



NEWSLETTER

Institute for Environment and Resources
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EDITOR 'S LETTER

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Institute for Environment and Resources (IER), Vietnam National University of Ho Chi Minh City has published quarterly a NEWSLETTER to exchange information of research, postgraduate training, technology transfers and consultancy activities which relates to environmental protection, properly use of natural resources and sustainable development of Ho Chi Minh City and neighbour regions.

The editor board is grateful to introduce NEWSLETTER and hope to receive articles from environmental scientists, which report the most news in the field of environment in Ho Chi Minh City and neighbour regions.

NEWS

THE DETERMINATION OF POPs IN THE ENVIRONMENT: A GLOBAL CHALLENGE

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The widespread occurrence of persistent organic pollutants (POPs) is a question of major concern and the knowledge of their environmental fate and ecotoxicology is of priority scientific interest. Their long life times and potential for long-range transport requires that concerted international action is put in place to effectively control exposures since such chemicals released in one place may have impacts at a considerable distance from the source. International negotiations finally resulted in the adoption of the Stockholm Convention on Persistent Organic Pollutants in May 2001, which included 12 substances for primary regulation.

In order to compile and evaluate existing data on the sources of these substances in the environment, their levels and impact on biota, their transboundary transport, and to assess the root causes and management capacity of the different countries, UNEP launched a study to regionally assess the problem, which has recently been completed. The world was divided in twelve regions, one of them being the Southeast Asia and South Pacific Region, which included: Australia, Cambodia, Indonesia, Laos, Malaysia, New Zealand, Philippines, Singapore, Thailand and Viet Nam.

The presentation will summarise the general information on levels, trends and transport pathways of POPs in the environment and identify the main gaps of knowledge. Particular emphasis will be placed to the Southeast Asia and South Pacific Region.

In this respect, the levels of several persistent toxic substances (PTS) in air have been reported to be high in the Southeast Asian countries. In particular, DDT, chlordanes, HCHs, and PCBs were found to be relatively high in the air above coastal areas. Biomass burning (e.g. Indonesia) has produced episodic events of smoke haze and associated PAHs emissions. High levels of DDT and PCBs were found in soil across the region but some sites in Australia and Viet Nam were reported to be the most contaminated. However, studies of temporal trends revealed that DDT and several other organochlorinated pesticides are decreasing exponentially. Endosulphan and lindane were found at high levels in sediments and river waters in the region, particularly Malaysia and Thailand, suggesting the recent use of these chemicals.

The PTS levels in marine organisms such as fishes and mussels have been extensively studied in the region in the context of the Mussel Watch program. The spectrum of PTS in the collected samples has been reported, although there were indications that the levels of DDTs, HCHs and PCBs were declining.

PTS levels in humans have not been widely determined although Australia, New Zealand, and Singapore have undertaken population monitoring studies. New Zealanders have been found to have very low levels of PTS in blood and breast milk and could provide baseline values to compare with the rest of the region's human population.

The lack of appropriate research and monitoring programmes is the main barrier to the advancement of our common understanding of the occurrence and consequences of PTS in the environment. A major step towards the filling of the existing data gaps on sources, levels and effects at regional and global levels will be the activation of monitoring programs at three levels:

- Analysis of abiotic samples or sentinel species to identify hot spots and transport pathways. Monitoring activities should be established in the corresponding countries to fill the geographical data gaps, and ensuring the continuation of existing time trend series. Regional surveys of emerging persistent substances (e.g., PBDE) or those difficult to analyse (e.g., PCDD/F) should be particularly envisaged.
- Analysis of food to evaluate the general exposure of the population and to detect abnormal increases due to different cases of contamination. Monitoring design should allow the assessment of any correlation of POPs body-burden with factors as age and gender groups, dietary habits, occupation and education. In this context, total diet studies taking into account regional habits are of primary interest.
- Analysis of human tissues (blood, milk) for human body burdens estimation and risk evaluation. Human tissues are also exposure sources for developing bodies. Although this kind of assessment poses a series of technical and ethical problems, monitoring of human tissues provides the best information on human exposure to POPs. The data obtained should also allow the validation of exposure models.

Also, there is as yet little conclusive scientific information directly linking ecotoxicological and harmful human health effects to low levels of exposure to these contaminants. In this respect, it is necessary to develop:

- Environmental quality regional guidelines to evaluate the significance of the occurrence of POPs in air, soils, wastes, sediments, food and drinking water, so that management guidelines can be established.
- A better understanding of physiological and toxicological effects of contaminants on humans and species identified as most at risk, especially on development of offspring, and/or immunosuppression and endocrine disrupting properties.

- Detailed information on the diet and food consumption patterns of specific populations, including necessary information on other factors (e.g., smoking), which can influence contaminant exposures to allow better estimates of dietary intakes of contaminants and permit more reliable estimates of associated risks.

Integration of physical and biological models with information on environmental measurements of sources and pathways are required to aid the design and implementation of monitoring, research, and management including mitigation.

Contamination of Water Basins from Energy Sector of Armenia by PCBs

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The study was performed to reveal actual content of polychlorinated biphenyls (PCBs) in open water basins of the Republic of Armenia.

The following categories of open water basins were selected for the study:

1. Water basins, at which there are hydroelectric power plants (rivers Hrazdan, Vorotan);
2. Water basins, at which there are industrial enterprises; (rivers Debet and Voghchi);
3. Water basins, at which there are no industrial enterprises or hydroelectric power plants (the Lake Sevan and Arpa river).

Samples of water were analyzed by means of gas-liquid chromatography.

Determination of PCBs in samples taken from open water reservoirs of the 3rd category demonstrated that PCBs were detected in the range from 0.07 to 0.93mg/l. PCBs average concentration in water samples from the a.m. reservoirs was 0.61-0.83mg/l.

In samples of water taken from rivers belonging to the 1st category the content of PCBs was 2-fold higher than in water samples from reservoirs of the 3rd category. In these samples PCB residues ranged from 0.44 mcg/l to 2.93 mcg/l. Average PCB concentration in such reservoirs was 1.49 – 1.82 mcg/l.

Study of water samples taken from the rivers, in the water collection area of which there are enterprises having potential to contaminate the environment by PCBs (category 2), revealed that from the point of view of PCB-induced contamination these samples were in an intermediate state. Residues of PCBs made from 0.44 to 1.68 mcg/l. Average PCB content in these samples was 0.68-1.33 mcg/l.

Thus, all the open water basins studied for PCBs were contaminated by these substances. This signifies that:

1. the environment of Armenia is contaminated by PCBs
2. power engineering system is the main source of PCB-related contamination in Armenia.

STUDY OF INCINERATION TECHNOLOGY AND EXHAUST GAS TREATING FOR INDUSTRIAL HAZARDOUS WASTE INCINERATOR SUITED TO CONDITIONS OF VIETNAM

*By Prof. Dr of sc. Pham Ngoc Dang, Dr. Vu Cong Hoe,
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Subject: "Study of incineration technology and exhaust gas treating for industrial hazardous waste incinerator in conditions of Vietnam" of Ministry of Science Technology and Environment passed by the Ministry of Education and Training to the Center CEETIA was assigned to implement for 2 years 2001 - 2002. The content of the study includes:

- Assessment of the actual state of arising, collection, storage and treatment of industrial hazardous solid waste in Hanoi and Hai Phong.
- Assessment in respect of environment for hazardous solid waste incinerator being used in Vietnam.
- Studying, designing the incinerator technology and equipment for treating exhausted gas when burning industrial hazardous solid waste for Hanoi city.
- Manufacturing, installing, operating and measuring, assessing the quality of industrial hazardous solid waste incinerator at Nam Son waste treatment complex, Hanoi.
- Basic characteristics of the incinerator: burning capacity: 125 - 150kg/h; temperature inside the primary chamber: 700 -800⁰C, temperature inside the secondary chamber: 950 - 1050⁰C; exhaust gas retaining time: 01 second; temperature of exhaust gas: about 100⁰C. The exhaust gas will be treated through 3 equipment: wet type deduster, lined exhaust gas absorber and acticarban exhaust gas absorber. The result of measuring concentration of pollutants contained in exhaust gas reaches Vietnamese standard.

FLASH

POST-GRADUATION TRAINING

By the agreement of Vietnam National University of Ho Chi Minh City, Institute for Environment and Resources begins to enroll students in five post-graduating fields including "Solid Waste Technology", "Environmental Toxicology", "Environmental Resources Exploitation and Protection", "Environmental Management", "Water supply and drainage" and three masteral fields "Environmental Engineering", "Environmental Resources Exploitation and Protection" and "Environmental Management".

SCIENTIFIC RESEARCH

After a long time of researching, two ministerial projects of Prof. Lam Minh Triet were checked and taken over. Concerning to the environment in Cuu Long River delta, two projects can be summerized as follow:

The project : "Studying scientific basic to propose solutions for ensuring the environment for shrimp breeding in the coastal zone of Cuu Long River delta" was carried out by the principle of IER and the cooperation of Department of Science, Technology and Environment of Bac Lieu province and Institute of aquaculture II. The project focused on studying scientific and practical foundation serving integrated mangement of natural resources and environment, proposing safe solution for breeding shrimp environment and ensuring the substainable development of the coastal zone of Cuu Long River Delta.

The project “Studying to implement the model of supplying clean water and improving environmental hygiene for flooding region of Cuu Long River Delta” was expended into practice not only by IER but also by Department of Science, Technology and Environment of Dong Thap and Long An province, The People Committee of Cao Lanh and Thu Thua District, Long An Province and some other enterprises. The results are water supplying mobile stations which can operated and managed simply installed at Dong Thap and Long An provinces. The water after being treated can satisfy the hygienic standard. This model absolutely can be applied for other flooding regions. The project also promotes some solutions to improve the hygienic conditions for environment concerning outhouse, wastewater, waste in flooding regions of Cuu Long River delta to protect community’s health.

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To develop reasearching staff, IER has prepared for two researchers to study oversea-postgraduate program. They began by reporting two their draff projects named "Developing mathematical model applied for river water quality management in the lower section of Sai Gon – Dong Nai river" and “Researching on the store of Chloramphenicol and Nitrofurans in environment, food for shrimp and shrimp to determine precisely their sources and potential contamination as well as **their bio-accumulation possibility and mechanism and derivaties in the growing of shrimp.**”

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On March 24, a seminar on Mike 11 and Mike Basin software was presented by technicians of DHI Institute, Denmark at IER. This is one of advanced software serving monitoring and managing river basin.

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According to the decision number 85/BCÑ33-VP33 issued by Minister of Natural Resources and Environment Ministry, since February 23, 2004 the Institute for Environment and Resources – Vietnam National University of Ho Chi Minh City has been official member in the Vietnam national dioxin networking. As the results, IER will contributes its scientific achievement through the project “Analysing dioxin in ecological chain” as well as will be shared information from “National Steering Committee for surmounting dioxin used by American Army in Vietnam War” **“Ban chæ ñaño quốc gia khác phuic haâu quaû chaát ñoác hoùa hoïc do Myõ sôu duing”**. This is one of effective activities of Vietnamese Government to support the international project “Strengthen capacity for Institute for Environment and Resources” between IER and Swiss Federal of Technology, Lausanne signed by the governments of Vietnam and Switzerland.

INTERNATIONAL RELATIONS

OSAKA AGREEMENT

In March 2004, IER and the Graduate School of Engineering, Osaka University, Japan signed a memorandum on Student Exchange and an agreement on Academic Exchange. The memorandum which will be available for five years includes 12 articles concerning student exchange each year. Both parties will send students to each other institute and provide necessary conditions for them to stay, study. The host institute shall waive application, matriculation and tuition fees for the exchange students. In the agreement, both institutes agree to promote the universities’ education and academic research in the necessary fields such as (1) Collaborative research, lectures, symposiums...and the exchange of researchers pertaining; (2) Exchange of information and materials in those fields which are od interest to both parties; (3) Exchange graduate students. This agreement shall be in force for five years and shall be discussed to renewal.

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INTERNATIONAL TRAINING COURSE ON ATMOSPHERIC POLLUTION

In the framework of SDC project, IER collaborated with Swiss Institute of Technology, Lausanne – Switzerland (EPFL) to hold an international short course on Atmospheric Pollution. During one week from 23 to 29 April, 33 participants who are researchers, managers in environmental fields from the departments of Science and Technology, departments of Natural Resources and Environment of Ho Chi Minh city, Southern provinces, Universities and IER were given lecture concerning new knowledge on pollutants sources, the effects of air pollution on ozone, people and environment... by professors, lecturers of EPFL and IER. In the course, moreover, the participants have a look inside the mobil-automatic environmental monitoring station and practice to take and analyze air samples by modern equipment of IER's lab. The course also created a good opportunity for researchers, managers to communicate and make a prolonged networking . Before the closing, IER sent the evaluation form to each participant for them to evaluate the quality of the course. The result showed that most of them were interested in and had a high appreciate to the course and the lecturers. They expressed to attend in more short courses on different environmental issues such as Urban and Industrial park pollution management, Domestic and Solid Waste Treatment Technology, Environment Toxicology, Wastewater Treatment Engineering... The Board Staff will examine and collaborate to other Universities to hold consequently international short courses to satisfy the researching requirement of people who work in environmental fields.



NEW TEXTBOOKS

By the support of the Vietnam-Switzerland project's budget, after a period of compiling and editing, IER publishes five textbooks serving research and posttraining activities. The new textbook includes: (1) Construction standard TCXD-51-84, drainage system and work (Lam Minh Triet, Vo Kim Long); (2) Hydrolic calculation tables for Water supply and drainage system (Lam Minh Triet, Nguyen Phuoc Dan, Nguyen Thanh Hung); (3) Domestic and industrial wastewater treatment – calculation and design (Lam Minh Triet, Nguyen Phuoc Dan, Nguyen Thanh Hung); (4) Environmental Microbiology (Do Hong Lan Chi, Lam Minh Triet); (5) Air Pollution (Dinh Xuan Thang).

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