



**Secretariat of the Basel Convention**



**PROCEEDINGS**

**of the Regional Workshop on Successful Case Studies of Recycling, Reuse and Resource Recovery Methods Towards the Environmentally Sound Management of Hazardous Wastes and Implementation of Basel Convention in Africa**

**Ibadan, Nigeria 9 - 12 August 2004**



**Hosted by the Government of Nigeria with the Financial Assistance of the Secretariat of the Basel Convention (SBC/UNEP)**



**Basel Convention Regional Coordinating Center for Africa for Training & Technology Transfer  
Federal Ministry of Environment - University of Ibadan Linkage Centre  
for Cleaner Production Technology  
and Hazardous Waste Management  
University of Ibadan, Nigeria  
[www.baselinigeria.org](http://www.baselinigeria.org)**





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**The workshop was financed by the Secretariat of the Basel Convention (SBC), Geneva, Switzerland.**

**This publication is produced within the framework of the Basel Convention for the Environmentally Sound Management of Hazardous Wastes**

The Basel Convention Regional Coordinating Centre for Africa (BCCC-Nigeria) for Training and Technology Transfer in Hazardous Waste Management (located at the Federal Ministry of Environment-University of Ibadan Linkage Centre for Cleaner Production Technology and Hazardous Waste Management, Nigeria; herein referred to as the "FMENV/UNIV Ibadan/BCCC-Nigeria"), University of Ibadan, Ibadan, Nigeria was established in 1994 following Decision 111/19 made by the Parties to the Basel Convention. The purpose of the BCCC – Nigeria is to promote coordination of the policies and activities of the Basel Convention Regional Centres (BCRCs) in Pretoria South Africa for English Speaking Countries, Senegal for French Speaking countries and Egypt for Arab Speaking Countries towards ensuring successful implementation of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal and its Amendments by countries of the African Region.

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## 1. PREFACE

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The Basel Convention on the Control of Transboundary Movement of Hazardous Waste and Their disposal, provides in article 14 for the establishment of the Regional Centres. The main goal of the Basel Convention Regional Centres (BCRCs) is to strengthen the capacity of countries of the region for the implementation of the Basel Convention. The article stipulates that "according to the specific needs of different regions and sub-region, regional or sub-regional centres for training and technology transfer regarding the management of hazardous wastes and other wastes and the minimisation of their generation should be established"

Towards this end, a Regional Workshop on Successful Case Studies of Recycling, Reuse, and Resources Recovery Methods towards the Environmentally Sound Management of Hazardous Wastes and Implementation of Basel Convention in Africa was held at the Basel Convention Regional Coordinating Centre for Africa, located in (the Federal Ministry of Environment-University of Ibadan Linkage Centre,) Ibadan, Nigeria.

The workshop objectives are to:

- Promote the signing, ratification and implementation of the convention in the region
- Increase awareness of and benefits associated with Environmentally Sound Management of hazardous waste
- Analyse through training the best practices and proven technologies that work in hazardous waste management elsewhere both in developed and developing countries that are appropriate, readily adaptable in Africa and not entailing excessive cost.

### **Proceedings from the workshop**

The proceedings contain the introduction to the workshop. It also includes the agenda, the list of participants and the presentations made by country representatives, the Secretariat of Basel Convention, and invited speakers and International Consultants as well as the workshop recommendations.

For ease of placement on the web and downloading purposes, the proceedings have been collated in an order different to that followed during the workshop and provided in the agenda. The first part of the proceedings includes the outcome of the opening session. The second part contains presentations describing status reports of countries on their experiences on Environmentally Sound Management of hazardous waste. The third part contains presentations by invited speakers and various case studies on proven technologies and their operation in the region.

The workshop was supported by funding from the Secretariat of the Basel Convention Trust Fund. Their generous support is gratefully acknowledged. The organizers also wish to convey heartfelt thanks to the co-chairs, International Consultants and all the experts that contributed to the successful outcome of the workshop.

**Prof. Oladele Osibanjo**

**Director**

**Basel Convention Regional Coordinating Centre for Africa (BCCC, Nigeria)**

## 2. WORKSHOP PROGRAMME

<b>MONDAY, AUGUST 9, 2004</b>		
<b>09.00-10.00</b>	<b>Opening of the Workshop, Agenda</b>	<b>Director BCCC/Prof. O. Osibanjo</b>
	<b>Introduction of participants</b>	<b>Participants</b>
	<b>Welcome Address</b>	<b>Prof. Ayodele O. Falase, Vice Chancellor, University of Ibadan</b>
	<b>Welcome Remarks</b>	<b>Vice Chancellor, University of Ibadan</b>
	<b>Keynote Address on SBC and Basel Convention African perspective</b>	<b>Mr. Nelson Sabogal Senior Programme Officer/Capacity Building and Training, Secretariat of Basel Convention Geneva, Switzerland</b>
	<b>Goodwill Messages</b>	<b>United Nations Agencies, Federal and State Government, Non-Governmental Organisations</b>
	<b>Opening Address</b>	<b>Hon. Federal Minister of Environment, Nigeria, Col (Rtd). Bala Mande</b>
	<b>Vote of thanks</b>	<b>Director BCCC/Prof. O. Osibanjo</b>
<b>10.00- 10.30</b>	<b>Coffee Break, Group Photograph Official Commissioning of the New Building of Basel Convention Regional Coordinating Centre For Africa &amp; FMENV-U.I Linkage Centre.</b>	
<b>10.30- 12.00</b>	<b>Presentation of Country Reports (10 mins. Each)</b>	<b>Country Experts</b>
<b>12.30- 13.00</b>	<b>Presentation of Country Reports (10 mins. Each)</b>	<b>Country Experts.</b>
<b>13.00 –14.00</b>	<b>Lunch</b>	
<b>14.00 –16.30</b>	<b>Presentation of Country Reports (10mins. Each)</b>	<b>Country Experts</b>
<b>16.30 –17.00</b>	<b>Coffee Break</b>	
<b>17.00- 18.00</b>	<b>Industry perspective on Hazardous Waste Management Technologies issues in Africa</b>	<b>Mr. James Brice.</b>
<b><i>TUESDAY AUGUST 10, 2004</i></b>		
<b>09.00 –10.00</b>	<b>Guidelines for Selection of Environmentally Sound Technologies for Hazardous Waste Management</b>	<b>Mr. James Brice</b>
<b>10.00 –11.00</b>	<b>Highlights of Case studies of successful hazardous waste technologies adaptable to Africa</b>	<b>Mr. James Brice</b>
<b>11.00 –11.30</b>	<b>Coffee Break</b>	

<b>11.30 –13.00</b>	<b>Case Study 1 of Successful Technologies Demonstration of Technology/Exhibition</b>	<b>Mr. James Brice</b>
<b>13.00 –14.00</b>	<b>Lunch</b>	
<b>14.00 –15.00</b>	<b>Case Study 2 of Successful Technologies</b>	<b>Mr. James Brice</b>
<b>15.00 –15.30</b>	<b>Coffee Break</b>	
<b>15.30 – 16.00</b>	<b>Demonstration of Technology/Exhibition Case Study 2</b>	<b>Mr. James Brice</b>
<b>16.30 – 18.00</b>	<b>Case Study 3 of Successful Technologies Demonstration of Technology/Exhibition</b>	

***WEDNESDAY AUGUST 11, 2004***

<b>09.00 – 10.00</b>	<b>Guidelines on how to develop environmentally Sound Management (ESM) Project documents For Successful Grant Support and Implementation.</b>	<b>Prof. Niyi Osuntogun</b>
<b>10.00-11.00</b>	<b>Fund Mobilization For Environmentally Sound Management (ESM) Projects in Africa</b>	<b>Prof. Niyi Osuntogun</b>
<b>11.00-11.30</b>	<b>Coffee Break</b>	
<b>11.30-13.00</b>	<b>Case Study 4 of Successful Technologies Demonstration of Technology/Exhibition</b>	<b>Prof. Niyi Osuntogun</b>
<b>13.00 –14.00</b>	<b>Lunch</b>	
<b>14.00 –15.00</b>	<b>Roundtable discussion on the legal, technical, and financial conditions of the development and transfer of technologies in Africa.</b>	<b>Mr. Nelson Sabogal/ Mr. James Brice/ Prof. Niyi Osuntogun</b>
<b>15.00- 16.00</b>	<b>Evaluation of the Training Workshop</b>	<b>Mr. Nelson Sabogal/ Mr. James Brice/ Prof. Niyi Osuntogun</b>
<b>16.00 –16.30</b>	<b>Coffee Break</b>	
<b>16.30 –18.00</b>	<b>Consideration Of Workshop Draft Report</b>	<b>Mr. Nelson Sabogal/ Mr. James Brice/ Prof. Niyi Osuntogun</b>

***THURSDAY AUGUST 12, 2004***

<b>09.00 – 10.00</b>	<b>Industrial Visit</b>	
<b>10.00-11.00</b>	<b>Industrial Visit</b>	
<b>11.00-11.30</b>	<b>Coffee Break</b>	
<b>11.30-12.30</b>	<b>Industrial Visit</b>	
<b>12.30 –13.00</b>	<b>Industrial Visit</b>	
<b>13.00 –14.00</b>	<b>Lunch</b>	

### 3. PLENARY REPORT

#### 1. Background

During 9-12 August, 2004, the Basel Convention Coordinating Centre for Africa (BCCC-Africa), held its first workshop, the Regional Workshop on Successful Case Studies of Recycling, Reuse, and Resources Recovery Methods towards the Environmentally Sound Management of Hazardous Wastes and Implementation of the Basel Convention.

The Workshop was sponsored by the Secretariat of the Basel Convention, Geneva, and took place at the University of Ibadan Conference Centre, Ibadan, Nigeria.

The Workshop was divided into four (4) plenary sessions, consisting of opening session, technical presentations on topics from cleaner production technology and waste minimization, to development and fund mobilization for environmentally sound management projects. Specifically, presentations featured the following topics: Sources of Hazardous Waste; Quantities and Generation of Hazardous Waste; Current Management Practices; Environmental and Health Impacts; Institutional and Regulatory Framework for Hazardous Waste Management; Level of Public Awareness; National Needs for Achieving Environmentally Sound Management of Hazardous Waste; Suggestions for Future Improvement; Introduction to Hazardous Waste Immunization; Guidelines on How to Develop Environmentally Sound Management Projects; and Fund Mobilization for Environmentally Sound Management Projects in Africa: Sources, Problems, and Projects. Discussion sessions followed the presentations.

#### 2. Participants

The Workshop had thirty-nine (39) participants in total, including stakeholders from Government Institutions, Academia,

Industries, Non-Governmental Organisations, and United and United Nations Agencies. Representatives of twelve (12) African countries, including Cameroon, Democratic Republic of Congo, Ethiopia, Ghana, Kenya, Mauritius, Nigeria, South Africa, Sudan, Tanzania, and Zambia were also present at the Workshop. The names and details of the participants are included in the List of Participants of Annex 1.

#### 3. Main Objectives

The Main Objectives of the Workshop were to:

- (i) Promote the signing, ratification, and implementation of the Convention in the region;
- (ii) Increase awareness of and benefits associated with Environmentally Sound Management of Hazardous Waste;
- (iii) Analyse the best practices and proven technologies for hazardous waste management, in both developed and developing countries, and to identify those technologies that would be appropriate and readily adaptable in Africa.

#### 4. Opening of the Workshop

The Welcome Address at the Opening Ceremony on 9th August 2004 was given by the Vice Chancellor of the University of Ibadan Prof. Ayodele O. Falase ably represented by the Deputy Vice Chancellors Academic- Prof J. A. Akinwunmi and Administration Prof Olusoji Ofi who delivered the address. He heartily welcomed the participants to the University of Ibadan, Nigeria's premier university and averred that the Secretariat of Basel Convention deserves commendation for its vision in establishing Basel Convention Regional Centres (BCRCs) as Centres of Excellence for



improved capacity building and service delivery at the regional level on hazardous waste issues. He also noted with satisfaction that the Basel Convention Coordinating Centre at Ibadan would coordinate the three Basel Convention Regional Centres for training and technology transfer hosted in Egypt, Senegal and South Africa respectively. This is important as the successful implementation of the Basel Convention in Africa by the governments hinges on the availability of competent and well-trained experts, which therefore underscores the importance of this workshop.

The Vice Chancellor further declared that the Centre would provide adequate facilities for visiting scientists in the region to attend training workshops and partake in research programs and technology development projects that will benefit the entire African Region. The Centre was established he noted, as an aftermath of the successful collaboration between the University of Ibadan and the Federal government in respect of the scientific investigation of the toxic wastes from overseas illegally dumped at Koko port in 1988. It is also instructive he remarked that Professor Oladele Osibanjo who carried out the chemical identification of the toxic wastes in 1988 on behalf of the University for the Federal government, is the Director of the Federal Ministry of Environment-University of Ibadan Linkage Centre on Cleaner Production Technology and Hazardous Waste Management and the Basel Convention Regional Coordinating Centre for Africa for Training and Technology Transfer on hazardous waste management. He expects that the knowledge to be gained by the participants at the present workshop would go a long way in achieving the objectives of the Basel' Convention in the region, and assist the different levels of governments to develop and implement strategies that would counter the export of toxic and hazardous waste and technologies to Africa.

The Vice Chancellor used the occasion to seek additional funding from the Ministry of Environment to equip the building and make it functional. He also called on the Secretariat of Basel Convention, UNIDO, NEPAD Secretariat and other donor countries/ agencies to increase technical and financial assistance to the Centre to enable it fulfill its mandate soonest for the benefit of present and future generations of Africans. Finally he gave assurance that the University administration would provide the enabling environment for the Centre to perform optimally and fulfill its mandate.



U  
**some participants at the workshop**

The Keynote Address was read by Mr. Nelson Sabogal, Senior Programme Officer Capacity Building Training on behalf of Ms. Sachiko Kuwubara-Yamamoto, Executive Secretary, Secretariat of Basel Convention, Geneva. The address highlighted the aim of the Regional Workshop which is to analyse with the aid of lectures, slides/video clips and case studies, best practices and proven technologies that work in hazardous waste management elsewhere both in developed and developing countries that are appropriate, readily adaptable in Africa and not entailing excessive cost (Best Available Technology Not Entailing Excessive Cost (BATNEC). Guidelines on how to develop environmental sound management project proposals for successful grant support and implementation will be presented and a discussion on the legal, technical, financial conditions of the development and transfer of technologies in the region shall be covered in detail to make the programme holistic. As a result of this Workshop, Project Development Documents shall be prepared for the projects identified

to be environmentally and economically sound and sustainable in the region.

Some major stakeholders gave goodwill messages. Dr David Tommy, the UNIDO Country Representative in Nigeria in his goodwill message read by Mr. Adegboyega Ajani acknowledged the timeliness of the workshop as international concern and efforts are now focused on providing industry and economic perspectives in developing Multilateral Environmental Agreements (MEAs) in view of the threat of improper management of hazardous wastes. In this regard UNIDO as the United Nations specialized agency charged with promoting sustainable industrial development, in cooperation with the Food & Agricultural Organisation (FAO) of the United Nations, the Secretariat of the Basel Convention on Hazardous Wastes, has been assisting Nigeria in its efforts to implement the various conventions on hazardous wastes through awareness raising and capacity building programmes and activities.

The Senior Special Assistant to the President of Nigeria on New Partnership for African Development (NEPAD), Chief Mrs. Chinyere Asika ably represented by Dr. Lawrence Anukam declared that the main objective of the Action Plan of the Environmental Initiative of NEPAD is to assist African countries to integrate environmental considerations into poverty reduction policies and strategies. On the other hand one of the specific objectives of the action plan is to assist African countries to implement their commitments under the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal, the Bamako Convention of 1991, the Rotterdam Convention on the Prior Informed Consent, and the Stockholm Convention on Persistent Organic Pollutants, for which they are contracting Parties and to address other related environmental problems. Finally he indicated that the presence of NEPAD Nigeria at the workshop is a clear demonstration of its support for the programmes of the Basel Convention Regional Coordinating Centre for Africa located in Ibadan, Nigeria. He was

emphatic that NEPAD Nigeria will work closely with the Basel Convention Coordinating Centre in Ibadan, to facilitate the implementation of the action plan of the Environment Initiative of NEPAD particularly in the area of hazardous waste management.

Honourable Commissioner of Environment and Water Resources, Oyo State Alhaji Adelani A. Ashiru expressed in his goodwill message the satisfaction of the Executive Governor of Oyo State, Senator Rasheed A. Ladoja that this important regional workshop is taking place in Ibadan, the largest indigenous city in Africa. He wished the participants successful deliberations.

Dr Evans O. Aina, the first Director General of the defunct Federal Environmental Protection Agency (FEPA), which metamorphosed into the Federal Ministry of Environment in June 1999 at the onset of the return of environmental governance to the country, also gave a goodwill message. He recalled that Nigeria as one of the victims of the illegal trade in toxic wastes through the dumping of toxic and hazardous wastes at the port of Koko in the then Bendel state now Delta state, took an active part at the preparatory meetings leading to the 1989 Basel Convention. After a number of meetings, the final draft of the global convention, now known as Basel Convention was drawn up. He remembered with nostalgia that the Nigerian delegation led by him made very useful impact and influenced 19 out of the 29 articles that made up the convention, and because of the importance the Nigerian government attached to the Convention, a diplomatic offensive was mounted to ensure that African governments participated fully in the adoption of the Convention. To underscore the importance, over 116 nations attended the final session at Basel, out of which 41 were from Africa. Nigeria was the first African Country to sign the Convention and he had the honour and privilege to sign on behalf of the country.

Professor O. A. Afolabi, Director Department of Pollution Control and Environmental Health in the Federal Ministry of Environment, Nigeria, Colonel Bala Mande (Rtd). The Minister indicated that Nigeria in its efforts to manage hazardous wastes in an environmentally sound manner, has ratified the following Multilateral Environmental Conventions (MEAs): Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, including its Ban Amendment; Rotterdam Convention on the Prior Informed Consent Procedure (PIC) for Certain Chemicals and Pesticides in International Trade; Stockholm Convention on Persistent Organic Pollutants (POPs Convention) and Vienna Convention on the protection of the Ozone Layer and the Montreal Protocol on substances that Deplete the Ozone layer.

The Minister also declared that the Government of Nigeria has commissioned projects which are at various stages of completion for hazardous and other wastes management and resource recovery namely: Integrated waste management facilities studies in fifteen Nigerian industrial and commercial cities; Nyanya community- based Municipal Waste Management Pilot Project; Conversion of Agricultural Wastes to Briquettes - a Pilot Briquetting Plant in Makurdi; Studies on Effluent Treatment Facilities for four major Industrial Cities; and not the least the Provision of Incinerating Facilities at the three National Orthopaedic Hospitals, and the National Institute for Medical Research respectively. The Government is also implementing a number of programmes aimed at sound hazardous waste management which includes chemical tracking, toxic waste dump watch, registration of chemicals/pesticides, pest control and fumigation, hazardous wastes/toxic chemicals awareness - raising, and industrial/hazardous chemicals assessment and database.

The Honourable Minister also commended in a special way the Secretariat of the Basel Convention on its efforts in reducing and minimizing hazardous waste generation and transshipment and also assisting developing countries especially African countries with the environmentally sound management of hazardous and other wastes they generate. The selection and establishment of Basel Convention Coordinating Centre for the African Region in Nigeria is the most eloquent testimony of the Secretariat of Basel Convention's interest and determination to ensure that the African continent is saved from the dangers of generation, transshipment and disposal of hazardous wastes. He also commended the authorities of the University of Ibadan for ensuring that the Centre starts operation and fully prepared to take the challenges of coordinating the three Basel Convention Regional Centres for Training and Technology Transfer hosted in South Africa, Senegal and Egypt.

Finally the Minister assured the Secretariat of Basel Convention and all stakeholders that the government of Nigeria is fully committed to supporting the activities of the Basel Convention Coordinating Centre in Ibadan, Nigeria. He remarked that the opening ceremony of the workshop would be closely followed by the official commissioning of BCCC Building, which is an indication of the seriousness and commitment of the Nigerian government and hoped that the Centre will in no distant time organize trainings in the building.

##### **5. Official Commissioning of the new Building of the Basel Convention Regional Coordinating Centre for Africa for Training and Technology Transfer**

The participants and invited guests were transported to the new building of the Basel Convention Regional Coordinating Centre for Africa located within the campus of the University of Ibadan for its official commissioning by Professor O. A. Afolabi on behalf of the Honourable Minister of

Environment Colonel Bala Mande (Rtd). The building was built with funds provided exclusively by the Federal Ministry of Environment.



Opening of the new building



From left the BCCC Director Prof. O. Osibanjo, Mr. Sabogal of SBC and Dr. O. O. Dada of FMENV in front of the new building

**6. Session I: Country Presentations on Hazardous Waste Status**

The technical sessions kicked off with the presentation of reports on Hazardous Wastes Management in the participating countries. Delegates from each of the twelve African countries represented at the workshop made presentations on the situation of hazardous waste management in their countries. The presentations featured the following:

- Sources of Hazardous Wastes Quantities/Generation of Hazardous Waste.
- Current Management Practices Environmental and Health Impacts Institutional and Regulatory Framework for Hazardous Waste Management
- Level of Public Awareness

- National Needs for Achieving Environmentally Sound Management for Hazardous Waste
- Suggestions for Future Improvement

Among the different types of hazardous waste generated in Africa, those of concern are grouped as follows:

- Health care and medical wastes
- Stock of Obsolete Pesticides .
- Polychlorinated Biphenyl (PCBs)
- Used oil
- Used tyres
- Used automotive and dry cell batteries.
- Others.

It was highlighted that Africa is littered with non-engineered landfill sites and other inefficient means of waste disposal strategies e.g. incinerators with inappropriate air pollution control devices. This untoward development has led to some untimely human deaths, which was estimated to be up to 20,000 in a year.

The presenters identified contaminated sites in their countries to include dump site areas, thermal power plants, polluted rivers, streams and drinking water wells, oil spill sites, oil refineries etc. The presenters were united in rating current practices of Hazardous Waste Management in Africa as being inadequate to cope with the problem on ground.

Workshop participants expressed concern about lack of recognition of the magnitude of hazardous waste management problems in Africa because the continent lacks institutional capacity to deal with the problems and a robust system to monitor illegal importation. Almost all the countries recognized poverty as a basic factor that dwarfed the success of African efforts in the area of Environmentally Sound Management of Hazardous Waste.

From the country reports the needs for

achieving environmentally sound management of hazardous waste in Africa countries include the following:

- Construction of pre-treatment facilities
- Choice of appropriate efficient and environmentally sound technologies
- Strengthening of the legal and institutional framework
- Cleaner production at industry level.
- Capacity building/training
- Funding inventory of hazardous waste.
- Public awareness creation

## **7. Session II: Presentations and Discussions on Environmentally Sound Technologies for Recycling Reuse and Resource Recovery; Project Development and Funding Assistance Support**

The main technical session of the Workshop featured presentations on the following, among other topics:

- Introduction to Hazardous Waste Management (HZWM)
- Hazardous Waste Management Industry
- Waste Treatment and Disposal Technologies
- Cleaner Production and Waste Immunization
- Guidelines on How to Develop Environmentally Sound Management (ESM) Project Documents for Successful Grant Support and Implementation
- Fund Mobilization for Environmentally Sound Management (ESM) Projects in Africa: Sources, Problems and Prospects.

The lectures employed the active involvement of participants. Mr. James Brice, international consultant from South Africa, presented on several topics relevant to the

development of hazardous waste management schemes suitable for African nations. He introduced his first paper by describing the internationally accepted Waste Management Hierarchy," and suggested its usefulness for adapting waste management technologies for the African region. He also offered a detailed Guidance on Treatment and Disposal Alternatives for Industrial Wastes. The lectures on Cleaner Production Technology and Waste Minimisation were presented to cover the latest international developments with regards to waste prevention, since the reduction of waste requires a lower capital investment and offers a better rate of return than waste treatment and disposal, with greater protection of the environment. Many of the delegates were familiar with the basic principles of Cleaner Production (CP) mostly due to the efforts of the National Cleaner Production centres as sponsored by UNIDO.

However, several of the delegates suggested that training of the participants in the implementation of CP is required, since UNIDO has traditionally only provided 'pockets' of assistance in some African countries (such as Mauritius). The lectures on Waste treatment and Disposal provided an overall review of the technologies for HZW management, focusing on the checklists to be considered to assist delegates with the decision-making process for choosing the appropriate technologies for their purposes.

Professor Adeniyi Osuntogun, international consultant from Nigeria, presented lectures on guidelines for successful grant support and fund mobilization of ESM projects in the African region, and included tips for researching prospective donors and for developing detailed project proposals for funding of ESM projects.





## Discussion

The discussion on the Hazardous Waste Management Industry in Africa is summarized below. Participants indicated that the main challenge will be to define the HZWM industry in their countries, and the role of government to establish a HZWM system within their countries focusing on the following:

- Financing ,and the role of banks
- Community education and awareness
- Establishment of recycling and reprocessing industries Establishing transfer stations
- Enforcement on generators through correct waste manifest records, which would aid the correct data for waste quantities and types to be generated and monitored.
- That a hazardous waste management system needs to follow in the wake of an effective general waste management system.

The relationship between poverty, community health and hazardous waste disposal received much discussion and on several occasions delegates were requested to hold discussion points to the end of the presentation. It was agreed that the conclusion was to establish the HZWM program in such a manner as to alleviate poverty while simultaneously protecting the environment. It was resolved that this topic would be carried forward to future workshops.

Specific requests for further discussion were centered on the following:

*Pesticides:* Some countries admitted that pesticides are shipped to Finland for destruction, and requested assistance with developing local facilities. Consideration of the demographics, costs and environmental risks of transportation and storage calls for special consideration of the issues holistically.

*Medical waste:* A challenge with the current medical waste incinerators is the low operating temperatures (approx. 200°C) of these units, resulting in excess generation of dioxins and furans. Since the location of these facilities (at hospitals) are usually located in very close proximity of communities, the emissions from the incinerators presents a serious health risk to the same community which the hospital is meant to be serving.

*Laboratory waste:* The delegates from Ethiopia expressed concern about the significant volume of hazardous waste from laboratories. Mr. Brice demonstrated the system used in South Africa for the classification of Hazardous Chemicals (SANS 10228) and the guide documents for hazardous waste management, including laboratory chemicals and containers, labeling and packaging, and placarding and waste documentation.

*Used oil:* Discussions were made around the development in South Africa (SA), such as ROSE Foundation - a non-profit company established by the SA Petroleum Industry - which collects, treats and reuses used engine oil.

*The risks and hazards associated with dioxin and furan formation:* Delegates required further information on this topic, and the testing for such. It is felt that, given the excessive current cost of analyzing samples sent to the United States and Germany (US\$

10,000 per sample), it is recommended that a Regional Laboratory for POPs be established urgently at the Basel Convention Regional Coordinating Centre for Africa in Nigeria and well equipped to assist African governments to develop laboratory capacity for the analysis of POPs including dioxins and furans at reduced cost.

The participants were also delighted to acquire knowledge from the Prof. Osuntogun's presentations on international funding sources for research proposals and projects; techniques and formats for writing acceptable research proposals and projects.

### 8. Session III: Exhibition of Existing Hazardous Waste Technologies in Africa

There was exhibition of a high temperature, effective incinerator manufactured by a Nigerian company, Boskel Nigeria Limited for diverse hazardous wastes including transformer oils containing PCBs. Multinational petroleum companies in the country currently patronize the company for the destruction of PCB transformer oils, oil slop and other hazardous wastes generated. The company also showed slides of other technologies it has developed and which are operational. These are smokeless flares for oil and gas industry and smokeless oil slop burners. Future technologies under development by the company include used oil refining and mobile incinerators.



Participants viewing Boskel Nig. Ltd. exhibition stand

F&C Technologies (Pty) Limited of South Africa also presented with slides a technology for PCB management and control. The technology entails the destruction of PCBs

within the recycling of used transformer oil employing a chemical dechlorination plant, which was installed in 2000. The company was founded in March 1999 to break a monopoly in South Africa on the supply of regenerated transformer oil and the on-site regeneration (reclamation) of transformer oil in situ.

The Basel Convention Coordinating Centre for Africa, Nigeria also exhibited recycled hazardous waste products from laboratory scale experiments performed at the center. These include building tiles and bricks produced by the conversion of slag waste from automotive battery manufacturing companies as well as kieselghur waste from brewery industry. Recycled engine oil from used engine oil was also on display. There was also a poster drawing attention to potential heavy metals pollution from large volume importation of dry cell batteries for torch lights, table and wall clocks, portable radios etc especially from Asia into Africa, and which laboratory analyses have proved to contain high levels of cadmium and lead. The batteries usually have a short life span of less than 10 days with daily use and end up as solid waste in refuse dumps. The Secretariat of Basel Convention was requested to look into the problem towards the development of a regional strategy to halt the present trend.

### 9. Field Visit to Illegal Hazardous Waste Dumpsite and Non-Engineered Landfill Site for Automotive Battery Slag

The workshop participants accompanied by the Honourable Commissioner for Environment and Water Resources in Oyo State, some officials of the ministry, as well as newspapers and national television reporters were taken on a tour to the West African Battery Limited (Exide), Ibadan. The company, which began automotive battery manufacturing in the early 1980s which went bankrupt and closed down in 2000, was the largest automotive battery manufacturing plant in West Africa, producing 30,000 units



**Slag contaminated farm land in Ibadan**

of assorted batteries per week. It produced about 2500 metric tons of hazardous solid waste; slag, which contained about 5-6% lead, a highly toxic metal. Until 1994 the company employed the services of government registered waste collectors to cart away the slag for disposal in government approved sites. Unfortunately, the waste collectors dumped the slag in available bushes and farmlands. Following complaints of human health problems and death of livestock' by communities affected by the improper disposal of the slag, the defunct FEPA (now FMENV) and the Oyo State EPA intervened and ordered the company to dispense with the services of the waste contractors and construct an engineered landfill. The company acquired a disused quarry located about 8 kilometers away from the company. The landfill constructed was anything but a proper engineered landfill.

Participants saw the slag scattered over farmlands with most of the surrounding vegetation brownish in colour and dead. The landfill, which has since been abandoned, was in a messy state. The farmlands affected and the landfills need cleaning up, rehabilitation and remediation to restore the lands to productive use. The visit provided a case study of improper disposal of a dangerous waste and the adverse environmental and socio-economic effects.

## **10. Workshop Conclusions and Recommendations**

Throughout the workshop, participants expressed concern about lack of recognition of the magnitude of issues surrounding management of hazardous wastes throughout the region, including but not limited to: lack of adequate information on the volume, location, and sources of hazardous wastes generated; lack of knowledge and skill to identify technologies affordable by African countries for the environmentally sound management of hazardous wastes; lack of public awareness of the nature of hazardous waste and the danger it poses to human health and the environment; and lack of political will by various African countries to put in place appropriate legislations to deal with the issues of hazardous waste management.

Based on the foregoing, the recommendations arising from the workshop are as follows:

- (i) There is the need to obtain adequate finance for management of Hazardous Waste at national and international level.
- (ii) Need to raise public awareness on the existence of Hazardous Waste and the effects on human health and the Environment to all stakeholders.
- (iii) Conduct inventory of sources and volume of Hazardous Waste as well as waste characterization survey.
- (iv) Promote Integrated Management of Hazardous Waste through use of waste minimization and cleaner production technologies.
- (v) Use of efficient, sound and affordable technologies adaptable to African environment.
- (vi) Review of relevant legislations and regulation in order to promote efficient management of hazardous waste.
- (vii) Empowerment of salvagers at



dumpsites in the hierarchy of waste management.

- (viii) Hazardous waste management should follow proper management strategy of municipal domestic waste.
- (ix) Need for investment in research and development for new technology and waste minimization options for industries through the Basel Convention Regional centers
- (x) Consideration of the use of cement kilns for disposal of hazardous waste as fuel and as part of raw materials for the region.
- (xi) Memorandum of Understanding and contracts on purchase of any new technologies should have in the procurement policies means of dealing with the after waste.
- (xii) Countries need to avail themselves opportunities to develop programs/projects meeting local needs on hazardous waste management and adapt to meet donors objectives.

### **11. Project Documents Development and Fund Mobilization for Environmentally Sound Development Projects**

In view of the enormity and the critical importance of developing environmentally sound management of hazardous waste in Africa, the following projects are recommended for fund mobilization and implementation:

- (i) Contaminated sites - This includes inventorization, cleanup and remediation
- (ii) Health Care and Medical Wastes Management
- (iii) Used Engine Oil
- (iv) Lead Acid and Drycell Batteries

It is recommended that a regional approach should be adopted both for the implementation and fund mobilization for these projects. There should also be strong emphasis on capacity building as core component of each of the projects identified above.

### **12. Official Closing of the Workshop**

In his closing remarks, Professor O. Osibanjo stressed the importance of all participants to consider focusing on the prescribed checklist for choosing the appropriate technologies and of writing acceptable research proposals and projects for environmentally sound management of hazardous wastes. Following these remarks, he formally closed the workshop on Thursday, 12th August.

## **4. PART I- OPENING SESSION**

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### **WELCOME ADDRESS BY PROF. AYODELE. O. FALASE, VICE- CHANCELLOR, UNIVERSITY OF IBADAN, AT THE REGIONAL WORKSHOP ON SUCCESSFUL CASE STUDIES OF RECYCLING, REUSE AND RESOURCE RECOVERY METHODS TOWARDS THE ENVIRONMENTALLY SOUND MANAGEMENT (ESM) OF HAZARDOUS WASTES IN AFRICA, HELD AT THE CONFERENCE CENTRE UNIVERSITY OF IBADAN, NIGERIA ON 9TH AUGUST 2004**

It is with great pleasure and special satisfaction that I welcome to Nigeria's premier University , the distinguished array of eminent experts on hazardous wastes from across our great continent Africa as well as the eminent guests from government, industry and other stakeholders on the important and life- threatening problem of improper hazardous waste management in modern time. Let me welcome in a special way our August visitor, Mr. Nelson Sabogal from the Secretariat of the Basel Convention (SBC), Geneva who represents the sponsors of this unique regional workshop. I am reliably informed that the SBC and you in particular have been of immense assistance to Nigeria and African countries in general. I say a big thank you to you and the SBC.

Distinguished ladies and gentlemen, waste generation by man started since the beginning of civilization and has increased in geometric proportions as world population continues to explode. Waste management is of major concern to different levels of governments and people because the volume of waste generated is beyond the capacity of existing facilities to cope with. In most towns and cities in Africa and other third world regions, waste is not only heaped in huge quantities on refuse dumps but also lie in piles around the streets forming ugly refuse mountains, obstructing traffic and posing serious health risk to humans.

While wastes may generally be harmless or non-hazardous, yet some of the wastes generated by human activities are hazardous in nature and of environmental and public health concern because they are toxic to man and biodiversity , have long persistence in the environment, can bioaccumulate in man, plants and animals with deleterious health effects. Hazardous wastes are largely chemicals and are generated from a wide range of industrial, commercial, agricultural and domestic activities.

Nonetheless hazardous wastes include infectious waste such as diseased human/animal tissues, soiled bandages and syringes, often referred to as " medical", " clinical waste", " hospital waste" or "healthcare waste", Other hazardous wastes include redundant/expired/obsolete chemicals or medicines; laboratory waste and explosive waste from manufacturing operations or redundant munitions,

As a medical doctor I am particularly concerned about the potential health impact on the army of human scavengers who make their living on the urban refuse dumps since co-disposal of domestic and hazardous wastes is generally practiced in the African region. The scavengers work under unsanitary conditions without any personal protective equipment.

In some cities in Africa there are dumps that are running out of space due to co-disposal with hazardous industrial wastes and untreated hospital wastes. Open burning of refuse is generally carried out thereby exacerbating urban air pollution problems. Open burning of expired or seized drugs is also not environment friendly. Regulatory

agencies should come up with environmentally sound management alternatives. Not the least I am equally alarmed at the inclusion of hazardous used engine oil and electrical transformer oils containing carcinogenic polychlorinated hydrocarbons (PCBs) in hair creams/pomade in some countries including Nigeria. This is an indication of the low level of awareness of risks associated with hazardous waste in the region.

In view of the enormity of ecological and human problems associated with hazardous wastes, it is not surprising that hazardous waste has turned out to be one of the priority global environmental issues of our time. Even the rich and technologically advanced developed countries have not succeeded in successfully managing over 350,000 tons of hazardous wastes they generate annually. You will all recall that Nigeria was a victim with about 4000 tons of assorted toxic wastes from Italy illegally dumped in Koko port in the then Bendel State (now in Delta State). The coming into force of the 1989 Base' Convention is a global intervention mechanism put in place towards halting the hazardous waste trade internationally.

I recall with pride and satisfaction that our great university, specifically the Analytical Chemistry Unit of Chemistry Department, the Federal Radiation Protection Service, Department of Physics both in the Faculty of Science and the Departments of Medical Microbiology and Preventive and Social Medicine in the College of Medicine played major roles in the scientific investigations of the toxic wastes. It is instructive that Professor Oladele Osibanjo who carried out the chemical identification of the toxic wastes in 1988 is the Director of the Federal Ministry of Environment-University of Ibadan Linkage Centre on Cleaner Technology and Hazardous Waste Management and the Basel Convention Regional Coordinating Centre for Africa for Training and Technology Transfer on hazardous waste management. The Centre was established as aftermath of the successful collaboration between the university and federal government in respect of the Koko saga.

Distinguished Ladies and gentlemen, the Basel Convention Secretariat deserves commendation for its vision in establishing Basel Convention Coordinating Centres (BCRCs) as Centres of Excellence for improved capacity building and service delivery at the regional level on hazardous waste issues. This is important as the successful implementation of the Basel Convention in Africa by the government hinges on the availability of competent and well- trained experts. This point underscores the importance of this workshop on successful case studies of recycling, reuse and resource recovery methods towards the Environmentally Sound Management (ESM) of hazardous wastes in Africa.

Again I wish to thank the Basel Convention Secretariat for funding this very important workshop, as making the right choice of technology for sound hazardous waste management requires expertise and deep knowledge of the issues if the continent must derive full benefit from available technologies by making the right choices. I am confident that the knowledge to be gained by the participants would go a long way in achieving the objectives of the Base' Convention in the region, and assist the different levels of governments to develop strategies to counter the export of toxic and hazardous waste and technologies to Africa.

Another important event immediately following this opening ceremony is the Official Commissioning, by the Honourable Minister of Environment, Col. Bala Mande (Rtd), of the Basel Conventional Regional Coordinating Centre built with funds provided exclusively by the Federal Ministry of Environment. We are grateful to the Honourable

Minister for the completion of this project. The building has a laboratory which is yet to be equipped for hazardous waste studies. When completed, there would be adequate facilities for visiting scientists in the region to attend training workshops and partake in research programmes and technology development projects that will benefit the entire African region. Relevant Faculties and Departments in the University and other institutions will cooperate with the Centre in its research and human development programmes. I recommend the Centre to fellow African countries to make full use of its facilities and the opportunities offered. Let me use this occasion to announce that the Department of Chemistry will commence a new M.Sc Programme (Professional/Academic) during 2004/2005 on Environmental Chemistry and Chemical Pollution Control with strong emphasis on hazardous waste management, control technology and regulatory issues.

I wish to use this opportunity to seek additional funding from the Ministry of Environment to equip the building and make it functional. I also call on Basel Convention Secretariat, UNIDO, NEPAD Secretariat and other donor countries/ agencies to increase technical and financial assistance to the Centre to enable it fulfill its mandate soonest for the benefit of present and future generations of Africans. I wish to assure you that University would provide the enabling environment for the Centre to enable its fulfill its mandate.

Finally I implore the distinguished participants to take time off their busy schedule to look round the campus and avail themselves of the delight of Ibadan city, as there are lots of interesting places to visit and enjoy. I wish you a successful workshop.

Honourable Minister of Environment, distinguished ladies and gentlemen, I thank you for your kind attention.

**Professor Ayodele O. Falase**  
**Vice Chancellor**

**Statement by the representative of the Secretariat of the Basel Convention, Mr. Nelson Sabogal, to the Regional Workshop on Successful Case Studies of Recycling, Reuse and Resource Recovery Methods towards the Environmentally Sound Management of Hazardous Wastes and Implementation of Basel Convention in Africa**

**Ibadan, Nigeria, 9-12 August 2004**

On behalf of the Secretariat of the Basel Convention, I wish to welcome all of you to this Regional Workshop organized by the Basel Convention Regional Co-ordinating Centre in Ibadan with the financial support of the Trust Fund of the Basel Convention.

This Workshop is the result of one of the project proposals submitted by the Regional Co-ordinating Centre to the first session of the Open-Ended Working Group of the Parties to the Basel Convention held in April 2003.

The main aim of this Regional Workshop is to analyse with the aid of lectures, slides/video clips and case studies, best practices and proven technologies that work in hazardous waste management elsewhere both in developed and developing countries that are appropriate, readily adaptable in Africa and not entailing excessive cost (Best Available Technology Not Entailing Excessive Cost (BATNEC)). Guidelines on how to develop environmental sound management project proposals for successful grant support and implementation will be presented and a discussion on the legal, technical, financial conditions of the development and transfer of technologies in the region shall be covered in detail to make the programme holistic. As a result of this Workshop, Project Development Documents shall be prepared for the projects identified to be environmentally and economically sound and sustainable in the region.

The Secretariat wishes to thank the high interest of the Parties in Africa, and I am very happy to note the participation of Cameroun, Ethiopia, Ghana, Kenya, Mauritius, Nigeria, Senegal, South Africa, Sudan, Tanzania, the Democratic Republic of Congo and Zambia.

Also, on behalf of the Secretariat and the Basel Convention Regional Centre, I wish to express my deep gratitude for your willingness to participate and share your experiences in successful case studies in the field that can be replicated in other countries, taking into account regional and national diversities and specifications to implement the Basel Convention.

I wish to invite you to build your recommendations based on the case studies and discussions.

Finally, I wish to thank the Basel Convention Co-ordinating Regional Centre in Nigeria, its Director and staff, for their hard work in preparing and organizing this Regional Workshop, the invaluable assistance of the Ministry of Environment and the University of Ibadan Prof. Ayodele Falase – Vice Chancellor and I wish a successful outcome of this Regional Workshop.

Thank you.

**ADDRESS BY THE UNIDO REPRESENTATIVE, DR. DAVID TOMMY, AT THE OPENING CEREMONY OF THE REGIONAL WORKSHOP ON SUCCESSFUL CASE STUDIES OF RECYCLING, REUSE AND RESOURCE RECOVERY METHODS TOWARDS THE ENVIRONMENTALLY SOUND MANAGEMENT (ESM) HAZARDOUS WASTES IN AFRICA, IBADAN, NIGERIA, 9-12 AUGUST 2004**

We wish to express our sincere appreciation and gratitude for the invitation extended to us to deliver a Good Will message at this opening ceremony of the Workshop on Successful Case Studies of Recycling, Reuse and Resource Recovery Methods Towards the Environmentally Sound Management of Hazardous Wastes in Africa. UNIDO commends the co-operative efforts of the organizers in making this workshop a reality.

The workshop has come at a very appropriate time when international concern and efforts are now focus on providing industry and economy perspectives in developing Multilateral Environmental Agreements (MEAs) such as the Strategic Approach to International Chemical Management (SAICM) in view of the threat of improper management of hazardous wastes. Considering the devastating effects of that these wastes have on the health of humans, animals and plants and the damages they cause to the environment, their proper management is imperative to sustainable development. It is therefore important not only to determine the source, extent and type of hazardous wastes being produced and used today, but also to have accurate information on the amount of such chemical/wastes generated in the past. Also important is information on the location, transportation and disposal of such chemical/wastes, how they are managed, and the method of disposal and in case of improper disposal, how existing and potential problems can be addressed.

It is within this context that UNIDO as the UN specialized agency charged with promoting sustainable industrial development, in cooperation with the Food & Agricultural Organization (FAO) of the UN, the Secretariat of the Basel Convention (SBC) on Hazardous Wastes, has been assisting Nigeria in her efforts to implement the various conventions on hazardous wastes through awareness raising and capacity building programmes/activities. April 2001, the Federal Ministry of Environment, in cooperation with UNIDO, FAO and the Secretariat of Basel Convention (SBC) organized as Awareness Raising Seminar on Hazardous Wastes Management, at the Sheraton Hotel in Lagos. The seminar was able to sensitize the public, and in particular, the News Media on the existing and potential dangers that hazardous chemicals pose to human and physical environment and the need for their safe and sound management.

As a follow up to the seminar, UNIDO and FAO organized a training programme on inventorization of obsolete pesticides in September 2001 and about 30 participants drawn from the Federal Ministry of Environment, State EPAs, the private sector and NGOs were trained. We hope that with the continued cooperation of our national counterparts including FMENV, other pertinent Ministries, State EPAs, industries, NGOs/CBOs etc. these achievements will be consolidated and built upon with training of more counterparts, undertaking the inventorization exercise, processing and disposal of some collected wastes.

The Stockholm Convention on Persistent Organic Pollutants (POPs) requires countries that ratified the convention to prepared, as a first step, National Implementation Plans (NIPs), which describe how the production and use of these pollutants can be reduced and eventually eliminated. UNIDO is currently assisting more than 40 countries

(including Nigeria) to prepare their NIPs for the implementation of the Stockholm Convention.

UNIDO is currently developing a regional project on POPs Contaminated Sites for the Guinea Current Large Marine Ecosystem (GCLME). The project, which is to be presented to GEF for funding, will involve awareness raising and capacity building in the development of policy and regulatory framework, acquisition of Environmentally Sustainable Technologies (ESTs), and skills acquisition in areas of Best Environmental Practices (BEPs) and Best Available Techniques (BATs). The project will also carry out a series of demonstration projects and training on contaminated land and groundwater management.

UNIDO as the current Chairman of the Inter-Organization Programme for the Sound Management of Chemicals (IOMC) and with its experience of industries and chemicals management in developing and transition economy countries is well equipped to assist Governments to work towards achieving the Millennium Development Goals (MDGs) through implementation of programmes/activities that will promote environmental sustainability.

UNIDO welcomes the opportunity of working with the Government, industry, the business sector, NGOs/CBOs, the donor community and other relevant stakeholders in the implementation of programmes/projects to improve economic and environmental performance and sustainability.

We thank you for your attention and hope that you will find the training programme useful.

**GOODWILL MESSAGE BY CHIEF (MRS.) CHINYERE ASIKA, SENIOR SPECIAL ASSISTANT TO THE PRESIDENT ON NEPAD AND HEAD OF NEPAD NIGERIA AT THE REGIONAL WORKSHOP ON SUCCESSFUL CASE STUDIES OF RECYCLING, REUSE AND RESOURCE RECOVERY METHODS TOWARDS THE ENVIRONMENTALLY SOUND MANAGEMENT (ESM) OF HAZARDOUS WASTES IN AFRICA, UNIVERSITY OF IBADAN, NIGERIA  
9-12 AUGUST 2004**

It is my pleasure to be here this morning for the opening ceremony of this very important Regional Workshop. Let me first commend the efforts of the Basel Convention Regional Co-ordinating Centre for Africa, Ibadan. Nigeria also known as the Federal Ministry of Environment-University of Ibadan Linkage Centre for Hazardous Wastes Management and Cleaner Production Technology, for organising this workshop. Let me also extend my appreciation to the United Nations Environment Programme (UNEP) and the Secretariat of the Basel Convention for their support, commitment and collaboration in the organization of this workshop.

The New Partnership for Africa's Development (NEPAD) is an initiative adopted by the African Heads of State and Government. The initiative is based on a common vision and a shared conviction, that they have a pressing duty to eradicate poverty and to place their countries, both individually and collectively, on a path of sustainable growth and development.

The Action Plan of the Environment Initiative of NEPAD has been prepared under the leadership of African Ministerial Conference on the Environment (AMCEN), and in close

co-operation with the Secretariat of NEPAD and the African Union as well as the support of UNEP and the Global Environment Facility. The main objective of the action plan is to assist African countries to integrate environmental considerations into poverty reduction policies and strategies.

The development of the action plan followed a consultative process led by African experts. Eight thematic workshops were held in 2003 to finalize the action plan. The workshops were held in different African countries: Algeria, on desertification; South Africa, on invasive species; Mali, on poverty and environment; Cameroon, on forests; Kenya, on wetlands; Senegal, on health and environment; Nigeria, on marine and coastal environment and freshwater resources; and Morocco, on climate change. In addition, a consultative meeting was held with civil society groups in Nairobi.

The implementation of the action plan will be a challenge which will require the support and active participation by all African countries and the development partners. An immediate step for the implementation of the action plan is to build the capacity of the African countries. In this regard, a multi-million dollar project on capacity - building programme for the implementation of the action plan has been prepared. The implementation of this strategic project will be carried out under the aegis of AMCEN.

Majority of our African countries are parties to many of the regional and international environmental conventions such as the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal, the Bamako Convention of 1991, the Rotterdam Convention on the Prior Informed Consent, and Stockholm Convention on Persistent Organic Pollutants. One of the specific objectives of the action plan of the Environment Initiative of NEPAD is to assist these African countries to implement their commitments under these Conventions for which they are contracting Parties and to address other related environmental problems.

The United Nations Resolution (57/7) recognizes the need to establish NEPAD National offices with responsibility for monitoring the implementation of NEPAD programmes at country level and serving as a repository of information, among other functions.

In order to ensure operationalization of NEPAD programmes at the country level, the Federal Government of Nigeria has established an institutional arrangement in the Presidency to be responsible for implementation of NEPAD programmes in Nigeria. Mr. President also established the post of Senior Special Assistant to President on NEPAD to head the NEPAD Nigeria.

The NEPAD Nigeria is mandated to identify and work with partners in the public and private sectors, including the civil society and international organizations operating in Nigeria, to develop, implement, and promote NEPAD programmes at the country level. Our presence here today is a clear demonstration of our support for this programme. NEPAD Nigeria will work closely with the Basel Convention Regional Coordinating Centre for Africa located here in Ibadan, to facilitate the implementation of the action plan of the Environment Initiative of NEPAD particularly in the area of hazardous waste management.

Once again, I wish to thank the organizers of this very important workshop. I also wish to thank the representatives of various countries here present for their participation. I wish you all fruitful deliberation.

Thank you and God bless.



**A GOODWILL MESSAGE PRESENTED BY THE HONOURABLE COMMISSIONER FOR ENVIRONMENT AND WATER RESOURCES. HON. AZEEZ ADELANI ASHIRU AT THE OPENING CEREMONY OF A REGIONAL WORKSHOP ON SUCCESSFUL CASE STUDIES OF WASTE RECYCLING, REUSE AND RESOURCES RECOVERY METHODS TOWARDS THE ENVIRONMENTALLY SOUND MANAGEMENT (ESM) OF HAZARDOUS WASTES IN AFRICA, NIGERIA ON THE 9TH AUGUST, 2004 AT THE UNIVERSITY OF IBADAN CONFERENCE CENTRE**

The Government and the entire citizens of Oyo State are privileged to be hosting several countries of Africa covering North, South, East, Central and West Africa at this Regional workshop sponsored by United Nations Environment Programme (UNEP) on successful case studies of waste recycling, reuse and resource recovery methods towards the Environmentally Sound Management (ESM) of hazardous waste in Africa.

Industrialization is vital to a nation's socio-economic development as well as its political status in the international committee of nations. Industrial sectors provide ready employment opportunities to people. However, industries vary according to process technology, size, nature of products, characteristics and complexity of wastes discharged.

Ideally, siting of industries should strike a balance between socio-economic and environmental considerations. In most developing countries of the world siting of industries is based on various criteria some of which are environmentally unacceptable, thereby posing serious threat to public health and environmental quality. Significant in this respect, is the establishment of industries alongside residential areas.

Although industrialization is inevitable, various devastating ecological and human disasters continuously occurred in the past which implicate industries as major contributors to environmental degradation and pollution problems of various magnitude. Industrial wastes contain toxic and hazardous substances, most of which are detrimental to human health and the environment. These include heavy metals such as lead, cadmium and mercury; and toxic organic chemicals such as pesticides, polychlorinated biphenyls (PCBs), dioxins, polyaromatic hydrocarbons (PAHs), petrochemicals and phenolic compounds. For instance, the case of the "Minamata disease" in Japan in the 60s which was occasioned by Mercury poisoning of consumers of fish from Minamata Bay, Japan, which had been chemically contaminated by untreated effluents from a plastic factory. Another case was the "Itai-Itai" poisoning from ingestion of rice irrigated with effluent containing the toxic metal cadmium. The infamous koko toxic waste dump saga is still fresh in our memory. Coming back home in Ibadan at Olodo, was a case of battery wastes illegally and indiscriminately dumped on a farm land leading to chemical contamination of fish pond nearby, which caused sporadic death of residents and farmers on the contaminated land. The most pathetic of this case was premature, termination of pregnancies among domestic animals and human beings. The State Environmental Protection Agency (SEPA) now Ministry of Environment and Water Resources quickly rose to this occasion by conducting series of analytical investigations which eventually led to the declaration of the land as "No Farming Area" The devastating effect of this illegal waste dump is still lingering on at Otukunle Village near Olodo till today. Oyo State Government is inviting UNEP to visit the site of this severely degraded soil for possible assistance towards its reclamation and remediation.

Rapid industrial development in both developed and developing countries have

increased the rate of hazardous wastes generation several folds. This has also heightened the threat posed by "Toxic wastes Trade" or illegal Dumping of Toxic Wastes" in poor, unsuspecting poverty stricken African countries.

Surface and under ground water contamination, air pollution, solid waste heaps, general environmental degradation including loss of land and aquatic resources are major environmental problems caused by industrialization in Nigeria. Improper handling, treatment and disposal of untreated industrial wastes have resulted into coloured, murky, odourous and unwholesome surface waters, fish kills and loss of recreational amenities.

I want to take this opportunity to inform this forum that Oyo State Government places high premium on environmental Quality. It has enforced mandatory preparation of Environmental Impact Assessment (EIA) and Environmental Audit Report (EAR) on potential and existing projects. The pace of industrial monitoring has been intensified, with a view to tracking down industrial toxic wastes dumpers and to minimise rate of waste generation. It has also intensified efforts on public enlightenment on prevention of industrial waste dumping.

His Excellency, the Executive Governor of Oyo State, Alh. (Dr.) Rashidi Adewolu Ladoja is particularly happy, that this regional workshop is taking place in Ibadan, the largest city In black Africa, now that the efforts of the present civilian administration to provide a healthy, safe and aesthetically pleasing environment for the citizens of Oyo State, is yielding positive results. There is no other place that could best hold this workshop than University of Ibadan, the centre of academic Excellence in Africa.

All participants are hereby implored to participate actively in all deliberations, of this workshop and afford themselves of a good taste of Yoruba culture and tradition, that will forever enliven their memory of being in Nigeria.

Wishing you a successful stay in Nigeria and happy interactions. I also wish you safe journey back to your countries.

Thank you.

**OPENING ADDRESS BY COL. (RTD.) BALA MANDE, HONOURABLE MINISTER OF ENVIRONMENT AT THE REGIONAL WORKSHOP ON SUCCESSFUL CASE STUDIES OF RECYCLING, RE-USE AND RESOURCE RECOVERY METHODS TOWARDS THE ENVIRONMENTALLY SOUND MANAGEMENT (ESM) OF HAZARDOUS WASTES IN AFRICA, IBADAN, NIGERIA 9-12<sup>TH</sup> AUGUST, 2004**

It is my pleasure to join the Vice-Chancellor of the University of Ibadan in welcoming you to the venue of this Workshop on "**Recycling, Reuse and resource Recovery Methods towards the Environmentally Sound Management of Hazardous Wastes in Africa**". The workshop, I understand is jointly organized by the Basel Convention Coordinating centre for Africa (BCCC), Ibadan- Nigeria and the Secretariat of the Basel Convention (SBC) Geneva, Switzerland. Coming at a time of Africa's quest for prudent management of available natural resources and re-use of recyclable and reusable materials, this workshop creates a privileged opportunity for stakeholder appraisal of our seriousness in solving certain environmental problems using appropriate, readily adaptable and cost effective technologies and processes.

In recent years, Africa has been exposed increasingly to new and global forms of man made pollution which are raising the magnitude and incidence of emergency situations. Some of these hazards include the building up of carbon dioxide levels and other green house gases, oil spills in the oceans, coastal areas and land; the steady destruction of the earth's protective ozone layer and the slow but sure warming up of the atmosphere with the obvious hazards they pose to the regional climatic patterns and regimes.

It is now common knowledge that with increased industrialization of some African countries, hazardous waste management has at present become an equally serious problem. Even for those countries for which it has not yet become a serious problem, it can be argued that it has to be taken seriously before the problem becomes so acute that it would take an extraordinary share of national resources and expertise for solution, which the countries can ill-afford at their current state of development.

This workshop is a significant step in the efforts of BCCC and SBC to build the capacity of African countries in the environmentally sound management of hazardous wastes. Hazardous wastes are those wastes that meet one of the following four criteria: ignitability, corrosivity, reactivity, and toxicity. For effective management of hazardous wastes, countries are encouraged to adopt a holistic approach that can put into practice a reliable and integrated cradle-to-grave management system.

Sound management of hazardous wastes must not only consider more than the current approach of careful storage and disposal practices, but also should consider the various other alternatives available, individually or in combination, to formulate an appropriate strategy. Among the options that are currently available and should be considered by the workshop are the following:

- Minimization of wastes generated by changing or modifying the industrial process,
- Reprocessing of the wastes produced in order to recover energy and materials,
- Transfer of the wastes to another industry which can use them as inputs.
- Separation of hazardous from non-hazardous wastes at the source, and
- Processing of the wastes physically or biologically to render them less hazardous or non-hazardous.

The Basel Convention on the Transboundary Movements of Hazardous Wastes and their Disposal was developed under the auspices of the United Nations Environment Programme to regulate and control transboundary movements of hazardous wastes and their disposal at international and national levels. The secretariat of the Basel Convention is steadily promoting the establishment of Basel Convention Regional Centres and their Coordinating Centers in specified regions of the world. The role of these centers is to promote capacity building in hazardous waste management through training and technology transfer activities.

In our efforts to manage hazardous wastes in an environmentally sound manner, Nigeria has ratified the following conventions:

- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, including its Ban Amendment.
- Rotterdam Convention on the Prior Informed Consent Procedure (PIC) for Certain Chemicals and Pesticides in International Trade.

- Stockholm Convention on Persistent Organic Pollutants (POPs Convention).
- Vienna Convention on the protection of the Ozone Layer and the Montreal Protocol on substances that Deplete the Ozone layer

Ladies and gentlemen, it may interest you to note that the Government of Nigeria has commissioned projects which are at various stages of completion for hazardous and other wastes management and resource recovery namely:

- Integrated waste management facilities studies in fifteen Nigerian industrial and commercial cities.
- Nyanya community- based Municipal Waste Management Pilot Project
- Conversion of Agricultural Wastes to Briquettes – a Pilot Briquetting Plant in Makurdi.
- Studies on Effluent Treatment Facilities for four major Industrial Cities.
- Provision of Incinerating Facilities at the three National Orthopaedic Hospitals, and the National Institute for Medical Research.

The Government is also implementing a number of programmes aimed at sound hazardous waste arrangement which includes chemical tracking/toxic waste dump watch, registration of chemicals/pesticides, pest control and fumigation, hazardous wastes/toxic chemicals awareness – raising, and industrial/hazardous chemicals assessment and database.

The Government in conjunction with the United Nations Environment Programme (Chemicals) has completed Dioxin and Furan Inventory in Nigeria. It is also executing biomedical and hospital wastes project jointly with the Secretariat of the Basel Convention and the World Health Organization. In addition, the Government is finalizing a grant agreement on the national implementation of the African Stockpiles programme. The programme is financially supported by the Government of Canada and technically assisted by Croplife International.

With these national and other international efforts made to ride our environment of hazardous wastes and toxic chemicals, I believe that this workshop could not have come at a better time than now. The workshop which aims to discuss case studies and proven technologies in hazardous waste management will undoubtedly afford participants the opportunity to assess and possibly recommend the adoption of such processes and technologies for the environmentally sound management of hazardous wastes in their respective African countries.

At this juncture I would like to commend in a special way the Secretariat of the Basel Convention on its efforts in reducing and minimizing hazardous waste generation and transshipment and also assisting developing countries especially African countries with the environmentally sound management of hazardous and other wastes they generate. The selection and establishment of Basel Convention Coordinating Centre for the African Region in Nigeria is the most eloquent testimony of the Secretariat of Basel Convention's interest and determination to ensure that the African continent is saved from the dangers of generation, transshipment and disposal of hazardous wastes.. I would also commend the authorities of the University of Ibadan for ensuring that the Centre starts operation and fully prepared to take the challenges of coordinating the three Basel Convention Regional Centres for Training and Technology Transfer hosted in South Africa, Senegal and Egypt.

I want to assure the Secretariat of Basel Convention and all stakeholders that the government of Nigeria is fully committed to supporting the activities of Basel Convention Coordinating Centre in Ibadan, Nigeria. I therefore will expect encouraging recommendations at the end of the workshop. Your recommendations should aim at recycling, re-use and resource recovery methods that are affordable, easily adaptable, environmentally sound and sustainable.

I think it justifiable to speak of mindless misuse of the world's resources. We know that the world's resources are limited and finite. The continued growth in the consumption of our resources must therefore have a point of termination, and in some respects and in some places especially Africa, we may in a few decades be confronted with shortages. To avert this impending catastrophe, we must adopt the techniques of resource recovery and materials re-use and recycling as being promoted by the organizers of this workshop.

Distinguished ladies and gentlemen, the opening ceremony of the workshop will be closely followed by the official commissioning of BCCC Building. It is an indication of our seriousness and commitment. We do hope that the Centre will in no distant time organize trainings in the building.

Once more, I urge all the participants to avail themselves the golden opportunity the workshop will offer.

While wishing you the most fruitful discussions, I hereby declare the workshop open.

Thank you for your kind attention.