

## EDITORIAL 19-3

### A REFLECTION OPPOSING THE MASSIFICATION OF AGRICULTURAL PRODUCTION

This new volume of *Ambiente & Sociedade* brings 14 articles comprising a diversity of topics: agroecology and its multiple polysemies, environmental education practices, environmental behavior of university students, ecosystems and vulnerability, coastal tourism, development-aimed public policy, environmentalism and information and communication networks, agrochemical control policy, and water rationing strategies.

We touch issues which are on the spotlight of the environmental agenda in every volume; this time, we chose the problem of food production enhancement technologies and how they increase the risk to the environment and human health.

These days have glyphosate again creating controversy. Pointed out as carcinogenic, the herbicide that is responsible for removing weeds in crops controls more than half the global herbicide market. Now this debate involves the World Health Organization (WHO), the Food and Agriculture Organization of the United Nations (FAO), the European Union, and the United States of America.

Recent studies even show that glyphosate is possibly the biggest factor in the development of highly prevailing diseases in western societies, such as autism, ADHD, Alzheimer, and cancer.

The innumerable impacts derived from the emergence of agrochemicals and their intensive use have intensified the unease. After the second half of the 20<sup>th</sup> century, new technologies associated with the green revolution boosted the food production capacity, promoting environmental and health risks. More recently, since the second green revolution –that of GMOs, risks have been magnified considerably, and characterized especially by uncertainty.

Since 2008 Brazil has become the greatest consumer of agrochemicals, overtaking the United States, and also taking the leadership in the world market of these products. 22 out of 50 of the pesticides which are used in the country are banned in the EU or even in countries home to the producing companies.

The use of agrochemicals in Brazil is mainly related to export crops, such as soy, cotton, sugar cane, tobacco, and some fruits, all of them within the agribusiness model. However, we cannot underestimate the use that is given by family agriculture, producing a big share of fruits and vegetables for national consumption.

According to the National Agency for Sanitary Vigilance (ANVISA in Portuguese), 19% of the global production of pesticides is used in Brazil. Agrochemicals pollute the soil, the air, underground and surface freshwater, affecting every living being and impacting upon the entire food chain. In a recent special publication by the Brazilian Collective Health Association (ABRASCO in Portuguese), throughout 2015 the average Brazilian person consumed 7.36 liters of agrochemicals. The last ANVISA report, in 2013, showed that 78% of the collected food samples were contaminated with agrochemicals, while 36% of them tested positive for unauthorized substances and/or higher traces concentrations than what is accepted. Furthermore, research published in 2011 by the Brazilian Institute of Geography and Statistics (IBGE in Portuguese) revealed that freshwater pollution by pesticides and fertilizers is already the second highest, only behind contamination by household sewage.

Let's recall what Rachel Carson already warned us back in 1962, in her book *Silent Spring*. She showed how DDT (dichloro-diphenyl-trichloroethane) could cause cancer in human beings and interfered in the wildlife wellbeing, increasing mortality among birds. Carson even compared the effect of DDT sprayings with that of atomic bombs. Numerous studies demonstrated how the pesticide eradicated many harmless insects which were essential to the ecosystems; it was even associated with the near extinction of the pilgrim falcon.

The author also spoke against the distorted rationality of the process leading humans into seeking immediate answers, yet with severe long-term consequences, and irresponsibly giving institutional support to the chemistry industry. The claim was based especially on the lack of knowledge on the impact of the synthetic products used in cities and farming activities, as well as the absence of studies analyzing their effects. At that time, insecticides were considered extremely selective –therefore regarded as “safe”, since they allegedly acted upon harmful organisms only. This was later refuted and exposed in *Silent Spring* and posterior studies.

The evocative title of the book makes reference to the silence of the birds and insects, which were devastated by the used of biocides, as named for the first time. The book pictures a fictional city stricken by environmental damage, diagnosed by the author over time. According to her, the fictional city is a compendium of existing ones, for example, the use of DDT during the Second World War to eliminate disease vectors in combat areas.

The concept of insecticide biomagnification, that is to say, the substance's buildup and potentiation throughout the food chain, is also portrayed in the book. DDT is sprayed on crops and runs off into water bodies, where it is absorbed by small algae. Algae are then consumed by small invertebrates and tiny fish, later consumed by bigger fish and birds, increasing the pollutant's concentration every time, for it accumulates itself in fat tissue. Ultimately, DDT concentrations in the highest trophic level are lethally high and even threaten some species with extinction.

Ten years after *Silent Spring* was published, the domestic production of DDT in the U.S.A. was forbidden, along with the creation of the U.S. Environmental Protection Agency. On May 23<sup>rd</sup>, 2001, 122 countries signed the Stockholm convention on persis-

tent organic pollutants (POPs), aiming to phase out a list of 12 initial toxic substances, including DDT.

Risks multiply themselves, especially environmental and technological ones with severe consequences; they are key factors for understanding the characteristics, limits and transformations of the uncertain modernity and the industrial system. And society, creator of risks, becomes increasingly thoughtful, autocritical, acknowledging the risks behind the perils generated by society, and thus reacts to them.

Reflexivity allows us to acknowledge “manufactured uncertainties”, which are those created by the very own development of science and technology, result of human intervention in nature (Giddens, 1991, 1994). This enables anyone, no matter what context they are embedded in, to be able to appreciate the side effects associated with science and technology.

Since the 1990s, research has started recognizing the uncertainties related to those risks derived from chemical contaminants in diet, especially agrochemicals, mad-cow disease and avian flu, and GMOs. More recently, the refinement of analytical methods supports the evidence of the presence of micropollutants in food, biological samples, and even in humans, in concentrations as low as parts per billion or trillion. Nonetheless, there are still doubts regarding the risk level of a great variety of pollutants that we are in contact with, and the possibility of synergy among them.

GMOs represent a relatively new branch of research (genetic engineering); agrochemicals manufacturers create seeds which are resistant to their own pesticides, or even seeds producing insecticide plants. This GMO- and pesticide-based agricultural model is a clear example of the practices which are threatening the future of soils and agricultural biodiversity.

GMOs comprise a double risk, by their very nature of being genetically modified material, and by the intensification of the use of agrochemicals. Given their resistance to pesticides, the continuous use of transgenic seeds favors the resistance of weeds and harmful insects as well, which in turn leads the farmer to increase the dosage every time. It is not by chance that Brazil has become the world leader in agrochemicals consumption in 2008, after ten years of growing GMOs. More than half of the amount is used on soy, the first transgenic crop introduced in Brazil. In addition, the use of GMOs represents a high risk of biodiversity loss.

Amongst the social-environmental impacts, transgenic seeds spawn living beings that have the capacity of dispersion and multiplication within the environment. The contamination of non-GMO crops has been subject of important discussions for the present and future of food productions, and for the nations’ food security and sovereignty.

The global dissemination of GMOs has been characterized by the lack of scientific accuracy or dialogue with society, and there is no consent within the scientific community on the safety of GMOs to the human health or the environment.

The response capacity in face of this crisis must emerge from society as a whole, and from its power to become reflexive. Although not quite significant yet, the interest and search for organic foods and permaculture goes in that direction. Frequently, those who choose other production systems are, likewise, concerned with the planet’s health

and with their own as well. For this trend to continue, it is critical to have growing transparency as for food commercialization, thus evincing how important it is to be able to identify GMOs within the market.

The article “Agroecology: polysemy, pluralism and controversies” by Luiz Antonio Norder, Claire Lamine, Stephane Bellon and Alfio Brandenburg, analyses the peculiarities of agroecology in science, social movements, education, and government policies, based on the Brazilian and French experience.

Authors Laila Sandroni and Maria José Carneiro survey the production in social sciences dealing with environments where the conservation of biodiversity is a central aspect to the research. They pinpoint some bibliographical trends and knowledge gaps in the article “Biodiversity Conservation” in Brazilian social sciences: a systematic review from 1992 to 2010”.

In an attempt to identify the stakeholders’ perceptions and expectations about the contribution of third sector organizations to environmental education, authors Virgínia Talaveira Valentini Tristão and José Americo Martelli Tristão use the Delphi method to identify the way this happens as a new pedagogical proposal. The article is called “The contribution of NGOs in environmental education: na evaluation od stakeholders perception”.

Aiming to clarify the strategies used by the media to greenwash ethanol production, Wendell Ficher Teixeira Assis analyses advertising sponsored by the sugar-cane sector through the main media outlets, as well as those published by the European Union and United States press in the article “Media justifications: strategies for environmentalization of ethanol production through advertising”.

In the paper called “Local benefits of the Atlantic Forest: evidences from rural communities in Southern Brazil”, the authors Gisele Garcia Alarcon, Alfredo Celso Fantini and Carlos H. Salvador sought to understand how rural producers perceive the role of the forest as keeper of environmental services, through the study of these communities and the application of surveys.

By means of a comparative study, Pedro Luiz Côrtes, António Guerner Dias, Maria Eduarda da Silva Teixeira Fernandes and Jorge Manuel Vieira Pamplona examined university students’ behavior before environmental matters, observing what factors influenced their speech, stance, and options. “Environmental behavior: a comparative study between Brazilian and Portuguese students” is the name of the article.

A field survey and vulnerability index analysis were the tools that Luana Portz, João Pedro De Moura Jardim, Rogério Portantiolo Manzolli and Nelson Sambaqui Gruber used to identify the factors that contributed the most to the degradation of the frontal dunes at the seafont in Capão da Canoa, RS, Brazil, and reported it in their article “Impacts on the dunes system: natural dynamic versus anthropogenic interference”.

“Public policies development: convergences and divergences in the Bodoquena-Pantanal Geopark” is an article by Maria Cristiane Fernandes da Silva Lunas, Ademir Kleber Morbeck de Oliveira and Vera Lúcia Ramos Bononi. They looked at both the implicit and explicit objectives of public policies aimed to implement the Geopark from a regional development perspective.

The authors Plínio Guimarães de Sousa, Esdras Matheus Matias and Vanice Santiago Fragoso Selva mapped real estate touristic projects in trying to identify their impacts on the Brazilian north-eastern coast and contrasting them with their environmental discourses. They report it in their article “From residential tourism to tourist real estate complexes: the appropriation of the coastal zone in the Northeast of Brazil by tourist real estate activities”.

By means of mapping the CDM activities and projects approved by the national Interministry Commission on Global Climate Change, the article “CDM projects in Brazil: Market opportunity for companies and new designated operational entities” by Camila Torres, Ricardo K.S. Fermam and Isabel Sbragia identifies opportunities for the entry of new certifying companies into the national CDM market.

In presenting the history of the creation of the Federal Law on agrochemicals production, commerce, and use control in Brazil, the article “(De)constructing the political agenda of control over pesticides in Brazil” retrieves the environmentalist movements’ participation and analyses the main attempts of deconstruction and weakening of those laws. Authors: Caroline da Rocha Franco and Victor Pelaez.

Sonia Aguiar, Iargo de Souza Santos, Nayara Arêdes and Sóstina Silva take networks composed by environmentalist organizations and social movements concerned with the protection of Brazilian biomes, and discuss about the organizational structures and informational and communication resources they use to reach their goals. You can read about it in “Biome-networks: information and communication for sociopolitical action in eco-regions”.

“Contribution to the study of measures for the reduction of apparent water loss in urban areas” is the name of the article written by Cristina Mendes Silva, Valter Lúcio de Pádua and Jorge Martins Borges, in which they evaluate how substituting hydrometers could be an alternative when needing efficiency improvements by the public supply service providers.

Authors Sílvia Laine Borges, Ludivine Eloy, Isabel Belloni Schmidt, Ana Carolina Sena Barradas and Ivanilton Almeida dos Santos, in their work “Fire management in Veredas (Palm Swamps): New perspectives on traditional farming systems in Jalapão, Brazil”, studied the ways in which traditional fire use fosters vegetation maintenance and contributes to the process of natural ecological succession.

We wish you all a pleasant reading.

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