



Prepared on behalf of International HCH and Pesticides Association (IHPA)

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**Aim**

The aim of this newsletter is to disseminate information in a cost-effective way on the developments taking place in bioremediation technology moving the frontiers of technology for commercial exploitation both in developed and developing countries. Special emphasis will be given to bio-removal of pollutants in soil, water matrices and will cover mainly Persistent Organic Pollutants (POPs) as designated by the Stockholm Convention on POPs and also other persistent toxic pollutants not covered under the POPs conventions. It will also highlight cleaner and environment friendly technologies, which show good promise. The newsletter will not go into technical details of selected scientific publications but only highlight salient features for the benefit of the readers.

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**Note from the Editor**

The first issue of the bioremediation newsletter came out in April 2002. The second issue is now released in August and during this month a major world gathering is to take place in Johannesburg. This meeting, known as 'The World Summit on Sustainable Development', is meant to be a follow-up of the Earth Summit held in Rio de Janeiro a decade ago. Ten years on, the title of the Johannesburg meeting whichever way it is defined will have technical, political and economic implications as to how to grow in an environmentally friendly way under the context of globalization. Rio Summit ended up dealing chiefly with such green concerns as global warming while Johannesburg is due to focus more on poverty alleviation. According to Mr. Valli Moosa, South Africa's environment minister, 'the stage is being set for one of the most significant global gatherings of modern times.'

It is befitting that this summit is taking place in Africa where issues such as AIDS, poverty alleviation, pollution, drought are major topics for Africa and the World's attention will be focused on this continent. It is expected that many international organizations will converge on Johannesburg to discuss a number of issues which would also include pollution control including POPs.

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**International Organizations.**

In the last issue, we provided contributions from UNEP and UNIDO on their work related to POPs. In this issue we are pleased to provide contribution from FAO, which is one of the very first UN organizations to embark on POPs remediation especially in Africa. The FAO has a great practical experience in handling and safely disposing of obsolete pesticides stocks in developing countries.

The FAO programme on obsolete and banned pesticides that began from a small initiative in 1994 is now high on the International Agenda. The initial focus was mainly in Africa and the Near East. Now the Far East, South American countries and the Caribbean are covered. Also in some limited ways guidelines and the necessary advice are provided to the Commonwealth Independent States (CIS). In Africa the FAO inventory database indicates the existence of a total of 120, 000 tonnes. This toxic waste contains both Persistent Organic Pollutants (POPs) and other pesticides. FAO continues to be concerned on how to get rid of a total of nearly 50,000 tonnes of waste identified in 46 countries in Africa. The remaining 70,000 tonnes most of which is made up of POPs is to be left to a company that generated and is responsible for the production of the chemical over a period of several decades.

The effort to address the problem country by country having proved to be very slow, FAO is embarking on Africa wide initiative referred to as Africa Stockpile Programme (ASP). It is a programme that is born and being developed under a strategic partnership involving several UN and other organizations. The objective is to raise US\$ 250 million to free Africa from the legacy and bondage of toxic waste that has been inflicted on the continent for decades. In order to highlight ASP and its basic objectives, the relevant information is attached herewith.

The issues and problems surrounding the obsolete and banned pesticide stocks in Africa can't be summarised in simple terms. The usual terms such as stewardship, responsible-use and safe-use are far from their meanings. The problem and quantities of obsolete stockpiles instead of decreasing are on the increase. Pesticide waste fall into four major categories:

1. Obsolete pesticides that are in liquid form, granules, powders, gasses, emulsions, etc;
2. Empty pesticide containers of all kinds and types that are left at the farm gates, high streets both in rural and urban areas. Most containers are used for domestic purposes such as for fetching or storing water and food.
3. Heavily contaminated soil;
4. Buried pesticides and/or related waste of all types and kinds, etc.

There is not a single country free from obsolete pesticide waste and the problem is worse in Africa for the following four major reasons.

1. There is widespread unawareness of the inherent danger of pesticides
2. No facilities for disposal
3. No expertise to provide the necessary guidance and above all
4. No financial resources to address the problem.

Some major disposal operations are currently operational such as in Ethiopia for which a sum of US\$ 4.4 million was secured from benevolent donors namely the Governments of the Netherlands, Sweden and USAID to clean up a total of 1,500 tonnes identified at the outset. Unfortunately an additional total of 1,900 tonnes was identified soon after FAO appointed a manager for the disposal operation. The additional waste required a further sum of US\$ 3.5 million for disposal. At this stage it is impossible for many countries that are in need of assistance because of serious financial constraints but as and when the ASP will take off the ground and running, most will benefit and be free from the legacy of toxic waste in order of priorities.

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**News Items:**

Central and Eastern Europe.

As far as hazardous pesticides including POPs are concerned, this region neighbouring the EU and other West European countries pose a great risk due to unlimited production, storage and use of hazardous pesticides (many of them POPs) during the days of cold war era. This problem was very well expanded in the last IHPA Forum in Poznan. One news item from Russia given below shows the gravity of the situation due to illegal operations.

Russia in May 2002 signed the Stockholm POPs Convention. Problems facing Russia and the CIS countries in dealing with POPs are enormous. One such problem is faced by the Kalingrad Region, which will send 90 tons of chemical pesticides to Krasnyy Bor testing ground in Leningrad Region to be reprocessed or buried there. This also includes 39 tons of hazardous pesticides brought illegally from Lithuania as fertilizer. Russia faces a formidable challenge in identifying hot spots and taking the required action and the cost of these operations could be enormous and needs international cooperation.

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Initiatives in Central and Eastern Europe CEE.

The IHPA Fora on POPs in CEE held over a number of years including the last one at Poznan has opened the eyes of donor countries and International organizations. Thanks to the overwhelming support given by host countries and participation by many institutions and individual experts, there is a greater awareness, appreciation and understanding of the problems faced by CEE countries in dealing with POPs. The 7th International HCH & Pesticides Forum to be held in May 2003 in Kiev is appropriately named 'Towards the Establishment of a Central/Eastern European and Central Asia'. Obsolete Pesticides Stockpile Project similar to ASP. For further information contact: [john.vijgen@get2net.dk](mailto:john.vijgen@get2net.dk) or <http://hjem.get2net.dk/HCH-Pesticides>

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UNIDO's Programme Turns to Central and Eastern Europe(CEE):

UNIDO in collaboration with The Ministry of Environment of the Slovak Republic, organized in June, 2002 an 'International Forum on Strategies and Priorities for Environmental Industries'. The Forum was attended by very senior level government delegations from 18 CES countries. UNIDO is also working closely with IHPA (Mr. John Vijgen ) to develop a regional initiative on 'Establishment of a Fund for Disposal of Obsolete Stockpiles of Persistent organic Pollutants in CEE'. In the Forum, Mr. Zoltan Csizer, Director, UNIDO presented an elaborate paper giving UNIDO's programme on POPs . He mentioned about UNIDO's enabling activities on POPs supported by GEF. To date UNIDO got 22 proposals approved by GEF on a global basis. Of this 7 proposals cover CEE countries. UNIDO is also putting emphasis on non-combustion technologies for destroying POPs. According to Mr. Csizer, one project in Slovak Republic and The Philippines is already being implemented. Projects on following categories are under various stages of formulation:

- Environmentally sound POPs disposal technologies.
- Botanical or biological replacements for POPs pesticides
- Bio and phytoremediation of POPs contaminated wastes/soils
- Cleaner production to remove POPs emissions from industrial and agro-processing industries.

He also specified a proposal for the establishment of a fund for the disposal of obsolete stockpiles of POPs in the CEE in collaboration with IHPA. This was the follow-up of the Poznan Forum held in the year 2001.

(For further information on the paper please contact [z.csizer@unido.org](mailto:z.csizer@unido.org))

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Phytoremediation: Comprehensive Reports from DGlass Associates.

Market reports on bioremediation and phytoremediation, and although they are now 2-3 years old, are available and would provide a great deal of background on the commercial applications of this technology, including information on actual field projects for soil remediation, groundwater remediation, wastewater treatment, and other uses. The reports also discuss the market size, the industry and the companies pursuing the technology. The executive summary of the most comprehensive phytoremediation report is available online at [www.channel1.com/dglassassoc/INFO/phy99exc.htm](http://www.channel1.com/dglassassoc/INFO/phy99exc.htm)  
Links to other phyto reports and bioremediation reports can be accessed from home page <http://www.channel1.com/dglassassoc/>

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Training course on Phytoremediation

ITRC Phytotechnologies - August 13. This ITRC seminar focuses on the ITRC Phytotechnologies Technical and Regulatory Guidance and Phytoremediation Decision Tree. It provides technical and regulatory information to help you understand, evaluate and make informed decisions on phytotechnology proposals. For more information and to register, see <http://www.itrcweb.org> or <http://clu-in.org/studio> .

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Arsenic Removal:

Arsenic leaching into the drinking water has been one of the major problems faced in some developing countries. An incident in Bangladesh is an eye opener to this problem. Here are some proven alternatives for above ground Treatment of arsenic in groundwater (EPA 542-S-02-002). This issue paper, developed for EPA's Engineering Forum, identifies and summarizes Experiences with proven above ground treatment alternatives for arsenic in groundwater, and provides information on their relative effectiveness and cost. The four technologies included in the report are precipitation/coprecipitation, adsorption, ion exchange, and membrane filtration. The report describes the theory and operation of each technique, available project-specific performance and cost data, and limitations. The report also discusses special considerations for retrofitting systems to meet the lower arsenic drinking water standard (maximum contaminant level or MCL) of 10 ug/l (June 2002, 63 pages). View or download at <http://clu-in.org/techpubs.htm>.

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Funding for Project Proposal.

A fourth call for outline proposals will soon be announced by the UK LINK Bioremediation Programme. Launched in April 2001, the Programme supports the development of technologies that will provide UK industry with the multi-disciplinary capability necessary to enable the commercial exploitation of biotechnology for the clean up of contaminated land, air and water. The programme is sponsored by the DTI, the Biotechnology and Biological Sciences Research Council (BBSRC), Engineering & Physical Sciences Research Council (EPSRC) and Environment Agency (EA). Up to GBP 7.5 million of public funding is available, NERC, MRC, ESRC and SEERAD (Scottish Executive Environment and Rural Affairs Department) will contribute on a project-by-project basis. Public support will be no more than 50% of total eligible costs. The following focus areas have been identified for the programme:

- 1) To understand and exploit natural attenuation in groundwater and soil;
- 2) To improve engineered in situ bioremediation, interfacing microbiology with engineering and hydrogeology;
- 3) To translate the results of laboratory studies into the field (scale-up);
- 4) To position bioremediation within a risk management framework;
- 5) To develop the ability to monitor in situ microbial processes;
- 6) To understand the constraints on in situ microbial processes;
- 7) To integrate bioremediation with other technologies;
- 8) To quantify human health impacts of bioremediation and develop surrogate testing;

9) To address socio-economic issues of bioremediation technologies and decision-support mechanisms.

Projects must involve one or more companies and at least one research base organisation and must be able to demonstrate clear and realistic routes to commercial exploitation. Multinationals can also participate provided they have a significant manufacturing and research operation in the UK, and the benefits of research are to be exploited in the UK or European Economic Area. It is the planned exploitation route that is key and the net benefit to the UK. For information contact the Programme Co-ordinators: Colin Cunningham ([c.cunningham@ed.ac.uk](mailto:c.cunningham@ed.ac.uk)) or Jim Philp ([j.philp@napier.ac.uk](mailto:j.philp@napier.ac.uk)) Contaminated Land Assessment and Remediation Research Centre (CLARRC) or visit the programme website [www.clarrc.ed.ac.uk/link](http://www.clarrc.ed.ac.uk/link).

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Green revolution is now 'Greed Revolution': Swaminathan

Mr. M.S. Swaminathan, the father of green revolution warns that 'green revolution' is becoming 'greed revolution' as evident in the indiscriminate use of pesticides for higher productivity. Exploitive agriculture posed great dangers if carried out with only an immediate profit or production motive. According to Mr. Swaminathan the emerging exploitive farmers should be wary of this. Intensive cultivation without conservation of soil fertility and structure would lead to desertification. Instead of agricultural prosperity, it may lead us into an era of agricultural disaster.

He said that indiscriminate use of pesticides, fungicides and herbicides could cause adverse changes in biological balance. If not properly applied, it could lead to an increase in the incidence of cancer and other diseases through toxic residues in grains or other edible parts of crops.

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