

Environmental injustice inside our bodies? – Human body burdens of dangerous chemicals in Brazil and Germany

Our responsibility for one world: International Environmental Justice

The international division of labour has changed national economies worldwide. More and more we realize that it has also changed the environment. But economic benefits and burdens for the environment and our health have been distributed unevenly. The Organisation for Economic Co-operation and Development (OECD) estimated that the annual growth of chemicals production in the BRICS states (Brazil, Russia, India, China, and South Africa) exceeds the growth in the highly industrialized OECD states including Germany by the factor of three.

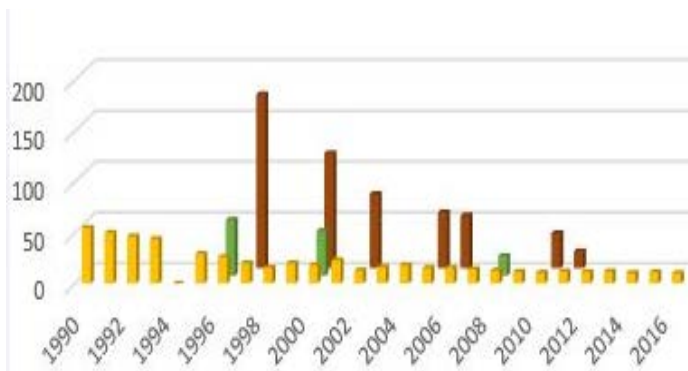
Does this lead to higher pollution in developing countries and thus to environmental and health related injustice? This question has been approached by a joint project of the German Environment Agency (UBA) and the Universidade Federal da Bahia in Salvador (UFBA), Brazil, within the framework of the program „Ciência sem fronteiras” (Science without borders).

For this project the region of the All Saints Bay (Baía Todos os Santos) was chosen as an example. For developing countries many data are available for highly polluted local hotspots where electronic devices are scrapped, textiles are produced or ships are wrecked. However, data on normally industrialized larger areas are scarce.

The All Saints Bay stretches over 1,200 sqkm and opens to the Atlantic Ocean near the city of Salvador which is the capital of the Brazilian State of Bahia. 2.1 million inhabitants are living in the urban and rural areas surrounding the bay. The bay and its neighbouring marine areas are a major source of food for the local people. Beside fish, shellfish such as mussels and crabs are the main protein source for many local communities.

The environment and the waters of the All Saints Bay are far from being unpolluted. At the northern shore of the Bay the largest petrochemical complex of the southern hemisphere is situated. Even directly in front of this large industrial complex local people – mostly children and teenagers – can be watched picking seafood from the highly contaminated sediments (see picture). Other industrial activities caused high levels of mercury and lead in the bay's ecosystems and probably in humans.





Blood lead levels in Brazil and Germany. Yellow: Blood lead levels from Germany (ESB, general population). Green: Brazil, general population. Red: Brazil, specifically exposed populations (several data sources, see below; all data in µg/L).

Indeed, preliminary data show that humans and ecosystems in the area of All Saints Bay are considerably polluted. For example, Polycyclic Aromatic Hydrocarbons (PAHs), which are ingredients of crude oil and are also formed during combustion processes, are found in shellfish in higher concentrations than in comparable studies from other regions in Brazil. In those parts of the bay that are influenced by the activities of the petrochemical complex the fingerprint of the different chemicals that form the mixture of PAHs indicate contaminations of crude oil while in less influenced parts of the bay

PAHs are more similar to those that are formed by combustion (transported via the air).

A comprehensive documentation of the geological, meteorological, hydrographical, social, and climatologic conditions and some aspects of environmental quality in this region was compiled by Professor Tavares from UFBA in a social environmental atlas of the Baía Todos os Santos. This extensive piece of basic knowledge is the prerequisite for an interpretation and assessment of environmental data. For comparison, data for Germany can be used to illustrate average levels of contamination in an industrialized country. This information about human and environmental trends of pollution has been available since 1985 from the German Environmental Specimen Bank (ESB).

The ongoing co-operation between the Federal University of Bahia UFBA and the German Environment Agency will make further data available in the form of a systematic review of Biomonitoring data of the most important environmental pollutants. The goal is to evaluate the validity of the hypothesis that preliminary data indicate: International economic co-operation is not environmentally just. Those parts of the value creation chain that are environmentally risky are preferentially located in developing countries.

Websites

- **German Environmental Specimen Bank (ESB)** [short link: <http://bit.ly/1LbVSRn>]

Data sources

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Author: Dr Andreas Gies, Head of Environmental Hygiene Department, Prof. Tania Tavares, UFBA

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Office address: Corrensplatz 1, D - 14195 Berlin

E-mail: telegramm@uba.de | Internet: www.umweltbundesamt.de

Picture p. 1: Sonilda Maria Teixeira da Silva

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