

# ENVIRONMENTAL LEVELS AND TRENDS

## AN ASSESSMENT OF 30 YEARS OF ENVIRONMENTAL ORGANOCHLORINE RESIDUE DATA FROM SOUTHERN AFRICA

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### Introduction

The recent conclusion of the negotiations of the Stockholm Convention on Persistent Organic Pollutants (??) highlighted a number of issues regarding developing countries. These include inter alia social, health and economic concerns, related to knowledge, alternatives and implementation of the provisions of the Convention. However, it is also true that many developing countries may become party to the convention without a good basis on which to assess the situation in their own environments, due to a lack of data. Where there are data available, these are likely to be in the form of scattered publications, reports or sources not in the public domain. This apparent lack of information has led to the GEF supporting a global project, to assess, on a regional basis, the source, environmental and long range transport data associated, not only with the identified POPs, but also other chemicals that have similar properties. The aim of this project, with UNEP Chemicals as implementing agency, started in 2001, and is due for completion early in 2003.

A major part of this project was the data collection phase. An online system (??) was developed by UNEP, where, on a regional basis, regional task team members, as well as others entered available data. Source and environmental data were collected for aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, toxaphene, PCBs, dioxins, furans, chlordecone, hexabromobiphenyl, HCH, PAHs, PBDE, chlorinated paraffins, endosulphan, atrazine, pentachlorophenol, organic mercury tin and lead compounds, phthalates, octylphenols, and nonylphenols.

The aim of this presentation is to assess the data collected by this project, for South Africa, Zimbabwe, Swaziland, Lesotho, Namibia and Botswana.

### Methods and Materials

The major form of data collection was via literature searches and contacts with scientists and administrators where appropriate. The last was especially relevant, as many reports and non-published theses and data were traced that were otherwise not taken up in literature indexes.

All data sources were evaluated according to a number of criteria, as required for the on-line data forms (??). Some of these criteria were locality, matrix, date and sample treatment information. Multiple analysis (e.g. DDT residue data for 10 dolphins were entered on one form, indicating number of samples, minimum, maximum, mean and median, where available. Geographic data was entered as UNEP ?? designations, but in most cases, the name of the site was entered in the comments section. The entered data were then checked, mostly against the original source, before that specific form was accepted.

### Results and Discussion

Between 200-300 data sources were identified. Some of these were not used as not enough of the criteria were met within the source. Of the six countries, Only Lesotho had no environmental residue

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data that we could trace. Swaziland had very little. More was available for Botswana and Namibia, but the bulk of the data were from Zimbabwe and South Africa. For all the countries, the most data were for pesticide residues. Most of these were for the organochlorine pesticides, with DDT and dieldrin featuring in most. This reflected the previous use of these two pesticides for agriculture and Tsetse fly control, as well as the ongoing use of DDT for malaria control. Some recent studies have provided substantial data for other organochlorine residues in water and fish and water. Atrazine seems to have been a major concern in South Africa, with many studies looking at this particular chemical in ground and surface water specifically.

For nonylphenol very little data was available for South Africa, and none for the other countries. PCB data was obtained mainly from South Africa, with some coming from Zimbabwe, and none from the other countries. PCB data were relatively old, some dating two decades or more, mainly from marine studies.

Dioxins and furans featured very little with some scattered data from South Africa (??) and Namibia (??) only. It is remarkable that almost all the samples that were tested had detectable quantities of these compounds.

The major matrixes that were analysed were biota and water. Fish and bird residues featured prominently, but there were also data for crocodiles, insects, cats and marine mammals, again most of them featuring the OC pesticides. Very little of the data reflected spillages or other incidents, with most studies concentrating on general residue levels.

A significant proportion of the data were from Zimbabwe, that reflected local and international attention on the use of DDT for various purposes, especially for Tsetse fly and malaria control around the Lake Kariba Region. In South Africa, the distribution of the studies concentrated mainly along the coast, and the eastern and northern interior. This reflected the concern from agricultural use and consequent fresh water and marine pollution. Hardly any studies were performed in the more arid parts of the country, except for a small number concerned with locust control.

Although there are numerous studies available for heavy metals (lead, mercury and tin) levels in all manner of matrixes in all the countries, none that we could trace actually measured the organometals. Nor did we trace any studies or reports concerning chlordecone, hexabromobiphenyl, PAHs, PBDE, chlorinated paraffins, pentachlorophenol, and octylphenols.