Continuing The Nigeria STP Plus
Chemical Safety Research Project

BY:
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AT
IUPAC COCI SAFETY TRAINING WORKSHOP IN PARIS ON 8TH JULY 2019

THINK
SAFETY FIRST

What’s on my food?

Warning
Pesticides
Outline

- Introduction (Self and Country)
- STP Update
- Training Module Highlights
- Current Chemical Safety Research Project
- Future Projects
- Closing
Introduction (Self)

- Chemical Regulator/Inspector with National Agency for Food and Drugs Administration and Control (NAFDAC), Nigeria
- STP Fellowship at National Silicates, Toronto, Canada
- Research on Chemical Innovation and Regulation at the University of Barcelona, Spain and University of Algarve, Portugal

Skills:
- Chemical Regulations and Control (Chemical Conventions-REACH)
- Response to chemical incidents and accidents
- Chemical industrial Audits, Inspections,
- Chemical monitoring and surveillances
- Outreach & Public Awareness on Chemical safety and Security Strategies
- Regulatory Affairs
**Introduction - Nigeria**

- **923,768 km²** land area and **13,000 sq km** water area.
- Divided into six geopolitical zones.
- Has tropical climate type because of its location just north of the equator.
STP Update: Chemical Safety Awareness

• The following awareness Programmes were carried out to promote Chemical safety and security protocols in Nigeria

• Television Awareness

• Radio Programs

• Internal trainings for Regulators (Monthly)

• Workshops (Crop life, NCDC, ICCON, Cameroon)

• Development of chemical safety Flyers and Brochures
Update continued

- Interactive Training Sessions
Update......Recent

- Conducted a Webinar Presentation on chemical safety and Security

- Gave an outlook of the European Chemical regulation and control System

- Participants: Industries, Academia, Governments and other stakeholders involved in the Nigeria Chemical management systems

- A plaque Was presented in Absentia
Classroom Training on the 24th January on Perception of chemical risks and Way forward. Barcelona
Class room Training Cont’d
Symposium: Promotion of Regulation of Pesticides towards environmental safety on 6-7 June 2019, Portugal
Training Highlights

Many practices are the same for chemical safety and security, but there are few areas of conflict.

<table>
<thead>
<tr>
<th>Chemical Safety</th>
<th>Chemical Security</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevent non-deliberate release of toxic chemicals</td>
<td>Prevent deliberate release of toxic</td>
</tr>
<tr>
<td>Comprises of measures to prevent chemical accident</td>
<td>Measures to prevent chemical incident</td>
</tr>
<tr>
<td>Comprise disciplines such as occupational safety, public safety, process safety, environment safety, consumer safety and transport safety.</td>
<td>Policies to prevent attempts to acquire toxic chemicals or chemical weapons precursors.</td>
</tr>
<tr>
<td>Prevent humans from the hazardous effects of chemicals</td>
<td>Prevent chemicals from coming in contact with people</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Safety</th>
<th>Security</th>
</tr>
</thead>
<tbody>
<tr>
<td>Label</td>
<td>label everything so people recognize hazardous chemicals</td>
<td>labels help identify targets for theft or attack</td>
</tr>
<tr>
<td></td>
<td>Location is Essential for Emergency Responders</td>
<td>locations of chemicals can publicize targets for theft or attack</td>
</tr>
<tr>
<td></td>
<td>share knowledge about chemical hazards so that people will know and be alert.</td>
<td>sharing knowledge of chemical hazards could inspire harmful behavior</td>
</tr>
<tr>
<td>Access Control: (Unlocking exit doors is secure, but not safe.)</td>
<td>For safety, people need to be able to leave the facility quickly through many routes.</td>
<td>For security, you want to control exits as well as entrances to protect chemicals (or equipment).</td>
</tr>
</tbody>
</table>
Training Highlights...Need for Chemical Safety

- Chemicals are dual use Materials
- Bhopal India, over 25000), 11000
- Chlorine gas explosion
- Toxic gas pollution, School Students hospitalized
- Lead poisoning Zamfara, Niger Ikeja cantonment

Incidents: (Bomb Explosions, Acid bath)
Highlights: Causes of Industrial Chemical Accidents

Major industrial chemical accidents are low frequency, but high significant impacts: Explosions, Fire, emissions, injuries, and deaths.

- Transport activities
- Technical breakdown
- Human error
- Energy related
- Hierarchy of control neglected

Thermal Runaway
Highlights: Impacts cont`d..
Highlights: Safety Tips (Safety Behaviours)

Behavior Based Safety (BBS) focuses on behaviors that promote safety.

Remember: Behavior is “the manner of conducting oneself”

Behaviors cannot be isolated from the environment in which they occur.

Therefore, Employees are expected to promote safe practices. Working environment must encourage this behavior.
Highlights: Safety Tips (management of toxic Xcals)

- Green Metrics (AE & EF)
- Purchase original chemicals
- Clear labelling with HCS
- Avoid Dispensing, retain chemicals in its correct/original containers: Using a different container made from different material could lead to an unexpected reaction.
- Use Safety Data Sheet (SDS) and Appropriate PPEs
- Qualified and authorized Personnel should handle dangerous chemicals
- Clear danger signs where necessary
- Adequate chemical Inventory
- Always dispose chemicals correctly
- Strict adherence to regulatory authorities
Integrated Chemical Safety and Security Risk Management

Objectives of Integrated Chemical Safety and Security Risk Management:
- More effective risk reduction
- Better communication
- Increased safety and security culture
- More effective use of limited resources
CHEMICAL SAFETY PROJECT

PESTICIDES
STRATEGIES FOR EFFECTIVE CONTROL OF PESTICIDES TOWARDS ENVIRONMENTAL SUSTAINABILITY IN NIGERIA.
Research Methodology

• Pesticide Residue Analysis
• Comparative Assessments of the EU, USA and FRN Pesticide Regulations
• Nigeria Pesticide Data
Results: National Pesticide Data

Pesticides Imported Qty (MT) 2013-2018

Tonnes of AS used Globally

Percentage Imported Pesticides 2013-2018

Results: Manufacturing Industries

% Registered Manufacturing Industries in Nigeria (Jan. 2019)

- Food, Beverages, Tobacco: 27.2%
- Basic Metal: 9.4%
- Vehicles: 7%
- Electrical/Electronics: 3.9%
- Textile: 14.8%
- Chemical/Pharmaceutical: 11.3%
- Plastic/Rubber: 6.5%
- Non-Metals: 13%
- Pulp/Paper: 2.9%

% Agrochemical Manufacturing companies
- Agrochemical: 0.2%
- Manufacturing Sector: 99.8%
RESULTS-Residue Analysis

Percentage Pesticides Below/Above MRL

<table>
<thead>
<tr>
<th>Pesticide</th>
<th>% Below MRL</th>
<th>% Above MRL</th>
</tr>
</thead>
<tbody>
<tr>
<td>LINDANE</td>
<td>36</td>
<td>64</td>
</tr>
<tr>
<td>ALDRIN</td>
<td>9</td>
<td>91</td>
</tr>
<tr>
<td>DDT</td>
<td>45</td>
<td>55</td>
</tr>
<tr>
<td>DICHLORVOS</td>
<td>27</td>
<td>73</td>
</tr>
<tr>
<td>DIMETHOATE</td>
<td>45</td>
<td>55</td>
</tr>
<tr>
<td>DIAZINON</td>
<td>45</td>
<td>55</td>
</tr>
<tr>
<td>CHLORPYRIFOS</td>
<td>18</td>
<td>82</td>
</tr>
<tr>
<td>PERMETHRIN</td>
<td>36</td>
<td>64</td>
</tr>
<tr>
<td>CYPERMETHRIN</td>
<td>82</td>
<td>18</td>
</tr>
</tbody>
</table>

Legend: % BELOW MRL, % Above MRL
## Results - Regulations

<table>
<thead>
<tr>
<th>REGULATIONS</th>
<th>EU</th>
<th>USA</th>
<th>FRN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorization and Placement of PPPs on the Market</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Data Requirements for AS, Adjuvants, Synergists, Co-formulants</td>
<td>√</td>
<td>√</td>
<td>X</td>
</tr>
<tr>
<td>Data Requirements for PPPs</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>CLP regulations for Dangerous Preparations</td>
<td>√</td>
<td>√</td>
<td>X</td>
</tr>
<tr>
<td>Labelling Regulations</td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Legal Limits</td>
<td>√</td>
<td>√</td>
<td>Adopt CODEX</td>
</tr>
<tr>
<td>Sustainable/Responsible Use of Pesticides (RUP)</td>
<td>√</td>
<td>√</td>
<td>X</td>
</tr>
<tr>
<td>(Involves certification/training of applicators)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pesticides Use in Organic Agriculture</td>
<td>√</td>
<td>√</td>
<td>X</td>
</tr>
<tr>
<td>Environmental Liability and Endangered Species</td>
<td>√</td>
<td>√</td>
<td>X</td>
</tr>
<tr>
<td>Statistics on Pesticides</td>
<td>√</td>
<td>(Sale and Use-Eurostat)</td>
<td>√ (Import &amp; Export Data available but no consumption data &amp; Regulations</td>
</tr>
<tr>
<td>Inspection and Maintenance of machinery for pesticide Applications</td>
<td>√</td>
<td>√</td>
<td>X</td>
</tr>
<tr>
<td>Pesticide Limit in Drinking Water</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Surface and Groundwater Quality</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Disposal of Pesticides</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
</tbody>
</table>

- Conclusions, Recommendations and Regulatory Model/Road Map to be developed at the end of the Research
Future Plans

Communicate the outcome of the Research to Nigeria Pesticide Regulatory Authorities towards improved safety control of Agrochemicals in Nigeria

• Chemical safety trainings to be carried out in High Schools
• Promoting safety practices in high schools by giving academic awards to best graduating students in chemistry Subjects.

• Cooperate with other STP fellows for a safety training projects to Chemical industries and Agrochemical Marketers
• Continue with Trainings of professionals involved in Chemicals Management

• Academic Prize for best graduating student had commenced in a high school in Abuja as my own community development initiative towards safety practices of chemistry (First Recipient will be in July, 2019.
• Need support from STP to continue on this initiative
Reflection
• Actress American
• Born: August 24, 1965

Novelist, writes comedy
1917-2007

Scientist-anthropologist
American
1901-1978

National Resources, Ecology
and Evolutionary Biology. 1960
Gratitude

Special Thanks to
• Dr. Bernard West
• Carolyn Ribes
• Robert Audette
• COCI IUPAC
ALONE WE CAN DO SO LITTLE, TOGETHER WE CAN DO SO MUCH

Nature is our treasure, help save it

PROMOTE CHEMICAL SAFETY FOR THE SAKE OF HUMANITY.