EXTREME EVENTS, URGENCIES, AND CLIMATE CHANGE

The hurricane season has left behind a trail of human and material destruction throughout the Caribbean and the United States. Scientists are increasingly assertive about the connection between climate change and the growing strength and frequency of extreme events, such as hurricanes Harvey and Irma, occurring last September in the Caribbean and in the south of the United States, mainly in Texas and Florida. There is clear evidence that hurricane Irma gained strength due to the unusual warming of the Caribbean Sea. The rise of the sea level is worsened by climate change, aside from enhancing hurricane impact.

The poorest nations that had most of its buildings destroyed by these events can't just "adapt" to hurricanes such as Irma. Barbuda's Prime Minister, Gaston Browne, reported that Irma wrecked 95% of the buildings, leaving the island "practically uninhabitable". The greatest problems were faced by the affected small Caribbean islands, which have scarce resources to protect themselves, not to mention the investments needed for this kind of record-breaking hurricanes.

Irma was the strongest hurricane in the Atlantic Ocean regarding maximum sustained winds since Wilma, in 2005, which passed through Mexico, Haiti, Cuba, and Florida. Recent research shows that hurricanes have strengthened themselves in the last decades. The rising temperature of the land and oceans raises the available potential energy for hurricane formation, such as those in the Atlantic Ocean.

The greatest challenge is to acknowledge that it is simply impossible for the most vulnerable populations to "adapt" to the future impacts of climate change. Moreover, some small insular countries will have to be relocated onto higher ground. Sea barriers and flood defenses are practically useless when their islands are already almost underwater.

Irma gained intensity when over the sea, where water temperatures were 0.5 to 1.25°C above average. Atlantic hurricanes have been gaining strength, according to research showing this trend throughout the last 30 years. A study about the issue led by James Elsner, from University of Florida, was published by the journal Nature in 2008, showing how Atlantic hurricanes have been getting stronger as time went by, and how their strength is increasing faster than what it did 25 years ago. Other studies, such as that published in the journal Geophysical Research Letters in 2012 by C.M. Kishtawal, from Ahmedabad Space Research Center in India, confirms this trend.

Nevertheless, and in spite of all this evidence, a significant group of people continue rejecting everything science has to say about climate change in the past 100 years, since the relationship between greenhouse gases and global warming was described for the first time. Scientific consensus does not shake these people. Neither does the word from the main scientific research centers in the world and from the major scientific associations. Furthermore, U.S. president Donald Trump positions himself within the deniers, enhancing

the setbacks of one of the largest greenhouse gas-emitting countries, thus giving a huge step backwards from the positive policy of the previous administration in charge of president Obama.

The increasingly frequent and strong extreme events and the vulnerability of people in risk areas urgently demand advancements in preventive and participatory management. We need an environmental governance of natural disaster risks that can allow the development of contemporary societies' adaptation capacity.

Nowadays, the concepts behind the expression "adaptation capacity" have been associated to the Intergovernmental Panel on Climate Change (IPCC), which describes adaptation as an "adjustment in natural or human systems in response to real or expected climate stimuli or to its effects". For IPCC, there are six determining factors that influence the adaptation response: economic resources, technology, information and skills, infrastructure, institutions, and liquid assets. Researchers have called this a synergic combination among general and specific elements, which establish a virtuous cycle for a sustainable long term adaptation capacity.

Social-environmental risk management highlights more and more the need to increase the engagement of society by means of initiatives that enhance the level of environmental awareness. This is an intellectual, social learning process, based on dialogue and interaction. It involves constant recreation and reinterpretation of information, concepts, and meanings, which arise from what is learnt in training and formation courses to improve civil society and government practices, from a cooperation perspective among the stakeholders.

There are multiple challenges to articulate these actors into systems that can make complex decisions, and they are strongly linked to the need of higher transparency and bringing the stakeholders closer to the risk society issues. For this to happen, we need to boost knowledge and dialogue.

The prevailing rationale is reproduced as scientists develop data, models, and conclusions, and expect society to accept them without questioning. However, science is not socially or politically inert, especially if its conclusions demand shifts in people's lifestyles. Scientists have the complex duty of acknowledging its scope over society and communicating its impact to all those who will have to withstand its consequences.

This context leads us to move forward towards the science of readiness.

The science of readiness needs to engage with the development and evaluation of disaster management plans. The tasks in this field require analyzing prior events to see whether the responses were effective in alleviating potentially adverse outcomes. Hence, having a science-management dialogue, and coordinating the different agencies has key importance. We can grasp this importance by seeing at what happened with Irma in Florida; preventive action, communication with society, the capacity of guaranteeing anticipation and clarity in decision-making by government staff, and preparing and mobilizing resources. These staffs were an essential factor in the planning that mitigated the otherwise even harder impacts, given the hurricane's strength. This shows the importance of articulating technology and social tools in order to increase the level of prevention and precaution.

Opening up this volume, we have the article called "*Analysis of pro-environmental attitudes and behaviors: an exploratory study with a sample of Brazilian university students*", from the authors **María Amérigo**, **Juan A. García** and **Pedro L. Côrtes**, which explores a model of environmental concern composed by four attitude-related dimensions (apathy, anthropocentrism, connectivity and emotional affinity), analyzing their relationships with pro-environmental behaviors, in order to show which strategies can be strengthened to increase environmental awareness regarding energy saving, waste and green consumption.

In seeking to understand the real dimension and the way environmental problems caused by oil exploitation technologies in remote places are handled, the authors **José Eduardo Viglio**, **Gabriela Marques Di Giulio** and **Lúcia da Costa Ferreira** use concepts borrowed from Environmental Sociology and data from quali-quantitative research in order to identify potential environmental consequences in communication and in the licensing process of the Brazilian pre-salt layer, in the article: "*Not all glitters in the black gold: uncertainties an environmental threats of the Brazilian Pre-salt*".

The article "*The interdependence of climate and socioeconomic vulnerability in the ABC Paulista region*", by the author **María Cleofé Valverde**. By means of the creation of indexes based on the aggregation of indicators collected in the IBGE censuses, and based on extreme rainfall data, she tries to identify the socioeconomic, demographic, sanitary, and extreme rain vulnerabilities in the cities of Santo André, São Caetano do Sul, São Bernardo do Campo, Mauá, Diadema, Rio Grande da Serra, e Ribeirão Pires, São Paulo state.

The authors **Gabriela Vieira de Toledo Lisboa Ataide** and **Patrícia Campos Borja** discuss about the way in which the implementation of basic sanitation municipal plans and the promotion of social and environmental justice in the cities of Alagoinhas and Belo Horizonte relate to the interests of society, the market, politics, and its institutions, in the article called "*Social and environmental justice in basic sanitation: a view on municipal planning experiences*".

"*The meaning and relevance of Ecovillages for the construction of sustainable societal alternatives*", by **Maria Accioly Dias**, **Carlos Frederico B. Loureiro**, **Leandro Chevitarese** and **Cecília de Mello e Souza**, analyzes the literature concerning ecovillages, its challenges, limits, and social role, besides discussing the way in which this diffusion of ideas and sustainable alternative practices promote concrete action to build social alternatives.

In the article titled "*Walking ethnography for the comprehension of corporal and multisensorial interactions in environmental education*", authors **Valéria Ghisloti Iared** and **Haydée Torres de Oliveira** investigate the production of significance in the aesthetic/affective experience of people with nature, aiming to understand the relationships with the human world, in addition to reflecting upon the potentials and limitations of this methodology in environmental education phenomenological research and practice.

Daniel Rondinelli Roquetti, **Evandro Mateus Moretto** and **Sérgio Mantovani Paiva Pulice** analyze how the population resettlement process that has been encouraged by the installation of the Barra Grande hydroelectric plant reorganized the local socioecological system, affecting its resilience. The article is called "*Dam-forced displacement and social-ecological resilience: the Barra Grande Hydropower Plant in Southern Brazil*".

The authors **María Barba Núñez**, **Carmen Morán de Castro** and **Pablo Meira Cartea** review the environmental education proposals contained within public policies, as well as its funding lines, in a historic moment such as the present-day; its need is greater than ever, hence they discuss the way in which the political and activist dimensions of a counter-hegemonic field are permanently subject of submission and adaptation to other models. It is entitled "*Environmental education in times of crisis. Where is it when it is most necessary?*".

Alexander Turra, **Antonia Cecília Zacagnini Amaral**, **Aurea Maria Ciotti**, **Carmen L.D.B. Rossi Wongtschowski**, **Yara Schaeffer-Novelli**, **Antonio Carlos Marques**, **Eduardo Siegle**, **Paulo Antonio de Almeida Sinisgalli**, **Cláudia Regina dos Santos** and **Aline Borges do Carmo** apply the environmental services approach to improve the Environmental Impact Assessment of the expansion works project of the São Sebastião Port (São Paulo, Brazil), strengthening our understanding of the project effects on the environmental components and processes, and on the human wellness, in the article called "*Environmental impact assessment under an ecosystem approach: the São Sebastião harbor expansion project*".

Reflecting upon the challenges of global environmental policies was the goal of "*The challenges of the Anthropocene: from international environmental politics to global governance*", by **Matías Franchini**, **Eduardo Viola** and **Ana Flávia Barros-Platiau**. It highlights the inconsistence among international environmental politics institutions and the progressive decay of planetary boundaries, in addition to stressing the need to consciously build new institutional spaces and structures where it can be ensured the cooperation among countries, fostering the transition from environmental politics to global governance.

The debate around the dramatic securitization movement of climate change, seen as grounds for a potential great global crisis, the authors **Jeroen Warner** and **Ingrid Boas** reflect upon the "promotion" of this crisis, considering in which way its framing, audience, and repercussion interfere in its development over time, in the article "*Securitisation of climate change: the risk of exaggeration*".

The article "*Power-knowledge relations in the field of Political Ecology*" by **Enrique Leff** seeks to establish a sociopolitical geography of environmental conflicts by questioning and criticizing the epistemic core of political ecology.

By analyzing the Itaipu Agreement revision, proposed by Paraguay in 2008, the author **Wagner Costa Ribeiro** argues that sharing cross-border water can be a utopia when using natural resources in border areas, pointing out the difficulties of achieving successful cooperation in water use. "*Shared use of transboundary water resources in La Plata River basin: utopia or reality?*" is the name of the article.

Daniel Ryan explores the politicization of climatic issues within the Latin-American context, presenting the way in which climate change is a matter sufficiently relevant as to enter the parties' and coalitions' agendas, in addition to thinking about the factors that affect the level of politicization in the environmental agenda, in the article "*Politics and climate change: exploring the relationship between political parties and climate issues in Latin America*".

We wish you all a great reading.

Pedro Roberto Jacobi
Editor-in-Chief, Ambiente & Sociedade Journal
Professor, Education School, University of São Paulo
Professor, Graduate Program in Environmental Science, University of São Paulo

Leandro Giatti
Adjoint Editor, Ambiente & Sociedade Journal
Associate professor, Environmental Health Department, Public Health Faculty, University of São Paulo.

http://dx.doi.org/10.1590/1809-4422asoceditorialv2032017