



Agrohydrology Research Group



# Abstract Book

## 3<sup>rd</sup> International Youth Forum

### on

## Soil and Water Conservation

Tarbiat Modares University, Noor, I.R. IRAN

16-21 October 2021

کتابچه چکیده مقالات

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**Editors:**

- Dr. A. Khaledi Darvishan - Prof. SHR. Sadeghi - Dr. V. Moosavi

**Conference Main Theme:**

**Soil and Water Conservation (SWC) under Changing Environments**

**● Sub-Themes:**

- Smart SWC
- Adaptive SWC
- Youth Roles in SWC
- Climate Change and SWC
- SWC in Developing Countries
- Performance Evaluation of SWC Projects
- Impacts and Possible Solutions of COVID-19 Pandemic on SWC Practices

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**3<sup>rd</sup> International Youth Forum  
on  
Soil and Water Conservation  
(3<sup>rd</sup> IYFSWC)**

***Faculty of Natural Resources and Marine Sciences,  
Tarbiat Modares University, Noor, I.R. IRAN***

***16-21 October, 2021***

**Abstract Book**

**Editors:**

- Dr. A. Khaledi Darvishan - Prof. SHR. Sadeghi - Dr. V. Moosavi



Professor Dr. Seyed Hamidreza Sadeghi,  
Scientific Secretary

**Respected excellences, senior scientists, colleagues, audience, organizers, and distinguished guests:**

Greetings,

I, as a member and Deputy President for the World Association of Soil and Water Conservation (<http://www.waswac.org.cn/waswac/index.htm>), Honorary President, Watershed Management Society of Iran (<http://www.wmsi.ir/>), and a professor in the Department of Watershed Management Engineering at Tarbiat Modares University TMU (Iran) am very privileged to welcome to all participants of the 3<sup>rd</sup> International Youth Forum on Soil and Water Conservation jointly organized by WASWAC and TMU. The application for the forum was received the precious WASWAC consent during the last board meeting of WASWAC at Delhi in Nov. 2019. Since then, many efforts were made to publicize the meeting and receive the maximum contribution to the main theme, Soil and Water Conservation (SWC) under Changing Environments. However, the COVID-19 Pandemic paralyzed all activities worldwide. Nonetheless, the attempts were persistently continued through different ways and aspects. Consequently, the call for papers was dispatched, more than 70 weekly meetings were held, some 106 papers were received, the YOPA contest was held, and top ten papers were selected among nominated contributors, the forum was postponed by five months, hoping to get better conditions, and finally the semi-virtual type was decided for holding 3<sup>rd</sup>IYFSWC during October 16-21, 2021. Afterward, the forum received valuable supports from different international and national bodies. The UNESCO branch in Tehran, the Iranian National Commission for UNESCO, Agrohydrology Research Group (TMU) and Kalleh Dairy Company also financially supported the forum, whose valuable cooperation is greatly appreciated. Incontestably, thinking about the simultaneous fulfillment of watershed balance and human needs is vital for decision-makers, politicians, and experts to properly govern declining situations of the biotic and abiotic resources at different scales. In this direction, scientific gatherings on managing two crucial commodities of soil and water while considering global and livelihood security facilitate an appropriate platform to propose new ideas and exchange valuable experiences among peoples with various backgrounds, living standards, and even governmental situations. Such issues need more consideration in developing countries due to the ever-increasing population and uncontrolled developmental activities to balance all contradictory sectors in the ecosystems. It is therefore needed to overcome existing myopia in the management of soil and water resources through propagating applied, and scientific outcomes resulted from promising and fruitful gatherings to bring as many as scientists around a table to elucidate scientifically based practical solutions for the existing issues in the world to convince politicians, decision-makers, planners, practitioners, and even end-users. It is ultimately hoped that all stakeholders proportionate their needs and expectations to conserve all resources as a precious heritage for future generations holistically. I hope the outcomes of the forum not only fulfill human demands and welfare but also guarantee the sustainable production of the system for present and future generations economically efficient and ecologically friend as it strives in the forthcoming gathering. On this occasion, I profoundly extend my thanks and greetings to all those who collaborated with the forum and wishing them all the best.



Dr. Abdulvahed Khaledi Darvishan  
(Associate Professor)  
Executive Secretary

**Respected excellences, senior scientists, colleagues, audience, organizers, and distinguished guests:**

Greetings,

As the executive secretary, it is my great pleasure to welcome you all to the 3<sup>rd</sup> International Youth Forum on Soil and Water Conservation jointly organized by World Association of Soil and Water Conservation (WASWAC) and Tarbiat Mosares University (TMU). Despite the negative effects of COVID-19 pandemic on all the scientific activities and conferences worldwide, we received valuable contributions from nine countries of Iran, China, India, Serbia, Russia, Turkey, Italy, Montenegro and Germany. A total of 107 abstract/full papers were received, of which 51 full papers were evaluated for WASWAC Youth Outstanding Paper Award (YOPA)-2021 by an international valuable group of senior scientists. The other 56 abstract/full papers received for participation in the conference were also evaluated by valuable group of international referees. I would like to thank all the organizers including the President and Deputy of Research and Technology of Tarbiat Modares University, the Dean and Vice Chancellor for Research of the Faculty of Natural Resources and Marine Sciences of Tarbiat Modares University and the President and Secretariat of World Association of Soil and Water Conservation. The valuable contributions of all the scientific and executive committees and reviewers are also appreciated. Because of COVID-19 pandemic conditions, the forum was basically organized and held online and I would like also to thank my colleagues, student branch and the experts of IT center and open course office of Tarbiat Modares University. I do really hope this event has created a good opportunity in scientific sessions for senior and young scientists to bring and share their knowledge and to learn more on the most up-to-date aspects of soil and water conservation.

I wish all of you success, health, happiness and prosperity!



Dr. Vahid Moosavi  
(Assistant Professor)  
Organizing Secretary

**Respected scientists, colleagues and distinguished guests:**

Greetings,

I am very delighted and honored to have this opportunity to welcome you all to the 3<sup>rd</sup> International Youth Forum on Soil and Water Conservation. The major goal and feature of this forum is to bring academic scientists, engineers and researchers together to exchange and share their experiences and research results about different aspects of soil and water conservation and discuss the practical challenges encountered and the solutions adopted. A sustainable soil and water resource is a utopia in different societies. It could be achieved by a proper balance between socio-economic development and environmental protection. The forum provides a setting for discussing recent developments in soil and water conservation specially under changing environments. I hope all participants will have a technically rewarding experience. I would like to extend my sincere gratitude to all of you who kindly helped us make this event come together to become a success.

## Key Organizers

- Faculty of Natural Resources and Marine Sciences, Tarbiat Modares University, IRAN
- World Association of Soil and Water Conservation (WASWAC)





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Abdulvahed Khaledi Darvishan

(Associate Professor)  
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Vahid Moosavi

(Assistant Professor)  
Organizing Secretary



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Secretary



**Forum Main Theme:**

➤ **Soil and Water Conservation (SWC) under Changing Environments**

**Sub-Themes:**

- **Smart SWC**
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- **Youth Roles in SWC**
- **Climate Change and SWC**
- **SWC in Developing Countries**
- **Performance Evaluation of SWC Projects**
- **Impacts and Possible Solutions of COVID-19 Pandemic on SWC Practices**

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## Construction and Calibration of a Portable Rain Simulator Designed for In Situ Researches of Soil Resistance to Erosion

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### Abstract

Land degradation caused by erosion processes is a widespread global problem. A rain simulator is one of the tools often used to determine the resistance of soils to erosion processes. The aim of this publication is to present the process of construction and calibration of a small, portable field simulator which would be implemented in researches designed to determine the changes of soils' shear strength parameters in forested areas (in situ) caused by the change of soil moisture content achieved by rain simulation. The constructed simulator consists of a metal frame, sprayers (with specific nozzles), a sediment funnel/tray made of metal, water and sediment collector unit, a water tank and pump, and a set of rubber hoses, manometer, valves, reducers, adapters and other supplementary equipment. The calibration was carried out by using the pluviometer method. The choice of nozzles was based on the criteria of low water consumption (losses), high uniformity coefficient (CU) and the possibility of achieving the intensity of downpour rains specific for the investigated area. Further calibration of the device consisted of determining the raindrop diameter and the distribution of rainfall when the simulator is positioned on slopes (7° and 15°). The achieved rain intensity was 1.7-1.9 mm.min<sup>-1</sup>, with a uniformity coefficient (CU) of 92.23-93.70% for raindrop diameters (D50) equal to 1.2 mm. The kinetic energy of simulated rain (Ke) was 2.82·10<sup>-6</sup> J. The constructed simulator proved itself to be in accordance with all of the criteria given, and it can successfully be implemented in researches aimed to determine the resistance of forest soils to erosion processes, infiltration, and sediment yield.

**Keywords:** Field Rain Simulator, Portable Rain Simulator, Erosion, Raindrop Distribution, Raindrop Diameter.