POPs Newsletter

No 17, June 2009
Prepared on behalf of **IHPA**

In this issue:

Aim

The aim of this newsletter is to disseminate information in a cost-effective way on the developments taking place in the area of POPs as implicated in the Stockholm Convention and other PTS of concern. It will cover, among others, the news on science and technology for disposal of obsolete stocks and remediation of POPs contamination which might be of interest for commercial exploitation both in developed and developing countries. Special emphasis will be given to bio-remediation, non-combustion related technologies which will benefit developing countries. The newsletter will not go into technical details of selected scientific publications but only highlight salient features for the benefit of the readers. One can **subscribe** and read IHPA Newsletter (2 times/yr free of charge).

Note from the Editors

This Newsletter is coming out a few months before the 10th IHPA Forum to be held in Brno from Sept. 7-9, 2009 under the leadership of our co-editor Prof. Ivan Holoubek. In this issue we are having a brief review on Malaria written by the editor to commemorate April 24 which was Malaria day. During this period we had he 4th COP meeting of POPs in Geneva and we have an abstract of an interesting paper on POPs contaminated soil published in a journal - Environmental Science. The publishers of the journal through Dr. Roland Weber has given free access to the readers for a limited period.

1. Malaria - tiny mosquito that daunts the world

By

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The author is an organic chemist and was involved in total synthesis if cinchona alkaloids with Prof. Marshall Gates and worked in UNIDO on pesticide safety in agriculture and public health use. Currently he is a freelance consultant. This article is published to commemorate the Malaria day which fell in April 2009.

1.1 Introduction

According to history, malarial parasites first infected *Homo erectus*[1] a million years ago in the forests of Southeast Asia. Until 1880 it was a mystery, when a French Physician Charles Laveran spotted a strange microbe in the blood of affected patients and other researchers began to trace the complex web linking the mosquito, the parasite and the illness. We now know that there are four species of malarial parasites (*plasmaodium vivax* is the most common and *plasmodium falciparum* the most deadly). In 1955, WHO declared that with new drugs the disease would soon be eradicated. That turned out to be a wishful thinking because almost 270 million people are infected with malaria and 1-2 million die annually mainly children in Africa alone. With grave statistics in their hand and man losing the battle against malaria, WHO started “Roll back Malaria Programme” and once again the world’s attention has been drawn to it and more philanthropists from different walks of life and aid organizations joined to provide financial support in cash and in kind. The latest one was from the UN through a 3 billion dollar aid to combat one single tiny creature - mosquito (*Anopheles*).

April 25 this year was World Malaria Day and this prompted extensive media coverage and it was the Financial Times[2], UK that led the way with a twelve six column pages review dated April 24, 2009. This tiny but noisy and deadly creature, has a direct bearing on UN Millennium Development Goal and an International Convention called the Stockholm Convention which included the insecticide DDT (p,p dichlorodiphenyltrichloroethane) as one of the persistent organic pollutants that should be eliminated to protect mankind and the environment. It is rather ironical that this very chemical from the time of the discovery of its insecticidal properties by Muller[3] in 1940 especially against mosquito, saved millions and millions of lives including possibly of that of the author of this article who hails from mosquito prevalent Indian sub-continent, DDT was marketed in 1942 under the name of Gesarol in crop protection and under the name Neocid in the field of human hygiene[4]. The chemical interferes with the transport of Na+, K+, and Mg2+ in Adenosine triphospharases. Extensive use of the chemical, especially in agriculture, resulted in many species building up resistance thereby most of the chemical ended up in the environment. However, its proper use in malaria vector control has been a great boon to many developing countries as poor man’s answer for prevention of malaria. After the publication of Silver Springs by Rachel Carson[5], Beyond Silent Spring from UNEP/ICIPE [6] Our Stolen Future by Theo Colborn and others[7] in which US Vice President and Nobel Laureate Al Gore wrote “it is now clear that we waited too long to ask the right questions about the CFCs that eventually attacked the ozone layer, and we are going too slow in addressing the threat of climate change. We certainly waited too log to ask the right questions about PCBs, DDT and other chemicals, now banned, that presented serious human health risks” he added on to say that the American people have the right to know the substances to which they and their children are being exposed and to know every thing that science can tell us about the hazards. All this meant dark clouds started gathering on the fate of DDT which ignited a great debate as to what should be done with DDT. The DDT was embroiled in a complex issue of political, economic, social, technical, financial, environmental and toxicological connotations. While the “haves” in developed and developing countries successfully moved to safer alternatives in terms of prevention and cure, the “have nots” in poor developing countries especially children were succumbing to the disease in their millions. According to an estimate more than a million die each year and an estimated 12 billion dollar productivity is lost in Africa alone. So the money spent by aid agencies is pittance compared to this loss of productivity, let alone the loss of lives of innocent children. South Africa was free of malaria till 1997 but it started coming back after the government stopped spraying with DDT in favour of less effective alternatives. By 2000 the number of malaria cases reached 64 000 in South Africa alone and the situation got so bad, South Africa’s Kwa Zulu Natal province switched back to DDT despite its detrimental effects on wildlife[8]. In this connection I would like to refer to our citing in IHPA Newsletter[9] in which we covered the problems facing developing countries in getting safer alternatives for malaria control.

By all calculations, such big losses of life is avoidable and simple prevention such as the residual insecticide sprays including the DDT as per WHO instructions and the use of impregnated bed nets are already saving millions of people from the formidable mosquito and new drug alternatives are used to cure *plasmodium falciparum* its most lethal variant.

1.2 Chemistry

The breakthrough occurred in the 17th century when European missionaries learned that the bark of South American cinchona trees contained the potent but toxic remedy now known as quinine. In 1817, the first isolation of quinine from cinchona bark was done by Pierre Joseph Pelletier. By 1920s reliable supplies of quinine was available. In 1943 a better alternative chloroquine was introduced by the US Military. Now man’s arsenal against malaria includes related drugs mefloquine, halofantrine, Fansidar and the expensive Chinese herbal medicine from qing haosu called artimisinin. Unfortunately many of these drugs are becoming victims to malarial parasite resistance especially in the Thai/Burma/Cambodia border area.

Total Synthesis of quinine or its isomers in the laboratory was achieved by three famous synthetic chemists first in 1944 by Robert Woodword[10] later by Marshall Gates[11] and finally by Gilbert Stork[12] in the USA. However, these classical total synthesis did not bring better and simpler molecules.

1.3 Malaria cycle

The malaria cycle starts when the parasite is transferred from an adult female mosquito to humans and within minutes it reaches the liver and replicates defying body immune system. Then the parasites from the liver enter back into the blood stream and enter the red blood cells and form male and female cells called gametocytes and start to reproduce again defying the human immune system. At this stage the infected person gets fever and chills. When other mosquitoes bite the infected person and suck up the gametocytes where in its gut the parasite enters gamete/zygote stage and when it bites another human the malaria cycle starts again. This is a simple way of describing a complex cycle relationship of mosquito-parasites and man. The DNA mapping of the single–celled malaria parasite and the mosquito that carries it, scientists hope to understand the enemy better. They were surprised that evolution designed so perfectly for piercing human body's defences. The new genomic data of the parasite will give the researchers a clue as to where to intervene in its pathway with new drugs[8]

1.4 Fight against malaria

Scientists in the UK looked at it in a "lateral thinking" and asked the question, why mosquitoes are not infected by the very parasites they generate and how their immune system kills malarial parasites[13]. According to their findings, a complex of two proteins (LR1M1 and APL1C) that detect the parasites and activates a third protein TEP1 which kills the parasites by punching holes in their cell membranes. This findings could open up ways and methods of combating the disease. In the 80s and 90s drug companies gave up looking for potent medicines and the feeling was "it makes little sense to turn out costly pharmaceuticals for people who can't afford shoes". Developing a right vaccine could be the answer for the poor man to fight the disease. But 20 years on, finding a good vaccine is still many years even decades away. However, drug companies with a change of heart are now fully involved in finding better drugs to combat malaria. Until then the "have nots" in developing countries will have to adopt "prevention is better than cure" and should try keep the malaria messenger *viz* the formidable mosquito at bay by simple physical/chemical/ biological/physical and environmental approaches. Through community involvement under the Integrated Vector Management (IVM).

1.5 Conclusion

The Stockholm Convention through the Global Environment Facility (GEF) has established a financing mechanism to promote capacity building for DDT alternatives in developing countries. Here the so called public/private partnership (PPP) as possible answer to protect the "have nots" from malaria in the developing countries through IVM. Whatever the case, mosquitoes which survived for millions of years can only be controlled but can never be eliminated.

1.6 Useful References

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5. Rachel Carson, Silent Spring , Pub. Houghton Mifflin, 1962
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8. Fred Guterl, Newsweek, October 14, p53, 2002.
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13. Chem.and Industry, March 23, p.11, 2009.

2. POPs contaminated sites

2.1 The start of remediation in industrial countries

All of us might recall the famous "Love Canal" story which started almost 80 years back when General Electric Company Ltd., dumped toxic persistent chemicals in a vast area in a town called Niagra Falls and also directly in the vicinity of Hudson river. At that time there was nothing legally wrong with what the company did but when decades later, residential areas and schools and playgrounds started developing around the contaminated areas, the residents started the ill effects of getting exposed to toxic persistent chemicals. Deadly chemicals started oozing (leaking or penetrating) through the ground into basements and a school, burning children and pets and, according to experts, causing birth defects and miscarriages. The neighbourhood had been built on a 19th-century canal where a toxic mix of more than 80 industrial chemicals had been buried. The American government stepped in and the well known US EPA "Superfund " was initiated.

After decades of court litigations, passing a number legislations, developing land remediation techniques, evacuation of townships, payment of compensation and finally carrying out expensive remediation, the Love Canal site was recently declared free of PTS and was taken off the Superfund List.

According to the reports, the removal of Love Canal from the Superfund list will be mostly symbolic. The cleanup at the toxic waste site, the nation's most notorious, took 21 years and cost close to $400 million, before a clean verdict was given.

That is not the end of the story. The PCBs stuck in the sediments of the Hudson river needed to be cleaned up and for the first time

in May, 2009 according to New York Times, “a floating dredge lowered a clamshell bucket to the bottom of the Hudson River and pulled up a load of muck contaminated with PCBs — oily industrial lubricants that General Electric spent decades dumping into the river, and decades more fighting to keep there. It was a big moment — the beginning, after years of legal, scientific and political wrangling, of one of the costliest and most complicated environmental cleanups in American history. It was testimony to the power of sustained advocacy, and a tribute to everyone — private citizens, environmental groups, scientists, politicians from both parties — who had fought to make it happen”.
This a clear indication of the great burden faced by society at large due to POPs and other PTS contaminated sites.

2.2. Series on Dioxin/POPs contaminated sites from Science Community
Recently the journal Environmental Pollution Research (ESPR) has started a series on ”Case Studies on Dioxin and POP Contaminated Sites – Contemporary and Future Relevance and Challenges” documenting the contemporary challenge of Dioxin/POPs contaminated sites. By this approach the science community give their contribution to evaluating and documenting the contemporary challenges of contaminated sites.
The introduction article and the editorial have given open access for free download :
http://www.scientificjournals.com/sj/espr/Pdf/aId/10649 and http://www.springerlink.com/content/0q10km8582605r1x/fulltext.pdf

Abstract of the introduction article:
Once they have been generated, PCDD/Fs and other POPs can persist in soils and sediments and in waste repositories for periods extending from decades to centuries. In 1994 the USEPA concluded that contaminated sites and other reservoirs are likely to become the major source of contemporary pollution problems with these substances.
With this in mind, this introduction article is the first in a new series in ESPR under the title ”Case Studies on Dioxin and POP Contaminated Sites – Contemporary and Future Relevance and Challenges” and which will address this important issue. The series will document various experiences from sites contaminated with PCDD/F and other POPs. This article provides a review of the subject in its own right and identifies the key issues arising from dioxin/POPs contaminated sites. Additionally, it highlights the important conclusions which can be drawn from these examples. The key aims of this article and of the series as a whole are to provide a comprehensive overview of the types of PCDD/F contaminated sites which exist as a result of historical activities. It details the various processes whereby these sites became contaminated and attempts to evaluate their contemporary relevance as sources of PCDD/Fs and other POPs. It also details the various strategies used to assess these historical legacies of contamination and the concepts developed, or which are under development, to effect their remediation.

The introduction article *(**link to introduction article*) provides a systematic categorisation of types of PCDD/F and POPs contaminated sites. These are categorised according to the chemical or manufacturing process which generated the PCDD/Fs or POPs and also includes the use and disposal aspects of the product life-cycle in question.
The highest historical PCDD/F and dioxin-like PCB contamination burdens have arisen as a result of the production of chlorine and of chlorinated organic chemicals. In particular the production of chlorinated pesticides, PCBs and the related contaminated waste streams are identified as responsible for historical releases of TEQs at the scale of many tonnes. Along with such releases, major PCDD/F contaminated sites have been created through the application or improper disposal of contaminated pesticides, PCBs and other organochlorine chemicals as well through the recycling of wastes and their attempted destruction. In some extreme examples PCDD/F contaminated sites have also resulted from thermal processes such as waste incinerators, secondary metal industries or from the recycling or deposition of specific waste (e.g. electronic waste or car shredder wastes) which often contain chlorinated or brominated organic chemicals.

The examples of PCDD/F and dioxin-like PCB contamination of fish in European rivers or the impact of contaminated sites upon fishing grounds and upon other food resources demonstrate the relevance of these historical problems to current and future human generations Many of the recent food contamination problems which have emerged in Europe and elsewhere demonstrate how PCDD/F and dioxin like PCBs from historical sources can directly contaminate human and animal feedstuffs indeed highlight their considerable contemporary relevance in this respect.
Accordingly, some key experiences and lessons learnt regarding the production, use, disposal and remediation of POPs from the contaminated sites are summarised.

An important criterion for evaluating the significance and risks of PCDD/Fs and other POPs at contaminated sites is their present or future potential for mobility. This, in turn, determines to a large degree their propensity for off-site transport and environmental accessibility. The detailed evaluation of contaminated site cases reveals different site specific factors which influence the varied pathways through which poorly water soluble POPs can be mobilised. Co-contaminants with greater water solubility are also typically present at such sites. Hence, pumping of groundwater (pump & treat) is often required in addition to attempting to physically secure a site. At an increasing number of contaminated sites securing measures are failing after relatively short time spans compared to the time horizon which applies to persistent organic pollutant contamination. Due to the immense costs and challenges associated with remediation of contaminated sites “monitored natural attenuation” is increasingly gaining purchase as a conceptual remediation approach. However, these concepts may well prove limited in their practical application to contaminated sites containing persistent organic pollutants and other key pollutants like heavy metals.

It is inevitable, therefore, that dioxin/POPs contaminated sites will remain of contemporary and future relevance. They will continue to represent an environmental issue for future generations to address. The securing and/or remediation of dioxin/POPs contaminated sites is very costly, generally in the order of tens or hundreds of millions of dollars. Secured landfills and secured production sites need to be considered as constructions not made for “eternity” but built for a finite time scale. Accordingly, they will need to be controlled, supervised and potentially repaired/renewed. Furthermore, the leachates and groundwater impacted by these sites will require ongoing monitoring and potential further remediation. These activities result in high maintenance costs, which are accrued for decades or centuries and should, therefore, be compared to the fully sustainable option of complete remediation. The contaminated site case studies highlight that while extensive policies and established funds for remediation exist in most of the industrialised western countries, even these relatively well regulated and wealthy countries face significant challenges in implementation a remediation strategy. In this highlights the fact that ultimately only the prevention of contaminated sites represents a sustainable solution for the future and that the Polluter Pays Principle needs to be applied in a comprehensive way to current problems and those which may emerge in the future.

With the continuing shift of industrial activities to developing and transition economies which often have poor regulation (and weak self-regulation of industries), additional global challenges regarding POPs and other contaminated sites may be expected. In this respect, a comprehensive application of the "polluter pays principle" in these countries will also be a key to facilitate the clean-up of contaminated areas and the prevention of future contaminated sites. The threats and challenges of contaminated sites and the high costs of securing/remediating the problems highlight the need for a comprehensive approach based upon integrated pollution prevention and control. If applied to all polluting (and potentially polluting) industrial sectors around the globe such an approach will prove to be both the cheapest and most sustainable way to underpin the development of industries in developing and transition economies.

2.3 The situation of contaminated sites in developing countries – Stockholm Convention activities as a start for clean-up

While industrialized countries have started introducing policy and legal framework for chemical contaminated sites, developing countries are practically in the dark regarding information on POPs contaminated sites let alone taking measures to identify and monitor contaminated sites including taking action in remediating such sites. The Stockholm Convention, taking this into account specifically under article 6 section 1e says “parties of the Convention shall endeavour to develop appropriate strategies for identifying sites contaminated by chemicals listed in Annex A , B, or C.I remediation of those sites is undertaken, it shall be performed in an environmentally sound manner”. In other words, the Convention calls for capacity building in developing countries to systematically identify POPs contaminated sites and develop suitable cost effective and environmental acceptable technologies for environmentally sustainable remediation of sites if needed. This should be based on risk assessment and in consultation with all relevant stakeholders. It calls for private/public participation (PPP).

With cost of proper remediation of contaminated sites could be beyond the reach of almost all developing countries, bioremediation and phytoremediation might be very attractive methods for dealing with POPs contaminated sites.

In this connection in the ESPR series on Dioxin/POPs contaminated sites a paper authored by Dr. P. C. Abhilash and Dr. Nandita Singh of Botanical Research Institute, Lucknow, India describes the fate of HCH isomers in contaminated soil and a first investigation into phytoremediation. It is also interesting to note that HCH isomers - including the two key waste isomers alpha- and beta-HCH - has recently been added to the expanded list of the Stockholm Convention (see item 4).

2.4 Case study on remediation of HCH contaminated sites “Seasonal variation of HCH isomers in open soil and plant-rhizospheric soil system of a contaminated environment”

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Abstract of the paper

Background, aim, and scope: Lindane, technically 1, 2, 3, 4, 5, 6-hexachlorocyclohexane (γ- HCH), is the most commonly detected organochlorine pesticide from diverse environmental compartments. Currently, India is the largest consumer and producer of lindane in the world. The production of lindane results in the generation of large quantities of waste HCH isomers (mainly α-, β- and δ-). All these isomers are toxic and have a long-range environmental transport potential. The aim of this study was to monitor the seasonal variation of HCH isomers in an open soil–plant–rhizospheric soil system of a contaminated industrial area. For this, selected plant species and their rhizospheric soil (soil samples collected at a depth range of 0–45 cm near to the root system) and open soil samples (soil samples collected (0–30 cm depth) from 1–1.5 m samples with their respective soil-system was studied by multivariate statistical approaches.

Results: The mean concentration of total HCH in plant samples, open soil and rhizospheric soil samples were found in the range of 14.12 to 59.29 mg kg^{-1}; 38.64 to 104.18 mg kg^{-1} and 8.38 to 26.05 mg kg^{-1}, respectively. Cluster grouping reveals that S. torvum and W. somnifera can accumulate more HCH than other studied species.

Discussion:
There was a marked seasonal difference in the occurrence of HCH isomers in plant samples ($p < 0.05$) and open soil samples ($p < 0.01$). Comparatively higher levels of HCH isomers were detected from plant samples during summer, while higher levels of HCH isomers were detected from soil samples during the winter season. There was no significant difference in seasonal variation of HCH isomers away from the plant root system) were collected for 2 years two summer seasons and two winter seasons).

Materials and methods:
Seven plant species along with their rhizospheric soil and open soil samples were collected seasonally from different parts of the industry. Plant samples were separated into root, leaf and stem. HCH isomers in plant and soil samples were extracted by matrix solid-phase dispersion extraction (MSPD) and Soxhlet extraction, respectively, followed by GC-ECD. The seasonal difference in occurrence of HCH isomers in plant in rhizospheric soil samples; however, total HCH in rhizospheric soil samples were 4 to 5-fold lower than the open soil samples. The total concentration of HCH isomers in roots is linearly related to their rhizospheric HCH level. Conclusions HCH isomers were detected in open soil, plants and rhizospheric soil samples. Monitoring studies clearly revealed that the above-mentioned industrial area is contaminated with all major isomers of HCH. Occurrence of all these isomers in the study area point out the lack of sustainable management practices of this industry for protecting the area from hazardous waste. The analytical results confirmed that accumulation depends upon the plant species, soil and climatic conditions.

Recommendations and perspectives:
Recently, α-, β- and γ- HCH have been nominated by the POPs Reviewing Committee for inclusion into the Stockholm Convention to address the HCH contamination on a global level. Therefore, there is an urgent need to stop the production of lindane and remediate contaminated soil sites. Based on the monitoring studies, the promising species like W. somnifera and S. torvum may be selected for the on-site phytoremediation of HCH-contaminated soil.
The mismanagement of HCH residues from the organochlorine industry and their contemporary relevance often after decades of their deposition is one key example demonstrating the necessity to evaluate the waste deposits of the respective organochlorine productions and the need for a strict waste management, and the necessity of an integrated pollution prevention and control strategy for the whole organochlorine industry including also in the developing countries.

Although the use of HCH has been discontinued for a considerable period of time in many countries, the residues continue to have a significant impact on a number of ecosystems (Abhilash 2009). A second important environmental threat from HCH production is the HCH residues deposited at the production sites (Vijgen et al. 2006; Weber et al. 2008).

3. Source: European Commission, Environment DG May 1, 2009 - Submitted by Mr. John Vijgen, Director, IHPA.

At a meeting of the Parties to the Stockholm Convention on Persistent Organic Pollutants in Geneva from 4-8 May (See also item 4), the EU will call for nine new chemicals to be added to its list of dangerous substances to be phased out globally. If successful, it will be the first time since the adoption of the Convention that new substances have been added to the list. The nine proposed chemicals are: commercial pentabromodiphenyl ether, commercial octabromodiphenyl ether, chlordecone, hexabromobiphenyl, alpha-hexachlorocyclohexane, beta-hexachlorocyclohexane, lindane, perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride and pentachlorobenzene. Use of persistent organic pollutants (POPs) is heavily restricted within the European Union, because of the risks they pose to human health. POPs can lead to cancer, birth defects and immune and reproductive system dysfunction. Because of their nature, these chemicals can travel long distances and are found even in remote areas of the planet, far away from their use and production. Once emitted into to the environment they remain there for decades, and make their way up the food chain, accumulating in ever increasing concentrations in the fatty tissue of animals and humans. The EU therefore believes they meet the requirements for being phased out at a global level. The nine chemicals will be discussed during the 4th Conference of the Parties (COP) to the Stockholm Convention, which currently targets 12 POPs, known as the 'dirty dozen'. The 12 consist of nine pesticides including DDT, polychlorinated biphenyls (PCBs) previously used in industry, and unintentional by-products of industrial processes including dioxins and furans. Other important subjects for the COP include reaching agreement on rules to determine when a Party is in breach of the Convention and how to respond to such breaches; endorsing a decision to promote synergies between the three chemicals Conventions (Stockholm, Basel and Rotterdam); and examining the effectiveness of the Convention and the tools for assessing this. EU legislation implementing the Stockholm Convention goes further than the international agreement. Its aim is to eliminate the production and use of internationally recognised POPs. The EU adopted an implementation plan in 2007 to complement Member State national plans.

4. Conference of Parties COP4 to Stockholm Convention: Geneva, May 4-8, 2009 adds nine new chemicals to the dirty dozen

Over 800 participants, representing more than 149 governments, as well as intergovernmental and non-governmental organizations, and UN agencies, attended the meeting. **COP4** considered several reports on activities within the Convention’s mandate and adopted 33 decisions on, *inter alia*, nine new chemicals, financial resources, guidance to the financial mechanism, implementation plans, technical assistance, synergies and effectiveness evaluation. The COP4 emphasized the close links with Basel and Rotterdam conventions. Delegates agreed to a proposal by Chile, supported by Switzerland, to address the item on synergies among the Stockholm, Rotterdam, and Basel Conventions earlier in the meeting, as it may have financial implications. Since 2001 more than $300 million (excluding cost of hiring) have been allotted for various projects under the Stockholm Convention.

Secretariat introduced the evaluation of the continued need for DDT and alternatives (**UNEP/POPS/COP.4/4**), the expert group report on the production and use of DDT and alternatives (**UNEP/POPS/COP.4/5**), and the draft business plan for a global partnership on alternatives (**UNEP/POPS/COP.4/6**. Several African and Asian countries noted the continued need for the use of DDT for disease vector control (see item 1 of this Newsletter.)
On PCBs the meeting endorsed the Secretariat’s proposal for the establishment of an International PCBs Elimination Network (PEN) and requested aid agencies to support the network.
Nine new chemicals were included in the POPs list (***Link to IISD newsletter*).
These includes:

- the three key Hexachlorocycloxane (HCH) isomers: Alpha-HCH, Beta-HCH and Gamma-HCH (Lindane) (see item 3),
- the first three brominated compounds: commercial Pentabromodiphenylether (c-PentaBDE), commercial Octabromodiphenylether (c-OctaBDE) and Hexabromobiphenyl (HBB),
- Perfluorooctane sulfonic acid (PFOS) as the first fluorinated compound
- the pesticide Chlorodecone and
- Pentachlorobenzene (PeCB)

Capacity building: As part of capacity building the COP4 agreed to set Stockholm Convention Centres:

- endorses, for four years, eight nominated Stockholm Convention centres listed in Annex I, namely centres located in China, Kuwait, the Czech Republic, Brazil, Mexico, Panama, Uruguay and Spain;
- invites four nominated centres listed in Annex II, namely those in Algeria, Senegal, Iran and the Russian Federation, to continue their activities, seek support in complying with the decision SC-2/9 criteria, and be considered for endorsement at COP5;
- Zambia endorsed the Basel Convention Regional Centre in Africa as a regional centre

The Arab Group, Uganda, Myanmar and Zambia stressed the importance of establishing new regional centres. Switzerland suggested that new Secretariat positions be shared with both the Rotterdam and the Basel Conventions. Tanzania highlighted capacity building in promoting alternatives to DDT and PCB phase-out as crucial issues for Africa and also stressed the need to build capacity in global monitoring, while Ghana emphasized information sharing and awareness raising.

5. Brief notes on a HCH contaminated site in Brazil: Environmental (in)justice?

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Between 1950 and 1962 at a place near Rio de Janeiro called “Cidade dos Meninos”, a factory manufacturing HCH and DDT for use in vector control operated close to a local school for poor children. Since the closure of the facility, tonnes of highly chlorinated residues from this manufacturing facility was left standing at this site without any protection. Cows and small agricultural pastures where also part of this neighbourhood for three decades until the authorities discovered the contaminated site towards the end of 1989. In 1995 after removing up to 40 tonnes of residues from the site, a second attempt to clean the site brought additional has problem: more chlorinated by-products (including PCDD/PCDF) were produced “in-situ” after the mixture of the contaminated soil was treated with hydrated lime. In 1997, after 7 years of protected legal actions the Federal Government ordered to remove all of the 1 346 people that still lived in this area. Since most of the people are very poor, only two families sued the government on their own and won the case. In 2004, as a result of this legal measures, the Federal Government declared through a legislative process offered a compensation of R$10 000 (US$ 4 500) to each person who agreed to get out of the area (up to R$ 50 000/family). This amount of money, however, is less than 20% that what is given in average, for those who lost a job or was in jail during the military governments in Brazil (1964-1985). Why, after more than 45 years, the Government has now decided that these people had to move out of that land? Basically, because this is the last free area in the so called “baixada fluminense” (a plain land near Rio de Janeiro city), and there is a road under construction that will connect the two most important harbours in Rio de Janeiro State and the development must goes on. Meanwhile, as far as I, am concerned, the Project of Law is still under discussion in the Federal Congress of Brazil, and besides the two families that sued the government, no money was given to any other family, and most of the people still live at the same contaminated place today.

6. Obsolete pesticides a ticking time bomb and why we have to act now

by
John Vijgen, International HCH & Pesticides Association, IHPA, and Christian Egenhofer, Centre for European Policy Studies, CEPS, May 2009,.

RANKED AMONG THE WORLD'S TOP 10 THINK TANKS

CEPS Special Report

Thinking ahead for Europe

CENTRE FOR EUROPEAN POLICY STUDIES

OBSOLETE PESTICIDES
A TICKING TIME BOMB AND WHY WE HAVE TO ACT NOW

Playing on obsolete pesticides, these children are exposed to enormous dangers.
Photograph: Courtesy of Berto Collet, Tauw, The Netherlands (2007).

JOHN VIJGEN
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MAY 2009

The report can be downloaded from CEPS website **http://shop.ceps.eu/index3.php** or from IHPA library

Executive Summary

Pesticides become obsolete when they can no longer be used for their intended purpose because they have been banned on account of their prolonged impact on the environment and/or because they cannot be used due to age, deterioration or a change of specification of currently applied pesticides. This problem has been addressed by the Stockholm Convention on Persistent Organic Pollutants (POPs), which was ratified by most EU member states and many but not all non-EU countries from Central and Eastern Europe and the former Soviet Union. It entered into force in 2004.

The Convention and the subsequent National Implementation Plans (NIPs) drawn up by signatories have addressed the problems to some extent, notably within the EU. Within the EU, producers have been legally obliged to manage obsolete pesticides (OPs), including organising their collection and destruction according to EU laws applicable to hazardous waste management. With EU enlargement, EU law has consequently become applicable to the new member states as well. The process has been accelerated by EU programmes such as PHARE or national programmes established by some member states.

However, implementation of the provisions of the Stockholm Convention on their own is hardly sufficient to effectively deal with the risks associated with OPs. The Convention only deals with nine specific OPs (hereafter called Persistent Organic Pollutant or POP pesticides), which represent a small proportion of the total number that are obsolete. In addition, and in close geographical proximity to the EU, problems remain, especially in South-East Europe and the countries of the former Soviet Union.

There are considerable risks of not acting. Unprotected sites – estimated to number in the tens of thousands – constitute a lethal danger for humans and animals alike. OPs seriously risk undermining agricultural trade between the EU and non-EU countries from Europe and the former Soviet Union. The estimated direct and indirect damages as a result of the Nitrofen food scandal in Germany from 2002 alone have been estimated to exceed €500 million. OPs in non-EU countries also constitute an imminent risk for the EU because stocks are often stored near watercourses. OPs risk being washed into floodwaters especially in times of floods such as those in Germany in 2002 or in Romania, Ukraine and Moldova in 2008.

At the same time, the clean-up costs for OPs are relatively low, around €3,000 per tonne. With a total volume of an estimated 256,000 to 263,500 tonnes in the new EU member states, the accession countries, the countries of the European Neighbourhood Policy (ENP), the Russian Federation and Central Asia, the total required cost would be approximately €780 million.

There are signs that some countries are willing to act. With the help of the World Bank, the Republic of Moldova has eliminated 1,150 tonnes of POP pesticides. In Ukraine, efforts are ongoing to export 1,000 tonnes of OPs to Germany for destruction and the elimination of a further 2,000 tonnes is already planned.

To further accelerate destruction, EU financial and technical assistance will be needed. At the same time, this will increase awareness, provide technical knowledge, generate domestic co-financing and in the medium term, possibly generate national legislation, where it is still missing.

We call upon the European Commission to lead and develop an Action Plan – in partnership with the EU member states, European Parliament, non-EU countries such as those falling under the European Neighbourhood Policy or those from Central Asia, international organisations such as the FAO, UNEP, UNDP, UNIDO, World Bank and GEF, agricultural organisations, NGOs, consumer organisations and industry including chemical industry and food retailers – consisting of the following steps:

- The Council led by the Presidency should address OPs in the Council Working Party on International Environment Issues.
- The European Parliament should:

    request an amendment to the pesticides strategy with a binding requirement to report stocks of OPs and

    feature OPs in the coming New Neighbourhood Strategy.

- The countries that still possess OPs should:

    make their removal a priority in their national Environment Plans,

    add their destruction to the agenda of negotiations with donors and

    make national funds available for co-funding.

- The European Commission, the European Parliament and EU member states should improve the dialogue on the scale and urgency of the problem and possible solutions.
- New EU member states should urgently comply with rules on reporting of OP stocks, quality of pesticides storage, etc.
- Plant protection associations, in cooperation with all national and international stakeholders, should consider designing and ultimately establishing so-called ‘empty container programmes’ to collect and destroy OPs following the example of France and Poland.

7. Hot from the press:

PTS pollution in Mekong river threatens the Dolphins species according to WWF. Taken from BBC World News
Pollution in the Mekong river has pushed freshwater dolphins in Cambodia and Laos to the brink of extinction, the conservation group WWF has said.
Only 64 to 76 Irrawaddy dolphins remain in the Mekong, it says, and calls for a cross-border plan to help the dolphins. Toxic levels of pesticides, mercury and other pollutants have been found in more than 50 calves that have died since 2003. According to WWF these pollutants including DDT, PCBs coming from different countries through which the river flows, cause suppression on immune system in baby dolphins

8. The 10th IHPA Forum

10th International HCH and Pesticides Forum

“How many obsolete pesticides have been disposed of 8 years after signature of Stockholm Convention”

07 – 10 September, 2009,
RECETOX, Masaryk University, Brno,
Czech Republic

Organizer and Venue

Chair of the Forum: *Prof. Dr. Ivan Holoubek, RECETOX, Masaryk University, Brno, CR; Regional CEECs POPs Centre and National POPs Centre of the Czech Republic*

Organizers

- *International HCH & Pesticides Association (IHPA), The Netherlands*
- *Ministry of the Environment, The Czech Republic*
- *Federal Environment Agency of Germany (UBA)*
- *RECETOX, Masaryk University, Brno, CR, Central and Eastern European Regional POPs Centre, National POPs Centre, The Czech Republic*
- *Milieukontakt International, The Netherlands*
- *Ministry of Agriculture, The Czech Republic*

- *Institute of Public Health Ostrava, The Czech Republic*
- *Tauw Group, The Netherlands*

Venue for the 10th HCH Forum

- Brno Hotel Continental, Brno

Timing: 07 - 10 September, 2009

Main topics/Indicative program

- ***Central and Eastern European POPs pesticide hot spots and their management***
- ***National implementation plans – realization, problems***
- ***Stockholm Convention – 8 years after signature***
- ***Waste management experiences***
- ***Monitoring of POP pesticides***

On September 10, 2009:
A special Field trip will be organized to the famous remediation site of Spolana Neratovice

Summary of dates for submissions:

Registration – June 30, 2009
Abstract submission - June, 2009
Paper submission – July 31, 2009

For registration see: http://recetox.muni.cz/index-en.php

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