THE STATUS OF AIR QUALITY IN DEVELOPING COUNTRIES- CASE STUDY OF KENYA

PROF. SHEM O. WANDIGA

Department of Chemistry, University of Nairobi, P. O. Box 30197-00100, Nairobi, Kenya

wandigas@uonbi.ac.ke

BACKGROUND SITUATION

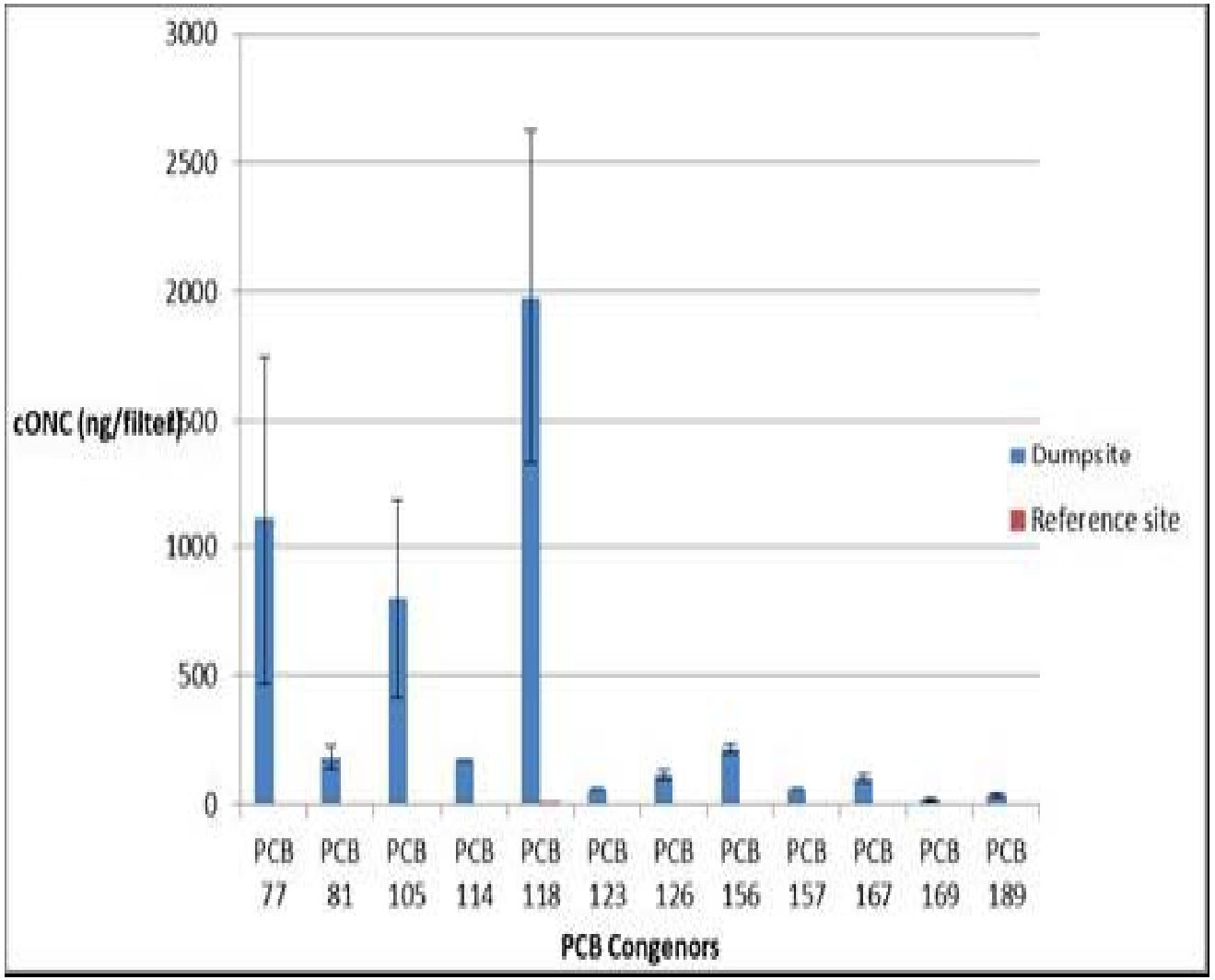
- Pollution of air impacts negatively on the human health and development.

- Major sources of pollution include:
  - Industrial activities- Energy generation, industrial chemicals etc.
  - Agricultural activities- Application of pesticides
  - Uncontrolled combustion activities eg. Municipal wates, biomass burning, forest fires.
  - Transport industry- Motor vehicle exhaust
  - Domestic activities eg. Use of firewood with no proper pollution control

- Existing data is mainly for background sites.

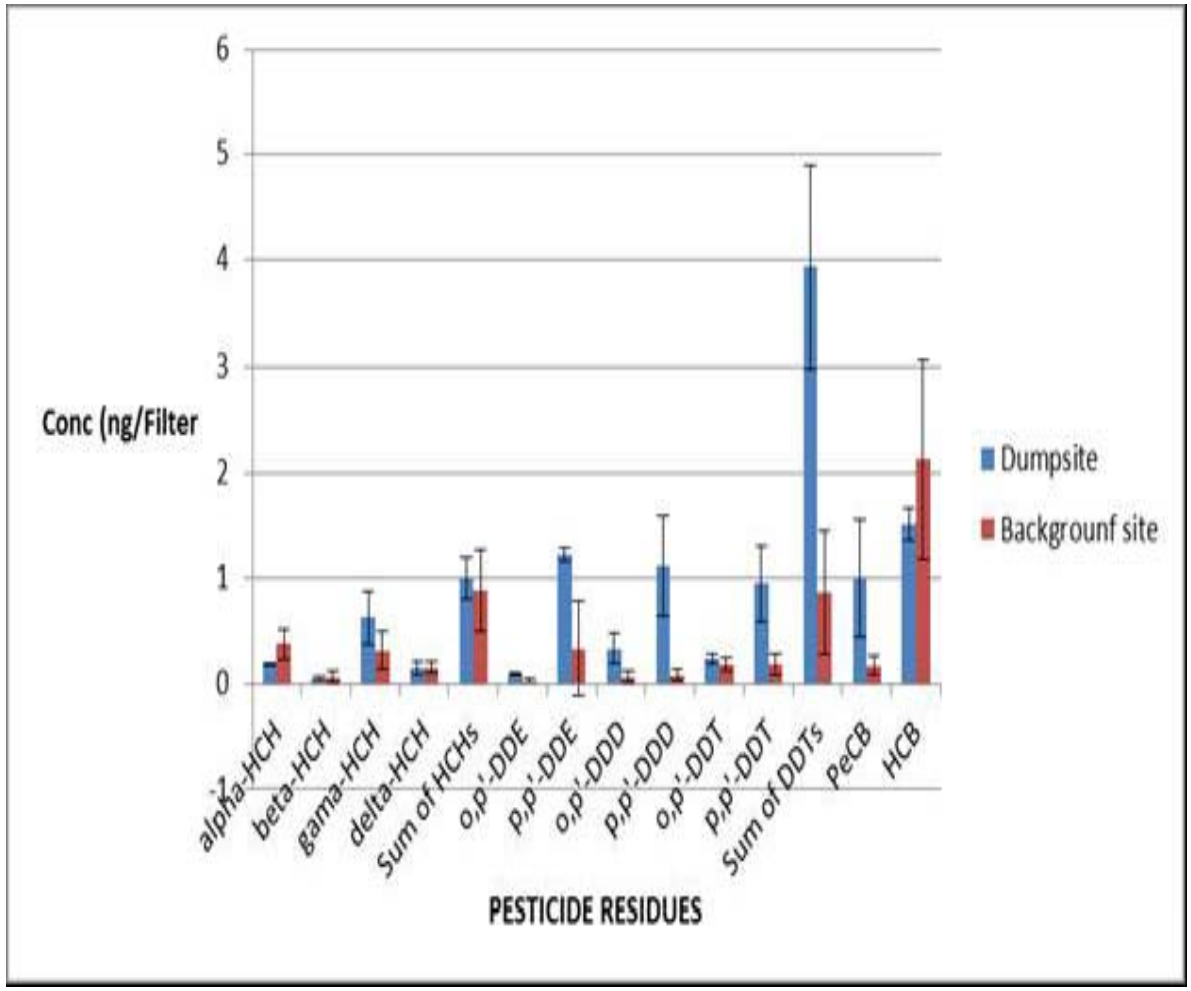
Comparison of PCBs in background and hotspot sites in Kenya

- The levels of polychlorinated biphenlys (PCBs) is higher in impacted sites: dumpsites, industrial area etc.



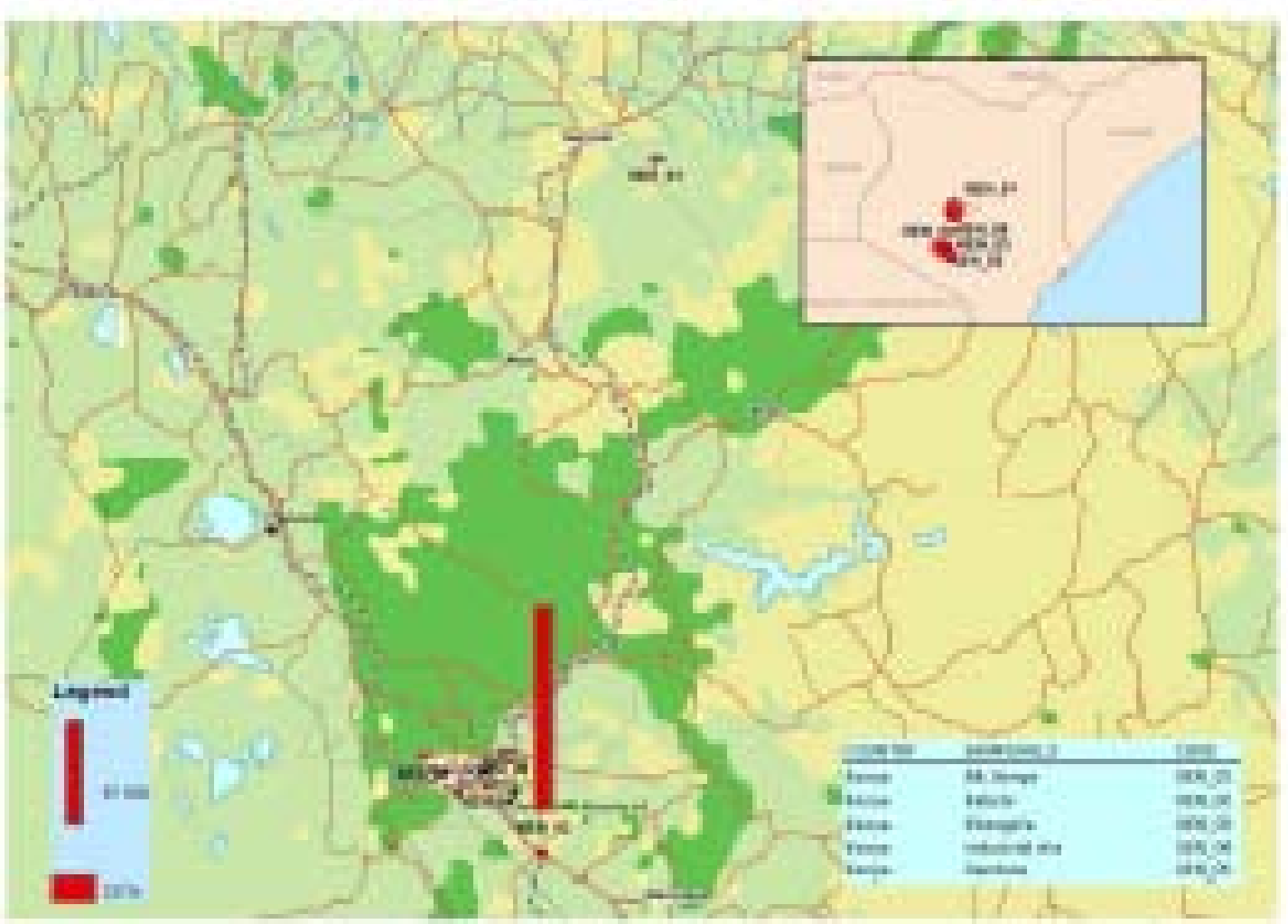
Comparison of pesticide levels in background and hotspot site

- The levels of chlorinated pesticides is higher in impacted sites- dumpsites, obsolete pesticides dumpsites, industrial areas etc.



Spatial Distribution of DDT in Ambient Air

- High DDT levels in air from Kitengela Obsolete pesticide dumpsite.
- Stockpiles have been incinerated.
- But DDT releases from contaminated soil.
- Contaminated soil impact on air quality.



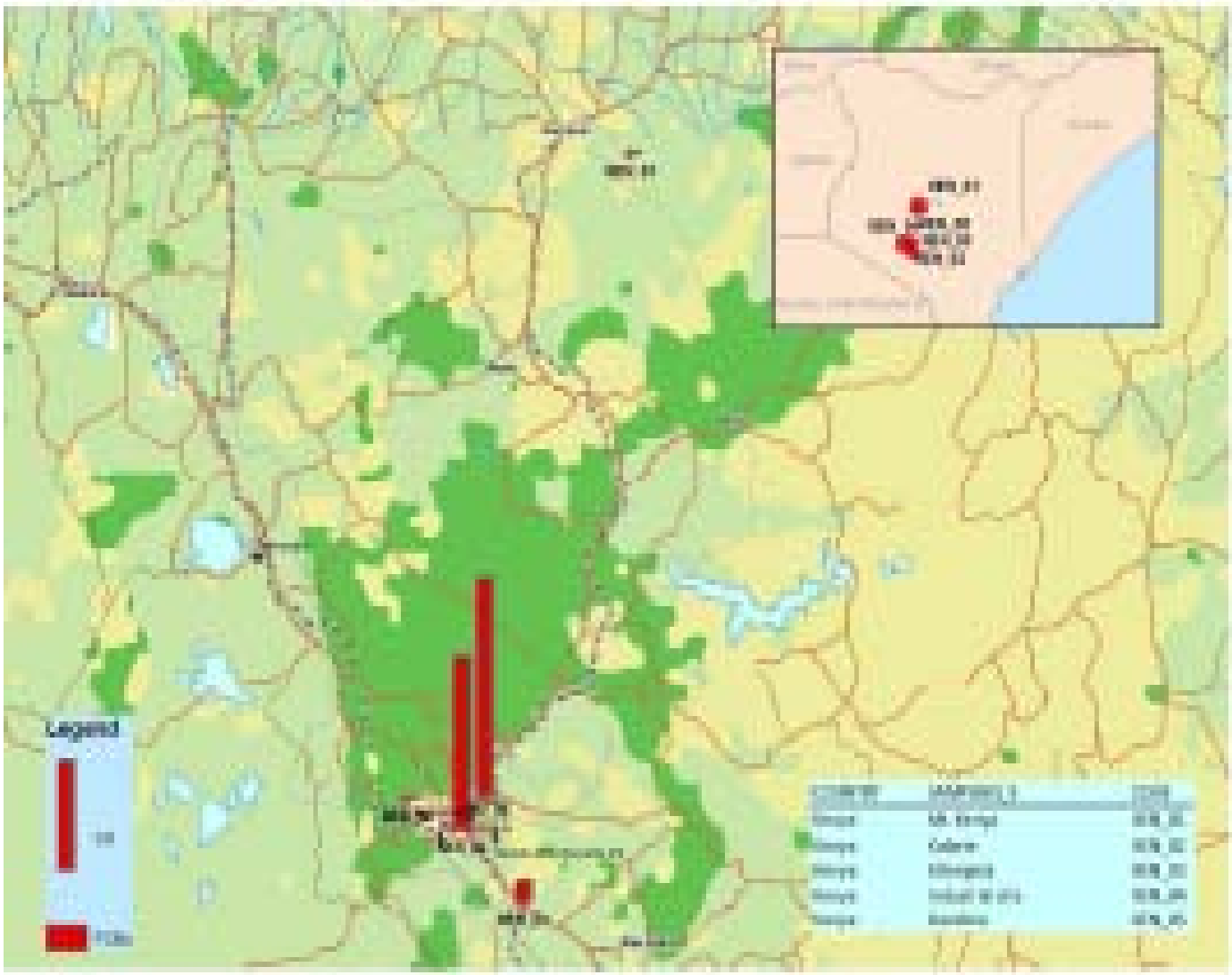
Spatial trends of in sum α,β,γ, δ Hexachloro cyclohexanes Ambient Air

- High HCHs levels in air from Kitengela Obsolete pesticide dumpsite.
- Stockpiles have been incinerated.
- But HCH releases from contaminated soil.

➢ Contaminated soil impact on air quality.

Spatial Distribution of Σ7PCBs in Ambient Air

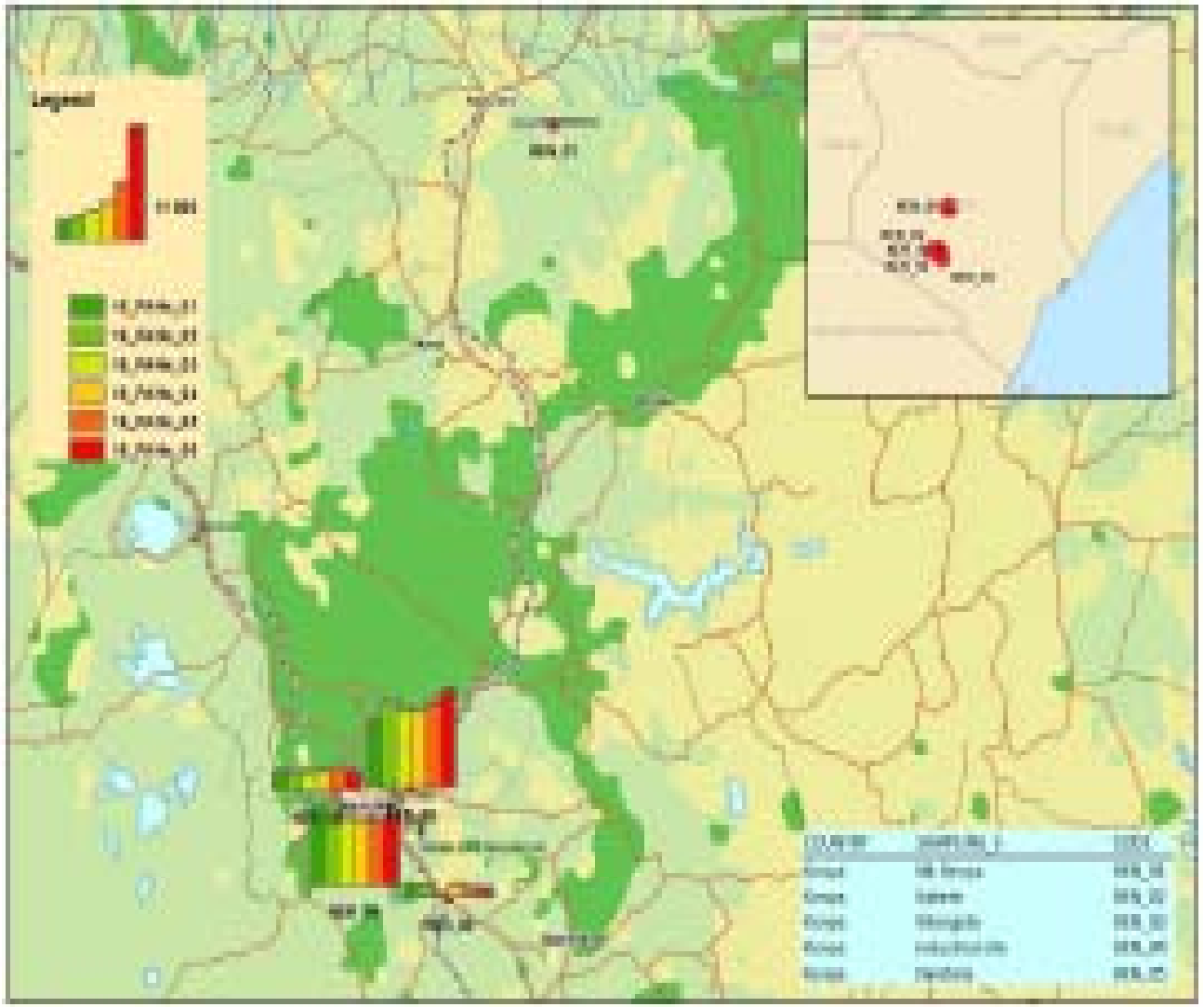
- High PCBs levels in air from industrial area and waste dumpsite.
- ❖ Combustion activities,
- ❖ Hazardous wastes disposal
- ❖ Leakages releases from contaminated sites



Spatial trends of Polyaromatic Hydrocarbons (PAHs) in Ambient Air

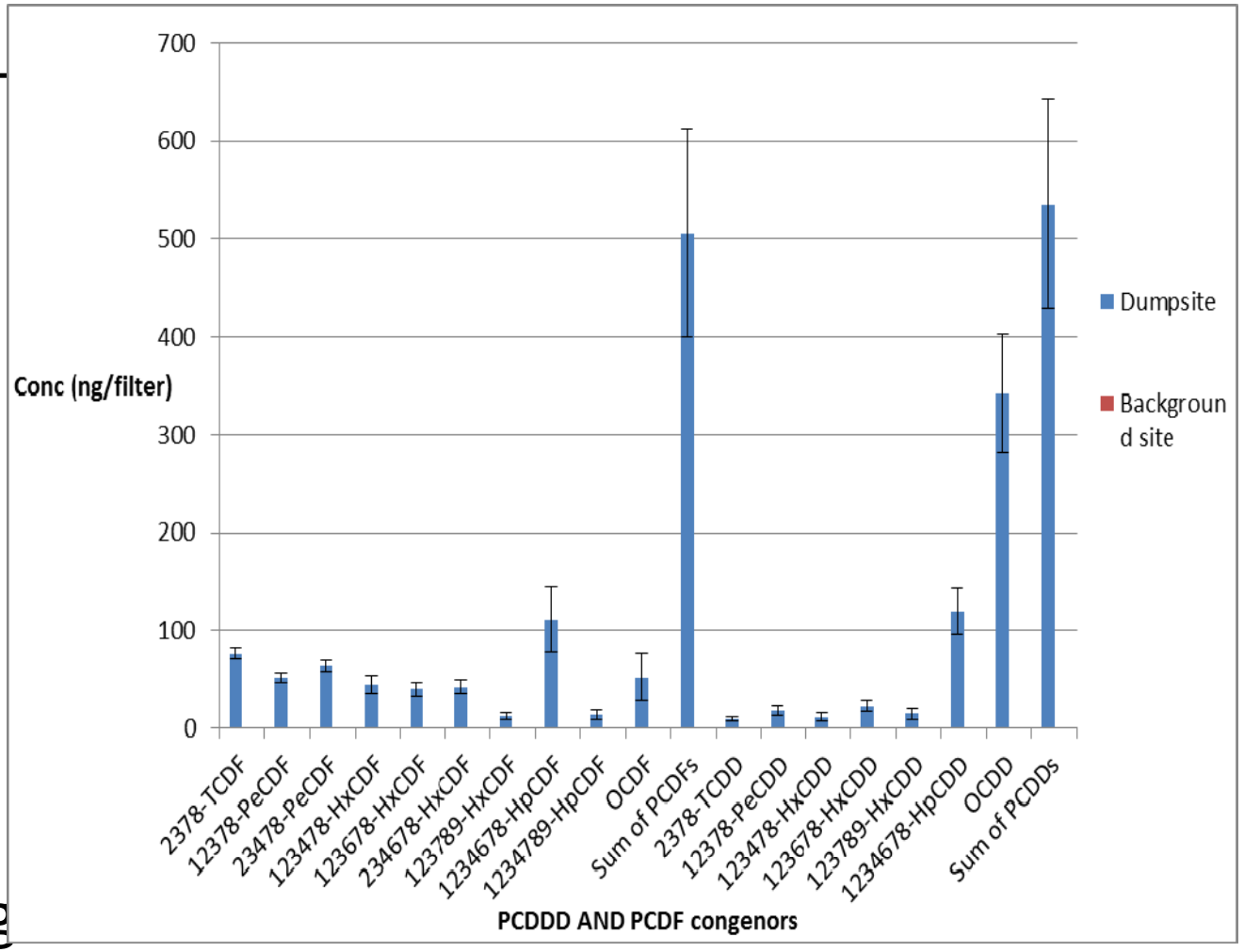
- High PAHS levels in air from industrial area and waste dumpsite.

❖ Combustion activities are main sources of PAHs eg. Plastics, tyres, biomass etc.,



Comparison of dioxin/furan concentrations in gradient and background sites in Kenya- Based on Passive air Sampling

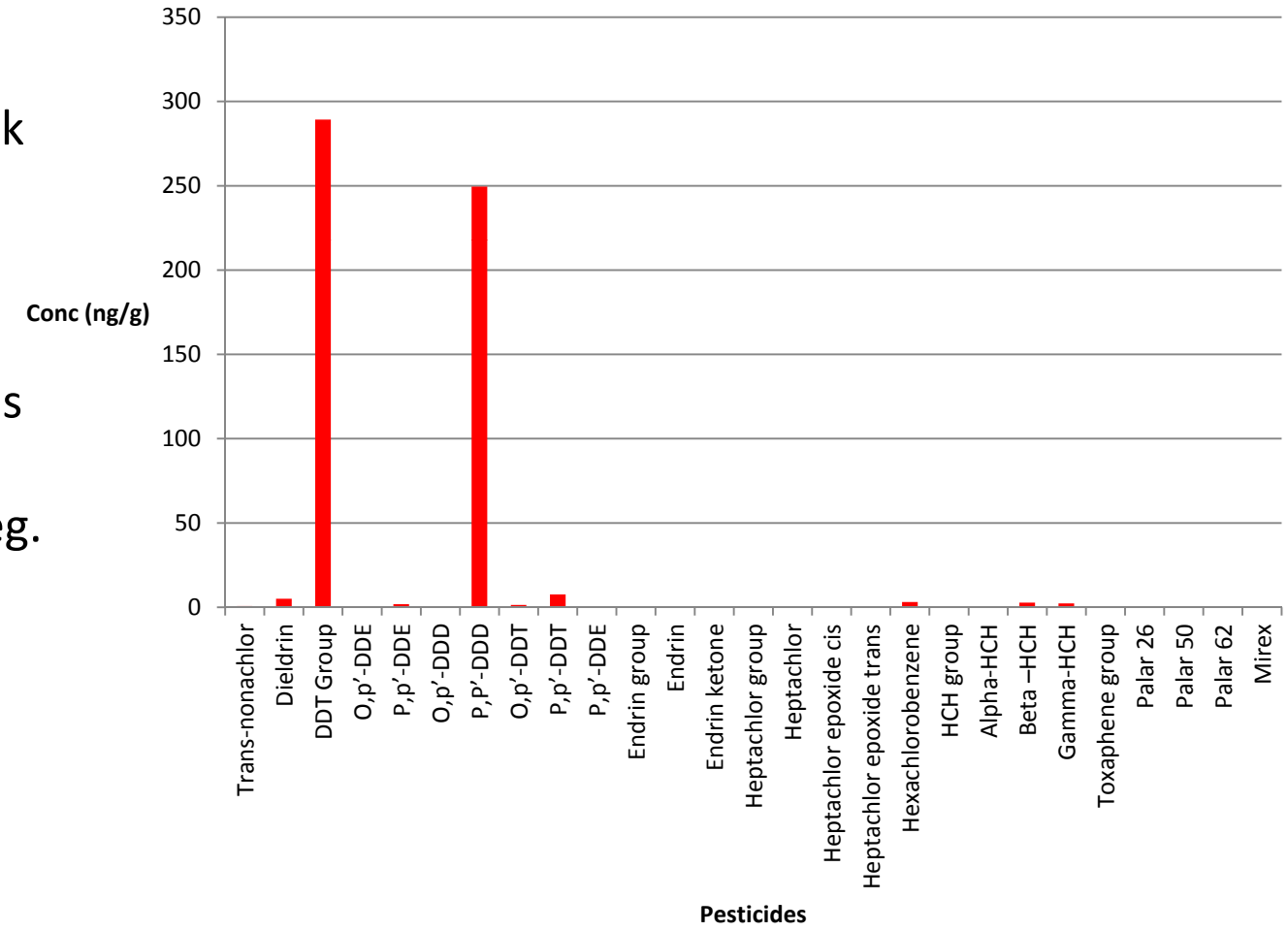
- The levels of un-intentionally produced persistent organic pollutants (UPOPs) is higher in impacted sites- e.g. dumpsites, biomass burning etc.



POPs pesticide concentrations in mothers' milk in Kenya

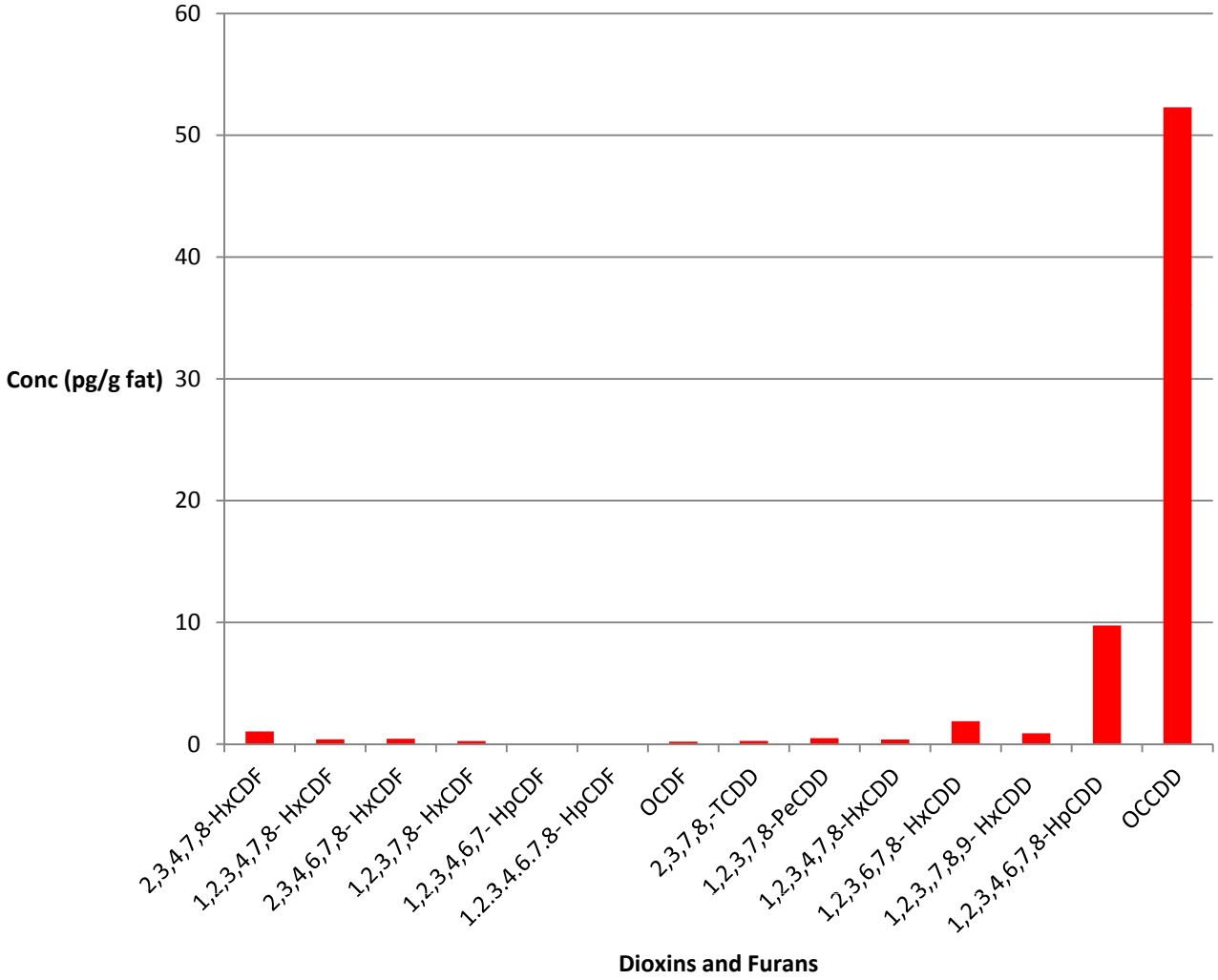
- Presticide residues have been detected in mothers milk samples.

- This is due to contaminations from environment eg. through food stuff



Dioxins and furans measured in mothers milk samples in Kenya

- Dioxins and furans have been detected in mothers milk samples.
- This is due to contaminations from environment eg. through food stuff



Key Message from POPs results

- **Research activities have revealed the presence of all POPs residues in environmental media- Air, soil and human samples.**
  - Limited sites for ambient air measurements.
  - Contaminated soil, foodstuff etc.?
  - Municipal dumpsites and combustion of solid wastes?
  - Medical incinerations activities ?
  - Biomass burning-rice, sugarcane, firewood?
  - Industrial emissions and effluents?
- **Priorities for POPs monitoring ?**
  - Put up POPs management interventions
  - Emphasis to reduce POPs releases and protection of the public and environment?
  - Adoption of POPs alternatives

Key messages

- **There is need for POPs monitoring-**
  - Currently National institutions have analytical capacities for pesticides.
  - The institutions need training to ensure QA & QC and strategy for sustainability.

- **Build partnership in managing hazardous chemicals in environment .**
  - Strategic Partnerships.
  - Analytical capacity building.

- Increase awareness among the general public to control impact of human activities that contribute to POPs releases