Supplementary Table S5 Cost-benefit analyses resulting from improving N management

Type of N fluxes	Costs based on WTP (€ kg^{-1} N)	N flux in 2018 (Tg N yr^{-1})	Total cost (Billion Euro)	Reduced cost (Billion €)		
				Manure replacement	Balanced fertilization	Integrated approaches
N fertilizer	0.8 (0.6–1.0)	28.6 (22.9–34.3)	22.9 (18.3–34.3)	3.4 (2.5–4.2)	9.8 (7.4–12.3)	12.5 (9.4–15.6)
NH_3 to air	4.0 (2.0–6.0)	7.2 (5.8–8.7)	28.8 (11.6–52.2)	2.8 (1.2–1.9)	8.0 (6.6–9.9)	10.0 (9.5–14.2)
N_2O to air	2.0 (1.0–3.0)	1.0 (0.8–1.2)	2.0 (0.8–3.6)	0.2 (0.1–0.4)	0.6 (0.4–0.7)	0.8 (0.6–0.9)
NO_x to air	4.0 (2.0–6.0)	0.6 (0.4–0.7)	2.4 (0.8–4.2)	0.3 (0.2–0.4)	0.8 (0.6–0.9)	0.8 (0.6–0.9)
N_r to water	3.0 (1.0–5.0)	6.2 (5.1–7.6)	18.6 (15.3–38.0)	1.5 (1.2–2.3)	5.1 (4.4–6.7)	6.3 (3.1–9.2)
Total	-	-	74.7 (68.0–93.0)	8.2 (6.6–9.9)	24.3 (21.9–28.8)	30.4 (28.5–35.8)

Note: The indirect costs are based on Willingness To Pay (WTP) in the EU27, adjusted by dividing this by a factor of 5 according to the ratio of mean per capita GDP in China (approx. 6100 Euro yr^{-1}) to mean per capita GDP in EU27 (30600 Euro yr^{-1}). The total costs and reduced costs in Billion Euro are average values. The uncertainty range given per unit costs was applied to these costs.