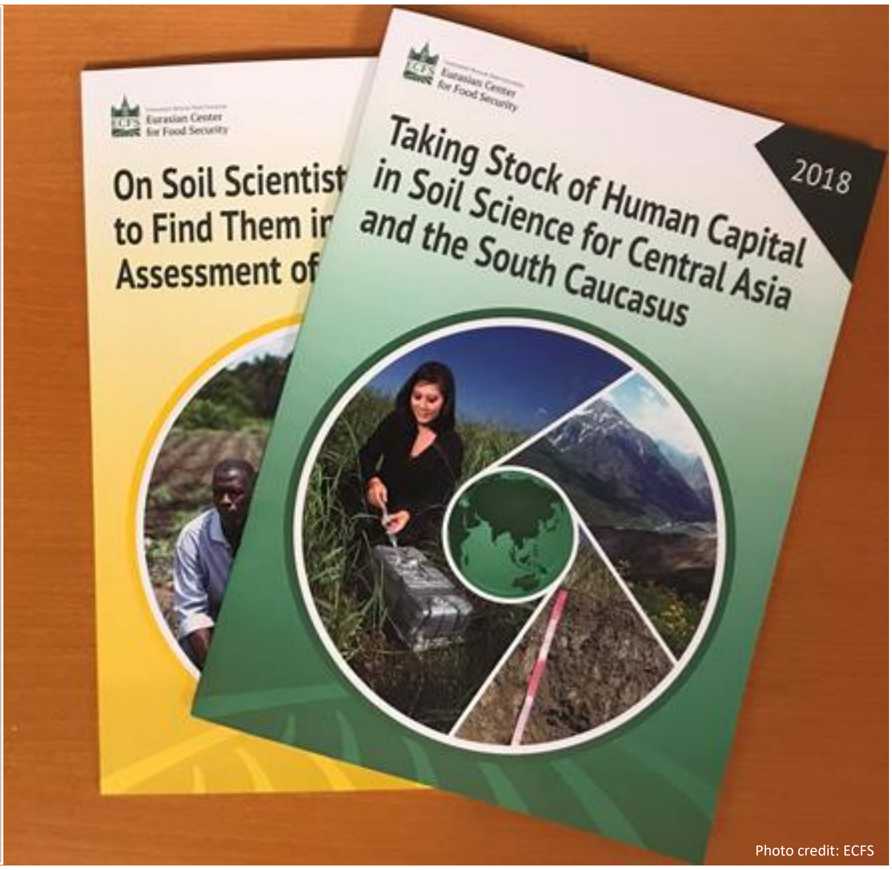
Lomonosov Moscow State University

Eurasian Center for Food Security

Contents



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In the new issue of the Newsletter, we have summed up the World Soil Day 2018 event, which ECFS has helped to organize for the third year in a row.

We also review the work of our colleagues, who have returned from two APEC conferences in China where they presented the results of their research. In addition, before the holidays we have gifts for you: two new publications on human capital in the field of soil science, the links to which you will find inside.

We wish you a wonderful holiday and look forward to being in touch in the New Year!

Gaps in Human Capital in Soil Science Need to be Filled to Effectively Address Food Security Challenges

By Svetlana Sapanova and Anna Buyvolova

Soils are a critical resource for maintaining and advancing food security, especially when it is under the pressure of climate change. Soil science informs the optimization of land use and primary production sectors of agribusiness to ensure food security. Human capital is the key component of agricultural advisory services needed to achieve food security through sustainable soil management while balancing the needs of agricultural, industrial, and urban development with the need to conserve natural resources and biodiversity. Human capital is the foundation of science and the services it can provide to society.

World Soil Day 2018 brought together 97 experts from 33 organizations in St. Petersburg to discuss the role of human

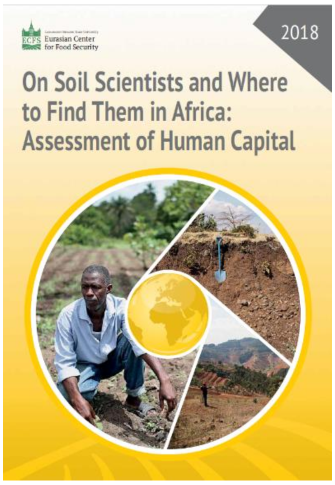
Plenary Session of World Soil Day 2018, St. Petersburg University

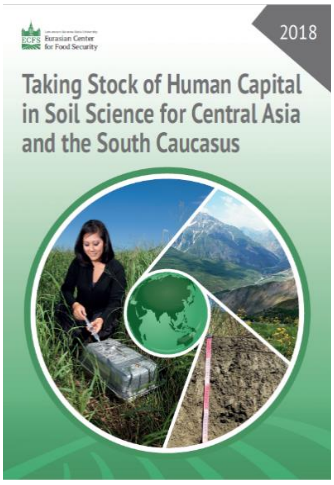
capital in soil science as well as the role of soil science and natural resource management in ensuring food security. On December 5 and 6, 2018, the Eurasian Center for Food Security (ECFS) at Lomonosov Moscow State University, the Central Museum of Soil Science named after V.V. Dokuchaeva, St. Petersburg State University, and the Food and Agriculture Organization (FAO) Liaison Office of the Russian Federation, together with the World Bank and other partners, held a scientific and practical conference Food Security and Human Capital in Soil Science. Representatives of 10 countries—Armenia, Cambodia, China, Indonesia, Italy, Russia, South Africa, Thailand, the United States, and Uganda—took part in the event.

On **December 5**, in the Assembly Hall of St. Petersburg State University, a plenary session of World Soil Day was held. The venue is a remarkable place for every soil scientist: it is where soil science was born and where, in 1883, Vasilii V. Dokuchaev, father of soil science, defended his doctoral thesis *Russian Chernozems*. The event was opened by **Sergey A. Shoba**, the Director of ECFS and President of the Dokuchaev Soil Science Society. He introduced two areas of discussion: "soil science as a fundamental science" and "the role of soil science in ensuring food security." A welcoming speech was given by **Apichart Jongskul**, the Chaipattana Foundation, Thailand, the country that initiated the celebration of World Soil Day globally. "Quality food cannot be imagined without healthy soil," he insisted. "In order for the Earth not to turn into a desert, we need to coordinate efforts and act. It is difficult for one person to change the world, for a group of people it is within their power."

FAO representative **Rosa Cuevas** reported on the state of the world's soil resources, saying "Ninety-five percent of the food comes from the soil." She continued: "To feed the growing population of the planet (according to forecasts, by 2050 it will be 9.7 billion people), we need to develop more productive and sustainable farming systems." **Xiande Li** from the Institute of Economics and Agricultural Development of the Chinese Academy of Agricultural Sciences shared the experience of his country, where the issue of food supply is quite acute. "It is difficult to ensure food security in a country with a population of 1.4 billion people," the scientist noted. He cited many interesting statistics on China's agriculture, particularly on soil pollution. Sixteen percent of the country's soils are polluted; 83 percent with inorganic substances. However, only 40 percent of the applied chemical fertilizers are effective.

Two new reports on human capital in soil science—in Africa and in Central Asia and the South Caucasus—prepared by ECFS and the World Bank were presented during the conference. These studies took stock of existing human capital in soil science in several regions to gain insight into current structural gaps in this human capital. These gaps need to be filled to effectively address the current and emerging food security challenges. **Thomas Thompson**, Professor of Agronomy and Soil Science and Associate Dean and Director of Global Programs in the College of Agriculture and Life Sciences at Virginia Tech (United States), and **Kanysh Nurimgereev**, an Independent Consultant, presented the results of their research *Taking Stock of Human Capital in Soil Science for Central Asia and the South Caucasus* (available online). **Andrei B. Rozanov**, Senior Lecturer in Soil Science at the University of South Africa, Stellenbosch, and **Liesl**





Weise, Independent International Consultant, discussed soil scientists in Africa. Their report *On Soil Scientists and Where to Find Them in Africa: Assessment of Human Capital* is also available online.

At another session of the conference Vice-President of the Society of Soil Scientists of V.V. Dokuchaev and Head of the Department of Soil Science and Soil Ecology of St. Petersburg State University **Boris F. Aparin** noted that, in the entire history of agriculture, humanity has lost more than 1 billion hectares of fertile soil. "The land and the state of its resources remain terra incognita for many. One of our tasks is to talk about the problem not only on this day, but always in our workplaces," he said. So, the Central Soil Science Museum of V.V. Dokuchaev is actively promoting the soil science. "Previously, a person realized that the soil is important from his childhood," noted the Director of the museum **Elena Yu. Sukhacheva**. Many of the museum's educational programs are aimed specifically at children. Interestingly, this basically means that the museum is a scientific institution.

Roundtable discussions took place in the Central Museum of Soil Science of V.V. Dokuchaev

According to Sukhacheva, excursions, workshops, festivals and off-site exhibitions are a hobby of the museum's researchers, who approach it seriously and with great enthusiasm. For example, after the plenary session, participants joined the solemn Parade of Soils, which has been held at the museum's initiative since 2014. Details about the Soil Parade 2018 are available here (Channel One, Russia – Video and article).

The first day of the event included a poster session on the topic *Soil Pollution, Remediation and Food Quality*, FAO workshop for future soil scientists, and a game prepared by the museum.

On **December 6**, participants met at the site of the museum. Two roundtable sessions—one on soil carbon management and one on digital agriculture—were held in the museum's main hall.

The participants of the first roundtable session discussed the importance of soil organic matter for two global tasks: increasing agricultural productivity to enhance food security and mitigating the effects of climate change by fixing carbon in soils used in agriculture. Professor of Lomonosov Moscow State University and ECFS member **Vladimir A. Romanenkov** spoke about the "4 per mille" initiative, according to which the annual increase in carbon stocks in soils of 0.4 percent will be able to offset carbon dioxide emissions from fuel combustion. However, according to the professor, the carbon stock will increase only for a limited period of 30–50 years. "It is important not to maximize carbon reserves in the soil, but to reach the optimum level," he added. US World Bank Lead Agriculture Specialist **Erick Fernandes** spoke about the five principles of climate smart agriculture as well as the restoring soil carbon, 60 percent of which is contained in the top 2 meters of soil. Fernandes demonstrated the results of degraded land restoration programs in China, Brazil, India, Rwanda, and Turkey. Thus, in one example, after two or three years of work, a plot of saline soils in the state of Uttar Pradesh (India) was transformed into fertile soils.

At the second roundtable session, representatives of science and business discussed the prospects for the use of digital technologies in agriculture. **Daniil N.**

Kozlov spoke about the stages of scientific and technological progress in agriculture and modern digital technologies of spatial analysis. World Bank Consultant **Anna Yu. Buyvolova** briefly reviewed innovative express methods of soil and crop analysis. “Submitting soil samples to the laboratory, ordering an examination to interpret the analysis takes away the time and money from the farmer,” she said. “Now many companies are working on technologies that take into account soil indicators and make it possible to increase the productivity of farms.” Director General of the National Movement for Conservation Agriculture **Lyudmila V. Orlova** spoke about the new paradigm of conservation in agriculture based on a system of digitalization. She explained that, with the help of such a system, an economically and environmentally efficient way to produce high-quality food can be implemented. “Now there is no need to invent new technologies from scratch——they already exist in sufficient quantities. It is important to adapt the accumulated knowledge and learn how to apply existing technologies,” Orlova added. Chief Agronomist in PhosAgro-Region **Lidia N. Dubrovskih** shared the results of a three-year experiment on the effectiveness of the use of various phosphate fertilizers and invited all soil scientists to participate in discussion platforms where new company developments are discussed.

The event resulted in a lively panel discussion about the problems of education in soil science. Both speakers and listeners—international experts and researchers, representatives of academic and business spheres—actively participated. Some of the main conclusions were that there is a need to introduce more practical training in natural science faculties and departments, and to take students out more often “to the field” and to farms; also the soil science can be studied by looking at related fields; a need to expand education opportunities, including by organizing summer schools; and a need to conduct surveys among graduates and employers to detect gaps in the curriculum. Another important issue that was repeatedly raised by speakers and listeners during the two days of the World Soil Day celebration is related to the need to create some platforms for the exchange of views between farmers, representatives of science, politics and business.

All the conference materials are available on the ECFS website.

ECFS Staff Present their Research at Two Events in China

By Olga Cherkasova, Arthur Rykalin and Evgeniy Tsvetnov

At the end of October and the beginning of November, two international conferences were held in Beijing (China) in which members of the ECFS Economic Basics of Food Security took part.

On October 30–31, 2018, at the **Conference on Smallholders and Poverty Alleviation in the Asia-Pacific Region**, ECFS expert **Yevgeny Tsvetnov** spoke on the topic “The role of Russia in food security of the Eurasian Region.” In his speech, he reflected on the fact that the problems of poverty and food security are inextricably linked. The poor are subject to significant risks in the context of the economic availability of food and its quality. Thus it is necessary to identify a strategy by which people in these economic conditions will earn more and be able to overcome the problem of poverty and food insecurity. One possible approach is to study the possibilities of interaction between countries, especially neighboring countries. In his report, Tsvetnov demonstrated that Russia plays a key role in ensuring food security in the countries of Central Asia.

The main factors determining Russia’s central position in the region are the presence of attractive Russian sales markets for agricultural products of neighboring countries; the high import dependence of many countries of Central Asia in terms of agri-food products, particularly grain, and the ability of Russia to meet these needs; and the region’s dependence on the income of labor migrants, most of whom come from Russia.

In addition, Russia plays an important role in the international trade structure of Central Asian countries and is one of the largest importers of their products. This directly affects the economic affordability of food in the focal countries. The most important factor in the influence of Russia on the food security of Central Asian countries is that Russia is a key labor market for its inhabitants. Migrants from the Kyrgyz Republic, Tajikistan, and Uzbekistan, earning in Russia, have the opportunity to support their families at home, improving their financial situation and and their ability to afford food. Remittances of individuals from Russia to their families at home have a significant impact on the economies of these countries, especially the economies of the Kyrgyz Republic and Tajikistan, accounting for 33 and 31 percent of the GDP of these countries.

The **Symposium on the Integrated Rural-Urban Development Strategy: Connecting Approaches in Asia-Pacific Region** took place on November 1—2.

The audience was greatly interested in the presentation of **Xiande Li** from the Institute of Economics and Agricultural Development of the Chinese Academy of Agricultural Sciences. The scientist spoke about the Chinese experience in the field of integrated development of urban and rural areas. In the initial period of reforming the Chinese economy, the country's main task was industrialization; at that time, rural areas supported urban development, as a result of which the gap in the development of cities and villages increased. Since 2003, when China was going through a late stage of industrialization, urban areas began to support rural areas, and industry to support agriculture. The trend of a growing development gap between the city and the village has been stopped, but the difference between them remains significant. To resolve this situation, the Integrated Development between Urban and Rural Areas (IDURA) program was adopted. IDURA is based on the principle of interdependence of cities and villages, which is manifested in the constant movement of population, cash flow, and technology. This program equal rights for urban and rural residents in terms of access to education, health care,

Participants of the Symposium on the Integrated Rural-Urban Development Strategy: Connecting Approaches in Asia-Pacific Region, China, 2018

social security, and other public services. In addition, IDURA contributes to the development of infrastructure, credit and insurance in rural areas.

A specialist from the Republic of Korea, **Yoon Ho Park,** identified two main problems of rural development that are similar to Russian problems: depopulation and aging of the rural population. Since the 2000s, a number of policy measures have been adopted in Korea that have influenced the development of rural areas: a law aimed at balanced national development (2004); a law aimed at improving the quality of life for farmers, as well as those engaged in forestry and fisheries (2004); and support measures for settlement in rural areas in the form of grants (2009).

Since 2013, Korea has been implementing the "Happy Life Zone Development Project," which involves access to various types of public services through interaction and cooperation between the authorities of the neighboring regions.

The success of the implemented policy measures in Korea is seen in the modernization of the village, the constant expansion of rural development, and the creation of an institutional framework for the ongoing development of these territories.

Along with representatives of academic and governmental structures of Chile, China, Japan, Korea, the Philippines, and other countries, ECFS members **Arthur Rykalin** and **Olga Cherkasova** also spoke at the symposium.

Rykalin's report was devoted to the impact of urbanization and agricultural exports on the development of rural areas in Russia. Accelerated urbanization— seen in the development of million-plus cities in the largest country in the world—will will inevitably also accelerate the degradation of social life in rural areas. Rapid growth of the agricultural sector, import substitution, and export growth plans are not always converted into improving the well-being of small farms in rural areas.

Olga Cherkasova and Arthur Rykalin (ECFS)

Intensive development of agriculture, including as a result of the outflow of population to the cities, leads to soil degradation and a significant use of chemical fertilizers and pesticides. Agricultural growth is primarily associated with the growth of a small number of agro-holdings, which leads to a concentration of land holdings. The tragedy of the massacre in the village of Kushchevskaya, a "tractor march" from the Krasnodar region (designed to shed light on the farmers' troubles), and a the large number of lawsuits over land allotments, all indirectly testify to the plight of farmers. Bees dying from fertilizers in neighboring fields, a massive reduction in the number of pigs on small farms, uneven income distribution, high rates of palm oil imports—these and other facts signify problems in modern agriculture. The development of agriculture today does not mean the development of rural areas and improvement of social conditions for rural residents.

Despite the fact that Russia has become the world leader in the export of wheat, Russian agro-economic science lags far behind. This is manifested in its share of budget expenditures on science, in the ratings of its agricultural universities, and in the level of its scholarships.

Approximately 30 percent of rural residents want to move to the cities; the proportion of young villagers is 50 percent. The average level of rural wages is almost two times lower than in the city.

The problems of Russian agriculture and its rural areas often lie outside the agricultural plane. The liberal-market management system of the national economy, a narrow commercial approach to agriculture, urbanization, the desire for urban living, unproductive work, and a financial system with high interest rates—these and other factors wash out resources from rural areas, including the most important—human capital.

In her report, Cherkasova highlighted the impact of the growth in the exports of Russian agri-food products on the development of rural and urban areas in Russia.

Russia's potential to increase cereal production can be enhanced. However, if exports do not grow at the same time, such a scenario will lead to negative consequences—lower prices and lower incomes for agricultural producers. Boosting grain exports requires investment in agricultural technology, infrastructure development, and the introduction of a package of measures to support exports.

A promising direction for the export of Russian grain is China, which is associated with a growing population and limited natural resources, as well as a change in consumption patterns. Both rural and urban households in China over the past 25 years have seen changes in the structure of the consumption of basic foodstuffs: the share of cereals has decreased and the share of meat and milk has increased. To develop domestic livestock breeding, it is necessary to increase the feed base; the demand for feed can satisfy the increase in exports of Russian feed grain.

Global warming will increase the bioclimatic potential of Russia, and, accordingly, promises additional export opportunities for Russian agriculture, especially Siberia and the Far North. It is assumed that the northern border of effective farming can significantly recede, which would give Russia significant additional arable land. This newly arable land can gradually be developed and incorporated into agricultural circulation. Thus an increase in agricultural production will contribute to the employment of the rural population and raise its standard of living; it will also increase the rational use of land, which implies sustainable development of rural areas of Russia.

Event Calendar 2019

Date	City, Country	Event
February 12–13	Addis Ababa, Ethiopia	The First FAO/WHO/AU International Conference on Food Safety (website will be posted when available)
February 28	—	International Innovation Award for Sustainable Food and Agriculture (Please submit a nomination **before 28 February 2019**)
March 24–26	Budapest, Hungary	3rd Agriculture and Climate Change Conference
April 23–24	Geneva, Switzerland	FAO/WHO/WTO International Forum on Food Safety and Trade (website will be posted when available)
May 20–24	Antwerp, Belgium	AquaConSoil: 15th International Conference: Sustainable Use and Management of Soil, Sediment and Water Resources