

EDITORIAL NOTE

The Editorial Board of the Journal *Ciência&Trópico* is honored to dedicate this issue to the discussion about Desertification in partnership with the Center for the Study of the Biosphere from Space (CESBIO) – Toulouse/France. *Ciência&Trópico* which, over the years, consolidates the interdisciplinarity at national and international level, invited Dr. Richard Escadafal, who is Chair of the *Comité Scientifique Français de la Désertification*, and leader of research projects of CESBIO (France) in the Mediterranean region, to Special Editor of this edition. The debate presented by the authors illustrates the importance of strategies for the definition and monitoring of drylands.

Desertification is the degradation of land in arid, semiarid, and dry sub-humid areas. It is caused primarily by human activities and climatic variations. The drylands do not refer to the expansion of existing deserts. It is known, however, that they are widespread. They cover about 40% of the total land surface of Earth, and are described by a climate with low average rainfall, and recurrent periods of drought. Adapted to those constraints, specific ecosystems have developed, such as arid lands, and formed some of the most beautiful landscapes of our planet. Since the beginning of their development, human societies have learned how to live in those environments, and they continue to develop and tailor strategies and technologies to cope with the constraints of such irregular climates.

Information on the condition of land and vegetation, land use and more generally on changes in the environment is essential for better management of drylands and to enable the populations living in them to improve their conditions. This special issue is illustrating and commenting

on the role of remote sensing techniques and geomatic techniques in the important task of characterization and monitoring of drylands.

Throughout the different contributions, case studies from Brazil and Africa present different approaches based on the use of images obtained from Earth observation satellites. Whereas not covering the full range of applications, the six documents provide an original introduction to the most common issues in drylands and to the way remote sensing technologies help to tackle them.

The article *Téledétection appliquée à l'étude du biome Caatinga: une revue de la littérature*, written by Admilson Pacheco, presents the contribution of remote sensing to the study of the Caatinga Biome by means of a literature review. The author states that some studies in this ecosystem are indispensable because this biome is one of the most threatened because of the unsuitable and unsustainable use of natural resources. Therefore, scientific and technical research works on remote sensing of multispectral and multitemporal satellite image processing techniques, as well as local databases and maps, were used to examine the nature, trend and quantification of the environmental monitoring process of conservation.

With *Remote sensing of drylands: when soils come into the picture*, Richard Escadafal seeks to distinguish biological and mineralogical features from semiarid lands. He points out that soil color seems to be an important parameter of the optical properties of dryland soils, as it was illustrated in the Sahara. The author states that the previously explored causes of “soil noise” in vegetation indices are confirmed, as well as the way to correct them, and the strategies for the optimized use of optical remote sensing of drylands are completed, taking into account the soil surface.

In the article *Correlation between soil erodibility and satellite data on areas of current desertification: a case study in Senegal*, the authors Waldir de Carvalho Junior, Maud Loireau, Mireille Fargette, Braz Calderano Filho e Abdoulaye Wélé verify if there is any correlation between the soil erodibility and the data obtained from satellite images. This paper represents a first attempt of a model that predicts the risk of soil erosion, based on information contained in satellite images. The authors' choice of data, calculations and analyzes is detailed because they state, on the one hand, that there is a moderate positive correlation between soil

erodibility, and on the other hand, the *Normalized Difference Vegetation Index* displayed during the dry season, as well as the Band 5 displayed at the beginning of the dry season.

Following the above parameter, Sônia Barreto Perdigão de Oliveira, Margareth Sílvia Benício de Souza Carvalho, Abdelfettah Sifedine, Betina Ferraz, and Eduardo Sávio P. R. Martins, with the article *Uso de sensoriamento remoto para mapeamento de áreas suscetíveis à desertificação na região semiárida do Brasil*, make evident the possibility of a periodical update and the establishment of a plan to monitor the degradation of drylands in the Brazilian semi-arid region through the use of remote sensing. This sensing was used to map and identify the state of degradation/desertification of the entire Brazilian semi-arid, where the susceptible to desertification areas are. It was also verified the efficiency of the Landsat 8 satellite images and the potential of the remote sensing technique in the mapping of this subject, showing a high degree of reliability in the delimitation of the affected areas.

Neison Cabral Ferreira Freire and Admilson da Penha Pacheco, in the article *Uma abordagem geoespacial e espectro-temporal da degradação ambiental no Bioma Caatinga na região de Xingó, Brasil*, aim to establish a geospatial and spectral-temporal methodology to analyze and map the environmental degradation of the Caatinga biome in the semiarid region of Xingó – state of Alagoas, Brazil, through the crossing of time series of satellite images and demographic data. The authors detected areas under risk which could be desertified in the six municipalities surrounding the Xingó Hydroelectric Power Plant. The results obtained evidenced a desolating context of environmental degradation in the extensive study area, with a significant devastation of the Caatinga, increase of exposed soil and decrease of agro-pastoral areas. They lead to the conclusion that a significant portion of the studied area presents significant environmental problems regarding to the risk of desertification.

To finalize this edition, the article *Intermittent rivers of the Brazilian northeast: the case of Alto Paraíba, Brazil*, written by Janaína Barbosa da Silva and Simone Mirtes Araújo Duarte, aims to identify the surface uses along the Alto Paraíba basin, especially the existence of natural and anthropogenic vegetation; their physiognomies based on the types of densification; superficial use; and susceptible to degradation areas,

considering that the Northeast region of the country is marked by the presence of temporary rivers, also known as intermittent or ephemeral rivers. It was identified, thus, that the presence or absence of water is a preponderant factor in the use of the surface. These results allow the scientific, civil, and political communities to better understand the current conditions of this basin, favoring extensive discussions about its preservation.

The Journal *Ciência & Trópico*, within an interdisciplinary perspective, which has always been a milestone since its origins, publishes this edition in partnership with CESBIO, and reaffirms its international nature by means of the discussion about Desertification. We would like to thank the authors for the articles presented, and notably Dr. Richard Escadafal and Dr. Neison Freire for their collaborative works in this edition of the Journal.

Alexandrina Sobreira de Moura

Editor in Chief

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Guest Editors