

**ЧАСТИНА 1**  
**МЕТОДОЛОГІЧНІ ПРОБЛЕМИ СУЧАСНОЇ ЕКОНОМІКИ**

**Розділ 1**

**Економіка природокористування і  
еколого-економічні проблеми**

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**Economic, social and ecological horizons in the new era of science**

*The article is dedicated to the scientific issues, which were in the focus of the World Science Forum, held 17-19 November 2011 in Budapest. The article reveals the problems of new scientific superpowers emergence, as well as the emergence of new fields of science, new opportunities for scientific cooperation at the global level, new models and regulations in science policy. The consequences of scientific discoveries and the role of science in solving different pressing global economic, social and environmental problems are tackled in the article.*

*Keywords: science, scientific cooperation, scientific paradigm, scientific superpowers.*

World Science Forum in Budapest is often called "Davos of Science". World Science Forum's (WSF) closing statement was endorsed by universal applause at WSF's closing session held in Hungary's Parliament Building on 19 November, 2011.

World Science Forum was organized in accordance with the principles laid down in the 1999 Budapest "Declaration on Science and the Use of Scientific Knowledge" with the objectives given below:

1. To provide major stakeholders with a global forum for dialogue on the new roles, responsibilities, and challenges of science and to discuss issues of common interest to the scientific community and to the general public.
2. To better understand and promote the need for science and scientific advice in policy making.
3. To exchange views and ideas on how to promote and communicate science and its basic values to societies at large and to various stakeholder groups.
4. To promote the mutual understanding of different cultures through scientific dialogue.
5. To promote education for a more even distribution of knowledge wealth among countries, regions, and social groups.

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6. To address the ethical, social, cultural, environmental, gender, economic, and health issues of scientific research.

7. To address public concerns and awareness regarding the role of science in society and the role of society for science.

Outstanding researchers and high-ranking decision-makers participated in this global scientific event, among them were Nobel-laureate scientists, ministers for science policy, and world leaders of science diplomacy, the largest investors in R&D, and the representatives of prestigious international scientific journals. Prepared by the Steering Committee, a common closing statement was issued by participants, a body of recommendations which, as endorsed by a prestigious gathering, surely cannot be overlooked.

The main aim of this initiative was to promote the quality of dialogue on knowledge in a global society. Experiencing the changes in the role of science we strive to offer a forum to discuss policy objectives in reference to the creation, dissemination, and utilization of knowledge. The Forum seek to provide the scientific community and public policy makers with a global platform to exchange, discuss and harmonize their ideas in respect to the growing interdependence of science with society.

The main theme of the 2011 Forum was “The Changing Landscape of Science – Challenges and Opportunities”. With the contribution of world leading scientists and science policy makers it would like to present the geographical, thematic, and social aspects of this subject focusing on some of the most burning issues of science and global society.

Viktor Orbán, the Prime Minister of Hungary, opened the Forum with Irina Bokova, Director-General of UNESCO; József Pálkás, President of the Hungarian Academy of Science; Yuan Tseh Lee, President of ICSU ; Alain I. Leshner, Chief Executive Officer of AAAS and Dominique Ristori, Director-General of the European Commission’s Joint Research Centre (JRC)[3]. The Secretary-General of the United Nations, Ban Ki-moon, delivered a message to participants during the opening.

Participants focused on changes in science due to global efforts in research and development and to the growing importance of emerging economies. Themes addressed included: new forces at play in science and technology; trends in higher education and the new generation of researchers.

The goals of World Science Forum 2011:

1. Exploring the geographical, thematic and social aspects of the changes of science in an integrated manner, and introducing new emerging superpowers of science;
2. Pointing out the significance of emerging fields of science and their expected results;
3. Mapping out possible solutions for such global challenges as epidemics, natural catastrophes, famine, environmental-social problems and health issues concerning all of mankind;
4. Emphasizing the need for an evidence based policy-making;
5. Overseeing the emergence of scientific objectives and initiatives responsible for the improvement of the common good;
6. Issuing a common closing statement as a forum of fora and thereby institutionalizing its intentions, making the results of WSF a body of recommendations that cannot be overlooked.

Main topics of World Science Forum 2011:

1. The emergence of new scientific superpowers;
2. The emergence of new fields of science;
3. New opportunities for scientific co-operation on a global level;
4. New models, regulations and intentions in science-policy and education;
5. 5. The role of science in solving pressing global challenges (infections, famine, and environmental protection);
6. The consequences of scientific discoveries for the economy and culture.

The main events of the Forum were: Executive board meeting of African parliamentary

forum on science and technology; world federation of science journalist board meeting; plenary sessions "Developing a coherent and compatible science enterprise";

Youth-ways session on "Scientific collaboration in the changing landscape of science: new generation of science and researchers"; "Forum of global Fora: sharing knowledge for global challenges"; ICSU: "Forsight Scenarios: What will international science be like in 2031?" Brazil: "Sustainable Food Production"; Ceremonial Hall, Hungarian Academy of Sciences; "Parliamentary session".

The 2011 event was a beginning of a new era in the history of World Science Forum. World Science Forum 2013 will be hosted by Rio de Janeiro, Brazil.

The success of events of the World Science Forum organized so far proved that the original idea and intention behind this initiative is becoming more and more a reality. The scientists, politicians, decision-makers and representatives of civil society conducted fruitful dialogue on burning issues affecting the scientific world and society simultaneously, and summed up the common tasks ahead of us. The growing international interest in the World Science Forum shows that there is a growing consensus: the World Science Forum, co-organized by the Hungarian Academy, UNESCO and ICSU, is the largest event of global science policy today, and it is gradually recognized as the "Davos of Science" worldwide.

#### **Declaration of the Budapest World Science Forum**

With the encouragement and support of partner organisations, the United Nations Educational, Scientific and Cultural Organization (UNESCO), the International Council for Science (ICSU) and all invited organisations and fellow scientists, the participants of the Budapest World Science Forum held from 17 to 19 November in Budapest, recognizing the relevance of the outcomes of 1999 World Conference on Science (WCS) and taking into account the reports of the biannual World Science Forum (WSF), as well as the debates and the outcomes of this World Science Forum on the "Changing Landscape of Science: Challenges and Opportunities", adopt the present declaration.

1. The treasure of scientific knowledge and its underlying research approaches are a common heritage of humankind. More than ever before, the world will be shaped by science.

2. The first decade of the third millennium has witnessed steady and fundamental changes in the global landscape of science. The scale and scope of these transformations are so robust that a new milestone in the history of science has been reached, and a new era of global science has commenced. This new era presents challenges and opportunities bringing political, social and policy implications on a previously unseen scale.

3. The growing complexity of grand challenges including population growth, climate change, food supply, energy shortages, natural and technological catastrophes, epidemics, and sustainability require that the world's scientific establishments assume new roles.

4. New scientific fields have appeared and continue to carve out their niches in the general field of science.

5. The unforeseen spread of information and communication technologies, the inexpensive and instant access to information resources and databanks, and the fall of communication barriers between countries and communities have accelerated the accumulation and dissemination of knowledge.

6. The former triadic dominance of North America, Europe and Japan in global knowledge production has been seriously challenged, and a new multipolar world of science has emerged accompanied by the rise of new scientific powerhouses, which are now not only prominent actors in world economy but have become key players in cutting edge research and development activities.

7. In this new context of global science, science diplomacy is now an acknowledged tool to promote partnership among nations by fostering scientific co-operation.

8. Educational systems have received strong support from their respective governments to

the extent that emerging countries currently produce more university graduates and PhDs than the developed world thus rearranging the entire global “knowledge map”. In spite of these new developments the US, EU and Japan are still leaders in scientific performance and continue to invest heavily in research and innovation. The competition is more intense and more open than ever before in the world arena of science.

9. The expansion of scientific networks has also changed the circle of actors participating in research activities. A field once dominated by states and their research networks of national academies, learned societies, and universities is now complemented by a complex network of global companies, international organisations, and individual researchers who are attracted to the best available research infrastructure.

10. The accelerating “knowledge economies” have generated new migration patterns for scientists and increasing mobility. Both the winners and losers of brain drain are facing the need for more intensive co-operation between universities, public research organisations, and industry in both graduate and post-graduate education and the elite training of scientists.

11. The advancements in science have also shed light on new and previously unforeseen concerns. Climate change, the large-scale and irreversible impact of human civilization on the world’s fauna and flora, an overconsumption of natural resources, and their respective consequences require stronger involvement from both scientists and society. Developments in many research fields (e.g. genetics, biotechnology, neuroscience, nuclear physics, etc.) have considerable moral and ethical implications that require an urgent and global dialogue between scientists and the broader public.

In light of this declaration, the Forum made the following recommendations:

**1. Responsible and ethical conduct of research and innovation**

In this era of global science, the scientific establishment needs to implement continuous self-reflection to appropriately evaluate its responsibilities, duties and rules of conduct in research and innovation. A universal code of conduct addressing the rights, freedoms and responsibilities of scientific researchers, and the universal rules of scientific research should be shared by the world’s scientific community. Furthermore, these rules and policies should be respected by the states and adopted by their national legislations. Scientists should strengthen their individual and institutional responsibilities to avoid possible harm to society due to ignorance or misjudgement of the consequences of new discoveries and applications of scientific knowledge. It is the responsibility of those who promote science and scientists to maintain the primacy of moral and social concerns over short-term economic interest in the selection and implementation of industrialised research projects.

**2. Improved dialogue with society on scientific issues**

In times of rapid and fundamental changes in the social environment, the sciences should be supported in their co-operative efforts to describe and evaluate with the best available methods the consequences of policy actions and explorations of both natural and social sciences. Participation of societies should be promoted in order to make science more democratic and to build further trust in science. To this end societies must be prepared to knowledgeably discuss the moral and ethical consequences of science and technology by strengthening policies to enhance awareness and public understanding of science and improving and broadening the scope of education.

**3. International collaboration in science should be promoted**

Better international co-ordination is needed for science research projects focusing on global challenges. International co-operation is essential for decreasing the knowledge divide and regional disparities. The free co-operation and movement of scientists should be promoted by the elimination of harmful bureaucracy and false regulation and by providing the funds to further international co-operation. To avoid repetition, redundancy, and excessive expense in scientific research, the international scientific community should be involved in the development of an improved method to monitor past and present research activities and their results.

#### **4. Collaborative policies to overcome knowledge-divides in the World**

The rapid development and increasing cost of science combined with the expansion of patent policies and regulations have further widened the knowledge and economic divide between the developed and developing world. In a world where the best science and the best researchers are attracted only by excellent research infrastructures, developing countries should be supported in their efforts to build their research capacities. However, co-funded actions for building capacities can only be successful if support is provided in a socially responsible way and if it creates a win-win situation for both the promoter and the recipient. Brain-drain and brain-gain policies should be co-ordinated for the joint benefit of all affected countries.

#### **5. Capacity building for science needs to be strengthened**

Scientific discoveries are foundations for innovation and social and economic development. Investment in science provides a capacity for future development at a national level and an opportunity to face global challenges internationally. It is primarily the responsibility of governments to increase support for science, and develop effective policies for technology and innovation. Comprehensive actions should be taken to strengthen the role of women in science and innovation and to expand the participation of women in science and science policy making. The socio-economic impacts of science and scientific capacity are well-documented. An institutionalisation of such an advisory process is necessary; informed decisions result in great savings [1].

**Conclusions.** There is an urgent need to elaborate new, effective science policies at national, regional and global levels to better co-ordinate and monitor scientific research worldwide, to harmonise university education systems, and to facilitate global and regional scientific co-operation based on equity and participation.

1. *Declaration of the Budapest World Science Forum 2011 on a New Era of Global Science* <http://www.sciforum.hu/declaration/index.html>.
2. *From input to output. A selection of highlights of JRC activities.* European Commission, European Union. – 2011. – P. 15.
3. *JRC Annual Report 2010.* JRC European Commission, 2011. – 68 p.

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#### **Л. Г. Мельник, І. Б. Дегтярьова, С. В. Шевцов Економічні, соціальні та екологічні горизонти нової наукової ери**

*Стаття присвячена питанням науки, які були в центрі уваги Всесвітнього наукового форуму, що відбувся 17–19 листопада 2011 року в Будапешті. У статті розкриваються проблеми появи нових наукових наддержав, а також питання виникнення нових галузей науки, нових можливостей для науково-технічного співробітництва на глобальному рівні, питання появи нових моделей та регулювання наукової політики. В статті розглядаються питання ролі науки та значення наукових відкриттів у вирішенні різноманітних актуальних глобальних економічних, соціальних та екологічних проблем.*

*Ключові слова: наука, наукове співробітництво, наукова парадигма, наукові наддержави.*

#### **Л. Г. Мельник, И. Б. Дегтярёва, С. В. Шевцов Экономические, социальные и экологические горизонты новой научной эры**

*Статья посвящена вопросам науки, которые были в центре внимания Всемирного научного форума, состоявшегося 17–19 ноября 2011 года в Будапеште. В статье раскрываются проблемы появления новых научных сверхдержав, а также вопросы возникновения новых отраслей науки, новых возможностей для научно-технического сотрудничества на глобальном уровне, вопросы появления новых моделей и регулирования научной политики. В статье рассматриваются вопросы роли науки и значения научных открытий в решении различных актуальных глобальных экономических, социальных и экологических проблем.*

*Ключевые слова: наука, научное сотрудничество, научная парадигма, научные сверхдержавы.*