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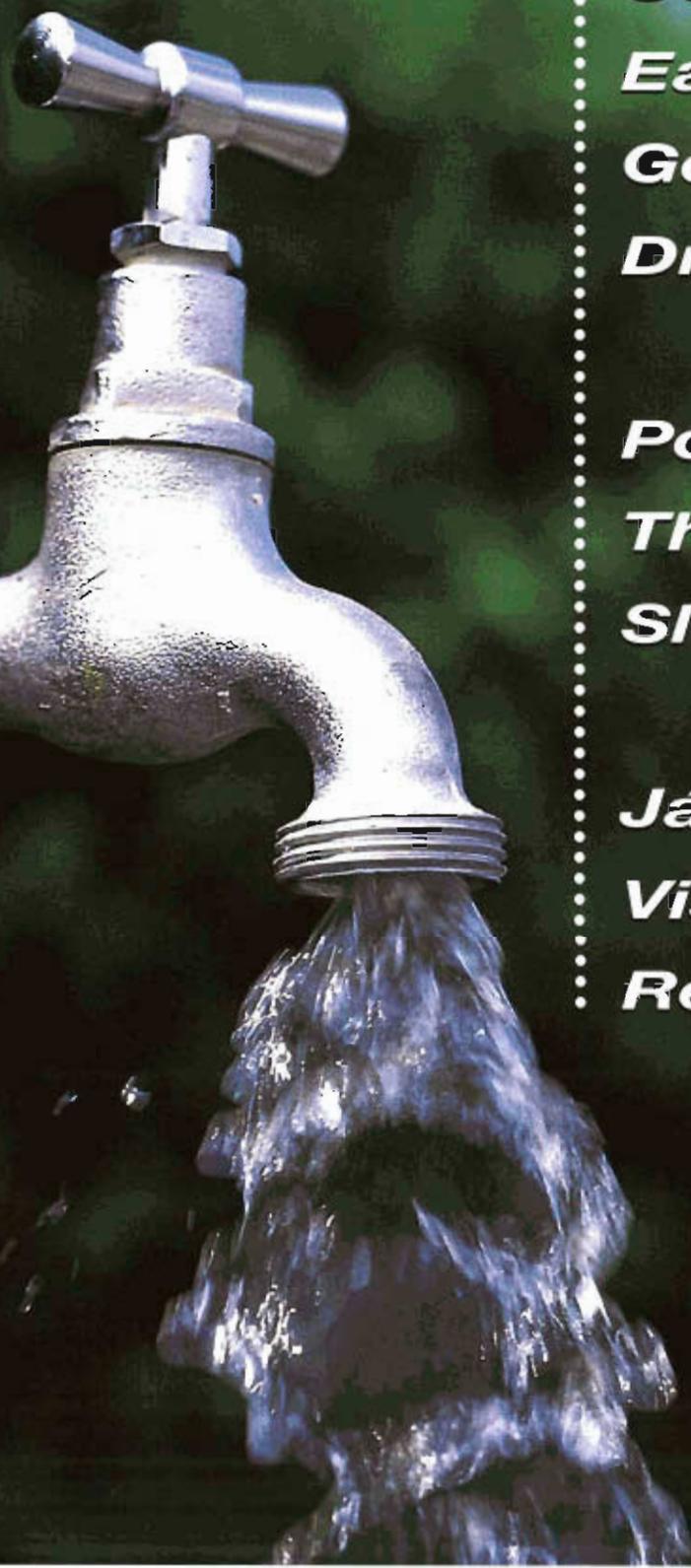
Summer '98

International Institute for Applied Systems Analysis

*Water Quality in
Central and
Eastern Europe:
Good to the Last
Drop?*

*Population:
The Human Race
Slows to a Crawl*

*János Kornai on
Visions and
Reality*



+++ S T O P +++

Politics of Climate Change

Politics of Climate Change - A European Perspective, a newly published book edited by IIASA Deputy Director for Programs Dr. Jill Jäger and Professor Tim O'Riordan, School of Environmental Sciences at the University of East Anglia, UK, examines the policies of climate change in Europe from the perspective of both practical politics and institutional redesign. The book contains important analyses of the significance of institutional change for international agreements, and of the role of international law in determining national policies in EU countries. The book is published by Routledge, London, UK.

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E D I T O R I A L

By the time this issue of *Options* is published, my six years as IIASA Director will have been completed. In this, my last editorial, I would like to say a few words about how IIASA adjusted to fundamental changes happening in the world just before and concurrent to my tenure as Director.

With the end of the Cold War, the immediate political rationale for IIASA's existence ceased as well. Moreover, nagging problems such as an unclear agenda, a diffuse set of isolated projects, and inadequate attention to enforcing high scientific standards were exacerbated by the Institute's poor financial state. IIASA's survival was at stake.

Bleak as the immediate picture seemed in 1990, there were many encouraging signs. IIASA scientists had conducted a number of first-rate research projects in the 1970s and 1980s, providing clear evidence of the Institute's potential for the future. During those decades, the Institute developed an excellent Young Scientists Summer Program and a fine network of loyal alumni. Although IIASA was characterized too often as "the place where the Soviets and



*Dr. Peter E. de Jánosi
IIASA Director*

and Americans work together," and not enough by what was actually being done, IIASA's research achievements on topics such as energy, water, air pollution, demography, and sustainable development were well recognized in some circles. Clearly, the potential for success was there.



Laxenburg Castle - home of IIASA

In rebuilding IIASA for the post-Cold War world, the first complex task was to formulate a framework for IIASA's activities, one that was specific enough to create a coherent program of activities yet broad enough to accommodate a diverse set of interests. Global change and sustainability became the key concepts for the new agenda, for which international, interdisciplinary research projects were to be selected that would utilize first-rate science and address urgent policy issues. To ensure that the projects would meet the high standards required for a competitive international research institute, IIASA established a wide variety of steering, advisory and evaluation committees.

The Institute engaged in productive collaboration with many other international efforts, such as the Intergovernmental Panel on Climate Change, the International Geosphere-Biosphere Programme, the Economic Commission for Europe, and the World Energy Council. Such collaboration became important to ensure that IIASA's work would be well integrated with other global change initiatives and yet retain its unique identity. In addition, an adequate financial base for the Institute's ambitious program had to be found.

Much progress has been made on all fronts in the past six years. A May 1996 report of an evaluation committee, chaired by Professor Bert Bolin, formerly of the International Institute of Meteorology, Stockholm, noted with approval, "... a successful transition of IIASA from its Cold War roots and methodological focus into a major research and policy institution with a focus on global environmental change."

These are high accolades that are deserved not only by IIASA's environmentally oriented projects, but also by those grappling with economic, technological and methodological issues. Those who had faith in IIASA should be pleased. Nevertheless, IIASA continues to face daunting challenges that require the vigilance, imagination and energy of its leadership.

Clearly, the research program needs further development and expansion, and the Institute's public outreach must increase. Despite the progress made in improving the Institute's finances, financial instability remains a serious concern because inter-

national organizations suffer first when governmental budgets are under pressure. All countries prefer to support their own scientists and national institutes. Such preferences are perfectly understandable, though most regrettable, because problems requiring international attention are expanding dramatically.

Financial instability is a stark reality for IIASA, but the mitigation of its effects is possible. Doing so will necessitate improvements in IIASA's governance structure, especially the National Member Organizations. Happily, constructive steps are now being taken in the right direction.

Today's IIASA is a lean, flexible, vibrant, and productive research organization meeting a genuine demand. The Institute is a rare example of an organization established for one purpose — to facilitate collaboration in Cold War days — that found a new purpose: to carry out international and interdisciplinary activities on global change and sustainability. IIASA is well positioned to grow further and prosper in a new era. In fact, Norway has now applied for membership, and other countries can be expected to follow in coming years.

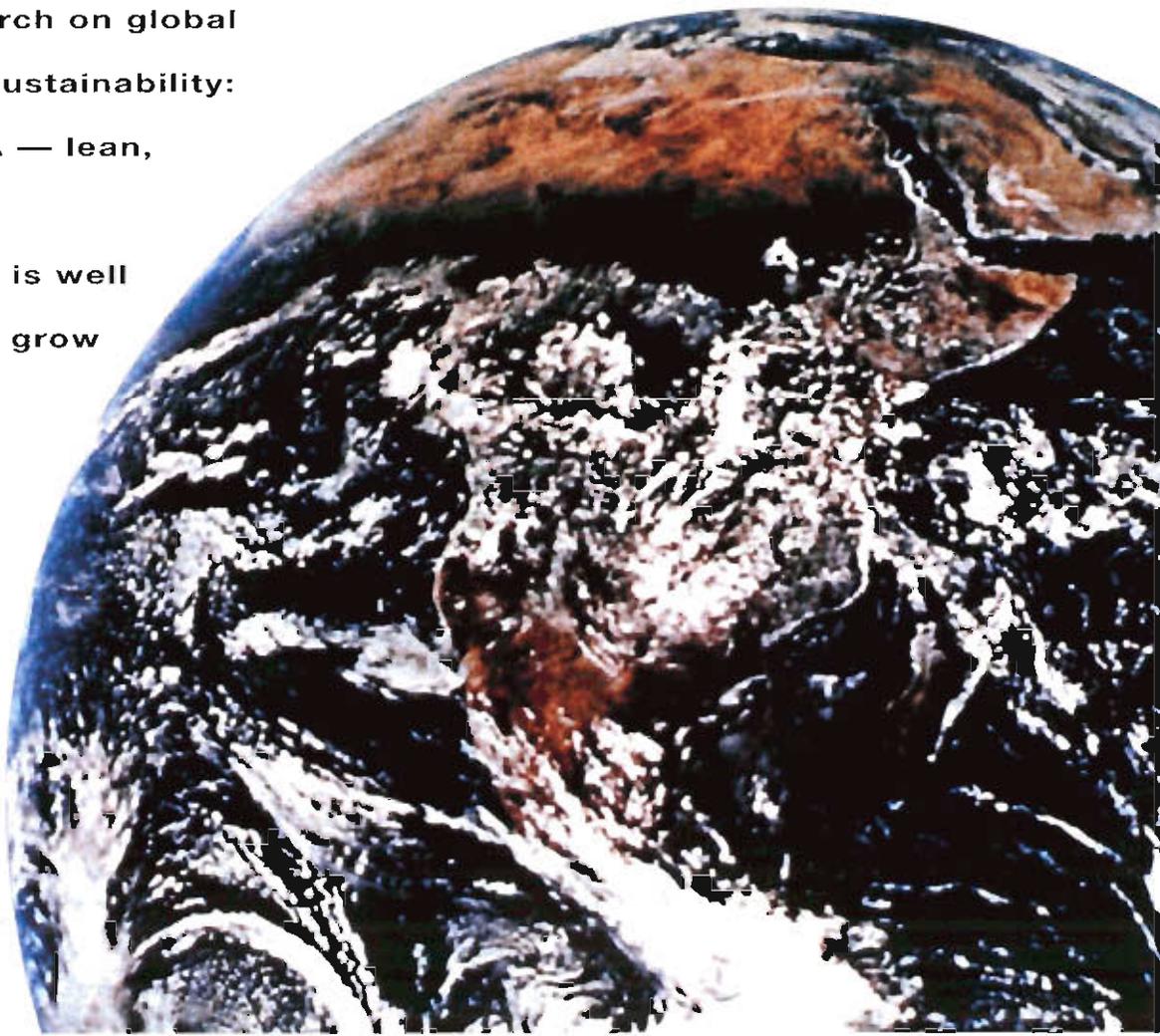
★★★

It has been a great joy and privilege to participate in IIASA's successful transformation.



Dr. Peter E. de János

Unique research on global change and sustainability:
 Today's IIASA — lean, flexible, and productive — is well positioned to grow further and prosper in a new era.



Research Updates

Natural Land Cover Classification Set Up

The IASA Project on Modeling Land-Use and Land-Cover Changes in Europe and Northern Asia (LUC) has set up a natural land-cover classification. Project members will use the classification to simulate current and future natural land-cover distribution in relation to changes in environmental conditions at different scales. It is set



up after an evaluation of existing classifications and combines vegetation characteristics (so-called eco-physiognomic principles) with environmental attributes. The classification can easily be compared with other existing land-cover databases/classifications.

The classification aims to link land-cover information at different spatial scales. It relates, for example, broad-scale climate changes to local conditions, like soil fertility. By using the classification within the LUC model, the Project expects that the interactions between climate, soil, and landform on the one hand, and minor and major natural land-cover changes on the other, will be better understood.

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Study Traces Heavy Metal Loads in Agricultural Lands

Agricultural soils have been subjected to long-term accumulation of heavy metals from atmospheric deposition and certain agricultural practices like fertilizing, manuring or sewage sludge application. The objective of this study, performed by IASA's Project on Regional Material Balance Approaches to Long-Term Environmental Planning, was to analyze the inputs of cadmium, zinc and lead to

farmland due to agricultural practices during 1955-1994 in the "Black Triangle" region encompassing parts of Poland, the Czech Republic and Germany.

The analysis showed that agricultural and atmospheric loads increased slightly at the beginning of the study period and peaked in the 1970s or early 1980s. Since about 1988, there has been a sharp decrease in heavy

metal load in the entire area. This reflects the political and economic changes in the former centrally planned economies. The economic changes induced emission decreases (and consequently atmospheric deposition decreases) as well as a sharp decrease in fertilizer application.

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Playing by the Rules: The Montreal Protocol's Non-Compliance Procedure

Non-compliance procedures are a recent innovation that may improve the capacity to address problems of compliance with multilateral environmental agreements. The only major international environmental agreement with an operating non-compliance procedure is the Montreal Protocol on Substances That Deplete the Ozone Layer. Its experience is, therefore, highly relevant for parties designing similar procedures for other multilateral environmental agreements.

IASA's Project on International Environmental Commitments has undertaken the first independent review and assessment of the origins, operation and effectiveness of the Montreal Protocol's Non-Compliance Procedure,

giving special attention to the 10-member Implementation Committee that manages the procedure. Among other things, the study shows that the Committee has had some influence in getting countries to report data as required by the Protocol. The study concludes that the Non-Compliance Procedure's pragmatic, solution-oriented approach is one reason it has been used actively.

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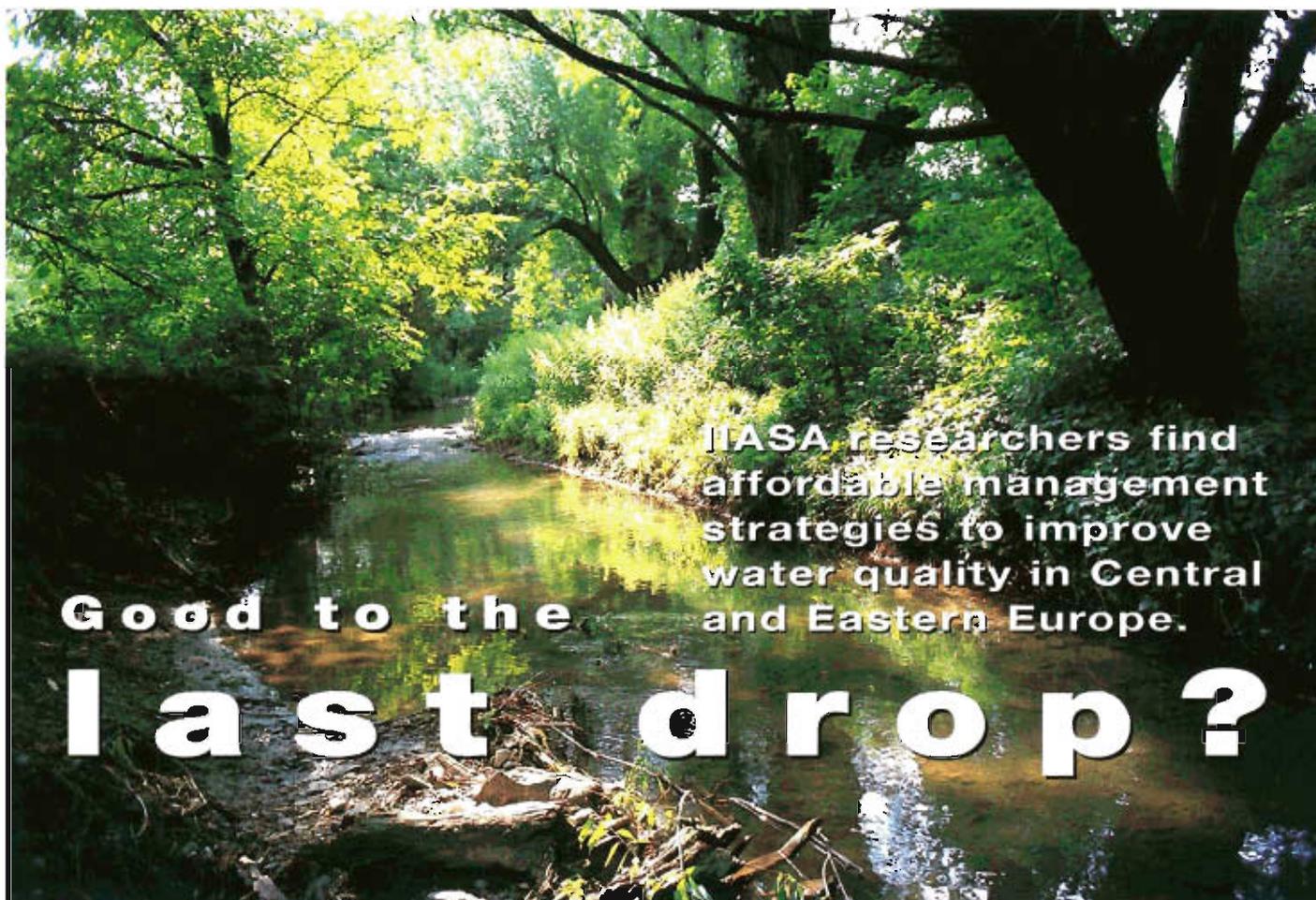
Ownership Transformation in Russian Privatized Enterprises

Upon the initiative of the Russian Federation's Ministry of Economy, the Economic Transition and Integration Project at IASA conducted research on the behavior of formerly state-owned Russian enterprises under liberalization, privatization and restructuring. Further transformation of Russian medium and large enterprises is crucial for the continuation and success of transition-related reforms. Too many enterprises are not becoming sufficiently market-oriented despite reform efforts at the macro-economic level.

This study includes a close investigation of the controversial behavioral strategies of managers and owners in Russia. The examination of institutional changes inside and outside enterprises, following the first phases of privatization, reveals insights into the background of evolving incentives and behavior patterns. Based on enterprise surveys and new data, the study is producing policy-relevant recommendations and clarification regarding owners' control and stockholders' strategies, with a particularly interesting explanation of Russian peculiarities of control versus ownership. Resolving these issues is essential to ensure the irreversibility of the privatization process.

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Good to the

last drop?

IIASA researchers find affordable management strategies to improve water quality in Central and Eastern Europe.

6

— its availability and quality — is a key concern for the world's population.

Agriculture, manufacturing and the service sector depend on water in its many forms. Not having water, its derivatives, or goods associated with it, would be inconceivable for most people in today's industrialized Western world. Yet, many of them take this everyday, clear liquid for granted. Its quality has not been achieved by chance: Environmentalists, conservationists and politicians have spent the greater part of the last three decades cleaning up the waters of the West.

Water Here, Water There

Elsewhere the picture is different. For example, the fall of the Iron Curtain presented a Central and Eastern European (CEE) stage plagued by environmental problems. One immediate concern is the degradation of water quality. More than 50 percent

of the total monitored stream length in Poland, Bulgaria, and Slovakia belongs to the poorest water quality class for those countries. The water downstream of large municipalities often resembles wastewater. The amount of wastewater collected is much smaller than the original amount of "clean" water supplied. At least 20 percent of wastes from municipal sewerage systems is discharged directly into rivers without treatment, and existing treatment is often inadequate.

So why not just clean up? Because water pollution and its control in CEE transition economies is different than we know it in the West. The situation differs due to the merging of several factors: the nature of the pollution problem (coexistence of point and non-point sources, traditional and toxic contamination, and local and regional problems — all managed in a step-by-step manner over several decades in the West), limited financial resources, and unique economic restructuring with an emphasis on

decentralization and privatization. Apart from political, social and institutional difficulties endured during the unprecedented transition process, the move toward market economics has changed the basis for environmental regulation. Strong enforcement now requires real money rather than centrally planned actions by state bureaucracies.

The basic questions for the region are: What standards can CEE nations afford to enforce, how much will it cost, who will pay, and how much time will it take to adjust? In other words, what type of future legislation is needed? Whatever policies are chosen, implementation is confronted by daunting economic preconditions. Per capita gross domestic product (GDP), a measure of the strength of an economy, is merely one-fifth to one-tenth of the most developed Western European countries. Thus, domestic financial resources available to pay for water quality improvements are very limited in the near term.

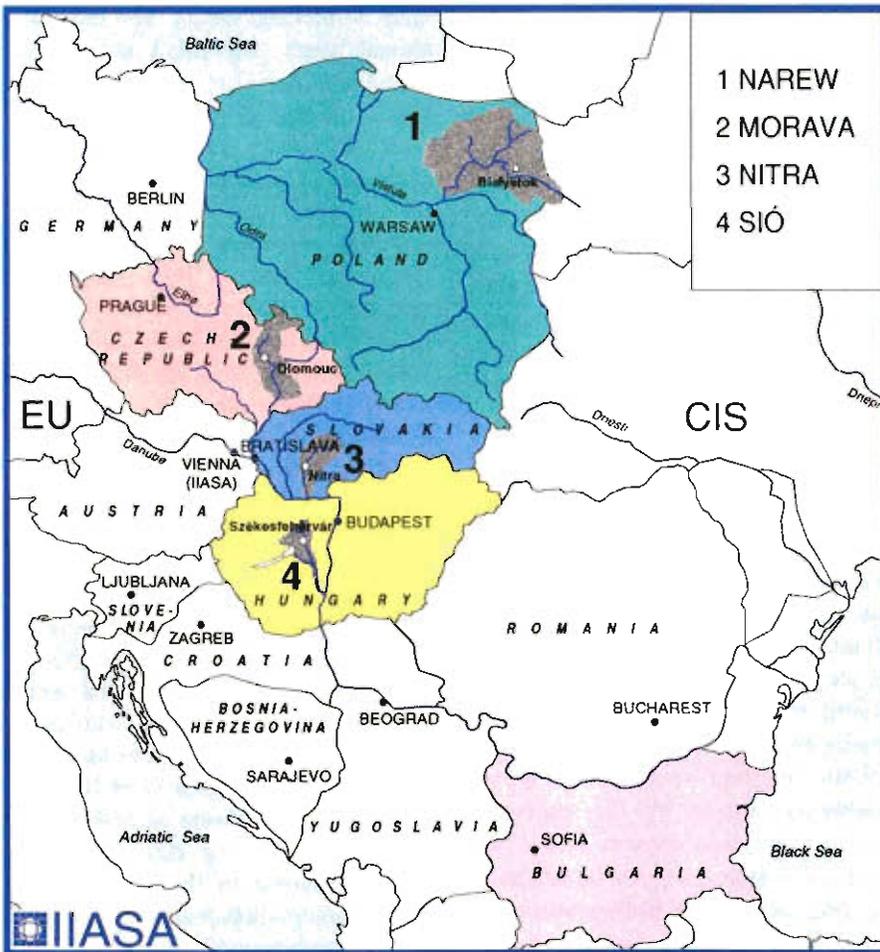


Figure 1. CEE countries and case study regions.

Research — The First Step

To address these issues, IIASA's Water Resources Project conducted a three-year study to develop innovative strategies and methods for water quality management on a river basin scale that would be practical and affordable in the short term, yet flexible, allowing gradual tightening of water quality standards as economies improve. The results of the study, recently presented before members of the research and policy-making communities at an international workshop on "Degraded River Basins in Central and Eastern Europe," are being summarized in a policy-oriented book and in numerous technical articles.

Based on comprehensive data collection in five countries, case studies were conducted with local partners on four representative river basins in the region (see Figure 1):

- Sió River System in Hungary;
- Nitra River basin in the Slovak Republic;

- Morava River in the Czech Republic; and,
- Narew River in Poland.

Through the case studies, researchers were able to demonstrate the efficacy of different water quality management strategies using IIASA's com-

puter-based models called DSS, decision support systems (see Box: "the Tools").

According to the study, four main issues characterize the water pollution problem in CEE:

- **High emission levels:** Municipalities, industries, and agricultural activities are the main emission sources. Municipal discharges pose a particular problem because past emphasis was on expanding communal water supply rather than increasing sewage collection and treatment. Reducing this gap is proving to be very costly. The problem is more serious in rural areas where water infrastructure is most deficient. In the late 1980s, wastewater treatment plants had inadequate capacity, collecting more sewage than they could treat. Today, the plants often have excess capacity due to reduced water consumption as a consequence of demand-based water pricing. Sludge disposal is far from adequate and the fate of a significant portion is, in fact, unknown. Lack of industrial pre-treatment of wastewaters also causes serious problems.

- **Water quality deterioration:** Before the transition, non-sustainable development practices associated with municipal infrastructure and outdated production technologies in industry and agriculture caused increasingly high pollution loads in many water bodies. The resultant water quality →

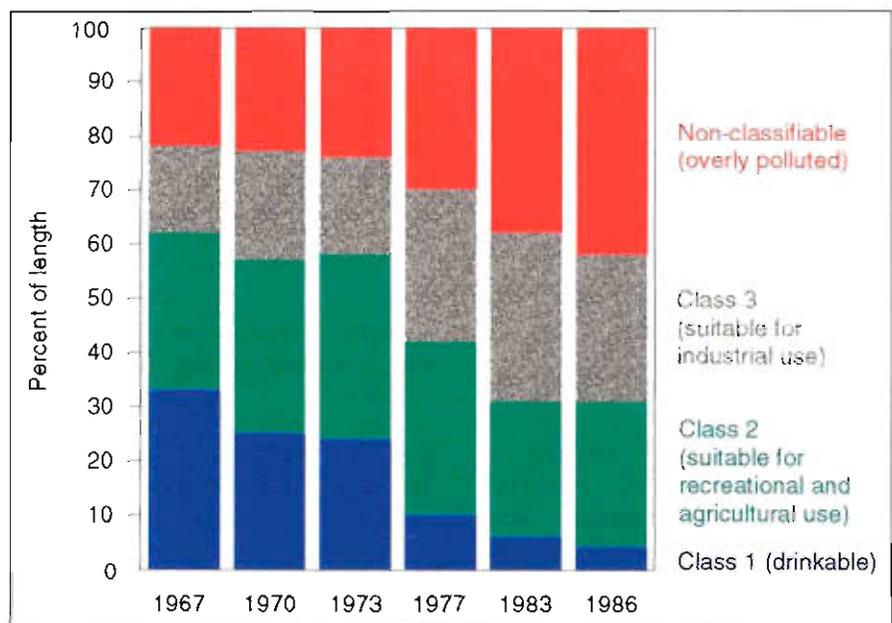


Figure 2. River quality in Poland, 1967-1986.

→ problems include low dissolved oxygen (most aquatic species require sufficient amounts), higher nutrient levels (i.e., nitrogen and phosphorous from agricultural fertilizers), eutrophication of lakes, rivers and inland seas, high levels of nitrate contamination and toxic substances, and high salinity. In Poland, for example, the percentage of river waters classified as drinkable fell from 35 percent in 1967 to next to nothing in the late 1980s (see Figure 2). Today, almost 50 percent of the river waters are so polluted that they are no longer suitable for industrial use. These conditions lead to an aquatic habitat unfit for fish and other species, unaesthetic rivers and lakes, and water unsuitable for drinking. The picture is similar throughout the CEE region.

- Water use problems:

Contaminated waters limited the potential types of uses of those waters. Contamination was associated with high consumption combined with low levels of reuse and recycling. For example, domestic water consumption per person was twice as high in Prague as in Vienna in the late 1980s. In many rural areas throughout the CEE river basins, water was so polluted that authorities recommended bottled water for children.

- Transboundary pollution:

All waters from IIASA's CEE case studies drain into the Baltic Sea or Black Sea. Local water pollution, whether accidental or continual, causes considerable problems downstream in other nations and in international water bodies. In this respect, the reduction of local nutrient emissions that cause eutrophication of the inland seas, far from the pollution's origin, deserves particular attention. Such remediation is extremely costly and indicates the presence of a trade-off between local and regional water quality issues.

The transition process offers the CEE countries a unique chance to improve water-quality management despite the acute scarcity of resources. In the case of municipalities, emissions have been unaffected by the transition. Investment needs are tremendous, approximately 500-1,000 US\$/capita, which is about 20 to 40

percent of annual GDP per capita. In comparison, industrial and agricultural emissions fell significantly during the recent past. The key is to link economic reform with environmental protection. Restructuring industry and agriculture in conjunction with the introduction of clean technologies and adjustments to market economic principles will make local decision makers more accountable and ideally more responsive to local pollution problems.

The Analysis Shows ...

The IIASA study suggests an initial strategy to focus on low-cost/high-gain measures, with the ability to blend in policy for tackling medium- to long-term issues. Using the tools described in "The Tools" box, study results shown in Figure 3 reveal that significant improvements in water quality (measured by the improvement in dissolved oxygen as a common local indicator) can be attained for three of the case studies with relatively acceptable investment levels (measured in investment cost as a percentage of the best available technology cost). The same conclusion is

were formulated as the key environmental target. The IIASA researchers developed decision support systems (DSS) capable of producing various river basin water quality management strategies. Components of the DSS include simulation models that relate polluting emissions to ambient water quality as well as their respective changes, a policy formulation unit (incorporating a combination of local and regional goals, standards, economic instruments, etc.), and optimization methods to develop, for instance, least-cost policies. The DSS facilitate uncertainty analysis, cost estimations routines and various other assessments.

Figure 4 illustrates one example of what the 'clever' DSS can tell policy makers. In this case, the DSS were used to estimate the incremental costs of nitrogen and phosphorous emission reductions for the Nitra River basin, a crucial issue in efforts to restore the water quality in the Baltic or Black Seas. As shown in the graph, these costs are rather high and, consequently, can be implemented only in the longer term. Cost surfaces (as that presented in Figure 4) vary from sub-basin to sub-basin, calling for the

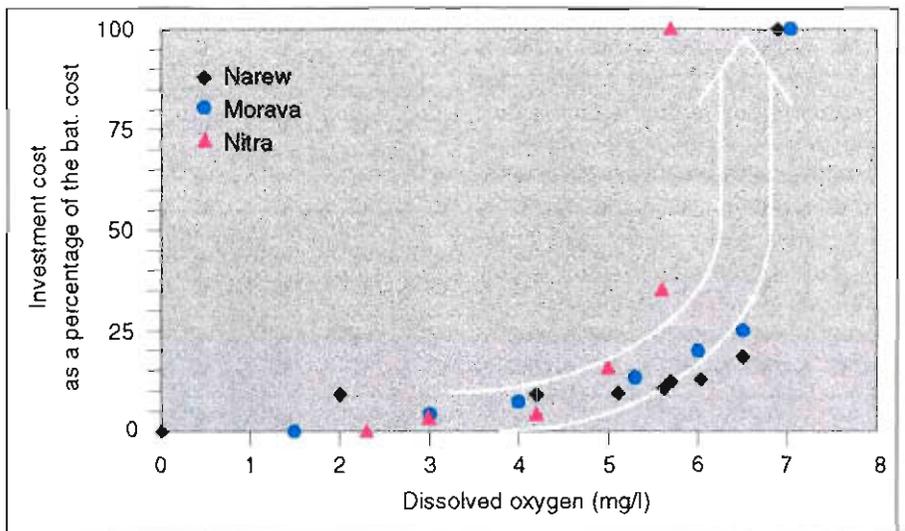


Figure 3. Investment cost versus water quality for three river basins in CEE.

also true for the Siö River, where ammonia is the most important water quality indicator (rather than dissolved oxygen).

In proposing practical alternatives for affordable water-quality management, ambient water quality goals

development of least-cost nutrient reduction policies by the DSS on, say, the Danube River Basin scale. In this case, policy makers have already recognized this need.

"Cost-effectiveness — as an important principle in the short term — may

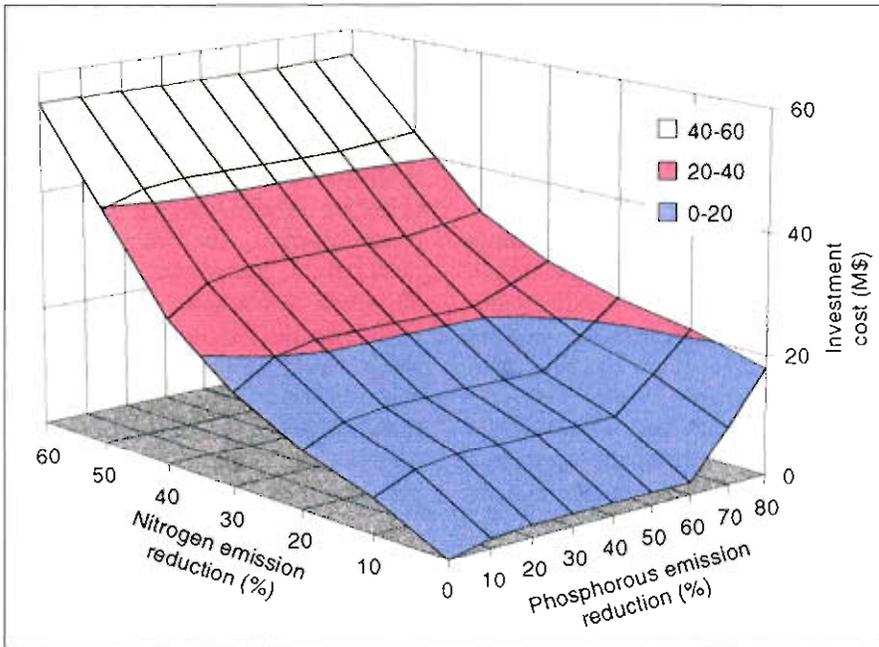


Figure 4. Incremental cost of nitrogen and phosphorous emission-reduction policies for the Nitra River in Slovakia.

require significant pollution control efforts from one source and much less from another, but this strategy can achieve control at lower costs," says Dr. Mark Smith, research scholar with the Project. For this reason, the Project constructed these DSS tools. They are designed to help local water quality experts or officials plan strategically and determine a range of efficient management strategies to improve water quality in their region. In order to secure successful technology transfer throughout CEE, user manuals are distributed free of charge with the DSS. They can also be downloaded from IIASA's World Wide Web site (see "The Tools").

What is to be Done?

With regard to future water-quality management, important changes at the international level include CEE countries' association agreements with the European Union (EU). CEE nations will need to implement stricter environmental regulations and participate in international cooperation on such matters. "The central issue is how CEE countries can achieve the largest improvement now using the scarce financial resources available and how they can design the process such that in the long run sustainable, EU-type requirements are met," says Professor László Somlyódy, Leader of the IIASA

Project, adding, "These countries should not forget the nature of the management process: 'Rich' Western countries needed 20-30 years to achieve the environmental quality enjoyed there today."

The IIASA approach provides many conclusions and recommendations that should be implemented in a step-wise manner over time, explains Somlyódy. Some key elements are:

- reducing water use through full-cost pricing of water;
- identifying and immediately dealing with pollution "hot-spots";

- planning effectively at the river-basin scale, particularly considering the input of local professionals, to develop efficient, least-cost policies (Figure 4 and 5);
- eliminating the gap between sewage and wastewater treatment; as well as enhancing sewerage development to close material cycles (that is, to eliminate direct discharge and non-treatment); and,
- using EU norms as guidance in setting long-term, water-quality targets.

In order to implement these recommendations and bear the fruit of such changes, numerous other, more general principles are necessary. Initially, policy makers should define phased effluent and ambient standards in harmony with multistage upgrading and development of wastewater treatment plants, accompanied by tightening requirements and promoting best management practices in industry and agriculture. This should all be part of establishing a regulatory framework and incentives for investment and infrastructure to promote the use of clean technologies and pollution control. If effective, a healthy willingness will emerge regarding the use of innovative methods in water-quality planning, wastewater management, and financing.

These step-wise goals, incorporated in the stages shown in Figure 5, →

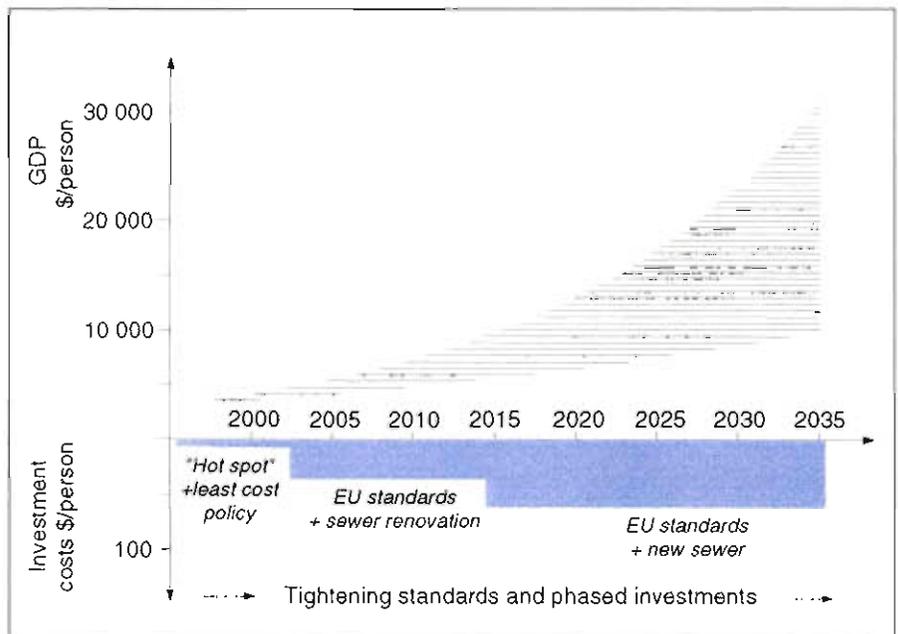


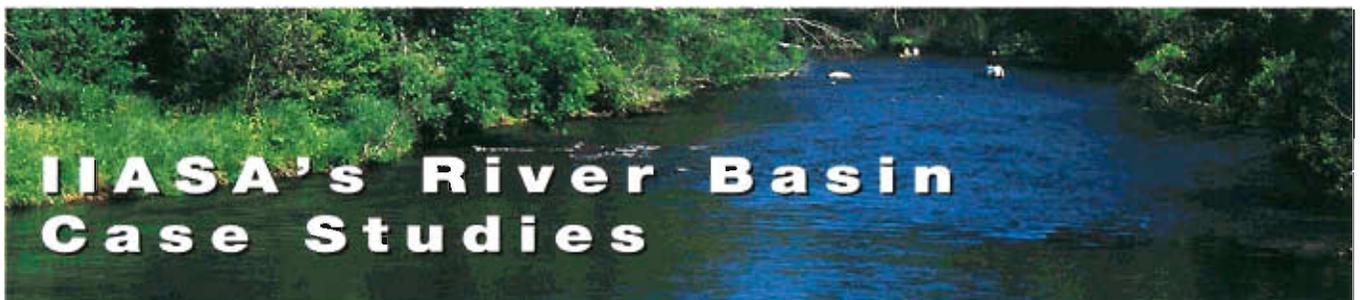
Figure 5. Step-wise municipal wastewater management policy and economic growth (upper bound GDP/person curve assumes six percent annual GDP growth per year, lower bound curve assumes 3 percent per year).

→ depend on the expected GDP per person, which will continue to be the determining factor for how much financial resources will be available for water quality improvement measures. Scenarios are uncertain; however, several CEE economies are well on the way to recovery, with GDP exceeding pre-transition levels. This fuels the hope that increasing amounts of domestic financing will be available for environmental improvement. There are already some positive examples, though not in all the CEE countries. In addition, an emerging economic attractiveness of CEE nations

implies future increases in foreign investment, and good environmental attitudes of Western companies and industries can indirectly contribute to the improvement of the CEE water quality situation.

Such prospects make the medium and long-term future look much brighter for CEE water-quality managers and policy makers, despite facing a task far more complex than their counterparts in the West. No one expects the road ahead to be easy, but the CEE has the advantage of avoiding mistakes previously

made in the West. The transition to Western water-quality norms will take time, but using Western management experiences, adjusting them to the local conditions, and creating a receptive policy framework in CEE countries locally and regionally will be necessary to succeed. Good technical, local knowledge exists and important institutions such as river basin agencies are, in fact, already in place. Based on these positive signs, it seems the speed of the process of further change and improvement will now largely depend on CEE economic development. ■



Sió River System, Hungary, (about 9000 km² and a population of almost one million): Water availability, water allocation and operation of the river/channel system are key issues. The majority of the nation's chemical industries are in this area. More than 35 industrial and 25 municipal point sources result in frequent violation of effluent standards. Sewer systems serve only 50-55 percent of the population, while 97 percent have access to the public water supply. Decreasing water availability and increasing pollution since 1993 have led to fish-kills (ammonia toxicity) and dramatic overall water quality decline. Authorities are striving to clean up the river system, but are concerned about costs to the chemical industry and the economically stressed municipalities. A new environment act and a water act were passed last year; new water-quality legislation is being prepared.

Nitra River, Slovak Republic, (over 5000 km² and almost 700,000 inhabitants): Water quality (Class VI-V, where V is worst) is extremely poor. The river system is mainly

used for waste disposal. Fishing and water-based recreation are detrimental to health. Municipalities, the main source of pollution, contribute 70 percent of traditional pollutants (30-50 percent of which has industrial origin). Few wastewater treatment plants exist. Only 50 percent of the wastewater is treated. Industrial discharge directly into the Nitra constitutes 30 percent of the river's total pollution. Past enforcement of water-quality standards and charges were lax. The amount of effluent charges and fines collected was (and is) low.

Morava River, Czech Republic, (over 10,000 km² and about 2.7 million inhabitants): Municipal, agricultural and industrial pollution make the Morava the most polluted river in the country. The main water quality concerns are nitrogen, phosphorous, organic micro-pollutants and, in some tributaries, dissolved oxygen. More than 50 percent of the major streams in the Morava river basin are classified as Class V („very heavily polluted“). Agriculture contributes 40-60 per-

cent of the total pollutants to the river (non-point sources). About 75 percent of the population is served by sewer systems. Direct discharge of wastewater collected from septic tanks of the remaining 25 percent of the population is still common.

Narew River, Poland, (28,000 km² and a population slightly below one million): Municipalities and industry are major polluters: Municipal wastewater treatment is insufficient and industries frequently dump effluents into the municipal sewer system or directly into the river. Major pollutants include organic material, nitrogen and phosphorous. The effects not only create local problems, but also influence the water quality downstream in Lake Zegzyskie (drinking water for Warsaw), the Vistula, and the Baltic Sea. In 1991, the Polish government started passing legislation on water quality management specifying standards, effluent levels, permit requirements and charges/fines for wastewater discharge. A new water law is being finalized.

The Tools

STREAMPLAN

This Spreadsheet Tool for River Environment Assessment Management and PLANNing (STREAMPLAN) is a decision-support system that allows decision-makers to evaluate river basin water-quality policies (related to organic material and nutrients) on the basis of local and regional water-quality goals, effluent standards, costs, financing, economic instruments,

municipal water-management issues, and the generation of wastewater treatment plant alternatives. The software can be applied to a broad range of river basins.

(<http://www.iiasa.ac.at/Research/WAT/docs/stream.html>)

DESERT

The DECision Support system for Evaluating River basin sTrategies

(DESERT) is a flexible, Microsoft® Windows-based tool for decision support of water-quality management at the river basin scale. This software provides a powerful instrument for developing least-cost and mixed river basin policies as well as their verification under conditions deviating from the design scenario.

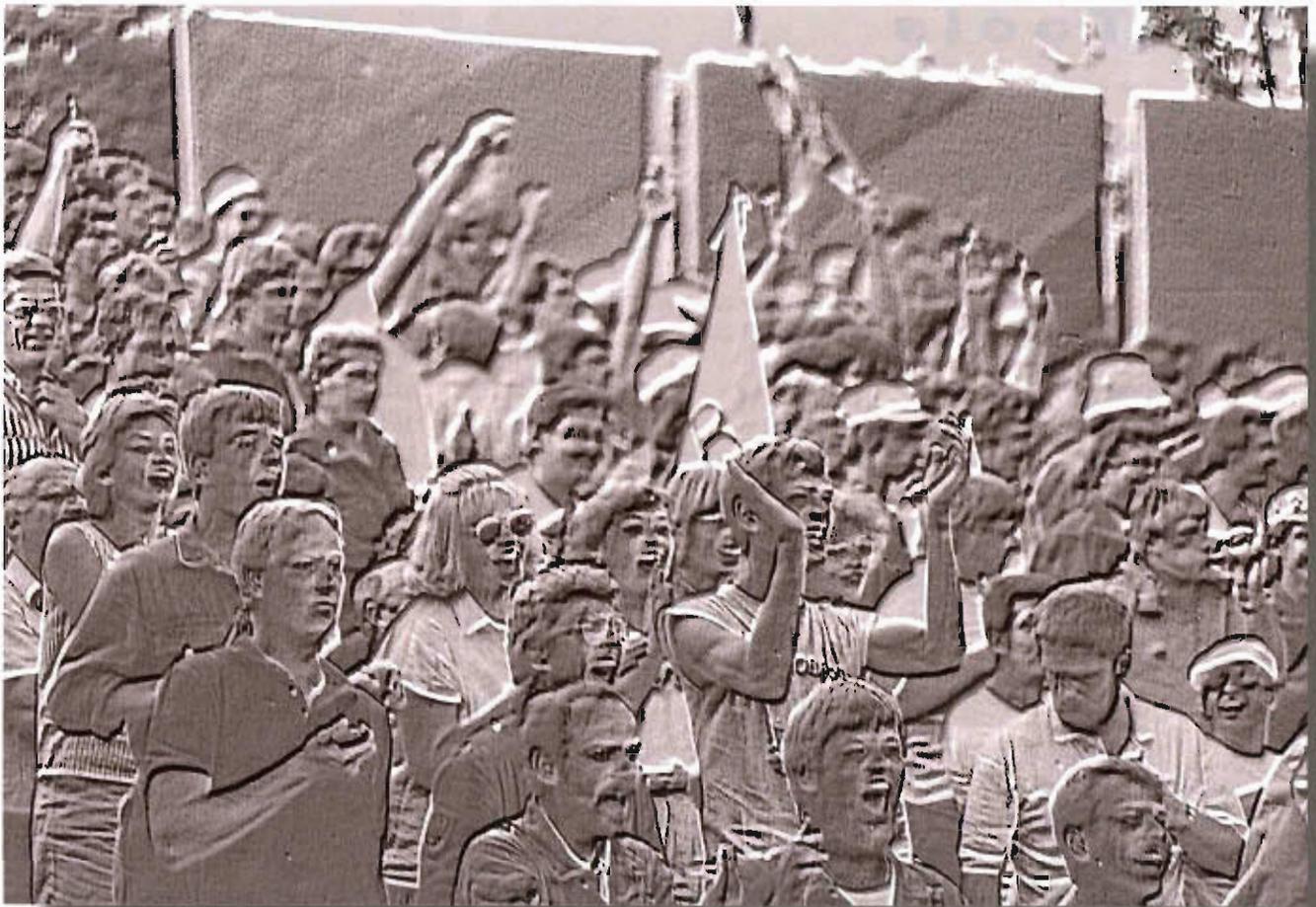
(<http://www.iiasa.ac.at/Research/WAT/docs/desert.html>) ■

	STREAMPLAN	DESERT
Developed by:	IIASA	IIASA and the Institute for Water and Environmental Problems (Russia)
Availability	- from IIASA - free of charge for research and academic purposes	
Focus	policy assessment at treatment plant, municipal and river basin level	policy assessment at river basin level
Hydraulics	uniform flow	steady or unsteady
Water quality	six constituents related to carbon, nitrogen, and phosphorous; linear reaction equations	large number of constituents; non-linear reactions and flexibility to formulate them
Calibration	no	generalized uncertainty analysis and parameter estimation
Optimization	linear programming	dynamic programming for handling non-linear issues
Water quality management policies	- effluent standards (including minimum treatment levels) - uniform emission reduction - ambient standard based on least-cost policies - mixed - regional nutrient emission reduction, policies with economic instruments (effluent charges, water price, fees, etc.), and a large number of combined policies	

STREAMPLAN and DESERT complement one another in various ways:

- calibration parameters for hydraulics and water-quality simulation from DESERT;
- transfer coefficients from DESERT;
- broader range of policy formulation by using STREAMPLAN;
- wastewater treatment alternatives derivation by using STREAMPLAN; and,
- checking STREAMPLAN designs with DESERT (water quality simulation).





The Human Race Slows to a Crawl

The IIASA Population Project's new population projections reflect a slowdown in growth.

In the past 80 years, the world's population has quadrupled: For every one person living at the turn of the century, there are now four. Indeed, the past 40 years have witnessed the fastest population growth ever in the history of mankind. Will the population continue its trend of doubling every 35 to 40 years? Not according to new population projections by IIASA's Population, Development and Environment Project. On the contrary, the Project predicts a two-thirds chance that the world's population may not double within the next century, if ever.

IIASA's Population, Development and Environment Project routinely updates global population projections

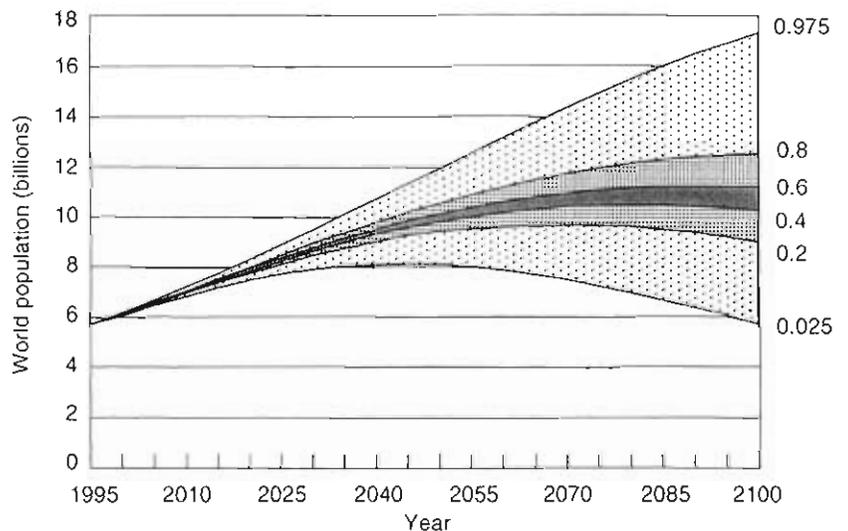


Figure 1: Calculated distribution of the size of the world's population (in billions): 1995 - 2100. The figures on the right-hand side refer to the proportion of cases, out of every 1000 cases, in which the world's population size could fall below the line indicated.

that are used for its own studies on how population affects environment and development, and for other IASA projects focusing on topics ranging from land use to transboundary air pollution. For this round of updates, however, the Project developed a new method of projecting population growth that differs from others in both its worldwide scope and its treatment of uncertainty.

The Challenge: Dealing with Uncertainty

Many uncertainties influence the formulation of population projections; often, these uncertainties are ignored. "The usefulness of a population projection is enhanced by knowing its range of uncertainty," says Project Leader Wolfgang Lutz. Indeed, the uncertainty could influence the actions of policy makers. Lutz and his colleagues addressed the problem by developing a new methodology for projecting population growth based on expert opinions that also provide uncertainty ranges for future fertility, mortality and migration assumptions. These subjective uncertainty distributions for the three components of population change were then translated into probabilistic projections for 13 major world regions.

Also, unlike most other projections, the Project's projections — and the

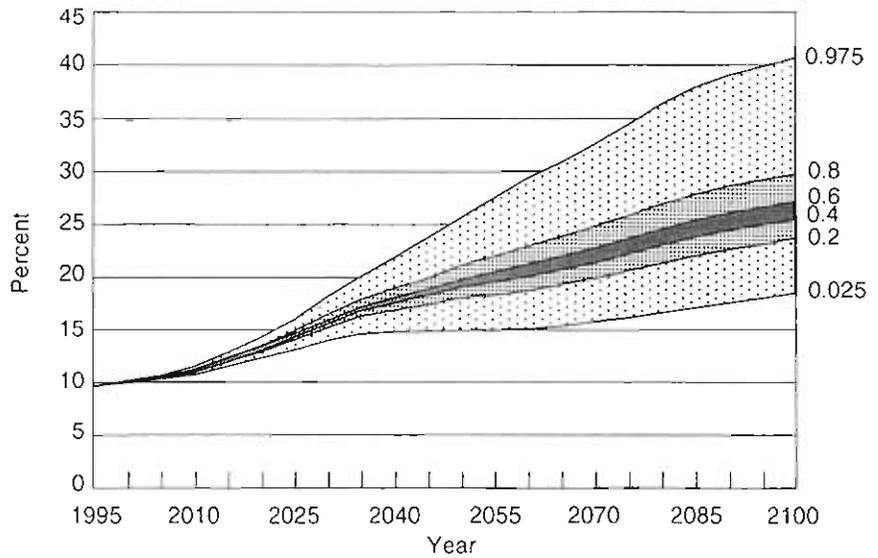


Figure 3: Calculated distribution of the world's population in the 60-or-older age group (in percent). The figures on the right-hand side refer to the proportion of cases, out of every 1000 cases, in which the percentage of the 60-or-older age group could fall below the line indicated.

assumptions they are based on — are clearly spelled out and substantively discussed in scholarly papers and in the Project's recently released, revised edition of "The Future Population of the World: What Can We Assume Today?"

World Projections

One of the most startling of the Project's latest population projections is that the total world population is unlikely to double again in the next century, if ever. In more than 60 percent of all simulations, the growth of the total world population would

level off or even start to decline before reaching the 11.5 billion mark (double today's population; see Figure 1).

Why the drastic slowdown? Many reasons, say Project researchers, but the biggest factor is the continuing decline in fertility in all world regions. This decline in fertility affects not only the total population size, but also the distribution within age groups. According to the Project's projections, population age distributions in all world regions are likely to make a steady shift from a current, predominantly young population to one that increasingly falls into the "over 60" age bracket.

For example, in 1995, 31.4 percent of the world's population was age 14 or younger. According to the Project's probabilistic projections, the percentage may clearly fall over time, to a projected median percentage of 17.2 by 2100 (with a 60 percent certainty of 16 to 19 percent; see Figure 2).

On the other hand, the proportion of those in the age 60 or older bracket may greatly expand. The Project predicts, in its most likely scenario, that by 2050, 19.7 percent of the world's population may be in this age group, compared with 9.5 percent in 1995. By 2100, the proportion could increase to 27.1 percent. There is a 97.5 percent chance that the proportion of elderly may at least double by 2100, →

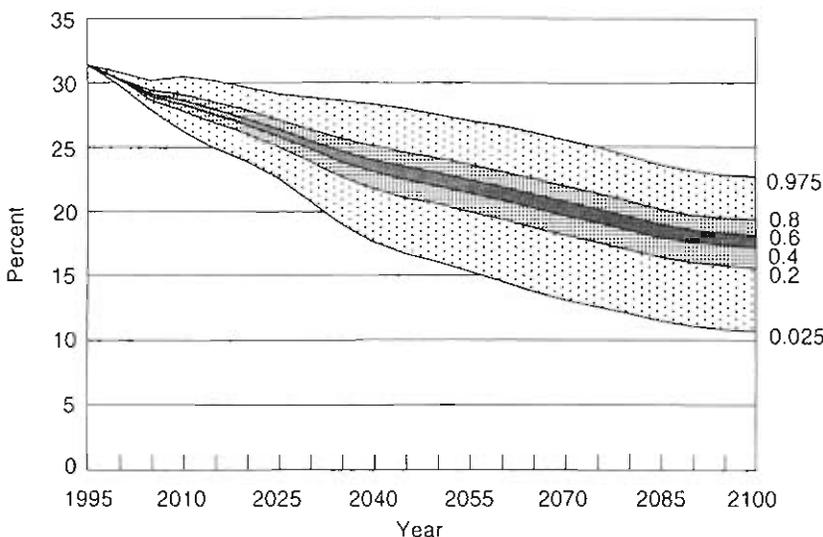


Figure 2: Calculated distribution of the world's population in the 0 - 14 age group (in percent). The figures on the right-hand side refer to the proportion of cases, out of every 1000 cases, in which the percentage of the 0 - 14 age group could fall below the line indicated.

→ and it could even more than quadruple (see Figure 3).

**Regional Projections:
Population Winners and Losers**

The IASA Population Project's probabilistic projections for world regions reveal startling trends for the European part of the Former Soviet Union. Over the course of the 21st century, population in the region is likely to decrease, according to the median projection (see Figure 4). By 2020, the population could fall from 238 million in 1995 to 224 million. By 2050, the population may fall to 189 million and by 2100 to 147 million. The causes of the projected population decline in this region are below-replacement fertility, relatively high mortality, especially for males, and net out-migration. Above-replacement fertility, significantly improved mortality rates as well as net-migration gains are only considered as possibilities for the medium- to long-term future.

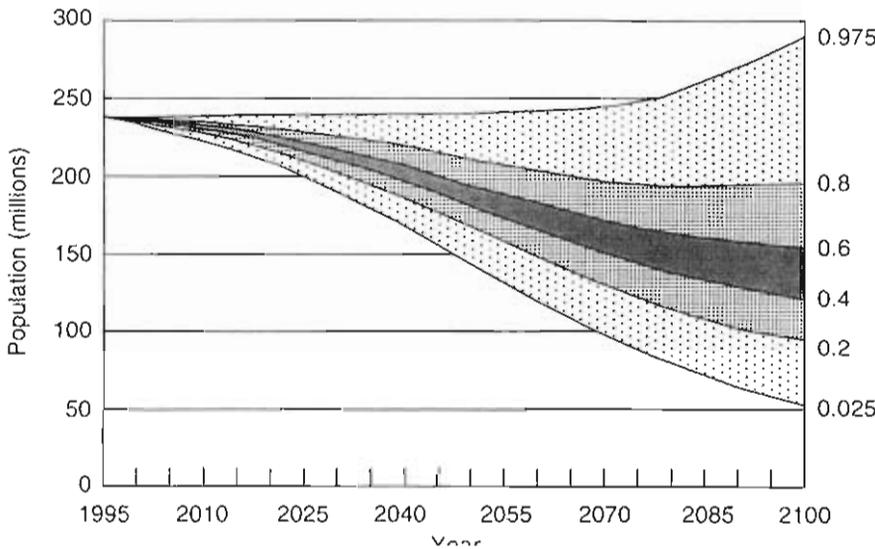


Figure 4: Future population size in the European part of the former Soviet Union, uncorrelated random variations in fertility and mortality paths. The figures on the right-hand side refer to the proportion of cases, out of every 1000 cases, in which the population size could fall below the line indicated.

The Project's projections for North America tell a different story: Projections show slow but steady population growth for this region (see Figure 5). The population of North America in 1995 was 297 million. The population could increase to 356 million in 2020, 405 million in 2050, and

greatly restricted and if the USA has a long period of below-replacement fertility.

—Regional age structures

As indicated earlier, while the percentage of children age 14 and under

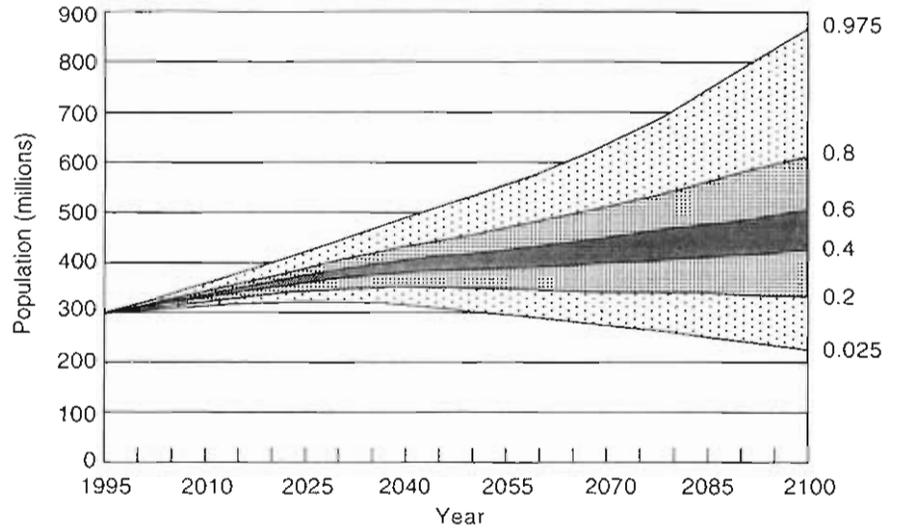


Figure 5: Future population size in North America, uncorrelated random variations in fertility and mortality paths. The figures on the right-hand side refer to the proportion of cases, out of every 1000 cases, in which the population size could fall below the line indicated.

will likely decrease during the 21st century in all regions, the percentage of the population age 60 or over may grow. For example, in North Africa, 38.8 percent of the population were age 14 and below in 1995. In 2050, the percentage could fall to 27.0 percent, and to 18.7 percent by 2100, under the median projection. On the other hand, the proportion of the North African population age 60 and above was 5.9 percent in 1995; by 2100, the proportion could be 24 percent. The phenomenon of population aging will occur on a worldwide scale during the 21st century.

In China and Centrally Planned Asia (CPA), 27.3 percent of the population in 1995 were age 14 or below. By 2020, the percentage could fall to 21.2, and to 17.1 percent by 2100. This decrease in population in the 0 to 14 age bracket may be accompanied by an increase in the percentage of the population age 60 and above. In 1995, 9.2 percent of the population was 60 or older; by 2050, the proportion could be 25.3 percent, and by 2100 it could increase to 28.3 percent, under the median projection.

In China and Centrally Planned Asia (CPA), 27.3 percent of the population in 1995 were age 14 or below. By 2020, the percentage could fall to 21.2, and to 17.1 percent by 2100. This decrease in population in the 0 to 14 age bracket may be accompanied by an increase in the percentage of the population age 60 and above. In 1995, 9.2 percent of the population was 60 or older; by 2050, the proportion could be 25.3 percent, and by 2100 it could increase to 28.3 percent, under the median projection.

Incorporating Judgment into Projections

In making population projections, and in particular probabilistic ones, there is no substitute for judgment. The main question is, what is the best

way to incorporate judgment into projections? With their emphasis on expert opinion and levels of certainty, the Project's probabilistic projections attempt to do just that.

"Probabilistic projections are our best estimates of expected future population sizes combined with our best estimates of the associated confi-

dence intervals," says Lutz. Expert opinion can be wrong, he explains, but there is no better alternative. According to Lutz, expert opinion — especially when derived from an interactive group process — incorporates the relevant knowledge that has accumulated over years of experience and study into a wide range of disciplines. It also accommodates human intuition

and nonquantitative judgment and is therefore more comprehensive than any specific formal model. "It is far from perfect, but until we develop a true model that generates future trends in fertility, mortality and migration, expert opinion is the best guide that we have," concludes Lutz. ■

DemoGraphics '94 Version 2.4 Released

A new version of the DemoGraphics '94 software package, developed by Gerhard Heilig of IIASA's Project on Modeling Land-Use and Land-Cover Changes in Europe and Northern Asia (and formerly with IIASA's Population Project), is now available. DemoGraphics '94 is a graphical database and tool for population education. It also can be used as a computer-based demographic reference system.

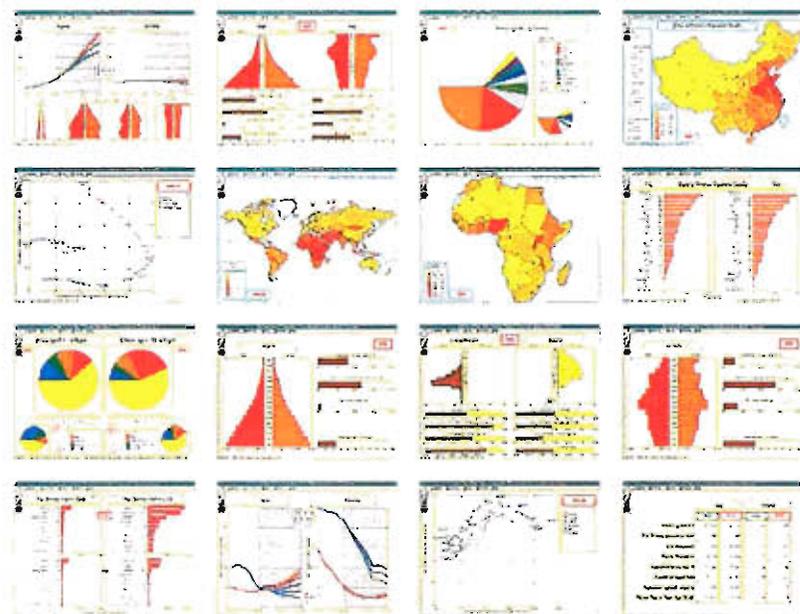
The new version includes dozens of new modules, which make it easier to compare, tabulate, rank and analyze the demographic situation of countries and regions worldwide. The package includes three data sets:

1. data from the UN Population Estimates and Projections (1994 Revision), conducted by the United Nations Population Division;
2. the World Population Scenarios and the European Country Scenarios (1994 Edition), developed by IIASA's Population Project; and
3. a small set of sub-national data for China from various sources. The data set includes basic population statistics by province.

Due to copyright restrictions, all data are encrypted. Data can be used freely within DemoGraphics '94 and printed out in tables and charts, but you cannot export it as ASCII files. The software runs under MS-Windows 3.1/3.11 or MS-Windows 95, and costs US\$ 35 (including packaging and shipping).

To order, please contact:
Dr. Gerhard Heilig
LUC-Project
International Institute for Applied Systems Analysis (IIASA)
Schlossplatz 1
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fax (+43-2236) 71313
e-mail: heilig@iiasa.ac.at
<http://www.iiasa.ac.at/Research/LUC/>

DemoGraphics'94



Turning visions into reality

Economist János Kornai talks about welfare, freedom and the transition of Central and Eastern Europe.

János Kornai's distinguished career in economics reflects a unique combination of East-West experiences. Born and educated in Hungary, Professor Kornai was an early critic of centralized economies when, in the mid-1950s, he wrote a book dealing with the over-centralization of socialist economies. The work caused considerable controversy in Hungary and elsewhere, and Professor Kornai lost his job in Hungary as a university professor because of it. Yet, he continued to live and work in Hungary, and is respected both for his decision to remain there and for his many contributions since then to economics in general and to the Hungarian transition in particular.

Over the years, Professor Kornai has written a series of books questioning general equilibrium theory and analyzing economic shortage and the communist system.

Professor Kornai joined the faculty of Harvard University in Cambridge, Massachusetts, USA, on a part-time basis in 1986 and was named the Allie S. Freed Professor of Economics there in 1992. His ties to Hungary remain strong: In 1992, he became a Permanent Fellow of the Collegium Budapest, Institute for Advanced Study; and, since 1967, he has been a Research Professor at the Institute of Economics, Hungarian Academy of Sciences.

In June, Professor Kornai visited IIASA as a speaker for the Institute's 1996 Tjalling Koopmans Lecture Series; the title of his talk was "The Political Economy of Reforming the Welfare State in Transition Economies." After the lecture, Professor Kornai talked with *Options* editors about the unprecedented changes in Central and Eastern Europe (CEE).



Q: *Due to budgetary problems, many countries in Western Europe and North America have found it necessary to reform previously sensitive elements of domestic welfare policy. Of course, transition economies in CEE are different, but does their overall economic state permit politically easier reform of welfare policy?*

Kornai: It is hard to make meaningful generalizations. The difficulties of reforming the welfare system vary from country to country. In some countries, like Sweden or Hungary, the ratio of welfare spending to GDP is very high and large reductions are needed. This can generate strong resistance. In some other countries, this ratio is much lower, so less reduction is needed and can be handled more easily.

Of course, the difficulties will depend on many other factors as well. The development of real wages in the last few years is a prime example. If they have risen, it is easier to reduce entitlements because the population's mood is generally favorable. The process is much more painful when the economic situation is bad and the standard of living has declined.

Q: *Early in the CEE transition process, economic difficulties*

were the political justification for reform, creating so-called "windows of opportunity" for policy makers. This seems to have changed dramatically. Why?

Kornai: The special "window of opportunity" was open only once, during the great historical moment of 1989-1991 when communism collapsed in Europe and a new chapter of history began. That was the right time for making relatively quick and dramatic changes and asking for large sacrifices.

There are, of course, recurrent other chances. It is well known that the beginning of a new parliamentary cycle (or immediately after the election of a new president in a presidential system) is the best time to introduce unpopular but necessary measures. Later, when the new election approaches, politicians are reluctant to do anything that could lead to loss of votes.

In some strange way, there are opportunities to make serious changes when the situation turns to the worse. In general, many politicians are inclined to postpone unpopular reforms and just muddle through. But if a catastrophe occurs, or if a country is on the verge of catastrophe, the population pulls together and is, perhaps, ready for bold actions. The populace is more willing to rally behind a government when times are tough.

Q: *Are experiences from Western market economies now of greater benefit for CEE policy makers than at the start of transition?*

Kornai: Post-socialist countries have much to learn from more advanced market economies all the time, at each stage of transition. At the beginning, we had to understand

some basic lessons, the relevance of private property, the virtues of market-determined prices, decentralization, and so forth. As we progress, we need a more precise understanding of the details, of the exact rules governing various institutions, and of the practice of operating the organizations of a market economy.

Q: *CEE countries are striving to join the European Union (EU). How will unavoidable changes to the CEE social systems (financing and benefits) influence their populations' demands to join or not to join the EU?*

Kornai: The welfare reform in post-socialist systems is a necessary condition for balancing the fiscal budget. We need to reduce public spending, and associated with this change, a considerable reduction of taxes to become more similar to the typical European economies. That is part of the harmonization process.

I do not expect that, in the perception of the man on the street, the welfare reform will be regarded as a by-product of joining the EU. These are two different processes. A citizen may support or reject one or the other or both, but it will not be linked as parts of the same change. Therefore, the welfare reform will make the decision of joining the EU neither more nor less attractive.

Q: *The political economy of the European Union is also changing with time. Considering all the subtle obstacles, how long do you realistically expect it to take until CEE nations are fully integrated into the EU?*

Kornai: I am not prepared to give you a prophecy in this matter. The Hungarian target year is 2000; but the date of formal entry will depend on the willingness of the present EU members to let Hungary enter. Other CEE nations may have other target years. Whatever the importance of formal membership, that is only a part of the deeper process you alluded to: when CEE nations really will be integrated into the European economy.

That is not a legal, but a substantive issue. It started already with foreign trade liberalization, in shifting the trade from the inward-looking COMECON trade to the outward-looking foreign trade activities where EU became the number-one market for CEE nations. But it may take a decade or more to become fully integrated.

Q: *In the 1980s, you wrote a book titled Vision and Reality, Market and State The Transition from socialist economic systems toward market economies has caused people of the CEE region great hardship but provided many opportunities. The visions initially portrayed by politicians were so promising. Presently, most CEE nations have reversed the contraction of their economies but few are faring markedly better than in pre-transition times. Is reality causing visions to change, or have the visions of policy makers and their citizens begun to diverge?*

Kornai: As for the comparison between the present and the past, I do not favor oversimplifying "aggregation," reaching conclusions like "things are better," or "the situation became worse." Post-socialist transformation is continuing on many fronts, in the different spheres of political, social and economic changes. On each front, the frequency and depth of success and failure might be different. I regard as an extremely important result the elimination of chronic shortages. Many people are forgetting what a great achievement it is that we no longer have to stand in queues for bread and meat. I also want to underline the importance of economic freedom. There were times when individuals did not have the right to quit their jobs at their own initiatives but were almost bound to the workplace. People could not start businesses, because any kind of capitalistic activity was forbidden. Today, we see a great surge of private initiative, invention and entrepreneurship.

You mentioned a book of mine written in the 1980s. Let me recall another one: *The Road to a Free Economy*. Here I presented my vision of the transition to

a market economy; that was the first book on the subject. I am convinced that my own country, Hungary, and many other countries went a long way in the direction of that vision.

Your observation is correct: visions do diverge. The divergence appeared from the very beginning, but perhaps the difference between various types of "Weltanschauung" (global perspective) is increasing. Small wonder, because people have different political and ethical principles, different goals they want to achieve, different instruments to achieve their goals, and different preferences for certain types of policies. The great merit of a pluralistic democracy is that, in contrast to the monolithic endeavors of the communist system, democracy allows the expression of divergent visions in the free press, and also permits the formation of competing parties to fight for the realization of the various visions.

Q: *You just mentioned the importance of expressing visions or views in the free press. Can particular types of today's press or media activities offer economists, like yourself, or other scientists who work on public-policy-relevant issues more effective ways to disseminate useful findings?*

Kornai: Yes, we need the permanent support of the press. In my experience, the mass media and the printed press welcome economists and other experts to address a wide audience or readership. I never heard complaints that my colleagues were unable to publish an article in a newspaper, or give an interview on television or radio. The problem is the opposite: many experts do not take this opportunity to reach a large number of people.

I see, however, also problems with the journalists. Some of them do not study the new and very complex problems with sufficient care; there are quite often errors, or misunderstandings, where we would need a precise explanation.

I hope that the cooperation between the press and the economic profession will further improve. ■

「IIASA日本週間シンポジウム」

——21世紀に向けてのアジア——

IIASA Days in Japan: Asia Towards the 21st Century

Japan, as the only supporting member nation in Asia, has always played a leadership role in IIASA's research activities through collaboration and joint research projects.

*Peter de Játosi,
IIASA Director*

The accelerating seriousness of global environmental problems and the slow pace of technical innovation call for an organization like IIASA that can provide effective and efficient means for international and interdisciplinary collaboration.

*Takashi Mukaibo,
Chairman, The Japan Committee
for IIASA*

This year, the now traditional IIASA Days dawned in the land of the rising sun. The outreach activity brings research results closer to interested parties around the world, particularly in countries affiliated with the Institute. In April, Japan welcomed a delegation of IIASA research and management staff, including Austrian Council member Kurt Komarek. The IIASA team presented a wide array of research to the Japanese scientific and decision-making communities, further strengthening the already thriving cooperation between the groups and the Institute.

Initial plans for IIASA Days in Japan were formulated in early 1995 and were followed by more than a year of intensive preparation and cooperation between the Institute and its Japanese National Member Organization, the Japan Committee for IIASA, as well as a high-level "IIASA Days Committee" established in Japan and supported by a Working Group of Japanese IIASA alumni.

The highlight of this memorable event was a two-day Symposium, "Asia Towards the 21st Century," held in Tokyo at the United Nations University (UNU), which had generously offered its facilities. The Symposium was co-organized by the Japan Committee for IIASA and the Institute, supported by the New Energy and Industrial Technology Development Organization (NEDO), the Global Environmental Forum, the Central Research Institute of Electric Power Industry (CRIEPI), and sponsored by the Japan Ministry of Industry (MITI) and the Environment Agency of the Government of Japan.

A capacity crowd of some 400 participants attended sessions on global issues as well as on Asian regional issues. Within this framework, IIASA scholars presented their work on energy, technological and economic development, international environmental commitments, population, methods for decision support, land-use and land-cover changes, and



transboundary air pollution, which included a presentation of the RAINS-Asia model. Experts from numerous scientific organizations, government bodies and industry presented related research work in Japan and commented on the IIASA activities.

Following the symposium, members of the IIASA management also had the opportunity to meet with high-level government officials, while IIASA researchers spoke at several research institutions in Tokyo.

Furthermore, the IIASA team presented their work at two additional seminars elsewhere in Japan, to foster contacts and collaboration with scien-

tific institutions throughout the country. RITE, the Research Institute of Innovative Technology for the Earth, hosted a meeting at its exceptional facilities in Kyoto, where IIASA Director Peter de Jánosi and members of the IIASA group met with senior management staff. The National Institute of Environmental Studies (NIES) in Tsukuba was host of a one-day seminar, jointly organized by several research institutions in the region, including the Forestry and Forest Products Research Institute, the Japan International Research Center for Agricultural Sciences, the National Institute of Agro-Environmental Sciences, the National Institute for Resources and Environment, and the

University of Tsukuba. The program, focusing on transboundary air pollution, land-use and land-cover changes, and methodologies for global issues, included presentations by IIASA Deputy Director Jill Jäger and several scholars, and benefited from intensive discussions with Japanese colleagues.

The limited space here prevents us from listing the many generous individuals to whom IIASA is grateful for their exemplary hospitality and for their dedication and effort in making the "IIASA Days in Japan" such a successful and exceptionally well organized series of events. ■

Text and photos by Elisabeth Krippel



1) Several hundred representatives from the scientific and policy-making communities in Japan attended the Symposium "Asia Towards the 21st Century" at the United Nations University

2) Takashi Mukaibo, Chairman of the Japan Committee for IIASA (right) and Yoshikazu Sawaragi, Chairman of the Japan Institute of Systems Research

3) Members of the IIASA group and their hosts at RITE in Kyoto

4) The IIASA delegation visiting NIES in Tsukuba

5) Yoichi Kaya, Vice-Chairman of the IIASA Council, speaking at the Opening Ceremony of the IIASA Days in Japan Symposium



IIASA Alumni Meetings

In Hungary



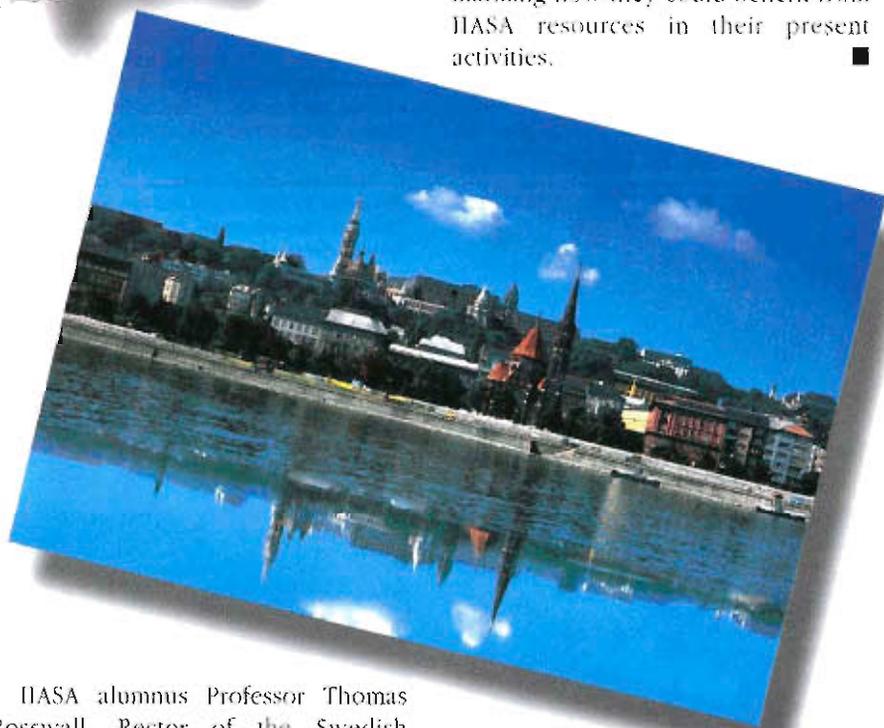
On April 19, IIASA's Hungarian NMO Secretariat organized the annual meeting for its IIASA alumni in Budapest. Joined by members of Hungary's NMO Committee to IIASA, more than 25 alumni attended to hear opening remarks by the Hungarian IIASA Council Member, Academician Domokos Kosáry, followed by IIASA Director Peter E. de János's report on the Institute's general situation and future plans. Three Institute staff members — László Somlyódy, Leader of the Water Resources Project, János Gács, Deputy Leader of the Economic Transition and Integration Project, and Arpad Csurgay, Advisor to the Director — also made the trip to Budapest to present their work. The meeting concluded with alumni summarizing how they could benefit from IIASA resources in their present activities. ■

In Sweden

At an afternoon seminar arranged by the Swedish Council for Planning and Coordination of Research (Swedish National Member Organization (NMO) to IIASA) in Stockholm, IIASA Deputy Director Jill Jäger gave an overview of IIASA's research activities to a group of Swedish IIASA alumni. She described the Institute's procedure in establishing research projects and its advantages in attracting groups with existing networks.

The May 7th meeting included a special presentation by Dr. Cynthia Rosenzweig from IIASA's Project on Modeling Land-Use and Land-Cover Changes in Europe and Northern Asia. Dr. Rosenzweig informed the audience about the Project's goal to analyze environmental consequences of land-use and land-cover changes in the region from 1900 to 1990, and about its subsequent effort to predict changes in land use and land cover between 1990 and 2050 under different assumptions of future demographic, economic, technological, social and political conditions.

IIASA alumnus Professor Thomas Rosswall, Rector of the Swedish University of Agricultural Sciences and member of an IIASA Steering Committee, gave a speech at the post-seminar dinner. He pointed out highlights of IIASA's research and the importance for the Swedish NMO to disseminate such information and promote use of the Institute's special resources. ■



Budapest, Hungary

Meetings

Second Ruhr/Katowice Policy Comparison Workshop 25-26 April, Laxenburg, Austria

This workshop reviewed policy issues related to IIASA's Regional Material Balance Approaches to Long-term Environmental Policy Planning. Participants developed assessment criteria for policies dealing with heavy metal pollution in the Black Triangle and Upper Silesia Region of Germany, Poland and the Czech Republic. Discussions focused on policies related to heavy metals, as well as reviews of socio-economic conditions for the clean-up and restructuring of the Katowice area in Poland.

Contact: Stefan Aunderberg
(e-mail: anderber@iiasa.ac.at)

Rethinking International Population Projections 6-8 June, Laxenburg, Austria

Organized by IIASA's Population, Development and Environment Project, this meeting discussed basic alternative approaches to population projections. Participants, including many of the world's leading experts on population projection, dealt with issues ranging from ways to perform and present projections to uncertainty in population projections. A forthcoming volume will include many of the papers and recommendations.

Contact: Wolfgang Lutz
(e-mail: lutz@iiasa.ac.at)

Institutional Changes and Economic Behaviors 21-23 June, Laxenburg, Austria

Some 40 researchers participated in this workshop sponsored by IIASA's Project on Systems Analysis of Technological and Economic Dynamics. Participants looked at the nature of institutions, how they affect economic behaviors, and the mechanisms by which they emerge and change. Presentations were made on institutional changes in the former Soviet Union, Latin America and Germany.

Contact: Iouri Kaniovski
(e-mail: kaniov@iiasa.ac.at)

Joint International Energy Workshop/JSER International Conference on Energy, Economy and Environment 25-27 June, Osaka, Japan

More than 200 international energy experts attended the 1996 meeting of the International Energy Workshop (IEW). This year, it was organized jointly with the Japan Society of Energy and Resources (JSER). At the meeting, participants discussed issues such as climate change, urban energy systems, renewable energy, global and world regional energy projections, and carbon-free energy supplies.

Contact: Leo Schrattenbolzer
(e-mail: leo@iiasa.ac.at)

In Memoriam

With regret we inform IIASA's friends and collaborators of the death of Dr. habil. Gyorgy Sonnevend on April 11. Professor Sonnevend, of the Department of Numerical Analysis at the ELTE University in Budapest, Hungary, was affiliated with IIASA's Systems of Decision Sciences Program from 1984 onwards and, more recently, worked with the Dynamic Systems Project.

Hot off the Press

IIASA's Water Resources Project Presents its Latest Book

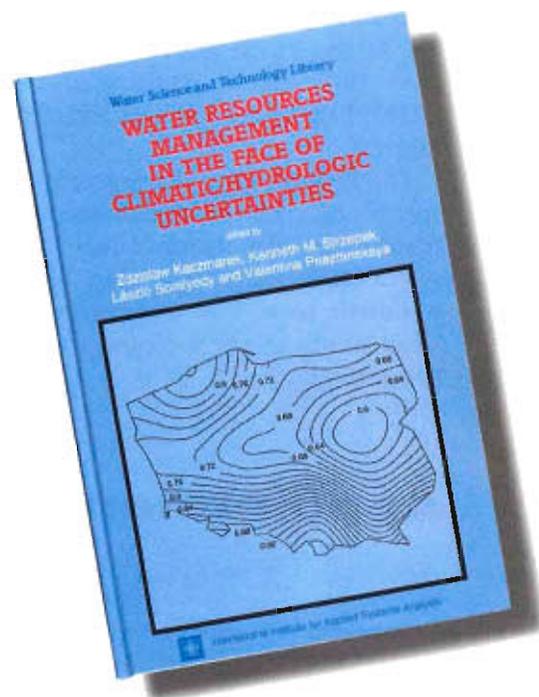
Climate change, its causes and effects, has become a highly visible ecological and political issue due to potential influences on environment and society. Climate change could have a profound effect on how we live.

Scientists at the Second World Climate Conference in November 1990

unanimously accepted the following statement: "Among the most important impacts of climate change will be its effects on the hydrological cycle and water management systems, and through these, on socio-economic systems." This principle was the foundation for work by IIASA's Water Resources Project, which culminated in the book *Water Resources Management in the Face of Climatic/Hydrological Uncertainties*, edited by Z. Kaczmarek, K. Strzepek, L. Somlyódy, and V. Priazhinskaya, and published by Kluwer Academic Publishers.

The book presents the first international and comprehensive effort to examine a broad range of impacts of climatic fluctuations and climate change on water resources, including river runoff, water quality, water temperature, water use and demand, reservoir management, and water resources planning and management. Another unique aspect of the book is the inclusion of case studies in Africa, Europe and North America.

The book is intended for government policy makers and staff members; government, private and university researchers; university scholars; and upper-level undergraduate and graduate students. →





YSSP participants at the Program's midsummer review workshop, where the young scientists present their work.



Interaction with peers is an important component of the YSSP.



YSSP participants find time to have fun too, here at IIASA's July 4th celebration.

1996 Young Scientists Summer Program

From the beginning of June to the end of August, 56 graduate students from 19 countries participated in IIASA's 1996 Young Scientists Summer Program.

The Program gives these people a special opportunity to acquire international experience, enhance their research skills and become part of a worldwide network of specialists with broad interdisciplinary and cross-cultural perspectives.

Appointments

Francesca Chiaromonte (Italy), a recent Ph.D. graduate from the

University of Minnesota, has joined IIASA's Systems Analysis of Technology and Economic Dynamics Project.

Xiubin Li (China), from the Institute of Geography at the Chinese Academy of Sciences in Beijing, has joined IIASA's Project on Modeling Land-Use and Land-Cover Changes in Europe and Northern Asia.

Svetlana Rojkova (Russia), from the Dokuchaev Soil Institute, Moscow, has joined IIASA's Project on Modeling Land-Use and Land-Cover Changes in Europe and Northern Asia.

Vassili Toukhnovskii, (Ukraine), from the Forestry Department, National Agricultural University, Kiev, has joined the Project on Forest Resources, Environment and Socioeconomics Development of Siberia.

Ulf Dieckmann (Germany), from the Institute for Advanced Study, Berlin, has recently joined IIASA's new Adaptive Dynamics Network Project.

Selected Grants & Contracts

Transboundary Air Pollution

IIASA's Transboundary Air Pollution Project has received external financing for two of its activities. Funds from the European Commission (DGXI) in Brussels support the work on ground-level ozone in Europe, and a grant from the Austrian Bundesamt fuer Umwelt, Wald und Landschaft helps finance the study on the European transport sector's contribution to critical load exceedances of sulphur and nitrogen compounds.

Population Projections and Environmental Change

The John D. and Catherine T. MacArthur Foundation of Chicago, USA, has contributed to the IIASA Population, Development and Environment Project's

research on international population projections in the context of global environmental change.

Lifestyles, Sustainability, and Integrated Assessment

With the support of DGXII at the European Commission in Brussels, IIASA, under the coordination of Deputy Director Jill Jäger, is undertaking a study on Urban Lifestyles, Sustainability and integrated Environmental Assessment (ULYSSES) together with nine research organizations in seven European countries.

Evaluating the Radiation Legacy

The United States Department of Energy has awarded funds to IIASA for the evaluation of the radiation legacy of the Former Soviet Union, being conducted by the Institute's Project on Radiation Safety of the Biosphere.

Siberian Case Study

The European Commission's DGXI in Brussels has provided financial support for IIASA's Project on Forest Resources, Environment and Socio-economic Development of Siberia.

Announcement

1997 Open Meeting of the Human Dimensions of Global Environmental Change Research Community, 12-14 June 1997, IIASA, Laxenburg, Austria

This meeting is a follow-up to the First Open Meeting of the Human Dimensions of Global Environmental Change Community held at Duke University, USA, on June 1-3, 1995. It is sponsored by IIASA and the Social Science Research Council (SSRC), with co-sponsorship from Directorate General XII of the European Commission. Other co-sponsors will be announced at a later date.

The purpose of the meeting is to bring together the growing human

Awards

On 8 May, the Austrian Academy of Sciences ceremoniously announced the election of Professor Karl Sigmund, research scholar with IIASA's Dynamic Systems Project, as "Korrespondierendes Mitglied" (Corresponding Member) and Academician Yuri Osipov, IIASA Institute Scholar and President of the Russian Academy of Sciences, as "Korrespondierendes Mitglied im Ausland" (Corresponding Member Abroad).

On 2 June, IIASA Research Scholar and Co-Leader of the Risk, Policy and Complexity Project, Joanne Linnerooth-Bayer, was awarded the Executive Committee's Distinguished Scientist Award of the Society for Risk Analysis-Europe by its President, Ray Kemp.

At the IIASA Council meeting in June, members of the Council conferred the title of IIASA Honorary Scholar upon Academician Domokos Kosáry, President of the Hungarian Academy of Sciences and Chairman of the Hungarian National Member Organization to IIASA, and Dr. Peter E. de

dimensions research community to promote exchanges of information on current research, teaching and outreach, to encourage networking in this new field, and to attract social scientists, humanists and others not previously involved in human dimensions work. There will be special plenary sessions on: Attitudes and Behavior in Global Change, Integrated Assessment, Health and Global Change, Business and Trade, Environmental Security, Governance, and Technological Change. There also will be numerous small group sessions. Those wishing to organize multi-paper sessions for the conference on the plenary topics or other topics at local, regional and global scales are urged to communicate with the organizers: final proposals for such sessions are due by December 1, 1996. Proposals for

Jánosi, IIASA's Director over the last six years, for their many outstanding contributions and long-standing dedication to the Institute. ■



Karl Sigmund,
above left
Yuri Osipov,
above right
Joanne Linnerooth-Bayer,
right
Domokos Kosáry,
Peter D. Jánosi,
below



individual papers also can be submitted. The meeting will include additional informal research group meetings and modeling and publications displays.

For additional and updated information:

Check the World Wide Web sites of IIASA at <http://www.iiasa.ac.at/> (What's New) and the SSRC at <http://www.ssrc.org/>.

Or, consult meeting staff; contact either Claudia Heilig-Staindl at IIASA, A-2361 Laxenburg, Austria, +43-2236-807 tel., +43-2236-72659 fax, staindl@iiasa.ac.at, or the Global Environmental Change Program at the Social Science Research Council, 810 7th Avenue, New York, NY 10019, +212-377-2700 tel., +212-377-2727 fax.

Austria

The Austrian Academy of Sciences

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The National Committee for Applied Systems Analysis and Management

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FURTHER INFORMATION:



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