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REFERENCES

Adhya, T. K., Linquist, B., Serchinger, T., Wassmann, R., & Yan, X. (2014). *Wetting and Drying: Reducing Greenhouse Gas Emissions and Saving Water From Rice Production*. Working Paper, Installment 8 of Creating a Sustainable Food Future. World Resources Institute, Washington, DC.

Africare, O. A. (n.d.). WWF–ICRISAT Project (2010)'More Rice for People. *More Water for the Planet', WWF–ICRISAT Project, Hyderabad, India*.

Ahmad, S., Li, C., Dai, G., Zhan, M., Wang, J., Pan, S., & Cao, C. (2009). Greenhouse gas emission from direct seeding paddy field under different rice tillage systems in central China. *Soil and Tillage Research*, *106*(1), 54–61. http://doi.org/10.1016/j.still.2009.09.005

Alexandratos, N., Bruinsma, J., & others. (2012). World agriculture towards 2030/2050: the 2012 revision. *ESA Work. Pap*, *3*.

Ali, R., Awan, T., Ahmad, M., Saleem, U., Akhtar, M., & others. (2012). Diversification of rice-based cropping systems to improve soil fertility, sustainable productivity and economics. *Journal of Animal and Plant Sciences*, *22*(1), 108–12.

Aulakh, M. S., Wassmann, R., Bueno, C., & Rennenberg, H. (2001). Impact of root exudates of different cultivars and plant development stages of rice (Oryza sativa L.) on methane production in a paddy soil. *Plant and Soil*, *230*(1), 77–86. http://doi.org/10.1023/A:1004817212321

Barrett, C. B., Moser, C. M., McHugh, O. V., & Barison, J. (2004). Better Technology, Better Plots, or Better Farmers? Identifying Changes in Productivity and Risk among Malagasy Rice Farmers. *American Journal of Agricultural Economics*, *86*(4), 869–888. http://doi.org/10.1111/j.0002-9092.2004.00640.x

Berkhout, E., Glover, D., & Kuyvenhoven, A. (2015). On-farm impact of the System of Rice Intensification (SRI): Evidence and knowledge gaps. *Agricultural Systems*, *132*, 157–166. http://doi.org/10.1016/j.agsy.2014.10.001

Bouman, B. A. M., Yang, X., Wang, H., Wang, Z., Zhao, J., & Chen, B. (2006). Performance of aerobic rice varieties under irrigated conditions in North China. *Field Crops Research*, *97*(1), 53–65. http://doi.org/10.1016/j.fcr.2005.08.015

Buendia, L. V., Neue, H.-U., Wassmann, R., Lantin, R. S., & Javellana, A. M. (1997). Understanding the nature of methane emission from rice ecosystems as basis of mitigation strategies. *Applied Energy*, *56*(3–4), 433–444. http://doi.org/10.1016/S0306-2619(97)00022-6

Cai, Z., Xing, G., Yan, X., Xu, H., Tsuruta, H., Yagi, K., & Minami, K. (1997). Methane and nitrous oxide emissions from rice paddy fields as affected by nitrogen fertilisers and water management. *Plant and Soil*, *196*(1), 7–14. http://doi.org/10.1023/A:1004263405020

Cassman, K. G., Dobermann, A., Walters, D. T., & Yang, H. (2003). Meeting Cereal Demand While Protecting Natural Resources and Improving Environmental Quality. *Annual Review of Environment and Resources*, *28*(1), 315–358. http://doi.org/10.1146/annurev.energy.28.040202.122858

Choi, J., Kim, G., Park, W., Shin, M., Choi, Y., Lee, S., … Yun, D. (2014). Effect of SRI water management on water quality and greenhouse gas emissions in Korea. *Irrigation and Drainage*, *63*(2), 263–270.

Cicerone, R. J., & Oremland, R. S. (1988). Biogeochemical aspects of atmospheric methane. *Global Biogeochemical Cycles*, *2*(4), 299–327. http://doi.org/10.1029/GB002i004p00299

Corton, T. M., Bajita, J. B., Grospe, F. S., Pamplona, R. R., Jr, C. A. A., Wassmann, R., … Buendia, L. V. (2000). Methane Emission from Irrigated and Intensively Managed Rice Fields in Central Luzon (Philippines). *Nutrient Cycling in Agroecosystems*, *58*(1-3), 37–53. http://doi.org/10.1023/A:1009826131741

Craswell, E. T., Datta, S. D., Obcemea, W. N., & Hartantyo, M. (1981). Time and mode of nitrogen fertilizer application to tropical wetland rice. *Fertilizer Research*, *2*(4), 247–259. http://doi.org/10.1007/BF01050197

Das, K., & Baruah, K. K. (2008). A comparison of growth and photosynthetic characteristics of two improved rice cultivars on methane emission from rainfed agroecosystem of northeast India. *Agriculture, Ecosystems & Environment*, *124*(1–2), 105–113. http://doi.org/10.1016/j.agee.2007.09.007

Das, S., & Adhya, T. K. (2014). 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*, *213*, 185–192. http://doi.org/10.1016/j.geoderma.2013.08.011

Dill, J., Deichert, G., & Thu, L. T. N. (2013). *Promoting the System of Rice Intensification Lessons Learned from Trà Vinh Province, Viet Nam*. Germany: GIZ.

Dobermann, A. (2007). Nutrient use efficiency–measurement and management. *Fertilizer Best Management Practices*, *1*.

Fageria, N. K., Baligar, V. C., & Jones, C. A. (2010). *Growth and Mineral Nutrition of Field Crops, Third Edition*. CRC Press.

FAO Statistical Service Online, accessed December8, 2016. http://www.fao.org/faostat

Feng, J., Chen, C., Zhang, Y., Song, Z., Deng, A., Zheng, C., & Zhang, W. (2013). Impacts of cropping practices on yield-scaled greenhouse gas emissions from rice fields in China: A meta-analysis. *Agriculture, Ecosystems & Environment*, *164*, 220–228. http://doi.org/10.1016/j.agee.2012.10.009

Galloway, J. N., Aber, J. D., Erisman, J. W., Seitzinger, S. P., Howarth, R. W., Cowling, E. B., & Cosby, B. J. (2003). The Nitrogen Cascade. *BioScience*, *53*(4), 341–356. http://doi.org/10.1641/0006-3568(2003)053[0341:TNC]2.0.CO;2

Gathorne-Hardy DR, A., Prof, D., Reddy, N., Motkuri Mr., V., & Hariss-White Prof., B. (2013). A Life Cycle Assessment (LCA) of Greenhouse Gas Emissions from SRI and Flooded Rice Production in SE India. *Taiwan Water Conservancy*, *61*(4), 110–125.

Ghosh, S., Majumdar, D., & Jain, M. C. (2003). Methane and nitrous oxide emissions from an irrigated rice of North India. *Chemosphere*, *51*(3), 181–195. http://doi.org/10.1016/S0045-6535(02)00822-6

Griscolm et al, “Natural climate solutions”. *Proceedings of the National Academy of Sciences*, 114 (44) 11645-11650.

Gutierrez, J., Kim, S. Y., & Kim, P. J. (2013). Effect of rice cultivar on CH4 emissions and productivity in Korean paddy soil. *Field Crops Research*, *146*, 16–24. http://doi.org/10.1016/j.fcr.2013.03.003

Hou, H., Peng, S., Xu, J., Yang, S., & Mao, Z. (2012). Seasonal variations of CH4 and N2O emissions in response to water management of paddy fields located in Southeast China. *Chemosphere*, *89*(7), 884–892. http://doi.org/10.1016/j.chemosphere.2012.04.066

Hussain, S., Peng, S., Fahad, S., Khaliq, A., Huang, J., Cui, K., & Nie, L. (2014). Rice management interventions to mitigate greenhouse gas emissions: a review. *Environmental Science and Pollution Research*, *22*(5), 3342–3360. http://doi.org/10.1007/s11356-014-3760-4

Itoh, M., Sudo, S., Mori, S., Saito, H., Yoshida, T., Shiratori, Y., … Yagi, K. (2011). Mitigation of methane emissions from paddy fields by prolonging midseason drainage. *Agriculture, Ecosystems & Environment*, *141*(3–4), 359–372. http://doi.org/10.1016/j.agee.2011.03.019

Jacinthe, P.-A., & Lal, R. (2005). Labile carbon and methane uptake as affected by tillage intensity in a Mollisol. *Soil and Tillage Research*, *80*(1–2), 35–45. http://doi.org/10.1016/j.still.2004.02.018

Jain, N., Dubey, R., Dubey, D. S., Singh, J., Khanna, M., Pathak, H., & Bhatia, A. (2013). Mitigation of greenhouse gas emission with system of rice intensification in the Indo-Gangetic Plains. *Paddy and Water Environment*, *12*(3), 355–363. http://doi.org/10.1007/s10333-013-0390-2

Jia, Z., Cai, Z., & Tsuruta, H. (2006). Effect of rice cultivar on CH4 production potential of rice soil and CH4 emission in a pot experiment. *Soil Science and Plant Nutrition*, *52*(3), 341–348. http://doi.org/10.1111/j.1747-0765.2006.00043.x

Ju, X.-T., Xing, G.-X., Chen, X.-P., Zhang, S.-L., Zhang, L.-J., Liu, X.-J., … Zhang, F.-S. (2009). Reducing environmental risk by improving N management in intensive Chinese agricultural systems. *Proceedings of the National Academy of Sciences*, *106*(9), 3041–3046. http://doi.org/10.1073/pnas.0813417106

Katayanagi, N., Furukawa, Y., Fumoto, T., & Hosen, Y. (2012). Validation of the DNDC-Rice model by using CH4 and N2O flux data from rice cultivated in pots under alternate wetting and drying irrigation management. *Soil Science and Plant Nutrition*, *58*(3), 360–372. http://doi.org/10.1080/00380768.2012.682955

Khaliq, A., Shakeel, M., Matloob, A., Hussain, S., Tanveer, A., & Murtaza, G. (2013). Influence of tillage and weed control practices on growth and yield of wheat. *Philippine Journal of Crop Science (PJCS) December*, *38*(3), 00–00.

Khush, G. S. (2005). What it will take to feed 5.0 billion rice consumers in 2030. *Plant Molecular Biology*, *59*(1), 1–6.

Kumar, V., & Ladha, J. K. (2011). Direct Seeding of Rice: recent developments and future research needs. *Advances in Agronomy*, (111), 297–413.

Ladha, J. K., Pathak, H., J. Krupnik, T., Six, J., & van Kessel, C. (2005). Efficiency of Fertilizer Nitrogen in Cereal Production: Retrospects and Prospects. In D. L. Sparks (Ed.), *Advances in Agronomy* (Vol. 87, pp. 85–156). Academic Press. Retrieved from http://www.sciencedirect.com/science/article/pii/S0065211305870038

Lampayan, R. M., Rejesus, R. M., Singleton, G. R., & Bouman, B. A. M. (2015). Adoption and economics of alternate wetting and drying water management for irrigated lowland rice. *Field Crops Research*, *170*, 95–108. http://doi.org/10.1016/j.fcr.2014.10.013

LIANG, W., SHI, Y., ZHANG, H., YUE, J., & HUANG, G.-H. (2007). Greenhouse Gas Emissions from Northeast China Rice Fields in Fallow Season. *Pedosphere*, *17*(5), 630–638. http://doi.org/10.1016/S1002-0160(07)60075-7

Li, C., Frolking, S., Xiao, X., Moore, B., Boles, S., Qiu, J., ... Sass, R. (2005). Modeling impacts of farming management alternatives on CO2, CH4, and N2O emissions: A case study for water management of rice agriculture of China. *Global Biogeochemical Cycles*, *19*(3), GB3010. http://doi.org/10.1029/2004GB002341

Li, C., Salas, W., DeAngelo, B., & Rose, S. (2006). Assessing Alternatives for Mitigating Net Greenhouse Gas Emissions and Increasing Yields from Rice Production in China Over the Next Twenty Years. *Journal of Environment Quality*, *35*(4), 1554. http://doi.org/10.2134/jeq2005.0208

Linquist, B. A., Anders, M. M., Adviento-Borbe, M. A. A., Chaney, R. L., Nalley, L. L., da Rosa, E. F. F., & van Kessel, C. (2015). Reducing greenhouse gas emissions, water use, and grain arsenic levels in rice systems. *Global Change Biology*, *21*(1), 407–417. http://doi.org/10.1111/gcb.12701

Liu, Y., Yang, M., Wu, Y., Wang, H., Chen, Y., & Wu, W. (2011). Reducing CH4 and CO2 emissions from waterlogged paddy soil with biochar. *Journal of Soils and Sediments*, *11*(6), 930–939. http://doi.org/10.1007/s11368-011-0376-x

Luo, L. J. (2010). Breeding for water-saving and drought-resistance rice (WDR) in China. *Journal of Experimental Botany*, erq185. http://doi.org/10.1093/jxb/erq185

Lu, W. F., Chen, W., Duan, B. W., Guo, W. M., Lu, Y., Lantin, R. S., ... Neue, H. U. (2000). Methane Emissions and Mitigation Options in Irrigated Rice Fields in Southeast China. *Nutrient Cycling in Agroecosystems*, *58*(1-3), 65–73. http://doi.org/10.1023/A:1009830232650

McDonald, A. J., Hobbs, P. R., & Riha, S. J. (2006). Does the system of rice intensification outperform conventional best management?: A synopsis of the empirical record. *Field Crops Research*, *96*(1), 31–36. http://doi.org/10.1016/j.fcr.2005.05.003

Mei, X. Q., Ye, Z. H., & Wong, M. H. (2009). The relationship of root porosity and radial oxygen loss on arsenic tolerance and uptake in rice grains and straw. *Environmental Pollution*, *157*(8–9), 2550–2557. http://doi.org/10.1016/j.envpol.2009.02.037

Minamikawa, K., & Sakai, N. (2006). The practical use of water management based on soil redox potential for decreasing methane emission from a paddy field in Japan. *Agriculture, Ecosystems & Environment*, *116*(3–4), 181–188. http://doi.org/10.1016/j.agee.2006.02.006

Mishra, S., Rath, A. K., Adhya, T. K., Rao, V. R., & Sethunathan, N. (1997). Effect of continuous and alternate water regimes on methane efflux from rice under greenhouse conditions. *Biology and Fertility of Soils*, *24*(4), 399–405. http://doi.org/10.1007/s003740050264

Myhre, G., Shindell, D., Breon, F.-M., Collins, W., Fuglestvedt, J., Huan, J., … Zhang, H. (2013). Anthropogenic and natural radiative forcing. In *The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge ; New York: Cambridge University Press.

Omonode, R. A., Vyn, T. J., Smith, D. R., Hegymegi, P., & Gál, A. (2007). Soil carbon dioxide and methane fluxes from long-term tillage systems in continuous corn and corn–soybean rotations. *Soil and Tillage Research*, *95*(1–2), 182–195. http://doi.org/10.1016/j.still.2006.12.004

Parthasarathi, T., Vanitha, K., Lakshamanakumar, P., Kalaiyarasi, D., & others. (2012). Aerobic rice-mitigating water stress for the future climate change. *Int. J. Agron. Plant Prod*, *3*(7), 241–254.

Pathak, H., & Wassmann, R. (2007). Introducing greenhouse gas mitigation as a development objective in rice-based agriculture: I. Generation of technical coefficients. *Agricultural Systems*, *94*(3), 807–825. http://doi.org/10.1016/j.agsy.2006.11.015

Petersen, S. O., Schjønning, P., Thomsen, I. K., & Christensen, B. T. (2008). Nitrous oxide evolution from structurally intact soil as influenced by tillage and soil water content. *Soil Biology and Biochemistry*, *40*(4), 967–977. http://doi.org/10.1016/j.soilbio.2007.11.017

Pittelkow, C. M., Adviento-Borbe, M. A., Hill, J. E., Six, J., van Kessel, C., & Linquist, B. A. (2013). Yield-scaled global warming potential of annual nitrous oxide and methane emissions from continuously flooded rice in response to nitrogen input. *Agriculture, Ecosystems & Environment*, *177*, 10–20. http://doi.org/10.1016/j.agee.2013.05.011

Rickman, J., Pyseth, M., Bunna, S., Sinath, P., Fukai, S., Basnayake, J., & others. (2001). Direct seeding of rice in Cambodia. In *Increased lowland rice production in the Mekong Region: Proceedings of an International Workshop held in Vientiane, Laos, 30 October-2 November 2000.* (pp. 60–65). Australian Centre for International Agricultural Research (ACIAR).

Riya, S., Zhou, S., Watanabe, Y., Sagehashi, M., Terada, A., & Hosomi, M. (2012). CH4 and N2O emissions from different varieties of forage rice (Oryza sativa L.) treating liquid cattle waste. *Science of The Total Environment*, *419*, 178–186. http://doi.org/10.1016/j.scitotenv.2012.01.014

Satyanarayana, A., Thiyagarajan, T. M., & Uphoff, N. (2006). Opportunities for water saving with higher yield from the system of rice intensification. *Irrigation Science*, *25*(2), 99–115. http://doi.org/10.1007/s00271-006-0038-8

Shang, Q., Yang, X., Gao, C., Wu, P., Liu, J., Xu, Y., ... Guo, S. (2011). 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*, *17*(6), 2196–2210. http://doi.org/10.1111/j.1365-2486.2010.02374.x

Sinha, S. K., & Talati, J. (2007). Productivity impacts of the system of rice intensification (SRI): A case study in West Bengal, India. *Agricultural Water Management*, *87*(1), 55–60. http://doi.org/10.1016/j.agwat.2006.06.009

Siopongco, J., Wassmann, R., & Sander, B. (2013). Alternate wetting and drying in Philippine rice production: feasibility study for a Clean Development Mechanism. *Technical Bulletin*, (17).

Smith, P., Martino, D., Cai, Z., Gwary, D., Janzen, H., Kumar, P., ... others. (2008). Greenhouse gas mitigation in agriculture. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *363*(1492), 789–813.

Thakur, A. K. (2010). Critiquing SRI criticism: beyond scepticism with empiricism. *Current Science*, *98*(10), 1294–1299.

Towprayoon, S., Smakgahn, K., & Poonkaew, S. (2005). Mitigation of methane and nitrous oxide emissions from drained irrigated rice fields. *Chemosphere*, *59*(11), 1547–1556. http://doi.org/10.1016/j.chemosphere.2005.02.009

Wang, B., Xu, Y., Wang, Z., Li, Z., Guo, Y., Shao, K., & Chen, Z. (1999). Methane emissions from ricefields as affected by organic amendment, water regime, crop establishment, and rice cultivar. *Environmental Monitoring and Assessment*, *57*(2), 213–228. http://doi.org/10.1023/A:1006039231459

Wang, M.-X., & Shangguan, X.-J. (1996). CH4 emission from various rice fields in P.R. China. *Theoretical and Applied Climatology*, *55*(1-4), 129–138. http://doi.org/10.1007/BF00864708

Wassmann, R., Neue, H. U., Lantin, R. S., Makarim, K., Chareonsilp, N., Buendia, L. V., & Rennenberg, H. (2000). Characterization of Methane Emissions from Rice Fields in Asia. II. Differences among Irrigated, Rainfed, and Deepwater Rice. *Nutrient Cycling in Agroecosystems*, *58*(1-3), 13–22. http://doi.org/10.1023/A:1009822030832

Wassmann, R., & Pathak, H. (2007). Introducing greenhouse gas mitigation as a development objective in rice-based agriculture: II. Cost–benefit assessment for different technologies, regions and scales. *Agricultural Systems*, *94*(3), 826–840. http://doi.org/10.1016/j.agsy.2006.11.009

Win, K. T., Nonaka, R., Win, A. T., Sasada, Y., Toyota, K., & Motobayashi, T. (2013). Effects of water saving irrigation and rice variety on greenhouse gas emissions and water use efficiency in a paddy field fertilized with anaerobically digested pig slurry. *Paddy and Water Environment*, *13*(1), 51–60. http://doi.org/10.1007/s10333-013-0406-y

Xiaoguang, Y., Bouman, B. A. M., Huaqi, W., Zhimin, W., Junfang, Z., & Bin, C. (2005). Performance of temperate aerobic rice under different water regimes in North China. *Agricultural Water Management*, *74*(2), 107–122. http://doi.org/10.1016/j.agwat.2004.11.008

Xue, C., Yang, X., Bouman, B. A. M., Deng, W., Zhang, Q., Yan, W., ... Wang, H. (2008). Optimizing yield, water requirements, and water productivity of aerobic rice for the North China Plain. *Irrigation Science*, *26*(6), 459–474. http://doi.org/10.1007/s00271-008-0107-2

Xu, Y., Ge, J., Tian, S., Li, S., Nguy-Robertson, A. L., Zhan, M., & Cao, C. (2015). 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*, *505*, 1043–1052. http://doi.org/10.1016/j.scitotenv.2014.10.073

Yan, X., Akiyama, H., Yagi, K., & Akimoto, H. (2009). Global estimations of the inventory and mitigation potential of methane emissions from rice cultivation conducted using the 2006 Intergovernmental Panel on Climate Change Guidelines. *Global Biogeochemical Cycles*, *23*(2), n/a–n/a. http://doi.org/10.1029/2008GB003299

Yao, F., Huang, J., Cui, K., Nie, L., Xiang, J., Liu, X., ... Peng, S. (2012). Agronomic performance of high-yielding rice variety grown under alternate wetting and drying irrigation. *Field Crops Research*, *126*, 16–22. http://doi.org/10.1016/j.fcr.2011.09.018

Yu, K., Chen, G., & Patrick, W. H. (2004). Reduction of global warming potential contribution from a rice field by irrigation, organic matter, and fertilizer management. *Global Biogeochemical Cycles*, *18*(3), GB3018. http://doi.org/10.1029/2004GB002251

Zhang, W., Xu, M., Wang, X., Huang, Q., Nie, J., Li, Z., ... Lee, K. B. (2012). Effects of organic amendments on soil carbon sequestration in paddy fields of subtropical China. *Journal of Soils and Sediments*, *12*(4), 457–470. http://doi.org/10.1007/s11368-011-0467-8

Zou, J., Huang, Y., Lu, Y., Zheng, X., & Wang, Y. (2005). Direct emission factor for N2O from rice–winter wheat rotation systems in southeast China. *Atmospheric Environment*, *39*(26), 4755–4765. http://doi.org/10.1016/j.atmosenv.2005.04.028

Zschornack, T., Bayer, C., Zanatta, J. A., Vieira, F. C. B., & Anghinoni, I. (2011). Mitigation of methane and nitrous oxide emissions from flood-irrigated rice by no incorporation of winter crop residues into the soil. *Revista Brasileira de Ciência Do Solo*, *35*(2), 623–634. http://doi.org/10.1590/S0100-06832011000200031