Sustainable development

Fostering the Future

Although Karl Popper maintained that the future is unpredictable, the forecasting work now performed by teams of experts following the "foresight" methodology is of fundamental importance for sustainable world development. The exchanging of knowledge, experience, and views between scientists, representatives of industry and business, and public officials systematizes and integrates our awareness of the most important fields of science and the economy. Through the end of the last century, research activity rested upon the canon of the scientist's curiosity. 21st-century science, although highly specialized, strives to integrate various disciplines.

Sustainable, stable socioeconomic growth is attainable only by taking a systemic approach, targeted not just at predicting the future but also at fostering it, aiming to shape a desirable vision of the future world. The systemic analysis that underpins the foresight approach is geared towards resolving the large-scale, socio-technological problems faced by humanity, related to energy, technology, living conditions, health, and the biosphere. Predictions and scenarios are jointly constructed not only by scientists but also by decision-makers and all stakeholders involved in a given process. While systemic analysis does have its limitations stemming from the great complexity of the processes involved, its great advantage lies in bringing objectivism to the subjective process of decision making and a sense of balance to reconciling the frequently contradictory interests of various social groups anxious to solve a given problem.

Popper posited his view 20 years ago, when science was in a phase of sector specialization. Predictions then made by narrowly specialized experts, without the currently available methodology or broad interdisciplinary knowledge at their disposal, naturally had to fall short of the mark.

The development of integrative science has honed our ability to forecast both microscale processes and megatrends. However, while the new approach has given us considerable capacity to predict the sustainable use of natural resources of water, energy, raw materials, and space, predictions of the dynamics of socioeconomic systems are still characterized by randomness. Man as an unpredictable causative force, by making revolutionary scientific discoveries and irrational decisions (e.g. terrorism), can drastically alter how both local communities and global society function. The times we now live in have rightfully been named the Anthropocene – for the first time in history, mankind has become the dominant force in shaping processes in the natural world. Nowadays competitiveness and sustainable development hinge not just on technologies, energy, and raw materials, but also on a non-degraded natural space. One country of considerable economic potential developing a systemic approach to shaping its future, where the condition of the natural environment plays a significant role, is the Netherlands. Until recently, however, water ecosystems there were shaped in keeping with the 19th-century engineering principle of maximizing water transfer and ease of maintenance.

Systemic analysis is geared toward resolving the large-scale, socio-technological problems faced by humanity

The now burgeoning fields of ecology and limnology, and especially interdisciplinary environmental sciences like ecohydrology, are laying the foundations for harmonizing economic functions with natural ones.

In Poland, an admirable example of such harmonization can be found in the UNESCO demonstration project in the Pilica basin. The main aim of the project is to reduce phosphorous compound contamination of the Pilica and Sulejowski reservoir, causing the reservoir's eutrophication and toxic algae blooms. A biofiltration system featuring willows as its main component is now improving water quality and turning sewage into biomass, subsequently harnessed as bioenergy by the local community.

This example illustrates how trans-disciplinary science and a systemic approach can ensure that environmental protection is not a costly endeavor, therefore rejected by the public. Quite the opposite – the systemic application of ecological biotechnologies can generate a positive feedback loop, linking improvements in the condition of the environment to economic growth and creating jobs, thus favoring sustainable development. ■

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