



BOOK REVIEW

Shit, P.K., Pourghasemi, H.R., Bhunia, G.S. (Eds.), 2020. *Gully Erosion Studies from India and Surrounding Regions*. Advances in Science, Technology & Innovation. Springer International Publishing. <https://doi.org/10.1007/978-3-030-23243-6>

It is well-known that erosion is a big concern for humankind because it threatens soils affecting fertility or biodiversity among other issues (Borrelli *et al.*, 2017; García-Ruiz *et al.*, 2015). The books published about this topic are diverse and try to focus on specific shapes or landforms, which is also helpful for the readers characterized by plenty of interest to learn and apply new geomorphological knowledge. However, the publications of materials devoted to covering land degradation processes focused on large territories such as a group of countries or specific continents are scarce and possibly also interesting for other scientists coming from other disciplines. Soil erosion should not be considered only at the hillslope or watershed scale, but also at a global process affecting large areas such as different countries that share among them similar environmental conditions or human activities (Lal, 2001; Poesen, 2018; Rodrigo-Comino *et al.*, 2018).

Under this above-mentioned consideration, I started to read this book recently published about one hot topic highly discussed nowadays, gully erosion (GE). Gullies and other associate processes such as rills, interrills, ravines or landslides among others are considered by scholars one of the most important manifestations of land degradation processes over the world, because they represent an extreme mobilisation of sediments, water and associated nutrients, irremediably, in many cases, irreparable (Arabameri *et al.*, 2020; Casali *et al.*, 2006; Martínez-Casasnovas *et al.*, 2009). However, GE also remarks on evidence of the past to understand the current landscapes. In chapter 26 (Hosseinalizadeh *et al.*, 2020), the authors insist that GE act as “one of the few geomorphological evidence of a past soil erosion which reflects the impacts of environmental changes on the landscape”. I fully agree that this is key for land managers and policymakers because it allows producing medium-scale erosion susceptibility maps that may help to mitigate the “environmental and socioeconomic-related challenges of soil erosion”, even contributing to achieving some SDGs (Sustainable Development Goals) such as SDSs 1 (No poverty), 2 (Zero hunger), 3 (Good health and well-being), 6 (Clean water and sanitation), and 11 (sustainable cities and communities) (Abdulkadir *et al.*, 2020).

I was surprised to read the alarming statement by Kumar *et al.* (2020) for Indian ravines on the need to pay attention to the "realistic assessment of the policy gap by a dedicated agency especially related to tenure provision, illegal land occupation and land use policy". It is disappointing to observe how this book presents the negative impacts of GE affecting, for example, aquatic environments (Kar *et al.*, 2020; Mahala, 2020) or plant biodiversity (Kala *et al.*, 2020) and the lack of governmental plans to solve them. Therefore, I can understand that one of the most important conclusions of this book is that further research and more work related to awareness is necessary. Fortunately, I consider that this book probably contains brilliant material to introduce, review and give context about the detection and remediation of areas affected by GE, considering India and surrounding countries as examples that can be extrapolated for other countries over the world. Therefore, I would strongly encourage policymakers and land planners to read this book too.

I will not go into too much detail, but shortly I would want to pick out the most important parts of the book, some conclusions and novel topics discussed. Firstly, it is highly appreciated that the authors

include a wide range spectrum of modelling techniques to show how GE can be assessed. Random forest model, diverse-based runoff-sediment yield modelling, Bayesian weight of evidence, machine learning algorithms or the traditional RUSLE, SWAT or MARS models among others. On the other hand, I also consider that they are well-performed experiments and in situ measurements that present novel results. One example is presented in chapter 18 using flume experiments. The results give new insights on how to assess GE and understand plant responses that could be included to develop control measures paying special attention to the roots of about <1 mm in diameter with unequal impact on soil anti-scourability (Shit *et al.*, 2020a). It is also impressive the field measurements conducted by Islam *et al.*, (2020) and Joshi (2020) using pins or a self-made microprofilometer to estimate the cross-sectional profiles of several gullies inserted into an expanding gully network.

On the other hand, I also want to discuss some aspects to be mentioned in future editions or further research conducted by the authors and editors. Dedicating a chapter related to gullies intentionally built for agricultural drainages (e.g. Agri-spillways; Rodrigo-Comino *et al.*, 2017) or urban areas (e.g. Informal urban patterns; Adediji *et al.*, 2013) would fill an important gap. Discussing how well the authors can deal with it using these well-explained modelling techniques and *in situ* measurements would be appreciated from my point of view. As a geographer, I also miss a final or introductory chapter related to the whole studied area, summarizing the differences or similarities among countries and regions. It would give a global perspective for potential solutions or policies to be designed in Southern and Western Asia. This idea could also be materialised in the form of a review paper joining all the results obtained in this book.

To conclude, I consider that if you liked other books such as “Gully Erosion Under Global Change” (Li *et al.*, 2004), “Gully Erosion and Management Methods and Application: A field Manual” (Singh and Dubey, 2002), the book chapters written by Rădoane and Rădoane, (2017), Aber *et al.* (2010) and Poesen *et al.* (2006), or the review papers by Bocco, (1991), Castillo and Gómez (2016) and Kertész and Gergely (2011), you will highly appreciate the read of Gully Erosion Studies from India and Surrounding Regions by (Shit *et al.*, 2020b) as scientist, policymaker or land planner.

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