

**S**iberia's vast forests are not only one of the world's last great frontiers: they are a natural heritage of truly global importance. For Russia, they are a potential cornerstone of the economy; for the world as a whole, they are a key tool in the maintenance of a stable climate and a healthy biosphere.

On March 9 IIASA signed an agreement with the Russian Academy of Sciences and the Ministry of Ecology and Natural Resources for a major, multi-year project on *Forest Resources, Environment, and Socio-Economic Development of Siberia*. The project's goals are: to analyze the state of Siberia's forests and develop data bases on forest ecosystems from the Urals to the Pacific; to assess their biospheric role, especially with regard to global warming and biodiversity; to identify strategies that will increase their contribution to sustainable socio-economic development; and to carry out a detailed case study of the Ust-Ilimsk region.

Siberia has 19 percent of the world's forested area — five million square kilometers, an area roughly two-thirds the size of the continental USA — and 17 percent of the world's standing timber. Within that timber is an estimated 40,000 million tons of carbon, nearly half the amount sequestered by the forests of the Amazon Basin.

The changes in the former Soviet Union offer unprecedented opportunities and risks for devel-

opment of Siberia's environment, forest resources, and forest industries. In spite of its timber and mineral wealth, the region suffers from weaker economic development than other parts of Russia and a high incidence of social problems. Healthy forests and forest industries could improve the economic and social vitality of Siberia and the environmental well-being of the entire world.

Considerable effort has gone into setting up an elaborate project network. The study will involve dozens of researchers throughout Russia as well as collaborators in the USA, Canada, Japan, Finland, Sweden, and other countries. Two core research teams will be set up, one at IIASA led by Sten Nilsson, the Leader of the Institute's Forest Resources Project, and the other in Moscow under Alexander Isaev, Director of the Center for Ecological and Forest Productivity Problems of the Russian Academy of Sciences.

Following initial set-up work and a preliminary analysis of available data, work began this fall to develop two sets of data bases, one on resources and ecology, the other on industry, infrastructure, and socio-economic factors. In 1993 work will begin on studies of forest resources, markets, industry and infrastructure, regional and global ecological factors, and socio-economic aspects. Some of the studies will focus on the non-wood benefits of forests, from wildlife

habitat and recreation to local and global climate amelioration.

The last stages of work will be integrated analyses of the subsidiary studies leading to policy recommendations for sustainable development. Current practices are anything but sustainable. Research by IIASA's Forest Resources Project indicates that some of Siberia's forests could be mined out in 40 to 50 years.

Historically Siberia's forest industry has been characterized by massive industrial developments. In setting up the Ust-Ilimsk combine some 20 years ago authorities built a new town and airport, a railway line connecting the development to the Baikal-Amur railroad, and one of the largest hydroelectric power plants in Russia, with a capacity of four million kilowatts and a reservoir of 2000 square kilometers. The combine was assigned a wood catchment area of 36,000 square kilometers, almost the size of Switzerland.

Restructuring the Siberian forest industry will be difficult and expensive. The industry is characterized by obsolete technology, low productivity, and products of low quality. In addition, much of it is far from the major world markets.

Any recommendations regarding possible industrial strategies — what to produce, how, and for whom — will be consistent with the broader goal of environmental and socio-economic sustainability. ■

## INTERVIEW

models of economies and say to politicians, 'Each of these scenarios is efficient, but we could go this way or this way, we could have a world with a lot of forests or a little, more biodiversity or less. If you want to move that way, then here's what the economy might look like, here are the implications for future generations, and here are the choices and the sacrifices needed to reach those objectives.'

That's very different from what we have been doing. In my five months in the World Bank I repeatedly watched economists trying to determine, 'What are the right answers for Brazil or India, what is the right thing to tell them to do.' As economists we're used to saying to politicians, 'This is where you want to go to be efficient' — without ever telling them that our answer assumes the current generation holds all the rights. In the political sphere the debate is not about whether this generation is efficiently exploiting resources, but about the rights of future generations or the rights of the poor.

*Q: How did you get involved in environmental economics?*

I was an environmentalist before I was an economist. I've been struggling with these two secular religions — I think that's the best way to describe them — for 25 years.

In the late '70s I spent a lot of time in Brazil, working in the Amazon, reading a lot of ecology and anthropology. I began to realize that neither the neoclassical paradigm nor the Marxist paradigm was explaining things.

Why is it that when Western societies moved into the Amazon, the social systems that they tried to implant would collapse and destroy the ecosystem also — a devolution of both systems? I concluded that development is a process of co-evolution between social systems and environmental systems.

I read a lot about the sociology and philosophy of Western science and started thinking about how it

relates to environmental debates.

The basic question is, Why is it that when we come to complex issues, perfectly good scientists start contradicting each other and then start accusing the other of being wrong? How do we come to an environmental consensus?

Knowledge is a social construction. I think we need to recognize some of the myths maintained within disciplinary patterns of thinking, to distinguish between differences in assumptions between disciplines and between old and new environmental understandings.

*I believe strongly in the 'invisible hand' of the market and its ability to help us get places efficiently. But we still have to decide where we want to go.*

*Q: What sort of myths?*

For 300 or 400 years Westerners have believed that knowledge is converging into a coherent whole. We saw the sciences as islands of knowledge, gradually growing and pushing back the sea of ignorance. All we needed to do was to study harder, to push back the sea, and a coherent truth would emerge. In fact, the sea seems to be growing faster than our islands of disciplinary knowledge. We seem to be asking questions faster than science can answer them.

If our sciences were truly merging, any incoherence between scientists would indicate that at least one of them was wrong. Economists, and scientists generally, dismiss understandings which do not fit their own. Economists have

avored delaying action in the midst of incoherence.

Most philosophers of science now recognize that there are different patterns of thinking. The Newtonian pattern divides the world up atomistically, and then assumes that everything is connected mechanistically; this is very different from an evolutionary pattern, where the parts keep changing. In a mechanistic world, you can reverse all the processes; in an evolutionary world, nothing ever reverses. These are different patterns of thinking, and they will never merge.

Even when disciplines share patterns of thinking, they might work on totally different time scales, or totally different levels of aggregation across parts, or simply deal with different parts.

Coherence comes through discourse. Environmental knowledge is not inherently coherent: understanding is reached through a process of discourse coming to a consensus.

Global climate change is a case in point. All kinds of knowledge are being brought together, from oceanography to silviculture. There are scientists working with different patterns of thinking, and totally different time scales. They don't cohere. Economists must work with the understanding that is emerging through discourse.

*Q: Are there other assumptions that hinder economists?*

There is an assumption that all cultures would merge to one correct, Western way of thinking; differences might continue with respect to art, food, and music, but technologies and social organization would merge to one best way. Development economists typically projected a convergence to Western ways. I think the reculturalization of the republics of the old USSR and the general disillusion with development in Third World countries suggest that this view is false. Economists need to learn to address cultural diversity. ■