

## ***Interactive comment on “Assess arsenic distribution in groundwater applying GIS in capital of Punjab, Pakistan” by M. M. Akhtar et al.***

**M. M. Akhtar et al.**

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Dear Referee, Thanks for review my paper and gave value able comments With the reference of your comments dated 3 May 2015, following modifications has been completed

Suggestion No.1: A better discussion about the origin of arsenic, based on a more detailed geological description and industrial activity, would improve greatly the report. Schematic geographic and geological maps of the investigated areas would help to clarify the issue. Response: To include a new Schematic geographic and geological map is seem to be a new work direction. I already included maximum aspects and information which highlight the arsenic issue in the study area. Further the geographic

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informations are included in the maps of figure 1 and figure 2.

Suggestion No.2: The main rivers (feeding and polluting the aquifers) should be shown. Some arrows indicating direction of groundwater flow should be shown also. In the initial part the paper is rather repetitive and could be shortened. Response: This suggestion is accepted and figure No.2 has been modified by including groundwater flow direction, landfill sites and river. Modifications There are a few points to be clarified

Modification No.1: Page 2124 Text: Both the temperature and rainfall vary greatly from season to season with a mean temperature that ranges from 34 °C in June to 12 °C in January and an average rainfall 20 of 575 mm $\text{year}^{-1}$ , which can vary from 300 to 1200mm. The evapotranspiration is about 1750mm $\text{year}^{-1}$ , which is the principal reason why extensive irrigation is needed for agricultural purposes (NESPAK, 1993 in Gabriel and Khan, 2010). Comment the evapotranspiration cannot be higher than rainfall: do the authors mean “potential evapotranspiration”?

Response:

The sentence has been modified. (Old) The value 1750 mm $\text{year}^{-1}$  represent potential evapotranspiration (PE). (New) The potential evapotranspiration (PE) is about 1750mm $\text{year}^{-1}$  (Page No.5 Line No.10)

Modification No.2: Page 2125 Text: In Lahore the groundwater table currently varies between 14 and 43m (WASA, Lahore), and is dropping an average of 0.84m $\text{year}^{-1}$ . Comment: It is not clear if 14/43 m is the depth of groundwater from the surface or if it is the thickness of the aquifer. The authors use feet or meters in a loose way: they should use only SI units (i.e. meters)

Response: I agree with the referee point and information has been modified (Page No.5 Line No.25)

In Lahore the groundwater level from surface was observed between 14m to 43m (WASA, Lahore), and is dropping an average of 0.84 m $\text{year}^{-1}$ .

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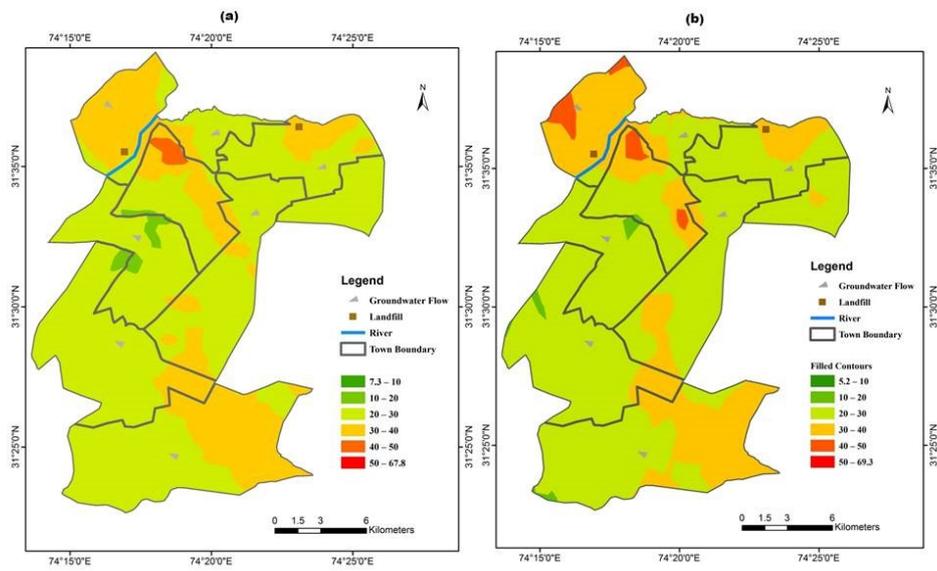


Fig. 1.

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