SI Table S1: Analysis of variance (mean square) of the data for soil properties

Source of variation	df	OC (%)	Total N (%)	P (mg kg^{-1})	K (mg kg^{-1})	S (mg kg^{-1})	C Stock (t ha^{-1})
				boro			
Replication	2	0.00001	1.00×10^{-7}	0.02209	5.55×10^{-8}	0.02500	0.0041
Treatments	9	0.05876***	4.661×10^{-4}***	0.34847***	1.52×10^{-4}***	5.39800***	24.0968***
Error	18	0.00007	8.22×10^{-7}	0.01140	1.416×10^{-7}	0.02444	0.0268
Total	29						
				aman			
Replication	2	0.00020	3.33×10^{-6}	0.01262	3.333×10^{-6}	0.00100	0.0783
Treatments	9	0.09018***	4.38×10^{-4}***	0.66798***	2.13×10^{-4}***	2.67967***	37.0509***
Error	18	0.00017	3.33×10^{-6}	0.00832	3.33×10^{-6}	0.02156	0.0770
Total	29						

OC = organic carbon, N = nitrogen, P =phosphorus, K = potassium, S =Sulfur. ***= Significant at 0.1% level of probability.

SI Table S2: Gain (+) or loss (-) of nutrients and change in carbon stock from initial bulk soil after cultivating rice with the application of chemical fertilizers and co-compost combination in the first (*boro)* and second rice (*aman*) seasons

Treatment	OC (%)	Total N (%)	P (mg kg^{-1})	K (mg kg^{-1})	S (mg kg^{-1})	ΔCs (%)
			boro			
T_1	-22.59g	-12.65h	-8.78a	-16.46f	-13.34e	-22.04g
T_2	-3.74f	-8.02g	-13.19b	-18.86g	-17.67f	-3.067f
T_3	0.39c	7.40c	-14.46cd	1.90bc	-0.13a	1.10c
T_4	1.15c	7.10cd	-13.82bc	1.61bc	-0.56a	1.87c
T_5	-0.60d	8.95b	-14.46cd	1.27c	-2.51bc	0.10d
T_6	-1.87e	6.17de	-15.10de	1.27c	-3.60c	-1.187e
T_7	6.20a	11.11a	-15.74ef	2.70a	-1.86b	6.95a
T_8	5.24b	7.10cd	-16.44f	2.18ab	-3.60c	5.97b
T_9	-1.34de	4.01f	-15.74ef	-7.71e	-8.58d	-0.643de
T_{10}	-0.57d	5.25e	-15.42def	-5.93d	-7.50d	0.133d
Level of significance	***	***	***	***	***	***
Coefficient of variation (%)	-25.78	5.38	-4.76	-11.30	-11.41	-43.42
			aman			
T_1	-26.41f	-7.40e	-4.28a	-13.66g	-2.73c	-25.88f
T_2	4.50b	-6.48e	-13.44fg	-14.97h	-12.26e	5.23b
T_3	-0.66de	10.19ab	-10.16cd	13.33a	0.30ab	0.04de
T_4	1.55c	8.64c	-11.66e	1.89d	0.30ab	2.27c
T_5	-0.18de	9.87b	-8.40b	3.67c	0.520a	0.53de
T_6	-1.19e	8.02c	-9.58c	8.19b	-2.08c	-0.49e
T_7	7.96a	11.11a	-11.11de	0.98d	-0.78b	8.72a
T_8	9.09a	8.33c	-12.87f	1.16d	-2.30c	9.86a
T_9	1.78c	6.17d	-13.35f	-1.08e	-6.85d	2.49c
T_{10}	0.19d	5.86d	-14.40g	-5.08f	-6.19d	0.90d
Level of significance	***	***	***	***	***	***
Coefficient of variation (%)	-229.49	3.18	-5.33	-109.59	-19.83	4.87

OC= organic carbon, N = nitrogen, P =phosphorus, K = potassium, S =Sulfur, ΔCs = carbon stock change. Means with the same letters do not differ significantly, ***= Significant at 0.1% level of probability. T_1 = BRRI recommended dose of fertilizer (RDF); T_2 = co-compost (CC) 5.0 t ha^{-1}; T_3 = RDF + CC 2.0 t ha^{-1}; T_4 = RDF + CC 1.5 t ha^{-1}; T_5 = RDF + CC 1.0 t ha^{-1}; T_6 = RDF + CC 0.5 t ha^{-1}; T_7 = 75% RDF + CC 2.0 t ha^{-1}; T_8 = 75% RDF + CC 1.5 t ha^{-1}; T_9 = 75% RDF + CC 1.0 t ha^{-1}; T_{10} = 75% RDF + CC 0.5 t ha^{-1}.

SI Table S3: Analysis of variance (mean square) of the changes in soil properties

Source of variation	df	OC (%)	Total N (%)	P (mg kg^{-1})	K (mg kg^{-1})	S (mg kg^{-1})	ΔCs (%)
				boro			
Replication	2	0.032	0.038	0.8970	0.072	0.471	4.064
Treatments	9	188.759***	177.568***	14.1919***	199.410***	101.325***	191.438***
Error	18	0.209	0.314	0.4652	0.185	0.459	0.220
Total	29						
				aman			
Replication	2	0.610	0.339	0.5176	0.986	0.0181	9.092
Treatments	9	290.075***	135.823***	27.1974***	232.903***	50.2882***	294.055***
Error	18	0.599	0.513	0.3391	0.369	0.4044	0.512
Total	29						

OC organic carbon, N = nitrogen, P =phosphorus, K = potassium, S =Sulfur, ΔCs = carbon stock change. ***= Significant at 0.1% level of probability.

SI Table S4: Effect of application of chemical fertilizers and co-compost combination on the properties of soil fractions after second rice (*aman*) season

Treatments	Fraction	OC (%)	Total N (%)	C:N ratio
T_1	>53 µm	1.33b	0.221a	6.00b
	<53 µm	1.59a	0.198a	8.05a
Level of significance		***	*	***
Coefficient of variation (%)		0.24	4.04	4.53
T_2	>53 µm	1.98b	0.197	10.10b
	<53 µm	2.14a	0.186	11.56a
Level of significance		**	NS	**
Coefficient of variation (%)		0.68	2.10	0.61
T_3	>53 µm	1.88b	0.220a	8.52b
	<53 µm	1.90a	0.202b	9.43a
Level of significance		**	**	***
Coefficient of variation (%)		0.19	0.17	0.38
T_4	>53 µm	1.91b	0.212a	9.03b
	<53 µm	1.99a	0.202b	9.85a
Level of significance		**	*	**
Coefficient of variation (%)		0.54	2.08	0.61
T_5	>53 µm	1.88	0.208	9.01b
	<53 µm	1.91	0.201	9.47a
Level of significance		NS	NS	**
Coefficient of variation (%)		3.11	0.69	0.72
T_6	>53 µm	1.85b	0.212	8.75b
	<53 µm	1.95a	0.207	9.39a
Level of significance		**	NS	**
Coefficient of variation (%)		0.56	0.51	1.06
T_7	>53 µm	2.11b	0.225	9.40b
	<53 µm	2.34a	0.216	10.54a
Level of significance		***	NS	**
Coefficient of variation (%)		0.14	2.72	1.69
T_8	>53 µm	2.11b	0.211	10.0b
	<53 µm	2.33a	0.208	11.18a
Level of significance		**	NS	**
Coefficient of variation (%)		0.45	0.34	0.78
T_9	>53 µm	1.88b	0.211	8.91b
	<53 µm	1.95a	0.207	9.39a
Level of significance		*	NS	*
Coefficient of variation (%)		0.92	0.34	1.26
T_{10}	>53 µm	1.88b	0.222a	8.46b
	<53 µm	1.97a	0.212b	9.27a
Level of significance		**	*	**

Coefficient of variation (%)	0.37	0.16	0.52

T_1 = BRRI recommended dose of fertilizer (RDF); T_2 = co-compost (CC) 5.0 t ha^{-1}; T_3 = RDF + CC 2.0 t ha^{-1}; T_4 = RDF + CC 1.5 t ha^{-1}; T_5 = RDF + CC 1.0 t ha^{-1}; T_6 = RDF + CC 0.5 t ha^{-1}; T_7 = 75% RDF + CC 2.0 t ha^{-1}; T_8 = 75% RDF + CC 1.5 t ha^{-1}; T_9 = 75% RDF + CC 1.0 t ha^{-1}; T_{10} = 75% RDF + CC 0.5 t ha^{-1}. Means with the different letters differ significantly. *= Significant at 5% level of probability, **= Significant at 1% level of probability and ***= Significant at 0.1% level of probability and NS means non-significant.

SI Table S5: Effect of application of chemical fertilizer + co-compost combinations on the yield of *boro* and *aman* rice

Season, variety	Fertilizer + co-compost combination	Grain yield	Straw yield
		(t ha^{-1})	
boro, BRRI dhan89	T_1	6.5	8.1
	T_2	4	5.4
	T_3	6.9	8.4
	T_4	6.6	8.1
	T_5	6.5	8.1
	T_6	6.2	7.7
	T_7	6.5	8.0
	T_8	6.2	7.8
	T_9	6	7.6
	T_{10}	5.7	7.1
aman, BRRI dhan49	T_1	5.9	6.1
	T_2	2.96	4.5
	T_3	6.38	7.3
	T_4	6.12	7.0
	T_5	5.95	6.7
	T_6	5.68	6.4
	T_7	5.57	6.7
	T_8	5.42	6.8
	T_9	5.08	6.5
	T_{10}	4.94	6.1

T_1 = BRRI recommended dose of fertilizer (RDF); T_2 = co-compost (CC) 5.0 t ha^{-1}; T_3 = RDF + CC 2.0 t ha^{-1}; T_4 = RDF + CC 1.5 t ha^{-1}; T_5 = RDF + CC 1.0 t ha^{-1}; T_6 = RDF + CC 0.5 t ha^{-1}; T_7 = 75% RDF + CC 2.0 t ha^{-1}; T_8 = 75% RDF + CC 1.5 t ha^{-1}; T_9 = 75% RDF + CC 1.0 t ha^{-1}; T_{10} = 75% RDF + CC 0.5 t ha^{-1}.