Interactive comment on “Re-volatilisation of soil accumulated pollutants triggered by the summer monsoon in India” by Gerhard Lammel et al.

Anonymous Referee #2

Received and published: 13 July 2018

The authors discussed the re-volatilisation of the nowadays-banned POPs accumulated in soils. The abstract is too simple; there was not description on the data, the methods, and models used. The way of the method validation is also not very clear.

Specific Comments:

Line 18: Clean air masses from the Indian Ocean, advected with the onset of the summer monsoon, are found to trigger or enhance re-volatilisation of the nowadays banned chemicals hexachlorocyclohexane (HCH) and polychlorinated biphenyls (PCBs) from background soils in southern India.

Comments: Re-volatilisation of the chemicals in soil always exists at the boundary between soil and air, and cannot triggered by clean air masses from the Indian Ocean.
Line 29: Semivolatile substances (i.e., vapour pressure at 293 K in the range 10^-6 – 10^-2 Pa) tend to re-volatilise from land and seasurfaces to which they had previously been deposited, once a level of contamination in chemical equilibrium with air pollution is reached.

Comments: This statement is not correct since both the deposition and re-volatilisation co-exist regardless if the equilibrium is reached or not.

Line 56: Thus far, studies on environmental exposure of the Indian subcontinent have been mostly limited to urban areas (Chakraborty and Zhang, 2012; Sharma et al., 2014; Chakraborty et al., 2015), while the continental background was scarcely addressed.

Comments: The following three published papers should be addressed in the manuscript, since these three papers studied the SVOCs in Indian air and soil on a national scale.


lung cancer risk of atmospheric polycyclic aromatic hydrocarbons in some Asian countries, Environmental Science & Technology. 2016, 50 (13), 7163–7174

Page 205: The differences in concentrations before and during monsoon are significant (P < 0.05, t-test) in south, central and parts of northern India (Fig. 3b,c).

Comments: In Fig. 3, there is no Panels b and c indicated!

Line 225: but soil concentrations only decreased for p,p’-DDT, while they have levelled off for $\alpha$-HCH, or are even still on the rise (PCB153, Fig. S4).

Comments: There is no Fig. S4!

Line 260: Both, field measurements and modelling results reveal a thus far overlooked mechanism of pollutant cycling over the Indian subcontinent, i.e. monsoon-driven mobilisation from previously contaminated soils.

Comments: Rewrite the sentence.