

**Supplementary information: Coastal Salinity Management and Cropping System Intensification through Conservation Agriculture in the Ganges Delta**

**Table S1.** Analysis of variance (ANOVA) of various parameters.

Parameters	Parameter df	Error df	Sum of squares	Mean sum of squares	F <sub>Cal</sub>
<b>2020-21</b>					
Weed biomass (g m <sup>-2</sup> ) in potato	9	18	110.28	12.25	7.88**
Weed biomass (g m <sup>-2</sup> ) in mustard	9	18	6.24	0.69	18.67**
Weed biomass (g m <sup>-2</sup> ) in garlic	9	18	357.72	39.75	20.59**
Soil salinity (dS m <sup>-1</sup> ) in potato Dec 2020	9	18	7.21	0.80	3.26*
Soil salinity (dS m <sup>-1</sup> ) in potato Jan 2021	9	18	16.89	1.88	16.83**
Soil salinity (dS m <sup>-1</sup> ) in potato Feb 2021	9	18	14.88	1.65	10.39**
Soil salinity (dS m <sup>-1</sup> ) in potato Mar 2021	9	18	15.00	1.67	16.09**
Soil salinity (dS m <sup>-1</sup> ) in potato Apr 2021	9	18	19.32	2.15	26.49**
Soil salinity (dS m <sup>-1</sup> ) in potato May 2021	9	18	36.95	4.11	22.72**
Soil salinity (dS m <sup>-1</sup> ) in mustard Dec 2020	9	18	17.01	1.89	7.79**
Soil salinity (dS m <sup>-1</sup> ) in mustard Jan 2021	9	18	9.91	1.10	5.44**
Soil salinity (dS m <sup>-1</sup> ) in mustard Feb 2021	9	18	22.40	2.49	14.52**
Soil salinity (dS m <sup>-1</sup> ) in mustard Mar 2021	9	18	22.64	2.52	16.99**
Soil salinity (dS m <sup>-1</sup> ) in mustard Apr 2021	9	18	17.39	1.93	19.57**
Soil salinity (dS m <sup>-1</sup> ) in mustard May 2021	9	18	20.36	2.26	15.20**
Soil salinity (dS m <sup>-1</sup> ) in garlic Dec 2020	9	18	10.85	1.21	13.40**
Soil salinity (dS m <sup>-1</sup> ) in garlic Jan 2021	9	18	14.23	1.58	2.73*
Soil salinity (dS m <sup>-1</sup> ) in garlic Feb 2021	9	18	25.28	2.81	7.98**
Soil salinity (dS m <sup>-1</sup> ) in garlic Mar 2021	9	18	17.66	1.96	20.33**
Soil salinity (dS m <sup>-1</sup> ) in garlic Apr 2021	9	18	18.01	2.00	11.80**
Soil salinity (dS m <sup>-1</sup> ) in garlic May 2021	9	18	27.53	3.06	9.53**
Tuber yield (t ha <sup>-1</sup> ) in potato	9	18	211.26	23.47	4.10**
Seed yield (t ha <sup>-1</sup> ) in mustard	9	18	0.28	0.03	2.66*

Bulb yield (t ha <sup>-1</sup> ) in garlic	9	18	33.57	3.73	5.14**
Seed yield (t ha <sup>-1</sup> ) of green gram after potato	9	18	0.33	0.04	2.47*
Seed yield (t ha <sup>-1</sup> ) of green gram after mustard	9	18	0.07	0.01	3.30*
Seed yield (t ha <sup>-1</sup> ) of green gram after garlic	9	18	0.07	0.01	3.11*
Rice equivalent yield (t ha <sup>-1</sup> ) of cropping systems	12	24	648.41	54.03	31.73**
Cost of cultivation (\$ ha <sup>-1</sup> ) of cropping systems	12	24	10504275.90	875356.30	1864.36**
Gross return (\$ ha <sup>-1</sup> ) of cropping systems	12	24	39604733.89	3300394.49	80.12**
Net return (\$ ha <sup>-1</sup> ) of cropping systems	12	24	16367760.06	1363980.01	33.40**
Benefit cost ratio of cropping systems	12	24	3.26	0.27	22.01**
<b>2021-22</b>					
Weed biomass (g m <sup>-2</sup> ) in potato	9	18	110.81	12.31	8.48**
Weed biomass (g m <sup>-2</sup> ) in mustard	9	18	6.42	0.71	34.19**
Weed biomass (g m <sup>-2</sup> ) in garlic	9	18	2270.74	252.30	8.84**
Soil salinity (dS m <sup>-1</sup> ) in potato Dec 2021	9	18	5.17	0.57	11.48**
Soil salinity (dS m <sup>-1</sup> ) in potato Jan 2022	9	18	29.69	3.30	46.14**
Soil salinity (dS m <sup>-1</sup> ) in potato Feb 2022	9	18	59.51	6.61	29.74**
Soil salinity (dS m <sup>-1</sup> ) in potato Mar 2022	9	18	131.70	14.63	117.23**
Soil salinity (dS m <sup>-1</sup> ) in potato Apr 2022	9	18	131.91	14.66	51.26**
Soil salinity (dS m <sup>-1</sup> ) in potato May 2022	9	18	189.31	21.03	73.33**
Soil salinity (dS m <sup>-1</sup> ) in mustard Dec 2021	9	18	10.22	1.14	32.53**
Soil salinity (dS m <sup>-1</sup> ) in mustard Jan 2022	9	18	13.39	1.49	23.50**
Soil salinity (dS m <sup>-1</sup> ) in mustard Feb 2022	9	18	29.48	3.28	25.22**
Soil salinity (dS m <sup>-1</sup> ) in mustard Mar 2022	9	18	37.63	4.18	39.10**
Soil salinity (dS m <sup>-1</sup> ) in mustard Apr 2022	9	18	39.06	4.34	10.80**
Soil salinity (dS m <sup>-1</sup> ) in mustard May 2022	9	18	80.44	8.94	14.32**
Soil salinity (dS m <sup>-1</sup> ) in garlic Dec 2021	9	18	5.13	0.57	30.18**
Soil salinity (dS m <sup>-1</sup> ) in garlic Jan 2022	9	18	31.89	3.54	50.62**
Soil salinity (dS m <sup>-1</sup> ) in garlic Feb 2022	9	18	49.51	5.50	67.86**

Soil salinity (dS m <sup>-1</sup> ) in garlic Mar 2022	9	18	86.61	9.62	88.17**
Soil salinity (dS m <sup>-1</sup> ) in garlic Apr 2022	9	18	32.87	3.65	4.66**
Soil salinity (dS m <sup>-1</sup> ) in garlic May 2022	9	18	110.75	12.31	12.52**
Tuber yield (t ha <sup>-1</sup> ) in potato	9	18	722.97	80.33	15.33**
Seed yield (t ha <sup>-1</sup> ) in mustard	9	18	1.61	0.18	4.70**
Bulb yield (t ha <sup>-1</sup> ) in garlic	9	18	53.11	5.90	13.70**
Seed yield (t ha <sup>-1</sup> ) of green gram after potato	9	18	1.27	0.14	15.37**
Seed yield (t ha <sup>-1</sup> ) of green gram after mustard	9	18	0.65	0.07	6.27**
Seed yield (t ha <sup>-1</sup> ) of green gram after garlic	9	18	0.04	0.004	4.31**
Rice equivalent yield (t ha <sup>-1</sup> ) of cropping systems	12	24	2440.44	203.37	65.12**
Cost of cultivation (\$ ha <sup>-1</sup> ) of cropping systems	12	24	25548838.70	2129069.89	170144.14**
Gross return (\$ ha <sup>-1</sup> ) of cropping systems	12	24	77875807.02	6489650.58	329.23**
Net return (\$ ha <sup>-1</sup> ) of cropping systems	12	24	31000029.91	2583335.83	137.87**
Benefit cost ratio of cropping systems	12	24	4.24	0.35	130.21**
Total OC (g kg <sup>-1</sup> ) in potato plot	9	18	4.98	0.55	26.43**
Very labile C (g kg <sup>-1</sup> ) in potato plot	9	18	0.49	0.05	36.62**
Labile C (g kg <sup>-1</sup> ) in potato plot	9	18	0.22	0.02	38.05**
Less labile C (g kg <sup>-1</sup> ) in potato plot	9	18	0.48	0.05	26.38**
Non-labile C (g kg <sup>-1</sup> ) in potato plot	9	18	0.14	0.02	10.78**
Lability Index in potato plot	9	18	0.01	0.001	113.57**
Carbon pool index in potato plot	9	18	0.25	0.03	24.30**
Carbon management index in potato plot	9	18	6840.02	760.00	32.15**
Total OC (g kg <sup>-1</sup> ) in mustard plot	9	18	0.30	0.03	9.50**
Very labile C (g kg <sup>-1</sup> ) in mustard plot	9	18	0.04	0.004	17.97**
Labile C (g kg <sup>-1</sup> ) in mustard plot	9	18	0.01	0.001	15.18**
Less labile C (g kg <sup>-1</sup> ) in mustard plot	9	18	0.04	0.005	4.83**
Non-labile C (g kg <sup>-1</sup> ) in mustard plot	9	18	0.006	0.001	2.08

Lability Index in mustard plot	9	18	0.003	0.0003	20.55**
Carbon pool index in mustard plot	9	18	0.01	0.002	9.50**
Carbon management index in mustard plot	9	18	506.79	56.31	12.95**
Total OC (g kg <sup>-1</sup> ) in garlic plot	9	18	0.75	0.08	8.44**
Very labile C (g kg <sup>-1</sup> ) in garlic plot	9	18	0.08	0.01	13.28**
Labile C (g kg <sup>-1</sup> ) in garlic plot	9	18	0.04	0.005	16.49**
Less labile C (g kg <sup>-1</sup> ) in garlic plot	9	18	0.09	0.01	11.89**
Non-labile C (g kg <sup>-1</sup> ) in garlic plot	9	18	0.01	0.002	0.99
Lability Index in garlic plot	9	18	0.005	0.001	79.51**
Carbon pool index in garlic plot	9	18	0.04	0.004	8.42**
Carbon management index in garlic plot	9	18	1208.98	134.33	13.96**
<b>2022-23</b>					
Weed biomass (g m <sup>-2</sup> ) in potato	9	18	114.83	12.76	210.38**
Weed biomass (g m <sup>-2</sup> ) in mustard	9	18	4.22	0.47	53.61**
Weed biomass (g m <sup>-2</sup> ) in garlic	9	18	1830.78	203.42	447.63**
Soil salinity (dS m <sup>-1</sup> ) in potato Dec 2022	9	18	6.79	0.75	19.58**
Soil salinity (dS m <sup>-1</sup> ) in potato Jan 2023	9	18	35.78	3.98	75.35**
Soil salinity (dS m <sup>-1</sup> ) in potato Feb 2023	9	18	76.36	8.48	33.58**
Soil salinity (dS m <sup>-1</sup> ) in potato Mar 2023	9	18	156.79	17.42	100.96**
Soil salinity (dS m <sup>-1</sup> ) in potato Apr 2023	9	18	144.62	16.07	63.88**
Soil salinity (dS m <sup>-1</sup> ) in potato May 2023	9	18	217.11	24.12	83.10**
Soil salinity (dS m <sup>-1</sup> ) in mustard Dec 2022	9	18	15.10	1.68	120.97**
Soil salinity (dS m <sup>-1</sup> ) in mustard Jan 2023	9	18	18.70	2.08	27.51**
Soil salinity (dS m <sup>-1</sup> ) in mustard Feb 2023	9	18	33.72	3.75	36.38**
Soil salinity (dS m <sup>-1</sup> ) in mustard Mar 2023	9	18	46.62	5.18	73.01**
Soil salinity (dS m <sup>-1</sup> ) in mustard Apr 2023	9	18	60.67	6.74	27.29**
Soil salinity (dS m <sup>-1</sup> ) in mustard May 2023	9	18	106.62	11.85	25.89**
Soil salinity (dS m <sup>-1</sup> ) in garlic Dec 2022	9	18	11.60	1.29	62.38**
Soil salinity (dS m <sup>-1</sup> ) in garlic Jan 2023	9	18	46.69	5.19	113.42**

Soil salinity (dS m <sup>-1</sup> ) in garlic Feb 2023	9	18	69.17	7.69	94.71**
Soil salinity (dS m <sup>-1</sup> ) in garlic Mar 2023	9	18	123.12	13.68	95.21**
Soil salinity (dS m <sup>-1</sup> ) in garlic Apr 2023	9	18	102.61	11.40	27.75**
Soil salinity (dS m <sup>-1</sup> ) in garlic May 2023	9	18	180.09	20.01	24.98**
Tuber yield (t ha <sup>-1</sup> ) in potato	9	18	768.89	85.43	27.48**
Seed yield (t ha <sup>-1</sup> ) in mustard	9	18	2.27	0.25	6.05**
Bulb yield (t ha <sup>-1</sup> ) in garlic	9	18	72.95	8.11	10.27**
Seed yield (t ha <sup>-1</sup> ) of green gram after potato	9	18	0.59	0.07	7.12**
Seed yield (t ha <sup>-1</sup> ) of green gram after mustard	9	18	0.18	0.02	13.23**
Seed yield (t ha <sup>-1</sup> ) of green gram after garlic	9	18	0.02	0.002	1.85
Rice equivalent yield (t ha <sup>-1</sup> ) of cropping systems	12	24	1729.62	144.13	79.64**
Cost of cultivation (\$ ha <sup>-1</sup> ) of cropping systems	12	24	23439253.11	1953271.09	1741.06**
Gross return (\$ ha <sup>-1</sup> ) of cropping systems	12	24	94595126.73	7882927.23	1774.78**
Net return (\$ ha <sup>-1</sup> ) of cropping systems	12	24	50038762.32	4169896.86	3784.43**
Benefit cost ratio of cropping systems	12	24	7.06	0.59	6624.47**
Total OC (g kg <sup>-1</sup> ) in potato plot	9	18	19.51	2.17	29.71**
Very labile C (g kg <sup>-1</sup> ) in potato plot	9	18	1.64	0.18	35.49**
Labile C (g kg <sup>-1</sup> ) in potato plot	9	18	0.74	0.08	36.39**
Less labile C (g kg <sup>-1</sup> ) in potato plot	9	18	1.87	0.21	30.75**
Non-labile C (g kg <sup>-1</sup> ) in potato plot	9	18	0.84	0.09	20.33**
Lability Index in potato plot	9	18	0.01	0.001	113.57**
Carbon pool index in potato plot	9	18	1.03	0.11	28.70**
Carbon management index in potato plot	9	18	25234.12	2803.79	33.62**
Total OC (g kg <sup>-1</sup> ) in mustard plot	9	18	3.84	0.43	13.73**
Very labile C (g kg <sup>-1</sup> ) in mustard plot	9	18	0.31	0.03	16.67**
Labile C (g kg <sup>-1</sup> ) in mustard plot	9	18	0.13	0.01	15.75**
Less labile C (g kg <sup>-1</sup> ) in mustard plot	9	18	0.38	0.04	14.66**
Non-labile C (g kg <sup>-1</sup> ) in mustard plot	9	18	0.20	0.02	7.26**

Lability Index in mustard plot	9	18	0.003	0.0003	20.55**
Carbon pool index in mustard plot	9	18	0.22	0.02	12.60**
Carbon management index in mustard plot	9	18	5018.08	557.56	14.87**
Total OC (g kg <sup>-1</sup> ) in garlic plot	9	18	6.84	0.76	20.51**
Very labile C (g kg <sup>-1</sup> ) in garlic plot	9	18	0.55	0.06	24.43**
Labile C (g kg <sup>-1</sup> ) in garlic plot	9	18	0.26	0.03	26.40**
Less labile C (g kg <sup>-1</sup> ) in garlic plot	9	18	0.67	0.07	18.29**
Non-labile C (g kg <sup>-1</sup> ) in garlic plot	9	18	0.30	0.03	12.42
Lability Index in garlic plot	9	18	0.005	0.001	79.51**
Carbon pool index in garlic plot	9	18	0.41	0.05	18.74**
Carbon management index in garlic plot	9	18	9943.31	1104.81	21.15**

\*Significant at  $p<0.05$ ; \*\*Significant at  $p<0.001$