РОЗДІЛ 1

Економіка природокористування і еколого-економічна проблеми

The Enabling Power of Science for Economic and Sustainability Problems Solution

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The article analyses important issues that contribute to the responsibility of science in ensuring sustainable development in the world, the role of science in achieving peace, the way science impacts on decision-making in society, forms of interaction with the administrative authorities to ensure dialogue between science and different social spheres. It tackles the actual problems of the transfer of innovation, the transition to renewable sources of energy and resources, adaption to accelerating change, dissemination and popularization of scientific knowledge, economic, social and environmental transformations, etc. It also stresses the importance of international science for the benefit of the whole society.

Keywords: sustainability, science, the environment, health, responsibility, ethics, transformation.

УДК: 502.131.1 *JEL codes*: M41, O30, Q32

Introduction. The power of science is significant and scientific world is looking for ways in which science can help solve endless environmental, economic and social problems. For this World Science Forum plays an important part. It is held every two years with the participation of the world leading academies of science. The fact that the Forum was attended by more than 900 leading scientists from more than 100 countries speaks for the importance of this event. This year's Forum was focused on topic "More responsibility and ethics of science to the solution of major global challenges in the field of the environment and health."

Scientists, decision-makers from the world of politics, industry, representatives of the civil society and the media discuss critical global issues and the potential contribution of Science towards helping meeting these challenges.

Problem. World economic, social and environmental problems cannot be solved without the enabling power of science that was the main theme of the 2015 Forum. Reflecting on the way how science opens new paths for the improvement of human life, business innovation and

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policy making is urgent especially nowadays when the world is looking for best transformation for sustainable development.

Recent research. Issues of sustainable development as well as the role of science in economic and environmental problems were raised by H. Daly [3], H. Odum [12], R. Perelet [13], E. Weizsäcker [10; 11], etc.

Goal of the article. Highlighting urgent issues of world science policy, disaster risk reduction, resilience, the latest advances in brain research, global health policies, and renewable energy for sustainability may help solving major global challenges in the field of the environment and health.

Economic, social and environmental capacity of science

In 2015 scientific community gathered in Budapest November 4-7 for World Science Forum "The Enabling Power of Science" reflected on the capacity of science to open new paths for the improvement of human life, business innovation and policy making.

Speakers of the Forum presented their ideas through 6 plenary and 9 thematic session and various side events for selected audiences. In the course of 6 plenary and 9 thematic sessions and over 70 lectures the most excellent speakers of the world of science, politics and society will present their views to the participants of the Forum. The main theme of the 2015 Forum followed two narratives: the first on "Sustainability" contributing to the UN dialogue on the Post 2015 Agenda; the achievements made and the challenges ahead in meeting the ambitious goals set by the governments. The second on "Communication" discussed means of effective exchange of information and the ever-growing need for confidence between science and society, and science and policy makers. The contribution of science to policy-making was discussed in the House of Parliament of Hungary in a prestigious session providing an insight to the latest developments and procedures of scientific policy-advice.

During the Forum a number of hot issues were discussed. The main were "Sustainability check 2015", "Science in the innovation ecosystem", "Science in policy making", "Science engagement: communicating with society", "Integrating efforts to tackle global challenges", "Confidence in science" as well as parallel thematic sessions "Emerging diseases, global health policies", "Science for peace, mapping the brain, unlocking the mind", "Parliamentarians".

The Forum raises important issues that contribute to the responsibility of science in ensuring sustainable development in the world, the role of science in achieving peace, the way science impacts on decision-making in society, forms of interaction with the administrative authorities, to ensure dialogue between science and different social spheres. Some sections tackled the actual problem: the transfer of innovation, the transition to renewable sources of energy and resources to adapt to accelerating change, dissemination and popularization of scientific knowledge, etc. The International Union of Journalists and UNESCO played an active role in the conference. In particular, UNESCO presented the award for Argentine scientists for scientific research in biology.

Bjorn Lomborg, Director of Copenhagen Consensus Center reported on extreme poverty during 1820–2015 issues, global life expectancy during 1820–2015, air pollution death during 1900–2050 and world's most important problems: such as education, health, jobs, no corruption, nutrition, no violence, clean water & sanitation, support for people who can't work, better infrastructure, equality, reliable energy, no discrimination, political freedom, protect forests, rivers & oceans, phone & Internet, action on climate change [5].

One more hot issue discussed is human health and ecosystems. Jacqueline McGlade, Chief Scientist, United Nations Environment Programme reported on Ebola spread, illegal trade in bush meat due to urbanization and deforestation, land use access rights, localized soil productivity loss and farming, water conservation and water rights as major threats to human health and ecosystems [6].

Professor Shamir Uri from Israel Institute of Technology and Senior Consultant (Israel Water Authority) speculated on global water demand. Among stresses on sustainable management of water, sanitation and hygiene there are population growth and rural to urban migration; depletion of sources and degradation of quality, weather variability and climate change, environmental degradation and costs, economic costs, inadequate professional and technical skills, most ubiquitous and critical: failures of governance [8].

Rana Dajani, Associate Professor from Hashemite University talked about innovation within the interdisciplinary boundaries; communicating with society, scientists' role in society as well as lesson learned and models to be applied [7].

As a result, the Declaration of the 7th World Science Forum on The Enabling Power of Science was adopted. It says for the decisions necessary for progress on the way to sustainable development.

Decision making for sustainable development

The scientific community documented during the 7th World Science Forum on The Enabling Power of Science Forum in the Declaration the major priorities for sustainable development ensuring. Its preamble states that the scientific community and the international academies need to mobilize and play their role to advance the use of science to support global and national initiatives to meet the objectives defined in the Agenda 2030, the Sendai Framework for Disaster Risk Reduction 2015–2030 and the upcoming agreement of the COP21 Paris Climate Summit. Science plays an important role in policy making and call for international collaboration to advance science as the foundation of sustainable development worldwide. The major stances are:

1. Shift for new, sustainable development paths.

2. Agreement on Climate Change.

3. Knowledge-base for disaster risk reduction.

4. Scientific advice for policies.

5. International collaboration for capacity-building in the developing world.

6. Balanced investment in science [9].

For future sustainable economic, social and environmental development a number of transformations are important. Science here may help for forming basic possible economic social and environmental transformations. They are the following:

Humanitarian transformation. This is the most significant transformation to occur. In the "bio-socio-labour" triad a leading position is for personal (information) essence of a human being, i.e., man "socio". It is the personal qualities that will determine the development of the working environment and shape the contours of the whole society.

Technological transformation. This type of transformation requires a transition from technologies based on material means of production to information based technologies. The main feature of these technologies is cost priority of information technology implementation and execution of production functions.

Transformation of space and time concentration of production factors. In industrial society, the implementation of production processes is carried out by concentrating in a

specific location of corresponding production factors. Moreover, these factors of production (capital goods, raw materials, information) might be created (reproduced) in different periods of time, i.e., to be deconcentrated in time.

Production transformation. Territorial deconcentration of production factors can significantly affect the configuration of the spatial environment. For many computer and head are the major means of production. Different assignments (work) as well as necessary resources are available on the Internet (e-mail).

Labour transformation. It's about the intellectualization of work processes; reducing the share of physical labour; reducing the specific gravity and duration of the work performed under difficult and hazardous conditions; enhancing creativity; increase individual potential and responsibility of each person, etc.

Motivation transformation. The nature of work naturally causes the nature of motivation system. As noted above, pre-industrial societies were characterized by motivation based on the power coercion, and in the era of industrial production motivation based on economic agreements prevailed. The information society creates preconditions for the development of free creative work with various forms of social and psychological impact.

Economic relationship transformation. Information society removes the basis of economic relations inherent to industrial society. Informational nature of the means of production makes them extremely affordable for uncontrolled use. After all, principles of production, action programs start to take the priority position. Information tool does not disappear, being sold or stolen. It remains with its owner, even though they may already be used by other producers.

Communication transformation. The development of the information economy will inevitably transform the so-called industrial metabolism, i.e. matter flows, energy and information societies which communicate with nature and through which exchanges occur between individual economic units. The transition from the production and consumption of material goods mainly to the production and consumption of information products primarily reduces the amount of raw materials used in the production process.

Transformation of consumption. The key phenomenon of consumption is a shift from consumption of material goods priorities to the priority of information goods consumption. Instead of the main functions to meet the needs of human material "bio" or maintenance of material production, they begin to perform support functions to meet the information needs of the man "socio" and maintenance of information production.

Environmental transformations. For the past 2–3 decades, these programmes have serves global science (and society) by developing strategies and promoting and coordinating research in their respective areas of interest. They have also increasingly been involved in communicating the outcomes of their research. They have major contribution to the assessment work of the Intergovernmental Panel on Climate Change. Their major role is to join together to form the Earth System Science Partnership, which has been responsible for cross-cutting projects in areas such as carbon, water, food systems and health. The world scientific community focuses on climate, geosphere-biosphere, biodiversity and human dimensions. Five Grand Challenges in Earth System Science for global sustainability are Earth System Sustainability Initiative and Global Environmental Change Programmes and Partnership (Table 1).

Healthcare system transformation. Health services are one of the basic consumer products. Informatization of economy can have a significant impact on this very important service sector. By the end of the XX century it became obvious that any organism is not only the matter-energy, but also the information system. Inherent space and time matter and energy

flows management systems cause reproductive processes that form the essence of biological organisms. Accordingly, a violation of these programs leads to a violation of inherent functional mechanisms.

Social transformation. Globalization processes of social life naturally cause changes in social organization, transformed from national or regional to mono society forms that create a single international society. Apparently, it is not by accident that globalization is also called the process of a global village formation. Internationalization of economic and social processes is forcing to create unified control authorities.

Table 1

Sustainability areas of activity for the period of 2017 [4]

Area	Actions
Earth System Sustainability Initiative and	1.Implement new strategic framework for global sustainability, based on Grand Challenges document. 2.Co-design and launch a major new 10-year initiative.
Global Environmental Change Programmes and Partnership	3.Merge Earth System Science Partnership into a new structure to implement the new initiative. 4.Integrate programme activities as necessary to implement the new initiative

Cultural transformation. Creation of a single social space inevitably forms a single cultural environment. This phenomenon is called by experts the oecumene trend (from Greek *"οἰκουμένη"* a term originally used in the Greco-Roman world to refer to the inhabited universe (or at least the known part of it)). The emergence of the Internet, the appearance of international TV systems, the increased possibility of direct contacts between representatives of different cultures cause avalanche process of cultural exchange.

These transformations will add significantly to the implementation of sustainable development strategies on the global arena. Here in the foreground comes the role of governments. All governments are responsible for establishing long-term sustainable and balanced mechanisms for the funding of scientific research especially in the context of budgetary constraints. Mobilization of research-derived knowledge will guarantee that it fulfils its role to serve society.

Conclusions. The enabling power of science solves for decision making for sustainable development. The scientific community head the concerted action and mobilize the international academies to play their role, supporting latest research for Global Sustainability Programme. The principle priority themes and actions proposed for the period till 2017 refer to earth systems sustainability research and global environmental change, global Earth observing systems, polar research, resilience, the latest advances in brain research, global health and wellbeing policies, world science policy, sustainable energy, ecosystem change and society as well as economic, social and environmental transformations for sustainability.

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Мобілізація наукового потенціалу для вирішення економічних проблем і проблем сестейнового розвитку

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У статті досліджено найважливіші питання, що обумовлюють відповідальність науки у забезпеченні сестейнового (сталого) розвитку на Землі, роль науки в досягненні миру, шляхи впливу науки на прийняття рішень у суспільстві, форми взаємодії з адміністративними органами, забезпечення діалогу науки з різними суспільними сферами. Аналізуються актуальні проблеми трансферу інновацій, переходу до відновлюваних джерел енергії та ресурсів, адаптації до прискорених змін, популяризації наукових знань, економічні, соціальні, екологічні трансформації та ін. Запропоновано основні напрямки трансформаційних перетворень у суспільстві, серед яких слід виділити гуманітарну, технологічну трансформацію, трансформацію просторово-часової концентрації виробничих факторів, трансформацію виробничої сфери, праці, форм мотивації, економічних відносин, комунікаційну, трансформацію споживання, охорони здоров'я, а також освіти.

Ключові слова: сестейновість, наука, навколишнє середовище, здоров'я, відповідальність, етика, трансформація.

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**Мобилизация научного потенциала
для решения экономических проблем и проблем сестейнового развития**

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Рассматриваются важнейшие вопросы, обусловливающие ответственность науки в обеспечении сестейнового (устойчивого) развития на Земле, роль науки в достижении мира, пути воздействия науки на принятие решений в обществе, формы взаимодействия с административными органами, обеспечение диалога науки с различными общественными сферами. Анализируются актуальные проблемы: трансфера инноваций, перехода к возобновимым источникам энергии и ресурсов, адаптации к ускоряющимся изменениям, распространения и популяризации научных знаний, экономические, социальные и экологические трансформации и

др. Предложены основные направления трансформационных преобразований в обществе, среди которых следует выделить гуманитарную, технологическую трансформацию, трансформацию пространственно-временной концентрации производственных факторов, трансформацию производственной сферы, труда, форм мотивации, экономических отношений, коммуникационную, трансформацию потребления, здравоохранения, а также образования.

Ключевые слова: сестейновость, наука, окружающая среда, здоровье, ответственность, этика, трансформация.

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