Report on the Symposium
IRRIGATION AND DRAINAGE IN THE LIGHT OF CLIMATE CHANGE
with international participation
9–11 September 2020, Hotel Srbija, Vršac, Serbia

The Symposium entitled "Irrigation and Drainage in the Light of Climate Change" with international participation was officially opened on 9 September 2020 at Hotel Srbija in Vršac. The event was organized by the Serbian Society of Soil Science in co-organization with the Faculty of Agriculture, University of Belgrade, and the Faculty of Agriculture, University of Novi Sad.

The Chair of the Organizing Committee, Prof. Dr Ružica Stričević from the Faculty of Agriculture, University of Belgrade, officially opened this important event dedicated to irrigation and drainage as essential agrotechnical and hydrotechnical measures for climate change adaptation. She emphasized that the conclusions of the Symposium should provide guidelines for the development and improvement of irrigation and drainage, considering that the success and advancement of agricultural production and society as a whole largely depend on these measures. The scientific meeting also highlighted the vulnerability of agriculture and the water sector under conditions of climate variability, which may have far-reaching consequences for agriculture.

The President of the Serbian Society of Soil Science (SDPZ), Prof. Dr Boško Gajić, stated in his opening address that this Symposium continues the long tradition of the Society, whose primary mission is the development of soil science, including irrigation and drainage as one of its important disciplines. He stressed the relevance of the selected topics, designed to address both current and future needs of agriculture and society.

Due to specific circumstances caused by the COVID-19 virus and regulations regarding indoor gatherings, the Symposium was organized in a hybrid format. Part of the scientific and professional community attended in person, while another part followed the program via an online platform provided by the United Nations Development Programme (UNDP). In total, 60 scientists and experts from Serbia and abroad, mainly from the region, participated.

The official language of the Symposium was Serbian. The International Scientific Committee consisted of 45 members, including 9 from abroad. Papers from six countries were submitted: Italy, Croatia, Bosnia and Herzegovina – Republic of Srpska, Montenegro, North Macedonia, and Serbia.

The most important institutions from the agricultural and water management sectors in Serbia participated, including:

- Faculty of Agriculture, University of Belgrade
- Faculty of Agriculture, University of Novi Sad
- Faculty of Agronomy, Čačak, University of Kragujevac
- Faculty of Agronomy, Lešak, University of Kosovska Mitrovica
- Faculty of Civil Engineering, University of Belgrade
- Faculty of Forestry, University of Belgrade
- Faculty of Physics, University of Belgrade
- Institute of Field and Vegetable Crops, Novi Sad
- Maize Research Institute, Zemun Polje
- Institute for Forage Crops, Kruševac

- Institute of Lowland Forestry and Environment, University of Novi Sad
- Public Water Management Company “Srbijavode”
- Soil Institute, Belgrade
- Republic Hydrometeorological Service of Serbia (RHMZ)
- Ministry of Interior, Emergency Sector
- United Nations Development Programme
- Other companies closely related to the soil and water sectors.

Internationally represented institutions included:

- Mediterranean Agronomic Institute of Bari, Italy
- Faculty of Agricultural Sciences and Food and Agricultural Institute, Ss. Cyril and Methodius University in Skopje, North Macedonia
- Agricultural Institute Osijek, Croatia
- Biotechnical University of Montenegro
- Water Management Institute Bijeljina, Republic of Srpska
- Agricultural Institute of Republic of Srpska, Banja Luka
- Other organizations and companies.

A total of 39 papers were presented, including 8 invited lectures covering all thematic areas of the Symposium:

1. Soil as a basis for rational water management
2. Irrigation
3. Drainage
4. Climate change and water resources
5. Application of information technologies and remote sensing in soil and water management
6. Agricultural soil erosion
7. Use of renewable energy sources for irrigation and drainage
8. Fertigation

All submitted abstracts were peer-reviewed and published in electronic and printed form in the Book of Abstracts (ISBN 978-86-912877-3-3), in Serbian and English. Presentations, posters, panel discussions, and the Book of Abstracts are available on the Serbian Society of Soil Science website. Full papers are planned for publication in the journal *Soil and Plant*, published by the Serbian Society of Soil Science.

On the first day (09.09.2020), 27 participants attended in person. Eleven oral presentations were delivered, and a Poster Session was held from 17:30 to 18:30, with a total of 14 posters. Discussions followed each session.

On the second day (10.09.2020), 36 participants attended onsite, while 24 participants followed the program online via the ZOOM platform from 09:00 to 18:00. Six presentations were delivered online and four orally, followed by discussions.

On the third day (11.09.2020), the main conclusions were presented based on oral presentations, posters, panel discussions, and general discussions. The best poster award was presented. After the closing session, participants visited the VP Tamiš-Dunav facility in Pančevo, irrigation and drainage systems at Agros d.o.o. Opovo, and the Naïve Art Museum in Kovačica.

Within the Symposium, a Panel Discussion entitled “Climate Change, Adaptation of Vulnerable Sectors (Agriculture, Water Management, Forestry)” was organized, moderated by Snežana Ostojić Paunović (UNDP). Panelists included experts in climate change (Prof. Dr Vladimir Đurđević), agriculture (Prof. Dr Ružica Stričević, Prof. Dr Slaven Prodanović, Prof. Dr Olivera Petrović Obradović), water management (Prof. Dr Tina Dašić), and forestry (Dr Dejan Stojanović). After introductory remarks, discussions were opened, conclusions drawn, and recommendations formulated, aligned with the general conclusions of the Symposium.

Based on the written and presented papers, as well as the productive discussion, the following important conclusions were reached:

- It is necessary to strengthen the awareness of the scientific community, professional public and citizens about the risks posed by climate change to vulnerable sectors such as agriculture and water management, and about the inevitability of applying climate change mitigation and adaptation measures.
- Risks such as floods, droughts, soil erosion, fires, land degradation (land devastation), water scarcity, the occurrence of extremely high and low temperatures, late spring frosts, hail, etc., were recognized.
- In order to mitigate climate change, it is necessary to take care of water consumption and water saving at all levels and in all sectors, not only in agriculture. It is necessary to maintain soil fertility in order to prevent desertification (land degradation), soil salinization and the decline of soil fertility. Continuous training of farmers is necessary regarding the application of possible measures in order to mitigate the consequences of climate change.
- It is necessary to build the capacity of human resources through continuous training, acquisition of skills and knowledge for the use of new information technologies, agrotechnical and hydrotechnical measures at all levels: from farmers, engineers and consultants to local self-government, the scientific community and state institutions, for the purpose of climate change mitigation and adaptation.
- The importance of institutions such as the Republic Hydrometeorological Service of Serbia (RHMZ) and early warnings of rain, hail or frost for the implementation of mitigation measures was emphasized. Furthermore, the importance of educational staff was highlighted, whose task should be to read precise data from radar systems that should serve farmers. For the precise determination of irrigation regimes, especially for new crops, it is desirable that the RHMZ website displays measured data from a Class “A” evap-orimeter. Considering that there is a respectable number of small meteorological stations (on agricultural holdings), it is proposed to find a possibility for integrating them into the RHMZ network, so that microclimate data could be better used in practice to reduce risks.
- The planned development of irrigation should be accompanied by adequate systemic solutions for the management of the systems, primarily for the purpose of climate change mitigation and subsequently for adaptation. This means that it is necessary to adopt the Law on Water Users Associations, which has proven to be a very efficient water management model in the countries of the region and worldwide. A Water Users Association should be a non-profit organization whose task would be to maintain the distribution network of irrigation systems and to collect real costs, so that the system would be self-sustainable. This type of water management would enable local self-government and farmers themselves to recognize the importance of water, its value in the production process, and to contribute to its efficient use.

- It is necessary to increase investments in the maintenance of drainage systems, because in the future more abundant precipitation of higher intensity is expected than the one for which drainage systems were designed.
- Based on the presented papers, research in open-field conditions as well as through crop production modelling indicates that the average yields of the most important arable crops do not show a decline in yield; however, a trend of greater yield variability is observed, which indicates that very unstable yields may be expected, including even yield failure. This points to the need for vigilant monitoring and the application of adequate agrotechnical measures.
- In order to use the irrigation development fund more efficiently, the Serbian Society of Soil Science, in cooperation with the faculties of agriculture, should propose to the competent state authorities cooperation in the process of redefining the allocation of subsidized funds, with the aim of forming a working group within the competent Ministry that would develop a set of documentation with procedures for approving subsidies. Irrigation subsidies should be approved in accordance with: an irrigation project that includes, among other things, a specification of materials with technical norms; selection of the best supplier based on three offers; approval in the first phase of only 50% of the granted subsidized funds; execution of works; inspection/control of the executed works; and, upon a positive assessment, payment of the remaining 50% of the subsidy.
- A major question is how to motivate the traditional agricultural producer to use the possibility of obtaining subsidies, considering that these are often realized by people from other sectors of the economy, for whom agriculture is not the primary activity.

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Scientific, Programme and
Organizing Committee of the Symposium