nature food

Article https://doi.org/10.1038/s43016-024-00940-z

Co-benefits for net carbon emissions and rice yields through improved management of organic nitrogen and water

In the format provided by the authors and unedited

Supplementary text

Data calculations

The global warming potential (GWP) was calculated as CO_2-equivalents, based on radiative forcing of greenhouse gases at 100-year time scale, and the GWP is calculated as follow (IPCC, 2013):

$$GWP = 25 \times CH_4 + 265 \times N_2O$$

The net GWP indicated a balance of CO_2-equivalents between GWP and SOC sequestration. Here, the SOC sequestration was normalized to the top 20 cm depth. The NGWPI was net GWP intensity, and calculated as net GWP per Mg grain yield (Mosier et al., 2006).

$$\text{Net GWP} = \text{GWP} - 44/12 \times \text{SOC sequestration}$$

$$\text{NGWPI} = \text{Net GWP/grain yield}$$

Random Forest Model

Random forest model (RF) is a machine learning algorithm, and has built-in variable importance assessment and error monitoring while it is not rigorous in distributional assumptions for data. The RF consisted classification or regression trees that are created via recursive partitioning of the data space, wherein each partition was fit with a simple prediction. Each tree was constructed using a bootstrap sample, and the split at each node was selected from a random dataset as independent trees (Breiman, 2001). In general, approximately one-third of instances were left out in each tree and they were the ‘out-of-bag’ (OOB) data. The OOB data were used to estimate the mean squared error (MSE).

References

Breiman, L., (2001). Random Forests. Mach Learn 45, 5-32 https://doi.org/10.1023/A:1010933404324.

IPCC, (2013). Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, United Kingdom.

Mosier, A.R., Halvorson, A.D., Reule, C.A., Liu, X.J., (2006). Net global warming potential and greenhouse gas intensity in irrigated cropping systems in northeastern Colorado. J. Environ. Qual. 35, 1584-1598 https://doi.org/10.2134/jeq2005.0232.

Supplementary table

Table S1 The Variance Inflation Factor (VIF) of explanatory variables for rice yield, CH_4 emission, N_2O emission and SOC in the meta-analysis.

Management	Target variable	Categorical variables	VIF	Numeric variables	VIF
SN	Rice yield	Organic N ratio	1.44	MAT	3.51
		Organic N source	1.28	MAP	2.88
		Cropping system	1.21	Soil clay content	1.20
		Duration	1.26	Soil pH	2.08
				Initial SOC concentration	2.13
				C:N ratio in organic N source	2.98
				Organic C input	3.34
				Organic N input	3.49
				Synthetic N input	1.80
	CH_4 emission	Organic N ratio	1.44	MAT	6.76
		Organic N source	1.28	MAP	3.14
		Cropping system	1.21	Soil clay content	1.11
		Duration	1.26	Soil pH	2.23
				Initial SOC concentration	3.16
				C:N ratio in organic N source	3.02
				Organic C input	5.13
				Organic N input	6.88
				Synthetic N input	2.30
	N_2O emission	Organic N ratio	1.72	MAT	5.25
		Organic N source	1.55	MAP	4.42
		Cropping system	1.56	Soil clay content	1.35
		Duration	1.53	Soil pH	1.79
				Initial SOC concentration	3.26
				C:N ratio in organic N source	2.60
				Organic C input	3.62
				Organic N input	4.90
				Synthetic N input	2.32
	SOC	Organic N ratio	1.71	MAT	5.63
		Organic N source	1.36	MAP	2.81
		Cropping system	2.15	Soil clay content	1.81
		Duration	2.15	Soil pH	1.99
				Initial SOC concentration	2.11
				C:N ratio in organic N source	3.24

				Organic C input	6.06
				Organic N input	9.22
				Synthetic N input	2.76
AN	Rice yield	Organic N ratio	2.11	MAT	1.85
		Organic N source	1.58	MAP	1.27
		Cropping system	1.87	Soil clay content	1.60
		Duration	1.22	Soil pH	1.43
				Initial SOC concentration	1.64
				C:N ratio in organic N source	2.27
				Organic C input	2.50
				Organic N input	2.61
				Synthetic N input	1.41
	CH_4 emission	Organic N ratio	2.11	MAT	2.81
		Organic N source	1.58	MAP	3.07
		Cropping system	1.87	Soil clay content	1.81
		Duration	1.22	Soil pH	2.03
				Initial SOC concentration	1.33
				C:N ratio in organic N source	2.09
				Organic C input	2.23
				Organic N input	2.57
				Synthetic N input	1.58
	N_2O emission	Organic N ratio	1.87	MAT	3.80
		Organic N source	2.51	MAP	3.60
		Cropping system	2.10	Soil clay content	1.74
		Duration	1.40	Soil pH	2.16
				Initial SOC concentration	1.58
				C:N ratio in organic N source	2.48
				Organic C input	2.24
				Organic N input	2.88
				Synthetic N input	2.48
	SOC	Organic N ratio	1.58	MAT	4.30
		Organic N source	1.79	MAP	/
		Cropping system	1.66	Soil clay content	1.42
		Duration	1.35	Soil pH	1.49
				Initial SOC concentration	6.90
				C:N ratio in organic N source	2.60
				Organic C input	3.67
				Organic N input	4.33
				Synthetic N input	3.66

Supplementary figure

Fig. S1 Distribution of study sites and main rice production regions on the globe. The abbreviation SN stands for substitution of synthetic N with organic N source and AN represents addition of extra organic N source to synthetic N. The reference represents synthetic N fertilization alone.

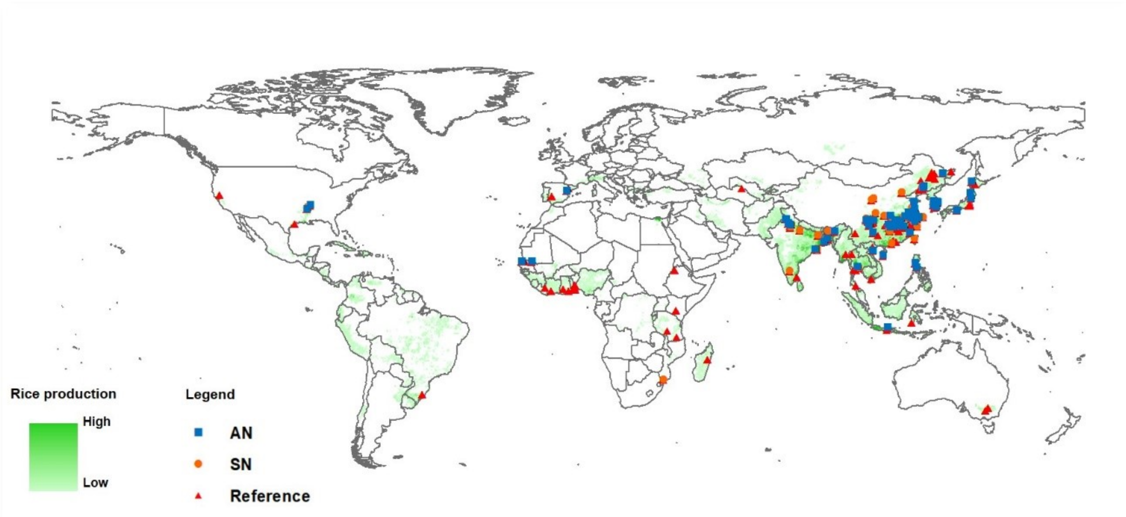


Fig. S2 The relative importance of variables to effect sizes of rice yield (a, e), CH_4 emission (b, f), N_2O emission (c, g), SOC (d, h) for different organic N fertilization managements, respectively. a-d, AN; e-h, SN. The abbreviation SN (orange) stands for substitution of synthetic N with organic N source and AN (blue) represents addition of extra organic N source to synthetic N. MAT, mean annual temperature; MAP, mean annual precipitation; SOC, soil organic carbon.

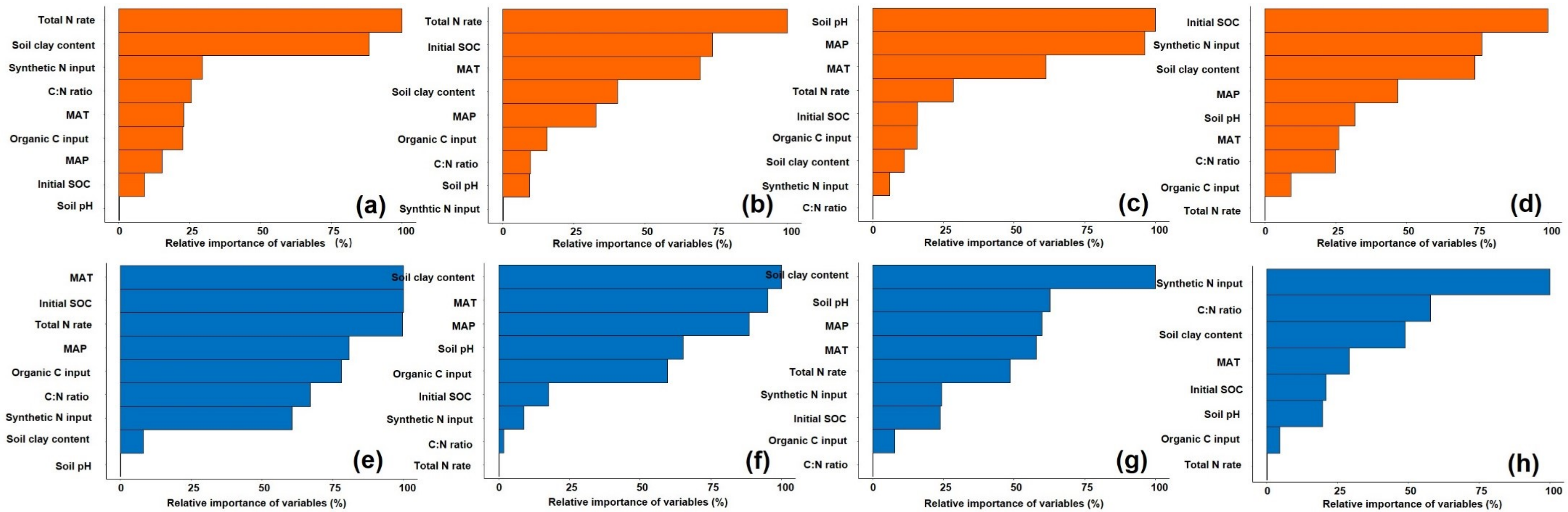
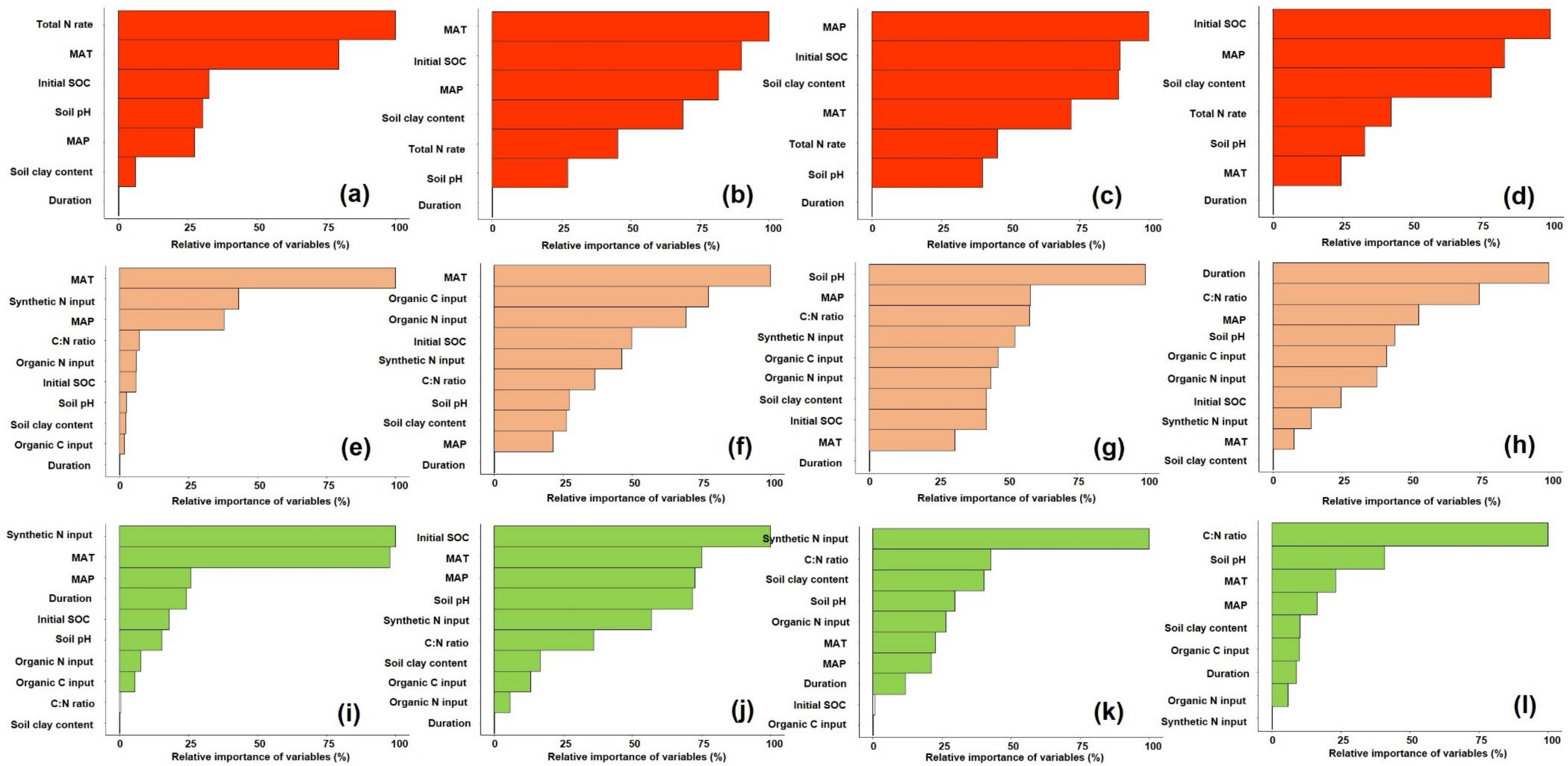


Fig. S3 The relative importance of variables to rice yield (a, e, i), CH_4 emission (b, f, j), N_2O emission (c, g, k), SOC (d, h, l) for different fertilization and water managements, respectively. a-d, BAU; e-h, CF; i-l, IF. BAU, business as usual; CF, conventional flooding; IF, intermittent flooding. MAT, mean annual temperature; MAP, mean annual precipitation; SOC sequestration, soil organic carbon sequestration rate.



Extended reference lists

1. For meta-analysis

ID	References
1	Abao, E.B., Bronson, K.F., Wassmann, R. and Singh, U. Simultaneous records of methane and nitrous oxide emissions in rice-based cropping systems under rainfed conditions. Nutr. Cycl. Agroecosys. 58, 131-139 (2000).
2	Adhya, T.K., Bharati, K., Mohanty, S.R., Ramakrishnan, B., Rao, V.R., Sethunathan, N. and Wassmann, R. Methane emission from rice fields at Cuttack, India. Nutr. Cycl. Agroecosys. 58, 95-105 (2000).
3	Aulakh, M.S., Khera, T.S., Doran, J.W. and Bronson, K.F. Denitrification, N_2O and CO_2 fluxes in rice-wheat cropping system as affected by crop residues, fertilizer N and legume green manure. Biol. Fertility Soils 34, 375-389 (2001).
4	Bharali, A., Baruah, K.K., Baruah, S.G. and Bhattacharyya, P. Impacts of integrated nutrient management on methane emission, global warming potential and carbon storage capacity in rice grown in a northeast India soil. Environ Sci. Pollut. R. 25, 5889-5901 (2018).
5	Bharati, K., Mohanty, S.R., Singh, D.P., Rao, V.R. and Adhya, T.K. Influence of incorporation or dual cropping of Azolla on methane emission from a flooded alluvial soil planted to rice in eastern India. Agr. Ecosyst. Environ. 79, 73-83 (2000).
6	Bhatia, A., Pathak, H., Jain, N., Singh, P.K. and Singh, A.K. Global warming potential of manure amended soils under rice-wheat system in the Indo-Gangetic plains. Atmos. Environ. 39, 6976-6984 (2005).
7	Bhattacharyya, P., Nayak, A.K., Mohanty, S., Tripathi, R., Shahid, M., Kumar, A., Raja, R., Panda, B.B., Roy, K.S., Neogi, S., Dash, P.K., Shukla, A.K. and Rao, K.S. Greenhouse gas emission in relation to labile soil C, N pools and functional microbial diversity as influenced by 39 years long-term fertilizer management in tropical rice. Soil Till Res. 129, 93-105 (2013).
8	Bhattacharyya, P., Roy, K.S., Neogi, S., Adhya, T.K., Rao, K.S. and Manna, M.C. Effects of rice straw and nitrogen fertilization on greenhouse gas emissions and carbon storage in tropical flooded soil planted with rice. Soil Till Res. 124, 119-130 (2012).
9	Chareonsilp, N., Buddhaboon, C., Promnart, P., Wassmann, R. and Lantin, R.S. Methane emission from deep water rice fields in Thailand. Nutr. Cycl. Agroecosys. 58, 121-130 (2000).
10	Corton, T.M., Bajita, J.B., Grospe, F.S., Pamplona, R.R., Assis, C.A., Wassmann, R., Lantin, R.S. and Buendia, L.V. Methane emission from irrigated and intensively managed rice fields in Central Luzon (Philippines). Nutr. Cycl. Agroecosys. 58, 37-53 (2000).
11	Dash, P.K., Bhattacharyya, P., Shahid, M., Roy, K.S., Swain, C.K., Tripathi, R. and Nayak, A.K. Low carbon resource conservation techniques for energy savings, carbon gain and lowering GHGs emission in lowland transplanted rice. Soil Till Res. 174, 45-57 (2017).
12	Datta, A., Yeluripati, J.B., Nayak, D.R., Mahata, K.R., Santra, S.C. and Adhya, T.K. Seasonal variation of methane flux from coastal saline rice field with the application of

	different organic manures. Atmos. Environ. 66, 114-122 (2013).
13	Fumoto, T., Yanagihara, T., Saito, T. and Yagi, K. Assessment of the methane mitigation potentials of alternative water regimes in rice fields using a process-based biogeochemistry model. Global Change Biology 16, 1847-1859 (2010).
14	Haque, M.M., Biswas, J.C., Hwang, H.Y. and Kim, P.J. Annual net carbon budget in rice soil. Nutr. Cycl. Agroecosys. 116, 31-40 (2020).
15	Haque, M.M., Kim, S.Y., Kim, G.W. and Kim, P.J. Optimization of removal and recycling ratio of cover crop biomass using carbon balance to sustain soil organic carbon stocks in a mono-rice paddy system. Agr. Ecosyst. Environ. 207, 119-125 (2015).
16	Hu, Q., Liu, T., Jiang, S., Cao, C., Li, C., Chen, B. and Liu, J. Combined effects of straw returning and chemical N fertilization on greenhouse gas emissions and yield from paddy fields in northwest Hubei province, China. J. Soil Sci. Plant Nut. 20, 392-406 (2020).
17	Hu, Y.-l., Tang, S.-r., Tao, K., He, Q.-x., Tian, W., Qing, X.-h., Wu, Y.-z. and Meng, L. Effects of optimizing fertilization on N_2O and CH_4 emissions in a paddy-cowpea rotation system in the tropical region of China. Huanjing Kexue 40, 5182-5190 (2019).
18	Jain, M.C., Kumar, S., Wassmann, R., Mitra, S., Singh, S.D., Singh, J.P., Singh, R., Yadav, A.K. and Gupta, S. Methane emissions from irrigated rice fields in northern India (New Delhi). Nutr. Cycl. Agroecosys. 58, 75-83 (2000).
19	Janz, B., Weller, S., Kraus, D., Racela, H.S., Wassmann, R., Butterbach-Bahl, K. and Kiese, R. Greenhouse gas footprint of diversifying rice cropping systems: Impacts of water regime and organic amendments. Agr. Ecosyst. Environ. 270, 41-54 (2019).
20	Jeong, S.T., Kim, G.W., Hwang, H.Y., Kim, P.J. and Kim, S.Y. Beneficial effect of compost utilization on reducing greenhouse gas emissions in a rice cultivation system through the overall management chain. Sci. Total Environ. 613, 115-122 (2018).
21	Kim, J., Yoo, G., Kim, D., Ding, W. and Kang, H. Combined application of biochar and slow-release fertilizer reduces methane emission but enhances rice yield by different mechanisms. Applied Soil Ecology 117, 57-62 (2017).
22	Kim, S.Y., Lee, C.H., Gutierrez, J. and Kim, P.J. Contribution of winter cover crop amendments on global warming potential in rice paddy soil during cultivation. Plant Soil 366, 273-286 (2013).
23	Kong, D., Li, S., Jin, Y., Wu, S., Chen, J., Hu, T., Wang, H., Liu, S. and Zou, J. Linking methane emissions to methanogenic and methanotrophic communities under different fertilization strategies in rice paddies. Geoderma 347, 233-243 (2019).
24	Ma, Y., Liu, D.L., Schwenke, G. and Yang, B. The global warming potential of straw-return can be reduced by application of straw-decomposing microbial inoculants and biochar in rice-wheat production systems. Environ. Pollut. 252, 835-845 (2019).
25	Mai Van, T., Tesfai, M., Borrell, A., Nagothu, U.S., Thi Phuong Loan, B., Vu Duong, Q. and Le Quoc, T. Effect of organic, inorganic and slow-release urea fertilizers on CH_4 and N_2O emissions from rice paddy fields. Paddy and Water Environment 15, 317-330 (2017).
26	Maneepitak, S., Ullah, H., Datta, A., Shrestha, R.P., Shrestha, S. and Kachenchart, B. Effects of water and rice straw management practices on water savings and greenhouse gas emissions from a double-rice paddy field in the Central Plain of Thailand. Eur. J. Agron. 107, 18-29 (2019).
27	Maris, S.C., Teira-Esmatges, M.R., Bosch-Serra, A.D., Moreno-Garcia, B. and Catala,

	M.M. Effect of fertilizing with pig slurry and chicken manure on GHG emissions from Mediterranean paddies. Sci. Total Environ. 569, 306-320 (2016).
28	Minamikawa, K. and Sakai, N. The practical use of water management based on soil redox potential for decreasing methane emission from a paddy field in Japan. Agr. Ecosyst. Environ. 116, 181-188 (2006).
29	Mohanty, S., Swain, C.K., Sethi, S.K., Dalai, P.C., Bhattachrayya, P., Kumar, A., Tripathi, R., Shahid, M., Panda, B.B., Kumar, U., Lal, B., Gautam, P., Munda, S. and Nayak, A.K. Crop establishment and nitrogen management affect greenhouse gas emission and biological activity in tropical rice production. Ecol. Eng. 104, 80-98 (2017).
30	Rogers, C.W., Smartt, A.D., Brye, K.R. and Norman, R.J. Nitrogen Source Effects on Methane emissions from drill-seeded, delayed-flood rice production. Soil Sci. 182, 9-17 (2017).
31	Sander, B.O., Samson, M. and Buresh, R.J. Methane and nitrous oxide emissions from flooded rice fields as affected by water and straw management between rice crops. Geoderma 235, 355-362 (2014).
32	Setyanto, P., Makarim, A.K., Fagi, A.M., Wassmann, R. and Buendia, L.V. Crop management affecting methane emissions from irrigated and rainfed rice in Central Java (Indonesia). Nutr. Cycl. Agroecosys. 58, 85-93 (2000).
33	Song, H.J., Lee, J.H., Jeong, H.-C., Choi, E.-J., Oh, T.-K., Hong, C.-O. and Kim, P.J. Effect of straw incorporation on methane emission in rice paddy: conversion factor and smart straw management. Applied Biological Chemistry 62 (2019).
34	Takakai, F., Ichikawa, J., Ogawa, M., Ogaya, S., Yasuda, K., Kobayashi, Y., Sato, T., Kaneta, Y. and Nagahama, K.-i. Suppression of CH_4 emission by rice straw removal and application of bio-ethanol production residue in a paddy field in akita, Japan. Agriculture-Basel 7 (2017).
35	Wang, H., Shen, M., Hui, D., Chen, J., Sun, G., Wang, X., Lu, C., Sheng, J., Chen, L., Luo, Y., Zheng, J. and Zhang, Y. Straw incorporation influences soil organic carbon sequestration, greenhouse gas emission, and crop yields in a Chinese rice (oryza sativa L.)-wheat (triticum aestivum L.) cropping system. Soil Till Res. 195 (2019).
36	Wassmann, R., Buendia, L.V., Lantin, R.S., Bueno, C.S., Lubigan, L.A., Umali, A., Nocon, N.N., Javellana, A.M. and Neue, H.U. Mechanisms of crop management impact on methane emissions from rice fields in Los Banos, Philippines. Nutr. Cycl. Agroecosys. 58, 107-119 (2000).
37	Wu, X., Wang, W., Xie, K., Yin, C., Hou, H. and Xie, X. Combined effects of straw and water management on CH_4 emissions from rice fields. J. Environ. Manage. 231, 1257-1262 (2019).
38	Cai, Z.C., Tsuruta, H. and Minami, K. Methane emission from rice fields in China: Measurements and influencing factors. J. Geophys. Res. 105, 17231-127242 (2000).
39	Zou, J., Huang, Y., Jiang, J., Zheng, X. and Sass, R.L. A 3-year field measurement of methane and nitrous oxide emissions from rice paddies in China: Effects of water regime, crop residue, and fertilizer application. Global Biogeochem. Cy. 19, GB2021 (2005).
40	Ma, J., Xu, H., Yagi, K. and Cai, Z.C. Methane emission from paddy soils as affected by wheat straw returning mode. Plant Soil 313, 167-174 (2008).
41	Zhang G B , Ma E D , Zhang X Y , et al. Effects of rice straw incorporation and land

	management in winter on methane emission during rice-growing season. Journal of Agro-Environment Science, 2009.
42	Xu Y C, Shen Q R, Li M L, et al. Effect of soil water status and mulching on N_2O and CH_4 emission from lowland rice field in China. Biology and Fertility of Soils, 2004, 39(3):215-217.
43	Lu, W.F., et al., Methane Emissions and Mitigation Options in Irrigated Rice Fields in Southeast China. Nutrient Cycling in Agroecosystems, 2000. 58(1): p. 65-73.
44	Qin X, Li Y, Liu K, et al. The effect of Long-term fertilization treatment on methane emission from rice field in Hunan. Chinese Journal of Agrometeorology, 2006.
45	Liu J J, Wu P P, Xie X L, et al. Methane emission from late rice fields in Hunan red soil under different long-term fertilizing systems. Acta Ecologica Sinica, 2008.
46	Ma, J., Xu, H., Cai, Z.C., Kazuyuki, Y. CH_4 and N_2O emissions from rice fields as affected by mulching of strips of wheat straws. Acta Pedologica Sinica, 2010, 47(1): 84-89
47	Ma, E., Ma, J., Xu, H., Cai, Z., Yagi, K. Effects of rice straw returning methods in wheat-growing season on CH_4 emissions from following rice-growing season. Ecology and Environmental Sciences, 2010, 19(3): 729-732
48	Hang Yuhao, Wang Qiangsheng, Xu Guochun, Liu Xin. 2017. Effects of water regimes and straw incorporation on greenhouse gas emissions in a rice-wheat cropping system [J]. Ecology and Environmental Sciences, 26(11): 1844-1855
49	Li et al. Effects of non-flooded with straw mulching management on methane emission and rice yield in paddy field. Journal of Agro-Environment Science, 2012, 31(10): 2053-2059.
50	Lin et al. CH_4 Emission characteristics of yellow-mud field under long-term fertilization in southern China and its greenhouse effect. Hunan Agricultural Sciences, 2014, 7: 35-37
51	Qin et al. Effects of straw mulching on greenhouse gas intensity under on-tillage conditions. Transactions of the Chinese Society of Agricultural Engineering, 2012, 28(6): 210-216
52	Wang et al. Effect of patterns of straw returning to field on methane and nitrous oxide emissions during rice-growing season in a rice-wheat double cropping system. Jiangsu Journal of Agricultural Sciences, 2014, 30(4): 758-763
53	Wu et al. Effects of different organic fertilizers on greenhouse gas emissions and yield in paddy soils. Transactions of the Chinese Society of Agricultural Engineering, 2018, 34(4): 162-169
54	Xiong et al. Effects of different long-term fertilization and crop residue management on methane emissions from paddy fields with purple soil. Journal of Southwest China Normal University, 2013, 38(5): 98-102
55	Zhang et al. Effects of years of straw return to soil on greenhouse gas emission in rice/wheat rotation systems. Chinese Journal of Eco-Agriculture, 2015, 23(3): 302-308
56	Zhang et al. Preliminary study on effect of straw incorporation on net global warming potential in high production rice-wheat double cropping systems. Journal of Aro-Environment Science, 2012, 31(8): 1647-1653
57	Zhao et al. Impact of different fertilization practices on greenhouse gas emission from paddy field. Journal of Agro-Environment Science, 2014, 33(11): 2273-2278
58	Zhang, J., et al., Interactive effects of straw incorporation and tillage on crop yield and

	greenhouse gas emissions in double rice cropping system. Agriculture, Ecosystems & Environment, 2017. 250: p. 37-43.
59	Zhang, Z.S., et al., Effects of tillage practices and straw returning methods on greenhouse gas emissions and net ecosystem economic budget in rice–wheat cropping systems in central China. Atmospheric Environment, 2015. 122: p. 636-644.
60	Jiang, Y., et al., Lime application lowers the global warming potential of a double rice cropping system. Geoderma, 2018. 325: p. 1-8.
61	Zhang, Z., et al., The effects of rape residue mulching on net global warming potential and greenhouse gas intensity from no-tillage paddy fields. The Scientific World Journal, 2014. 2014: p. 1-9.
62	Ji, X., et al., The effect of rice straw incorporation into paddy soil on carbon sequestration and emissions in the double cropping rice system. Journal of the Science of Food and Agriculture, 2012. 92(5): p. 1038-1045.
63	Wang, C., et al., Greenhouse gas emissions in response to straw incorporation, water management and their interaction in a paddy field in subtropical central China. Archives of Agronomy and Soil Science, 2017. 63(2): p. 171-184.
64	Xu, S., et al., Treated domestic sewage irrigation significantly decreased the CH_4, N_2O and NH_3 emissions from paddy fields with straw incorporation. Atmospheric Environment, 2017. 169: p. 1-10.
65	TANG, H.M., et al., Methane and nitrous oxide emissions as affected by long-term fertilizer management from double-cropping paddy fields in Southern China. The Journal of Agricultural Science, 2016. 154(8): p. 1378-1391.
66	Wang, W., et al., Mitigating effects of ex situ application of rice straw on CH_4 and N_2O emissions from paddy-upland coexisting system. Scientific Reports, 2016. 6(1).
67	Zhang, Z.S., et al., Effects of nitrogen fertilizer sources and tillage practices on greenhouse gas emissions in paddy fields of central China. Atmospheric Environment, 2016. 144: p. 274-281.
68	Gao, X., et al., Mushroom residue application affects CH_4 and N_2O emissions from fields under rice-wheat rotation. Archiv für Acker- und Pflanzenbau und Bodenkunde, 2017. 63(6): p. 748-760.
69	Liu, W., et al., Greenhouse gas emissions, soil quality, and crop productivity from a mono-rice cultivation system as influenced by fallow season straw management. Environmental Science and Pollution Research, 2016. 23(1): p. 315-328.
70	Yang Z, Lu Y, Zhang F, et al. Comparative analysis of the effects of straw-returning and decomposed manure on paddy soil fertility betterment. Transactions of the Chinese Society of Agricultural Engineering, 2008, 24(3):214-218.
71	Meng et al. Effects of partial mineral nitrogen substitution by organic fertilizer nitrogen on the yields of rice grains and their proper substitution rate. Scientia Agricultura Sinica, 2009, 40(2): 532-542
72	Li et al. Effect of combined application of organic and inorganic fertilizers on greenhouse gases exchange and comprehensive global warming potential in paddy fields. Journal of Soil and Water Conservation, 2013, 27(6): 298-304
73	Zhao et al. Effects of organic manure partial substitution for chemical fertilizer on crop yield and soil microbiome in a rice-wheat cropping system. Journal of Nanjing

	Agricultural University, 2016, 39(4): 594-602
74	Li et al. Effects of organic fertilizers on yield and quality of rice grains and nitrogen use efficiency. Hunan Agricultural Sciences, 2010, 36(3): 258-262
75	Liu et al. Effects of different organic-inorganic fertilizer combination ratios on rice yield and nutrient loss with surface runoff. Chinese Journal of Ecology, 2017, 36(2): 405-412
76	Guo. Effect of fertilization management on greenhouse gas emissions and soil microbial properties in rice-wheat rotation system. Thesis of master's degree, Chinese Academy of Agricultural Sciences, 2015.
77	Zhang. Gaseous loss and balance of nitrogen from paddy field in irrigation area of the upper Yellow River. Thesis of doctor's degree, Chinese Academy of Agricultural Sciences, 2011.
78	Guan. Effects of fertilizer application modes on yield and nutrient uptake of rice and wheat and soil biological properties. Thesis of doctor's degree, Huazhong Agricultural University, 2012.
79	Zhao. Study on the characteristics of N accumulation and leaching in different farmlands in the Yellow River irrigation region of Ningxia. Thesis of doctor's degree, Chinese Academy of Agricultural Sciences, 2012
80	Yang. Observation of net global warming potential under different nitrogen managements in annual rice-wheat rotation systems. Thesis of doctor's degree, Nanjing Agricultural University, 2015.
81	Wang et al. Effects of combined applications of pig manure and chemical fertilizers on CH_4 and N_2O emissions and their global warming potentials in paddy fields with double-rice cropping. Environmental Science, 2014, 35(8): 3120-3127
82	He et al. Effects of fertilization reduction and organic fertilizer replacement on rice yield and nutrient utilization. Hunan Agricultural Sciences, 2017, 3: 31-34
83	Guo. Studies on optimized nutrient management for rice yield and its physiological and ecological mechanisms. Thesis of doctor's degree, Nanjing Agricultural University, 2015.
84	Sun et al. Effects of pig manure and biogas slurry application on CH_4 and N_2O emissions and their greenhouse effects on paddy field. Journal of China Agricultural University, 2012, 17(5): 124-131
85	Zhang. Study on the effects and mechanism of reducing nitrogen application in paddy field. Thesis of master's degree, Academy of Agricultural Sciences, 2010.
86	Liu et al. Effects of different combined application ratio of organic-inorganic fertilization on CH_4 and N_2O emissions in paddy season. Ecology and Environmental Sciences, 2016, 25(5): 808-814
87	Yuan et al. Assessing environmental impacts of organic and inorganic fertilizer on daily and seasonal Greenhouse Gases effluxes in rice field. Atmospheric Environment, 2017, 155, 119-128
88	Zhao et al. Effects of organic−inorganic compound fertilizer with reduced chemical fertilizer application on crop yields, soil biological activity and bacterial community structure in a rice–wheat cropping system. Applied Soil Ecology, 2016, 99, 1-12
89	Li. Nitrogen dynamics in paddy field after irrigation of biogas slurry and its impact on the environment. Thesis of master's degree, Zhejiang University, 2011
90	Guan, et al. Effects of chemical fertilizer applied combing with organic manure on yield

	of rice and nitrogen using efficiency. Chinese Agricultural Science Bulletin, 2009, 25(1): 88-92
91	Li et al. Effects of pig manure application on ammonia volatilization in soil during rice season in Chengdu Plain. Journal of Agro-Environment Science, 2015, 34(11): 2236-2244
92	Ru. Effects of organic manuring with chemical nitrogen fertilizer on nitrogen transformation in soils and nitrogen use efficiency in the rice-rice cropping system. Thesis of master's degree, Zhejiang University, 2015.
93	Kong et al. Effects of integrated fertilization with commercial organic manure and chemical fertilizers on heavy metal balance in soil-rice cropping system. Chinese Journal of Rice Science, 2006, 5: 517-523
94	Zhang et al. Effects of combined application of organic fertilizer and chemical fertilizer on double cropping rice nutrient utilization and leaching loss from paddy soil. Journal of Soil and Water Conservation, 2012, 26(1): 22-27
95	Qin. Greenhouse gases (CH_4 and N_2O) emission from rice and vegetable fields under conventional and organic cropping regimes in Southeast China. Thesis of doctor's degree, Nanjing Agricultural University, 2012
96	Huo et al. The effects of organic manures application on methane emission and its simulation in paddy fields. Journal of Agro-Environment Science, 2013, 32(10): 2084-2092
97	Liu et al. Rice Yield, Nitrogen Use Efficiency （NUE） and Nitrogen Leaching Losses as Affected by Long-term Combined application of manure and chemical frtilizers in Yellow River Irrigated Region of Ningxia, China. Journal of Agro-Environment Science, 2015, 34(5): 947-954
98	Guo et al. Effect of fertilizer management on greenhouse gas emission and nutrient status in paddy soil. Journal of Plant Nutrition and Fertilizer, 2016, 22(2): 337-345
99	Zeng et al. Effect of swine manure application on wheat and rice yields, soil phosphorus accumulation and leaching risk. Journal of Hunan Agricultural University (Natural Sciences), 2016, 42(2): 202-207
100	Ji et al. Effects of long-term fertilization on storages and capacities of SOC in the paddy topsoil in Poyang Lake ecological area. Resources and Environment in the Yangze Basin, 2012, 21(2): 187-194
101	Zhu. Effects of different fertilization application methods on the ecosystem environment and the yield. Thesis of master's degree, Shanghaijiaotong University, 2014.
102	Ji. Effects of manure amendment on soil nitrate leaching potential and distribution of soil 15N natural abundance in paddy fields. Thesis of master's degree, Zhejiang University, 2014.
103	Das, S. and T.K. Adhya, Effect of combine application of organic manure and inorganic fertilizer on methane and nitrous oxide emissions from a tropical flooded soil planted to rice. Geoderma, 2014. 213: p. 185-192.
104	Das, B., et al., Effect of integrated nutrient management practice on soil aggregate properties, its stability and aggregate-associated carbon content in an intensive rice–wheat system. Soil and Tillage Research, 2014. 136: p. 9-18.
105	Zhao, Z., et al., Quantifying nitrogen loading from a paddy field in Shanghai, China with modified DNDC model. Agriculture, Ecosystems & Environment, 2014. 197: p. 212-221.

106	Nayak, A.K., et al., Long-term effect of different integrated nutrient management on soil organic carbon and its fractions and sustainability of rice–wheat system in Indo Gangetic Plains of India. Field Crops Research, 2012. 127: p. 129-139.
107	Yang, B., et al., Mitigating net global warming potential and greenhouse gas intensities by substituting chemical nitrogen fertilizers with organic fertilization strategies in rice–wheat annual rotation systems in China: A 3-year field experiment. Ecological Engineering, 2015. 81: p. 289-297.
108	Banger, K., et al., Impact of long-term additions of chemical fertilizers and farm yard manure on carbon and nitrogen sequestration under rice-cowpea cropping system in semi-arid tropics. Plant and Soil, 2009. 318(1-2): p. 27-35.
109	Gogoi, B., et al., Soil properties under rainfed rice (oryza sativa) crop as affected by integrated supply of nutrients. International Journal of Agriculture Innovations and Research, 2015. 3(6): p. 2319-1473.
110	Banger, K., et al., Impact of long-term additions of chemical fertilizers and farm yard manure on carbon and nitrogen sequestration under rice-cowpea cropping system in semi-arid tropics. Plant and Soil, 2009. 318(1-2): p. 27-35.
111	Chen, R., et al., Mitigating methane emissions from irrigated paddy fields by application of aerobically composted livestock manures in eastern China. Soil Use and Management, 2011. 27(1): p. 103-109.
112	Chang, E., et al., Effects of long-term treatments of different organic fertilizers complemented with chemical N fertilizer on the chemical and biological properties of soils. Soil science and plant nutrition (Tokyo), 2014. 60(4): p. 499-511.
113	Sharma, S.K., et al., Influence of rice varieties, nitrogen management and planting methods on methane emission and water productivity. Paddy and Water Environment, 2016. 14(2): p. 325-333.
114	Zhao, Z., et al., Assessing impacts of alternative fertilizer management practices on both nitrogen loading and greenhouse gas emissions in rice cultivation. Atmospheric Environment, 2015. 119: p. 393-401.
115	Hou et al. Effect of long-term located organic-inorganic fertilizer application on rice yield and soil fertility in red soil area of China. Scientia Agricultural Sinica, 2011, 44(3): 516-523
116	Bandyopadhyay, K.K. and M.C. Sarkar, Nitrogen use efficiency, ^{15}N balance, and nitrogen losses in flooded rice in an inceptisol. Communications in Soil Science and Plant Analysis, 2005. 36(11-12): p. 1661-1679.
117	Chen, D., et al., Nitrogen dynamics of anaerobically digested slurry used to fertilize paddy fields. Biology and Fertility of Soils, 2013. 49(6): p. 647-659.
118	Liu, T., et al., Effects of N fertilizer sources and tillage practices on NH_3 volatilization, grain yield, and N use efficiency of rice fields in central China. Frontiers in Plant Science, 2018. 9.
119	Zhang, M., et al., Integration of urea deep placement and organic addition for improving yield and soil properties and decreasing N loss in paddy field. Agriculture, Ecosystems & Environment, 2017. 247: p. 236-245.
120	Wang, Z.Y., et al., A Four-Year Record of Methane Emissions from Irrigated Rice Fields in the Beijing Region of China. Nutrient Cycling in Agroecosystems, 2000. 58(1): p. 55-

	63.
121	Qin, Y., et al., Methane and nitrous oxide emissions from organic and conventional rice cropping systems in Southeast China. Biology and Fertility of Soils, 2010. 46(8): p. 825-834.
122	Zou, J., et al., Integrated effect of incorporation with different organic manures on CH_4 and N_2O emissions from rice paddy. Huan Jing Ke Xue, 2003. 24(4): p. 7-12.
123	Ma, J., et al., Wheat straw management affects CH_4 and N_2O emissions from rice fields. Soil Biology and Biochemistry, 2009. 41(5): p. 1022-1028.
124	Wang, J., et al., Methane emissions from a rice agroecosystem in South China: Effects of water regime, straw incorporation and nitrogen fertilizer. Nutrient Cycling in Agroecosystems, 2012. 93(1): p. 103-112.
125	Yao, Z., et al., Nitrous oxide and methane fluxes from a rice–wheat crop rotation under wheat residue incorporation and no-tillage practices. Atmospheric Environment, 2013. 79: p. 641-649.
126	Hou, P., et al., Methane emissions from rice fields under continuous straw return in the middle-lower reaches of the Yangtze River. J Environ Sci (China), 2013. 25(9): p. 1874-81.
127	Wang, J., et al., Methane and nitrous oxide emissions as affected by organic–inorganic mixed fertilizer from a rice paddy in southeast China. Journal of Soils and Sediments, 2013. 13(8): p. 1408-1417.
128	Li, X., et al., Methane and nitrous oxide emissions from rice paddy soil as influenced by timing of application of hydroquinone and dicyandiamide. Nutrient Cycling in Agroecosystems, 2009. 85(1): p. 31-40.
129	Hang, X., et al., Differences in rice yield and CH_4 and N_2O emissions among mechanical planting methods with straw incorporation in Jianghuai area, China. Soil and Tillage Research, 2014. 144: p. 205-210.
130	Zhang, L., et al., Integrative effects of soil tillage and straw management on crop yields and greenhouse gas emissions in a rice–wheat cropping system. European Journal of Agronomy, 2015. 63: p. 47-54.
131	Liu, G., et al., Effects of straw incorporation along with microbial inoculant on methane and nitrous oxide emissions from rice fields. Science of The Total Environment, 2015. 518-519: p. 209-216.
132	Xiong, Z., et al., Differences in net global warming potential and greenhouse gas intensity between major rice-based cropping systems in China. Scientific Reports, 2016. 5(1).
133	Shen, J., et al., Contrasting effects of straw and straw-derived biochar amendments on greenhouse gas emissions within double rice cropping systems. Agriculture, Ecosystems & Environment, 2014. 188: p. 264-274.
134	Liu, Y., et al., Net global warming potential and greenhouse gas intensity from the double rice system with integrated soil−crop system management: A three-year field study. Atmospheric Environment, 2015. 116: p. 92-101.
135	Liang, X.Q., et al., Nitrogen management to reduce yield-scaled global warming potential in rice. Field Crops Research, 2013. 146: p. 66-74.
136	Gao, X., et al., Greenhouse gas intensity and net ecosystem carbon budget following the application of green manures in rice paddies. Nutrient Cycling in Agroecosystems, 2016.

	106(2): p. 169-183.
137	Zhang et al. Effects of wheat straw returning and soil tillage on CH_4 and N_2O emissions in paddy season. Ecology and Environmental Sciences, 2009, 18(6): 2334-2338
138	Liu, Q., et al., Carbon footprint of rice production under biochar amendment - a case study in a Chinese rice cropping system. GCB Bioenergy, 2016. 8(1): p. 148-159.
139	Liu, W., et al., Greenhouse gas emissions, soil quality, and crop productivity from a mono-rice cultivation system as influenced by fallow season straw management. Environmental Science and Pollution Research, 2016. 23(1): p. 315-328.
140	Zhang, Z., et al., Emissions of CH_4 and CO_2 from paddy fields as affected by tillage practices and crop residues in central China. Paddy and Water Environment, 2016. 14(1): p. 85-92.
141	Xu, G., et al., Integrated rice-duck farming mitigates the global warming potential in rice season. Science of The Total Environment, 2017. 575: p. 58-66.
142	Hu, N., et al., Effects of different straw returning modes on greenhouse gas emissions and crop yields in a rice–wheat rotation system. Agriculture, Ecosystems & Environment, 2016. 223: p. 115-122.
143	Sun, L., et al., Nitrogen fertilizer in combination with an ameliorant mitigated yield-scaled greenhouse gas emissions from a coastal saline rice field in southeastern China. Environmental Science and Pollution Research, 2018. 25(16): p. 15896-15908.
144	Jiang, J., et al., Assessment of reactive nitrogen mitigation potential of different nitrogen treatments under direct-seeded rice and wheat cropping system. Environmental Science and Pollution Research, 2018. 25(20): p. 20241-20254.
145	Kreye, C., et al., Fluxes of methane and nitrous oxide in water-saving rice production in north China. Nutrient Cycling in Agroecosystems, 2007. 77(3): p. 293-304.
146	Zhang, G.B., et al., Case study on effects of water management and rice straw incorporation in rice fields on production, oxidation, and emission of methane during fallow and following rice seasons. Soil Research, 2011. 49(3): p. 238.
147	Yao, Z., et al., Benefits of integrated nutrient management on N_2O and NO mitigations in water-saving ground cover rice production systems. Science of The Total Environment, 2019. 646: p. 1155-1163.
148	Yang, Y., et al., Winter tillage with the incorporation of stubble reduces the net global warming potential and greenhouse gas intensity of double-cropping rice fields. Soil and Tillage Research, 2018. 183: p. 19-27.
149	Wang et al. Effects of conservation tillage and balanced fertilization on nitrogen loss from paddy field and rice yields in Chaohu Region. Journal of Agro-Environment Science, 2010, 29(6): 1164-1171
150	Li et al. Effects of different fertilization treatments on runoff and leaching losses of nitrogen in paddy field. Journal of Soil and Water Conservation, 2016, 30(5): 23-28, 33
151	Chen et al. Characteristics of nitrogen and phosphorus runoff losses in organic and conventional rice-wheat rotation farm-land in Taihu Lake Region. Journal of Agro-Environment Science, 2016, 35(8): 1550-1558.
152	Xue, L., Y. Yu and L. Yang, Maintaining yields and reducing nitrogen loss in rice-wheat rotation system in Taihu Lake region with proper fertilizer management. Environmental research letters, 2014. 9(11): p. 115010.

153	Liu et al. Effects of straw-returning on annual overland runoff NPK loss in farmland. 2012, 21(6): 1031-1036
154	Zhou et al. Effects of bio-organic fertilizer on rice yield and soil fertility of supplementary cultivated land in hilly area. Tianjin Agricultural Sciences, 2017, 23(8): 98-101
155	Zheng et al. Yield effect of organic manure as substitution for nitrogen fertilizer in rice. Journal of Anhui Agricultural Sciences, 2017, 45(22): 32-33, 64
156	Zhang et al. Organic manure partial replacing chemical fertilizer: effect on supply ability and apparent budget of rice soil nitrogen. Journal of Agriculture, 2018, 8(12): 28-32
157	Cheng, W., Padre, A.T., Shiono, H., Sato, C., Toan, N.-S., Tawaraya, K. and Kumagai, K. Changes in the pH, EC, available P, SOC and TN stocks in a single rice paddy after long-term application of inorganic fertilizers and organic matters in a cold temperate region of Japan. J. Soils Sed. 17, 1834-1842 (2017).
158	Cui, Y.-f., Meng, J., Wang, Q.-x., Zhang, W.-m., Cheng, X.-y. and Chen, W.-f. Effects of straw and biochar addition on soil nitrogen, carbon, and super rice yield in cold waterlogged paddy soils of North China. J. Integr. Agr. 16, 1064-1074 (2017).
159	Wang et al. Agronomic and environmental effects of partial substitution of organic manure to chemical fertilizers in rice cropping system. Thesis of master's degree, Zhejiang University, 2019.
160	Wang et al. Effect of different organic fertilizer substitution for chemical fertilizer on rice production. Agriculture and Technology, 2018, 38(2): 3-4, 16.
161	Tian et al. Effect of different dosages of organic fertilizer combined with chemical fertilizer on growth and yield of rice. Heilongjiang Agricultural Sciences, 2019, 5: 31-35
162	Tao et al. Effects of application of commercial organic fertilizer on rice. Anhui Agricultural Science Bulletin, 2017, 23(6): 105-111
163	Sun et al. Experiment of organic fertilizer partial substitution for chemical fertilizer in rice. Zhejiang Agricultural Sciences, 2018, 59(12): 2256-2257
164	Sun et al. Effect of different organic fertilizer rate to yield and soil fertility. Sichuan Agricultural Science and Technology, 2018, 2: 50-52
165	Liu et al. Effect of combined application of organic and chemical fertilizer on rice yield and soil fertility. 2018, 59(5): 694-697
166	Lin et al. Studies on the important ecological effects of applying organic manure in the soil-rice system. Thesis of doctor's degree, Zhejiang University, 2018.
167	Liu et al. Study of optimized application ratio of organic and inorganic fertilizer in rice of Jiangsu. Modern Agricultural Science and Technology, 2018, 23: 27-28, 31
168	Li et al. Effects of basal application of organic fertilizer replacing inorganic N tillering fertilizer retroposition on rice yield and growth. Chinese Agricultural Science Bulletin, 2018, 34(4): 21-26
169	Ji et al. Exploration on the proportion of inorganic and organic fertilizers based on rice field experiment. China Agricultural Technology Extension, 2019, 35(3): 44-45
170	Huang et al. Exploration on the proportion of inorganic and organic fertilizers based on rice field experiment. Agricultural Technology and Equipment, 2018, 7:14-15
171	Chen et al. Effects of different rates of organic fertilizer application on rice growth and soil organic matter in winter paddy fields. Subtropical Agricultural Research, 2019, 15(4): 223-228

172	Chen et al. Application effects of swine and cow manures on rice yield nutrient uptakes and use efficiencies and soil fertility. Soils, 2018, 50(1): 59-65
173	Chen et al. Effect of long-term organic fertilizers application on rice yield, nitrogen and phosphorus use efficiency. Chinese Soils and Fertilizer, 2017, 1: 92-97
174	Chen et al. Study of organic nitrogen substituting for 20% chemical nitrogen on rice yield. Shanghai Agricultural Science and Technology, 2017, 6: 95-96
175	Hu. Effects of organic nutrient replacement part of fertilizer on rice growth and soil physical and chemical properties. Thesis of master's degree, Jiangxi Agricultural University, 2018.
176	Li. Safety application of organic manure partial substitution chemical nitrogen fertilizer and soil environmental capacity—taking lettuce and rice as examples. Thesis of master's degree, Zhejiang University, 2019.
177	Sui. Effect of different straw returning on carbon and nitrogen sequestration and rice growth and development. Thesis of doctor's degree, Shenyang Agricultural University, 2016.
178	Tang. Research on the optimum ratio of organic fertilizer replacing chemical fertilizer nitrogen and its effect. Thesis of master's degree, Hunan Agricultural University, 2019.
179	Banerjee, B., et al., Dynamics of organic carbon and microbial biomass in alluvial soil with tillage and amendments in rice-wheat systems. Environmental Monitoring and Assessment, 2006. 119(1-3): p. 173-189.
180	Chaudhary, S., G.S. Dheri and B.S. Brar, Long-term effects of NPK fertilizers and organic manures on carbon stabilization and management index under rice-wheat cropping system. Soil and Tillage Research, 2017. 166: p. 59-66.
181	DAS, B., et al., Evaluating fertilization effects on soil physical properties using a soil quality index in an intensive rice-wheat cropping system. Pedosphere, 2016. 26(6): p. 887-894.
182	Ghosh, S., et al., Organic amendments influence soil quality and carbon sequestration in the Indo-Gangetic plains of India. Agriculture, Ecosystems & Environment, 2012. 156: p. 134-141.
183	Choudhury, G.S., et al., Tillage and residue management effects on soil aggregation, organic carbon dynamics and yield attribute in rice–wheat cropping system under reclaimed sodic soil. Soil and Tillage Research, 2014. 136: p. 76-83.
184	Lee, S.B., et al., Changes of soil organic carbon and its fractions in relation to soil physical properties in a long-term fertilized paddy. 2009. 104(2): p. 227-232.
185	Liu, Y., et al., Soil CO_2 emissions and drivers in rice-wheat rotation fields subjected to different long-term fertilization practices. Clean Soil Air Water, 2016. 44(7): p. 867-876.
186	Nie, S.A., et al., Dissolved organic nitrogen distribution in differently fertilized paddy soil profiles: Implications for its potential loss. Agriculture, Ecosystems & Environment, 2018. 262: p. 58-64.
187	Rahman, F., et al., Effect of organic and inorganic fertilizers and rice straw on carbon sequestration and soil fertility under a rice-rice cropping pattern. Carbon Management, 2016. 7(1-2): p. 41-53.
188	Shahid, M., et al., Carbon and nitrogen fractions and stocks under 41 years of chemical and organic fertilization in a sub-humid tropical rice soil. Soil and Tillage Research, 2017.

	170: p. 136-146.
189	Tang, H., et al., Long-term effects of NPK fertilizers and organic manures on soil organic carbon and carbon management index under a double-cropping rice system in Southern China. Communications in Soil Science and Plant Analysis, 2018. 49(16): p. 1976-1989.
190	Yaduvanshi, N.P.S., Substitution of inorganic fertilizers by organic manures and the effect on soil fertility in a rice–wheat rotation on reclaimed sodic soil in India. The Journal of Agricultural Science, 2003. 140(2): p. 161-168.
191	Yan, D., D. Wang and L. Yang, Long-term effect of chemical fertilizer, straw, and manure on labile organic matter fractions in a paddy soil. Biology and Fertility of Soils, 2007. 44(1): p. 93-101.
192	Yan, X., et al., Carbon sequestration efficiency in paddy soil and upland soil under long-term fertilization in southern China. Soil & Tillage Research, 2013. 130: p. 42-51.
193	Liu et al. Effects of long-term fertilization on physical and chemical properties of yellow soil paddy soil. Journal of Jiangsu Agricultural Sciences, 2017, 45(19): 294-298
194	Nie et al. Effects of long-term fertilization on reddish paddy soil quality and its evaluation in a typical double rice cropping region of China. Chinese Journal of Applied Ecology, 2010, 21(6): 1453-1460
195	Krupnik, T.J., C. Shennan and J. Rodenburg, Yield, water productivity and nutrient balances under the system of rice intensification and recommended management practices in the Sahel. Field Crops Research, 2012. 130: p. 155-167.
196	Ismael, F., A. Ndayiragije and D. Fangueiro, New fertilizer strategies combining manure and urea for improved rice growth in Mozambique. Agronomy, 2021. 11(4): p. 783.
197	van Asten, P.J.A., et al., Effect of straw application on rice yields and nutrient availability on an alkaline and a pH-neutral soil in a Sahelian irrigation scheme. Nutrient Cycling in Agroecosystems, 2005. 72(3): p. 255-266.
198	Golden, B.R., et al., Recovery of Nitrogen in Fresh and Pelletized Poultry Litter by Rice. Soil Science Society of America Journal, 2006. 70(4): p. 1359-1369.
199	Li et al. Effects of chemical fertilizers application combined with manure on ammonia volatilization and rice yield in red paddy soil. Plant Nutrition and Fertilizer Science, 2005, 1: 51-56.

2. For water management

ID	References
1	Abao, E.B., Bronson, K.F., Wassmann, R. and Singh, U. Simultaneous records of methane and nitrous oxide emissions in rice-based cropping systems under rainfed conditions. Nutr. Cycl. Agroecosys. 58, 131-139 (2000).
2	Adhya, T.K., Bharati, K., Mohanty, S.R., Ramakrishnan, B., Rao, V.R., Sethunathan, N. and Wassmann, R. Methane emission from rice fields at Cuttack, India. Nutr. Cycl. Agroecosys. 58, 95-105 (2000).
3	Balaine, N., Carrijo, D.R., Adviento-Borbe, M.A. and Linquist, B. Greenhouse gases from irrigated rice systems under varying severity of alternate-wetting and drying irrigation. Soil Sci. Soc. Am. J. 83, 1533-1541 (2019).
4	Bayer, C., Costa, F.d.S., Pedroso, G.M., Zschornack, T., Camargo, E.S., de Lima, M.A., Frigheto, R.T.S., Gomes, J., Marcolin, E. and Mussoi Macedo, V.R. Yield-scaled greenhouse gas emissions from flood irrigated rice under long-term conventional tillage and no-till systems in a Humid Subtropical climate. Field Crops Res. 162, 60-69 (2014).
5	Bharali, A., Baruah, K.K., Baruah, S.G. and Bhattacharyya, P. Impacts of integrated nutrient management on methane emission, global warming potential and carbon storage capacity in rice grown in a northeast India soil. Environ Sci. Pollut. R. 25, 5889-5901 (2018).
6	Bharati, K., Mohanty, S.R., Singh, D.P., Rao, V.R. and Adhya, T.K. Influence of incorporation or dual cropping of Azolla on methane emission from a flooded alluvial soil planted to rice in eastern India. Agr. Ecosyst. Environ. 79, 73-83 (2000).
7	Bhatia, A., Pathak, H., Jain, N., Singh, P.K. and Singh, A.K. Global warming potential of manure amended soils under rice-wheat system in the Indo-Gangetic plains. Atmos. Environ. 39, 6976-6984 (2005).
8	Bhattacharyya, P., Nayak, A.K., Mohanty, S., Tripathi, R., Shahid, M., Kumar, A., Raja, R., Panda, B.B., Roy, K.S., Neogi, S., Dash, P.K., Shukla, A.K. and Rao, K.S. Greenhouse gas emission in relation to labile soil C, N pools and functional microbial diversity as influenced by 39 years long-term fertilizer management in tropical rice. Soil Till Res. 129, 93-105 (2013).
9	Bhattacharyya, P., Roy, K.S., Neogi, S., Adhya, T.K., Rao, K.S. and Manna, M.C. Effects of rice straw and nitrogen fertilization on greenhouse gas emissions and carbon storage in tropical flooded soil planted with rice. Soil Till Res. 124, 119-130 (2012).
10	Camargo, E.S., Pedroso, G.M., Minamikawa, K., Shiratori, Y. and Bayer, C. Intercontinental comparison of greenhouse gas emissions from irrigated rice fields under feasible water management practices: Brazil and Japan. Soil Sci. Plant Nutr. 64, 59-67 (2018).
11	Cha-un, N., Chidthaisong, A., Yagi, K., Sudo, S. and Towprayoon, S. Greenhouse gas emissions, soil carbon sequestration and crop yields in a rain-fed rice field with crop rotation management. Agr. Ecosyst. Environ. 237, 109-120 (2017).
12	Dang Hoa, T., Trong Nghia, H., Tokida, T., Tirol-Padre, A. and Minamikawa, K. Impacts of alternate wetting and drying on greenhouse gas emission from paddy field in Central Vietnam. Soil Sci. Plant Nutr. 64, 14-22 (2018).

13	Dash, P.K., Bhattacharyya, P., Shahid, M., Roy, K.S., Swain, C.K., Tripathi, R. and Nayak, A.K. Low carbon resource conservation techniques for energy savings, carbon gain and lowering GHGs emission in lowland transplanted rice. Soil Till Res. 174, 45-57 (2017).
14	Datta, A., Santra, S.C. and Adhya, T.K. Environmental and economic opportunities of applications of different types and application methods of chemical fertilizer in rice paddy. Nutr. Cycl. Agroecosys. 107, 413-431 (2017).
15	Datta, A., Yeluripati, J.B., Nayak, D.R., Mahata, K.R., Santra, S.C. and Adhya, T.K. Seasonal variation of methane flux from coastal saline rice field with the application of different organic manures. Atmos. Environ. 66, 114-122 (2013).
16	Fumoto, T., Yanagihara, T., Saito, T. and Yagi, K. Assessment of the methane mitigation potentials of alternative water regimes in rice fields using a process-based biogeochemistry model. Global Change Biol. 16, 1847-1859 (2010).
17	Haque, M.M., Biswas, J.C., Hwang, H.Y. and Kim, P.J. Annual net carbon budget in rice soil. Nutr. Cycl. Agroecosys. 116, 31-40 (2020).
18	Haque, M.M., Biswas, J.C., Kim, S.Y. and Kim, P.J. Intermittent drainage in paddy soil: ecosystem carbon budget and global warming potential. Paddy and Water Environment 15, 403-411 (2017).
19	Haque, M.M., Kim, S.Y., Kim, G.W. and Kim, P.J. Optimization of removal and recycling ratio of cover crop biomass using carbon balance to sustain soil organic carbon stocks in a mono-rice paddy system. Agr. Ecosyst. Environ. 207, 119-125 (2015).
20	Harada, H., Kobayashi, H. and Shindo, H. Reduction in greenhouse gas emissions by no-tilling rice cultivation in Hachirogata polder, northern Japan: Life-cycle inventory analysis. Soil Sci. Plant Nutr. 53, 668-677 (2007).
21	Hoang Thi Thai, H., Do Dinh, T., Hoang Thi Ngoc, V., Tran Thi Anh, T., Duong Van, H., Tran Dang, H. and Rehman, H. Nitrogen fertilization effects on methane and nitrous oxide emissions from wetland rice fields of central Vietnam. International Journal of Agriculture and Biology 20, 1759-1767 (2018).
22	Hu, Q., Liu, T., Jiang, S., Cao, C., Li, C., Chen, B. and Liu, J. Combined effects of straw returning and chemical N fertilization on greenhouse gas emissions and yield from paddy fields in Northwest Hubei province, China. J. Soil Sci. Plant Nut. 20, 392-406 (2020).
23	Hu, Y.-l., Tang, S.-r., Tao, K., He, Q.-x., Tian, W., Qing, X.-h., Wu, Y.-z. and Meng, L. Effects of Optimizing Fertilization on N_2O and CH_4 Emissions in a Paddy-Cowpea Rotation System in the Tropical Region of China. Huanjing Kexue 40, 5182-5190 (2019).
24	Jain, M.C., Kumar, S., Wassmann, R., Mitra, S., Singh, S.D., Singh, J.P., Singh, R., Yadav, A.K. and Gupta, S. Methane emissions from irrigated rice fields in northern India (New Delhi). Nutr. Cycl. Agroecosys. 58, 75-83 (2000).
25	Jain, N., Dubey, R., Dubey, D.S., Singh, J., Khanna, M., Pathak, H. and Bhatia, A. Mitigation of greenhouse gas emission with system of rice intensification in the Indo-Gangetic Plains. Paddy and Water Environment 12, 355-363 (2014).
26	Janz, B., Weller, S., Kraus, D., Racela, H.S., Wassmann, R., Butterbach-Bahl, K. and Kiese, R. Greenhouse gas footprint of diversifying rice cropping systems: Impacts of water regime and organic amendments. Agr. Ecosyst. Environ. 270, 41-54 (2019).

27	Jeong, S.T., Kim, G.W., Hwang, H.Y., Kim, P.J. and Kim, S.Y. Beneficial effect of compost utilization on reducing greenhouse gas emissions in a rice cultivation system through the overall management chain. Sci. Total Environ. 613, 115-122 (2018).
28	Kim, J., Yoo, G., Kim, D., Ding, W. and Kang, H. Combined application of biochar and slow-release fertilizer reduces methane emission but enhances rice yield by different mechanisms. Applied Soil Ecology 117, 57-62 (2017).
29	Kim, S.Y., Lee, C.H., Gutierrez, J. and Kim, P.J. Contribution of winter cover crop amendments on global warming potential in rice paddy soil during cultivation. Plant Soil 366, 273-286 (2013).
30	Kong, D., Li, S., Jin, Y., Wu, S., Chen, J., Hu, T., Wang, H., Liu, S. and Zou, J. Linking methane emissions to methanogenic and methanotrophic communities under different fertilization strategies in rice paddies. Geoderma 347, 233-243 (2019).
31	Kurniawati, F.D., Setyanto, P., Suntoro, Cahyani, V.R. and Iop in International Conference on Climate Change, Vol. 200 012026-Article No.: 012026 (2018).
32	Liu, Y., Tang, H., Muhammad, A. and Huang, G. The effects of Chinese milk vetch returning with nitrogen fertilizer on rice yield and greenhouse gas emissions. Greenhouse Gases-Science and Technology 9, 743-753 (2019).
33	Liu, Y., Tang, H., Muhammad, A., Zhong, C., Li, P., Zhang, P., Yang, B. and Huang, G. Rice yield and greenhouse gas emissions affected by chinese milk vetch and rice straw retention with reduced nitrogen fertilization. Agron. J. 111, 3028-3038 (2019).
34	Ma, Y., Liu, D.L., Schwenke, G. and Yang, B. The global warming potential of straw-return can be reduced by application of straw-decomposing microbial inoculants and biochar in rice-wheat production systems. Environ. Pollut. 252, 835-845 (2019).
35	Mai Van, T., Tesfai, M., Borrell, A., Nagothu, U.S., Thi Phuong Loan, B., Vu Duong, Q. and Le Quoc, T. Effect of organic, inorganic and slow-release urea fertilizers on CH_4 and N_2O emissions from rice paddy fields. Paddy and Water Environment 15, 317-330 (2017).
36	Maneepitak, S., Ullah, H., Datta, A., Shrestha, R.P., Shrestha, S. and Kachenchart, B. Effects of water and rice straw management practices on water savings and greenhouse gas emissions from a double-rice paddy field in the Central Plain of Thailand. Eur. J. Agron. 107, 18-29 (2019).
37	Maris, S.C., Teira-Esmatges, M.R., Bosch-Serra, A.D., Moreno-Garcia, B. and Catala, M.M. Effect of fertilizing with pig slurry and chicken manure on GHG emissions from Mediterranean paddies. Sci. Total Environ. 569, 306-320 (2016).
38	Minamikawa, K. and Sakai, N. The practical use of water management based on soil redox potential for decreasing methane emission from a paddy field in Japan. Agr. Ecosyst. Environ. 116, 181-188 (2006).
39	Mohanty, S., Swain, C.K., Sethi, S.K., Dalai, P.C., Bhattachrayya, P., Kumar, A., Tripathi, R., Shahid, M., Panda, B.B., Kumar, U., Lal, B., Gautam, P., Munda, S. and Nayak, A.K. Crop establishment and nitrogen management affect greenhouse gas emission and biological activity in tropical rice production. Ecol. Eng. 104, 80-98 (2017).
40	Nakajima, M., Cheng, W., Hanayama, S. and Okada, M. Shallow autumn tillage does not reduce CH_4 emission from an andisol paddy field in Morioka, a cold region in Japan.

	J Agric Meteorol 73, 92-99 (2017).
41	Naser, H.M., Nagata, O., Sultana, S. and Hatano, R. Impact of management practices on methane emissions from paddy grown on mineral soil over peat in central Hokkaido, Japan. Atmosphere 9 (2018).
42	Naser, H.M., Nagata, O., Tamura, S. and Hatano, R. Methane emissions from five paddy fields with different amounts of rice straw application in central Hokkaido, Japan. Soil Sci. Plant Nutr. 53, 95-101 (2007).
43	Nishimura, S., Sawamoto, T., Akiyama, H., Sudo, S. and Yagi, K. Methane and nitrous oxide emissions from a paddy field with Japanese conventional water management and fertilizer application. Global Biogeochem. Cy. 18 (2004).
44	Raheem, A., Zhang, J., Huang, J., Jiane, Y., Siddik, M.A., Denga, A., Gao, J. and Zhang, W. Greenhouse gas emissions from a rice-rice-green manure cropping system in South China. Geoderma 353, 331-339 (2019).
45	Rogers, C.W., Smartt, A.D., Brye, K.R. and Norman, R.J. Nitrogen source effects on methane emissions from drill-seeded, delayed-flood rice production. Soil Sci. 182, 9-17 (2017).
46	Sander, B.O., Samson, M. and Buresh, R.J. Methane and nitrous oxide emissions from flooded rice fields as affected by water and straw management between rice crops. Geoderma 235, 355-362 (2014).
47	Setyanto, P., Makarim, A.K., Fagi, A.M., Wassmann, R. and Buendia, L.V. Crop management affecting methane emissions from irrigated and rainfed rice in Central Java (Indonesia). Nutr. Cycl. Agroecosys. 58, 85-93 (2000).
48	Setyanto, P., Pramono, A., Adriany, T.A., Susilawati, H.L., Tokida, T., Padre, A.T. and Minamikawa, K. Alternate wetting and drying reduces methane emission from a rice paddy in Central Java, Indonesia without yield loss. Soil Sci. Plant Nutr. 64, 23-30 (2018).
49	Shin, Y.K. and Yun, S.H. Varietal differences in methane emission from Korean rice cultivars. Nutr. Cycl. Agroecosys. 58, 315-319 (2000).
50	Song, H.J., Lee, J.H., Jeong, H.-C., Choi, E.-J., Oh, T.-K., Hong, C.-O. and Kim, P.J. Effect of straw incorporation on methane emission in rice paddy: conversion factor and smart straw management. Applied Biological Chemistry 62 (2019).
51	Sun, H., Feng, Y., Ji, Y., Shi, W., Yang, L. and Xing, B. N_2O and CH_4 emissions from N-fertilized rice paddy soil can be mitigated by wood vinegar application at an appropriate rate. Atmos. Environ. 185, 153-158 (2018).
52	Takakai, F., Hatakeyama, K., Nishida, M., Nagata, O., Sato, T. and Kaneta, Y. Effect of the long-term application of organic matter on soil carbon accumulation and GHG emissions from a rice paddy field in a cool-temperate region, Japan-II. Effect of different compost applications. Soil Sci. Plant Nutr. 66, 96-105 (2020).
53	Takakai, F., Ichikawa, J., Ogawa, M., Ogaya, S., Yasuda, K., Kobayashi, Y., Sato, T., Kaneta, Y. and Nagahama, K.-i. Suppression of CH_4 emission by rice straw removal and application of bio-ethanol production residue in a paddy field in Akita, Japan. Agriculture-Basel 7 (2017).
54	Tariq, A., Quynh Duong, V., Jensen, L.S., de Tourdonnet, S., Sander, B.O., Wassmann, R., Trinh Van, M. and de Neergaard, A. Mitigating CH_4 and N_2O emissions from

	intensive rice production systems in northern Vietnam: Efficiency of drainage patterns in combination with rice residue incorporation. Agr. Ecosyst. Environ. 249, 101-111 (2017).
55	Thi Thai Hoa, H., Dinh Thuc, D., Thi Thu Giang, T., Tan Duc, H. and Rehman, H.U. Incorporation of rice straw mitigates CH_4 and N_2O emissions in water saving paddy fields of Central Vietnam. Arch Agron Soil Sci 65, 113-124 (2019).
56	Tirol-Padre, A., Minamikawa, K., Tokida, T., Wassmann, R. and Yagi, K. Site-specific feasibility of alternate wetting and drying as a greenhouse gas mitigation option in irrigated rice fields in Southeast Asia: a synthesis. Soil Sci. Plant Nutr. 64, 2-13 (2018).
57	Toma, Y., Sari, N.N., Akamatsu, K., Oomori, S., Nagata, O., Nishimura, S., Purwanto, B.H. and Ueno, H. Effects of green manure application and prolonging mid-season drainage on greenhouse gas emission from paddy fields in ehime, Southwestern Japan. Agriculture-Basel 9 (2019).
58	Wang, H., Shen, M., Hui, D., Chen, J., Sun, G., Wang, X., Lu, C., Sheng, J., Chen, L., Luo, Y., Zheng, J. and Zhang, Y. Straw incorporation influences soil organic carbon sequestration, greenhouse gas emission, and crop yields in a Chinese rice (oryza sativa L.)-wheat (triticum aestivum L.) cropping system. Soil Till Res. 195 (2019).
59	Wang, W., Chen, C., Wu, X., Xie, K., Yin, C., Hou, H. and Xie, X. Effects of reduced chemical fertilizer combined with straw retention on greenhouse gas budget and crop production in double rice fields. Biol. Fertility Soils 55, 89-96 (2019).
60	Wu, X., Wang, W., Xie, K., Yin, C., Hou, H. and Xie, X. Combined effects of straw and water management on CH_4 emissions from rice fields. J. Environ. Manage. 231, 1257-1262 (2019).
61	Xu, H., Zhu, B., Liu, J., Li, D., Yang, Y., Zhang, K., Jiang, Y., Hu, Y. and Zeng, Z. Azolla planting reduces methane emission and nitrogen fertilizer application in double rice cropping system in southern China. Agron. Sustain. Dev. 37 (2017).
62	Zhang, H., Liu, H., Hou, D., Zhou, Y., Liu, M., Wang, Z., Liu, L., Gu, J. and Yang, J. The effect of integrative crop management on root growth and methane emission of paddy rice. Crop Journal 7, 444-457 (2019).
63	Cai, Z., et al., Options for mitigating methane emission from a permanently flooded rice field. Global Change Biology, 2003. 9(1): p. 37-45.
64	Cai, Z.C., Tsuruta, H. and Minami, K. Methane emission from rice fields in China: Measurements and influencing factors. J. Geophys. Res. 105, 17231-127242 (2000).
65	Zou, J., Huang, Y., Jiang, J., Zheng, X. and Sass, R.L. A 3-year field measurement of methane and nitrous oxide emissions from rice paddies in China: Effects of water regime, crop residue, and fertilizer application. Global Biogeochem. Cy. 19, GB2021 (2005).
66	Peng et al. Effect of water-saving irrigation on the seasonal emission of CH4 from paddy field. Journal of Zhejiang University, 2006, 5: 546-550
67	Ma, J., Xu, H., Yagi, K. and Cai, Z.C. Methane emission from paddy soils as affected by wheat straw returning mode. Plant and Soil 313, 167-174 (2008).
68	Zhang G B, Ma E D, Zhang X Y, et al. Effects of rice straw incorporation and land management in winter on methane emission during rice-growing season. Journal of Agro-Environment Science, 2009.
69	Xu Y C, Shen Q R, Li M L, et al. Effect of soil water status and mulching on N_2O

	and CH_4 emission from lowland rice field in China. Biology and Fertility of Soils, 2004, 39(3):215-217.
70	Lu, W.F., et al., Methane Emissions and Mitigation Options in Irrigated Rice Fields in Southeast China. Nutrient cycling in agroecosystems, 2000. 58(1): p. 65-73.
71	Qin X, Li Y, Liu K, et al. The effect of Long-term fertilization treatment on methane emission from rice field in Hunan. Chinese Journal of Agrometeorology, 2006.
72	Shi et al. CH_4 emission from late rice field of red clay soil under different fertilization treatments. Journal of Ecology and Rural Environment, 2010, 26(2): 103-108
73	Liu J J, Wu P P, Xie X L, et al. Methane emission from late rice fields in Hunan red soil under different long-term fertilizing systems. Acta Ecologica Sinica, 2008.
74	Ma, J., Xu, H., Cai, Z.C., Kazuyuki, Y. CH_4 and N_2O emissions from rice fields as affected by mulching of strips of wheat straws. Acta Pedologica Sinica, 2010, 47(1): 84-89
75	Ma, E., Ma, J., Xu, H., Cai, Z., Yagi, K. Effects of rice straw returning methods in wheat-growing season on CH_4 emissions from following rice-growing season. Ecology and Environmental Sciences, 2010, 19(3): 729-732
76	Peng et al. Effect of water-saving irrigation on the law of CH_4 emission from paddy field. Environmental Science, 2007, 28(1): 9-13
77	Chen et al. Effect of rice straw manure on methane emission in late-rice paddy fields. Acta Pedologica Sinica, 2002, 2: 170-176
78	Hu et al. Effects of different rotation systems on greenhouse gas (CH_4 and N_2O) emissions in the Taihu Lake region, China. Chinese Journal of Applied Ecology, 2016, 27(1): 99-106
79	Hang Yuhao, Wang Qiangsheng, Xu Guochun, Liu Xin. 2017. Effects of water regimes and straw incorporation on greenhouse gas emissions in a rice-wheat cropping system [J]. Ecology and Environmental Sciences, 26(11): 1844-1855
80	Li et al. Effects of non-flooded with straw mulching management on methane emission and rice yield in paddy field. Journal of Agro-Environment Science, 2012, 31(10): 2053-2059.
81	Qin et al. Effects of straw mulching on greenhouse gas intensity under on-tillage conditions. Transactions of the Chinese Society of Agricultural Engineering, 2012, 28(6): 210-216
82	Wang et al. Effect of patterns of straw returning to field on methane and nitrous oxide emissions during rice-growing season in a rice-wheat double cropping system. Jiangsu Journal of Agricultural Sciences, 2014, 30(4): 758-763
83	Wu et al. Effects of different organic fertilizers on greenhouse gas emissions and yield in paddy soils. Transactions of the Chinese Society of Agricultural Engineering, 2018, 34(4): 162-169
84	Xu et al. Effects of continuous flooding in no-rice growing season on CH_4 and CO_2 emissions of rice growing season with straw returning. Journal of Agricultural Resources and Environment, 2017, 34(2): 145-152
85	Yi et al. Emissions of CH_4 and N_2O from Paddy Soil in South China Under Different Fertilization Patterns. Journal of Agro-Environment Science, 2014, 33(12): 2478-2484
86	Zhang et al. Effects of years of straw return to soil on greenhouse gas emission in

	rice/wheat rotation systems. Chinese Journal of Eco-Agriculture, 2015, 23(3): 302-308
87	Zhang et al. Preliminary study on effect of straw incorporation on net global warming potential in high production rice-wheat double cropping systems. Journal of Aro-Environment Science, 2012, 31(8): 1647-1653
88	Zhao et al. Impact of different fertilization practices on greenhouse gas emission from paddy field. 2014, 33(11): 2273-2278
89	Zhang, J., et al., Interactive effects of straw incorporation and tillage on crop yield and greenhouse gas emissions in double rice cropping system. Agriculture, Ecosystems & Environment, 2017. 250: p. 37-43.
90	Zhang, X., et al., Two approaches for net ecosystem carbon budgets and soil carbon sequestration in a rice – wheat rotation system in China. Nutrient Cycling in Agroecosystems, 2014. 100(3): p. 301-313.
91	Sui, Y., et al., Interactive effects of straw-derived biochar and N fertilization on soil C storage and rice productivity in rice paddies of Northeast China. Science of The Total Environment, 2016. 544: p. 203-210.
92	Zhang, Z.S., et al., Effects of tillage practices and straw returning methods on greenhouse gas emissions and net ecosystem economic budget in rice–wheat cropping systems in central China. Atmospheric Environment, 2015. 122: p. 636-644.
93	Jiang, Y., et al., Lime application lowers the global warming potential of a double rice cropping system. Geoderma, 2018. 325: p. 1-8.
94	Tang, H., et al., Effects of winter covering crop residue incorporation on CH_4 and N_2O emission from double-cropped paddy fields in southern China. Environmental Science and Pollution Research, 2015. 22(16): p. 12689-12698.
95	Zhang, Z., et al., The effects of rape residue mulching on net global warming potential and greenhouse gas intensity from no-tillage paddy fields. The Scientific World Journal, 2014. 2014: p. 1-9.
96	Ji, X., et al., The effect of rice straw incorporation into paddy soil on carbon sequestration and emissions in the double cropping rice system. Journal of the Science of Food and Agriculture, 2012. 92(5): p. 1038-1045.
97	Wang, C., et al., Greenhouse gas emissions in response to straw incorporation, water management and their interaction in a paddy field in subtropical central China. Archives of Agronomy and Soil Science, 2017. 63(2): p. 171-184.
98	Xu, S., et al., Treated domestic sewage irrigation significantly decreased the CH_4, N_2O and NH_3 emissions from paddy fields with straw incorporation. Atmospheric Environment, 2017. 169: p. 1-10.
99	Tang, H.M., et al., Methane and nitrous oxide emissions as affected by long-term fertilizer management from double-cropping paddy fields in Southern China. The Journal of Agricultural Science, 2016. 154(8): p. 1378-1391.
100	Wang, W., et al., Mitigating effects of ex situ application of rice straw on CH_4 and N_2O emissions from paddy-upland coexisting system. Scientific Reports, 2016. 6(1).
101	Zhang, Z.S., et al., Effects of nitrogen fertilizer sources and tillage practices on greenhouse gas emissions in paddy fields of central China. Atmospheric Environment, 2016. 144: p. 274-281.
102	Gao, X., et al., Mushroom residue application affects CH_4 and N_2O emissions from fields

	under rice-wheat rotation. Archiv für Acker- und Pflanzenbau und Bodenkunde, 2017. 63(6): p. 748-760.
103	Xia, L., et al., Integrating agronomic practices to reduce greenhouse gas emissions while increasing the economic return in a rice-based cropping system. Agriculture, Ecosystems & Environment, 2016. 231: p. 24-33.
104	Liu, W., et al., Greenhouse gas emissions, soil quality, and crop productivity from a mono-rice cultivation system as influenced by fallow season straw management. Environmental Science and Pollution Research, 2016. 23(1): p. 315-328.
105	Nie et al. Effects of combined application of organic fertilizer and chemical fertilizer on yield, quality and potassium uptake and transport of rice. Journal of Jiangsu Agricultural Science, 2016, 44(2): 122-125
106	Yang Z, Lu Y, Zhang F, et al. Comparative analysis of the effects of straw-returning and decomposed manure on paddy soil fertility betterment. Transactions of the Chinese Society of Agricultural Engineering, 2008, 24(3):214-218.
107	Meng et al. Effects of partial mineral nitrogen substitution by organic fertilizer nitrogen on the yields of rice grains and their proper substitution rate. 2009, 40(2): 532-542
108	Li et al. Effect of combined application of organic and inorganic fertilizers on greenhouse gases exchange and comprehensive global warming potential in paddy fields. Journal of soil and Water Conservation, 2013, 27(6): 298-304
109	Zhao et al. Effects of organic manure partial substitution for chemical fertilizer on crop yield and soil microbiome in a rice-wheat cropping system. Journal of Nanjing Agricultural University, 2016, 39(4): 594-602
110	Li et al. Effects of organic fertilizers on yield and quality of rice grains and nitrogen use efficiency. 2010, 36(3): 258-262
111	Lu et al. Effects of organic fertilizer partially substitute chemical fertilizer on rice yield and soil organic matters. China Agricultural Technology Extension, 2017, 33(5): 56-58
112	Liu et al. Effects of different organic-inorganic fertilizer combination ratios on rice yield and nutrient loss with surface runoff. Chinese Journal of Ecology, 2017, 36(2): 405-412
113	Guo. Effect of fertilization management on greenhouse gas emissions and soil microbial properties in rice-wheat rotation system. Thesis of master's degree, Chinese Academy of Agricultural Sciences, 2015.
114	Zhang. Gaseous loss and balance of nitrogen from paddy field in irrigation area of the upper Yellow River. Thesis of doctor's degree, Chinese Academy of Agricultural Sciences, 2011.
115	Guan. Effects of fertilizer application modes on yield and nutrient uptake of rice and wheat and soil biological properties. Thesis of doctor's degree, Huazhong Agricultural University, 2012.
116	Zhao. Study on the characteristics of N accumulation and leaching in different farmlands in the Yellow River irrigation region of Ningxia. Thesis of doctor's degree, Chinese Academy of Agricultural Sciences, 2012
117	Yang. Observation of net global warming potential under different nitrogen managements in annual rice-wheat rotation systems. Thesis of doctor's degree, Nanjing Agricultural University, 2015.
118	Wang et al. Effects of combined applications of pig manure and chemical fertilizers on

	CH_4 and N_2O emissions and their global warming potentials in paddy fields with double-rice cropping. Environmental Science, 2014, 35(8): 3120-3127
119	He et al. Effects of fertilization reduction and organic fertilizer replacement on rice yield and nutrient utilization. Hunan Agricultural Sciences, 2017, 3: 31-34
120	Guo. Studies on optimized nutrient management for rice yield and its physiological and ecological mechanisms. Thesis of doctor's degree, Nanjing Agricultural University, 2015.
121	Sun et al. Effects of pig manure and biogas slurry application on CH_4 and N_2O emissions and their greenhouse effects on paddy field. Journal of China Agricultural University, 2012, 17(5): 124-131
122	Zhang. Study on the effects and mechanism of reducing nitrogen application in paddy field. Thesis of master's degree, Academy of Agricultural Sciences, 2010.
123	Liu et al. Effects of different combined application ratio of organic-inorganic fertilization on CH_4 and N_2O emissions in paddy season. Ecology and Environmental Sciences, 2016, 25(5): 808-814
124	Yuan et al. Assessing environmental impacts of organic and inorganic fertilizer on daily and seasonal greenhouse gases effluxes in rice field. Atmospheric Environment, 2017, 155, 119-128
125	Zhao et al. Effects of organic–inorganic compound fertilizer with reduced chemical fertilizer application on crop yields, soil biological activity and bacterial community structure in a rice–wheat cropping system. Applied Soil Ecology, 2016, 99, 1-12
126	Yu et al. Effects of different organic materials on ammonia volatilization and rice yield in paddy fields. Journal of Zhejiang Agricultural Sciences, 2011, 4: 908-909, 913
127	Guan, et al. Effects of chemical fertilizer applied combing with organic manure on yield of rice and nitrogen using efficiency. Chinese Agricultural Science Bulletin, 2009, 25(1): 88-92
128	Li et al. Effects of pig manure application on ammonia volatilization in soil during rice season in Chengdu Plain. Journal of Agro-Environment Science, 2015, 34(11): 2236-2244
129	Ru. Effects of organic manuring with chemical nitrogen fertilizer on nitrogen transformation in soils and nitrogen use efficiency in the rice-rice cropping system. Thesis of master's degree, Zhejiang University, 2015.
130	Zhang et al. Effects of combined application of organic fertilizer and chemical fertilizer on double cropping rice nutrient utilization and leaching loss from paddy soil. Journal of Soil and Water Conservation, 2012, 26(1): 22-27
131	Liu et al. Rice yield, nitrogen use efficiency (NUE) and nitrogen leaching losses as affected by long-term combined application of manure and chemical fertilizers in Yellow River irrigated region of Ningxia, China. Journal of Agro-Environment Science, 2015, 34(5): 947-954
132	Guo et al. Effect of fertilizer management on greenhouse gas emission and nutrient status in paddy soil. Journal of Plant Nutrition and Fertilizer, 2016, 22(2): 337-345
133	Yu, Q., et al., Effects of nitrogen application level on rice nutrient uptake and ammonia volatilization. Rice Science, 2013. 20(2): p. 139-147.
134	Zhu. Effects of different fertilization application methods on the ecosystem environment

	and the yield. Thesis of master's degree, Sahnghaijiaotong University, 2014.
135	Das, S. and T.K. Adhya, Effect of combine application of organic manure and inorganic fertilizer on methane and nitrous oxide emissions from a tropical flooded soil planted to rice. Geoderma, 2014. 213: p. 185-192.
136	Das, B., et al., Effect of integrated nutrient management practice on soil aggregate properties, its stability and aggregate-associated carbon content in an intensive rice–wheat system. Soil and Tillage Research, 2014. 136: p. 9-18.
137	Zhao, Z., et al., Quantifying nitrogen loading from a paddy field in Shanghai, China with modified DNDC model. Agriculture, Ecosystems & Environment, 2014. 197: p. 212-221.
138	Yang, B., et al., Mitigating net global warming potential and greenhouse gas intensities by substituting chemical nitrogen fertilizers with organic fertilization strategies in rice–wheat annual rotation systems in China: A 3-year field experiment. Ecological Engineering, 2015. 81: p. 289-297.
139	Banger, K., et al., Impact of long-term additions of chemical fertilizers and farm yard manure on carbon and nitrogen sequestration under rice-cowpea cropping system in semi-arid tropics. Plant and Soil, 2009. 318(1-2): p. 27-35.
140	Chang, E., et al., Effects of long-term treatments of different organic fertilizers complemented with chemical N fertilizer on the chemical and biological properties of soils. Soil science and plant nutrition (Tokyo), 2014. 60(4): p. 499-511.
141	Sharma, S.K., et al., Influence of rice varieties, nitrogen management and planting methods on methane emission and water productivity. Paddy and Water Environment, 2016. 14(2): p. 325-333.
142	Zhao, Z., et al., Assessing impacts of alternative fertilizer management practices on both nitrogen loading and greenhouse gas emissions in rice cultivation. Atmospheric Environment, 2015. 119: p. 393-401.
143	Hou et al. Effect of long-term located organic-inorganic fertilizer application on rice yield and soil fertility in red soil area of China. Scientia Agricultural Sinica, 2011, 44(3): 516-523
144	Peng et al. Effects of long-term integrated fertilization with organic manure and chemical fertilizers on basic physical and chemical properties in paddy soils. Chinese Soil and Fertilizer, 2009, 2: 6-10
145	Bandyopadhyay, K.K. and M.C. Sarkar, Nitrogen use efficiency, ^{15}N balance, and nitrogen losses in flooded rice in an inceptisol. Communications in Soil Science and Plant Analysis, 2005. 36(11-12): p. 1661-1679.
146	Cao, Y., et al., Effects of wheat straw addition on dynamics and fate of nitrogen applied to paddy soils. Soil and Tillage Research, 2018. 178: p. 92-98.
147	Cao, Y., et al., Assessment of ammonia volatilization from paddy fields under crop management practices aimed to increase grain yield and N efficiency. Field Crops Research, 2013. 147: p. 23-31.
148	Li, Y., et al., Determination of optimum nitrogen application rates in Zhejiang Province, China, based on rice yields and ecological security. Journal of Integrative Agriculture, 2015. 14(12): p. 2426-2433.
149	Liu, T., et al., Effects of N fertilizer sources and tillage practices on NH_3 volatilization,

	grain yield, and N use efficiency of rice fields in Central China. Frontiers in Plant Science, 2018. 9.
150	Sun, H., et al., Rice production, nitrous oxide emission and ammonia volatilization as impacted by the nitrification inhibitor 2-chloro-6-(trichloromethyl)-pyridine. Field Crops Research, 2015. 173: p. 1-7.
151	Yao, Y., et al., Azolla biofertilizer for improving low nitrogen use efficiency in an intensive rice cropping system. Field Crops Research, 2018. 216: p. 158-164.
152	Zhang, M., et al., Integration of urea deep placement and organic addition for improving yield and soil properties and decreasing N loss in paddy field. Agriculture, Ecosystems & Environment, 2017. 247: p. 236-245.
153	Zhao, M., et al., Mitigating gaseous nitrogen emissions intensity from a Chinese rice cropping system through an improved management practice aimed to close the yield gap. Agriculture, Ecosystems & Environment, 2015. 203: p. 36-45.
154	Wang, Z.Y., et al., A Four-Year Record of Methane Emissions from Irrigated Rice Fields in the Beijing Region of China. Nutrient Cycling in Agroecosystems, 2000. 58(1): p. 55-63.
155	Zou, J., et al., Integrated effect of incorporation with different organic manures on CH_4 and N_2O emissions from rice paddy. Huan Jing Ke Xue, 2003. 24(4): p. 7-12.
156	Ma, J., et al., Wheat straw management affects CH_4 and N_2O emissions from rice fields. Soil Biology and Biochemistry, 2009. 41(5): p. 1022-1028.
157	Liu, S., et al., Fe(III) fertilization mitigating net global warming potential and greenhouse gas intensity in paddy rice-wheat rotation systems in China. Environmental Pollution, 2012. 164: p. 73-80.
158	Wang, J., et al., Methane emissions from a rice agroecosystem in South China: Effects of water regime, straw incorporation and nitrogen fertilizer. Nutrient Cycling in Agroecosystems, 2012. 93(1): p. 103-112.
159	Ma, Y.C., et al., Net global warming potential and greenhouse gas intensity of annual rice – wheat rotations with integrated soil – crop system management. Agriculture, Ecosystems & Environment, 2013. 164: p. 209-219.
160	Yao, Z., et al., Nitrous oxide and methane fluxes from a rice–wheat crop rotation under wheat residue incorporation and no-tillage practices. Atmospheric Environment, 2013. 79: p. 641-649.
161	Hou, P., et al., Methane emissions from rice fields under continuous straw return in the middle-lower reaches of the Yangtze River. J Environ Sci (China), 2013. 25(9): p. 1874-81.
162	Zhang, X., et al., Global warming potential and greenhouse gas intensity in rice agriculture driven by high yields and nitrogen use efficiency. Biogeosciences, 2016. 13(9): p. 2701-2714.
163	Li, X., et al., Methane and nitrous oxide emissions from rice paddy soil as influenced by timing of application of hydroquinone and dicyandiamide. Nutrient Cycling in Agroecosystems, 2009. 85(1): p. 31-40.
164	Hang, X., et al., Differences in rice yield and CH_4 and N_2O emissions among mechanical planting methods with straw incorporation in Jianghuai area, China. Soil and Tillage Research, 2014. 144: p. 205-210.

165	Zhang, L., et al., Integrative effects of soil tillage and straw management on crop yields and greenhouse gas emissions in a rice–wheat cropping system. European Journal of Agronomy, 2015. 63: p. 47-54.
166	Liu, G., et al., Effects of straw incorporation along with microbial inoculant on methane and nitrous oxide emissions from rice fields. Science of The Total Environment, 2015. 518-519: p. 209-216.
167	Xia, L., et al., Greenhouse gas emissions and reactive nitrogen releases from rice production with simultaneous incorporation of wheat straw and nitrogen fertilizer. Biogeosciences, 2016. 13(15): p. 4569-4579.
168	Xiong, Z., et al., Differences in net global warming potential and greenhouse gas intensity between major rice-based cropping systems in China. Scientific Reports, 2016. 5(1).
169	Shi et al. Annual CH_4 and N_2O emissions from double rice cropping systems under various fertilizer regimes in Hunan Province, China. Chinese Journal of Atmospheric Sciences, 2011, 35(4): 707-720
170	Yang, X., et al., Methane emissions from double rice agriculture under long-term fertilizing systems in Hunan, China. Agriculture, Ecosystems & Environment, 2010. 137(3-4): p. 308-316.
171	Shang, Q., et al., Net annual global warming potential and greenhouse gas intensity in Chinese double rice-cropping systems: a 3-year field measurement in long-term fertilizer experiments. Global Change Biology, 2011. 17(6): p. 2196-2210.
172	Tang et al. Effects of winter cover crop on methane and nitrous oxide emission from paddy field. Chinese Journal of Applied Ecology, 2010, 21(12): 3191-3199
173	Shen, J., et al., Contrasting effects of straw and straw-derived biochar amendments on greenhouse gas emissions within double rice cropping systems. Agriculture, Ecosystems & Environment, 2014. 188: p. 264-274.
174	Liu, Y., et al., Net global warming potential and greenhouse gas intensity from the double rice system with integrated soil–crop system management: A three-year field study. Atmospheric Environment, 2015. 116: p. 92-101.
175	Zhang, G., et al., Drainage and tillage practices in the winter fallow season mitigate CH_4 and N_2O emissions from a double-rice field in China. Atmospheric Chemistry and Physics, 2016. 16(18): p. 11853-11866.
176	Liang, X.Q., et al., Nitrogen management to reduce yield-scaled global warming potential in rice. Field Crops Research, 2013. 146: p. 66-74.
177	Gao, X., et al., Greenhouse gas intensity and net ecosystem carbon budget following the application of green manures in rice paddies. Nutrient Cycling in Agroecosystems, 2016. 106(2): p. 169-183.
178	Zhang et al. Effects of wheat straw returning and soil tillage on CH_4 and N_2O emissions in paddy season. Ecology and Environmental Sciences, 2009, 18(6): 2334-2338
179	Liu, Q., et al., Carbon footprint of rice production under biochar amendment - a case study in a Chinese rice cropping system. GCB Bioenergy, 2016. 8(1): p. 148-159.
180	Liu, W., et al., Greenhouse gas emissions, soil quality, and crop productivity from a mono-rice cultivation system as influenced by fallow season straw management. Environmental Science and Pollution Research, 2016. 23(1): p. 315-328.

181	Zhang, Z., et al., Emissions of CH_4 and CO_2 from paddy fields as affected by tillage practices and crop residues in central China. Paddy and Water Environment, 2016. 14(1): p. 85-92.
182	Xu, G., et al., Integrated rice-duck farming mitigates the global warming potential in rice season. Science of The Total Environment, 2017. 575: p. 58-66.
183	Hu, N., et al., Effects of different straw returning modes on greenhouse gas emissions and crop yields in a rice – wheat rotation system. Agriculture, Ecosystems & Environment, 2016. 223: p. 115-122.
184	Zheng, X., et al., Impacts of soil moisture on nitrous oxide emission from croplands: a case study on the rice-based agro-ecosystem in Southeast China. Chemosphere. 2000. 2(2): p. 207-224.
185	Sun, L., et al., Nitrogen fertilizer in combination with an ameliorant mitigated yield-scaled greenhouse gas emissions from a coastal saline rice field in southeastern China. Environmental Science and Pollution Research, 2018. 25(16): p. 15896-15908.
186	Zhang, G.B., et al., Case study on effects of water management and rice straw incorporation in rice fields on production, oxidation, and emission of methane during fallow and following rice seasons. Soil Research, 2011. 49(3): p. 238.
187	Yao, Z., et al., Benefits of integrated nutrient management on N_2O and NO mitigations in water-saving ground cover rice production systems. Science of The Total Environment, 2019. 646: p. 1155-1163.
188	Yang, Y., et al., Winter tillage with the incorporation of stubble reduces the net global warming potential and greenhouse gas intensity of double-cropping rice fields. Soil and Tillage Research, 2018. 183: p. 19-27.
189	Wang et al. Effects of conservation tillage and balanced fertilization on nitrogen loss from paddy field and rice yields in Chaohu Region. Journal of Agro-Environment Science, 2010, 29(6): 1164-1171
190	Li et al. Effects of different fertilization treatments on runoff and leaching losses of nitrogen in paddy field. Journal of Soil and Water Conservation, 2016, 30(5): 23-28, 33
191	Xue, L., Y. Yu and L. Yang, Maintaining yields and reducing nitrogen loss in rice-wheat rotation system in Taihu Lake region with proper fertilizer management. Environmental Research Letters, 2014. 9(11): p. 115010.
192	Liu et al. Effects of straw-returning on annual overland runoff NPK loss in farmland. 2012, 21(6): 1031-1036
193	Zhang et al. Study on N leaching and runoff under integrated high yield and high efficiency practices in paddy fields of Taihu Lake Region. Soils, 2018, 50(1): 35-42
194	Jiao et al. Effects of fertilization on nitrogen and phosphorus run-off loss from Qingzini paddy soil in Taihu Lake region during rice growth season. Chinese Journal of Ecology, 2007, 4: 495-500
195	Wen et al. Studies on the nitrogen loss from rice field with different fertilizer treatments. Bulletin of Science and Technology, 2011, 27(4): 549-553
196	Zhou et al. Effects of bio-organic fertilizer on rice yield and soil fertility of supplementary cultivated land in hilly area. Tianjin Agricultural Sciences, 2017, 23(8): 98-101
197	Zheng et al. Yield effect of organic manure as substitution for nitrogen fertilizer in rice.

	Journal of Anhui Agricultural Sciences, 2017, 45(22): 32-33, 64
198	Guo et al. Nutrient management on rice and wheat yield formation and the related physiological research. Thesis of master's degree, Nanjing Agricultural University, 2017.
199	Zhang et al. Organic manure partial replacing chemical fertilizer: effect on supply ability and apparent budget of rice soil nitrogen. Journal of Agriculture, 2018, 8(12): 28-32
200	Cheng, W., Padre, A.T., Shiono, H., Sato, C., Toan, N.-S., Tawaraya, K. and Kumagai, K. Changes in the pH, EC, available P, SOC and TN stocks in a single rice paddy after long-term application of inorganic fertilizers and organic matters in a cold temperate region of Japan. J. Soils Sed. 17, 1834-1842 (2017).
201	Cui, Y.-f., Meng, J., Wang, Q.-x., Zhang, W.-m., Cheng, X.-y. and Chen, W.-f. Effects of straw and biochar addition on soil nitrogen, carbon, and super rice yield in cold waterlogged paddy soils of North China. J. Integr. Agr. 16, 1064-1074 (2017).
202	Ye et al. Effect of chemical fertilizer reduction combined organic fertilizer on rice growth and gas regulation value in paddy field. Thesis of master's degree, Shenyang Agricultural University, 2018.
203	Wang et al. Agronomic and environmental effects of partial substitution of organic manure to chemical fertilizers in rice cropping system. Thesis of master's degree, Zhejiang University, 2019.
204	Wang et al. Effect of different organic fertilizer substitution for chemical fertilizer on rice production. Agriculture and Technology, 2018, 38(2): 3-4, 16.
205	Tian et al. Effect of different dosages of organic fertilizer combined with chemical fertilizer on growth and yield of rice. Heilongjiang Agricultural Sciences, 2019, 5: 31-35
206	Tao et al. Effects of application of commercial organic fertilizer on rice. Anhui Agricultural Science Bulletin, 2017, 23(6): 105-111
207	Sun et al. Experiment of organic fertilizer partial substitution for chemical fertilizer in rice. Zhejiang Agricultural Sciences, 2018, 59(12): 2256-2257
208	Sun et al. Effect of different organic fertilizer rate to yield and soil fertility. Sichuan Agricultural Science and Technology, 2018, 2: 50-52
209	Liu et al. Effect of combined application of organic and chemical fertilizer on rice yield and soil fertility. 2018, 59(5): 694-697
210	Lin et al. Studies on the important ecological effects of applying organic manure in the soil-rice system. Thesis of doctor's degree, Zhejiang University, 2018.
211	Liu et al. Study of optimized application ratio of organic and inorganic fertilizer in rice of Jiangsu. Modern Agricultural Science and Technology, 2018, 23: 27-28, 31
212	Li et al. Effects of basal application of organic fertilizer replacing inorganic N tillering fertilizer retroposition on rice yield and growth. Chinese Agricultural Science Bulletin, 2018, 34(4): 21-26
213	Ji et al. Exploration on the proportion of inorganic and organic fertilizers based on rice field experiment. China Agricultural Technology Extension, 2019, 35(3): 44-45
214	He et al. Effect of partial substitution of organic fertilizer for chemical fertilizer on rice yield and benefit. Modern Agricultural Science and Technology, 2019, 21: 3-4
215	Chen et al. Different ratio of organic fertilizer and inorganic fertilizer on growth and yield of rice. Chinese Rice, 2018, 24(5): 105-109

216	Chen et al. Effects of different rates of organic fertilizer application on rice growth and soil organic matter in winter paddy fields. Subtropical Agricultural Research, 2019, 15(4): 223-228
217	Chen et al. Application effects of swine and cow manures on rice yield nutrient uptakes and use efficiencies and soil fertility. Soils, 2018, 50(1): 59-65
218	Chen et al. Effect of long-term organic fertilizers application on rice yield, nitrogen and phosphorus use efficiency. Chinese Soils and Fertilizer, 2017, 1: 92-97
219	Chen et al. Study of organic nitrogen substituting for 20% chemical nitrogen on rice yield. Shanghai Agricultural Science and Technology, 2017, 6: 95-96
220	Hu. Effects of organic nutrient replacement part of fertilizer on rice growth and soil physical and chemical properties. Thesis of master's degree, Jiangxi Agricultural University, 2018.
221	Li. Study on effects of different organic fertilizers on rice yield and soil characteristics in double-cropping rice area of eastern Hunan. Thesis of master's degree, Hunan Agricultural University, 2018.
222	Li. Safety application of organic manure partial substitution chemical nitrogen fertilizer and soil environmental capacity—taking lettuce and rice as examples. Thesis of master's degree, Zhejiang University, 2019.
223	Sui. Effect of different straw returning on carbon and nitrogen sequestration and rice growth and development. Thesis of doctor's degree, Shenyang Agricultural University, 2016.
224	Tang. Research on the optimum ratio of organic fertilizer replacing chemical fertilizer nitrogen and its effect. Thesis of master's degree, Hunan Agricultural University, 2019.
225	Ali, M.A., et al., Integrated effects of organic, inorganic and biological amendments on methane emission, soil quality and rice productivity in irrigated paddy ecosystem of Bangladesh: field study of two consecutive rice growing seasons. Plant and Soil, 2014. 378(1-2): p. 239-252.
226	Banerjee, B., et al., Dynamics of organic carbon and microbial biomass in alluvial soil with tillage and amendments in rice-wheat systems. Environmental Monitoring and Assessment, 2006. 119(1-3): p. 173-189.
227	Chaudhary, S., G.S. Dheri and B.S. Brar, Long-term effects of NPK fertilizers and organic manures on carbon stabilization and management index under rice-wheat cropping system. Soil and Tillage Research, 2017. 166: p. 59-66.
228	DAS, B., et al., Evaluating fertilization effects on soil physical properties using a soil quality index in an intensive rice-wheat cropping system. Pedosphere, 2016. 26(6): p. 887-894.
229	Ghosh, S., et al., Organic amendments influence soil quality and carbon sequestration in the Indo-Gangetic plains of India. Agriculture, Ecosystems & Environment, 2012. 156: p. 134-141.
230	Choudhury, G.S., et al., Tillage and residue management effects on soil aggregation, organic carbon dynamics and yield attribute in rice–wheat cropping system under reclaimed sodic soil. Soil and Tillage Research, 2014. 136: p. 76-83.
231	Lee, S.B., et al., Changes of soil organic carbon and its fractions in relation to soil physical properties in a long-term fertilized paddy. 2009. 104(2): p. 227-232.

232	Liu, Y., et al., Soil CO_2 emissions and drivers in rice-wheat rotation fields subjected to different long-term fertilization practices. Clean Soil Air Water, 2016. 44(7): p. 867-876.
233	Nie, S.A., et al., Dissolved organic nitrogen distribution in differently fertilized paddy soil profiles: Implications for its potential loss. Agriculture, Ecosystems & Environment, 2018. 262: p. 58-64.
234	Rahman, F., et al., Effect of organic and inorganic fertilizers and rice straw on carbon sequestration and soil fertility under a rice-rice cropping pattern. Carbon management, 2016. 7(1-2): p. 41-53.
235	Shahid, M., et al., Carbon and nitrogen fractions and stocks under 41 years of chemical and organic fertilization in a sub-humid tropical rice soil. Soil and Tillage Research, 2017. 170: p. 136-146.
236	Tang, H., et al., Long-term effects of NPK fertilizers and organic manures on soil organic carbon and carbon management index under a double-cropping rice system in Southern China. Communications in Soil Science and Plant Analysis, 2018. 49(16): p. 1976-1989.
237	Wang, M.C. and C.H. Yang, Type of fertilizer applied to a paddy – upland rotation affects selected soil quality attributes. Geoderma, 2003. 114: p. 93-108.
238	Yaduvanshi, N.P.S., Substitution of inorganic fertilizers by organic manures and the effect on soil fertility in a rice–wheat rotation on reclaimed sodic soil in India. The Journal of Agricultural Science, 2003. 140(2): p. 161-168.
239	Yan, D., D. Wang and L. Yang, Long-term effect of chemical fertilizer, straw, and manure on labile organic matter fractions in a paddy soil. Biology and Fertility of Soils, 2007. 44(1): p. 93-101.
240	Yan, X., et al., Carbon sequestration efficiency in paddy soil and upland soil under long-term fertilization in southern China. Soil & Tillage Research, 2013. 130: p. 42-51.
241	Liu et al. Effects of long-term fertilization on physical and chemical properties of yellow soil paddy soil. Journal of Jiangsu Agricultural Sciences, 2017, 45(19): 294-298
242	Nie et al. Effects of long-term fertilization on reddish paddy soil quality and its evaluation in a typical double rice cropping region of China. Chinese Journal of Applied Ecology, 2010, 21(6): 1453-1460
243	Krupnik, T.J., C. Shennan and J. Rodenburg, Yield, water productivity and nutrient balances under the system of rice intensification and recommended management practices in the Sahel. Field Crops Research, 2012. 130: p. 155-167.
244	Andriamananjara, A., et al., Farmyard manure application has little effect on yield or phosphorus supply to irrigated rice growing on highly weathered soils. Field Crops Research, 2016. 198: p. 61-69.
245	Somado, E.A., et al., Combined effects of legumes with rock phosphorus on rice in west Africa. Agronomy journal, 2003. 95(5): p. 1172-1178.
246	Issaka, et al., Zero tillage improves soil properties, reduces nitrogen loss and increases productivity in a rice farmland in Ghana. Agronomy (Basel), 2019. 9(10): p. 641.
247	Kwesiga, J., et al., Effect of organic amendments on the productivity of rainfed lowland rice in the Kilombero floodplain of Tanzania. Agronomy, 2020. 10(9): p. 1280.
248	Ismael, F., A. Ndayiragije and D. Fangueiro, New fertilizer strategies combining manure and urea for improved rice growth in Mozambique. Agronomy, 2021. 11(4): p. 783.
249	van Asten, P.J.A., et al., Effect of straw application on rice yields and nutrient availability

	on an alkaline and a pH-neutral soil in a Sahelian irrigation scheme. Nutrient Cycling in Agroecosystems, 2005. 72(3): p. 255-266.
250	Zschornack, T., et al., Soil CH_4 and N_2O emissions from rice paddy fields in southern Brazil as affected by crop management levels: a three-year field study. Revista Brasileira de Ciência do Solo, 2018. 42.
251	Li et al. Effects of chemical fertilizers application combined with manure on ammonia volatilization and rice yield in red paddy soil. Plant Nutrition and Fertilizer Science, 2005, 1: 51-56.

3. For the scenario analysis of business as usual

ID	References
1	Abao, E.B., Bronson, K.F., Wassmann, R. and Singh, U. Simultaneous records of methane and nitrous oxide emissions in rice-based cropping systems under rainfed conditions. Nutr. Cycl. Agroecosys. 58, 131-139 (2000).
2	Adhya, T.K., Bharati, K., Mohanty, S.R., Ramakrishnan, B., Rao, V.R., Sethunathan, N. and Wassmann, R. Methane emission from rice fields at Cuttack, India. Nutr. Cycl. Agroecosys. 58, 95-105 (2000).
3	Babu, Y.J., Nayak, D.R. and Adhya, T.K. Potassium application reduces methane emission from a flooded field planted to rice. Biol. Fertility Soils 42, 532-541 (2006).
4	Baruah, A., Baruah, K.K. and Bhattacharyya, P. Comparative effectiveness of organic substitution in fertilizer schedule: Impacts on nitrous oxide emission, photosynthesis, and crop productivity in a tropical summer rice paddy. Water Air Soil Poll. 227, 410 (2016).
5	Baruah, A., Baruah, K.K., Gorh, D. and Gupta, P.K. Effect of organic residues with varied carbon-nitrogen ratios on grain yield, soil health, and nitrous oxide emission from a rice agroecosystem. Commun. Soil Sci. Plant Anal. 47, 1417-1429 (2016).
6	Baruah, K.K., Gogoi, B. and Gogoi, P. Plant physiological and soil characteristics associated with methane and nitrous oxide emission from rice paddy. Physiol. Mol. Biol. Plants 16, 79-91 (2010).
7	Bharali, A., Baruah, K.K., Baruah, S.G. and Bhattacharyya, P. Impacts of integrated nutrient management on methane emission, global warming potential and carbon storage capacity in rice grown in a northeast India soil. Environ Sci. Pollut. R. 25, 5889-5901 (2018).
8	Bharali, A., Baruah, K.K. and Gogoi, N. Methane emission from irrigated rice ecosystem: relationship with carbon fixation, partitioning and soil carbon storage. Paddy and Water Environment 15, 221-236 (2017).
9	Bharali, A., Baruah, K.K. and Gogoi, N. Potential option for mitigating methane emission from tropical paddy rice through selection of suitable rice varieties. Crop & Pasture Science 68, 421-433 (2017).
10	Bharati, K., Mohanty, S.R., Singh, D.P., Rao, V.R. and Adhya, T.K. Influence of incorporation or dual cropping of Azolla on methane emission from a flooded alluvial soil planted to rice in eastern India. Agr. Ecosyst. Environ. 79, 73-83 (2000).
11	Bhatia, A., Pathak, H., Jain, N., Singh, P.K. and Singh, A.K. Global warming potential of manure amended soils under rice-wheat system in the Indo-Gangetic plains. Atmos. Environ. 39, 6976-6984 (2005).
12	Bhattacharyya, P., Nayak, A.K., Mohanty, S., Tripathi, R., Shahid, M., Kumar, A., Raja, R., Panda, B.B., Roy, K.S., Neogi, S., Dash, P.K., Shukla, A.K. and Rao, K.S. Greenhouse gas emission in relation to labile soil C, N pools and functional microbial diversity as influenced by 39 years long-term fertilizer management in tropical rice. Soil Till Res. 129, 93-105 (2013).
13	Bhattacharyya, P., Roy, K.S., Neogi, S., Adhya, T.K., Rao, K.S. and Manna, M.C. Effects of rice straw and nitrogen fertilization on greenhouse gas emissions and carbon

	storage in tropical flooded soil planted with rice. Soil Till Res. 124, 119-130 (2012).
14	Borah, L. and Baruah, K.K. Effects of foliar application of plant growth hormone on methane emission from tropical rice paddy. Agr. Ecosyst. Environ. 233, 75-84 (2016).
15	Bordoloi, N., Baruah, K.K. and Thakur, A.J. Effectiveness of plant growth regulators on emission reduction of greenhouse gas (nitrous oxide): An approach for cleaner environment. J. Clean. Prod. 171, 333-344 (2018).
16	Chareonsilp, N., Buddhaboon, C., Promnart, P., Wassmann, R. and Lantin, R.S. Methane emission from deepwater rice fields in Thailand. Nutr. Cycl. Agroecosys. 58, 121-130 (2000).
17	Cha-un, N., Chidthaisong, A., Yagi, K., Sudo, S. and Towprayoon, S. Greenhouse gas emissions, soil carbon sequestration and crop yields in a rain-fed rice field with crop rotation management. Agr. Ecosyst. Environ. 237, 109-120 (2017).
18	Chidthaisong, A., Cha-un, N., Rossopa, B., Buddaboon, C., Kunuthai, C., Sriphirom, P., Towprayoon, S., Tokida, T., Padre, A.T. and Minamikawa, K. Evaluating the effects of alternate wetting and drying (AWD) on methane and nitrous oxide emissions from a paddy field in Thailand. Soil Sci. Plant Nutr. 64, 31-38 (2018).
19	Corton, T.M., Bajita, J.B., Grospe, F.S., Pamplona, R.R., Assis, C.A., Wassmann, R., Lantin, R.S. and Buendia, L.V. Methane emission from irrigated and intensively managed rice fields in Central Luzon (Philippines). Nutr. Cycl. Agroecosys. 58, 37-53 (2000).
20	Dash, P.K., Bhattacharyya, P., Shahid, M., Roy, K.S., Swain, C.K., Tripathi, R. and Nayak, A.K. Low carbon resource conservation techniques for energy savings, carbon gain and lowering GHGs emission in lowland transplanted rice. Soil Till Res. 174, 45-57 (2017).
21	Datta, A., Nayak, D.R., Sinhababu, D.P. and Adhya, T.K. Methane and nitrous oxide emissions from an integrated rainfed rice-fish farming system of Eastern India. Agr. Ecosyst. Environ. 129, 228-237 (2009).
22	Datta, A., Santra, S.C. and Adhya, T.K. Environmental and economic opportunities of applications of different types and application methods of chemical fertilizer in rice paddy. Nutr. Cycl. Agroecosys. 107, 413-431 (2017).
23	Datta, A., Yeluripati, J.B., Nayak, D.R., Mahata, K.R., Santra, S.C. and Adhya, T.K. Seasonal variation of methane flux from coastal saline rice field with the application of different organic manures. Atmos. Environ. 66, 114-122 (2013).
24	Fangueiro, D., Becerra, D., Albarran, A., Pena, D., Sanchez-Llerena, J., Rato-Nunes, J.M. and Lopez-Pineiro, A. Effect of tillage and water management on GHG emissions from Mediterranean rice growing ecosystems. Atmos. Environ. 150, 303-312 (2017).
25	Fawibe, O.O., Honda, K., Taguchi, Y., Park, S. and Isoda, A. Greenhouse gas emissions from rice field cultivation with drip irrigation and plastic film mulch. Nutr. Cycl. Agroecosys. 113, 51-62 (2019).
26	Feng, X., Jiang, C.-s., Peng, X.-l., Li, Y.-p. and Hao, Q.-j. Effects of the crop rotation on greenhouse gases from flooded paddy fields. Huanjing Kexue 40, 392-400 (2019).
27	Fumoto, T., Yanagihara, T., Saito, T. and Yagi, K. Assessment of the methane mitigation potentials of alternative water regimes in rice fields using a process-based biogeochemistry model. Global Change Biology 16, 1847-1859 (2010).

28	Gaihre, Y.K., Singh, U., Islam, S.M.M., Huda, A., Islam, M.R., Sanabria, J., Satter, M.A., Islam, M.R., Biswas, J.C., Jahiruddin, M. and Jahan, M.S. Nitrous oxide and nitric oxide emissions and nitrogen use efficiency as affected by nitrogen placement in lowland rice fields. Nutr. Cycl. Agroecosys. 110, 277-291 (2018).
29	Guo, C., Ren, T., Li, P., Wang, B., Zou, J., Hussain, S., Cong, R., Wu, L., Lu, J. and Li, X. Producing more grain yield of rice with less ammonia volatilization and greenhouse gases emission using slow/controlled-release urea. Environ Sci. Pollut. R. 26, 2569-2579 (2019).
30	Gupta, D.K., Bhatia, A., Kumar, A., Das, T.K., Jain, N., Tomer, R., Malyan, S.K., Fagodiya, R.K., Dubey, R. and Pathak, H. Mitigation of greenhouse gas emission from rice-wheat system of the Indo-Gangetic plains: Through tillage, irrigation and fertilizer management. Agr. Ecosyst. Environ. 230, 1-9 (2016).
31	Gwon, H.S., Khan, M.I., Yoon, Y.E., Lee, Y.B., Kim, P.J. and Hwang, H.Y. Unexpected higher decomposition of soil organic matter during cold fallow season in temperate rice paddy. Soil Till Res. 192, 250-257 (2019).
32	Haque, M.M., Biswas, J.C., Hwang, H.Y. and Kim, P.J. Annual net carbon budget in rice soil. Nutr. Cycl. Agroecosys. 116, 31-40 (2020).
33	Haque, M.M., Biswas, J.C., Kim, S.Y. and Kim, P.J. Intermittent drainage in paddy soil: ecosystem carbon budget and global warming potential. Paddy and Water Environment 15, 403-411 (2017).
34	Haque, M.M., Kim, S.Y., Kim, G.W. and Kim, P.J. Optimization of removal and recycling ratio of cover crop biomass using carbon balance to sustain soil organic carbon stocks in a mono-rice paddy system. Agr. Ecosyst. Environ. 207, 119-125 (2015).
35	Hu, Q., Liu, T., Jiang, S., Cao, C., Li, C., Chen, B. and Liu, J. Combined effects of straw returning and chemical N fertilization on greenhouse gas emissions and yield from paddy fields in northwest Hubei province, China. J. Soil Sci. Plant Nut. 20, 392-406 (2020).
36	Hu, Y.-l., Tang, S.-r., Tao, K., He, Q.-x., Tian, W., Qing, X.-h., Wu, Y.-z. and Meng, L. Effects of optimizing fertilization on N_2O and CH_4 emissions in a paddy-cowpea rotation system in the tropical region of China. Huanjing Kexue 40, 5182-5190 (2019).
37	Hwang, H.Y., Kim, G.W., Kim, S.Y., Haque, M.M., Khan, M.I. and Kim, P.J. Effect of cover cropping on the net global warming potential of rice paddy soil. Geoderma 292, 49-58 (2017).
38	Jain, M.C., Kumar, S., Wassmann, R., Mitra, S., Singh, S.D., Singh, J.P., Singh, R., Yadav, A.K. and Gupta, S. Methane emissions from irrigated rice fields in northern India (New Delhi). Nutr. Cycl. Agroecosys. 58, 75-83 (2000).
39	Janz, B., Weller, S., Kraus, D., Racela, H.S., Wassmann, R., Butterbach-Bahl, K. and Kiese, R. Greenhouse gas footprint of diversifying rice cropping systems: Impacts of water regime and organic amendments. Agr. Ecosyst. Environ. 270, 41-54 (2019).
40	Jeong, S.T., Kim, G.W., Hwang, H.Y., Kim, P.J. and Kim, S.Y. Beneficial effect of compost utilization on reducing greenhouse gas emissions in a rice cultivation system through the overall management chain. Sci. Total Environ. 613, 115-122 (2018).
41	Jumadi, O., Hartono, H., Masniawati, A., Iriany, R.N., Makkulawu, A.T. and Inubushi,

	K. Emissions of nitrous oxide and methane from rice field after granulated urea application with nitrification inhibitors and zeolite under different water managements. Paddy and Water Environment 17, 715-724 (2019).
42	Kang, S.-W., Park, J.-W., Seo, D.-C., Ok, Y.S., Park, K.-D., Choi, I.-W. and Cho, J.-S. Effect of biochar application on rice yield and greenhouse gas emission under different nutrient conditions from paddy soil. J. Environ. Eng. 142 (2016).
43	Kim, G.W., Jeong, S.T., Kim, P.J. and Gwon, H.S. Influence of nitrogen fertilization on the net ecosystem carbon budget in a temperate mono-rice paddy. Geoderma 306, 58-66 (2017).
44	Kim, J., Yoo, G., Kim, D., Ding, W. and Kang, H. Combined application of biochar and slow-release fertilizer reduces methane emission but enhances rice yield by different mechanisms. Applied Soil Ecology 117, 57-62 (2017).
45	Kim, S.Y., Gutierrez, J. and Kim, P.J. Unexpected stimulation of CH_4 emissions under continuous no-tillage system in mono-rice paddy soils during cultivation. Geoderma 267, 34-40 (2016).
46	Kim, S.Y., Lee, C.H., Gutierrez, J. and Kim, P.J. Contribution of winter cover crop amendments on global warming potential in rice paddy soil during cultivation. Plant Soil 366, 273-286 (2013).
47	Kong, D., Li, S., Jin, Y., Wu, S., Chen, J., Hu, T., Wang, H., Liu, S. and Zou, J. Linking methane emissions to methanogenic and methanotrophic communities under different fertilization strategies in rice paddies. Geoderma 347, 233-243 (2019).
48	Kumar, A., Nayak, A.K., Mohanty, S. and Das, B.S. Greenhouse gas emission from direct seeded paddy fields under different soil water potentials in Eastern India. Agr. Ecosyst. Environ. 228, 111-123 (2016).
49	Kumar, U., Jain, M.C., Pathak, H., Kumar, S. and Majumdar, D. Nitrous oxide emission from different fertilizers and its mitigation by nitrification inhibitors in irrigated rice. Biol. Fertility Soils 32, 474-478 (2000).
50	Kurniawati, F.D., Setyanto, P., Suntoro, Cahyani, V.R. and Iop in International Conference on Climate Change, Vol. 200 012026-Article No.: 012026 (2018).
51	LaHue, G.T., Chaney, R.L., Adyiento-Borbe, M.A. and Linguist, B.A. Alternate wetting and drying in high yielding direct-seeded rice systems accomplishes multiple environmental and agronomic objectives. Agr. Ecosyst. Environ. 229, 30-39 (2016).
52	Liu, J., Zang, H., Xu, H., Zhang, K., Jiang, Y., Hu, Y. and Zeng, Z. Methane emission and soil microbial communities in early rice paddy as influenced by urea-N fertilization. Plant and Soil 445, 85-100 (2019).
53	Liu, X., Zhou, J., Chi, Z., Zheng, J., Li, L., Zhang, X., Zheng, J., Cheng, K., Bian, R. and Pan, G. Biochar provided limited benefits for rice yield and greenhouse gas mitigation six years following an amendment in a fertile rice paddy. Catena 179, 20-28 (2019).
54	Liu, Y., Tang, H., Muhammad, A. and Huang, G. The effects of Chinese milk vetch returning with nitrogen fertilizer on rice yield and greenhouse gas emissions. Greenhouse Gases-Science and Technology 9, 743-753 (2019).
55	Liu, Y., Tang, H., Muhammad, A., Zhong, C., Li, P., Zhang, P., Yang, B. and Huang, G. Rice yield and greenhouse gas emissions affected by chinese milk vetch and rice straw

	retention with reduced nitrogen fertilization. Agron. J. 111, 3028-3038 (2019).
56	Lou, Y., Ren, L., Zhao, S., Shi, Y., Zhang, Y. and Zhu, H. Effects of silicate application on CH_4 and N_2O emissions and global warming potentials in paddy soil under enhanced UV-B radiation. Energy Science & Engineering 7, 1784-1794 (2019).
57	Ma, Y., Liu, D.L., Schwenke, G. and Yang, B. The global warming potential of straw-return can be reduced by application of straw-decomposing microbial inoculants and biochar in rice-wheat production systems. Environ. Pollut. 252, 835-845 (2019).
58	Mai Van, T., Tesfai, M., Borrell, A., Nagothu, U.S., Thi Phuong Loan, B., Vu Duong, Q. and Le Quoc, T. Effect of organic, inorganic and slow-release urea fertilizers on CH_4 and N_2O emissions from rice paddy fields. Paddy and Water Environment 15, 317-330 (2017).
59	Malla, G., Bhatia, A., Pathak, H., Prasad, S., Jain, N. and Singh, J. Mitigating nitrous oxide and methane emissions from soil in rice-wheat system of the Indo-Gangetic plain with nitrification and urease inhibitors. Chemosphere 58, 141-147 (2005).
60	Maneepitak, S., Ullah, H., Datta, A., Shrestha, R.P., Shrestha, S. and Kachenchart, B. Effects of water and rice straw management practices on water savings and greenhouse gas emissions from a double-rice paddy field in the Central Plain of Thailand. Eur. J. Agron. 107, 18-29 (2019).
61	Maris, S.C., Teira-Esmatges, M.R., Bosch-Serra, A.D., Moreno-Garcia, B. and Catala, M.M. Effect of fertilising with pig slurry and chicken manure on GHG emissions from Mediterranean paddies. Sci. Total Environ. 569, 306-320 (2016).
62	Minamikawa, K. and Sakai, N. The practical use of water management based on soil redox potential for decreasing methane emission from a paddy field in Japan. Agr. Ecosyst. Environ. 116, 181-188 (2006).
63	Mohanty, S., Swain, C.K., Sethi, S.K., Dalai, P.C., Bhattachrayya, P., Kumar, A., Tripathi, R., Shahid, M., Panda, B.B., Kumar, U., Lal, B., Gautam, P., Munda, S. and Nayak, A.K. Crop establishment and nitrogen management affect greenhouse gas emission and biological activity in tropical rice production. Ecol. Eng. 104, 80-98 (2017).
64	Naser, H.M., Nagata, O., Tamura, S. and Hatano, R. Methane emissions from five paddy fields with different amounts of rice straw application in central Hokkaido, Japan. Soil Sci. Plant Nutr. 53, 95-101 (2007).
65	Oo, A.Z., Sudo, S., Inubushi, K., Mano, M., Yamamoto, A., Ono, K., Osawa, T., Hayashida, S., Patra, P.K., Terao, Y., Elayakumar, P., Vanitha, K., Umamageswari, C., Jothimani, P. and Ravi, V. Methane and nitrous oxide emissions from conventional and modified rice cultivation systems in South India. Agr. Ecosyst. Environ. 252, 148-158 (2018).
66	Oo, A.Z., Win, K.T. and Bellingrath-Kimura, S.D. Within field spatial variation in methane emissions from lowland rice in Myanmar. Springer plus 4 (2015).
67	Raheem, A., Zhang, J., Huang, J., Jiane, Y., Siddik, M.A., Denga, A., Gao, J. and Zhang, W. Greenhouse gas emissions from a rice-rice-green manure cropping system in South China. Geoderma 353, 331-339 (2019).
68	Rogers, C.W., Brye, K.R., Norman, R.J., Gbur, E.E., Mattice, J.D., Parkin, T.B. and Roberts, T.L. Methane emissions from drill-seeded, delayed-flood rice production on

	a silt-loam soil in Arkansas. J. Environ. Qual. 42, 1059-1069 (2013).
69	Rogers, C.W., Smartt, A.D., Brye, K.R. and Norman, R.J. Nitrogen source effects on methane emissions from drill-seeded, delayed-flood rice production. Soil Sci. 182, 9-17 (2017).
70	Sander, B.O., Samson, M. and Buresh, R.J. Methane and nitrous oxide emissions from flooded rice fields as affected by water and straw management between rice crops. Geoderma 235, 355-362 (2014).
71	Sass, R.L., Fisher, F.M. and Andrews, J.A. Spatial variability in methane emissions from a Texas rice field with some general implications. Global Biogeochemical Cycling 16 (2002).
72	Setyanto, P., Makarim, A.K., Fagi, A.M., Wassmann, R. and Buendia, L.V. Crop management affecting methane emissions from irrigated and rainfed rice in Central Java (Indonesia). Nutr. Cycl. Agroecosys. 58, 85-93 (2000).
73	Shakoor, A., Xu, Y., Wang, Q., Chen, N., He, F., Zuo, H., Yin, H., Yang, X., Ma, Y. and Yang, S. Effects of fertilizer application schemes and soil environmental factors on nitrous oxide emission fluxes in a rice-wheat cropping system, east China. PloS One 13 (2018).
74	Sheng, F., Cao, C.-g. and Li, C.-f. Integrated rice-duck farming decreases global warming potential and increases net ecosystem economic budget in central China. Environ Sci. Pollut. R. 25, 22744-22753 (2018).
75	Sibayan, E.B., Samoy-Pascual, K., Grospe, F.S., Casil, M.E.D., Tokida, T., Padre, A.T. and Minamikawa, K. Effects of alternate wetting and drying technique on greenhouse gas emissions from irrigated rice paddy in Central Luzon, Philippines. Soil Sci. Plant Nutr. 64, 39-46 (2018).
76	Song, H.J., Lee, J.H., Jeong, H.-C., Choi, E.-J., Oh, T.-K., Hong, C.-O. and Kim, P.J. Effect of straw incorporation on methane emission in rice paddy: conversion factor and smart straw management. Applied Biological Chemistry 62 (2019).
77	Sriphirom, P., Chidthaisong, A. and Towprayoon, S. Effect of alternate wetting and drying water management on rice cultivation with low emissions and low water used during wet and dry season. J. Clean. Prod. 223, 980-988 (2019).
78	Sun, H., Feng, Y., Ji, Y., Shi, W., Yang, L. and Xing, B. N_2O and CH_4 emissions from N-fertilized rice paddy soil can be mitigated by wood vinegar application at an appropriate rate. Atmos. Environ. 185, 153-158 (2018).
79	Sun, M., Zhan, M., Zhao, M., Tang, L.L., Qin, M.G., Cao, C.G., Cai, M.L., Jiang, Y. and Liu, Z.H. Maize and rice double cropping benefits carbon footprint and soil carbon budget in paddy field. Field Crops Res. 243 (2019).
80	Suryavanshi, P., Singh, Y.V., Prasanna, R., Bhatia, A. and Shivay, Y.S. Pattern of methane emission and water productivity under different methods of rice crop establishment. Paddy and Water Environment 11, 321-329 (2013).
81	Takakai, F., Hatakeyama, K., Nishida, M., Nagata, O., Sato, T. and Kaneta, Y. Effect of the long-term application of organic matter on soil carbon accumulation and GHG emissions from a rice paddy field in a cool-temperate region, Japan-II. Effect of different compost applications. Soil Sci. Plant Nutr. 66, 96-105 (2020).
82	Takakai, F., Ichikawa, J., Ogawa, M., Ogaya, S., Yasuda, K., Kobayashi, Y., Sato, T.,

	Kaneta, Y. and Nagahama, K.-i. Suppression of CH_4 emission by rice straw removal and application of bio-ethanol production residue in a paddy field in Akita, Japan. Agriculture-Basel 7 (2017).
83	Tirol-Padre, A., Minamikawa, K., Tokida, T., Wassmann, R. and Yagi, K. Site-specific feasibility of alternate wetting and drying as a greenhouse gas mitigation option in irrigated rice fields in Southeast Asia: a synthesis. Soil Sci. Plant Nutr. 64, 2-13 (2018).
84	Towprayoon, S., Smakgahn, K. and Poonkaew, S. Mitigation of methane and nitrous oxide emissions from drained irrigated rice fields. Chemosphere 59, 1547-1556 (2005).
85	Wang, A., Ma, X., Xu, J. and Lu, W. Methane and nitrous oxide emissions in rice-crab culture systems of northeast China. Aquaculture and Fisheries 4, 134-141 (2019).
86	Wang, C., Liu, J., Shen, J., Chen, D., Li, Y., Jiang, B. and Wu, J. Effects of biochar amendment on net greenhouse gas emissions and soil fertility in a double rice cropping system: A 4-year field experiment. Agr. Ecosyst. Environ. 262, 83-96 (2018).
87	Wang, H., Shen, M., Hui, D., Chen, J., Sun, G., Wang, X., Lu, C., Sheng, J., Chen, L., Luo, Y., Zheng, J. and Zhang, Y. Straw incorporation influences soil organic carbon sequestration, greenhouse gas emission, and crop yields in a Chinese rice (oryza sativa L.)-wheat (triticum aestivum L.) cropping system. Soil Till Res. 195 (2019).
88	Wang, W., Chen, C., Wu, X., Xie, K., Yin, C., Hou, H. and Xie, X. Effects of reduced chemical fertilizer combined with straw retention on greenhouse gas budget and crop production in double rice fields. Biol. Fertility Soils 55, 89-96 (2019).
89	Wassmann, R., Buendia, L.V., Lantin, R.S., Bueno, C.S., Lubigan, L.A., Umali, A., Nocon, N.N., Javellana, A.M. and Neue, H.U. Mechanisms of crop management impact on methane emissions from rice fields in Los Banos, Philippines. Nutr. Cycl. Agroecosys. 58, 107-119 (2000).
90	Wu, K., Gong, P., Zhang, L., Wu, Z., Xie, X., Yang, H., Li, W., Song, Y. and Li, D. Yield-scaled N_2O and CH_4 emissions as affected by combined application of stabilized nitrogen fertilizer and pig manure in rice fields. Plant Soil and Environment 65, 497-502 (2019).
91	Wu, X., Wang, W., Xie, K., Yin, C., Hou, H. and Xie, X. Combined effects of straw and water management on CH_4 emissions from rice fields. J. Environ. Manage. 231, 1257-1262 (2019).
92	Xu, H., Zhu, B., Liu, J., Li, D., Yang, Y., Zhang, K., Jiang, Y., Hu, Y. and Zeng, Z. Azolla planting reduces methane emission and nitrogen fertilizer application in double rice cropping system in southern China. Agron. Sustain. Dev. 37 (2017).
93	Yuan, Y., Dai, X. and Wang, H. Fertilization effects on CH_4, N_2O and CO_2 fluxes from a subtropical double rice cropping system. Plant Soil and Environment 65, 189-197 (2019).
94	Zhang, H., Liu, H., Hou, D., Zhou, Y., Liu, M., Wang, Z., Liu, L., Gu, J. and Yang, J. The effect of integrative crop management on root growth and methane emission of paddy rice. Crop Journal 7, 444-457 (2019).
95	Zhang, Q., Zhang, H., Liu, X., Zhang, A., Xiao, M. and Yang, Z. Variation and driving factors of nitrous oxide emissions from irrigated paddy field in the arid and semiarid region. International Soil and Water Conservation Research 6, 245-252 (2018).
96	Zhang, X., Sun, H., Wang, J., Zhang, J., Liu, G. and Zhou, S. Effect of moisture

	gradient on rice yields and greenhouse gas emissions from rice paddies. Environ Sci. Pollut. R. 26, 33416-33426 (2019).
97	Zhou, X., Wu, L.-h., Dai, F. and Dong, C.-h. Effects of combined biochemical inhibitors and fertilization models on CH_4 and N_2O emission from yellow clayey field during rice growth season. Journal of Ecology and Rural Environment 34, 1122-1130 (2018).
98	Zschornack, T., da Rosa, C.M., Pedroso, G.M., Marcolin, E., Ferreira da Silva, P.R. and Bayer, C. Mitigation of yield-scaled greenhouse gas emissions in subtropical paddy rice under alternative irrigation systems. Nutr. Cycl. Agroecosys. 105, 61-73 (2016).
99	Zschornack, T., da Rosa, C.M., Sacramento dos Reis, C.E., Pedroso, G.M., Camargo, E.S., dos Santos, D.C., Boeni, M. and Bayer, C. Soil CH_4 and N_2O emissions from rice paddy fields in Southern Brazil as affected by crop management levels: a three-year field study. Rev Bras Cienc Solo 42 (2018).
100	Ahmad, S., et al., Greenhouse gas emission from direct seeding paddy field under different rice tillage systems in central China. Soil and Tillage Research, 2009. 106(1): p. 54-61.
101	Cai, Z., et al., Options for mitigating methane emission from a permanently flooded rice field. Global Change Biology, 2003. 9(1): p. 37-45.
102	Cai, Z.C., Tsuruta, H. and Minami, K. Methane emission from rice fields in China: Measurements and influencing factors. J. Geophys. Res. 105, 17231-127242 (2000).
103	Zou, J., Huang, Y., Jiang, J., Zheng, X. and Sass, R.L. A 3-year field measurement of methane and nitrous oxide emissions from rice paddies in China: Effects of water regime, crop residue, and fertilizer application. Global Biogeochemical Cycling 19, GB2021 (2005).
104	Zou, J., et al., Sewage irrigation increased methane and nitrous oxide emissions from rice paddies in southeast China. Agriculture, Ecosystems & Environment, 2009. 129(4): p. 516-522.
105	Ma, J., Xu, H., Yagi, K. and Cai, Z.C. Methane emission from paddy soils as affected by wheat straw returning mode. Plant and Soil 313, 167-174 (2008).
106	Li, X., et al., Methane and nitrous oxide emissions from rice paddy soil as influenced by timing of application of hydroquinone and dicyandiamide. Nutrient Cycling in Agroecosystems, 2009. 85(1): p. 31-40.
107	Zhang G B,　Ma E D,　Zhang X Y, et al. Effects of Rice Straw Incorporation and Land Management in Winter on Methane Emission During Rice-growing Season. Journal of Agro-Environment Science, 2009.
108	Xie, B., et al., Effects of nitrogen fertilizer on CH_4 emission from rice fields: multi-site field observations. Plant and Soil, 2010. 326(1-2): p. 393-401.
109	Xu Y C, Shen Q R, Li M L, et al. Effect of soil water status and mulching on N_2O and CH_4 emission from lowland rice field in China. Biology and Fertility of Soils, 2004, 39(3):215-217.
110	Lu, W.F., et al., Methane emissions and mitigation options in irrigated rice fields in Southeast China. Nutrient Cycling in Agroecosystems, 2000. 58(1): p. 65-73.
111	Dong, H., et al., Effect of ammonium-based, non-sulfate fertilizers on CH_4 emissions

	from a paddy field with a typical Chinese water management regime. Atmospheric Environment, 2011. 45(5): p. 1095-1101.
112	Yue, J., et al., Methane and nitrous oxide emissions from rice field and related microorganism in black soil, Northeastern China. Nutrient Cycling in Agroecosystems, 2005. 73(2-3): p. 293-301.
113	Lin et al. Methane emission flux from paddy fields and its control in Hubei. Agro-environmental Protection, 2000, 5: 267-270
114	Yuan et al. CH_4 and N_2O emissions and their GWPs assessment in intermittent irrigation rice paddy field. Scientia Agricultura Sinica, 2008, 41(12): 4294-4300
115	Qin X, Li Y, Liu K, et al. The effect of Long-term fertilization treatment on methane emission from rice field in Hunan. Chinese Journal of Agrometeorology, 2006.
116	Shi et al. CH_4 emission from late rice field of red clay soil under different fertilization treatments. Journal of Ecology and Rural Environment, 2010, 26(2): 103-108
117	Liu J., Wu P., Xie X., et al. Methane emission from late rice fields in Hunan red soil under different long-term fertilizing systems[J]. Acta Ecologica Sinica, 2008.
118	Cao et al. Methane emission from permeable paddy soils in Jiangsu Province. Agro-environmental Protection, 2000, 1: 10-14
119	Ma, J., Xu, H., Cai, Z.C., Kazuyuki, Y. CH_4 and N_2O emissions from rice fields as affected by mulching of strips of wheat straws. Acta Pedologica Sinica, 2010, 47(1): 84-89
120	Ma, E., Ma, J., Xu, H., Cai, Z., Yagi, K. Effects of rice straw returning methods in wheat-growing season on CH_4 emissions from following rice-growing season. Ecology and Environmental Sciences, 2010, 19(3): 729-732
121	Chen et al. Effect of rice straw manure on methane emission in late-rice paddy fields. Acta Pedologica Sinica, 2002, 2: 170-176
122	Hu et al. Effects of different rotation systems on greenhouse gas (CH_4 and N_2O) emissions in the Taihu Lake region, China. Chinese Journal of Applied Ecology, 2016, 27(1): 99-106
123	Hang Yuhao, Wang Qiangsheng, Xu Guochun, Liu Xin. 2017. Effects of water regimes and straw incorporation on greenhouse gas emissions in a rice-wheat cropping system [J]. Ecology and Environmental Sciences, 26(11): 1844-1855
124	Li et al. Effects of non-flooded with straw mulching management on methane emission and rice yield in paddy field. Journal of Agro-Environment Science, 2012, 31(10): 2053-2059.
125	Li et al. Biochar input to reduce trace greenhouse gas emission in paddy field. Transactions of the CSAE, 2014, 30(21): 234-240
126	Lin et al. CH_4 emission characteristics of yellow-mud field under long-term fertilization in Southern China and its greenhouse effect. Hunan Agricultural Sciences, 2014, 7: 35-37
127	Liu et al. Methane emission and its relationship with soil temperature and moisture during rice growth in film mulching upland rice field in South China, Transactions of the Chinese Society of Agricultural Engineering, 2013, 29(2): 110-116
128	Ma et al. Effect of nitrogen fertilizer application on greenhouse gas emissions from soil in paddy field. Transactions of the Chinese Society of Agricultural Engineering,

	2016, 32(S2): 128-134
129	Qin et al. Effects of straw mulching on greenhouse gas intensity under on-tillage conditions. Transactions of the Chinese Society of Agricultural Engineering, 2012, 28(6): 210-216
130	Tan et al. Effects of different cultivation patterns on methane and nitrous oxide emissions from rice fields. Jiangsu agricultural Sciences, 2013, 41(12): 341-344
131	Wang et al. Effect of patterns of straw returning to field on methane and nitrous oxide emissions during rice-growing season in a rice-wheat double cropping system. Jiangsu Journal of Agricultural Sciences, 2014, 30(4): 758-763
132	Wang et al. CH_4 and N_2O emissions from paddy field and their GWPs research in different irrigation on modes in cold region, 2016, 23(2): 95-100
133	Wu et al. Effects of different organic fertilizers on greenhouse gas emissions and yield in paddy soils. Transactions of the Chinese Society of Agricultural Engineering, 2018, 34(4): 162-169
134	Xiao et al. Effect of biochar application on CH_4 emission from paddy field under water saving irrigation. 2017, 10: 52-55, 60
135	Xiao et al. Comparative study on CH_4 emission difference of double cropping rice. Jiangsu Agricultural Sciences, 2018, 46(6): 250-255
136	Xiong et al. Effects of Different Long-Term Fertilization and Crop Residue Management on Methane Emissions from Paddy fields with Purple Soil. Journal of Southwest China Normal University, 2013, 38(5): 98-102
137	Yi et al. Methane and nitrous oxide emissions in paddy field as influenced by fertilization. 2013, 22(8): 1432-1437
138	Yi et al. Emissions of CH_4 and N_2O from paddy soil in south china under different fertilization patterns. Journal of Agro-Environment Science, 2014, 33(12): 2478-2484
139	Zhang et al. Effects of years of straw return to soil on greenhouse gas emission in rice/wheat rotation systems. Chinese Journal of Eco-Agriculture, 2015, 23(3): 302-308
140	Zhang et al. Preliminary study on effect of straw incorporation on net global warming potential in high production rice-wheat double cropping systems. Journal of Aro-Environment Science, 2012, 31(8): 1647-1653
141	Zhao et al. Impact of different fertilization practices on greenhouse gas emission from paddy field. 2014, 33(11): 2273-2278
142	Zheng et al. Mitigation options of methane emission and nutrient losses by surface runoff during rice growing season in a rice-wheat double cropping system. Jiangsu J. Agr. Sci., 2012, 28(5): 1031-1036
143	He et al. Effects of different fertilization techniques on the emission of methane and nitrous oxide from single cropping rice. Journal of Agro-Environment Science, 2013, 32(10): 2093-2098
144	Yin et al. Study on effect of lose-controlled compound fertilizer on CH_4 emission in paddy field and rice yield. Phosphate & Compound Fertilizer, 2016, 31(1)：49-52
145	Zhang, J., et al., Interactive effects of straw incorporation and tillage on crop yield and greenhouse gas emissions in double rice cropping system. Agriculture, Ecosystems & Environment, 2017. 250: p. 37-43.
146	Zhang, X., et al., Two approaches for net ecosystem carbon budgets and soil carbon

	sequestration in a rice – wheat rotation system in China. Nutrient Cycling in Agroecosystems, 2014. 100(3): p. 301-313.
147	Zhou, M., et al., A three-year experiment of annual methane and nitrous oxide emissions from the subtropical permanently flooded rice paddy fields of China: Emission factor, temperature sensitivity and fertilizer nitrogen effect. Agricultural and Forest Meteorology, 2018. 250-251: p. 299-307.
148	Wang, B., et al., Modifying nitrogen fertilizer practices can reduce greenhouse gas emissions from a Chinese double rice cropping system. Agriculture, Ecosystems & Environment, 2016. 215: p. 100-109.
149	Hou, H., et al., Controlled irrigation mitigates the annual integrative global warming potential of methane and nitrous oxide from the rice–winter wheat rotation systems in Southeast China. Ecological Engineering, 2016. 86: p. 239-246.
150	Sui, Y., et al., Interactive effects of straw-derived biochar and N fertilization on soil C storage and rice productivity in rice paddies of Northeast China. Science of The Total Environment, 2016. 544: p. 203-210.
151	Zhang, Z.S., et al., Effects of tillage practices and straw returning methods on greenhouse gas emissions and net ecosystem economic budget in rice–wheat cropping systems in central China. Atmospheric Environment, 2015. 122: p. 636-644.
152	Jiang, Y., et al., Lime application lowers the global warming potential of a double rice cropping system. Geoderma, 2018. 325: p. 1-8.
153	Zhang, Z., et al., The effects of rape residue mulching on net global warming potential and greenhouse gas intensity from no-tillage paddy fields. The Scientific World Journal, 2014. 2014: p. 1-9.
154	Li, C., et al., Effects of tillage and nitrogen fertilizers on CH_4 and CO_2 emissions and soil organic carbon in paddy fields of central China. PLoS One, 2012. 7(5): p. e34642.
155	Ji, X., et al., The effect of rice straw incorporation into paddy soil on carbon sequestration and emissions in the double cropping rice system. Journal of the Science of Food and Agriculture, 2012. 92(5): p. 1038-1045.
156	Wang, C., et al., Greenhouse gas emissions in response to straw incorporation, water management and their interaction in a paddy field in subtropical central China. Archives of Agronomy and Soil Science, 2017. 63(2): p. 171-184.
157	Xu, S., et al., Treated domestic sewage irrigation significantly decreased the CH_4, N_2O and NH_3 emissions from paddy fields with straw incorporation. Atmospheric Environment, 2017. 169: p. 1-10.
158	TANG, H.M., et al., Methane and nitrous oxide emissions as affected by long-term fertilizer management from double-cropping paddy fields in Southern China. The Journal of Agricultural Science, 2016. 154(8): p. 1378-1391.
159	Wang, W., et al., Mitigating effects of ex situ application of rice straw on CH_4 and N_2O emissions from paddy-upland coexisting system. Scientific Reports, 2016. 6(1).
160	Chen, Z., et al., Effects of nitrogen application rates on net annual global warming potential and greenhouse gas intensity in double-rice cropping systems of the Southern China. Environmental Science and Pollution Research, 2016. 23(24): p. 24781-24795.
161	Zhang, Z.S., et al., Effects of nitrogen fertilizer sources and tillage practices on greenhouse gas emissions in paddy fields of central China. Atmospheric Environment,

	2016. 144: p. 274-281.
162	Gao, X., et al., Mushroom residue application affects CH_4 and N_2O emissions from fields under rice-wheat rotation. Archiv für Acker- und Pflanzenbau und Bodenkunde, 2017. 63(6): p. 748-760.
163	Wang, F.Q., et al., Study on CH_4 and N_2O emissions from water-saving irrigation in Phaeozem paddy fields in cold areas. Journal of Environmental Biology, 2016. 37: p. 1077-1085.
164	Liu, W., et al., Greenhouse gas emissions, soil quality, and crop productivity from a mono-rice cultivation system as influenced by fallow season straw management. Environmental Science and Pollution Research, 2016. 23(1): p. 315-328.
165	Zhong, Y., et al., Exploring a suitable nitrogen fertilizer rate to reduce greenhouse gas emissions and ensure rice yields in paddy fields. Science of The Total Environment, 2016. 565: p. 420-426.
166	Nie et al. Effects of combined application of organic fertilizer and chemical fertilizer on yield, quality and potassium uptake and transport of rice. Journal of Jiangsu Agricultural Science, 2016, 44(2): 122-125
167	Yang Z, Lu Y, Zhang F, et al. Comparative analysis of the effects of straw-returning and decomposed manure on paddy soil fertility betterment. Transactions of the Chinese Society of Agricultural Engineering, 2008, 24(3):214-218.
168	Meng et al. Effects of partial mineral nitrogen substitution by organic fertilizer nitrogen on the yields of rice grains and their proper substitution rate. 2009, 40(2): 532-542
169	Li et al. Effect of combined application of organic and inorganic fertilizers on greenhouse gases exchange and comprehensive global warming potential in paddy fields. Journal of soil and Water Conservation, 2013, 27(6): 298-304
170	Zhao et al. Effects of organic manure partial substitution for chemical fertilizer on crop yield and soil microbiome in a rice-wheat cropping system. Journal of Nanjing Agricultural University, 2016, 39(4): 594-602
171	Li et al. Effects of organic fertilizers on yield and quality of rice grains and nitrogen use efficiency. 2010, 36(3): 258-262
172	Lu et al. Effects of organic fertilizer partially substitute chemical fertilizer on rice yield and soil organic matters. China Agricultural Technology Extension, 2017, 33(5): 56-58
173	Liu et al. Effects of different organic-inorganic fertilizer combination ratios on rice yield and nutrient loss with surface runoff. Chinese Journal of Ecology, 2017, 36(2): 405-412
174	Guo. Effect of fertilization management on greenhouse gas emissions and soil microbial properties in rice-wheat rotation system. Thesis of master's degree, Chinese Academy of Agricultural Sciences, 2015.
175	Zhang. Gaseous loss and balance of nitrogen from paddy field in irrigation area of the upper Yellow River. Thesis of doctor's degree, Chinese Academy of Agricultural Sciences, 2011.
176	Guan. Effects of fertilizer application modes on yield and nutrient uptake of rice and wheat and soil biological properties. Thesis of doctor's degree, Huazhong Agricultural University, 2012.

177	Zhao. Study on the characteristics of N accumulation and leaching in different farmlands in the Yellow River irrigation region of Ningxia. Thesis of doctor's degree, Chinese Academy of Agricultural Sciences, 2012
178	Yang. Observation of net global warming potential under different nitrogen managements in annual rice-wheat rotation systems. Thesis of doctor's degree, Nanjing Agricultural University, 2015.
179	Wang et al. Effects of combined applications of pig manure and chemical fertilizers on CH_4 and N_2O emissions and their global warming potentials in paddy fields with double-rice cropping. Environmental Science, 2014, 35(8): 3120-3127
180	He et al. Effects of fertilization reduction and organic fertilizer replacement on rice yield and nutrient utilization. Hunan Agricultural Sciences, 2017, 3: 31-34
181	Guo. Studies on optimized nutrient management for rice yield and its physiological and ecological mechanisms. Thesis of doctor's degree, Nanjing Agricultural University, 2015.
182	Sun et al. Effects of pig manure and biogas slurry application on CH_4 and N_2O emissions and their greenhouse effects on paddy field. Journal of China Agricultural University, 2012, 17(5): 124-131
183	Zhang. Study on the effects and mechanism of reducing nitrogen application in paddy field. Thesis of master's degree, Academy of Agricultural Sciences, 2010.
184	Yuan et al. Assessing environmental impacts of organic and inorganic fertilizer on daily and seasonal greenhouse gases effluxes in rice field. Atmospheric Environment, 2017, 155, 119-128
185	Zhao et al. Effects of organic–inorganic compound fertilizer with reduced chemical fertilizer application on crop yields, soil biological activity and bacterial community structure in a rice–wheat cropping system. Applied Soil Ecology, 2016, 99, 1-12
186	Yu et al. Effects of different organic materials on ammonia volatilization and rice yield in paddy fields. Journal of Zhejiang Agricultural Sciences, 2011, 4: 908-909, 913
187	Li et al. Nitrogen dynamics in paddy field after irrigation of biogas slurry and its impact on the environment. Thesis of master's degree, Zhejiang University, 2011.
188	Guan, et al. Effects of chemical fertilizer applied combing with organic manure on yield of rice and nitrogen using efficiency. Chinese Agricultural Science Bulletin, 2009, 25(1): 88-92
189	Li et al. Effects of pig manure application on ammonia volatilization in soil during rice season in Chengdu Plain. Journal of Agro-Environment Science, 2015, 34(11): 2236-2244
190	Ru. Effects of organic manuring with chemical nitrogen fertilizer on nitrogen transformation in soils and nitrogen use efficiency in the rice-rice cropping system. Thesis of master's degree, Zhejiang University, 2015.
191	Zhang et al. Effects of combined application of organic fertilizer and chemical fertilizer on double cropping rice nutrient utilization and leaching loss from paddy soil. Journal of Soil and Water Conservation, 2012, 26(1): 22-27
192	Qin. Greenhouse gases (CH_4 and N_2O) emission from rice and vegetable fields under conventional and organic cropping regimes in Southeast China. Thesis of doctor's degree, Nanjing Agricultural University, 2011.

193	Huo et al. The effects of organic manures application on methane emission and its simulation in paddy fields. Journal of Agro-Environment Science, 2013, 32(10): 2084-2092
194	Liu et al. Rice Yield, Nitrogen use efficiency (NUE) and nitrogen leaching losses as affected by long-term combined application of manure and chemical fertilizers in Yellow River irrigated region of ningxia, China. Journal of Agro-Environment Science, 2015, 34(5): 947-954
195	Guo et al. Effect of fertilizer management on greenhouse gas emission and nutrient status in paddy soil. Journal of Plant Nutrition and Fertilizer, 2016, 22(2): 337-345
196	Zeng et al. Effect of swine manure application on wheat and rice yields, soil phosphorus accumulation and leaching risk. Journal of Hunan Agricultural University (Natural Sciences), 2016, 42(2): 202-207
197	Ji et al. Effects of long-term fertilization on storages and capacities of SOC in the paddy topsoil in Poyang Lake ecological area. Resources and Environment in the Yangze Basin, 2012, 21(2): 187-194
198	Yu, Q., et al., Effects of nitrogen application level on rice nutrient uptake and ammonia volatilization. Rice Science, 2013. 20(2): p. 139-147.
199	Zhu. Effects of different fertilization application methods on the ecosystem environment and the yield. Thesis of master's degree, Shanghaijiaotong University, 2014.
200	Ji. Effects of manure amendment on soil nitrate leaching potential and distribution of soil 15N natural abundance in paddy fields. Thesis of master's degree, Zhejiang University, 2014.
201	Das, S. and T.K. Adhya, Effect of combine application of organic manure and inorganic fertilizer on methane and nitrous oxide emissions from a tropical flooded soil planted to rice. Geoderma, 2014. 213: p. 185-192.
202	Das, B., et al., Effect of integrated nutrient management practice on soil aggregate properties, its stability and aggregate-associated carbon content in an intensive rice–wheat system. Soil and Tillage Research, 2014. 136: p. 9-18.
203	Zhao, Z., et al., Quantifying nitrogen loading from a paddy field in Shanghai, China with modified DNDC model. Agriculture, Ecosystems & Environment, 2014. 197: p. 212-221.
204	Nayak, A.K., et al., Long-term effect of different integrated nutrient management on soil organic carbon and its fractions and sustainability of rice–wheat system in Indo Gangetic Plains of India. Field Crops Research, 2012. 127: p. 129-139.
205	Yang, B., et al., Mitigating net global warming potential and greenhouse gas intensities by substituting chemical nitrogen fertilizers with organic fertilization strategies in rice–wheat annual rotation systems in China: A 3-year field experiment. Ecological Engineering, 2015. 81: p. 289-297.
206	Banger, K., et al., Impact of long-term additions of chemical fertilizers and farm yard manure on carbon and nitrogen sequestration under rice-cowpea cropping system in semi-arid tropics. Plant and Soil, 2009. 318(1-2): p. 27-35.
207	Gogoi, B., et al., Soil properties under rainfed rice (oryza sativa) crop as affected by integrated supply of nutrients. International Journal of Agriculture Innovations and

	Research, 2015. 3(6): p. 2319-1473.
208	Banger, K., et al., Impact of long-term additions of chemical fertilizers and farm yard manure on carbon and nitrogen sequestration under rice-cowpea cropping system in semi-arid tropics. Plant and Soil, 2009. 318(1-2): p. 27-35.
209	Chen, R., et al., Mitigating methane emissions from irrigated paddy fields by application of aerobically composted livestock manures in eastern China. Soil Use and Management, 2011. 27(1): p. 103-109.
210	Chang, E., et al., Effects of long-term treatments of different organic fertilizers complemented with chemical N fertilizer on the chemical and biological properties of soils. Soil science and plant nutrition (Tokyo), 2014. 60(4): p. 499-511.
211	Sharma, S.K., et al., Influence of rice varieties, nitrogen management and planting methods on methane emission and water productivity. Paddy and Water Environment, 2016. 14(2): p. 325-333.
212	Zhao, Z., et al., Assessing impacts of alternative fertilizer management practices on both nitrogen loading and greenhouse gas emissions in rice cultivation. Atmospheric Environment, 2015. 119: p. 393-401.
213	Hou et al. Effect of long-term located organic-inorganic fertilizer application on rice yield and soil fertility in red soil area of China. Scientia Agricultural Sinica, 2011, 44(3): 516-523
214	Bandyopadhyay, K.K. and M.C. Sarkar, Nitrogen use Efficiency, ^{15}N balance, and nitrogen losses in flooded rice in an Inceptisol. Communications in Soil Science and Plant Analysis, 2005. 36(11-12): p. 1661-1679.
215	Cao, Y., et al., Effects of wheat straw addition on dynamics and fate of nitrogen applied to paddy soils. Soil and Tillage Research, 2018. 178: p. 92-98.
216	Cao, Y., et al., Assessment of ammonia volatilization from paddy fields under crop management practices aimed to increase grain yield and N efficiency. Field Crops Research, 2013. 147: p. 23-31.
217	Chen, D., et al., Nitrogen dynamics of anaerobically digested slurry used to fertilize paddy fields. Biology and Fertility of Soils, 2013. 49(6): p. 647-659.
218	Clemens, J., et al., Mitigation of greenhouse gas emissions by anaerobic digestion of cattle slurry. Agriculture, Ecosystems & Environment, 2006. 112(2-3): p. 171-177.
219	Dong, N.M., et al., Effects of alternating wetting and drying versus continuous flooding on fertilizer nitrogen fate in rice fields in the Mekong Delta, Vietnam. Soil Biology and Biochemistry, 2012. 47: p. 166-174.
220	He, T., et al., A two years study on the combined effects of biochar and inhibitors on ammonia volatilization in an intensively managed rice field. Agriculture, Ecosystems & Environment, 2018. 264: p. 44-53.
221	Li, H., et al., Mineral-nitrogen leaching and ammonia volatilization from a rice-rapeseed system as affected by 3, 4-dimethylpyrazole phosphate. Journal of Environmental Quality, 2009. 38(5): p. 2131-2137.
222	Li, H., et al., Reduction of ammonia volatilization from urea by a floating duckweed in flooded rice fields. Soil Science Society of America journal, 2009. 73(6): p. 1890-1895.
223	Li, P., et al., Reducing nitrogen losses through ammonia volatilization and surface

	runoff to improve apparent nitrogen recovery of double cropping of late rice using controlled release urea. Environmental Science and Pollution Research, 2017. 24(12): p. 11722-11733.
224	Li, P., et al., Nitrogen losses, use efficiency, and productivity of early rice under controlled-release urea. Agriculture, Ecosystems & Environment, 2018. 251: p. 78-87.
225	Liu, T., et al., Effects of N fertilizer sources and tillage practices on NH_3 volatilization, grain yield, and N use efficiency of rice fields in central China. Frontiers in Plant Science, 2018. 9.
226	Liu, T.Q., et al., Deep placement of nitrogen fertilizers reduces ammonia volatilization and increases nitrogen utilization efficiency in no-tillage paddy fields in central China. Field Crops Research, 2015. 184: p. 80-90.
227	Sun, H., et al., Rice production, nitrous oxide emission and ammonia volatilization as impacted by the nitrification inhibitor 2-chloro-6-(trichloromethyl)-pyridine. Field Crops Research, 2015. 173: p. 1-7.
228	Tang, Y., et al., Effect of the slow-release nitrogen fertilizer oxamide on ammonia volatilization and nitrogen use efficiency in paddy soil. Agronomy, 2018. 8(4): p. 53.
229	Wang, S., et al., Different effects of biochar and a nitrification inhibitor application on paddy soil denitrification: A field experiment over two consecutive rice-growing seasons. Science of The Total Environment, 2017. 593-594: p. 347-356.
230	Xu, J., et al., Ammonia volatilization losses from a rice paddy with different irrigation and nitrogen managements. Agricultural Water Management, 2012. 104: p. 184-192.
231	Xu, M., et al., Polyolefin-coated urea decreases ammonia volatilization in a double rice system of Southern China. Agronomy Journal, 2013. 105(1): p. 277-284.
232	Yang, S., et al., Nitrogen loss from paddy field with different water and nitrogen managements in Taihu lake region of China. Communications in Soil Science and Plant Analysis, 2013. 44(16): p. 2393-2407.
233	Yao, Y., et al., Azolla biofertilizer for improving low nitrogen use efficiency in an intensive rice cropping system. Field Crops Research, 2018. 216: p. 158-164.
234	Yao, Y., et al., Urea deep placement for minimizing NH_3 loss in an intensive rice cropping system. Field Crops Research, 2018. 218: p. 254-266.
235	Zhang, J., et al., Emissions of N_2O and NH_3, and nitrogen leaching from direct seeded rice under different tillage practices in central China. Agriculture, Ecosystems & Environment, 2011. 140(1-2): p. 164-173.
236	Zhang, M., et al., Integration of urea deep placement and organic addition for improving yield and soil properties and decreasing N loss in paddy field. Agriculture, Ecosystems & Environment, 2017. 247: p. 236-245.
237	Zhao, M., et al., Mitigating gaseous nitrogen emissions intensity from a Chinese rice cropping system through an improved management practice aimed to close the yield gap. Agriculture, Ecosystems & Environment, 2015. 203: p. 36-45.
238	Zhao, X., et al., Nitrogen fate and environmental consequence in paddy soil under rice-wheat rotation in the Taihu lake region, China. Plant and Soil, 2009. 319(1-2): p. 225-234.
239	Chen, W., et al., The effect of planting density on carbon dioxide, methane and nitrous oxide emissions from a cold paddy field in the Sanjiang Plain, northeast China.

	Agriculture, Ecosystems & Environment, 2013. 178: p. 64-70.
240	Zhu, X., et al., Effects of dense planting with less basal N fertilization on rice yield, N use efficiency and greenhouse gas emissions. International Journal of Agriculture and Biology, 2015. 17(06): p. 1091-1100.
241	Wang, Z.Y., et al., A four-year record of methane emissions from irrigated rice fields in the Beijing region of China. Nutrient cycling in agroecosystems, 2000. 58(1): p. 55-63.
242	Qin, Y., et al., Methane and nitrous oxide emissions from organic and conventional rice cropping systems in Southeast China. Biology and Fertility of Soils, 2010. 46(8): p. 825-834.
243	Zou, J., et al., Integrated effect of incorporation with different organic manures on CH_4 and N_2O emissions from rice paddy. Huan Jing Ke Xue, 2003. 24(4): p. 7-12.
244	Zhang et al. Effects of soil tillage on CH_4 emission during paddy season in a rice-wheat double cropping system. Scientia Agricultura Sinica, 2010, 43(16): 3357-3366
245	Dai et al. Effects of notillage and fertilization on paddy soil CH_4 and N_2O emissions and their greenhouse effect in Central China. Journal of applied Ecology, 2009, 20(9): 2166-2172
246	Ma, J., et al., Wheat straw management affects CH_4 and N_2O emissions from rice fields. Soil Biology and Biochemistry, 2009. 41(5): p. 1022-1028.
247	Zhang et al. Characteristics of CH_4 and N_2O Emissions and greenhouse effects for mechanical transplanting rice in rice-wheat rotation system. Journal of Agro-Environment Science, 2010, 29(7): 1403-1409
248	Li et al. Methane and nitrous oxide fluxes in aerobic and waterlogged production systems of rice crop. Acta Pedologica Sinica, 2003, 6: 864-869
249	Yuan et al. Methane and nitrous oxide emissions from rice-fish and rice-duck complex ecosystems and the evaluation of their economic significance. Scientia Agricultura Sinica, 2009, 42(6): 2052-2060
250	Zhang et al. Effects of land management in winter on production, oxidation and emission of CH_4 during the rice-growing season. Journal of Ecology and Rural Environment, 2010, 26(2): 97-102
251	Yao, Z., et al., A 3-year record of N_2O and CH_4 emissions from a sandy loam paddy during rice seasons as affected by different nitrogen application rates. Agriculture, Ecosystems & Environment, 2012. 152: p. 1-9.
252	Li, X., et al., Effect of timing and duration of midseason aeration on CH_4 and N_2O emissions from irrigated lowland rice paddies in China. Nutrient Cycling in Agroecosystems, 2011. 91(3): p. 293-305.
253	Wang, J., et al., Methane emissions from a rice agroecosystem in South China: Effects of water regime, straw incorporation and nitrogen fertilizer. Nutrient Cycling in Agroecosystems, 2012. 93(1): p. 103-112.
254	Ma, Y.C., et al., Net global warming potential and greenhouse gas intensity of annual rice–wheat rotations with integrated soil–crop system management. Agriculture, Ecosystems & Environment, 2013. 164: p. 209-219.
255	Yao, Z., et al., Nitrous oxide and methane fluxes from a rice–wheat crop rotation under wheat residue incorporation and no-tillage practices. Atmospheric Environment, 2013.

	79: p. 641-649.
256	Hou, P., et al., Methane emissions from rice fields under continuous straw return in the middle-lower reaches of the Yangtze River. J Environ Sci (China), 2013. 25(9): p. 1874-81.
257	Wang, J., et al., Methane and nitrous oxide emissions as affected by organic–inorganic mixed fertilizer from a rice paddy in southeast China. Journal of Soils and Sediments, 2013. 13(8): p. 1408-1417.
258	Zhang, X., et al., Global warming potential and greenhouse gas intensity in rice agriculture driven by high yields and nitrogen use efficiency. Biogeosciences, 2016. 13(9): p. 2701-2714.
259	Li, X., et al., Methane and nitrous oxide emissions from rice paddy soil as influenced by timing of application of hydroquinone and dicyandiamide. Nutrient Cycling in Agroecosystems, 2009. 85(1): p. 31-40.
260	Liu, S., et al., Methane and nitrous oxide emissions from direct-seeded and seedling-transplanted rice paddies in southeast China. Plant and Soil, 2014. 374(1-2): p. 285-297.
261	Hang, X., et al., Differences in rice yield and CH_4 and N_2O emissions among mechanical planting methods with straw incorporation in Jianghuai area, China. Soil and Tillage Research, 2014. 144: p. 205-210.
262	Zhang, L., et al., Integrative effects of soil tillage and straw management on crop yields and greenhouse gas emissions in a rice–wheat cropping system. European Journal of Agronomy, 2015. 63: p. 47-54.
263	Liu, G., et al., Effects of straw incorporation along with microbial inoculant on methane and nitrous oxide emissions from rice fields. Science of The Total Environment, 2015. 518-519: p. 209-216.
264	Xiong, Z., et al., Differences in net global warming potential and greenhouse gas intensity between major rice-based cropping systems in China. Scientific Reports, 2016. 5(1).
265	Li, C., et al., Emissions of CH_4 and CO_2 from double rice cropping systems under varying tillage and seeding methods. Atmospheric Environment, 2013. 80: p. 438-444.
266	Shi et al. Observation for CH_4 and N_2O emissions under different rates of nitrogen and phosphate fertilization in double rice fields. Environmental Science, 2011, 1989-1907
267	Shi et al. Annual CH_4 and N_2O emissions from double rice cropping systems under various fertilizer regimes in Hunan Province, China. Chinese Journal of Atmospheric Sciences, 2011, 35(4): 707-720
268	Yang, X., et al., Methane emissions from double rice agriculture under long-term fertilizing systems in Hunan, China. Agriculture, Ecosystems & Environment, 2010. 137(3-4): p. 308-316.
269	Shang, Q., et al., Net annual global warming potential and greenhouse gas intensity in Chinese double rice-cropping systems: a 3-year field measurement in long-term fertilizer experiments. Global Change Biology, 2011. 17(6): p. 2196-2210.
270	Tang et al. Effects of winter cover crop on methane and nitrous oxide emission from paddy field. Chinese Journal of Applied Ecology, 2010, 21(12): 3191-3199
271	Shen, J., et al., Contrasting effects of straw and straw-derived biochar amendments on

	greenhouse gas emissions within double rice cropping systems. Agriculture, Ecosystems & Environment, 2014. 188: p. 264-274.
272	Liu, Y., et al., Net global warming potential and greenhouse gas intensity from the double rice system with integrated soil–crop system management: A three-year field study. Atmospheric Environment, 2015. 116: p. 92-101.
273	Ma, J., et al., Timing of midseason aeration to reduce CH_4 and N_2O emissions from double rice cultivation in China. Soil science and plant nutrition (Tokyo), 2013. 59(1): p. 35-45.
274	Zhang, G., et al., Drainage and tillage practices in the winter fallow season mitigate CH_4 and N_2O emissions from a double-rice field in China. Atmospheric Chemistry and Physics, 2016. 16(18): p. 11853-11866.
275	Liang, K., et al., Grain yield, water productivity and CH_4 emission of irrigated rice in response to water management in south China. Agricultural Water Management, 2016. 163: p. 319-331.
276	Qin, X., et al., Effect of rice cultivars on yield-scaled methane emissions in a double rice field in South China. Journal of Integrative Environmental Sciences, 2015. 12: p. 47-66.
277	Liang, X.Q., et al., Nitrogen management to reduce yield-scaled global warming potential in rice. Field Crops Research, 2013. 146: p. 66-74.
278	Zhou, M., et al., Nitrous oxide and methane emissions from a subtropical rice–rapeseed rotation system in China: A 3-year field case study. Agriculture, Ecosystems & Environment, 2015. 212: p. 297-309.
279	Yao, Z., et al., Greenhouse gas fluxes and NO release from a Chinese subtropical rice-winter wheat rotation system under nitrogen fertilizer management. Journal of Geophysical Research: Biogeosciences, 2013. 118(2): p. 623-638.
280	Gao, X., et al., Greenhouse gas intensity and net ecosystem carbon budget following the application of green manures in rice paddies. Nutrient Cycling in Agroecosystems, 2016. 106(2): p. 169-183.
281	Zhang et al. Effects of wheat straw returning and soil tillage on CH_4 and N_2O emissions in paddy season. Ecology and Environmental Sciences, 2009, 18(6): 2334-2338
282	Liu, Q., et al., Carbon footprint of rice production under biochar amendment - a case study in a Chinese rice cropping system. GCB Bioenergy, 2016. 8(1): p. 148-159.
283	Liu, W., et al., Greenhouse gas emissions, soil quality, and crop productivity from a mono-rice cultivation system as influenced by fallow season straw management. Environmental Science and Pollution Research, 2016. 23(1): p. 315-328.
284	Zhang, Z., et al., Emissions of CH_4 and CO_2 from paddy fields as affected by tillage practices and crop residues in central China. Paddy and Water Environment, 2016. 14(1): p. 85-92.
285	Xu, Y., et al., Effects of water-saving irrigation practices and drought resistant rice variety on greenhouse gas emissions from a no-till paddy in the central lowlands of China. Science of The Total Environment, 2015. 505: p. 1043-1052.
286	Xu, Y., et al., Improved water management to reduce greenhouse gas emissions in no-till rapeseed–rice rotations in Central China. Agriculture, Ecosystems & Environment, 2016. 221: p. 87-98.

287	Hao, Q., et al., Drainage, no-tillage and crop rotation decreases annual cumulative emissions of methane and nitrous oxide from a rice field in Southwest China. Agriculture, Ecosystems & Environment, 2016. 233: p. 270-281.
288	Jiang, C., et al., Methane and nitrous oxide emissions from three paddy rice based cultivation systems in Southwest China. Advances in Atmospheric Sciences, 2006. 23(3): p. 415-424.
289	Peng et al. Influence of controlled irrigation on CH_4 and N_2O emissions from paddy fields and subsequent greenhouse effect. Advances in Water Science, 2010, 21(2): 235-240
290	Sun, H., et al., A two-year field measurement of methane and nitrous oxide fluxes from rice paddies under contrasting climate conditions. Scientific Reports, 2016. 6(1).
291	Sun, H., et al., CH_4 emission in response to water-saving and drought-resistance rice (WDR) and common rice varieties under different irrigation managements. Water, Air, & Soil Pollution, 2016. 227(2).
292	Xu, G., et al., Integrated rice-duck farming mitigates the global warming potential in rice season. Science of The Total Environment, 2017. 575: p. 58-66.
293	Zhang, X., et al., Comparison of greenhouse gas emissions from rice paddy fields under different nitrogen fertilization loads in Chongming Island, Eastern China. Science of The Total Environment, 2014. 472: p. 381-388.
294	Hu, N., et al., Effects of different straw returning modes on greenhouse gas emissions and crop yields in a rice – wheat rotation system. Agriculture, Ecosystems & Environment, 2016. 223: p. 115-122.
295	Liu, X., et al., Can biochar amendment be an ecological engineering technology to depress N_2O emission in rice paddies?—A cross site field experiment from South China. Ecological Engineering, 2012. 42: p. 168-173.
296	Zheng, X., et al., Impacts of soil moisture on nitrous oxide emission from croplands: a case study on the rice-based agro-ecosystem in Southeast China. Chemosphere. Global change science, 2000. 2(2): p. 207-224.
297	Su, M., et al., Nitrous oxide and methane emissions from paddy soils in southwest China. Geoderma Regional, 2017. 8: p. 1-11.
298	Zhang, A., et al., Effects of biochar amendment on soil quality, crop yield and greenhouse gas emission in a Chinese rice paddy: A field study of 2 consecutive rice growing cycles. Field Crops Research, 2012. 127: p. 153-160.
299	Zhang, A., et al., Change in net global warming potential of a rice–wheat cropping system with biochar soil amendment in a rice paddy from China. Agriculture, Ecosystems & Environment, 2013. 173: p. 37-45.
300	Zhang, A., et al., Effect of biochar amendment on yield and methane and nitrous oxide emissions from a rice paddy from Tai Lake plain, China. Agriculture, Ecosystems & Environment, 2010. 139(4): p. 469-475.
301	Zhou, W., et al., Substantial N_2O emission during the initial period of the wheat season due to the conversion of winter-flooded paddy to rice-wheat rotation. Atmospheric Environment, 2017. 170: p. 269-278.
302	Zhou, M., et al., Long-term field measurements of annual methane and nitrous oxide emissions from a Chinese subtropical wheat-rice rotation system. Soil Biology and

	Biochemistry, 2017. 115: p. 21-34.
303	Zhang, G., et al., Achieving low methane and nitrous oxide emissions with high economic incomes in a rice-based cropping system. Agricultural and Forest Meteorology, 2018. 259: p. 95-106.
304	Ji, Y., et al., Effects of urea and controlled release urea fertilizers on methane emission from paddy fields: A multi-year field study. Pedosphere, 2014. 24(5): p. 662-673.
305	Hou, H., et al., Seasonal variations of CH_4 and N_2O emissions in response to water management of paddy fields located in Southeast China. Chemosphere, 2012. 89(7): p. 884-892.
306	Wu, X., et al., Net global warming potential and greenhouse gas intensity as affected by different water management strategies in Chinese double rice-cropping systems. Scientific Reports, 2018. 8(1).
307	Sun, L., et al., Nitrogen fertilizer in combination with an ameliorant mitigated yield-scaled greenhouse gas emissions from a coastal saline rice field in southeastern China. Environmental Science and Pollution Research, 2018. 25(16): p. 15896-15908.
308	Jiang, J., et al., Assessment of reactive nitrogen mitigation potential of different nitrogen treatments under direct-seeded rice and wheat cropping system. Environmental Science and Pollution Research, 2018. 25(20): p. 20241-20254.
309	Kreye, C., et al., Fluxes of methane and nitrous oxide in water-saving rice production in north China. Nutrient Cycling in Agroecosystems, 2007. 77(3): p. 293-304.
310	Liu, G., et al., Combination of wet irrigation and nitrification inhibitor reduced nitrous oxide and methane emissions from a rice cropping system. Environmental Science and Pollution Research, 2016. 23(17): p. 17426-17436.
311	Zhang, G.B., et al., Case study on effects of water management and rice straw incorporation in rice fields on production, oxidation, and emission of methane during fallow and following rice seasons. Soil Research, 2011. 49(3): p. 238.
312	Yao, Z., et al., Benefits of integrated nutrient management on N_2O and NO mitigations in water-saving ground cover rice production systems. Science of The Total Environment, 2019. 646: p. 1155-1163.
313	Yang, Y., et al., Winter tillage with the incorporation of stubble reduces the net global warming potential and greenhouse gas intensity of double-cropping rice fields. Soil and Tillage Research, 2018. 183: p. 19-27.
314	Li, J., et al., Combination of modified nitrogen fertilizers and water saving irrigation can reduce greenhouse gas emissions and increase rice yield. Geoderma, 2018. 315: p. 1-10.
315	WANG, W., et al., Industrial and agricultural wastes decreased greenhouse-gas emissions and increased rice grain yield in a subtropical paddy field. Experimental Agriculture, 2018. 54(4): p. 623-640.
316	Wang, W., et al., Effects of steel slag application on greenhouse gas emissions and crop yield over multiple growing seasons in a subtropical paddy field in China. Field Crops Research, 2015. 171: p. 146-156.
317	Dong, W., et al., Water regime-nitrogen fertilizer incorporation interaction: Field study on methane and nitrous oxide emissions from a rice agroecosystem in Harbin, China. Journal of Environmental Sciences, 2018. 64: p. 289-297.

318	Zhu, X., et al., Dense planting with less basal nitrogen fertilization might benefit rice cropping for high yield with less environmental impacts. European Journal of Agronomy, 2016. 75: p. 50-59.
319	Tang, J., et al., Effects of irrigation regime and nitrogen fertilizer management on CH_4, N_2O and CO_2 emissions from saline – alkaline paddy fields in Northeast China. Sustainability, 2018. 10(2): p. 475.
320	Liang et al. Effect of slow-releasing nitrogen fertilizers on CH_4 and N_2O emission in maize and rice fields in black earth soil. Chinese Journal of Ecology, 2004, 3: 44-48
321	Wang et al. Optimal water-saving irrigation mode reducing N_2O emission from rice paddy field in cold region and increasing rice yield. Transactions of the Chinese Society of Agricultural Engineering, 2015, 31(15): 72-79
322	Liang, X.Q., et al., Mitigation of nutrient losses via surface runoff from rice cropping systems with alternate wetting and drying irrigation and site-specific nutrient management practices. Environmental Science and Pollution Research, 2013. 20(10): p. 6980-6991.
323	Wang et al. Effects of NM urea on nitrogen runoff losses of surface water and nitrogen fertilizer efficiency in paddy field. Transactions of the Chinese Society of Agricultural Engineering, 2011, 27(1): 106-111
324	Duan et al. Regular pattern of nitrogen and phosphorus losses in rice field of Hubei Province. Hubei Agricultural Sciences, 2012, 51(18): 3953-3957
325	Wang et al. Effects of conservation tillage and balanced fertilization on nitrogen loss from paddy field and rice yields in Chaohu Region. Journal of Agro-Environment Science, 2010, 29(6): 1164-1171
326	Zhang et al. Effects of irrigation and fertilization on nitrogen and phosphorus runoff from paddy field. Journal of Soil and Water Conservation, 2011, 25(6): 7-12
327	Zhang, Y., et al., Direct-seeded rice increases nitrogen runoff losses in southeastern China. Agriculture, Ecosystems & Environment, 2018. 251: p. 149-157.
328	Li et al. Effects of different fertilization treatments on runoff and leaching losses of nitrogen in paddy field. Journal of Soil and Water Conservation, 2016, 30(5): 23-28, 33
329	Yang et al. Effects of specific fertilizer on runoff loss of nitrogen and phosphorus and yield of rice. Hunan Agricultural Sciences, 2011, 7: 42-44
330	Chen et al. Characteristics of nitrogen and phosphorus runoff losses in organic and conventional rice-wheat rotation farm-land in Taihu Lake Region. Journal of Agro-Environment Science, 2016, 35(8): 1550-1558
331	Xue, L., Y. Yu and L. Yang, Maintaining yields and reducing nitrogen loss in rice-wheat rotation system in Taihu Lake region with proper fertilizer management. Environmental research letters, 2014. 9(11): p. 115010.
332	Chen, G., et al., Do high nitrogen use efficiency rice cultivars reduce nitrogen losses from paddy fields? Agriculture, Ecosystems & Environment, 2015. 209: p. 26-33.
333	Liu et al. Effects of straw-returning on annual overland runoff NPK loss in farmland. 2012, 21(6): 1031-1036
334	Wang, X., et al., Nitrogen cycling and losses under rice-wheat rotations with coated urea and urea in the Taihu Lake Region. Pedosphere, 2007. 17(1): p. 62-69.

335	Zhang et al. Study on N leaching and runoff under integrated high yield and high efficiency practices in paddy fields of Taihu Lake Region. Soils, 2018, 50(1): 35-42
336	Yue et al. Effects of rice cultivation patterns on nitrogen and phosphorus leaching and runoff losses. Chinese Journal of Eco-Agriculture, 2014, 22(12): 1424-1432
337	Wang, J., et al., Runoff nitrogen (N) losses and related metabolism enzyme activities in paddy field under different nitrogen fertilizer levels. Environmental Science and Pollution Research, 2018. 25(27): p. 27583-27593.
338	Zhou et al. Effects of bio-organic fertilizer on rice yield and soil fertility of supplementary cultivated land in hilly area. Tianjin Agricultural Sciences, 2017, 23(8): 98-101
339	Zheng et al. Yield effect of organic manure as substitution for nitrogen fertilizer in rice. Journal of Anhui Agricultural Sciences, 2017, 45(22): 32-33, 64
340	Zhang et al. Organic manure partial replacing chemical fertilizer: effect on supply ability and apparent budget of rice soil nitrogen. Journal of Agriculture, 2018, 8(12): 28-32
341	Yin et al. Study of substitute for chemical fertilizer with organic fertilizer on rice production in Liyang. Shanghai Agricultural Science and Technology, 2018, 3: 103-104
342	Dong, W., et al., Water regime-nitrogen fertilizer incorporation interaction: Field study on methane and nitrous oxide emissions from a rice agroecosystem in Harbin, China. Journal of Environmental Sciences, 2018. 64: p. 289-297.
343	Cui, Y.-f., Meng, J., Wang, Q.-x., Zhang, W.-m., Cheng, X.-y. and Chen, W.-f. Effects of straw and biochar addition on soil nitrogen, carbon, and super rice yield in cold waterlogged paddy soils of North China. J. Integr. Agr. 16, 1064-1074 (2017).
344	Nie, T., Chen, P., Zhang, Z., Qi, Z., Lin, Y. and Xu, D. Effects of different types of water and nitrogen fertilizer management on greenhouse gas emissions, yield, and water consumption of paddy fields in cold region of China. Int. J. Env. Res. Public Health 16 (2019).
345	Ye et al. Effect of chemical fertilizer reduction combined organic fertilizer on rice growth and gas regulation value in paddy field. Thesis of master's degree, Shenyang Agricultural University, 2018.
346	Wang et al. Agronomic and environmental effects of partial substitution of organic manure to chemical fertilizers in rice cropping system. Thesis of master's degree, Zhejiang University, 2019.
347	Wang et al. Effect of different organic fertilizer substitution for chemical fertilizer on rice production. Agriculture and technology, 2018, 38(2): 3-4, 16.
348	Tian et al. Effect of different dosages of organic fertilizer combined with chemical fertilizer on growth and yield of rice. Heilongjiang Agricultural Sciences, 2019, 5: 31-35
349	Tao et al. Effects of application of commercial organic fertilizer on rice. Anhui Agricultural Science Bulletin, 2017, 23(6): 105-111
350	Sun et al. Experiment of organic fertilizer partial substitution for chemical fertilizer in rice. Zhejiang Agricultural Sciences, 2018, 59(12): 2256-2257
351	Sun et al. Effect of different organic fertilizer rate to yield and soil fertility. Sichuan

	Agricultural Science and Technology, 2018, 2: 50-52
352	Liu et al. Effect of combined application of organic and chemical fertilizer on rice yield and soil fertility. 2018, 59(5): 694-697
353	Lin et al. Studies on the important ecological effects of applying organic manure in the soil-rice system. Thesis of doctor's degree, Zhejiang University, 2018.
354	Li et al. Effects of basal application of organic fertilizer replacing inorganic N tillering fertilizer retroposition on rice yield and growth. Chinese Agricultural Science Bulletin, 2018, 34(4): 21-26
355	Ji et al. Exploration on the proportion of inorganic and organic fertilizers based on rice field experiment. China Agricultural Technology Extension, 2019, 35(3): 44-45
356	Chen et al. Different ratio of organic fertilizer and inorganic fertilizer on growth and yield of rice. Chinese Rice, 2018, 24(5): 105-109
357	Chen et al. Effects of different rates of organic fertilizer application on rice growth and soil organic matter in winter paddy fields. Subtropical Agricultural Research, 2019, 15(4): 223-228
358	Chen et al. Application effects of swine and cow manures on rice yield nutrient uptakes and use efficiencies and soil fertility. Soils, 2018, 50(1): 59-65
359	Chen et al. Effect of long-term organic fertilizers application on rice yield, nitrogen and phosphorus use efficiency. Chinese Soils and Fertilizer, 2017, 1: 92-97
360	Hu. Effects of organic nutrient replacement part of fertilizer on rice growth and soil physical and chemical properties. Thesis of master's degree, Jiangxi Agricultural University, 2018.
361	Li. Study on effects of different organic fertilizers on rice yield and soil characteristics in double-cropping rice area of eastern Hunan. Thesis of master's degree, Hunan Agricultural University, 2018.
362	Li. Safety application of organic manure partial substitution chemical nitrogen fertilizer and soil environmental capacity——taking lettuce and rice as examples. Thesis of master's degree, Zhejiang University, 2019.
363	Wang et al. Greenhouse gases emissions from rice paddy field under different water and nitrogenous interaction in cold region of Northeast China. Thesis of doctor's degree, Shenyang Agricultural University, 2016.
364	Tang. Research on the optimum ratio of organic fertilizer replacing chemical fertilizer nitrogen and its effect. Thesis of master's degree, Hunan Agricultural University, 2019.
365	Scheer, C., et al., Methane and nitrous oxide fluxes in annual and perennial land-use systems of the irrigated areas in the Aral Sea Basin. Global Change Biology, 2008. 14: p. 2454-2468.
366	Banerjee, B., et al., Dynamics of organic carbon and microbial biomass in alluvial soil with tillage and amendments in rice-wheat systems. Environmental Monitoring and Assessment, 2006. 119(1-3): p. 173-189.
367	Chaudhary, S., G.S. Dheri and B.S. Brar, Long-term effects of NPK fertilizers and organic manures on carbon stabilization and management index under rice-wheat cropping system. Soil and Tillage Research, 2017. 166: p. 59-66.
368	Ghosh, S., et al., Organic amendments influence soil quality and carbon sequestration in the Indo-Gangetic plains of India. Agriculture, Ecosystems & Environment, 2012.

	156: p. 134-141.
369	Choudhury, G.S., et al., Tillage and residue management effects on soil aggregation, organic carbon dynamics and yield attribute in rice–wheat cropping system under reclaimed sodic soil. Soil and Tillage Research, 2014. 136: p. 76-83.
370	Hao, X.H., et al., Effect of long-term application of inorganic fertilizer and organic amendments on soil organic matter and microbial biomass in three subtropical paddy soils. Nutrient Cycling in Agroecosystems, 2008. 81(1): p. 17-24.
371	Kukal, S.S., Rehana-Rasool and D.K. Benbi, Soil organic carbon sequestration in relation to organic and inorganic fertilization in rice–wheat and maize–wheat systems. Soil & tillage research, 2009. 102(1): p. 87-92.
372	Lee, S.B., et al., Changes of soil organic carbon and its fractions in relation to soil physical properties in a long-term fertilized paddy. Changes of soil organic carbon and its fractions in relation to soil physical properties in a long-term fertilized paddy, 2009. 104(2): p. 227-232.
373	Liu, Y., et al., Soil CO_2 emissions and drivers in rice-wheat rotation fields subjected to different long-term fertilization practices. Clean Soil Air Water, 2016. 44(7): p. 867-876.
374	Nie, S.A., et al., Dissolved organic nitrogen distribution in differently fertilized paddy soil profiles: Implications for its potential loss. Agriculture, Ecosystems & Environment, 2018. 262: p. 58-64.
375	Rahman, F., et al., Effect of organic and inorganic fertilizers and rice straw on carbon sequestration and soil fertility under a rice-rice cropping pattern. Carbon management, 2016. 7(1-2): p. 41-53.
376	Shahid, M., et al., Carbon and nitrogen fractions and stocks under 41 years of chemical and organic fertilization in a sub-humid tropical rice soil. Soil and Tillage Research, 2017. 170: p. 136-146.
377	Tang, H., et al., Long-term effects of NPK fertilizers and organic manures on soil organic carbon and carbon management index under a double-cropping rice system in Southern China. Communications in soil science and plant analysis, 2018. 49(16): p. 1976-1989.
378	Wang, M.C. and C.H. Yang, Type of fertilizer applied to a paddy – upland rotation affects selected soil quality attributes. Geoderma, 2003. 114: p. 93-108.
379	Yaduvanshi, N.P.S., Substitution of inorganic fertilizers by organic manures and the effect on soil fertility in a rice–wheat rotation on reclaimed sodic soil in India. The Journal of Agricultural Science, 2003. 140(2): p. 161-168.
380	Yan, D., D. Wang and L. Yang, Long-term effect of chemical fertilizer, straw, and manure on labile organic matter fractions in a paddy soil. Biology and Fertility of Soils, 2007. 44(1): p. 93-101.
381	Yan, X., et al., Carbon sequestration efficiency in paddy soil and upland soil under long-term fertilization in southern China. Soil & Tillage Research, 2013. 130: p. 42-51.
382	Liu et al. Effects of long-term fertilization on physical and chemical properties of yellow soil paddy soil. Journal of Jiangsu Agricultural Sciences, 2017, 45(19): 294-298

383	Nie et al. Effects of long-term fertilization on reddish paddy soil quality and its evaluation in a typical double rice cropping region of China. Chinese Journal of Applied Ecology, 2010, 21(6): 1453-1460
384	Niang, A., et al., Yield variation of rainfed rice as affected by field water availability and N fertilizer use in central Benin. Nutrient Cycling in Agroecosystems, 2018. 110(2): p. 293-305.
385	Koné, B., et al., Nutrient constraint and yield potential of rice on upland soil in the south of the Dahoumey gap of West Africa. Archives of Agronomy and Soil Science, 2011. 57(7): p. 763-774.
386	Koffi, D., B. Vincent and M. Valere, Yield and nitrogen use efficiency of aromatic rice varieties in response to nitrogen fertilizer. Emirates Journal of Food and Agriculture, 2016. 28(2): p. 126.
387	Djaman, K., et al., Effects of alternate wetting and drying irrigation regime and nitrogen fertilizer on yield and nitrogen use efficiency of irrigated rice in the Sahel. Water, 2018. 10(6): p. 711.
388	Haefele, S.M., M.C.S. Wopereis and H. Wiechmann, Long-term fertility experiments for irrigated rice in the West African Sahel: agronomic results. Field crops research, 2002. 78(2): p. 119-131.
389	Krupnik, T.J., C. Shennan and J. Rodenburg, Yield, water productivity and nutrient balances under the system of rice intensification and recommended management practices in the Sahel. Field Crops Research, 2012. 130: p. 155-167.
390	Andriamananjara, A., et al., Farmyard manure application has little effect on yield or phosphorus supply to irrigated rice growing on highly weathered soils. Field Crops Research, 2016. 198: p. 61-69.
391	Aleminew, A., et al., Influence of nitrogen on the growth and use efficiency of rainfed lowland rice in northwest Ethiopia. Journal of plant nutrition, 2020. 43(15): p. 2243-2258.
392	Somado, E.A., et al., Combined effects of legumes with rock phosphorus on rice in west Africa. Agronomy journal, 2003. 95(5): p. 1172-1178.
393	Issaka, et al., Zero Tillage improves soil properties, reduces nitrogen loss and increases productivity in a rice farmland in Ghana. Agronomy (Basel), 2019. 9(10): p. 641.
394	MacCarthy, D.S., et al., Integrating biochar and inorganic fertilizer improves productivity and profitability of irrigated rice in Ghana, West Africa. Agronomy, 2020. 10(6): p. 904.
395	Ismael, F., A. Ndayiragije and D. Fangueiro, New fertilizer strategies combining manure and urea for improved rice growth in Mozambique. Agronomy, 2021. 11(4): p. 783.
396	van Asten, P.J.A., et al., Effect of straw application on rice yields and nutrient availability on an alkaline and a pH-neutral soil in a Sahelian Irrigation Scheme. Nutrient Cycling in Agroecosystems, 2005. 72(3): p. 255-266.
397	Bado, B.V., A. Aw and M. Ndiaye, Long-term effect of continuous cropping of irrigated rice on soil and yield trends in the Sahel of West Africa. Nutrient Cycling in Agroecosystems, 2010. 88(1): p. 133-141.
398	Njinju, S.M., et al., Grain yield responses of lowland rice varieties to increased amount

	of nitrogen fertilizer under tropical highland conditions in central Kenya. Plant production science, 2018. 21(2): p. 59-70.
399	Dunn, B.W., et al., Nitrogen fertilizer alleviates the disorder straight head in Australian rice. Australian Journal of Experimental Agriculture, 2006. 46(8): p. 1077.
400	Dunn, B.W., T.S. Dunn and H.G. Beecher, Nitrogen timing and rate effects on growth and grain yield of delayed permanent-water rice in south-eastern Australia. Crop and pasture science, 2014. 65(9): p. 878.
401	Golden, B.R., et al., Recovery of nitrogen in fresh and pelletized poultry litter by rice. Soil Science Society of America Journal, 2006. 70(4): p. 1359-1369.
402	Zschornack, T., et al., Soil CH_4 and N_2O emissions from rice paddy fields in Southern Brazil as affected by crop management levels: a three-year field study. Revista Brasileira de Ciência do Solo, 2018. 42.
403	Li et al. Effects of chemical fertilizers application combined with manure on ammonia volatilization and rice yield in red paddy soil. Plant Nutrition and Fertilizer Science, 2005, 1: 51-56.