TENTATIVE AGENDA
WORKSHOP ON THE EFFLUENT TRATMENT AND SAFE WASTE DISPOSAL OF TOXIC AND OBSOLETE PESTICIDES
Bogor, September 18-20, 2006

	Day 1, Monday, September 18, 2006		
No.	**Time**	**Activity**	**Person In Charge**
1	08.00 – 09.30	Registration (and coffee break)	
2	09.30 – 09.40	Report by National Coordinator	Mr. Agus Wahyudi
3	09.40 – 09.50	Remarks by Coordinator RENPAP	Mr. SP. Dhua
4	09.50 – 10.00	Remarks by UNIDO Representative Jakarta	Mr. Masayoshi Matsushita
5	10.00 – 10.10	Speech by UNIDO Vienna	
6	10.10 – 10.30	Speech and Opening Workshop by DG Agro and Chemical Industry	Mr. Benny Wachyudi
7	10.30 – 11.15	Presentation by PPI – Ministry of Agriculture	Mr. Mukti Setiarto
8	11.15 – 12.15	Country Report by Indonesia and Thailand	
9	12.15 – 13.15	Lunch	
10	13.15 – 14.15	Indonesian POPs Policy by Ministry of Environment	Mr. Achmad Gunawan
11	14.15 – 15.45	Country Report by China, India, and Nepal	
12	15.45 – 16.00	Coffee Break	
13	16.00 – 17.00	Country Report by Vietnam and Lao PDR	
14	19.00 – 21.00	Welcome Party at Hotel	

	Day 2, Tuesday, September 19, 2006		
1	08.30 – 09.30	Country Report by Kenya, Zambia, and Tanzania	
2	09.30 - 10.30	POPs in Indonesia by National Implementation POPs expert	Mr. Zainal A. Mas'ud
3	10.30 – 11.00	Departure to Syngenta Plant	
4	11.00 – 11.45	Presentation by Syngenta	Mrs. Etty Indrawati Lukman
5	11.45 – 12.15	Syngenta Plant Orientation	
6	12.15 – 13.15	Lunch	
7	13.15 – 13.45	Departure to The Hazarduous Waste Treatment Facility (PPLI)	
8	13.45 - 14.30	Presentation by PPLI	Mr. Syarif Hidayat
9	14.30 – 15.30	PPLI Plant Orientation	
10	15.30 – 16.00	Departure to Center of Leather Products	
11	16.00 – 17.30	Visit Center of Leather Products (Tajur)	

	Day 3, Wednesday, September 20, 2006		
1	08.30 – 09.30	Presentation by BBIA	Mr. Yang Yang Setiawan
2	09.30 10.00	Coffee Break	
3	10.00 - 11.00	Food Security and Health Presented by Ministry of Health	Mr. Roy Spåringga
4	11.00 – 11.15	Departure to Center of R&D for Agrobased Industry	
5	11.15 12.15	Center of R&D for Agrobased Industry Orientation	
6	12.15 - 13.15	Visit Bogor President Palace Bogor Botanical Garden	
7	13.15 14.15	Lunch	
8	14.15 15.15	Discussion and Recommendation	
9	15.15 – 15.45	Closing Remark continued with Farewell Party	

WORKSHOP ON THE EFFLUENT TRAITMENT AND SAFE WASTE DISPOSAL OF TOXIC AND OBSOLETE PESTICIDES

Persistent Organic Pollutants in Indonesia

Zainal Alim M, Djarot S. Hamiseno,Suminar S.A

Regional Network on Pesticide for Asia and The Pasific
Bogor,September 19, 2006

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1. INTRODUCTION

Persistent Organic Pollutants (POPs) are organic compounds that, to a varying degree, resist photolytic, biological and chemical degradation. POPs are often halogenated and characterized by low water solubility and high lipid solubility, leading to their bioaccumulation in fatty tissues. They are also semi-volatile, enabling them to move long distances in the atmosphere before deposition occurs. Hence, they constitute a serious environmental hazard that comes to expression as important long-term risk to individual species, to ecosystems and to human health. POPs chemicals may cause cancer and disorders in the reproductive and immune systems as well as in the developmental process.

During the last two decades much attention has been given to this group of substances at the international level after it became apparent that they are transported through the environment across borders. Individual countries alone are unable to control the environmental pollution from such border-crossing substances and critical concentrations have been reached in some regions, even in places where they have never been produced or used. Negotiations on a global, legally binding instrument to reduce and/or eliminate releases of POPs started in Montreal, Canada in 1998 under the auspices of UNEP. In May 23, 2001 126 countries and the EU agreed and adopted the text of this global treaty, referred to as the Stockholm Convention on Persistent Organic Pollutants.

The Stockholm Convention addresses the challenge posed by the toxic chemicals by starting with 12 of the worst POPs ever created. Nine of the POPs are **pesticides** : aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex and toxaphene. The Convention also targets two **Industrial Chemicals** : hexachlorobenzene (HCB), which also used as a pesticide and can be a byproduct of pesticide manufacture, and the class of industrial chemicals known as PCBs, or polychlorinated biphenyls. In addition, the Convention covers two families of **unintentional chemical by-products** : dioxins and furans. These compounds have no commercial use. Dioxins and furans result from combustion and from industrial processes such as the production of pesticides, polyvinyl chloride, and other chlorinated substances. Dioxins and furans are most potent cancer-causing chemicals known.

Indonesia has signed the Stockholm Convention, but does not have a status of Party; one of the requirement is a document called NIP (National Implementation Plan) endorsed by the government. The Republic of Indonesia commits to prepare NIP document as a work programme in developing and implementing policies, regulations, institutional efforts, and response actions to reduce or eliminate POPs release in Indonesia. The government of Indonesia decided to implement the NIP after the Stockholm Convention has been ratified with a target to eliminate POPs

by involving all stakeholders. Reasons behind the commitment are (1) POPs chemicals are still used in industries, namely PCBs and POPs residues are still detected in the environment in Indonesia, (2) the negative impact caused by POPs exposure has not been widely known by the community, (3) and the capacity and capability of infrastructures in POPs management are still limited.

In line with the preparation of the draft of NIP, a proposal to endorse the Stockholm Convention has been submitted by the Ministry of Environment (MoE) as the proponent to the President of the Republic of Indonesia. The proposal is submitted according to procedure stipulated in the Law No. 24/2000 regarding International Agreement in connection with the Presidential Decree No. 188/1998 regarding Procedure for Draft of Law.

Plan to endorse the Stockholm Convention has been registered in National Legislation Programme in the year 2006, coordinated by the Ministry of Justice & Human Right and the National Legislation Agency at the House of Representative. It is assumed that the endorsement will take place at the end of 2006; however, it can be expedited with the support of executive political commitment (the Government) and the legislative (House of Representative) by following the formal procedure.

2. POPs SUBSTANCES in INDONESIA

POPs substances are classified into POPs pesticides, POPs industrial chemicals, and POPs unintentional chemical by-products.

2.1. POPs Pesticides

POPs pesticides include aldrin ($C_{12}H_8Cl_6$), dieldrin ($C_{12}H_8Cl_6O$), endrin ($C_{12}H_8C_{l6}O$), hexachlorobenzene (C_6Cl_6), heptachlor ($C_{10}H_5Cl_7$), chlordane ($C_{10}H_6Cl_8$), DDT ($C_{14}H_9Cl_5$), mirex ($C_{10}Cl_{12}$) and toxaphene ($C_{10}H_{10}Cl_8$). The following are information regarding POPs pesticides in Indonesia[1]

(1) Aldrin: not registered and not allowed to be distributed, stored, and used since the regulation of Government Regulation (GR) 7/1973;
(2) Dieldrin: since 1992, in accordance with the Decree of Ministry of Agriculture 14/Kpts/TP.270/10 1992 prohibited to be used in Indonesia. This active compound used to be for termite control;
(3) Endrin: not registered and not allowed to be distributed, stored, and used in accordance with GR 7/1973;
(4) Heptachlor: never been registered;
(5) Chlordane: since 1992, in accordance with the Decree of Ministry of Agriculture 14/Kpts/TP.270/10 1992 prohibited to be used in Indonesia. This active compound used to be for termite control;
(6) DDT: never been registered[2];
(7) Mirex: never been registered;

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[1] Pesticide Committee
[2] Limited used by the Minstry of Health until 1990 to protect the community toward malarial vector

(8) Toxaphene: since 1980 nas been banned. Toxaphene used to be applied for pest control in cotton plantation.

An inventory carried out in 2003 revealed that there were no stockpile of POP pesticides (DDT, aldrin, dieldrin, chlordane, endrin, hexachlorobenzene, heptachlor, mirex, and toxaphene) in ex-warehouses in nine sampled cities, six districts, and two subdistricts. The survey also indicated that POP pesticides are no longer marketed in Indonesia and no import-export of these commodities recorded by the Statistics Bureau (BPS).

The environment quality in terms of POPs residues was monitored in April-October 2005. Samples were taken from surrounding agricultural sites and rivers in the cities of Medan, Agam (West Sumatera), Lampung, Cianjur, Brebes, Yogyakarta, and Batu-Malang. The samples consisted of river water, river sediment, and agricultural soil. The results showed that POPs, especially DDT and its derivatives, were detected in the water, soil, dan sediment samples. In river water, *p,p*-DDT and its derivatives were at the concentration level of 0.002 and 0.022 ppb. The highest concentration was detected for *p,p*-DDT (0.022 ppb) at apple orchard in (Fig. 1).

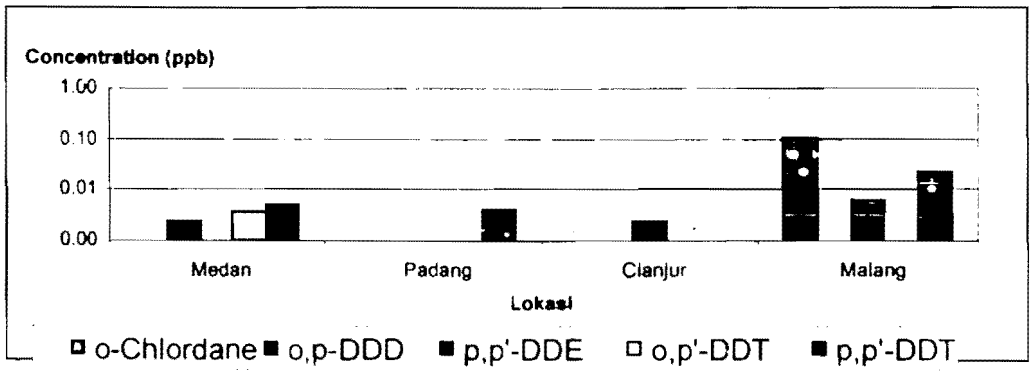

Figure 1 The Highest Concentration of POPs Detected in Water (KLH 2005)

In river sediment, POPs particularly DDT and its derivatives, were detected at the concentration of 0.230~8.62 ppb. In river sediment, HCB and heptachlor were also detected (Fig. 2). Soil samples contained DDT and its derivatives at the range of 0.24~48.4 ppb. The highest concentration was detected for *p,p*-DDT at agricultural land in Batu, Malang. In agricultural land at Cianjur, *p,p*-DDT was also detected at higher consentration compared to its derivatives (Fig. 3).

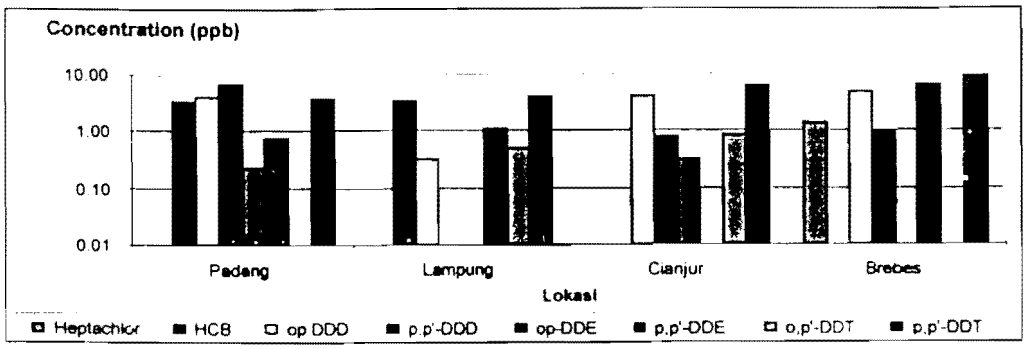

Figure 2 The Highest Concentration of POPs Detected in Sediment (KLH 2005)

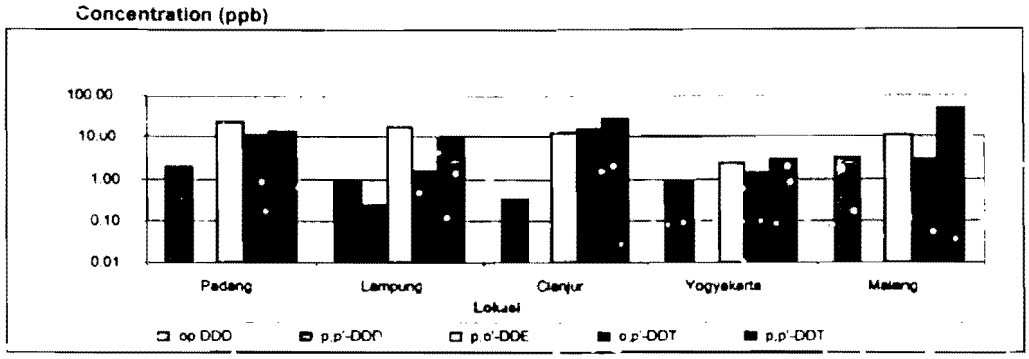

Figure 3 The Highest Concentration of POPs Detected in Soil (KLH 2005)

Joint survey between the University of Padjadjaran and KLH in July-October 2005 revealed that, overall, POPs were still detected in the environment, in the concentration range of 0.002-3.910 ppb in river water, 0.240-713.4 ppb in river sediment, and 0.340-1.282 ppb in soil.[3] Therefore, although have been banned in Indonesia, POPs were still exist in the environment, especially DDT and its derivatives. Soil and sediment are usually good medium for accumulation of POPs so that the levels of concentration are much higher as compared to that in river water.

2.2. POPs Industrial Chemicals

Two Industrial Chemicals targeted by the Stockholm Convention are hexachlorobenzene (HCB) and polychlorinated biphenyls (PCBs).

[3] KLH in collaboration with Padjadjaran University. 2005.

There is no record of HCB production in Indonesia, however, imported HCB was recorded from 1994 to 2002 to the amount of 92,569 kg (Fig. 4). The monitoring showed that HCB was detected on agricultural land. HCB might be used as auxilarry substance in textile industries, and this assumption must be verified through an inventory as textile and garment are important commodities for Indonesia.

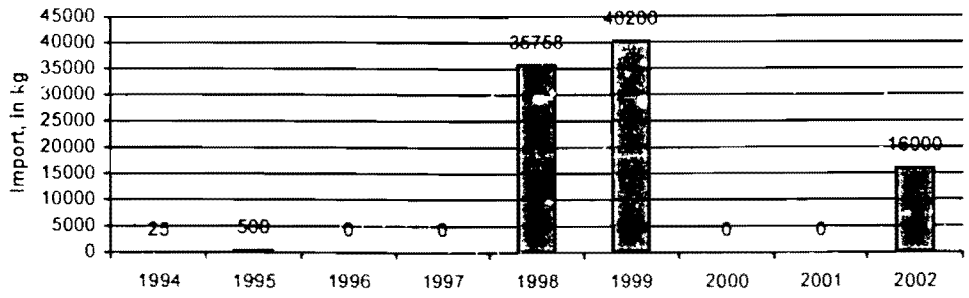

Figure 4 Imported HCB in 1994-2002, in kg

According to Indonesian Statistic Bureau, there were no explicit indications of export, import, and production of PCBs as a chemical in 2000. There is no separate subheading in the statistics data whether the traded transformers and other electrical equipment contain PCBs or not.

Use of PCB as synthetic organic chemical, also known as chlorinated hydrocarbons, has been prohibited by the GR 74/2001.

A preliminary survey on equipment containing PCB has been performed in 2004.[8] Inventory for PCBs was concentrated on the use in transformer and capacitors from only 1500 respondents. The respondents representing several category of sources, i.e. manufacturing & mining, power plants & electrical services, hospitals, harbour & airport, hotel, government office, commercial building, and military facility (Table 1). It is important to mention that the self-reported questionnaires are not properly filled-out due to low awareness of adverse impact of PCB.

Table 1 Summary of the results of the preliminary inventory on equipment containing PCB, by year of purchase

Electrical Equipment	Number of Response	≤1985*		>1985		Total
		Number	%*	Number	%*	
Transformer	244	1838***	44.1	2333	55.9	4171
Capacitor	120	277	6.2	4219	93.8	4496
Hydraulic Pump	33	39	11.7	295	88.3	334

* Year of purchase
** With respect to the total number of equipment
*** Average weight of equipment: 7,385 kg

Information regarding oil type in the transformer revealed that some respondents are using PCBs in their equipments, i.e. Clophen (17 pieces), Askarel (29 pieces), Pyranol (2 pieces), Terminol (1 piece), PCB (1 piece). It is clear that as many as 50 pieces or 1.2% of the total transformers are reported as equipment containing PCB. There are also 3 transformer reported as PCBs-free. In this self-reported information, the data may not be very accurate. So far, the inventory is limited to equipment having PCB concentration ≥ 0.05% and volume > 5 litres in closed systems (Table 2). Inventory method must be improved by including mining and transportation sectors. Inventory on wider coverage must use these findings to determine the prioritized targets.

Table 2 Summary of the quantitative test for PCBs

No.	Category	Sample		Concentration	Category of Source*
		Number	%		
1	Non-PCBs	27	77.2	<50 ppb-2.0 ppm	Varies
2	PCB-contaminated	2	5.7	70-400 ppm	Textile, airport, mining (1), chemical (2), ceramics (1)
3	'Highly contaminated with' PCBs	6	17.1	0.13-0.32%	Automotive (1), metal working (1), power plant (1)
Total		35	100		

* Numbers in bracket indicate the number of sample in the respective type of business.

Large transformer producers are also complying with ISO 14000 series that require that all transformers are PCB-free. Equipment containing PCB must be reported and disposed by a company designated to do the disposal, namely PT PPLI. Transportation and disposal are considered costly to the customers; especially those located in remote areas. For PCB elimination, capacity and number of disposal facility must be increase by considering geographical aspect as well as development of non-combustion technology.

In 1998, PLN with an assistance of designated consultants have formulated PCBs management.[4] The Ministry of Energy and Mining, particularly PLN, is recommended to undertake the necessary steps for a self-imposed safety management system for electrical equipment. The suggested program consists of fully identification and, if found, safe handling and reliable disposal of PCB-containing equipment. Concerning transformers, the alternative measure of exchange the oil of affected transformers will not be used. Nonetheless, the above-mentioned plan has not yet been implemented and when the date of completely abolished the equipment containing PCB has not been determined. Description concerning the proposed plan by PLN will be a good base for BAT/BEP in meeting the obligation for Stockholm Convention.

[4] Lahmeyer International & PT Jaya CM Manggala Pratama. 1998. Final Executive Summary and Final Report Volume III. Consulting Services for Strengthening PLN's Environmental Management Capabilities. World Bank Loan No 3761-IND

Most transformers (PCB-containing and PCB-free) belongs to Pertamina have been registered. Policy on using PCB-free equipment has been implemented before 1990. However, specific guideline for PCB disposal has not been issued so that the PCB-containing equipment is kept in special storage.

2.3. POPs unintentional chemical by-products (UPOPs)

Estimated UPOPs. According to the Standardized Toolkit (UNEP 2001), dioxin emissions per year are calculated as activity rate × emission factor. Activity rate is the amount of feed material or product produced, predicted from statistics data gathered by the National Statistics Bureau or the Regency/Provincial Statistics Office. The emission factors, stated in μg I-TEQ per unit feed matenal processed or product produced, were determined by expert judgment based on technology applied by respondents in the study.

Overall, dioxins and furans emission in 10 categories in the year 2000 are estimated as high as 20,977 g TEQ (Fig. 5). Categorical analysis shows that dioxins and furans emission in 2000 from the highest to the lowest (in g TEQ and %) are as following: power plants (13,939 g, 66.5%), pulp & paper industry plus others (4,442 g, 20.4%), uncontrolled combustions (1,640 g, 7.8%), iron and non-iron industry (939 g, 4.5%). Meanwhile, incineration, mineral industry, transportation, miscellaneous, and open waste dumps contributions are less than 1% (Fig. 6).

Overall, vector analysis indicates that the most emission is released to air (71.8%, mostly from biomass burning), to product (17.9%, mostly from textile and pulp & paper industry), and in residue (10.3%, mostly from iron & steel aluminium, and zinc production). Seventy-nine paper factories, including 7 integrated pulp & paper are operating in Indonesia. Meanwhile, emission released to water and land is less than 0.5% (Fig. 7).

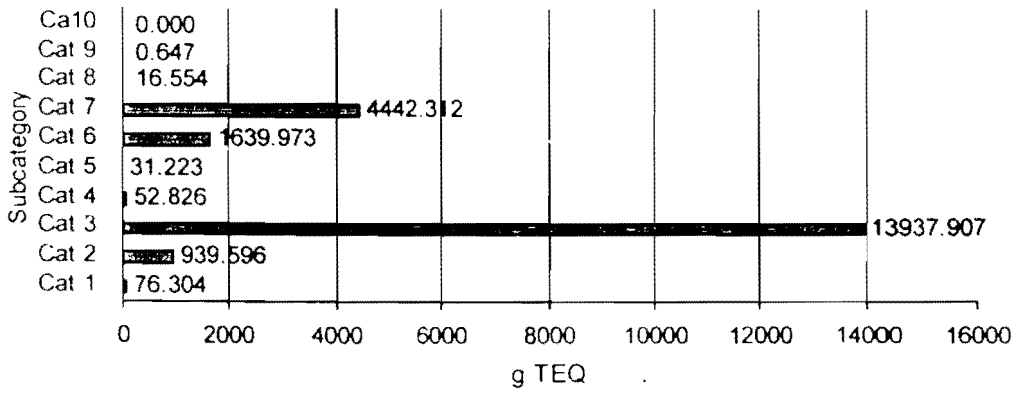

Figure 5 Estimated release of dioxins from ten categories, in g TEQ

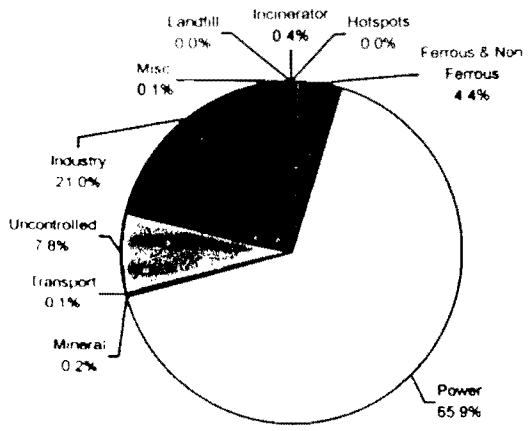

Figure 6 Percentage of release of dioxins from ten categories

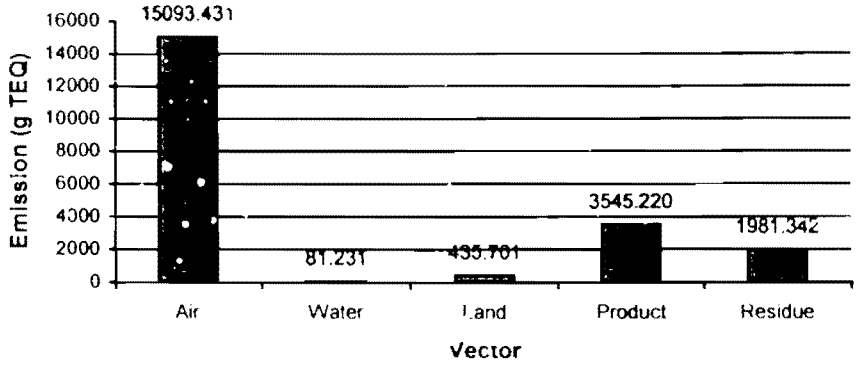

Figure 7 Estimated release of dioxins from five vectors, in g TEQ

Using the dioxin toolkit prepared by UNEP, this study estimated that the emission of dioxins and furans in Indonesia is approximately 20,977 g TEQ in the year 2000. This amount is comparable to the estimated emission of 17 European countries, which is 20,047 g TEQ (ranging from 1,318 g TEQ to 20,047 g TEQ).[5]

Incineration of Medical Waste. Total number of hospital in Indonesia is 1178, including about 49% having incinerator but only 77% of which declared that the incinerators are working. However, there is no report whether they are working properly in terms of dioxin/furans emission. Survey on incinerators operated by hospital in Jakarta revealed the existence of 11 incinerators, 7 actively operated, and 4 not active, usually small capacities of 0.15 m^3/day, installed in 1997 to 2001, and mostly using kerosene as fuel. The incinerators operate at temperature 900-

[5] Northern Ireland Department of the Environment. 2002. Dioxins and Dioxins-like PCBs in the UK Environment: Consultation Document. London: Department for Environment, Food and Rural Affairs (DEFRA Publications)

1200°C, 5 to 9 m high for stack, and mostly are located at less than 50 m distance from the residential areas.

Open Biomass Burning. It is obvious that in treatment the waste, open burning is practiced by urban (36%) and by rural people (55%). Composting is small, 1% in urban and 3% in rural areas (Table 3). This information supports the high contribution of open burning to emission of UPOPs. Achievement by WJEMP[6] project on an increasing percentage of urban waste composting might be replicated in other provinces.

Table 3 Percentage of domestic waste burning and ways to discard (BPS 2004)

	Urban	Rural	Total
Carried away by workers	41.28	1.49	18.41
Dumped	7.97	12.64	10.66
Turn into fertilizer	1.15	3.18	2.31
Burned	35.59	55.27	46.90
Thrown into river	6.90	8.50	7.82
Thrown anywhere	2.72	11.31	7.66
Other	4.39	7.61	6.24
Total	100.00	100.00	100.00

3. NATIONAL IMPLEMENTATION PLAN ON ELIMINATION AND REDUCTION OF POPs IN INDONESIA

National Implementation Plan (NIP) on elimination and reduction of POPs in Indonesia is a work programme in developing and implementing policies, regulations, institutional efforts, and response actions to reduce or eliminate POPs release in Indonesia. The government of Indonesia decided to implement the NIP after the Stockholm Convention has been ratified with a target to eliminate POPs by involving all stakeholders. Reasons behind the commitment are (i) POPs chemicals are still used in industries, namely PCB (polychorobyphenyls) and POPs residues are still detected in the environment in Indonesia, (ii) the negative impact caused by POPs exposure has not been widely known by the community, and (iii) the capacity and capability of infrastructures in POPs management are still limited.

In formulating strategy to implement Stockholm Convention, life cycle of POPs (Fig. 8) must be understood. POPs marketed in Indonesia are imported, except for UPOPs. Afterwards, these chemicals are used and the residues contaminated various products of industries, environment, and human. Therefore, the risks to be assessed should cover environmental risk, ecological risk, and human risk.

[6] KLH. 2004. West Java Environment Management Project.

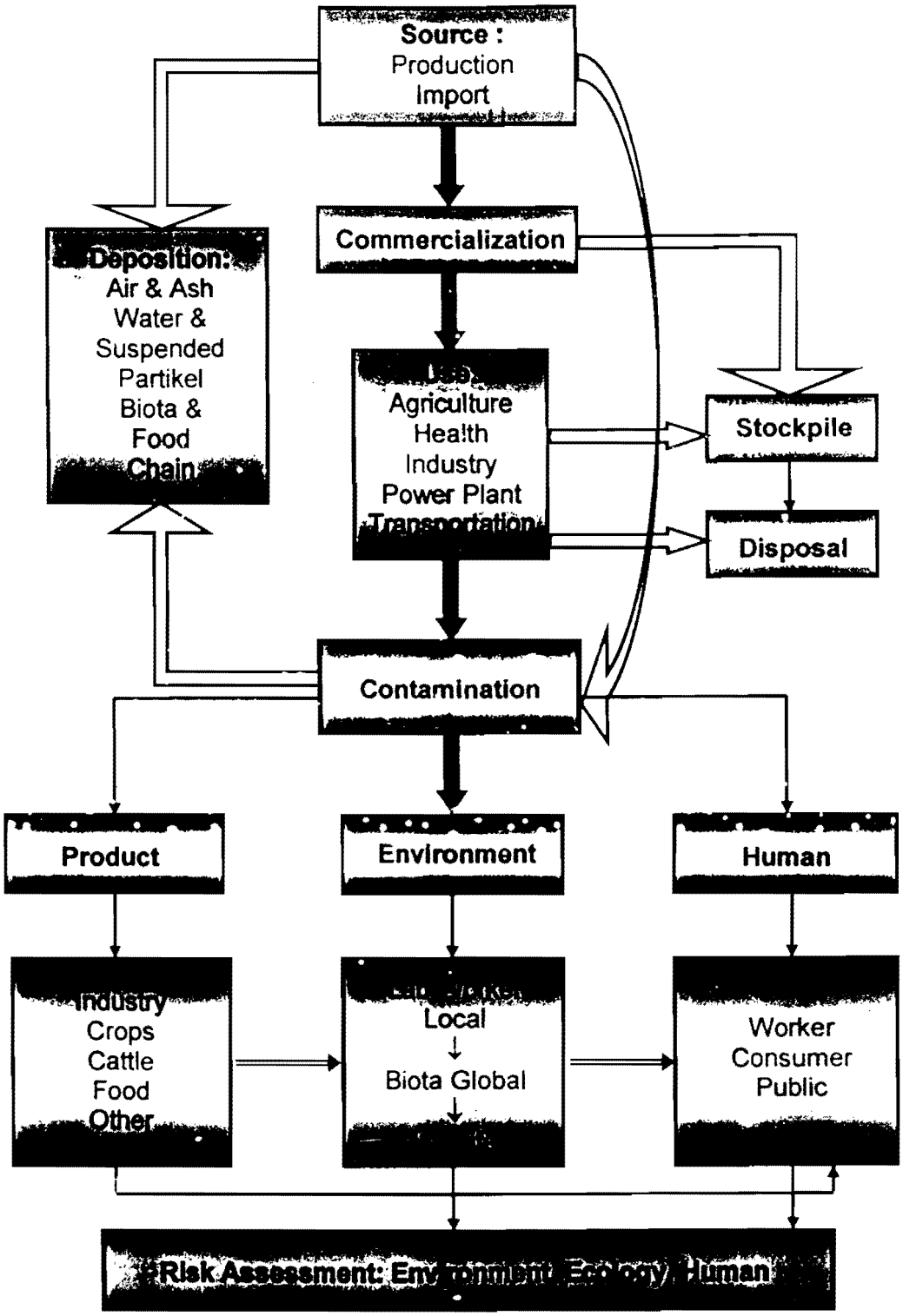

Figure 8. Life cycle of POP's (Noegrohati, 2004)

By analyzing the POPs life cycle, some gaps have been identified to meet the Convention obligations. Measures to be taken are

- Evaluate legislation and policies regarding POPs and decide the necessary instruments to make them effective,
- Organize the development of law instruments necessary to comply with the Convention, among other is regarding quality standard,
- Carry out comprehensive inventory on POPs (import/export, distribution, use, stockpile, disposal),
- Organize infrastructure strengthening, capacity, and capability in (a) obtaining valid and reliable data, (b) integrating monitoring and risk assessment caused by POPs exposure, and (c) conducting communication and education about the harmful of POPs and the risks on ecosystem and human health,
- Increase community awareness of the importance of reduction and elimination of POPs in ESM (environmentally sound manner),
- Coordinate research & development on the status and distribution of POPs in the tropics, alternative techniques or chemical for POPs substitutes, and alternatives for BAT and BEP,
- Coordinate the national implementation among all stakeholders to comply with the Convention, and
- Coordinate the review every 5 years and report it to the Secretariat of POPs.

Action plans to be implemented to comply with the Stockholm Convention in Indonesia:

(a) Starting in 2008, after the Stockholm Convention has been ratified by the government of the Republic of Indonesia, institutional strengthening shall be initiated by establishing B3 Committee that will undertake the POPs management. Simultaneously, legislation shall be strengthened, particularly the GR. 74/2001 regarding B3 management, followed by a review on other government regulations and ministerial decrees. Following the strong institutions and legislations, control on prohibition of production, export-import, distribution, and use of POPs can be carried out.

(b) Reduce or eliminate release from production and use of POPs by preventing illegal distribution, extend the inventory, and seek alternatives for POPs chemicals.

(c) Prevent and control illegal POPs pesticides distribution, apply integrated pest control and vector (IPM and IVM) to reduce the dependency of the community on synthetic pesticides, and make inventory on contaminated sites that needs remediation. Since IPM and IVM are not directly related to POPs control, these two measures can be commenced in 2010.

(d) Strengthen infrastructure capacity and capability (including accredited laboratories) and human resources to be able to conduct extensive inventory on PCB and equipment and materials containing PCB with a target to eliminate these articles in 2028. Simultaneously, registration and labelling of transformers and capacitors shall be immediately carried out (starting in 2009) as well as developing of non combustion techniques to destroy PCB.

(e) Control distribution and illegal trade of DDT, followed by inventory of ex-warehouse of DDT, and remediate the contaminated sites.

(f) Not tc register of exemption in using DDT as pesticide in agriculture and in combat of malaria.

(g) Reduce and eliminate unintentional POPs (UPOPs) release by

- Prepare legislation on prevention, control, and reduction of UPOPs, including level of dioxins/furans in the environment and products.
- Determine dioxins/furans emission in 5 industrial zones and 5 populated cities in addition to preparation of accredited laboratories for UPOPs. Therefore, dioxins/furans emission by public and private sectors can be reported annually.
- Apply BAT and BEP, initiated by preparation of guidelines and training on BAT/BEP for incinerator operators and cement kilns, including separation of materials that are dioxins/furans precursors,
- Formulate research and education programmes to prevent open burning and shifting cultivation.
- Establish BAT/BEP pilot project for source category of Part II Annex C of the text of Stockholm Convention: (i) domestic waste processing in 5 populated cities; (ii) specific incinerators for medical waste; (iii) cooperation with cement industries to use the kiln; and (iv) survey on additives used in paper manufacturers

UPCPs handling requires strengthening some designated laboratories, therefore, the implementation will be effective after 2010.

(h) Identification of material stockpiles and wastes containing POPs and subsequently manage them by ESM (*environmentally sound management*), in terms of handling, disposal, and transboundary movements (Basel Convention), for example, by remediation. Strengthening of infrastructure (laboratories) and human resources to analyze POPs are needed to support identification process. Except for UPOPs, these action plans will be started in 2009. The managed stockpiles include POPs that are accumulated in human and, hence, the impacts of POPs on human health can be assessed and monitored following the establishment of UPOPs laboratories.

(i) Survey on HCB to identify stockpiles, used equipment, and wastes, will be carried out in 2008 as the volumes and the distribution are not clearly known.

(j) Manage the stockpiles in safe manner, efficient, and environmentally sound manner by preparing guidelines, search for non-combustion techniques, provide non-combustion facilities for equipment containing PCB.

(k) Identify contaminated sites (Annex A, B, C) and remediate them in environmentally sound manner.

(l) Facilitate or exchange information and involve stakeholders, by establishing B3 Committee consisting of representatives from relevant institutions as stipulated in GR 74/2001. The Committee is responsible for

- coordinating various activities concerning POPs management, including exchange of information among stakeholders,
- increasing capability to control and to evaluate the programmes on reduction and elimination of POPs, and
- reviewing all regulations regarding POPs
- giving advises to the government concerning status of chemicals in POPs categories.

(m) Increase public awareness and capability by disseminating information concerning POPs through the following steps:
- Gather and disseminate information on POPs.
- Determine and educate target groups responsible for information delivery and provide relevant information for that purpose.
- Incorporate awareness on POPs as material for public education and coordinate the implementation.
- Give training for stakeholders
- Provide incentives or awards for successful manufacturer or individual in reducing or eliminating POPs releases in their respective work units.
- Increase public participation in addressing POPs.

(n) National focal point facilitates the evaluation on the effectiveness of Stockholm Convention by preparing progress reports on reducing and eliminating POPs in Indonesia. The evaluation shall be carried out by the CoP.

(o) The MoE as the national focal point also provides report to the CoP regarding improved legislation, updated statistical data on the quantity of imported POPs, efforts in improving human resources, evaluation on policies and recommendations to the government as well as results of inventories on POPs. The reports shall be submitted in 2009, and every 5 years afterwards. Information in the country shall be gathered a year prior to the report submission.

(p) Increase research, development, and monitoring activities by involving universities and other research institutions in the country, according to the following steps:
- Establish a committee on research and development,
- Determine criteria and mechanism for competitive-based research,
- Apply research and development, and
- Dissemination of the results.

(q) Submit proposals for technical assistance and financial assistance to support funding and expertise in addressing POPs management problems. The source of budget may come from the State Budget (APBN), the local government budget (APBD), private, and donor countries (bilateral and the world financial institutions).

(r) At national level, funding for activities in POPs elimination shall be provided in 2007 following the enacted of the NIP in a Presidential Decree, and the action plans can be implemented in 2008.

The National Implementation Plan, which is a commitment of all stakeholders, shall be updated every 2 years as required by the Conference of Parties to ensure that the action plans are implemented accordingly.

4. CONCLUSIONS

The Indonesia government has reduced and limited POPs usage for years. However POPs residues are still identified in Indonesia's environment, showing the weakness of the policies implementation, due to limited infrastructures, human resources, funding, and international collaboration. The commitment to ratify

Stockholm convention will improve the capacity and capability of infrastructures (laboratory, techniques, qualified human resources, etc.); collaboration, information and management; community awareness; and funding to reduce and eliminate POPs in Indonesia.

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