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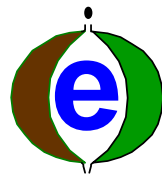


Swiss Agency for
the Environment,
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Landscape SAEFL

The International POPs Elimination Project (IPEP)

*Fostering Active and Effective Civil Society Participation in
Preparations for Implementation of the Stockholm Convention*

Country Situation Report on POPs in Tanzania



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About the International POPs Elimination Project

On May 1, 2004, the International POPs Elimination Network (IPEN <http://www.ipen.org>) began a global NGO project called the International POPs Elimination Project (IPEP) in partnership with the United Nations Industrial Development Organization (UNIDO) and the United Nations Environment Program (UNEP). The Global Environment Facility (GEF) provided core funding for the project.

IPEP has three principal objectives:

- Encourage and enable NGOs in 40 developing and transitional countries to engage in activities that provide concrete and immediate contributions to country efforts in preparing for the implementation of the Stockholm Convention;
- Enhance the skills and knowledge of NGOs to help build their capacity as effective stakeholders in the Convention implementation process;
- Help establish regional and national NGO coordination and capacity in all regions of the world in support of longer term efforts to achieve chemical safety.

IPEP will support preparation of reports on country situation, hotspots, policy briefs, and regional activities. Three principal types of activities will be supported by IPEP: participation in the National Implementation Plan, training and awareness workshops, and public information and awareness campaigns.

For more information, please see <http://www.ipen.org>

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The views expressed in this report are those of the authors and not necessarily the views of the institutions providing management and/or financial support.

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LIST OF ABBREVIATIONS

AAT	Agrochemicals Association of Tanzania
AGENDA	AGENDA for Environment and Responsible Development
ASP	African Stockpiles Programme
BATs	Best Available Techniques
BoT	Bank of Tanzania
CBO	Community Based Organisation
CSO	Civil Society Organisation
COSTECH	Tanzania Commission for Science and Technology
CPCT	Cleaner Production Center of Tanzania
CTI	Confederation of Tanzania Industries
DALDO	District Agricultural and Livestock Development Office
DDT	Dichlorodiphenyltrichloroethane
DoE	Division of Environment
ENVIROCARE	Environmental, Human Rights Care and Gender Organization
FAO	Food and Agriculture Organisation
GCLA	Government Chemist Laboratory Agency
GEF	Global Environmental Facility
ILO	International Labour Organisation
IPEP	International POPs Elimination Project
IPCS	International Programme on Chemical Safety
IPEN	International POPs Elimination Network
IPM	Integrated Pest Management
IPPM	Integrated Production and Pest Management
ISP	Internet Service Provider
IVM	Integrated Vector Management
JET	Journalists Environmental Association of Tanzania
KNCU	Kilimanjaro Native Cooperation Union
LVEMP	Lake Victoria Environmental Management Programme
MATI	Ministry of Agriculture Training Institute
MIT	Ministry of Industry and Trade
MAFS	Ministry of Agriculture and Food Security
MoH	Ministry of Health
MT	Metric tons
NAFCO	National Food Corporation
NEMC	National Environmental Management Council
NEP	National Environmental Policy
NGO	Non-government Organization
NIP	National Implementation Plan
OSHA	Occupational Safety and Health Authority
PCBs	Polychlorinated Biphenyls
PCDD	Polychlorinated dibenzo- <i>para</i> -dioxins
PIC	Prior Informed Consent
POPs	Persistent Organic Pollutants
RALDO	Regional Agricultural and Livestock Development Office
SUA	Sokoine University of Agriculture
TANESCO	Tanzania Electrical Supply Company

TCC	Tanzania Cigarette Company
TCCIA	Tanzania Chamber of Commerce, Industry and Agriculture
TPAWU	Tanzania Plantation and Agricultural Workers Union
TPCC	Tanzania Portland Cement Company
TPRI	Tropical Pesticide Research Institute
TRA	Tanzania Revenue Authority
TTCL	Tanzania Telecommunication Company Limited
UCLAS	University College of Lands and Architectural Studies
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
VPO	Vice President Office
WHO	World Health Organization
WWF	Worldwide Fund for Nature

EXECUTIVE SUMMARY

Persistent Organic Pollutants (POPs) are highly toxic chemicals even in small amounts and remain in the environment for several decades without degrading. They bioaccumulate and biomagnify especially in fatty tissues and up the food chain highly affecting human and wildlife. They undergo long range transport in air and water therefore they are present all over the world, even in regions where they have never been used.

POPs cause a number of serious adverse health effects to man and wildlife notably death, birth defects, cancer and tumors at multiple body sites, neural behavioral impairments including learning disorders, immune system changes, reproductive defects of exposed individuals as well as their offspring. Other adverse effects of POPs are disease such as endometriosis, increased incidence of diabetes and others.

Up to 2001 when the Stockholm Convention was adopted to protect human and environment from such chemicals, there were twelve known chemicals to possess POPs characteristics. They are composed of intentionally produced pesticides (i.e. Aldrin, Dieldrin, DDT, Endrin, Chlordane, Hexachlorobenzene, Mirex, Toxaphene and Heptachlor) and industrial chemicals (Polychlorinated biphenyls-PCBs) and unintentionally produced POPs especially during industrial and burning process namely Dioxins and Furans. Recently, there have been studies that reveal more chemicals that exhibit POPs characteristics. Among the proposed ones for inclusion as new candidates on the POPs list at the First Conference of the Parties held from 2 to 6 May 2005 are: Lindane a pesticide proposed by Mexico; chlordecone and hexabromobiphenyl, a pesticide and flame retardant respectively proposed by the European Union; and penta-BDE, a flame retardant proposed by Norway.

ENVIROCARE under the financial assistance from the International POPs Elimination Project (IPEP) conducted a Tanzania POPs situation study in few selected regions namely Coast, Morogoro, Kilimanjaro and Arusha regions. The study revealed that the few surveyed stores had a total of about 106,875 kilogram of POPs obsolete pesticides. They include DDT, Aldrin, Dieldrin and Toxaphene.

This report is a result of the information gathered and consultation made with several stakeholders including Vice President's Office (Division of Environment), National Environment Management Council (NEMC), Ministry of Industry and Trade, Ministry of Agriculture and Food Security, Tanzania Harbors Authority, Pesticides and chemical industries, Tropical Pesticide Research Institute (TPRI), Government Chemist Laboratory Agency (GCLA), Sokoine University of Agriculture (SUA), University of Dar es Salaam, cooperative unions, veterinary and farmers associations, farmers and NGOs among others.

The study shows that Tanzania used a lot of POPs pesticides for crop and animal pests control for many years. The remaining stocks of these pesticides, mainly obsolete are stored in several stores in the country under the Ministry of Agriculture and Food Security. Some stockpiles are now under the authority of the National Environment Management Council (example DDT obsolete stocks at Vikuge – Kibaha District). Storage conditions in most of the stores are very poor and threatening human life and the

environment. Shifting and disappearance of the stocks through leakage and wind drift to unknown places is also common in some stores. This was observed in RALDO Arusha (Toxaphene), DALDO Babati (DDT) and Tengeru Pest Control Center (Dieldrin). There were also claims that some stocks were collected from stores for disposal but there was no information about the individuals or agencies involved in clearing the stocks, when or where they were sent for disposal.

Places that were found to have POP stockpiles were Vikuge (DDT) in Coast Region; DALDO Ulanga (DDT and mixture of Endosulfan) and Tanzania Links (DDT) in Morogoro Region; Arusha Seed Farm (Aldrin), TPRI (Toxaphene) in Arusha Region and Manyara Region were DALDO Babati (DDT) and NAFCO Hanang (DDT).

Tanzania has no specific law governing the issues of POPs and public awareness except the National Industrial and Consumer Chemicals Act, 2003 and the National Environmental Management Act (NEMA) of 2004 which have specific sections about POPs and public educational campaigns on sound management of Chemicals.

Although Stockholm Convention is not yet known to the majority of Tanzanians, the government of Tanzania and other stakeholders including CSOs/ NGOs have some initiatives including the NIP currently under preparation to raise awareness and build some understanding and capacity towards POPs elimination. The government is determined to eliminate POPs as practicable by implementing the NIP and seeking international and local cooperation as needed.

1. WHAT ARE POPs

POPs are toxic contaminants that exhibit the following characteristics:

- They remain in the environment for a long time, lasting even for decades;
- They often bioaccumulate and biomagnify in living organisms including humans especially in fatty tissue;
- They evaporate and travel long distances through the air and water;
- They are generally highly toxic in very small concentrations.

They are named as POPs as they are not biodegradable and they travel long distance from where they were used previously. There are 12 chemicals listed in Annex A of the Stockholm Convention (Article 3) declared as POPs. Among the 12 POPs (Dirty Dozen), 9 of them are Pesticides. The pesticides include DDT, Chlordane, Heptachlor, Hexachlorobenzene, Toxaphene, Aldrin, Dieldrin, Endrin and Mirex. PCB (polychlorinated biphenyls) is an industrial chemical produced intentionally and other 2 are industrial chemicals which are produced unintentionally; these are Dioxins (Polychlorinated dibenzo-para-dioxins), Furans (Polychlorinated dibenzofuran).

2. SOURCES OF POPs

2.1 Stockpiles

The POPs stockpiled in various parts of Tanzania today were imported into Tanzania in 1970s and 1980s were originally intended for plant protection and for control of malaria

vector (mosquitoes). They came from different world states as donations or commercial chemicals. The donations came from countries like Japan, China, Greece and USA. It is thought that the donation was done in a good faith and the impacts of the pesticides were not known then. Some of the POPs stockpiles were formulated here in Tanzania, for example DDT was formulated by SAPA Chemical Industries and TWIGA Chemical industries both in Dar es Salaam and Tanzania Links in Morogoro.

Table A: Visited sites with POPs chemicals in Tanzania

SITE	POP Name	Source
Vikuge farm, Kibaha	DDT	Donation from Greece
SAPA Chemicals Industry, Dar es Salaam	DDT	Industrial production for commercial purpose before it was banned.
Tanzania Links Chemical Industry, Morogoro	DDT	Industrial production for commercial purpose before it was banned
DALDO Mahenge, Ulanga	*DDT	TWIGA chemicals Industry, Dar es Salaam.
Arusha Seed Farm	Aldrin	TWIGA chemicals Industry, Dar es Salaam.
Tengeru Pest Control	Aldrin	Nairobi
NAFCO Hanang	*DDT	TWIGA chemicals Industry, Dar es Salaam.
DALDO Babati	DDT	MAFS (Tanzania)

*The POPs are mixed with other obsolete pesticides (Endosulfan and Actelic [pirifosmethyl])

POPs stockpiles are owned by the Ministry of Agriculture and Food Security. When these chemicals expired, they were banned from use and they are no longer used. However, nothing has been done up to the moment to dispose of the chemicals. In some places these POPs stockpiles have been moved locally from one place to another for disposal, for example DDT at DALDO Babati and RALDO Arusha (Table C). Currently Tanzania has 176 MT of obsolete POPs pesticides that are stored in various areas. This IPEP study (2004/05) quantified 106.9 MT from the few areas surveyed.

2.2 Other sources of POPs

Other sources of POPs Chemicals in Tanzania include PCBs-containing oils used in electrical equipment (transformers, capacitors, oil circuit breakers, switchgears and reactors). A substantial amount of PCBs containing oils (43,000 MT) are contained in various types of electrical equipment. Sources of Dioxins and Furans are the unintended releases from human activities such as open burning of municipal solid wastes in disposal sites, burning of hospital wastes, industrial processes, bushfires, power generation plants, emission from transportation and burning of biomass.

The National Profile to assess chemicals management infrastructure in Tanzania was prepared in 1997, and reviewed in 1999 and 2002. The main objective of the National Profile is to maintain an authoritative national reference document on the state of affairs regarding chemical management in Tanzania. The national profile concludes that: -

- a) Tanzania imports and uses a substantial amount of chemicals especially agrochemicals;
- b) The infrastructure for transporting, handling, storing, formulating, applying, and disposing of chemicals is not adequate;

- c) The threat of adverse effects of chemical exposure to health risks or to environmental is real;
- d) Ignorance on the part of most of the people in handling chemicals and a generally low level of awareness to chemical hazards are the main contributing factors to health risks or to environmental problems related to chemicals;
- e) Lack of a specific government policy on management of chemicals is a severe deficiency;
- f) There exists nearly one hundred sectional legal instruments to manage various aspects of environmental management which cannot be enforced easily; however, a new Environmental Management Act was passed by the Parliament in October 2004.
- g) There is weak mechanism for cross-sectoral coordination at national and international level both in practice and procedures; and
- h) There exists a reasonable pool of experts for handling/managing chemicals who might need additional specialized training and continuing education on the subject.

3. LEVELS OF POPs IN TANZANIA

Tanzania has a huge accumulation of obsolete stockpiles of persistent pesticides and veterinary waste. These obsolete pesticide compounds such as herbicides, insecticides and industrial chemicals have been widely used in the past to protect crops, livestock, buildings and housing from damage caused by insect pests.

Table B below shows the intended applications of POPs in Tanzania before de-registering.

Table B: Past applications of POPs pesticides in Tanzania

Common Name	Class	Usage/application
Aldrin	Insecticide	<ul style="list-style-type: none"> • Control of insect pests of maize and cotton • Control of termite in buildings and soil
Dieldrin	Insecticide	<ul style="list-style-type: none"> • Control of insect pests in maize and cotton • Control of termite in the soil
DDT	Insecticide	<ul style="list-style-type: none"> • Control of insect pests in cotton • Control of mosquitoes for public health
Chlordane	Insecticide	<ul style="list-style-type: none"> • Control of insect pests in cotton, maize and vegetables • Control of termite
Heptachlor	Insecticide	<ul style="list-style-type: none"> • Control of soil insect pests including termites • Control of insects in cotton
Toxaphene	Acaricide	<ul style="list-style-type: none"> • For the control of insect pests in livestock

Source: Draft report on POPs Pesticides Inventory (Annex A, Part 1 Chemicals), VPO-DOE, May 2003

Tanzania has no adequate facility to store large amounts of these obsolete pesticides. Most of the obsolete pesticides are stockpiled in bags or leaking and corroded metal drums near settlements and rivers (example Vikuge farm in Coast Region and Tengeru Pest Control Center, Arusha). The labels for the containers or bags are missing or faded

which makes it impossible to know their content and origin. During the POPs country situation survey by ENVIROCARE, identification of POP stockpiles in the chemical stores was done under the help of field officers and storekeepers using the data/information available in their offices instead of reading the labels on the bags and/or containers. There are very few chemical containers and bags in the stores with their original labels, and if any, they are covered by dusts.

3.1 Storage conditions of stockpiles

According to the obsolete chemicals survey and POPs inventory made in Tanzania 1997/98 and 2003 respectively, most of the visited sites of obsolete pesticides were poorly built. In Babati for example, obsolete pesticides including POPs pesticides were stored in a pit dug around the District Agricultural Offices. Currently there are 20 bags of DDT of 20kg each that are buried in Nangara village that is about 8km from Lake Babati under the help of FARM Africa. The disposal pit has concrete that is waterproof and impermeable and in addition it is covered with reinforced concrete slabs to prevent access or breaking into the pit.

At Tengeru Pest Control in Arusha, drums containing Toxaphene were left draining in the Regional Agriculture Office compound. During the study, ENVIROCARE found that there is no more Toxaphene in the RALDOs office, the store has been cleaned and the chemical residues were disposed elsewhere. The few visited sites could reflect the situation of other sites. The shelter constructed during site stabilization done by NEMC in 1999 at Korogwe has significantly deteriorated. Some of the dust chemicals are taken by wind into nearby river and the environment. It has been noted therefore, that most of the sites have deteriorated further as compared to what was reported in the previous inventories.

3.2 Quantities of obsolete POPs pesticides in surveyed areas in Tanzania

During the inventories by a team of Government experts in 19 regions of Tanzania in 1997/98 and 2003 it was observed that there is a poor records-keeping system both in private and government offices during importation, formulation and distribution of POPs pesticides. Therefore it is difficult to get correct figures of the POPs quantities that were imported in the country before they were expired or deregistered. The data are scanty. Table C shows some imported POPs Pesticides between 1989 and 1992.

Table C: Quantities of some POPs pesticides imported into the country*

Trade Name	Common Name	Registration status	Usage	1989	1990	1991/92
Lirophene	Toxaphene	Provisional	Acaricide			
Diedrex 18%ec	Dieldrin	Provisional	Control of soil Insect pest	113,000 lts	-	5000 Lts
Actikil acryl paint	Aldrin + Dichlovos	Provisional	Control of Termites (construction industry)	-	50kg	-

U-combi	Methidathion + DDT	Provisional	Various Control of cotton insect pests	-	-	159,797 lts
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- EXTRACT: Rwazo AJM.; Chemical Import/Export Monitoring in Tanzania; WWF: Final Report, December, 1993

Note also that no importation of POPs pesticides after 1992 due to reasons mentioned on Section 3.2 of this report.

The magnitude of the POPs quantification problem can be estimated based on the assumption that the presence of obsolete stockpiles of POPs pesticides indicates that huge amounts of POPs pesticides were imported above actual needs. Although TPRI is the Designated Authority responsible for the registration of the imported Pesticides, they have no reliable data on the quantity imported as the companies that received the import permits imported less or more than what was indicated in their permits.

The quantities found at different sites in Tanzania during 1997/98, 2003 and 2004 are shown in Table D.

Table D: Quantity of POPs pesticides found in sites during inventories

Region	Site Name	POPs Name	1997/98 Inventory (Kg)	2003 Inventory (Kg)	2004 Survey under IPEP
Coast Region	Vikuge farm, Kibaha	DDT	70,000	70,000	70,000
Morogoro	DALDO Mahenge Ulanga	*DDT	5000	5,000	4,500
	Tanzania Links, Morogoro	DDT	19,500*	19,000*	<19,000*
Tanga	Korogwe	DDT	50,000	50,000	NS
	Tanganyika Coffee Board	Dieldrin	19,200*	---**	NS
Arusha	Arusha Seed Farm	Aldrin	1,098	1,000	75*
	DALDO Babati	DDT	440	400**	400+
	NAFCO Hanang	DDT	11,721*	10,000*	10,000*
	Tengeru	Dieldrin	2,300	2,000	---**
	Burka Estate	Dieldrin	360	---	---
	TPRI	Toxaphene	2,900	2,900	2,900+
	TFA Babati	Toxaphene	200	---**	---
	RALDO Arusha	Toxaphene	9,200	9,000	---
Mwanza	Ukiriguru Research Institute Misungwi	DDT	400	---**	NS
Tabora	TTMB Urambo	Aldrin	2,000	2,000	NS
Singida	Kilimo/Mifugo	Dieldrin	830	--	NS
Mbeya	MATI Uyole	DDT	6,000	6,000	NS
Mtwara	Kyela Valley Foods	Toxaphene	8,000	---	NS
Zanzibar	Plant Protection Division	DDT	NA	150	NS
Lindi	DALDO Lindi	DDT	1,438	---	NS

Dar es Salaam	SAPA Temeke	Chemicals	DDT	10,000	10,000	---
TOTAL				211,587	187,350	106,875

Source: Draft report on POPs Pesticides Inventory (Annex A, Part 1 Chemicals), VPO-DOE, May 2003.
2004 IPEP survey by ENVIROCARE

-- No chemical present

* Indicates mixture of POPs pesticides with other obsolete chemicals.

** Indicates part or all obsolete chemicals were shifted to unknown place.

NS Indicates the place was not surveyed in 2004/5 during IPEP study.

+ Indicates the POPs Pesticides are present as shown but locked in the store thus not accessed by the study team.

It can be seen from Table D above that there is a decrease in POPs pesticides stockpiles from 1998 to 2003, a decrease by 24,237kg, which is equal to 11.5%. This is due to the fact that the more they stay in the stores without disposal the more they disappear through leakage, wind drift or pilferages to unknown places and uses as observed in DALDO Babati, RALDO Arusha and Tengeru pest control. SAPA Chemical Industries Management claimed to have no more POPs (DDT), since it was collected for disposal, although they could not disclose the identity of the individual or agency that cleared the stocks, when the stocks were cleared and where they were sent for disposal. The team was denied access to the stores.

3.3 Relative geographical location of stockpiles of POPs pesticides in Tanzania.

The geographical distribution pattern of POPs pesticides is a reflection of the past national policy and practices on pest control under the Ministry of Agriculture and Livestock. The Ministry of Agriculture supervised the distribution of pesticides based on information collected on pests' outbreaks.

It is therefore evident that large stocks of obsolete pesticides are situated in areas of intensive cash crops agricultural activities and high industrial processing plants. These areas include Arusha, Manyara, Kilimanjaro, Iringa, Mbeya, Morogoro, Tanga, Shinyanga, Mwanza and Dar es Salaam regions.

3.4. Quantities of POPs at different community levels in Tanzania

3.4.1 Government stores

The government stores are the only places where POPs can be found in huge quantities. Up to year 2003, Tanzania had a total of 187,350 kg of POPs that is suspected to be decreasing year after year due to poor storage.

3.4.2 Kilimanjaro Native Cooperative Union (KNCU)

There are no any POPs found in KNCU any more as all the stock were distributed to the farmers before they were deregistered/ banned.

3.4.3 Veterinary shops

No POPs were found in these shops.

3.4.5 Household farmers

The survey did not find any farmers with the POPs pesticides stocks in the household. However this is not a conclusive answer as only a fraction of the farmers were interviewed. The possibility of farmers' possessing POPs pesticides is very low after they were banned.

4. DAMAGE CAUSED BY POPs

4.1 Adverse effects of POPs pesticides in Tanzania

Apparently, there is no detailed research and assessment undertaken in Tanzania to assess the actual adverse effects of POPs pesticides around the contaminated sites. Some preliminary studies showed the presence of residues and their metabolites in the topsoil and therefore further dispersion is expected.

4.2 Cases of affected human/wildlife population and mitigation measures

There are few examples supported with data of the effects of POPs pesticides to human and wildlife population in the country (Tanzania). The existing evidence includes case studies conducted on the effects of organochlorines in birds and agro-ecosystem of maize (Ijani et al (TPRI, 1997). The studies showed residues of organochlorines in the range of 0.001 – 1.45 ng/g.

There are no specific programs designed to study effects of POPs pesticides to human and wildlife population, hence the extent of the problem is not known.

However, in other parts of the world, there is a good evidence associating human exposure to specific POPs or classes of POPs with cancers and tumors at multiple sites; neurobehavioral impairment including learning disorders, reduced performance on standardized tests and changes in temperament; immune system changes; reproductive deficits and sex-linked disorders; a shortened period of lactation in nursing mothers; and diseases such as endometriosis, increased incidence of diabetes, and others.

Particularly disturbing is the concentration of these substances in human tissue and breast milk. These substances can be passed to the developing fetus through the placenta and to the young infant through breast milk. Even at very minute concentrations (parts per trillion) these substances can have profound impacts on the development of the brain and reproductive system of children. For this reason, it is particularly disturbing that these substances can be passed to the young child and developing fetus while they are in their most crucial stages of development.

The study conducted by ENVIROCARE in Kilimanjaro rural farmers identified some health effects which may be associated with POPs pesticide effects (although this needs further study). For example in Masama area (Hai District) the adult population is composed of mainly women. Most men died at mid age. The deaths are suspected to be associated with POPs herbicides as there was intensive application of POPs pesticides in coffee and other crops. The main labour force for spraying was men; they are the very ones who worked in settler farm plantations. The same story was told in Kibosho area where the people who worked in coffee plantations died abruptly after collapsing and vomiting. Other sufferings to the spraying men include loss of teeth, skin rashes, liver cancer and paralysis.

There is a great possibility that POPs-related health effects fit the above mentioned symptoms. Therefore there is a need to do epidemiological research on the adverse impacts of POPs to the health of the population around those areas.

5. LAWS CURRENTLY REGULATING POPs IN TANZANIA

In Tanzania there is no specific law governing the issues of POPs and public awareness except the National Industrial and Consumer Chemicals Act, 2003. Section 10(h) states specifically that one responsibility of the Chief Government Chemist, as the Registrar of Chemicals is to conduct public educational campaigns on sound management of Chemicals.

Section 46 provides among others for the immediate notification of public and relevant authorities in case of accidents and spills related to chemicals.

The survey made in Tanzania by a team of experts shows that the existing policies and legal framework are not adequate to manage POPs and their impacts. Since the problem of POPs is a new issue to Tanzania, most of the existing policies and legislations do not specially address POPs Management, thus posing difficulties to manage POPs chemicals and emissions in an environmentally sound manner.

In realization of the importance of Environmental Law in place, Tanzania prepared the **“Environmental Management Act (NEMA) 2004”** which was passed by the Parliament in October 2004, and expected to enter into force soon. Hazardous chemical management including POPs is covered in the Act, parts V, VI, VIII and IX.

The Environmental Management Act 2004 has specific section (Paragraph 77) for the management and control of persistent organic pollutants. This paragraph commits the Government of Tanzania to comply with Stockholm Convention on Persistent Organic Pollutants of 2001. Paragraph 179 of the Act commits the Government to develop legislation to address the requirements of International Agreements to which Tanzania is a Party, Stockholm Convention being one of them.

6. NGOs AND POPs

6.1 Narration on NGO (ENVIROCARE) capacity on POPs.

Since 1994 ENVIROCARE has been dealing with research on the pesticides situation in the Kilimanjaro area. In the year 2000 ENVIROCARE produced the book named PESTICIDES AND THE ENVIRONMENT IN TANZANIA as an output of the research, fieldwork and workshops on **“Hazards Awareness of synthetic Pesticides and the Search for their alternatives”** which were held in Moshi and Dar es Salaam, in 1999.

ENVIROCARE is an NGO with a very good capacity to deal with POPs as it has dealt with campaign against agricultural chemicals that pollute the environment and affect human health. ENVIROCARE has a good reputation among the people in Kilimanjaro region due to its efforts towards sensitization on organic agriculture, and what is more, it

has a well-established network with some local and international institutions that are concerned about the environment.

Sustainable development also entails creating a pollution-free environment. Agenda 21 is mainly on sustainable development. ENVIROCARE has been supporting sustainable farming in Kilimanjaro region since year 2002 through awareness raising on agro pesticides pollution, POPs inclusive. The programmes have enabled farmers to use indigenous knowledge in crop protection and use of organic fertilizers as well as natural botanicals. The activities carried out in the project were; advocating safe use/handling of pesticides through production and distribution of reader materials, seminars and workshops, studies to explore alternative methods of plant protection, promote alternative methods of plant protection such as the use of different types of plants with medicinal/insecticidal properties like the Neem tree and others.

6.2 Description of the current level of NGO communication and coordination (national, regionally, and internationally) on POPs

- ENVIROCARE has a well-established networking and coordination with the Government and Private institutions within and outside Tanzania, which work on POPs issues. Some of these are AGENDA for Environment and Responsible Development (AGENDA), Tanzania Plantation and Agricultural Workers Union (TPAWU), Tropical Pesticides Research Institute (TPRI), Government Chemist Laboratory Agency (GCLA) and Cleaner Production Center of Tanzania (CPCT).

ENVIROCARE, AGENDA and TPAWU are participating organizations of the International POPs Elimination Network (IPEN), a network of public interest NGOs and CSOs that works towards elimination of POPs.

There is also a network of NGOs and CSOs that works specifically on the Africa Stockpiles Programme (ASP) in Tanzania. It comprises a number of NGOs/CSOs on environment, health, farmers, workers and communities.

6.3 POPs information produced and disseminated by NGOs before IPEP began

6.3.1 ENVIROCARE

ENVIROCARE has been so active and conversant in producing the POPs information and disseminate to the public. POPs related materials that have been produced by ENVIROCARE are as shown below and the language in which they were published.

i. Books

- Pesticides and the Environment in Tanzania (2000) – in English.

ii. Booklets

- Mzunguko wa Sumu Isiyonekana (2002) – in Kiswahili (*Unseen Poison*)
- Matumizi ya Dawa za Asili kwa Wanyama na Mimea, Toleo la pili, 2004 – in Kiswahili - (*Natural Medicine for Animal and Plants, 2nd edition, 2004*).

iii. Posters

- Uchomaji wa Takataka za Plastiki in Sumu kwa afya yako na Mazingira – in Kiswahili – (*Plastic burning is dangerous to your health and environment*)

- Epuka madawa ya kilimo yaliyopigwa marufuku – in Kiswahili – (*Avoid using banned agrochemicals*)

The above materials were/are produced for pupils, farmers and other groups.

iv. Radio Programme

ENVIROCARE under the Pesticides Awareness Programme in Kilimanjaro Region, prepared and aired out radio programmes on POPs in Kiswahili. The programmes reached the community through Radio Sauti ya Injili Moshi. This radio station has been an effective tool for public awareness-raising since 1998 to present (2005).

Radio programme	Date aired
Kutumia madawa ya asili katika kilimo cha mboga (Sehemu ya 1,2 na 3) - <i>The use of organic/ natural pesticides in vegetable production (Part 1,2 and 3)</i>	September 2003
Udhibiti wa visumbufu vya mimea - <i>Integrated Pest Management (IPM)</i>	June 2000
Matumizi salama ya viuatilifu - <i>Safe use of Pesticides</i>	June 2000

v. Presentations

ENVIROCARE have been very active in participating in different local and international fora, where different topics on POPs are delivered. Example, In 8th March, 1999) on Women's day, ENVOROCARE made a presentation on "**Women and POPs**" Also participated in the African NGOs Skills share on the Ratification and Implementation of the Stockholm Convention on POPs in 2002 Arusha Tanzania.

6.3.2 AGENDA

POPs information produced from AGENDA includes:

- Awareness raising materials including brochures, news articles, leaflets, POPs facts preparation and dissemination to different stakeholders in both English and Kiswahili
- Discussion and presentation of study reports to communities and other regional stakeholders
- Presentation of the solution and study reports at different fora
- Holding workshops, press conferences and interviews with media
- Production and release of a quarterly newsletter on general chemical management and alternatives among other issues (production stopped some years back, plans to resume its production at some level is underway).

6.3.3 TPAWU

POP information includes:

- Quarterly newsletter to workers,
- Fliers distributed to workers and farmers,
- Training sessions and seminars to workers and farmers

7. EFFORTS TO DEAL WITH POPs IN TANZANIA

Tanzania being a party to the Stockholm Convention since April 2004, has undertaken inventory of chemicals twice, on general obsolete chemicals (1997/98) and on POPs (2003) as an initial step to the preparation of the National Implementation Plan (NIP). NGOs participating in the NIP in Tanzania include AGENDA, ENVIROCARE and Tanzania Association of Women Leaders in Agriculture and the Environment (TAWLAE). AGENDA is a member to the technical Committee on PCBs.

Assessment of the institutional and legal framework for the management of POPs was taken among others to determine the current capacity in monitoring of POPs releases and their impacts to Environment and human health.

The government is committed to undertake various interventions that are geared to minimize or prevent further releases of POPs. In a few cases some steps have already been taken that have resulted into significant reduction of releases of PCB and POPs pesticides. For example ABB TANELEC Company based in Arusha that manufactures and services electrical equipment (transformers, capacitors, switchers etc.) is no longer using PCBs in new transformers. Recently, all POPs pesticides have been removed from the register of pesticides.

In Tanzania, the National Environmental Management Council (NEMC) has taken up some initiatives to prevent further spreading of the POPs in the environment at Vikuge Farm and TPRI. At Vikuge farm, NEMC constructed a secured store where the DDT dust was repacked in bags. Since it is secured, the stock is ready for disposal in an environmentally sound way when funds are available.

In a nutshell, since these POPs pesticides were banned, not much has been done to dispose them either by government or private sectors. The only hope for disposal lies on the African Stockpile Program (ASP) in which Tanzania is listed as a phase-one country.

7.1. Responsible authorities and their capacity for monitoring releases of POPs pesticides

There exists a wide range of sectoral legislations with variable capacities to monitor releases of POPs pesticides. These include the Plant Protection Act (1997) and Plant Protection Regulations (1999) responsible for the control of the entire “life-cycle” of pesticides including POPs pesticides. Occupation Safety and Health Agency Act (2003) provides for the monitoring of environmental quality and health effects arising from various causes.

According to Tanzania National Environmental Management Act (2004), section 18(2) specifies the functions of the National Environment Management Council (NEMC). They include undertaking and coordination of research, investigation and surveys in the field of environment and collect, and disseminate information about the findings of such research,

investigation or survey, enforce and ensure compliance of the national environmental quality standards.

The Government Chemist Laboratory Agency is responsible under section 42 (2) of the Act for analyzing pesticides residues in human urine, blood and tissues in case of poisoning. There is limited capacity in terms of skills, financial resources and working tools in the respective institutions.

In the case of Plant Protection Act (1997) monitoring is done by the Inspectorate Services to ensure adherence to the legislation requirements. The legislation requirements include registration, permits for importation, certification of pesticides sellers and commercial operators and stringent penalties have been instituted for defaulters. The Physical and Chemical Division of the Tropical Pesticides Research Institute (TPRI) also analyses pesticides residues in environmental samples, human fluids, and animal feeds. However, scientists of TPRI and inspectors lack specific skills, adequate financial resources and working tools to enable them execute their duties effectively.

For the case of Zanzibar, section 5 of the Sustainable Environment Management Act (1996) provides for monitoring releases of toxic chemicals. The responsible authority is the Ministry of Agriculture, Natural Resources, Environment and Cooperatives of Zanzibar.

7.2 Possible ways to minimize further releases of POPs pesticides

Several researches have been carried out to investigate possible POPs alternatives. The recommended means of minimizing use of POPs include promotion of other products that have similar or better results and the control of POPs pesticides importation. This will enhance the use of alternative agricultural methods to include IPM and or organic farming practices without chemical pesticides in areas where POPs pesticides were once applied.

The most important approach for minimization of POPs pesticides releases is the government decision to prohibit use of POPs pesticides for agricultural activities. Controlling illegal traffic on the borders, awareness creation workshops to customs officers, importers, formulators and retailers on effects of POPs pesticides could further minimize releases of POPs pesticides.

7.3 Capacity to undertake regular monitoring of POPs in Tanzania

There is inadequate capacity to undertake regular monitoring of POPs releases in terms of expertise finance and working tools. Technicians in these institutions require specialized training on POPs monitoring procedures and analysis, determination of extent of contamination, assessment of impacts, determination of effectiveness of the alternatives and establishment of national emission factors for Dioxins and Furans.

There are few institutions however which have a number of facilities and trained personnel that can facilitate some of the functions of management of POPs, e.g. monitoring releases of PCB and undertaking analytical works. These are the Chief Government Chemist Laboratory Agency (GCLA), Tropical Pesticides Research (TPRI), and the University of Dar Es Salaam. Some of the facilities might need to be updated to

enable them to analyze trace values, e.g. in foods, soils, water, etc. Further more, training of staff on specific management and control aspects of PCB might be of value.

8. STATE OF STOCKHOLM CONVENTION RATIFICATION AND THE NATIONAL IMPLEMENTATION PLAN

Tanzania signed the Convention on the first day (23rd May 2001) in Stockholm and the Tanzanian Parliament ratified it on 3rd February 2004. Tanzania instruments of ratification were received at the UN offices on 30th April 2004 hence Tanzania became a party to the convention. Currently, Tanzania is in the process of developing the National Implementation Plan for the implementation of the Stockholm Convention.

As in other countries that are parties to the Convention, the convention provides restricted use of some POPs (Annex B) like DDT, which may be used for disease vector control like malaria control programmes under special exemption. Tanzania has applied for this special exemption and DDT may be used for such purpose if needs arise (but available records show that Tanzania had not used DDT for the past 5 years).

8.1 Evidence of implementation of the Stockholm Convention in Tanzania

- i. Vice President's Office - Division of Environment is implementing the POPs management projects (since 2003) where by the survey was made all over Tanzania and information regarding POPs was collected for the public information, awareness raising and education.

Examples of the Public awareness materials produced are:

- Report on Institutional and legal framework Assessment for POPs Management in Tanzania
 - Country report on DDT Inventory (Annex B Chemical)
 - Country report on Monitoring of Persistent Organic Pollutants (POPs)
- ii. All country POPs reports at VPO are freely available to the public (Some of them were used by ENVIROCARE to prepare this IPEP Country Situation Report)
 - iii. Public participation in addressing POPs and their health, Environmental effects and developing adequate responses, including opportunities for providing input at the national level regarding implementation of the Convention.

8.2 Forces that support the Stockholm Convention in Tanzania

- In Tanzania, the Vice President's Office (VPO) is the Focal Point for of the Stockholm Convention. It has the overall mandate to oversee the implementation of the Convention. There is no coordination mechanism established under the VPO for POPs management, but on collaboration with UNIDO and GEF, Tanzania is running the national project on POPs management under the VPO. The National project coordinating committee has been established to oversee the Implementation of the Stockholm Convention to ensure high level of technical output.

- There are other institutions also in Tanzania that are playing their sectional roles in the implementation of the Stockholm Convention in the POPs management. Some of them have established coordination mechanisms as required by the Rotterdam Convention and Plant Protection Act. The arrangement is that there are coordination committees formed at the policy and technical levels to advise ministries of Health and Agriculture and Food Security.

Table E shows the institutions that are actors in POPs management in Tanzania. They are also relevant sources of public Information and awareness capacity and expertise.

Table E: Institutions with key roles in POPs management

Institution	Roles
i) Vice President's Office – Division of Environment	Policy development and implementation, environmental planning, coordination and monitoring and policy oriented research.
ii) President's Office - Local Government Authorities	Policy implementation and enforcement of laws.
iii) Ministry of Agriculture, Natural Resources Tourism and Cooperatives - Depts. of Environment and Agriculture, Zanzibar	Policy development and implementation, Planning and coordination of agriculture and environmental matters.
iv) Ministry of Transport and Communication	Policy development and implementation, planning and coordination of transport aspects.
v) Ministry of Water, Construction, Energy and Lands- Zanzibar	Policy development and implementation, Planning and coordination of Water, Construction, Energy and Lands matter.
vi) Ministry of Energy and Minerals	Policy development and implementation, Planning and coordination of energy matters.
vii) Ministry of Health	Policy development and implementation planning and coordination of health issues.
viii) Ministry of Industry and Trade	Policy development and implementation, planning and coordination of industry and trade aspects.
ix) Ministry of Natural Resources and Tourism – Department of Forestry	Policy development and implementation, planning and coordination of forestry aspects.
x) Ministry of Home Affairs	Enforcement of Law and Order
xi) Ministry of Justice & Constitutional Affairs	Development of Legislation
xii) Ministry of Agriculture and Food Security- Department Plant Health Services	Policy development and implementation, planning coordination of agriculture development aspects and Regulation of plant protection substances management.
xiii) Ministry of Water	Policy development and implementation, planning and coordination of water matters and monitoring of water quality.
xiv) NEMC	<ul style="list-style-type: none"> • Carry out surveys which will assist in the proper management and conservation of the environment; • Undertake and coordinate research, investigation

Institution	Roles
	<p>and surveys in the field of environment and collect, and disseminate information about the findings of such research, investigation or survey;</p> <p>enforce and ensure compliance of the national environmental quality standards</p> <ul style="list-style-type: none"> • Undertake, in co-operation with relevant sector Ministries programmes intended to enhance environmental education and public awareness about the need for sound environmental management and enlisting public support and encouraging the effort made by other entities in that regard;
xv) GCLA	Advisor of government on matters of chemicals management; chemical analysis; coordination of industrial chemicals management; enforcement of Industrial and Consumer Chemicals Act; and technical backstopping.
xvi) Tertiary Education institutions and Research	Training and research and technical backstopping
xvii) TANESCO and State Fuel and Power Cooperation of Zanzibar	Owner of most of the electrical equipment and sites that are contaminated with PCBs.
xviii) TBS	Development of standards
xix) TPRI	Research, control and regulation of plant protection substances.
xx) OSHA	Advisor of government on matters related to occupational health and safety at work places
xxi) Occupational health centers	Diagnosis of occupational health related diseases and treatment of the same
xxii) NGOs (ENVIROCARE, AGENDA, AAT, JET, etc.)	Information dissemination and public sensitization, research, surveys or data gathering
xxiii) Media	Information dissemination and public sensitization

Source: Report on Institutional and Legal framework Assessment for POPs Management in Tanzania (VPO-DOE, 2003)

In General the capability of Institutions that deal with POPs management is low. No any Institution that has the Legislation or policy specifically addressing POPs. It was also noted that the percentage of the people of Tanzania who are aware of the Stockholm Convention is very low. It is only known to the interested parties such as some political leaders and the main actors on POPs management such Division of Environment (VPO), NEMC, TPRI, Ministries of Health, Agriculture and Food Security and GCLA. This can be proven by the results obtained from the questionnaires, which were used to test the understanding of the agricultural officers in the DALDOs office (Plant protection office) at Ulanga Mahenge. Out of the 5 officers, none indicated being aware of Stockholm Convention.

8.3 Public participation consultation process under the Stockholm Convention implementation in Tanzania

The whole process of POPs management under the Vice Presidents office is Participatory. The Public is free to access the POPs documents in the VPO (Director of Environment Office) but on request.

Examples of programmes where the public was involved include,

- i. Integrated pest management (IPM), Shinyanga.
- ii. Integrated vector management (IVM), Lushoto.
- iii. Integrated Production and Pest Management (IPPM), Zanzibar.

9. PUBLIC AWARENESS ACTIVITIES IN TANZANIA

At present there are no specific public information programmes for chemicals management. The existing public awareness programmes address environmental issues in general.

a) Capacity in information generation and dissemination

- In 2003, Tanzania started to build capacity in information generation and dissemination for the purpose of meeting her obligation under Article 10 of Stockholm Convention which elaborates on the importance of public information, awareness and education for the success of its implementation.
- Tanzania carried out a 21-day survey all over the country using 16 national experts who were drawn from government, parastatals organization, academia, research institutions and the independent sectors with the objective of determining the current national capacity to deal with issue of public information, education and awareness of POPs.

b) Laws and policies

The Tanzanian government in collaboration with other stakeholders formulates some policies, legislations and guidelines to guide environmental protection issues including public awareness. Some of the policy and legal instrument are;

- National Environmental Policy (1997);
- National Environmental Policy for Zanzibar (1992);
- Plant Protection Act (1997);
- Tropical Pesticides Research Institute (TPRI) Act (1979);
- National Industrial and Consumer Chemicals Act (2003);
- National Environmental Management Act (NEMA) 2004

With the exception of NEMA (2004) and the Industrial and Consumer Chemicals (2003), no other of the above policies and Acts specifically addresses POPs provisions on environmental awareness. Other relevant laws governing issues of POPs have little emphasis on public awareness. For example, Section 10 (h) of the National Industrial and Consumer Chemicals Act (2003) states that one of the functions of the Chief Government Chemist, as the Registrar of chemicals is “to conduct public educational campaigns on the sound management of chemicals”. Section 46 provides among others for immediate notification of the public and relevant authorities in cases of accidents and spills related to chemicals. In addition, Section 48 (3) requires the GCLA to use some of its funds received to address issues of public awareness on safe handling of chemicals.

c) Motivation schemes

Another activity done by the government of Zanzibar to promote environmental awareness and involvement include provision of motivation. This has at least applied in the mining sector. In Zanzibar the Presidential award have been established where by the best performing mining companies in environmental protection are issued annually.

9.1 NGOs and public awareness

There are about 12,000 NGOs and CSOs in Tanzania, but very few are known to be involved in POPs issues and public awareness. These are ENVIROCARE AGENDA and Tanzania Plantation and Agricultural Workers Union (TPAWU). The total number of NGOs dealing with POPs issues is not known clearly. However, there are efforts to involve more NGOs and CSOs dealing with health, environment and related issues in the ASP which has a component of POPs. Some of NGOs and CSOs have participated in POPs and other chemical convention workshops held in Tanzania. They include Lawyers Environmental Action Team (LEAT), Journalist Environmental Association of Tanzania (JET), Irrigation Training and Economic Empowerment Organization (IRTECO), Kagera Development and Credit Revolving Trust Fund (KADETFU), Lake Nyanza Environmental and Sanitation Org. (LANESO), Trade Union Congress of Tanzania (TUCTA), Wildlife Conservation Society of Tanzania (WCST), Joint Environment and Development Management Action (JEMA), Dodoma Environmental Network (DONET), Mountains Conservation Society of Tanzania (MCST), Women Environmental Association (WEA), Tanzania Association of Women Leaders in Agriculture and the Environment (TAWLAE), National Network of Farmers' Groups Tanzania (MVIWATA) and Tanzania Farmers Association (TFA).

The few involved NGOs and CSOs lack resources to cover the necessary programmes and area. Information and database is not, in practical terms adequate. Scattered environmental information; technology and lack of know-how are among obstacles to awareness raising activities. Poor accessibility of some places in Tanzania where POPs were used is also a problem. The POPs information in literature is complex and the language used is not appropriate for the majority of target groups, so translation to the local languages such as Kiswahili is important.

9.2 Recommendation on public awareness activities

Training and awareness raising activities to the public should be enhanced and supported while the database and information gathering activities on the POPs are being supported by governments and other international organizations funds committed to POPs elimination.

9.3 Assessment of existing public information and awareness: Current activities on environmental awareness

The following are some of activities that have been undertaken in Tanzania on information environmental awareness.¹

Newspapers

- i. Journalists Environmental Association of Tanzania (JET) does publish chemical management issues in most Tanzanian newspapers (Kiswahili and English). Feature articles, coverage of workshops/seminars/training, etc.; deliberations/recommendations in newspapers during sessions.
- ii. The Plant Health Services in the mainland publishes a newsletter in Kiswahili (*MKULIMA WA KISASA* – ‘A modern farmer’)
- iii. The Agricultural Research Commission of Zanzibar publishes monthly newsletter, in Kiswahili, *MKULIMA* (Farmer)
- iv. Newsletters by TANESCO, NEMC, CPCT and other NGOs/CSOs

Radio/TV programmes

- i. JET has 15 minutes per week radio programme in Kiswahili (*JET na Mazingira* – JET and Environment) on environment and related issues. The programme is broadcasted by Radio Tanzania Dar es Salaam, with countrywide coverage.
- ii. The Agricultural Research Commission of Zanzibar has 15-min radio programme weekly, in Kiswahili “*Kilimo Bora- Best Agricultural Practices*”.
- iii. The Department of Environment in Zanzibar has a Radio/TV programmes in Kiswahili (*MAZINGIRA YETU* – Our Environment).
- iv. ‘*Mazingira Yangu Mazingira Yetu* – My Environment, Our Environment,’ a TV/Video documentary on environmental issue produced and distributed by AGENDA in collaboration with PANOS London and Abantu Vision. The series were produced in Kiswahili.
- v. “*Sayansi na Teknolojia* – Science and Technology” Kiswahili TV documentary on science and technology produced by the Ministry of Science, Technology and Higher Education in collaboration with COSTECH.
- vi. Independent TV (ITV) Kiswahili Programme called “*Afya ya Jamii* – Community health” which is aired every Monday. It covers issues related to public health including environment and chemicals management issues.
- vii. Radio Tanzania Programme in Kiswahili, *Teknolojia* every Friday. Covers many issues including environment and chemicals management.
- viii. TANESCO radio programme “*Sikilizeni Bwana Umeme*”
- ix. SFPC radio programme “*Huduma za Wateja*”
- x. Radio Sauti ya Injili (RSI Moshi) a 30 minutes radio programme in Kiswahili, by ENVIROCARE, aired every Sunday at 6pm, covers many issues “*Kilimo na Mazingira-Agriculture and Environment*”, “*Kilimo Hai-Organic Farming*” and “*Kilimo Endelevu-Sustainable Farming*”

Training programmes

In TPRI - Pest Management Training is conducted for pesticide fumigators/pest controllers and retailers, 3 time a year addressing, legislation, safe use and handling of pesticides.

Exhibitions

Trade Fairs e.g. Saba Saba and Nane Nane – International Trade and Peasants Day Fair one week towards 7th July and 8th August respectively every year.

9.4 Obstacles to public awareness activities

- Information and data base is not in practical terms adequate. Scattered environmental information; technology and lack of know-how are among obstacles to awareness activities. Theoretically data collected by the government institutions and especially those dealing with human health and environmental protection initiatives are supposed to be accessible to the public, but there is no single national depository of sub-information. But the situation is improving slowly since the Government Chemist Laboratory Agency embarked on chemical and management programme in 1997.
- Limited exchange of information amongst other institutions. A national mechanism to facilitate an improved aspect of the information exchange does not exist.
- Poor accessibility of some places in Tanzania where POPs are used example Ulanga, and others where information flow is slow.
- The POPs information in literature is complex and in origin language, so translation to the local language i.e. Kiswahili is important.

10. RECOMMENDATIONS ON ELIMINATING POPs

i. Capacity building in information, storage, management and disseminating infrastructure.

Information is a very powerful tool in POPs elimination. Therefore its generation, storage, management and dissemination has a great contribution in the successful implementation of the Stockholm Convention that targets at elimination of POPs. Hence the following is recommended:

- a) Capacity building
 - i. Improving information disseminating and infrastructure for research in key institutions;
 - ii. Supporting regular review of POPs inventories; and
 - iii. Establishment of expert networks and facilitation of POPs information exchange activities at international, regional, sub-regional, national and local levels.
- b) Database
 - i. Establishment of a database on POPs; and
 - ii. Providing technical information for destruction/ disposal as reference materials in government departments and agencies, academic and research institutions and NGOs.

The existing database may be strengthened by:

- a) Building up of technical capacity for data management in all concerned institutions
- b) Put down the necessary infrastructure i.e. computers, telefax, E-mail, Internet, etc.

- c) Formulate, facilitate and publicise the network for information bank in the country.
 - d) Make required funds available for news subscription from international databanks.
- c) Training
 - i. Conducting training and monitoring of POPs releases and database management,
 - ii. Incorporation of POPs issues in school curricula; and
 - iii. Conduct training on POPs issues to journalists, customs personnel, agriculture extension officers, NGOs and other key actors in awareness creation.
 - d) Awareness
 - i. Establishing effective communication strategies for public information and awareness on POPs;
 - ii. Improvement of existing information dissemination mechanisms.
 - iii. Supporting development and dissemination of public information and awareness materials on POPs in a common language; and
 - iv. Supporting NGOs and professional associations dealing with awareness creation activities

Use of multimedia pathways to campaign against POPs: There exist information pathways that may be used to educate and disseminate information on POPs. However, the success of these pathways will very much depend on the target audience. This means, several pathways have to be developed and used for different user group. Multimedia pathways might be more effective as the majority of people might not be able to understand the complex encountered in POPs literature.

Table F shows the effectiveness of different information pathways in disseminating Environmental Public Information.

Table F: Effectiveness of information pathways

S/No	Information Pathway	Target Audience	Coverage	Relative Effectiveness
1	Radio programme	All (Rural and Urbanites)	Entire country	Very effective
2	Television Programmes	Mainly Urbanites	Mainly Urban areas and small towns	Very effective
3	Newspapers	Literates	Entire country	Effective
4	Publication of brochures / Newsletters / Booklets / Stickers	Literates	Mainly in Urban centres	Effective
5	Seminars / Workshops / Meetings	All	Specific groups	Very effective
6	Village/District environmental committees	Villages and Districts	Mainly rural	Effective

7	Commemoration of World Environment Day/ National Tree Planting Day/ Presidential Award	All	Whole nation	Fairly Effective
8	Essay Competitions (especially for school children)	Schools	Entire country	Fairly Effective
9	School curricula	Primary and Secondary schools	Entire country	Effective
10	NGOs and CBOs	All	Entire country	Very Effective
11	Drama/ Songs/ Traditional dances	All	Entire country	Effective

Source: Country Report on Public Information, Awareness and Education on POPs, VPO 2003

The above pathways are effective in their own way depending in their target audience. Therefore improving all of the above pathways is necessary. Each group of the citizen would benefit in different ways but meeting the same goals.

ii. Other recommendations on eliminating POPs

- Increase sensitization of all actors including the private sector for purposes of promoting awareness among the general public on POPs
- Harmonization of policies and legislations and review of the same
- Ensure there is Coordination mechanism to be instituted
- Cooperation among institutions involved in the implementation of POPs management programs should be enhanced.
- Strengthening the capacity building in terms of human resources, facilities and infrastructures for research, training and monitoring of POPs releases.
- International cooperation on exchange of technical information to improve scientific knowledge and skills on POPs management among researchers and other experts.
- Guidelines for POPs waste disposal to be put in place example Transformer oils.
- Promotion of Best Available Technologies (BAT) and Best Environmental Practices (BET) and use of alternatives
- NGOs and Government institutions to develop more capacities to monitor POPs chemicals and their impacts.
- Higher learning institutions to have programmes on POPs and how to undertake research on POPs alternatives.

11. RECOMMENDATIONS ON POPs INVENTORIES

Inventories of obsolete POPs done countrywide in 2003 showed that Tanzania had 187,350kgs of POPs. POPs amounts inventoried in 2004 under IPEP in selected representative areas the amount was 106,875kgs. This is a huge amount and a threat to human health and the environment in general. Storage conditions in some sites are very poor making continuing spills to the environment likely. The situation calls for immediate

remedial measures from responsible government, Civil Society Organisations and international community are needed to handle the stockpiles or destroy them in an environmentally sound ways.

12. ALTERNATIVES TO POPs

12.1 Alternatives of POPs pesticides in various applications

As mentioned above POPs pesticides were used in wide range applications to control various insect pests. Alternatives to POPs pesticides include substitute chemical pesticides, botanicals, biocides, Integrated Pest Management (IPM) and Integrated Vector Management (IVM). For example in Zanzibar botanicals are used in the control of hispa beetles in rice and also parasitoids are used to control cereal stem borers. Apart from these, Integrated Production and Pest Management (IPPM) is being emphasized to attain sustainable agricultural production. The chemical substitutes are already registered and approved for use. The biological control methods are not yet registered.

It must be appreciated that research for alternatives in the country is in place. Time is needed to ascertain the sustainability, acceptability and social-economic perceptions. Some of the recommended alternatives to POPs pesticides are shown in Tables G and Table H.

Table G: Alternatives to POPs pesticides

Types	Controlled Pest	Chemical Alternatives	Non Chemical Alternatives
DDT	<ul style="list-style-type: none"> • Mosquitoes (malaria vector) • House hold pests • Maize stalk borers 	<ul style="list-style-type: none"> • Lambda cyhalothrin • Tetramethrin • Permethrin • Fenitrothion • Diazinon • Deltamethrin • Dimethioate 	<ul style="list-style-type: none"> • Pyrethrum • Neuratanania (tubers) • Zanha africana • Swartia • Artemisia afra • Piliostigma
Aldrin	Soil pests (termites, grubs)	<ul style="list-style-type: none"> • Dazomet • Isazophos • Carbofuran • Carbosulfan • Chlorpyrifos 	<ul style="list-style-type: none"> • Azadiracta Indica (Neem) Extract • Euphobia Spp
Heptachlor	Soil pests (termites, grubs)	<ul style="list-style-type: none"> • Dazomet • Isazophos • Carbofuran • Carbosulfan • Chlorpyrifos 	<ul style="list-style-type: none"> • Azadiracta Indica (Neem) Extract • Euphobia Spp
Dieldrin	Soil pests	<ul style="list-style-type: none"> • Isazophos • Ethiofophos • Carbofuran • Chlorpyrifos 	<ul style="list-style-type: none"> • Azadiracta Indica (Neem) Extract • Euphobia Spp
Endrin	Soil pests	<ul style="list-style-type: none"> • Isazophos • Ethiofophos 	<ul style="list-style-type: none"> • Azadiracta Indica (Neem)

Types	Controlled Pest	Chemical Alternatives	Non Chemical Alternatives
		<ul style="list-style-type: none"> Carbofuran 	Extract <ul style="list-style-type: none"> Euphobia Spp
Toxaphene	<ul style="list-style-type: none"> A mixture with DDT was used against cotton pest complex Was used as acaricide in livestock against ticks 	Esfenvalerate Fenvalerate Betacyfluthrin Profenofos+Cypermthrin Amitraz Chlorfenviphos Ethion	Azadiracta Indica (Neem) Extract
Chlordane	Soil pests	<ul style="list-style-type: none"> Dazomet Isazophos Carbofuran Carbosulfan 	<ul style="list-style-type: none"> Azadiracta Indica (Neem) Extract Euphobia Spp
Hexachloro benzene	<ul style="list-style-type: none"> Soil pests Phytophagous pests Used in warehouses Public health pests Animal ectoparasites 	<ul style="list-style-type: none"> Dazomet Isazophos Carbofuran Carbosulfan Cypermethrin Phosphamidon Chlorpyrifos Quinalphos Dichlorvos Fenitrothion Pyrimiphos methyl Pyrimiphos methyl Dichlorvos Pyrethrins Permethrin Amitraz Chlorfenviphos Ethion 	<ul style="list-style-type: none"> Azadiracta Indica (Neem) Extract Euphobia Spp Azadiracta Indica (Neem) Extract Euphobia Spp and IPM

Source: POP Pesticides Inventory Draft report (Annex A, Part 1 Chemicals): VPO-DoE, -2004

Table H: Recommended botanical insecticides

Botanical Insecticide	Target crop	Target Insect Pest
Tephrosia vogelii	Maize Cabbage and other Brassicas	- Maize Stalk Borer Diamond Back moth - Cabbage aphid
Neuratanenia nuts	- Maize - Cabbage	- Maize Stalk Borer - Diamond Back moth - Cabbage aphid
Clematopsis scabifolia	- Maize	- Maize Stalk Borer
Gnidia kraussian	- Maize	- Maize Stalk Borer
Mixture of Neuratanenia mits (roots and leaves) and Gnidia kraussiana (1:1 ratio)	- Beans	- Aphids
Vernonia adventis	- Maize	- Maize Stalk Borer
Pyrethrum (hrysanthenum cineralia efolium)	- Maize	- Maize Stalk Borer

Source: Draft Report on POPs Pesticides Inventory (Annex A, Part 1 Chemicals), VPO 2003

12.2 Perceived effectiveness of the present alternatives

Non-chemical alternatives in some cases are relatively accepted and applied widely because they are effective and cheap as compared to conventional pesticides. However, alternatives to POPs pesticides require more time to show good results. In areas where IPM has been introduced such as Shinyanga, Mwanza and part of Kagera (Biharamulo), Tabora (Igunga, Nzega) and Mara (Bunda, Tarime) farmers have responded positively. Other areas where farmers have started to use alternative botanicals are those near agricultural research institutions such as Sokoine University of Agriculture (SUA), Uyole and Ukiliguru.

12.3 Overview of international and regional experiences and practices on POPs pesticides alternatives

Non-chemical alternatives including botanical insecticides and indigenous methods have been developed and practiced as alternatives to chemicals. In some countries the use of chemical pesticides is no longer a priority.

12.4 Present strategies used in promoting application of the alternatives

There are various strategies undertaken by relevant institutions in promoting application of alternative to POPs pesticides. These include: the policy emphasis on use of non-chemical pesticides, awareness creation to the general public and ratification of relevant Conventions.

12.5 Effectiveness of the present strategies

The importation, sale, use and formulation of POPs pesticides in the country are not allowed at present. Farmers in the regions where IPM strategies have been introduced have positively adopted them. Similarly, IVM strategies for the control of public health vectors are accepted and are being practiced by communities.

12.6 Overview of international and regional experiences on strategies to promote POPs pesticides alternatives

The strategies include encouragement of Governments to ratify relevant Conventions and organization of Inter-regional and national training workshops and meetings to enhance exchange of technical information and experiences. This enables experts from different countries to learn various techniques and technologies applied in those countries.

12.7 Recommendations on the practicable strategies for adoption

Demonstrations need to be carried out on various alternatives and assessment of their effectiveness, social-economic implications and suitability for the local conditions. The viable options are recommended for adoption if they meet stated criteria.

12.8. Challenges encountered during the country POPs situation analysis

Lack of past POPs statistical data at the sites and information from institutions responsible for monitoring importation, distribution, utilization, and health effects is a current challenge.

Identification of the POPs by their names was difficult. Some piles had no labels at all.

Some POPs sites are located in very remote areas with no public transport which makes their accessibility very difficult, example Ulanga (Morogoro) and NAFCO Hanang (Manyara)

There is a wide gap between the researchers and the farmers. The researchers seem to overlook the local knowledge on pesticide alternatives. The farmers do not know what researchers are doing. Therefore there is a need to invest resources to do more research on the way to improve and harness the potentiality and local available pesticides so as to make them safer for health, easily available in large quantities and right dose at the same time socially accepted.

13. NEW POPs

Among the new POPs proposed for inclusion as candidates on the POPs list at the recent First Conference of the Parties (COP1) of the Stockholm Convention held in Uruguay from 2-6 May 2005 are: lindane a pesticide proposed by Mexico; chlordecone and hexabromobiphenyl, a pesticide and flame retardant respectively proposed by the European Union; and penta-BDE, a flame retardant proposed by Norway. Lindane (Sapa BHC 1% D) is registered in Tanzania by TPRI (Reg. No. IN/0103, May 2003), registrant is Sapa Chemicals for use in garden, hides and skins against chewing pests.

14. USEFUL RESOURCES ON POPs IN TANZANIA

14.1 Sources of POPs information Tanzania

Table I provides the nature of national data related to the management of chemicals and how to gain access to such data. The table also indicates where the data is maintained, the source, who has access, and the media in which the data is maintained.

Table I: Location of national data

Type of Data	Location(s)	Data source	Who has access	How to gain access	Format
Production Statistics	BoS	Ministry of Industries and Trade, Ministry of Agriculture, surveys	Public	Request, buy	Automated data, Reports, files
Import Statistics	BoS, TRA, TPRI	Custom officers importers	Public	Request, buy	Automated data, reports, files
Export Statistics	BoS, TRA, TPRI	Custom officers exporters	Public	Request, buy	Automated data, reports, files
Chemical Use Statistics	Customs, TCCIA, AAT, CTI	-	Public	Request	Reports
Transport statistics	BoS	Ministry of Transport Transporters	Public	Request	Automated data, files
Industrial Accident Reports	OSHA	Inspectors, Industries, Workers	Public	Public	Automated data, files
Transport accident reports	Ministry of Transport and Communication , Ministry of Home Affairs	Public	Public	Public	Automated data, files
Occupational Health Data (agricultural)	Plant Health Services	Ministry of Agriculture and Food Security TPRI, farmers, surveys	Public	Public	Files
Occupational Health Data (industrial)	OSHA, Ministry of health	industries, workers, Inspectors, Ministry of health	Public	Public	Automated data, files
Poisoning Statistics	Ministry of	Ministry of Home Affairs,	Public	Public	Files

Type of Data	Location(s)	Data source	Who has access	How to gain access	Format
	Health, GCLA, poisons centre, OSHA	Ministry of health, poisons centre			
Pollutant Release and Transfer Register	-	-	-	-	-
Hazardous Waste and other waste Data	NEMC, UCLAS, City and Municipal Councils	Environmental Engineering sustainable City Programme office, District medical officers, Head of medical waste management and researchers, surveys, studies, reports	Public	Public	Reports, automated data
Register of Pesticides	TPRI	Pesticide registrants	Public	Public	Automated data
Register of Toxic Chemicals	NEMC, CGLA	NEMC, CGLA	Public	Public	Public
Inventory of Existing Chemicals	NEMC*	Industries, Ministries	Public	Request	Automated data
Register of Imports	Customs statistics dept., customs, TCCIA, CTI, TRA	Importers, TRA, TCCIA, AAT, customs	Public	Request	Automated data, files
Register of Producers	FI, Ministry of Industries and trade	Inspectors Producers	Public	Request	Automated data, files
PIC Decisions	GCLA (mainland), GCLA (Island), TPRI	IRPTC	Public	Request	Files
Quality standards	TBS	Foreign 7 International standards. Industries	Public	Request, buy	Standard document
Cleaner production Reports	CPCT, MIT, DOE, LVEMP	CP Assessment Reports, Project Reports	Public	Request	Reports

Source: National Profile to assess the National infrastructure for Managing chemicals, 2002

14.2 Availability of International Literature

Table J provides a summary of international literature on chemicals including POPs available in Tanzania.

Table J: Availability of international literature in Tanzania

Literature	Location(s)	Who has access	How to gain access
Environmental health Criteria Documents (WHO)	ILO, JCL, OSHA, TPRI, NEMC, WHO	Public	Request
Health and Safety Guides (WHO)	TPRI, WHO, GCLA, OSHA, EMC	Public	Request
International Safety Data Cards (IPCS/EC)	OSHA, CPCT, WHO	Public	Request
Decision Guidance Documents for PIC Chemicals (FAO/UNEP)	GCLA, TPRI	Public	Request
FAO/WHO Pesticides Safety Data Sheets	TPRI, Ministry of Agriculture and Food Security.	Public	Request
Documents from the FAO/WHO Joint Meeting on Pesticide Residues	GCLA , TPRI	Public	
Material Safety Data Sheets (industry)	ILO, OSHA	Public	Request
OECD Guidelines for Testing of Chemicals	-	-	-
Good Laboratory Practice Principles	-	-	-
Good Manufacturing Practice Principles	-	-	-
WHO/UNEP Global Environmental Library Network	-	-	-
Safety and Health at work, ILO-CIS bulletin	OSHA, ILO	Public	Request
African and Tanzania Safety and Health newsletter	OSHA	Public	Request
International & Foreign quality standards, Codex Alimentarius	TBS	Public	Request
Reports from Conventions Secretariats (Rotterdam, Basel, Stockholm)	VPO - DOE	Public	Request
Cleaner Production reports	CPCT	Public	Request

Source: National Profile to assess the National Infrastructure for Managing chemicals, 2002

14.3 Availability of international databases

Table K provides a summary of international databases available in Tanzania.

Table K: Availability of international databases

Database	Location(s)	Who has access	How to gain access
IRPTC	GCLA, NEMC, UDSM	Public	Public
ILO CIS	ILO, OSHA	Public	Request
IPCS INTOX	GCLA	Public	Public
Chemical Abstract Service Database	UDSM	Public	Public
Global Information Network on Chemicals (GINC)	-	-	-
STN Database	-	-	-
Relevant Databases from other countries	-	-	-
Databases over the Internet	Several	Public	Public

Source: National Profile to assess the National infrastructure for Managing chemicals, 2002

14.4 Web links which contain POPs information.

General POP information (www.pops.int)

Strategic Approach to International Chemicals Management
(<http://www.chem.unep.ch/saicm/>)

Other related links

These sites contain more information on the health and environmental impacts of POPs.

Physicians for Social Responsibility: www.psr.org/pops.htm

World Wildlife Fund:

<http://www.worldwildlife.org/toxics/progareas/pop/index.htm>

International POPs Elimination Network (IPEN)

www.ipen.org

Pesticide Action Network, Asia-Pacific (www.panap.net)

Pesticide Action Network UK (www.pan-uk.org)

Pesticide Action Network, Africa (www.pan-africa.sn)

Pesticide Action Network, Latin America (www.rap-al.org)

Pesticide Action Network, North America (www.panna.igc.org)

World Wildlife Fund, USA (www.panda.org)

Global Anti-Incineration Alliance (GAIA) (www.no-burn.org)

Health Care Without Harm (HCWH) (www.noharm.org)

Tanzania NGOs

Environmental, Human Rights Care and Gender Organization (ENVIROCARE), Tanzania. (www.envirocaretz.com)

AGENDA for Environment and Responsible Development, Tanzania

(www.agenda-tz.org)

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5. VPO (August, 2003), Country Report on Public Information, Awareness and Education on POPs
6. VPO (August, 2003), Country Report on Sites Contaminated with POPs
7. VPO (May, 2003), Draft Report on POPs Pesticides Inventory (Annex A, Part 1 Chemicals)
8. VPO (August, 2003), Draft Report on the Institutional and Legal Framework Assessment for POPs Management in Tanzania



Photo C: DDT stocks at Old Korogwe site in the Tanga region, the storage is few meters away from Pangani River (Source: Literatures)



Photo D: DDT tanks at NAFCO Hanang in Manyara Region



Photo E: Toxaphene tanks at TPRI



Photo F: DDT bag as observed at DALDO Ulanga, Morogoro