



GLOBAL MONITORING PLAN ACTIVITIES FOR POPs IN GHANA



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- ♣ Genesis
- ♣ Activities Related to Ambient Air Monitoring
- ♣ Human Breast Milk Monitoring in Ghana
- ♣ Screening of POPs in Surface Water
- ♣ Existing Partners



- ❖ Workshop to “Develop a POPs Global Monitoring Programme (GMP) to Support the Effectiveness Evaluation of the Stockholm Convention on POPs”, Geneva, Switzerland, 24-27 March 2003
- ❖ 3rd Summer School, RECETOX, Brno, June 2007
- ❖ First Africa Regional Organization Group (ROG) inception workshop, Nairobi, Kenya, 29-31 October 2007

Activities Related to Ambient Air Monitoring

❖ Background Air Monitoring: 2008-2009

- Use of Passive Air Samplers (PAS)
- Sampling Locations:
 - ✓ Kwabenya
 - ✓ East Legon
 - ✓ Lake Bosumtwi



- ❖ MONET-Africa project is coordinated by the Centre of Excellence in Environmental Chemistry and Ecotoxicology, Brno, Czech Republic (RECETOX)
- ❖ The MONET Africa pilot project implementation in Ghana was in an attempt to bridge the existing huge spatial data gaps
- ❖ Implementation in Ghana was in 2008. Project is ongoing with long-term goal to conduct assessment of the long-term trends for POPs levels in Ghana.

- ❖ Ghana and Kenya are the two active long term passive air POPs monitoring sites and active-passive inter-calibration exercise and screening of the POP levels in surface waters.
- ❖ Active air sampling stations were established in Ghana through RECETOX donation in 2013.
- ❖ Three months active-passive inter-calibration exercise was carried out in 2014 followed by regular weekly active air sampling

- ❖ Ghana sites serve as part of the African supersites providing the most precise information on the atmospheric levels of POPs and points of inter-calibration of passive and active air samplers.
- ❖ Inter-calibration exercise under the tropical conditions is crucial to determine site-specific performance of the passive samplers.

- In the execution of the project, MONET provided established sampling protocols and tools which included passive air sampling device consisting of polyurethane foam disks (15 cm diameter, 1.5 cm thick, density 0.030 g cm^{-3} , type N 3038; Gumotex Breclav, Czech Republic) housed in the protective chambers (Fig. 1 and 2)

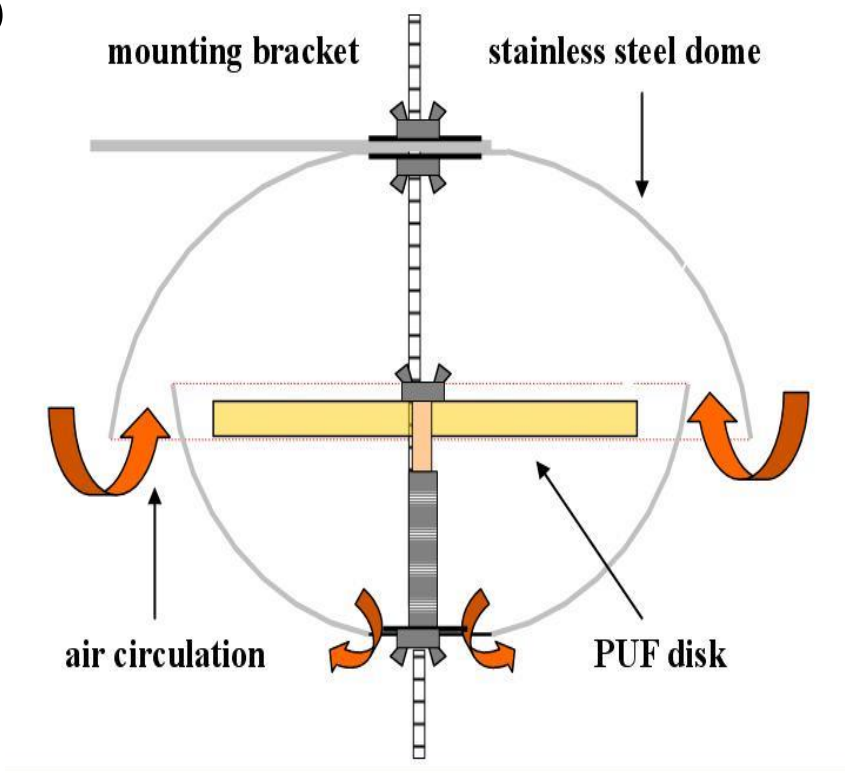


Fig. 1 Schematic Diagram of Passive air samplers

Fig. 2 Passive air samplers

KWABENYA SAMPLING SITE

❖ Location: Sub-urban residential area about 20 km to the north- east of the Accra city centre.

❖ Possible sources include agricultural activities where pesticides are applied, uncontrolled combustion activities, as well as motor vehicle emissions.





- ❖ Location: Abetifi
- ❖ Highest Point in Ghana
- ❖ Rural setting

- ❖ UNEP/GEF GMP1 Site
- ❖ East Legon is an urban background in a residential area 15 km to the north-east of the Accra city centre, close to the Accra international airport.
- ❖ It is not close to any industrial emission sources but may be affected by uncontrolled combustion activities (household/municipal wastes).
- ❖ It is about 25 km away from Tema, the industrial center of Ghana.



- The existing data for PFOS in water were produced using active and passive samplers through the pilot studies conducted in 2014 and passive sampling in aquatic pollutants in 2016.
- Selected analytes (especially PFCs) were measured with a goal of providing background information and a guidance for future monitoring efforts.
- Preliminary work was initiated to provide comparable POPs data in water media under the UNEP/GEF and MONET Africa programme in both 2014 and 2016.
- The UNEP/GEF project objective was to develop methodologies for analysis of new POPs in water matrix. Water samples were collected from Ghana in 2014 and 2016 by active sampling method.
- The MONET Africa water sampling was conducted in 2014 (in Running River) and 2016 (in Stagnant Lake) to test potential application of passive samplers in monitoring PFOS in water and for monitoring a range of priority and emerging pollutants, respectively.

SCREENING OF POPS IN SURFACE WATER

- MONET Africa water sampling exercise was conducted by employing two passive water sampling devices: XAD and semi permeable membrane device (SPMD).

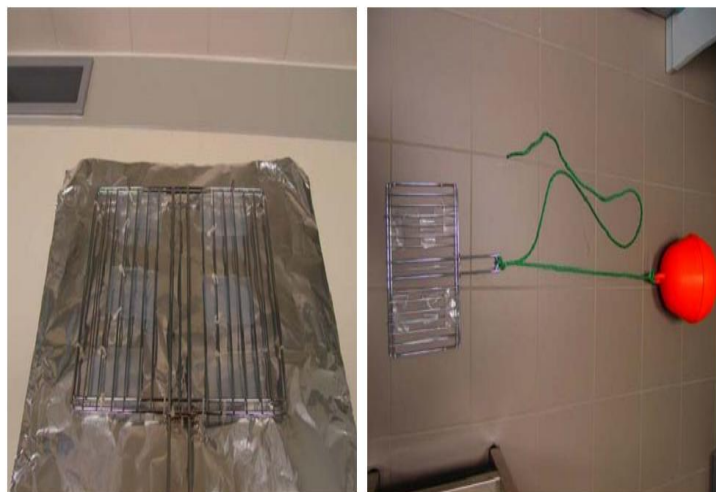


Fig. 3 Silicone rubber passive sampler



Fig. 4 XAD passive sampler and XAD trip blank

- For XAD resin, water sample was collected in 1 L bottle and stored for 3 days to allow organic contaminants to sorb on the resin, after which the water was drained.
- The residue consisting of the resin was stored at -18 °C until analysis. The SPMD used was silicon rubber.

- In 2014 MONET Africa conducted pilot study on screening of POPs in water using a combination of active and passive approaches in Ghana.
- Silicon rubber passive samplers were deployed at Nsakyi River (Running water) in Mayera.



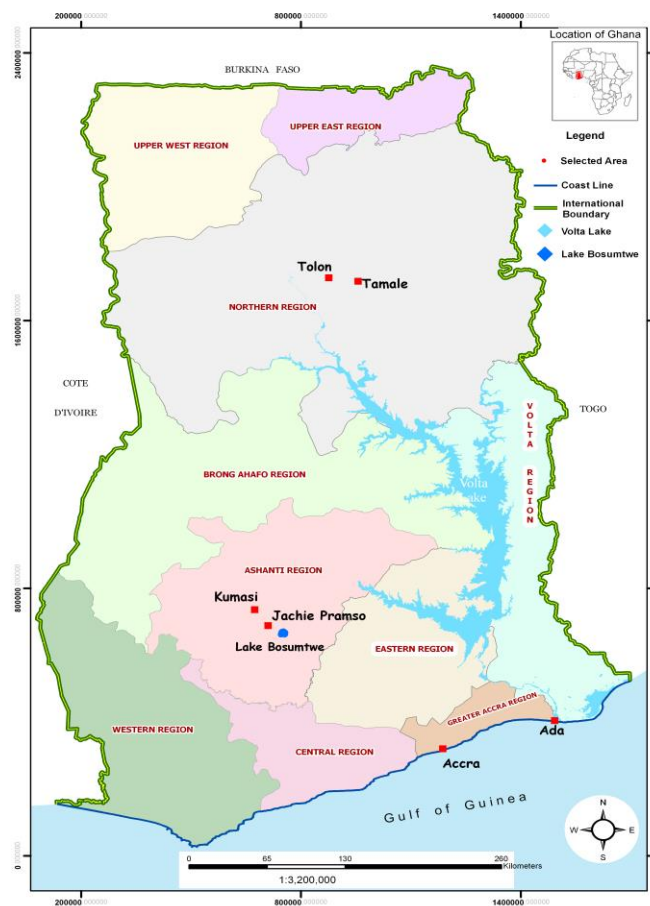
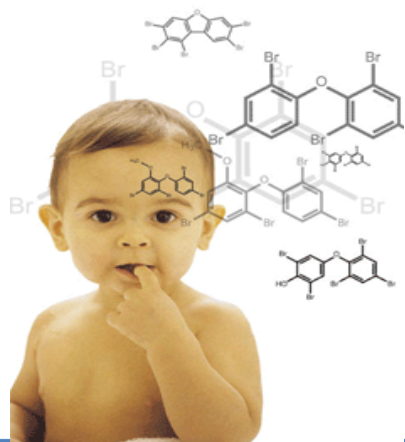
The SPMD was anchored on the metallic strainers and exposed in the field for a period of 28 days.

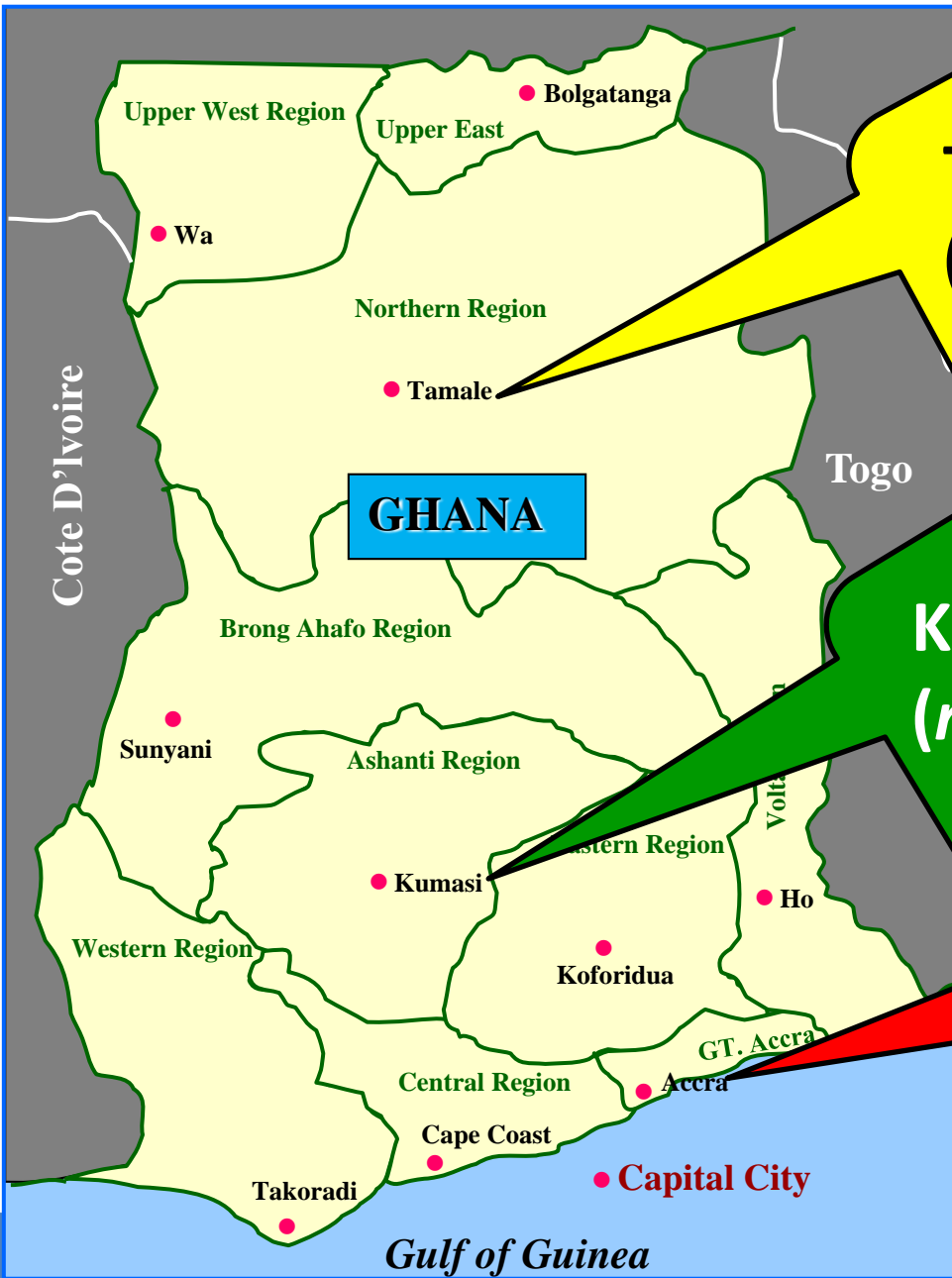
Similar monitoring was also conducted in the University of Ghana Botanical Garden Lake (Stagnant water) in 2016, all in Greater Accra Region.



❖ Human Breast Milk Studies

- Focus: General population of Ghana
- Sampling Locations: 6 Urban & Rural communities:
 - ✓ Southern (Ada ; Accra)
 - ✓ Middle (Jachie/Pramso, Kumasi)
 - ✓ Northern (Tolon, Tamale)



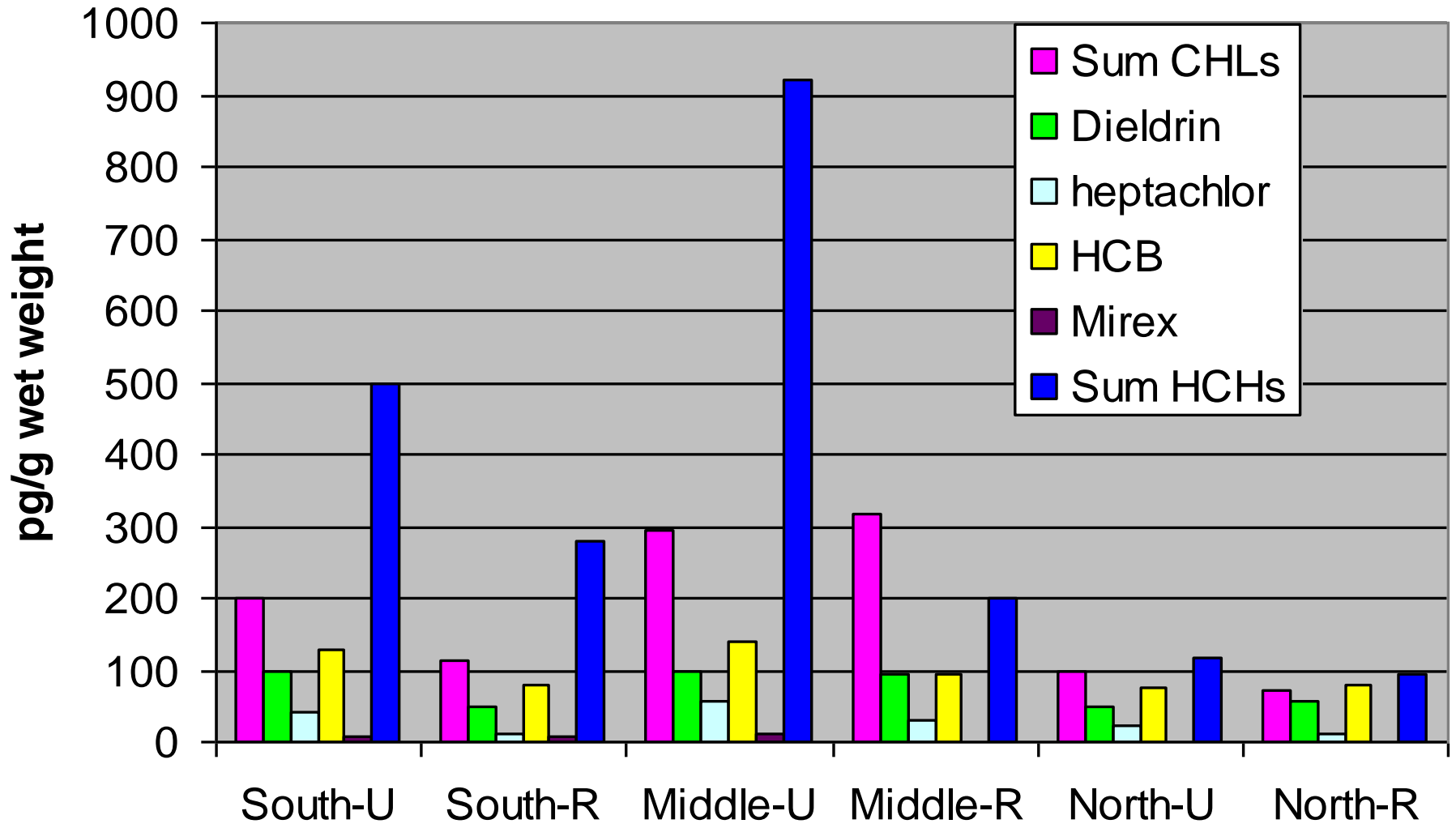


Tamale
(n = 12)

Kumasi
(n = 14)

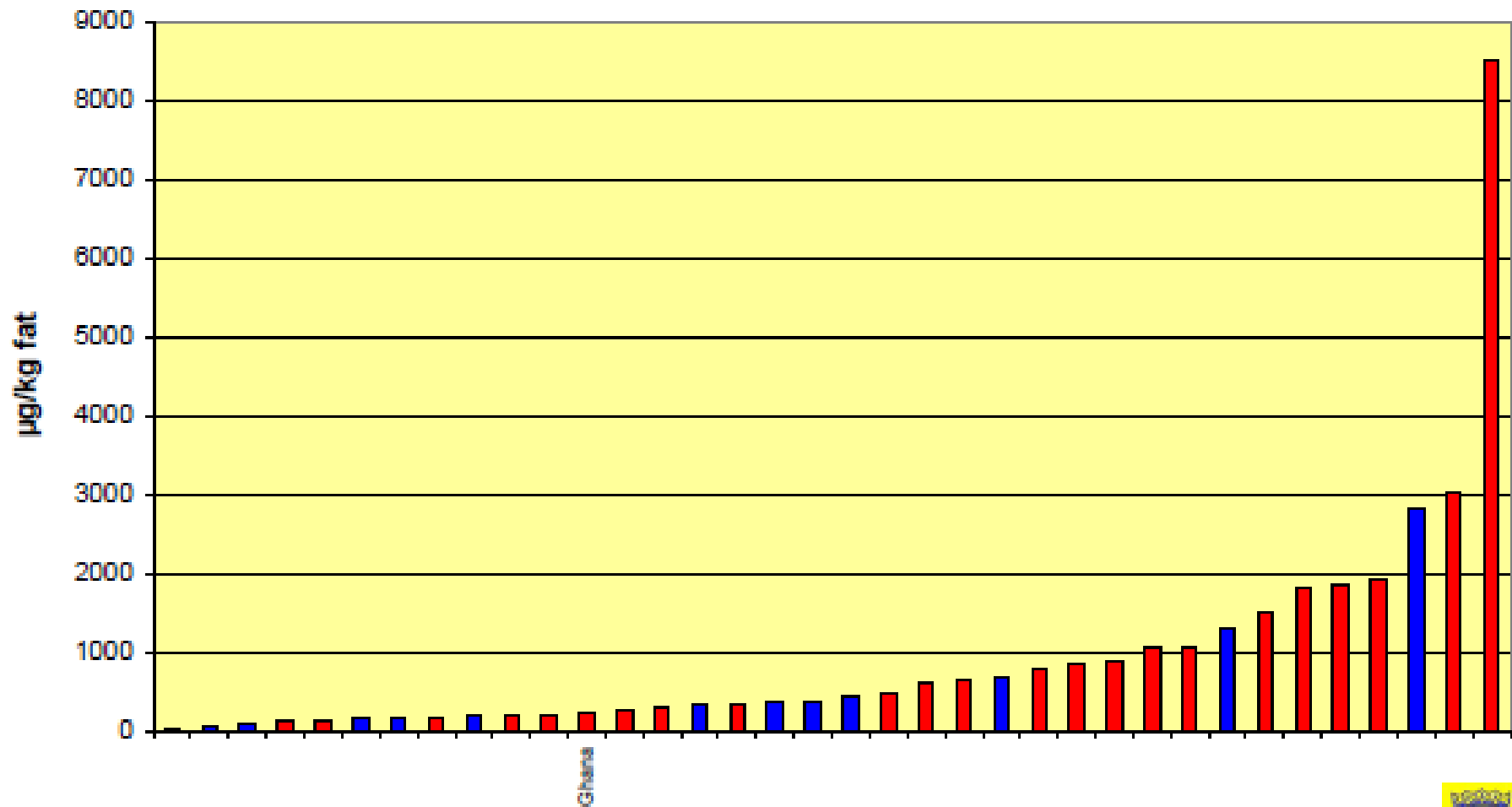
Accra
(n = 16)

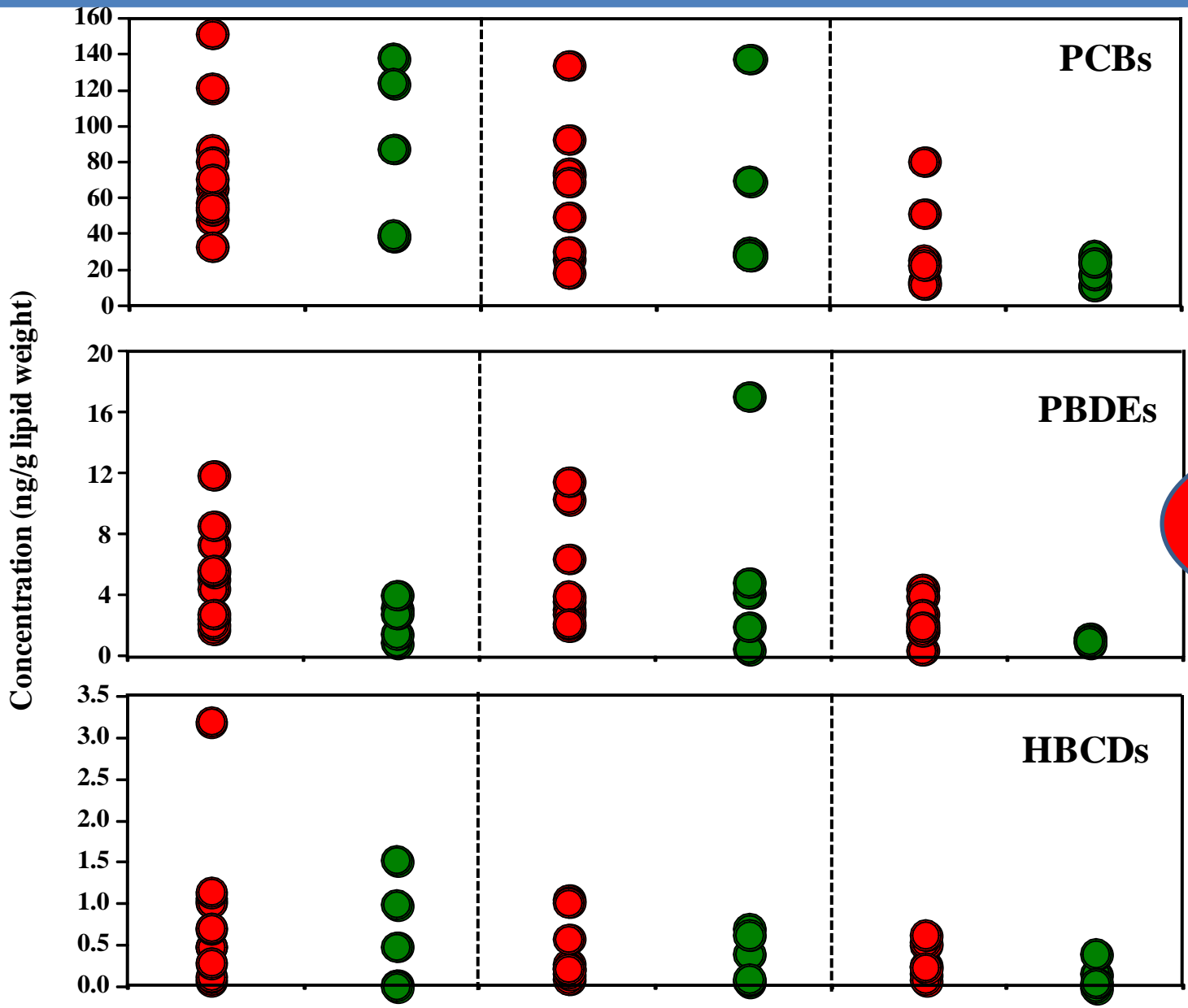




4th (2005-07) and 5th (2008-09) round: Mean levels of DDT

4th and 5th round: results for sum DDT





● Urban
● Rural

Urban
Rural

Results show widespread contamination in Ghana

All data from the above-mentioned programmes are made available in www.genasis.cz gradually – as the samples are analyzed in laboratories and also in GMP Data warehouse in line with reporting periods.



GLOBAL MONITORING PLAN FOR PERSISTENT ORGANIC POLLUTANTS



UNDER THE STOCKHOLM CONVENTION ARTICLE 16 ON EFFECTIVENESS EVALUATION

FIRST REGIONAL MONITORING DRAFT REPORT

AFRICA REGION



15TH MARCH 2009



GLOBAL MONITORING PLAN FOR PERSISTENT ORGANIC POLLUTANTS



UNDER THE STOCKHOLM CONVENTION ARTICLE 16 ON EFFECTIVENESS
EVALUATION

SECOND REGIONAL MONITORING REPORT

AFRICA REGION



MARCH 2015

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Other Existing partners

UNEP/GEF:

- The GMP1 project contributed to human capacity enhancement in Ghana to monitor POPs in ambient air using PUFPAS technique.
- Mothers' milk sampling capacity and contacts have been established and maintained in the country to provide the framework for future WHO mothers' milk survey in Ghana.
- In addition, we remain active participants in international inter-laboratory calibration exercises to evaluate our performance in POPs analysis.
- We are currently in preparation to embark on the upcoming UNEP „Bi-ennial Global Interlaboratory Assessment on Persistent Organic Pollutants” in this month to continually enhance our analytical performance of the laboratories in POPs analysis in the ambient air, mothers' milk and water.

Other Existing partners

WORLD HEALTH ORGANIZATION (WHO) MOTHERS' MILK SURVEY:

- Under the WHO Program, mothers' milk samples were sent from Ghana to the WHO reference laboratory for analysis. All mothers' milk sampling activities fully followed WHO approved protocol.

GHANAIAN INSTITUTIONS:

- Some academic and research institutions within the country have ongoing research activities mainly covering other media, but also address the core media to a limited extent.

The presence of POPs in Ghanaian environment signals a threat to human health and environment due to deleterious effects associated with POPs chemicals that negatively impacts on reproductive health, immunity and general wellbeing.

Therefore, the region should streamline POPs management into regional development agenda to support 25 reduction and elimination of POPs in the environment. POPs activities could also be included under the national/regional activities to implement the 2008 Libreville Declaration on Health and environment strategic Alliance (HESA).

Thank you for listening

