

Earth Bioresources and Environmental Biosafety: Challenges and Opportunities

4 to 7 November 2013

held at

National University of Life and Environmental Sciences of Ukraine (NULES),
Kyiv, Ukraine

The conference was dedicated to the
115th anniversary of NULES of Ukraine and the 15th anniversary of GCHERA.

The Conference was hosted by the National University of Life and Environmental Sciences of Ukraine with the support of the Cabinet of Ministers of Ukraine, Global Confederation of Higher Education Associations for Agricultural and Life Sciences (GCHERA), Food and Agriculture Organization of the UN (FAO), Iowa State University of Science and Technology (USA), Humboldt University in Berlin (Germany) and other universities and organizations.



Head of the Organizing Committee was the First Vice Prime Minister of Ukraine, Chairman of the Supervisory Board of NULES of Ukraine, Sergiy G. Arbuzov.

The main aim of the Conference was to discuss a wide range of burning issues concerning the quality and safety of life, sustainable environmental resources management, the role of higher education in sustainable development and improvement, cooperation with foreign partners aimed at improvement of efficiency and quality of scientific research on security of animal, plant, water and other biological resources of the planet, their management, exchange of experience, research and practical achievements.

The conference was opened by the Vice Prime Minister of Ukraine, K.I. Gryshchenko, who emphasized the topicality and importance of the issues raised by the conference participants and wished them success in their work.



The President of Ukraine, the Minister of Agrarian Policy and Food of Ukraine, the Presidium of the National Academy of Sciences of Ukraine and the National Academy of Agricultural Sciences of Ukraine, the Council of the Heads of Universities of Kiev region and many others sent their greeting to the participants of the Conference.

The Head of the National University of Life and Environmental Sciences of Ukraine, Co-Chairman of the Organizing Committee of the Conference, Academician of the NAS of Ukraine and NAAS of Ukraine, Dmytro O. Melnychuk, presented the report “NULES of Ukraine: history, achievements and prospects of development” which highlighted the main stages of formation and development of the university, outstanding scientific schools, academic achievements and prospects of development of NULES of Ukraine.



The following speakers presented the scientific reports during the plenary session:

The Co-Chairman of the Organizing Committee of the Conference, the Chairman of the Steering Board of GCHERA, the President of the Polytechnic Institute in La Salle Beauvais, **Philippe Choquet**, made the report “GCHERA - from the Consortium to the Global Confederation of Higher Education Associations for Agricultural and Life Sciences”. The scientist thoroughly analyzed the prospects of development of GCHERA and outlined strategic bases for development of the global community of universities of agricultural and life sciences.



The Co-Chairman of the Organizing Committee of the Conference, the Head of the National University of Life and Environmental Sciences of Ukraine, Academician of the NAS of Ukraine and the NAAS of Ukraine, **Dmytro O. Melnychuk**, delivered the scientific presentation “Acidosis of Nature –Global Cataclysm for Life on Our Planet” which covered negative consequences of this phenomenon such as loss of potable water, significant decrease of humus in the soil and thus increase of biomass on land, inhibition of growth and reproduction of algae and other aquatic organisms.



The Vice-President of the Association of the Research Universities, **Dr Ian Maw** presented the report “Research Universities –the Basis of the Progress of Scientific Research and Higher Education in the United States”. This report played a significant role in reforming the higher education system of Ukraine and all participants were greatly interested in the recommendations offered by the scientist.



The Head of the National Centre for Food and Agricultural Policy (USA), **Stanley Johnson** made the report “Role of Extension and GIS Technologies in Formation and Prediction of Global Agricultural and Food Policy”. The speaker pointed out that active use of geo-information technologies by agricultural producers can significantly improve the development of world agriculture.



The Co-Founder of GCHERA, Professor of Humboldt University of Berlin, **Ernst Lindemann**, highlighted the role of NULES of Ukraine and its Head, Dmytro O. Melnychuk, in foundation of GCHERA and in its activities, primarily in reforming higher agricultural education and research.



Active member of GCHERA, the Head of the Centre for International Activities of the University of Iowa (USA), **Professor David Acker** draw attention to the impact of NULES of Ukraine on reforming the education system in the post-socialist and developing countries, as well as organising the training of young scientists at world leading universities.



The President and Co-Founder of the U.S. Russian and Eastern European Business Council, **Professor V. Yudin** pointed out the main stages of the formation and development of GCHERA, its international importance and his vision of further development of the organization.



The European branch of the UN FAO (Hungary) was represented by **Dr. A. Rozstalnyy** who emphasized the important role of FAO in establishment of GCHERA and in formation and development of Ukrainian Laboratory of Quality and Safety of Agricultural Products of NULES of Ukraine and noted new ways of cooperation.



The Head of the Department of Research and Educational Support of Agricultural Production and Rural Development of the Ministry of Agrarian Policy and Food of Ukraine, **S. Kadygrob**, presented a speech which contained a greeting message of the Minister of Agrarian Policy and Food of Ukraine, M. Pryszyzhnyuk. The speaker underlined an important role of GCHERA and NULES of Ukraine in reforming the system of higher agricultural education in Ukraine.



The Head of the Global Institute of Sustainable Forestry of Yale University, **Professor Ch. Oliver** presented the report "Global Forest Bioresources: Present, Challenges and Opportunities" which highlighted the importance of long-term cooperation between Yale's Global Institute of Sustainable Forestry and NULES of Ukraine on the issues of radiation safety of soil, water and environmental objects.



The Senior Research Worker of the International Institute for Applied Systems Analysis of Laxenburg, **Professor A. Shvydenko**, delivered the report "Global Changes and Current Tendencies of Forestry in the World". The speaker presented materials concerning state and development of forestry in Europe and in the world, defined critical moments in the development of this industry and invited participants to closer cooperation.



Professor of Forest Ecology and Forestry of the University of Vermont (USA) **W. Keeton** presented the report “Towards a Unified Vision of Forest Carbon Management”. The report aroused great interest in the role of forests in climate change. At the end of the speech, the scientist outlined plans for normalization of forestry as an important factor for conservation of nature.



The President of the Association of European Life Science Universities (ICA), the Dean of the Faculty of Biosciences Engineering of Ghent University (Belgium), **Guido Van Huylenbroek** delivered the report “Multifunctional Agriculture in the Bio-Economy Era: the Global and Local Challenges” in which the scientist stated that bio-oriented economy and world agriculture require the shift from individual to system development strategies.



Professor of Ghent University (Belgium) **O. Van Cleemput** made the presentation “Global Soil Resources: Problems of Quality, Fertility and Safety” in which he thoroughly analyzed the problems of quality, fertility, safety and further development of soil and noted that agriculture, linking all social systems in the network of production, distribution and consumption, is the main activity of mankind.



The Head of Kazakh National Agrarian University, **Academician T. Yespolov** delivered the report “New Innovative Approaches to Kazakh Agroindustrial Complex Development: Program “Agrobusiness-2020””. The speaker emphasized the importance of cooperation between Kazakh National Agricultural University and NULES of Ukraine and shared experience of industrial-innovative development of agriculture in the country.



The Head of the Ukrainian Education and Research Institute of Bioresources Quality and Life Safety of NULES of Ukraine, **Professor S. Melnychuk**, made the report “Innovative IT-biotechnology in Ensuring Food Quality and Safety”. The author of the report presented the results of research in the development of rapid diagnostic methods of dangerous infections and use of computer sciences in global monitoring of the diseases.



The Vice-Rector for Research, Innovation and International Activities of NULES of Ukraine, **Academician M. Melnychuk** made the presentation “Biodiversity and Climate Change”. The scientist noted that the basis for success of humanity is living in harmony with nature. The Academician thoroughly analyzed the factors of climate change and outlined five key principles of sustainable human development.



The Head of the Slovak University of Agriculture in Nitra, the President of the Visegrad University Association, **Professor P. Bielik** delivered the report “Interregional Bridging and Local Benefits: A Case of Visegrad University Association” in which he called for cooperation in the context of major initiatives for the next programme period of the European Union 2014-2020 (European Union Strategy for the Danube Region).



The Vice-Rector for Research and International Research Collaboration of the University of Natural Resources and Life Sciences (Austria), **Professor Josef. Glössl** presented the report “Plants as Expression System for Recombinant Therapeutic Glycoproteins” in which he carefully described the process of obtaining recombinant glycoproteins for further development of plant expression systems for therapeutic glycoproteins.



The President of Ukrainian Agrarian Confederation, **L. Kozachenko** made the report “Science and Education – the Foundation for Successful Development of Modern Agribusiness” which indicated that education is an important investment in human capital development and outlined the most important ways of the development of modern education in accordance with world trends.



The Chairman of the Southern Scientific Centre of Russian Academy of Sciences, **Academician G. Matishov** presented the report “Features and Prospects of Aquaculture Development in the Southern Regions of Russia” which highlighted the problems and research results of the development of aquaculture in Russia. The Academician stressed the need to shift to the principles of rational use of water biological resources.



The conference was attended by more than 500 scientists from 25 countries, namely: the USA, France, Belgium, Austria, Germany, Canada, Italy, Sweden, Poland, Bulgaria, Georgia, Hungary, the Russian Federation, Belarus, Czech Republic, Slovak Republic, Kazakhstan, Azerbaijan, Armenia, Kyrgyzstan, Moldova, Tajikistan, Turkey, Uzbekistan, and Ukraine.

The Conference included plenary and section meetings, poster presentations, FAO workshop on quality and safety of food and agricultural products.

The participants prepared almost 400 topical and nearly 100 poster presentations (the reports will be published in the e-journal “Earth Bioresources and Life Quality”).

The summary of results the section meetings is as follows:

Section “Quality and Biosafety of Bioresources and Foodstuffs. Radiation Safety. The Role of Natural and Humanitarian Sciences in Sustainable Development”.

Fifteen participants presented their reports as well as 14 poster presentations, which highlighted burning issues concerning quality, biosafety radiation safety of bioresources and food.

Section “Plant Bioresources, Soil Science, Traditional and Gene Technologies of Present and Future, Plant Protection”. During the meeting 33 reports concerning biotechnologies, ecology, plant science, plant protection, soil science were delivered. The main issue discussed was development of organic production able to meet the food needs of the planet.



Section “Animal Science and Fish-Farming”. Twelve speakers presented their reports related to organization and management of livestock genetic resources, innovative technology solutions in preservation and reproduction of biological resources of livestock and aquaculture, as well as prospects for research in these areas both in Ukraine and abroad. Keynote speeches were delivered by the scientists from Humboldt University of Berlin and Southern Scientific Centre of Russian Academy of Sciences. For many years these two establishments have been partners of NULES of Ukraine in the field of animal husbandry and fish farming.



Section “Biosocial Economy. Global Agricultural and Food Policy. State Administration of Sustainable Environmental System Development”. During the meeting 31 reports were delivered and 80 poster presentations were made. The participants considered the prerequisites of biosocial economy establishment in Ukraine and worldwide, examined benchmarks for agrosphere and food policy of the country, as well as innovative approaches to formation of the system of state management of agricultural enterprises and socio-economic development of rural areas. The prospects of conducting joint master's programs with the universities in Europe and the U.S. were also considered during the meeting.



Section “Bioscience Engineering”. The participants discussed scientific achievements in technical systems for sustainable environmental resources management, renewable power engineering and biofuels. Sixty-two speakers presented their reports. Attention of the researchers was focused on creating at NULES of Ukraine a platform for display of modern equipment produced by world leading manufacturers.



Section “Alternative Energetics, Automation Electrotechnologies in Biotechnological Systems”. Twenty-six participants delivered their reports which addressed the issues of alternative power engineering and automated electro-technologies in biotechnological systems. Major scientific discussions concerned the development of Smart Grid technologies in Ukraine and worldwide.



Section “Topical Problems of Veterinary Medicine in Ensuring Food Safety and Veterinary Welfare in the Contest of Global Transformation”. Fifteen participants delivered their reports and 110 participants made poster presentations revealing urgent problems of veterinary medicine and innovative approaches to ensuring life quality. It is a global challenge to implement the system ensuring food safety and life quality.



Section “Sustainable Management of Forest and Urban Landscape at the Global and Regional Levels: Challenges and Prospects”. The participants discussed sustainable management of forest and urban landscapes under conditions of global climate change, innovative strategies of forestry development in Ukraine, resource-saving technologies of wood processing, rational use of forest resources, and modern methods of cultivation and restoration of forests. Twenty-five speakers presented their reports. Particularly notable was the report of the Head of Yale’s Global Institute of Sustainable Forestry, Professor Charles Oliver on systematic training of specialists at Yale University.



Section “Information, Telecommunication Technologies, Extension System”. The participants made 38 reports revealing prospects of information and telecommunication technologies in environmental resources management and covering GIS technologies, systems of assessing and monitoring the quality of biological resources and the environment. A lot of unique research results and ideas for implementation of joint international projects were presented at the meeting. The report of the Chairman of the Board of the National Centre for Food and Agricultural Policy (USA), Professor S. Johnson, aroused particular interest.



Section “Land Resources, Ecology, Law”. Ninety-two participants made their reports concerning topical issues of use, conservation and restoration of land resources based on systematic ecological approach with regard to legal aspects. Latest problems of bio-resources are largely dependent on the development of the legal

framework and introduction of appropriate reforms, which is why the work of the section resulted in presentation of scientific problem-solving initiatives for use of biological resources.



FAO Regional Workshop on Quality and Safety of Food and Agricultural Products. Section Meeting “The Mission of Students and Young Scientists in Knowledge Acquisition and Practical Implementation the Principles of Sustainable Development and Life Quality Improvement”. The participants made 11 scientific reports covering the role and contribution of students and young scientists to knowledge acquisition and practical implementation of the principles of sustainable development of nature and life quality improvement for present and future generations. Students effectively influence the management of the university through self-government. This fact induced to create a youth organisation at GCHERA.



Section “Research and Innovation Programs and Investment Proposals”. The work of the section was aimed at development of innovative activities of research and educational institutions in collaboration with the Science Park of NULES of Ukraine “Sustainable Environmental Resources Management and Life Quality”. The development of innovative infrastructure is the key to economic growth of Ukraine.

NULES of Ukraine made a unique decision to create a science park which faces strategic objectives of innovation development. The first foreign applicant for participation in the work of the Science Park was the Italian company “Carmak Croup ZRL”, which suggested the establishment of a modern wood processing plant.



The participants of the section meetings presented their proposals for solving burning issues discussed during the Conference. These proposals were approved at the plenary meeting on November, 7 2013 and can be found in the resolution of the Conference.



The Resolution of the Conference:

The Conference participants stated that the solution of global problems of rational use of biological resources and ensuring environmental sustainability require:

1. Expansion of research and intensification of cooperation with leading international scientific and financial institutions to ensure quality improvement of potable water and water for agricultural production, as well as the quality and safety of food and environmental objects according to international standards, WTO and WHO regulations;
2. Development and implementation of international projects on emission reduction of industrial hazardous wastes, including anthropogenic mineral and organic acids and their anhydrides into the environment;
3. Implementation of the system of measures aimed at adaptation to the global climate changes and the development of new economic concept of "biosocial economy" that will meet the growing needs of the population and environmental protection;
4. Formation of reliable human and animal health monitoring system due to the global climate changes, disturbances in ecobiosystems etc;
5. Creation and equipping on the basis of NULES of Ukraine an International Radioecological research ground in radioactively contaminated area after the Chernobyl disaster for long-term experimental studies, parametrization of models and development of innovative countermeasures for radiation protection of mankind and the environment;
6. Developing and mastering the new methods of radioactively contaminated areas rehabilitation and development the scientific basis for the gradual return of radioactively safe areas into commercial use;
7. Establishment of international interuniversity centers, institutes aimed at straightening common educational, research and innovation activities of the institutions;
8. Establishment on the basis of NULES of Ukraine (Ukrainian Laboratory of Quality and safety of AIC products) an International Training Centre under the auspices of the UN FAO for Eastern Europe and Central Asia aimed at training and retraining of specialists and analysts, and management of quality and safety of agricultural and food products and objects of the environment;
9. Development of results generalization of advanced research technologies in the field of monitoring of agrosphere and water resources quality and safety through the use of geospatial information, etc.;
10. Introduction of renewable energy based on Smart Grid technologies and solving problems of European standardization and certification of electricity in Ukraine;
11. improving the efficiency of genetically valuable plants species and breeds of livestock;

12. modernization of livestock farms technologies and the waste management in accordance with international environmental standards;
13. Effective and rational use of existing scientific potential, material and technical base of universities to commercialize research results through participation in innovative projects by Scientific Parks;
14. Promotion of the International Scientific Electronic Journal "Earth Bioresources and Life Quality" in order to improve the exchange of experience in ecosystems conservation, rational use of energy resources, assurance of bioresources quality and life safety;
15. Involvement of young scientists and students to the activities of GCHERA, including their membership in the GCHERA Executive Committee (a suggestion made by the Conference section of Young Scientists and Students, moderator – Head of the Student Organization of NULES of Ukraine O. Kukhar);
16. Expansion of international academic mobility of students, academic staff, ensuring their social guarantees;
17. Intensification of international cooperation in research, introducing modern educational curricula and training programs, including the projects and programs by double diplomas;

implementation of environmentally friendly training programs to ensure students' practical training, retraining and advanced training of specialists in the Centres for modern agricultural technique and technology.

The Conference participants unanimously agreed that the global community understands the acuteness of socio-environmental problems, the necessity of implementation of relevant national and planetary projects, the need for global reorientation of social, political, economic, technical, technological and cultural development as well as for high level of basic and applied research on bio-safety and environmental protection, the essence of which was covered in the reports of scientists. The participants also noted the growing interest of the international community in solving the problems of resource and environmental safety and increasing quality and safety of life.

To mark the Conference the participants planted a sapling of the oak, which is a biotechnological descendant of *Dub Zaliznyaka* (Oak of Zaliznyak) historic millennial tree.