scientific services	1,754,380	1,592,532
TOTAL	15,466,707	14,153,971

Contracts, Grants, and Donations 2008

- Barbara Boyle-Torey
- Richard Caputo
- Robin Dennis
- Anton Dobronogov
- Joshua Goldstein
- Leen Hordijk
- David E. Horlacher
- Aviott John
- Roger Levien
- Johannes Ledolter
- Marek Makowski
- Sadaaki Miyamoto
- Nebojsa Nakicenovic
- Dale Rothmans
- Tom Schelling
- Bob White

- Austrian Conference on Spatial Planning, Vienna, Austria
- Austrian Development Agency, Vienna, Austria
- Austrian Exchange Service, Vienna, Austria
- Austrian Research Promotion Agency, Vienna, Austria
- Austrian Science Fund, Vienna, Austria
- City of Vienna, Cultural Department, Science and Research Promotion, Vienna, Austria
- Federal Ministry for Education, Science and Culture, Vienna, Austria
- Federal Ministry for Science and Research, Vienna, Austria
- MERIT Consulting and Brokerage, Vienna, Austria
- Vienna Institute for Demography, Vienna, Austria
- Vienna Science and Technology Fund, Vienna, Austria
- Petroleo Brasileiro S.A., Rio de Janeiro, Brazil
- European Science Foundation, Strasbourg, France
- European Space Agency, Paris, France
- Carl von Ossietzky University, Oldenburg, Germany
- Forschungsverbund Berlin e.V., Berlin, Germany
- Friedrich Schiller University Jena, Jena, Germany
- Potsdam Institute for Climate Impact Research, Potsdam, Germany
- All India Disaster Mitigation Institute, Ahmedabad, India
- Ministry for the Environment and Territory, Rome, Italy
- Acid Deposition and Oxidant Research Center, Niigata, Japan
- Kyoto University, Kyoto, Japan
- Tokyo Electric Power Company, Tokyo, Japan
- Toyota Central Research & Development Laboratories, Inc., Aichi, Japan
- Toyota Motor Corporation, Aichi, Japan
- Korea Science and Engineering Foundation, Daejeon-City, Republic of Korea
- European Climate Foundation, Den Haag, Netherlands
- Netherlands Environmental Assessment Agency, Bilthoven, Netherlands
- Norwegian Meteorological Institute, Oslo, Norway
- ENIPPF Ltd., Moscow, Russia
- Institute for Energy and Finance, Moscow, Russia
- Russian Academy of Sciences, Moscow, Russia
- Swedish Environmental Research Institute Ltd, IVL, Goeteborg, Sweden
- Swedish Meteorological and Hydrological Institute, Norrkoepping, Sweden
- Royal Swedish Academy of Agriculture and Forestry, Stockholm, Sweden
- Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning, Stockholm, Sweden
- Clean Air Task Force (CATF), Boston, MA, USA
- Forest Trends, Washington, DC, USA
- Harvard Business School, Boston, USA
- National Academy of Sciences, Washington, DC, USA
- National Aeronautics and Space Administration, Washington, DC, USA
- Smith Richardson Foundation, Inc, Greensboro, USA
- United States Environmental Protection Agency, Washington DC, USA
- United States Institute of Peace, Washington, DC, USA
- Department for International Development, London, United Kingdom
- Entec UK Ltd, Newcastle, United Kingdom
- Imperial College of Science, Technology and Medicine, London, United Kingdom
- Manchester Metropolitan University, Manchester, United Kingdom
- University of Bristol, Bristol, United Kingdom
- European Commission, DG Agriculture and Rural Development, Brussels, Belgium
- European Commission, DG Environment, Brussels, Belgium
- European Commission, DG Environment, LIFE, Brussels, Belgium
- European Commission, DG Fisheries and Maritime Affairs, Brussels, Belgium
- European Commission, DG Research, Brussels, Belgium
- European Commission, Intelligent Energy Executive Agency, Brussels, Belgium
- European Commission – Joint Research Centre, Ispra (VA), Italy
- OPEC Fund for International Development, Vienna, Austria
- Food and Agriculture Organization of the United Nations, Rome, Italy
- The World Bank, Washington DC, USA

ABOUT IIASA

IIASA is an international, independent, and interdisciplinary research institution with thirty-seven years' experience in researching global change.

IIASA is sponsored by its National Member Organizations. On 1 January 2009 these were:

- AUSTRIA** The Austrian Academy of Sciences
- CHINA** The National Natural Science Foundation of China
- EGYPT** The Academy of Scientific Research and Technology (ASRT)
- ESTONIA** The Estonian Association for Systems Analysis
- FINLAND** The Finnish Committee for IIASA
- GERMANY** The Association for the Advancement of IIASA
- INDIA** The Technology Information, Forecasting and Assessment Council (TIFAC)
- JAPAN** The Japan Committee for IIASA
- NETHERLANDS** The Netherlands Organization for Scientific Research (NWO)
- NORWAY** The Research Council of Norway
- PAKISTAN** The Pakistan Academy of Sciences
- POLAND** The Polish Academy of Sciences
- REPUBLIC OF KOREA** The Korea Science and Engineering Foundation (KOSEF)
- RUSSIAN FEDERATION** The Russian Academy of Sciences
- SOUTH AFRICA** The National Research Foundation
- SWEDEN** The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (FORMAS)
- UKRAINE** The Ukrainian Academy of Sciences
- UNITED STATES OF AMERICA** The National Academy of Sciences



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