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CORRECTION

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Correction to: Towards estimating the economic cost of invasive alien species to African crop and livestock production

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Eschen et al. (2021) estimated the annual cost of invasive alien species (IAS) to African agriculture, separated into the cost due to yield loss, the cost of weeding, the loss of livestock-based income and the cost of research. The paper revealed the vast cost of IAS to the continent and estimated the total cost to be USD 3.66 Tn, with by far the largest part of the estimated cost (USD 3.63 Tn) due to weeding. The study concluded that there is a need for pre-emptive measures to reduce future costs, as well as measures that contribute to the control of widely established IAS to reduce losses and improve livelihoods.

After publication, it was brought to our attention that the estimated cost of weeding was much higher than can reasonably be expected although the input data and general approach to calculating the estimate were not disputed. We therefore revisited our calculations and found a scaling error that occurred during the application of wages to the harvested area for each of the five crop types. As described in the original article, we calculated the cost of weeding IAS in five crop types based on the harvested area in each African country, calculated from data in the SPAM database, the average abundance of alien species as a fraction of the weed community in African agricultural fields as deducted from the published literature. The average time spent weeding a hectare of each of the five crop types was taken from the published literature, and wages paid in each country for agricultural labour or similar jobs as reported on https://wagecalculator.org. We erroneously applied costs per square kilometre instead of the cost of weeding per hectare, resulting in substantially overestimated weeding costs. The calculations of the estimates of yield loss, the loss of livestock-based income and research costs were not affected by this error.

The original article can be found online at https://doi.org/10.1186/s43170-021-00038-7.

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Table 3 The absolute and relative contribution of labour, yield loss, lost livestock derived income and research to the annual cost of IAS to African agriculture in billions USD

Damage component	Annual cost contribution in	
	USD	Percentage
Yield loss	29.06	44.31
Weeding	36.34	55.42
Lost livestock derived income	0.17	0.26
Research	0.00	0.00
Total	65.58	

Table 4 Summary of estimated costs by country (in millions USD). For the yield losses by individual species, the values are the middle estimates, based on the literature and survey responses. A dash indicate that no estimate was made, whereas a zero indicates a small estimated value

Country	Annual-weeding-costs (million USD)	Reduced-grazing-potential	Damage caused (in millions USD) by							Total (million USD)
			Spodoptera-frugiperda	*Prostephanus-truncatus*	*Chilo-partellus*	*Phenacoccus-manihoti*	*Tuta-absoluta*	BBTV	*Bactrocera-dorsalis*	
Algeria	608	2	–	–	–	–	–	–	–	611
Angola	1066	1	368	–	–	–	2	96	185	1717
Benin	452	0	376	–	–	–	36	0	18	883
Botswana	26	0	1	–	1	–	2	–	0	31
Burkina-Faso	874	1	186	–	–	–	12	–	2	1075
Burundi	6	0	11	–	–	192	5	92	204	510
Côte-d'Ivoire	1212	1	211	–	–	495	–	–	64	1984
Cameroon	725	0	2237	–	363	79	24	17	1	3446
Central-African-Republic	125	1	137	–	–	21	–	1	18	304
Chad	1052	2	51	–	–	–	–	–	21	1126
Congo,-Republic-of-the	272	0	12	–	–	1163	1	24	100	1573
Congo,-Democratic-Republic-of-the	3166	0	418	–	–	0	–	16	451	4053
Djibouti	–	0	–	–	–	–	–	–	–	0
Egypt	520	9	–	–	–	–	967	–	–	1496
Equatorial-Guinea	–	–	–	–	–	–	0	2	14	16
Eritrea	32	3	16	–	10	–	–	–	16	78
Ethiopia	442	22	209	–	427	–	17	–	80	1197
Gabon	148	0	9	–	–	0	–	0	1	159
Gambia,-The	21	1	4	–	–	0	–	–	13	40
Ghana	703	0	277	14	–	0	–	–	94	1088
Guinea	427	0	37	–	–	0	–	–	35	500
Guinea-Bissau	0	0	4	1	–	3	–	–	24	33
Kenya	917	33	719	41	304	155	222	–	184	2576
Lesotho	69	–	–	–	8	–	8	–	–	85
Liberia	12	–	–	–	–	0	–	–	21	34
Libya	178	0	–	–	–	–	–	–	–	178
Malawi	457	1	31	59	127	1231	119	204	–	2288
Mali	1099	3	252	–	–	2	–	–	421	1776
Mauritania	5	0	–	–	–	–	–	–	13	18
Morocco	1442	5	–	–	–	–	211	–	–	1658
Mozambique	868	3	421	30	71	1587	58	36	107	3212
Namibia	365	1	9	–	–	–	5	–	13	392

Table 4 (continued)

Country	Annual-weeding-costs (million USD)	Reduced-grazing-potential	Damage caused (in millions USD) by							Total (million USD)
			Spodoptera-frugiperda	***Prostephanus-truncatus***	***Chilo-partellus***	***Phenacoccus-manihoti***	***Tuta-absoluta***	**BBTV**	***Bactrocera-dorsalis***	
Niger	2477	1	5	–	–	5	–	–	34	2522
Nigeria	10,194	2	500	–	–	238	1854	79	2202	15,069
Rwanda	13	1	17	6	–	59	–	0	47	143
South-Sudan	174	15	26	–	–	–	–	–	–	214
Senegal	589	0	25	3	–	7	284	–	42	950
Sierra-Leone	115	0	0	–	–	0	–	–	94	210
Somalia	16	5	16	–	9	–	–	–	–	46
South-Africa	2275	33	1082	–	599	–	–	–	–	3989
Sudan	542	7	5	–	7	–	–	–	256	816
Eswatini	8	1	–	–	7	–	–	–	54	70
Tanzania	1268	4	644	64	144	613	175	–	526	3438
Togo	303	0	13	13	–	3	–	–	1	334
Tunisia	228	1	–	–	–	–	118	–	–	348
Uganda	391	5	609	30	233	0	1	–	371	1639
Zambia	375	4	307	9	217	399	29	0	10	1350
Zimbabwe	89	1	144	11	65	0	–	–	80	390
Total	36,342	173	9394	282	2592	6254	4149	568	5820	65,573

Table 5 Estimated yield loss caused by individual IAS in Africa

Host plant	IAS	Yield loss values (billions USD) estimated by	
		Literature only	Literature + survey
Maize	*Spodoptera frugiperda*	6.9 (–)*	9.4 (7.7–12.1)
	Prostephanus truncatus	0.2 (0.1–0.3)	0.3 (0.2–0.5)
	Chilo partellus	2.6 (2.1–3.1)	2.6 (2.1–3.1)
Cassava	*Phenacoccus manihoti*	0.0 (0.0–0.0)	6.3 (5.5–7.3)
Tomato	*Phthorimaea absoluta*	4.8 (3.6–6.7)	4.1 (3.2–5.6)
Banana	BBTV	0.2 (–)	0.6 (0.5–0.6)
Mangoes (and citrus in survey)	*Bactrocera dorsalis*	3.5 (1.7–10.6)	5.8 (4.4–10.0)
Total		18.2	29.1

* Numbers in brackets indicate high and low estimates

We corrected this error in our calculations and have updated the results, specifically Table 3, which presents to total estimate, and Table 4, which presents the estimates for each country. These corrected Tables are presented here. We have updated the numbers stated in the Abstract and in the Results section of the manuscript text to reflect the corrected results. We also modified the discussion where these estimates are put into context. While the total estimate of IAS cost to African agriculture are now significantly lower, the conclusions and recommendations have not changed.

We have also corrected the value for the yield loss due to *Phthorimaea absoluta* based on the literature and a survey in Table 5. The value in the previous version of the manuscript was wrong due to a transcription error. The new value is corrected for abundance within each country, like the other values in the Table. This species was deleted from the abstract as the most costly species and minor changes to the Results and Discussion were made to align the text with the correct number. A reference made to an article 'in press' during publication has also been updated with the article's final reference detail.

We apologise for the errors and any confusion they may have caused.The original article has been updated.

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