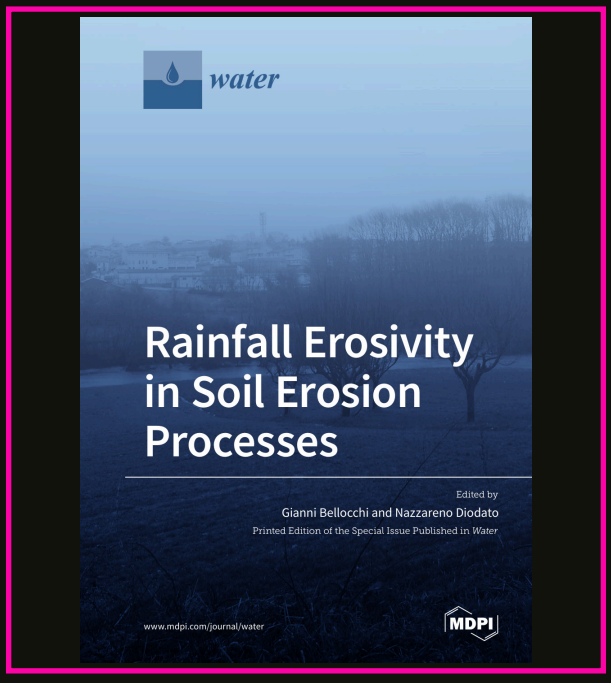
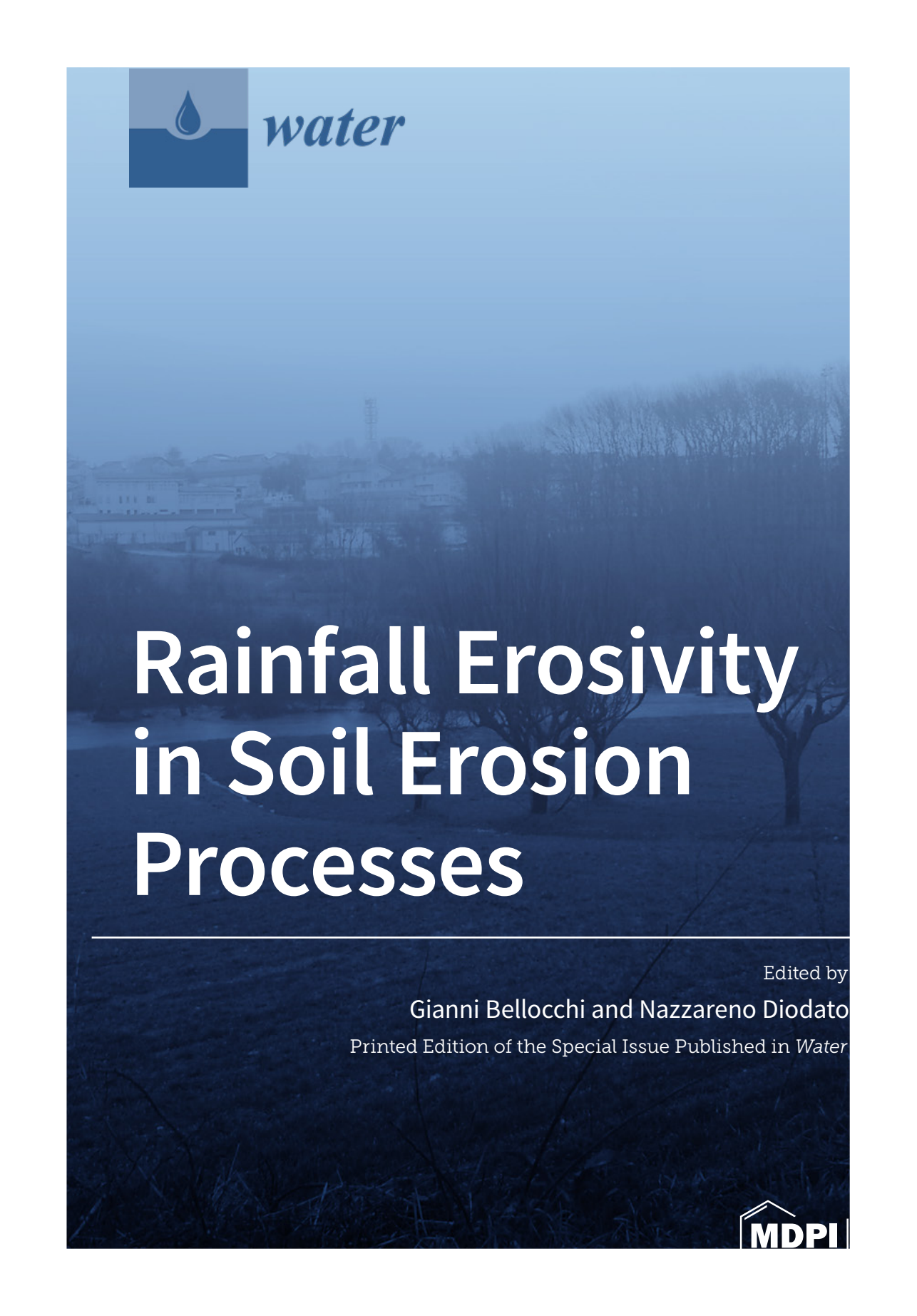
Processes (Gianni Bellocchi, Nazzareno Diodato)



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Rainfall Erosivity in Soil Erosion Processes

Edited by
Gianni Bellocchi and Nazzareno Diodato

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Special Issue Editors

Gianni Bellocchi
Nazzareno Diodato

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About the Special Issue Editors

Gianni Bellocchi holds a Ph.D. in agronomy and environment from the Sant'Anna School of Advanced Studies (Pisa, Italy). He is currently a senior scientist at INRAE (Institut national de recherche pour l'agriculture, l'alimentation et l'environnement). With expertise in agro-climatic and hydrological modelling, his research and publication interests include carbon–nitrogen cycles and biodiversity in natural and agricultural ecosystems with the support of modelling approaches.

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Editorial

Rainfall Erosivity in Soil Erosion Processes

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Abstract: Regional studies on the erosive power of rainfall patterns are still limited and the actual impacts that may follow on erosional and sedimentation processes are poorly understood. Given the several interrelated challenges of environmental management, it is also not always unclear what is relevant for the development of adaptive and integrated approaches facilitating sustainable water resource management. This editorial introduces the Special Issue entitled "Rainfall Erosivity in Soil Erosion Processes", which offers options to fill some of these gaps. Three studies performed in China and Central Asia (by Duulatov et al., *Water* **2019**, *11*, 897, Xu et al., **2019**, *11*, 2429, Gu et al. **2020**, *12*, 200) show that the erosion potential of rainfall is increasing in this region, driving social, economic, and environmental consequences. In the same region (the Weibei Plateau in China), Fu et al. (*Water* **2019**, *11*, 1514) assessed the effect of raindrop energy on the splash distance and particle size distribution of aggregate splash erosion. In the Mediterranean, updated estimates of current and future rainfall erosivity for Greece are provided by Vantas et al. (*Water* **2020**, *12*, 687), while Diodato and Bellocchi (*Water* **2019**, *11*, 2306) reconstructed and investigated seasonal net erosion in an Italian catchment using parsimonious modelling. Then, this Special Issue includes two technologically oriented articles by Ricks at al. The first (*Water* **2019**, *11*, 2386) evaluated a large-scale rainfall simulator design to simulate rainfall with characteristics similar to natural rainfall. The data provided contribute to the information that may be useful for the government's decision making when considering landscape changes caused by variations in the intensity of a rainfall event. The second article (*Water* **2020**, *12*, 515) illustrated a laboratory-scale test of mulching methods to protect against the discharge of sediment-laden stormwater from active construction sites (e.g., highway construction projects).

Keywords: erosion control; mulching; net soil erosion; raindrop energy; rainfall erosivity; runoff; sediment yield

1. Introduction

Rainfall erosivity is a major driver of sediment and nutrient losses worldwide, which may leave farmers vulnerable to crop failures and lead to unstable equilibrium states in landscapes [1,2]. The exposure of the Earth's surface to aggressive rainfall is a key factor controlling the water erosion in terrestrial ecosystems [3] and other damaging hydrological events, such as floods and flash floods [4]. The occurrence of hydrological extremes and the associated sediment loss during rainfall events are central features in the global climate system because worldwide variations in temperature and precipitation patterns produce corresponding changes in the development of natural hazards [5]. It is also assumed that extreme storms and rainfall-runoff erosivity are becoming more frequent due to climate change [6]. Highly vulnerable areas may result in catastrophic regime shifts connected with the occurrence of damaging hydrological events [7]. This explains the continuing interest of scientists and engineers in the hydrological response of landscapes. This interest ranges from a basic understanding of processes to prediction under changing conditions, driven by a greater recognition