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CHEMICALS AND THE **SUSTAINABLE DEVELOPMENT GOALS**

Organized by the SAICM Secretariat and the University of Cape Town

Issue: 3 of 2021
Discussion date: 22nd of September 2021

Discussion 3 Digest

Topic of Discussion: Climate Change and Chemicals: Connections and Consequences

To view the presenters' PowerPoint presentation, click here.

ABOUT THE PRESENTERS

Prof Alistair Boxall is Professor in Environmental Science in the Environment Department and Director of the NERC-funded ECORISC Centre for Doctoral Training.

Dr. Philip Landrigan, is a pediatrician and epidemiologist who directs the Program for Global Public Health and the Common Good and the Global Observatory on Pollution and Health at Boston College.

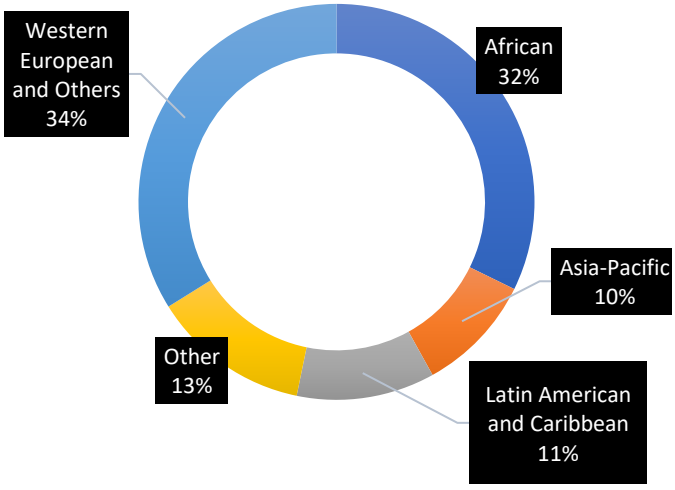
Dr. Arne Kätelhön is co-founder and managing director of Carbon Minds, a data analytics company and life-cycle data provider focusing on environmental sustainability in the chemical industry.

Dr Olwenn Martin is a Lecturer in Global Challenges at Brunel University. Her research is focused on 'emerging' issues for the assessment and management of risks from chemical pollutants, such as mixture and endocrine disruptors.

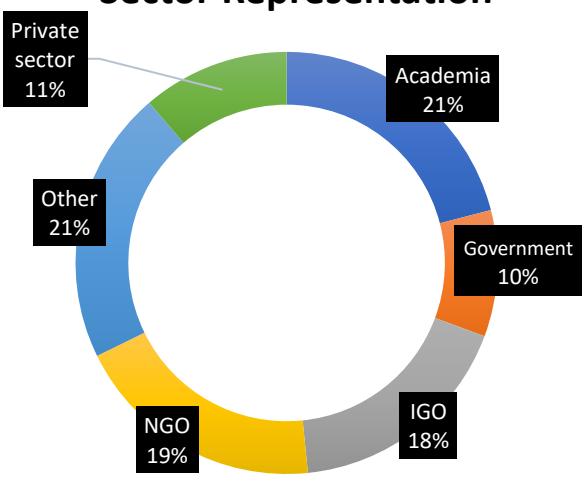
DISCUSSION 3 ATTENDANCE BREAKDOWN

TOTAL ATTENDEES FOR DISCUSSION 3: 62
Female: 33
Male: 27
Unknown: 2

Regional Representation



Sector Representation



Key:
IGO – Intergovernmental organisation
NGO – Non-governmental organisation

Chemicals and SDGs Community of Practice Discussion 3. Summary and looking ahead.

1. Petrochemicals are the second largest consumers of oil and gas after the transport and energy sectors, respectively, and are set to **account for more than a third of the growth in oil demand to 2030**, and nearly half to 2050. Yet petrochemicals remain a blind spot for climate policy.

2. Attention needs to be paid to the **unintended consequences of the transition from a fossil-based to a bio-based economy on pollution and SDGs.** For example, when looking at the plastics sector, combining biomass and carbon dioxide utilization with effective and efficient recycling could help achieve a net-zero emissions goal for the plastic sector.

3. When looking ahead, **better integration of chemical and climate policy is needed** and **opportunities for collaboration** between the two fields should be sought.

ANNEX

DETAILED SUMMARY OF DISCUSSION 3

THE DISCUSSION WAS STRUCTURED AROUND THREE QUESTIONS AND THE KEY DISCUSSION INPUTS FROM PARTICIPANTS ARE PRESENTED UNDER EACH:

Q1. How can climate change impact on chemical pollution? How can climate change impact on chemical exposures particularly for vulnerable populations like children and what would be the health consequences?

Economic and environmental pressure for farmers

- Inconveniences in rainfall patterns could result in doubling the number of inputs, such as chemical use (e.g., replanting where plants died). Therefore, it is a toll on both the economy as well as the environment.

Increase toxicity of pesticides

- In agriculture, temperature increases are evident, and it is causing pesticides to volatilize rapidly and increase human exposure to pesticides through inhalation.
- Temperature increases can result in a reduction in the effectiveness of the pesticide.
- Climate change can increase the chemical pollution rate to receptors, (e.g., a long intense heat period may cause volatilization of more chemicals which could result in more pollution of the atmosphere which is the receptor). The health impacts that this can cause will be deformed babies, a deformed reproduction system, and endocrine disruption

Production of petrochemicals

- Through the increased use of electric cars, petrol companies will lose customers and produce more petrochemicals.

Increase in chemical footprint

- Climate change will impact on breakdown and degradation of chemicals as well as the resultant products that in turn due to high temperatures will be everywhere like the atmosphere the environment in general. Children and other vulnerable groups become more exposed, particularly those living in low-income countries (LMICs), where there are insufficient disposal methods.
- Industrialisation and infrastructure construction is increasing and causes a lot of environmental damage.

Temperature fluctuations

- Chemical pollution is related to chemical exposure as the first depends on temperature, humidity, and some physical chemical features.
- Climate change will increase or reduce some pollution. For example, groundwater pollution is related to pollutant dissolution which is related to temperature.
- Infants, children are not aware of chemical pollution and are vulnerable to experiencing the health hazards caused by it.
- Climate change could result in high temperatures in the morning.

Increase demand and exposure to pesticides

- Extreme events from climate change may promote exposures to pesticides (e.g., the increased spraying to protect crops arising from the increase and emergency of new pests due to climate change).
- With an increase in the frequency of floods or high rainfall, it will facilitate runoff which will move

pesticides from land to waterbodies and cause water pollution.

- Climate changes cause the emergence of plants disease and insects' outbreaks that need more and new insecticides.

Pest outbreaks

- The report inter alia states that "higher atmospheric temperatures increase ground-level ozone, creating more smog and air pollution. Changes in rainfall and temperature can alter the distribution of disease-carrying vectors such as ticks and mosquitos. Drought, extreme heat, wildfire, and severe precipitation events can all damage crops. Sea level rise and melting permafrost erode land. All of these changes have social, political, and economic implications, such as increases in food and water prices, job loss, forced displacement and migration, and conflict over water, land or food"
- One Climate change impact observed in some regions is the new incursion of new pests and diseases. As a result, there has been a marked increase in pesticide demand. The increased pesticide use increases exposure particularly through runoff and deposition into water bodies (rivers) when people (women and children) get their domestic water.

Throughout the discussion, informal polls were conducted to help encourage discussion among the participants. They do not provide any representative data.

Poll 1 (N=14):
In relation to exposures and risks, which pollutants (e.g., metals, pesticides, Persistent Organic Pollutants(POPs)) will be most affected by climate change?

Participants' responses:

United Kingdom
- Metals (UK)

Zimbabwe
- Pesticides. Agriculture is the backbone of the country's economy and pesticide use is increasing significantly.

Malawi
- POPs.
- Pesticides.
- Metals.

South Africa
- Pesticides.
- Chemicals in products exposed to heat.
- chemical manufacturing plants (floods, heat, fire).

Iran
- POPs.

Eswatini
- Pesticides will be the most affected by climate change.

Togo
- Pesticides.
- POPs.

Other
- POPs (n=4).
- Industry should become more responsible.
- Pesticides.
- The relation of exposure and risk of pollutants is governed by many factors other than climate change, therefore, there is no order of the degree of impact of the various pollutants.

Poll 2 (N=9):
Besides climate change, what future changes are likely to be important for impacting chemical pollution in your country?

Participant's responses:

Nepal
- Diplomatic pressure from high-income countries (HICs) to LMICs.
- Some of the HICs hindered the governments best public health and environmentally friendly initiatives of chemical safety.

Colombia
- A responsible industry that does not use greenwashing to say it protects the environment is needed. Industry should be held accountable/responsible for the damages caused by their products.

South Africa
- Poor chemical waste disposal, poor prevention of chemical waste, lack of information on what products contain hazardous chemicals, how to prevent exposure and contamination and a lack of policy for chemical management.

Zimbabwe
- Current consumption patterns (e.g., increased ownership of mobile phones and computers) will increase electronic waste which will increase chemical pollution from BFR and heavy metals.

Togo
- Strong collaboration between NGO, academia and policymakers, science diplomat is necessary to know how, when, and what pilot project to show harmful impacts of chemical pollution without negatively impact population activities is needed.

Other
- Biodiversity crisis
- Economic factors.
- Specific issues such as lead in paint (we must ban the trade of pigments derived from lead globally).
- Health and economics issues.

Q2. Which circular carbon technology would be most suitable for producing chemicals and plastics with low climate impact in your country?

REGION	Question from Participant ➢ Presenters Answer
AFRICAN	Zimbabwe **For the countries without recycling processes in place yet, how best can containers be handled in the interim?** ➢ The collection and separation of plastic waste will be a pre-requirement for the implementation. The focus should be on making this possible. One way this waste can be "recycled" in a simpler way would be energetic recycling, i.e., burning with energy generation. This is commonly used now. However, the development and application of recycling technologies will be important for more sustainable chemical industry.
WESTERN EUROPEAN AND OTHERS	United Kingdom **How does large-scale biomass use particularly considering the huge time-lag (i.e., what's burned and released from biomass in a short time window needed to be compensated and absorbed by a much larger scale of new biomass plantation over a much longer time scale) justified?** **If the feedstock is biomass waste, when facilities are invested and developed, how to avoid the development of these facilities be avoided to discourage wasteful consumption of biomass and to secure stable biomass waste as feedstock?** ➢ It is important not to produce "biomass waste" intentionally to satisfy the demand. Since biomass is very limited in many regions, the other circular carbon technologies, e.g., CO2 utilization, would be an alternative.

Poll 3 (N=1):
What impact on competitiveness do you expect for chemical production regions?
Other:
- Increase the use of chemicals.

Q3: What do you think are the potential consequences of climate change policies on chemical pollution in your country?

REGION	RESPONSES FROM PARTICIPANTS
AFRICAN	**ZIMBABWE** ➢ Any switch to biofuels, as part of mitigation measures, has potential to increase pollution by pesticides and other agrochemicals. ➢ Without integration and coordination between the chemicals and climate sectors, there can be potential negative environmental effects (e.g., climate mitigation through reforestation increases the use of pesticides, if IPM is not extensively promoted and practised). **UGANDA** ➢ Climate change policies can present varied consequences on chemical pollution. Therefore, it is necessary that there is a large amount of support or complementary activities aimed at reducing chemical pollution. Consequences will depend on the design of the climate change policy. ➢ In LMICs with low expertise's in climate change policy and chemicals, chemical pollution may not be reduced as desired. ➢ Chemicals can be brought into the climate policy arena by including chemical practitioners as key stakeholders in all chemical policy issues.
WESTERN EUROPEAN AND OTHERS	**CANADA** ➢ There should be more awareness raising activities to help governments better understand the linkages between their work on climate change and toxic chemicals. Governments are urged to reduce their emissions of POPs and GHGs. Measures could include: - Reducing the illegal dumping of hazardous waste/the uncontrolled export of electronic wastes to countries with poor dismantling technologies and poor occupational health protection. - Approaches for reducing significantly or restricting open burning of waste. ➢ It is important to address the combined impacts of climate change and POPs on the most vulnerable populations (e.g., indigenous populations which rely on traditional/local diets (especially Arctic populations consuming marine mammals and fish) and those in malaria affected regions).

Poll 4 (N=4):
List examples of climate policy experts interacting or collaborating with chemical policy experts in your country.
No Interaction:
- South Africa.
- Myanmar development of Policies for Climate change and chemicals are implementing under two different agencies. Not exactly collaboration & coordination between them.
- Other: Mostly no coordination among these groups of experts

Yes Interactions:
- Togo: We have WASCAL scientists working with German cooperation agencies and lecturers on question related to climate changes globally.

Poll 5 (N=6):
What initiatives exist in your country to address the sustainability of chemicals beyond their health and environmental safety?

South Africa
- Extensive focus on how to use chemical production to boost the economy.

Togo
- Sustainability of chemicals (even includes in recycling) is only related to health and environmental safety now

Sierra Leone
- The innovative way is to have community engagement and capacity building activities in the country's local languages. This will facilitate better understanding and help address climate issues better.

Other
- Full understanding of nexus between climate change and chemical pollutant.
- Integration of chemicals in climate change policy initiatives.
- Capacity-building activities that focus on diverse environmental agendas such as climate change, biodiversity & chemicals, and waste.

RESOURCES

- Noyes et al (2009) The toxicology of climate change: Environmental contaminants in a warming world. Environment International. https://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/6983/Noyes%20et%20al.%202009%20climate%20change.pdf?sequence=1

- Balbus et al (2012) Implications of global climate change for the assessment and management of human health risks of chemicals in the natural environment. Environmental Toxicology and Chemistry. https://setac.onlinelibrary.wiley.com/doi/10.1002/etc.2046

- Boxall et al. (2009) Impacts of climate change on indirect human exposure to pathogens and chemicals from agriculture. Environmental Health Perspectives. https://pubmed.ncbi.nlm.nih.gov/19440487/

- UN Environment (UNEP). Global Chemicals Outlook II: From Legacies to Innovative Solutions: Implementing the 2030 Agenda for Sustainable Development. Nairobi: UNEP, 2019. https://www.unep.org/resources/report/global-chemicals-outlook-ii-legacies-innovative-solutions

- European Commission. Chemicals Strategy for Sustainability: Towards a Toxic-Free Environment. Brussels: European Commission, 2020. https://ec.europa.eu/environment/pdf/chemicals/2020/10/Strategy.pdf

- Kätelhön et al (2019). Climate change mitigation potential of carbon capture and utilization in the chemical industry. Proceedings of the National Academy of Sciences,116(23), pp.11187-11194. https://www.pnas.org/content/pnas/116/23/11187.full.pdf

- Meys et al (2020). Towards a circular economy for plastic packaging wastes–the environmental potential of chemical recycling. Resources, Conservation and Recycling,162, p.105010. https://www.sciencedirect.com/science/article/pii/S092134492030327X

This CoP is contributing to the SAICM/GEF project on Emerging Chemicals Policy Issues Knowledge Management Component. This activity is supported by the Global Environment Facility (GEF) project ID: 9771 on *Global Best Practices on Emerging Chemical Policy Issues of Concern under the Strategic Approach to International Chemicals Management (SAICM).*

If you have any question or require clarification on this initiative, please contact the SAICM Secretariat at saicm.chemicals@un.org or UCT at uctcops@outlook.com.

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