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Interactive comment on "Effect of polluted water on soil, sediments and plant contamination by heavy metals in El-Mahla El-Kobra, Egypt" *by* E. Mahmoud and A. M. Ghoneim

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Interactive comment on "Effect of polluted water on soil, sediments and plant contamination by heavy metals in El-Mahla El-Kobra, Egypt" E. Mahmoud and A. M. Ghoneim Anonymous Referee #2 comments The manuscript focused on the effect of polluted water on soil, sediments and plant contamination by heavy metals. The topic is interesting and the manuscript is well structured. the manuscript can be accepted after minor revision. The references in the introduction are not updated. See below to improve introduction section: 1. X. Gou, Y. Li and G. Wang Heavy metal concentrations and correlations in rain-fed farm soils of Sifangwu village, central Gansu Province, China Land Degradation Development Volume 18, Issue 1, January/February 2007, Pages: 77–88,

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1. Mimi Roy and Louis M. McDonald Metal Uptake in Plants and Health Risk Assessments in Metal-Contaminated Smelter Soils Land Degradation Development Volume 26, Issue C1 SED Interactive comment Printer-friendly version Discussion paper 8, November 2015, Pages: 785–792, 1. Daniel Sacristán, Blai Peñarroya and Luis Recatalá Increasing the Knowledge on the Management of Cu-Contaminated Agricultural Soils by Cropping Tomato (Solanum Lycopersicum L.)Land Degradation Development The figures could be improved to be more attractive. In table 4 show the average and standard deviation. which is the number of samples?

Author response for Reefer #2 âĂć The references in the introduction section are updated and modified. âĂć The figure quality is improved and average in Table 4 added.

Kindly refer to the revised manuscript for more details

Thank you

Referee #3 comments Dear authors, In your manuscript you discussed the impact of using untreated wastewater in agriculture; really you touch a real environmental problem in Egypt nowadays, and your manuscript it could be accepted after a major revision. My comments are: Title part: In your proposed title (Effect of polluted water on soil, sediments and plant contamination . . .. . .), the sources of these sediments are the polluted water itself as you presented in line25 page4, so the word sediments making confusion and I suggest C1 SED Interactive comment Printer-friendly version Discussion paper deleting it from the title to be (Effect of polluted water on soil and plant contamination . . ...). Author response âĂć The title changed to “Effect of polluted water on soil, sediments and plant contamination by heavy metals in El-Mahla El-Kobra, Egypt”.

Referee #3 comments Abstract part: Page 2, line 7, In the Abstract part you shouldn’t use abbreviations without telling the reader what it is mean, and once you tell the reader what it means you can use the abbreviations in the same part; as BOD and COD in the water of drains Zefta, I suggest being biochemical oxygen demand (BOD)

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and chemical oxygen demand (COD). Page 2, line 9, Irrigated by water from Zefta and No. 5 drains, you can add the word drainage or contaminated to be" irrigated by contaminated water from Zefta and No. 5 drains ". Author response âĂć The abstract adjusted according to your suggestion.

Referee #3 comments 1 Introduction General remark: You presented detailed reviews about how is danger the Cd contamination and little bit about Cu, but you did not present any review about the other contaminates, it should be a balance of what you represent. Page 2, line 23, On living organism such as plants, animals, âĂŤ delete (,) to be" plants and animals ". Page 3, line 2, Heavy metal,– I suggest to be heavy metals Page 3, line 4, Causing damage to plants when reach and under certain conditions become toxic to human and animals fed on these metal-enriched plants, âĂŤchange it to be " causing damage to plants ,and under certain conditions of high concentrations become toxic to . . .." Page 3, line 10 -14, Cd uptake by carrot roots was about five times more than the regulatory limits for men, eight times more for women, and 12 times more for children. The results indicating, carrots grown in contaminated soils by Cd have the potential to cause toxicological problems in men, women, and young children (Roy and McDonald, C2 SED Interactive comment Printer-friendly version Discussion paper 2013). âĂŤ- rephrase this paragraph to be, " According to Roy and McDonald (2013) Carrots grown in contaminated soils by Cd have the potential to cause toxicological problems in men, women, and young children, at which point, Cd uptake by carrot roots was about five times more than the regulatory limits for men, eight times more for women, and 12 times more for children". Page 3, line 16-17, For the Cu-contaminated agricultural soils with tomato (Solanum lycopersicum L.), âĂŤ- change it to be "For the Cu-contaminated soils planted with tomato (Solanum lycopersicum L.)." Page 3, line 21, Sultriness chlorosis , what does it mean? Page 4, line 6-8, Brevik and Sauer, 2015), – change it to be" Brevik and Sauer (2015) " Page 4, line 11-12, Density populated (), I suggest the putting between brackets, (number of population/area of El-Mahla El-Kobra). Author response âĂć In the introduction section, updated review about the heavy metals is added and most of your required changes

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have been taken into consideration on preparation of the revised manuscript. Referee #3 comments

2 Materials and methods 2.1 Site description, samples and analysis General remark: You should represent a map of the studied area that include the soil samples locations, in addition to the location of Zefta , No. 5 drains, and Baher El Mlah canal and the waters samples locations. Page 5, line 6, Baher El Mlah water, I suggest to be Baher El Mlah a tributary from River Nile. Page 5, line 16, The total heavy metals (Cd, Pb and Zn), it should be (Cd, Pb, Zn, Fe, Mn, Cu, and Ni) Page 5, line 18-19, Samples of rice and maize plants (age 65 days in summer 2012) that are grown in the studied soils, and other three plant species,âĂŤ- it should be "samples of rice and maize cultivated crops (age 65 days in summer 2012) that are grown in the studied soils, and other three aquatic plant species". Also you should indicate what is the part of the plant you analyzed? Are you analyzed the roots, shoots and leafs? Author response We added a map of the studied area (Fig. 1). Rice and maize shoots were analyzed for total heavy metals. Your suggestions and changes are considered on the revised manuscript. Referee #3 comments

3 Results and discussion 3.1 The effect of polluted water on plant and soil contamination Page 7, line 7, Cases of 200mgCd kg$-$1. âĂŤ delete (.) Page 7, lines 9, 17, 18, You wrote EC and said drains affect significantly the EC (Table 3), you must use the same expressions and units that you presented in the table 3 (TDS) or convert the values of TDS in the table3 to EC values. Page 7, line 24, And plant available phosphorus, delete the word plant. Page 7, line 27, 28, Mn, Cd and Ni contents" in soils " at Zefta drain were higher than these" in soils " at drain No. 5 which is due to high concentration of heavy metals in Zefta drain water (Table 3), âĂŤ You should delete (in soils) that you mentioned twice because the table 3 represent the analysis of water drains and that make a big confusion. Page 8, line 3, 4, These results coincide with those of, who found that irrigating (ElGendi et al., 1997) sandy soil in the Abou- Rawash,âĂŤyou should modificate this phrase to be " These results coincide with El-Gendi et al. (1997)

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who indicate that irrigating sandy soil in the Abou- Rawash . . ..". Page 8, line 6, Virgin soil one in the same area,– delete the word one. Author response This part is improved according to your comments.

Referee #3 comments 3.2 Bioconcentration factors (BF) Page 8, line 8, The BF values in the rice and maize plants at the harvesting stage and in the page 5 line 18 samples of rice and maize plants age 65 days are this age situated in the harvesting stage??? That is not correct!! Author response This part is revised.

Referee #3 comments 3.3 Quality of drainage water Page 8, line 15, With a BOD/COD ratio is below 0.5, the wastewater contains some C4 SED Interactive comment Printer-friendly version Discussion paper toxic components such as dyes and heavy metals, you should rephrase to be "The wastewater with a BOD/COD ratio is below 0.5 contains some toxic components such as dyes and heavy metals" Author response This part is changed to “The wastewater with a BOD/COD ratio is below 0.50 contains some toxic components such as dyes and heavy metals”.

Referee #3 comments

Page 8, line 15, The average value of pH in Zefta drain, drain No. 5 and Baher El Mlah was 12.2, 9.8 ,âĂŤ how can plants like Rice and Mize sustain the high alkalinity of irrigated water, also I in under the high pH values most of nutrient and heavy metals will be insoluble, please revise these values carefully. Author response Due to large amounts of industrial and contaminated water are discharged directly without treatment into irrigation canals which often contain heavy metals.

Referee #3 comments Page 8, line 16, The sodium considered adsorption ratios (SAR),–delete considered also you can delete the entire phrase except SAR because, you already told the reader what does it mean in previous context. Page 8, line 20, In water of Baher El Mlah ,– I suggest to add canal to be" in water of Baher El Mlah canal. Author response The sodium considered adsorption ratios deleted. Word canal is added to Baher El Mlah.

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Referee #3 comments 3.4 Heavy metal concentrations in sediments Page 10, line 20-21, Of wastewater from the urban and industrial area, – the industrial area belong to urban so I suggest to use resident word instead of urban. 3.5 Bioaccumulation coefficients of aquatic plants Page 10, line 26 and Page 11 line 15, As results these and As P. australis, your work about studying heavy metals so I suggest to not put (as) in the beginning of the phrase to prevent the confusion with Arsenic metal (As) . Page 11, line 2, The three species would be useful for bioremediation of waterways;–I suggest using the word phytoremediation instead of bioremediation. Page 11, line 10, Thus, their introduction is recommended??? What did you mean?? Author response We added the required changes and this part is changed. Referee #3 comments Page 11, line 21, From industrial, domestic as well as agricultural wastewater, – I suggested to be "from industrial, domestic wastewater as well as diffuse agricultural drainage water. Author response The conclusion section is adjusted to be (Delta drains often receive high amounts of organic and inorganic pollutants from industrial, domestic wastewater as well as diffuse agricultural drainage. High priority should be given to Zefta drain and drain No.5 sites which receive high loads of pollutants. This was confirmed by the lower water quality and polluted soils with heavy metals in the El- Mahla El-Kobra area. Industrial and municipal wastewater sources in El- Mahla El-Kobra area must be treated before it discharge in Zefta drain and drain No.5. Using heavy metals-contaminated agricultural soils in cultivation of rice and maize crops for human consumption may result in health hazards). Referee #3 comments Tables: Table 1 It will be good if you present the high and the low values of studied parameters for Baher El Mlah (you did 15 samples) and also you can present the average of each parameters between parentheses. The total Cd (11 ppm) for the soil irrigated by fresh water from Baher El Mlah, is the soil itself contaminated? and where these high value come from? Table 2 Are these values depending on the average values? . you present the limits of heavy metals but you did not present concentration of heavy metal in plant or soil, so I suggest delete this column or you should display the concentration in soil and plant in the same table. Table 3 You used (-), I suggest 0.0 instead of (-) or this

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mean that you did not measure these parameters. Also I suggest presenting the high and the low values as you did in COD and BOD. Figures: You already modificated it to be in color but in title of figure one you should show in what parts of maize and rice theses concentration (root or shot or leafs). As a final note, please revise typing and grammatical errors throughout the paper. Reviewers are much more likely to look favorably upon a manuscript that is well written in addition to making a considerable contribution to the field. This is a very interesting topic and I hope you are able to make the suggested changes. Author response The figures are changed to be in color and title modified. Also we adjusted the tables. Kindly refer to the revised manuscript for more details. Thank you

Please also note the supplement to this comment:
http://www.solid-earth-discuss.net/se-2015-34/se-2015-34-AC1-supplement.pdf

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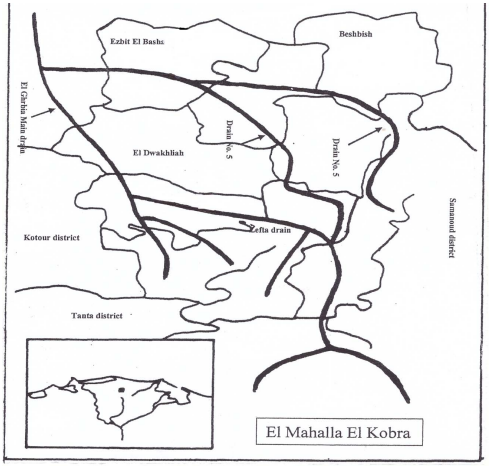

Figure 1. Location of study area.

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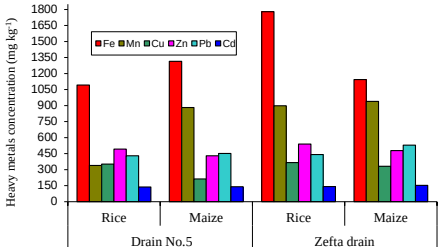

Figure 2. Concentration of heavy metals in maize and rice shoots grown in soils irrigated from Zefta drain and drain No.5.

Fig. 2. Figure 2. Concentration of heavy metals in maize and rice shoots grown in soils irrigated from Zefta drain and drain No.5.

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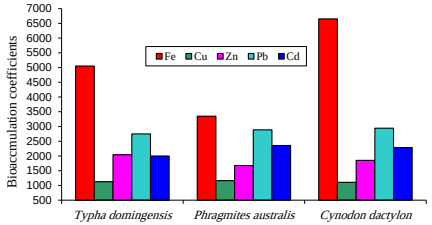

Figure 3. Bioaccumulation coefficients of heavy metals in *Typha domingensis*, *Phragmites australis* and *Cynodon dactylon* plants grown in Zefta drain.

Fig. 3. Figure 3. Bioaccumulation coefficients of heavy metals in Typha domingensis, Phragmites australis and Cynodon dactylon plants grown in Zefta drain.

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