Supplementary material

Table S1. Field survey.

Farmer's data		
1. Name: 2. Location (x, y): 3. Total area of the property, record if there is more than one: 4. Farming system classification: 5. Crop diversity: 6. Livestock diversity: 7. Land use within the property (% grassland, crops, forest, peatland, etc.):		
Crops	Cattle	Other livestock
1. Crop: 2. Cultivation area: ha 3. Seed quantity (potatoes only): n° 4. Quantity of finished product: kg 5. Fertiliser(s): 6. Fertiliser quantity: kg/ha 7. Method of application: 8. Source of energy used field operations: 9. Amount of energy: l 10. Machinery: 11. Litres of oil: 12. Hours of machine use: 13. Hours of irrigation per day: 14. Irrigation months: 15. Pump flow rate: l/s 16. Method of irrigation: 17. Water source: 18. Pumping depth: m 19. Horizontal distance (pumping): m 20. Irrigation power supply:	1. Categories division of livestock: 2. Number of animals in each category: 3. Weight of each category: kg 4. N° of animals sold: 5. N° of animals purchased: 6. N° Replacement animals: 7. Grazing months: 8. Hours per day of grazing: 9. Pasture type (grassland and/or scrubland): 10. Grass quality (high or low): 11. Grazing area: ha 12. Destination (grazing and/or guarding): 13. Type of fertiliser: 14. Fertiliser quantity: kg/ha 15. Type of fodder (bales and/or bolls): 16. Months forage feeding: n° 17. Fodder quantity: kg/animal day 18. Type of concentrate: 19. Months concentrated feed: n° 20. Amount of concentrate: kg/animal day 21. Manure management: 22. Percentage of manure managed: 23. Machinery used in the field: 24. Litres of oil: 25. Hours of machine use: 26. Existence of animals in the felling and fertilisation of this farm: n°(animals) kg/ha (fertilisers)	1. Type: 2. Quantity of finished product: kg 3. Categories division of livestock: 4. Number of animals in each category: 5. Duration of each category: months or years 6. Grazing months: 7. Hours per day of grazing: 8. Pasture type (grassland and/or scrubland): 9. Grass quality (high or low): 10. Grazing area: ha 11. Destination (grazing and/or guarding): 12. Type of fertiliser: 13. Fertiliser quantity: kg/ha 14. Type of fodder (bales and/or bolls): 15. Months forage feeding: n° 16. Fodder quantity: kg/animal day 17. Type of concéntrate: 18. Months concentrated feed: n° 19. Amount of concentrate: kg/animal day 20. Manure management: 21. Percentage of manure managed: 22. Machinery used in the field: 23. Litres of oil: 24. Hours of machine use: 25. Existence of animals in the felling and fertilisation of this farm: n°(animals) kg/ha (fertilisers)

Table S2. ANOSIM (Similarity index: Euclidean).

Permutation N:	9999
Mean rank within:	182.7
Mean rank between:	233.9
R:	**0.2356**
p (same):	**0.0002**

Table S3. Pairwise comparisons with Bonferroni correction.

	TR	CO	AG
TR		1	0.0036
CO	1		0.0036
AG	0.0036	0.0036	

Table S4. Summary PCA (variance-covariance matrix)

PC		Eigenvalue	% variance
1		1.95E+09	98.816
2		1.64E+07	0.83085
3		6.95E+06	0.35275
4		845.172	4.29E-05
5		154.884	7.86E-06
6		78.6933	3.99E-06
7		44.4589	2.26E-06
8		33.2073	1.69E-06
9		23.03	1.17E-06
10		22.452	1.14E-06
11		1.0781	5.47E-08
12		0.262837	1.33E-08
13		0.00674969	3.43E-10
14		2.62E-05	1.33E-12

Table S5. PCA Loadings.

	PC 1	PC 2	PC 3	PC 4	PC 5	PC 6	PC 7	PC 8	PC 9	PC 10	PC 11	PC 12	PC 13	PC 14
PA	2.06E-05	0.000569	0.001973	0.092778	0.16734	-0.54998	-0.59437	0.46744	-0.0024556	0.29719	0.024668	-0.014058	0.0025616	4.46E-05
FA	-4.91E-05	0.000362	-0.000491	0.14418	0.54618	-0.053407	0.08621	0.032654	0.30971	-0.28993	-0.38242	0.07686	-0.29568	0.49999
PCA	-6.90E-06	-2.75E-05	5.74E-05	0.0090675	-0.025153	0.085343	-0.034779	0.0086877	0.031889	0.017681	0.81143	-0.076507	-0.28028	0.49655
VA	1.61E-07	-3.58E-06	3.66E-06	-0.00015328	-0.001097	-0.0019812	0.0053538	0.00023781	0.002338	3.81E-05	-0.010796	-0.014557	0.8638	0.50347
CR	8.13E-05	-0.000368	-0.000527	0.038772	-0.037711	-0.287	0.65189	0.13051	0.37269	0.57711	0.025332	-0.0089529	-0.0054861	-0.000271
TPA	-5.56E-05	0.000331	-0.000431	0.1533	0.5197	0.030706	0.056119	0.042063	0.34391	-0.27168	0.41342	-0.0029682	0.29599	-0.49993
CSR	-6.14E-06	9.37E-05	-1.81E-05	-0.0089175	0.019453	-0.012404	0.019078	-0.0053046	-0.10275	0.052748	0.10075	0.98755	0.014927	0.005367
SSR	-2.75E-05	-0.000352	0.000426	0.0839	-0.18723	0.020203	0.3471	0.77609	-0.25203	-0.41342	0.015739	-0.0035577	-0.0016697	-5.95E-05
PY	-2.93E-05	0.000454	0.00015	-0.010274	0.15172	0.77339	-0.17704	0.37096	0.14584	0.42183	-0.10176	0.01505	0.0010258	0.00086194
TC	-7.53E-05	0.000952	-0.000465	0.029668	0.55834	-0.0068395	0.23848	-0.081191	-0.73862	0.25349	0.042489	-0.11058	0.00037067	-0.0008102
TS	-8.32E-05	-0.000822	0.000156	0.9682	-0.17701	0.073038	-0.029636	-0.1225	-0.070487	0.067457	-0.022309	0.0043966	0.0001821	0.00022803
OF	0.9993	-0.014584	-0.03457	9.25E-05	8.39E-05	3.70E-05	-7.52E-05	4.44E-05	-7.51E-05	-4.09E-05	8.60E-06	1.78E-06	8.04E-07	1.71E-07
MF	0.037015	0.53386	0.84476	0.00018957	-0.00027484	0.00062712	0.0015882	-0.0011207	0.00043104	-0.0004283	-4.69E-05	1.61E-05	-1.06E-05	-1.14E-06
SF	-0.0061358	0.84544	-0.53403	0.00066409	-0.001354	-0.000464	-0.0004404	0.00051765	0.00021595	-7.27E-05	3.31E-05	-2.91E-05	4.72E-06	5.29E-07

Table S6: Contribution (%) of CO_2, N_2O and CH_4 per hectare and year by crop and animal category.

	Traditional			**Conventional**			**Agroecological**		
	CO_2	N_2O	CH_4	CO_2	N_2O	CH_4	CO_2	N_2O	CH_4
Potatoes	42.9	57.0	0	39.9	60.0	0	33.7	66.2	0
Vegetables	21.1	78.8	0	21.6	78.3	0	0.9	99.0	0
Cattle	1.5	0.5	97.9	1.3	0.5	98.1	2.3	0.5	97.1
Sheep	0.1	0	99.9	0.5	0	99.5	0	0	100
Grassland	6.1	93.8	0	5.7	94.2	0	6.3	93.6	0

A

Assessment	CFT emission sources		
Crops	Seed production	SP	(a) (c)
	Fertiliser production	FP	
	Soil / fertiliser	S/F	
	Crop protection	CP	
	Energy use	EU	
Cattle	Feed production	FP	(b)
	Enteric fermentation	EF	
	Manure management	MM	
	Grazing	G	(c)
	Grassland fertilisation	GF	
	Energy & Processing	EP	
Sheep	Energy use	EU	(c)
	Feed production	FP	(d)
	Manure management	MM	
	Enteric fermentation	EF	

B

Assessment	Reorganised emission sources
(a) Crops	SP; FP; S/F; CP; EU
(b) Cattle	FP; EF; MM
(c) Sheep	FP; MM; EF
(d) Grassland	SP; FP; S/F; CP; EU; EU; G; GF; EP

Figure S1. CFT emissions sources reorganization, (A) organisation of emission sources in CFT, (B) reorganisation of emission sources for the purpose of this study. The letters in red indicate the grouping of the new assessments (a) crops (potatoes and vegetables), (b) cattle, (c) sheep, (d) grassland.

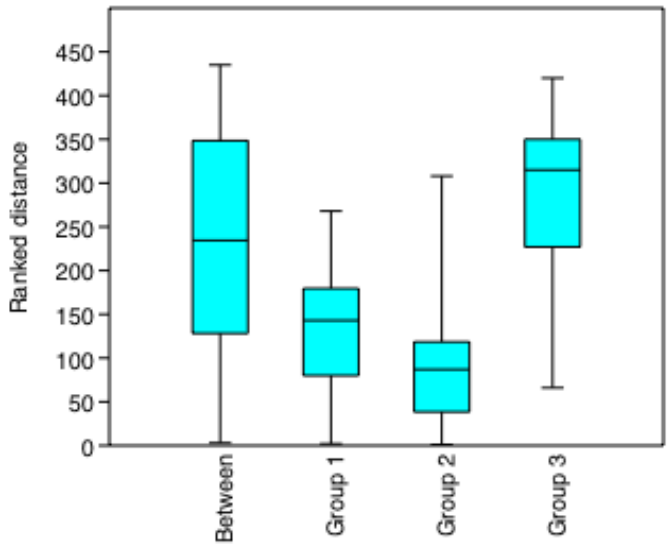

Figure S2. Analyses of similarities (ANOSIM). There is a significant difference between agricultural systems ($P < 0.05$). Group 1= traditional agriculture; Group 2= conventional agriculture and Group 3= agroecological agriculture.

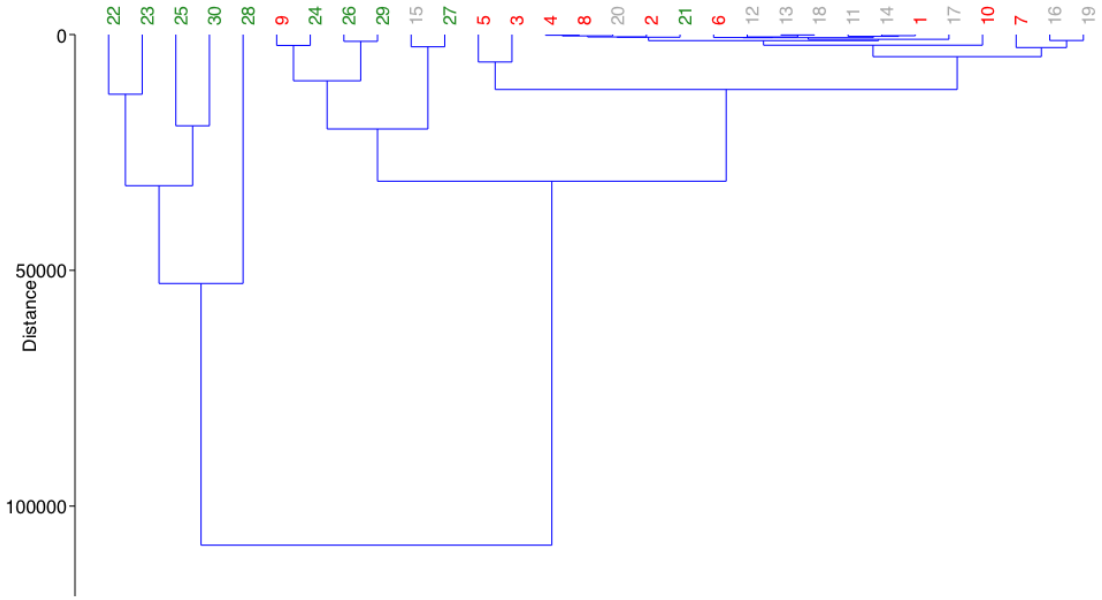

Figure S3. Agricultural systems hierarchical clustering. Algorithm: Paired group (UPGMA). Cophenetic coefficient: 0,9379.

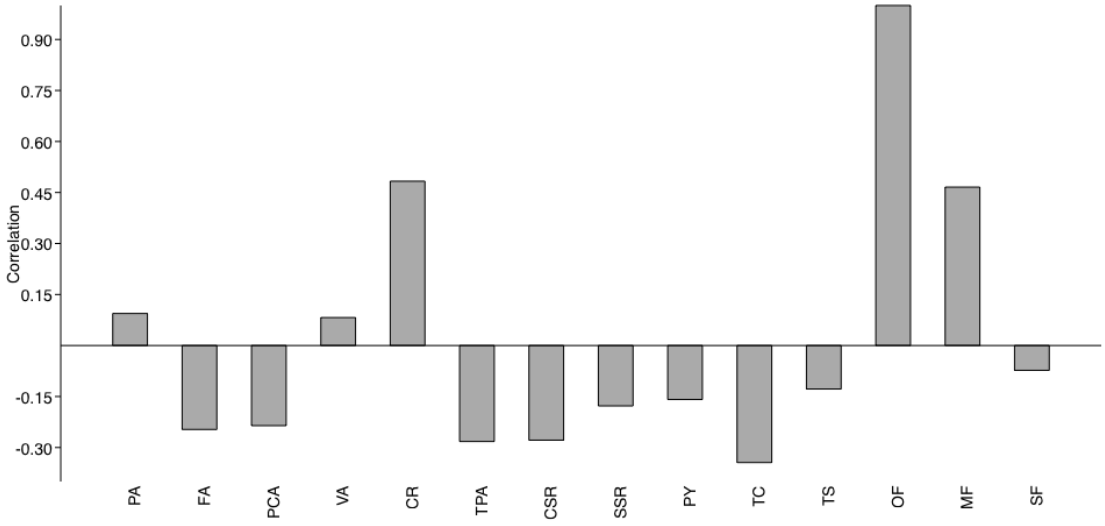

Figure S4. PC1 correlation plot.

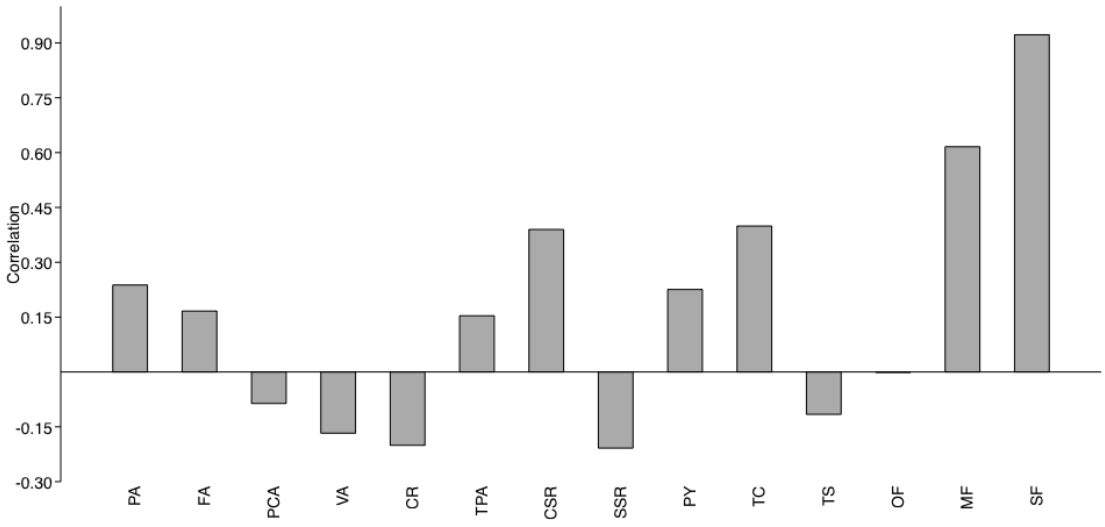

Figure S5. PC2 correlation plot.