

Table S1. Pakistan's agriculture sector's responsibility for environmental impact, under direct environmental impact versus total environmental impact based on sectoral consumption.

Item ¹	Total direct environmental impact	Total environmental impact based on inter plus intra-sectoral consumption	Percentage change in environmental impact responsibility (%) ²
Land (1000 ha)	43,640	18,791	-57 %
Water (Mm³/yr)	96,779	36,631	-62 %
Blue water (Mm ³ /yr)	74,942	28,360	-62 %
Grey water (Mm ³ /yr)	21,837	8,271	-62 %
Nitrogen impact (Gg N)	3,131	1,186	-62 %
N ₂ O (Gg N)	106	40	-62 %
NH ₃ (Gg N)	1,012	383	-62 %
NO _x (Gg N)	43	18	-59 %
N (Gg N)	1,970	746	-62 %
CO₂ (Gg)	2,428	1,547	-36 %

¹ ha= hectare, Mm³= cubic millimeter, Gg= gigagrams, yr= year. ² The change in responsibility is estimated in comparison to the conventional direct environmental responsibility. As can be seen, under our proposed method of considering the sectoral consumption-induced direct and indirect environmental impacts, Pakistan's agriculture sector environmental impact responsibility is reduced considerably. Which implies the diversification of environmental impact responsibility to the downstream importers of agricultural products.

Table S2. Pakistan's agriculture sector's direct environmental impacts and sectoral linkages.

Item ¹	Downstream environmental linkage	Internal environmental linkage	Total direct environmental impact	Pakistan's total sectoral environmental impact ¹
Land (1000 ha)	27,267	16,373	43,640	163,236
Water (Mm ³ /yr)	60,469	36,310	96,779	103,724
Blue water (Mm ³ /yr)	46,825	28,117	74,942	75,679
Grey water (Mm ³ /yr)	13,644	8,193	21,837	28,045
Nitrogen impact (Gg N)	1,956	1,175	3,131	3,415
N ₂ O (Gg N)	66	40	106	117
NH ₃ (Gg N)	632	380	1,012	1,022
NO _x (Gg N)	27	16	43	293
N (Gg N)	1,231	739	1,970	1,982
CO ₂ (Gg)	1,517	911	2,428	168,180

¹ Pakistan's total sectoral environmental impact is estimated as the sum of all sector environmental impacts from the 2015 input-output table available at: <https://worldmrio.com/>.

Table S3. Pakistan's agriculture sector's indirect environmental impacts and sectoral linkages.

Item	Upstream environmental linkage	Mixed environmental linkage	Total indirect environmental impact	Pakistan's total sectoral environmental impact
Land (1000 ha)	398	2020	2418	163,236
Water (Mm ³ /yr)	8	313	321	103,724
Blue water (Mm ³ /yr)	0.4	243	243	75,679
Grey water (Mm ³ /yr)	7.6	71	78	28,045
Nitrogen impact (Gg N)	1.5	10	12	3,415
N ₂ O (Gg N)	0.03	0.3	0.33	117
NH ₃ (Gg N)	0	3.3	3.3	1,022

NOx (Gg N)	1.4	0.1	1.5	293
N (Gg N)	0.04	6.4	6.44	1,982
CO ₂ (Gg)	628	7.9	636	168,180

Table S4. A comparison between the Pakistani agriculture sector and Pakistan's total sectoral environmental impacts.

Item	Total environmental impact (direct + indirect)	Pakistan's total sectoral environmental impact
Land (1000 ha)	46,058	163,236
Water (Mm ³ /yr)	97,100	103,724
Blue water (Mm ³ /yr)	75,185	75,679
Grey water (Mm ³ /yr)	21,915	28,045
Nitrogen impact (Gg N)	3,142	3,415
N ₂ O (Gg N)	106	117
NH ₃ (Gg N)	1,015	1,022
NOx (Gg N)	45	293
N (Gg N)	1,976	1,982
CO ₂ (Gg)	3,065	168,180