Tek B Sapkota
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PROFILE

- Over 15 years of research experience in the area of agriculture and climate interface in South Asia, Sub-Saharan Africa and Latin America
- Lead author of IPCC special report on “Climate Change and Land”
- Agricultural expert in "India GHG platform" (http://ghgplatform-india.org/), a multi-institution platform to regularly prepare GHG emission estimates at the national and state levels and undertake policy relevant analysis
- Expert in the analysis of synergy and trade-offs among food security, environment and development goals
- Dynamic and integrative system thinking across scale
- Proven leadership abilities and experience fostering multi-disciplinary and multi-country science team
- Demonstrated resource mobilization kills: over 10 million USD consolidated R4D funding as project leader, annually over 1 million USD project planning, implementation and reporting experience
- Excellent science communication skills: authored over 47 peer-reviewed articles, book chapters and technical reports, presented at more than 35 international conferences and contributed in development of various decision support tools
- Experienced in achieving impact at scale through strategic partnership, networking and science-based policy influence

RELATED EXPERIENCES

Climate Change/Agricultural Systems Scientist **July 2017-Present**
International Maize and Wheat Improvement Center (CIMMYT-Mexico)

- Coordinate Climate Change activities within CIMMYT and act as CIMMYT contact point for CGIAR research program on Climate Change Agriculture and Food Security.
- Lead climate change mitigation works within CIMMYT globally
- Lead a project to improve N_2O emission estimates globally. The core partners of this project are: University of Aberdeen, Yara, Indian Council of Agricultural Research (ICAR) and Borlaug Institute for South Asia (BISA).
- Lead Author of IPCC special report on climate change and land
- Represent CIMMYT in India GHG platform (http://ghgplatform-india.org/), a multi-institution platform to regularly prepare GHG emission estimates at the national and state levels and undertake policy relevant analysis

Associate Scientist: Climate Change/Agricultural Systems **July 2014-June 2017**
International Maize and Wheat Improvement Center (CIMMYT-New Delhi)

- Coordinate on-station as well as on-farm testing of various climate smart practices (e.g. precision water management, precision nutrient management, conservation agriculture and other sustainable intensification practices) in the cereal systems of South Asia (India, Nepal and Bangladesh)
- Coordinate greenhouse gas quantification from agricultural production systems from field, farm to landscape scale

- Analyze synergy and trade-offs among food security, climate change adaptation, mitigation goals of various climate smart practices
- Produce research based evidences for adaptation, mitigation and food security benefit of climate smart practices compared with existing practices
- Up-scale climate smart agricultural practices through integration in broader development plans at local to higher levels

Post-doctoral Fellow: Agricultural Systems/Climate Change July 2012-June 2014
International Maize and Wheat Improvement Center (CIMMYT-New Delhi)

- Develop, standardize and harmonize greenhouse gas quantification methods in agricultural production systems at different scale
- Identify data gaps at field scales and liaise with other agronomist and climate scientists to upgrade field experiments to include environmental impacts in those studies
- Analyze the environmental impacts on agricultural production and vice-versa from field to landscape scale and develop suitable response strategies
- Develop scenario analysis in relation to drivers of changes and incentives and disincentives
- Liaise with socio-economic and policy scientists to develop policy briefs related agricultural development in the face of climate change

Visiting Researcher 2009 – 2010
Aarhus University, Denmark

- Worked as one of the members of multidisciplinary team in CROPSYS (Cropping System Management) project for quantification of productivity and environmental impacts of various arable cropping systems
- Studied effects of catch crop on N leaching, N_2O emission and crop yield under organic and conventional cropping systems
- Measured net ecosystem exchange in the field (plant and soil respiration, photosynthesis) for environmental footprint calculation

Project Manager 2006 – 2008
Practical Action, Kathmandu,Nepal

- Worked as country project manager and lead Nepal components of a multinational project on climate-induced disaster risk reduction
- Designed, developed and tested various on-farm technologies for sustainable cropping systems and natural resource management for adaptation to changing climate
- Developed strategies for linking farm producers with market for on-farm conservation of local crops/varieties
- Reviewed the climate induced disaster management policy of the government of Nepal
- Organized and participated in various meetings, conferences and workshops with different stakeholders at national and regional levels

Program Officer 2002 – 2006
Local Initiatives for Biodiversity, Research and Development (LI-BIRD), Nepal

- Worked as team leader of project: "**Linking agro-biodiversity with market**" for conservation and promotion of local crops/landraces which later developed as Community-based biodiversity management mega-project in Nepal
- Promoted community based seed systems to ensure timely availability of locally adapted seeds to farmers, seed insurance mechanism, ensure farmer-to-farmer exchange of seeds

and most importantly conserve agro-biodiversity *in-situ*.

- Developed and tested various on-farm technologies such as agro-forestry system, shifting cultivation and integrated gardening for sustainable agricultural production
- Successfully implemented some participatory approaches such as Participatory Variety Selection and Farmers Field School (FFS)
- Provided trainings on IPM, FFS, Organic Agriculture and mushroom production at national and regional level as resource person
- Prepared and published several research papers based on the field experiments and developed project proposals to address field level challenges
- Coordinated and participated in different meetings, workshops and seminars at national, regional and international levels

Program Officer **2002**
Forum for Rural Welfare and Agricultural Reform for Development (FORWARD), Nepal

- Worked as tem leader of a research project "Management of Vegetable Diseases Using Plant Extracts"
- Prepared project proposals in the area of agricultural research and development
- Trained support staff to manage field trails and data collection techniques
- Analyzed data from various field experiments and prepare technical reports

EDUCATION

PhD (Agriculture, Environment and Landscape) **2011**
Sant' Anna School of Advanced Studies, Italy/Aarhus University, Denmark

M.Sc. (Agriculture) **2002**
Tribhuwan University, Nepal

B.Sc. (Agriculture) **1999**
Tribhuwan University, Nepal

FUNDING MOBILIZED

Mobilized over 10 million USD as project leader and activity leaders for different projects while working in CIMMYT, Practical Action, LI-BIRD and FORWARD.

TEACHING AND ACADEMIC METHORING

- Co-supervised 4 PhD students from Haryana Agricultural University (India) between 2012-2018 building their PhD research in the on-going projects in CIMMYT
- Supervised 7 PhD students (2 from Haryana agricultural university India, 1 from Kurukshetra University India, 1 from Technical university of Hamburg Germany, 1 from Trivhuwan University Nepal, 1 from Merut University India and 1 from University of Ibadan Nigeria) for short-term research stay under CLIFF (climate, food and farming) network.

SELECTED PUBLICATIONS

Tek B Sapkota

Summary: About 30 peer reviewed publications. Google Scholar citations since 2013: 708, h-index=12, i10-index=12. Details below.

Referred journal articles:

2018:

Sapkota, T. B., Vetter, S. H., Jat, M. L., Sirohi, S., Shirsath, P. B., Singh, R., Jat, H.S., Smith, P., Hillier, J., Stirling, C.M, 2018. Cost-effective opportunities for climate change mitigation in Indian agriculture. *Science of The Total Environment*, *655*, 1342–1354. https://doi.org/10.1016/J.SCITOTENV.2018.11.225

Yue, Q., Ledo, A., Cheng, K., Albanito, F., Lebender, U., **Sapkota, T.B**., Brentrup, F., Stirling, C.M., Smith, P., Sun, J., 2018. Re-assessing nitrous oxide emissions from croplands across Mainland China. Agric. Ecosyst. Environ. 268, 70–78.

Choudhary, M., Datta, A., Jat, H.S., Yadav, A.K., Gathala, M.K., **Sapkota, T.B**., Das, A.K., Sharma, P.C., Jat, M.L., Singh, R., Ladha, J.K., 2018. Changes in soil biology under conservation agriculture based sustainable intensification of cereal systems in Indo-Gangetic Plains. Geoderma 313, 193–204. doi:10.1016/j.geoderma.2017.10.041

Parihar, C.M., Parihar, M.D., **Sapkota, T.B**., Nanwal, R.K., Singh, A.K., Jat, S.L., Nayak, H.S., Mahala, D.M., Singh, L.K., Kakraliya, S.K., Stirling, C.M., Jat, M.L., 2018. Science of the Total Environment Long-term impact of conservation agriculture and diversi fi ed maize rotations on carbon pools and stocks , mineral nitrogen fractions and nitrous oxide fluxes in inceptisol of India. Sci. Total Environ. 640–641, 1382–1392. doi:10.1016/j.scitotenv.2018.05.405

Jat, R.D., Jat, H.S., Nanwal, R.K., Yadav, A.K., Bana, A., Choudhary, K.M., Kakraliya, S.K., Sutaliya, J.M., **Sapkota, T.B**., Jat, M.L., 2018. Conservation agriculture and precision nutrient management practices in maize-wheat system: Effects on crop and water productivity and economic profitability. F. Crop. Res. 222, 111–120. doi:10.1016/j.fcr.2018.03.025

Choudhary, M., Jat, H.S., Datta, A., Yadav, A.K., **Sapkota, T.B**., Mondal, S., Meena, R.P., Sharma, P.C., Jat, M.L., 2018. Sustainable intensification influences soil quality, biota, and productivity in cereal-based agroecosystems. Appl. Soil Ecol. 126, 189–198. Kakraliya, S.K., Jat, H.S., Singh, I., Sapkota, T.B., Singh, L.K., Sutaliya, J.M., Sharma, P.C., Jat, R.D., Choudhary, M., Lopez-Ridaura, S., Jat, M.L., 2018. Performance of portfolios of climate smart agriculture practices in a rice-wheat system of western Indo-Gangetic plains. Agric. Water Manag. 202, 122–133. doi:10.1016/j.agwat.2018.02.020

2017:

Sapkota, TB., Aryal, JP., Arun, KC., Shirsath, PB., Arumugam, P and Stirling, CM. 2017. Identifying high-yield low-emission pathways for the cereal production in South Asia. Mitig Adapt Strateg Glob Change. DOI 10.1007/s11027-017-9752-1

Sapkota, TB., Shankar, V., Rai, M., Jat, ML., Stirling, CM., Singh, LK., Jat, HS and Grewal, MS. 2017. Reducing Global Warming Potential through Sustainable Intensification of Basmati Rice-Wheat Systems in India. Sustainability. 9:1044; doi:10.3390/su9061044

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Sapkota, T.B., Jat, R.K., Singh, R.G., Jat, M.L., Clare M Stirling, Jat, M.K., Bijarniya, D., Kumar, M., Yadvinder-Singh, Saharawat, Y.S., Gupta, R.., 2017. Soil organic carbon changes after seven years of conservation agriculture based rice-wheat cropping system in the eastern Indo-Gangetic Plain of India, Soil Use and Management, 1–9. doi:10.1111/sum.12331.

Vetter, S.H., **Sapkota, T.B**., Hillier, J., Stirling, C.M., Macdiarmid, J.I., Aleksandrowicz, L., Green, R., Joy, E.J.M., Dangour, A.D., Smith, P., 2017. Greenhouse gas emissions from agricultural food production to supply Indian diets: Implications for climate change mitigation. Agriculture, Ecosystems & Environment 237, 234–241.

Albanito, F., Lebender, U., Cornulier, T., **Sapkota, T.B**., Brentrup, F., Stirling, C., and Hillier J. 2017. Direct nitrous oxide emissions from tropical and sub-tropical agricultural systems - a review and modelling of emission factors. Nature Scientific Report, 7, 44235. Doi: 10.1038/srept44235

Rozel C, Stirling C, **Sapkota TB**, Jat, ML, Misiko M, and Attwood, S. 2017 Gender and inorganic nitrogen: what are the implications of moving towards a more balanced use of nitrogen fertilizer in the tropics? Int J Agric Sustain 15:136–152. Doi: http://dx.doi.org/10.1080/14735903.2017.1295343

2016:

Aryal, J.P., **Sapkota, T.B**., Stirling, C.M., Jat, M.L., Jat, H.S., Rai, M., Mittal, S., & Sutaliya, J.M. 2016. Conservation agriculture-based wheat production better copes with extreme climate events than conventional tillage-based systems: A case of untimely excess rainfall in Haryana, India. *Agriculture, Ecosystems & Environment* **233**, 325–335.

Jat, M.L., Dagar, J.C., **Sapkota, T.B**., Yadvinder-Singh, Govaerts, B., Ridaura, S.L., Saharawat, Y.S., Sharma, R.K., Tetarwal, J.P., Jat, R.K., Hobbs, H., Stirling, C., 2016. Climate Change and Agriculture: Adaptation Strategies and Mitigation Opportunities for Food Security in South Asia and Latin America. Advances in Agronomy. doi:10.1016/bs.agron.2015.12.005

Wollenberg, E., Richards, M., Smith, P., Havlík, P., Obersteiner, M., Tubiello, F.N., Herold, M., Gerber, P., Carter, S., Reisinger, A., Vuuren, D. van, Dickie, A., Neufeldt, H., Sander, B.O., Wassmann, R., Sommer, R., Amonette, J.E., Falcucci, A., Herrero, M., Opio, C., Roman-Cuesta, R., Stehfest, E., Westhoek, H., Ortiz-Monasterio, I., **Sapkota, T**., Rufino, M.C., Thornton, P.K., Verchot, L., West, P.C., Soussana, J.-F., Baedeker, T., Sadler, M., Vermeulen, S., Campbell, B.M., 2016. Reducing emissions from agriculture to meet the 2°C target (accepted). Global Change Biology 1–6. doi:10.1111/gcb.13340

Khatri-Chhetri, A., Aryal, J.P., **Sapkota, T.B**., Khurana, R., 2016. Economic benefits of climate-smart agricultural practices to smallholder farmers in the Indo-Gangetic Plains of India. Current Science. 110. doi:10.18520/cs/v110/i7/1251-1256

2015:

Sapkota, T.B., M.L. Jat, V. Shankar, L.K. Singh, M. Rai, M.S. Grewal, and C.M. Stirling. 2015. Tillage, residue and nitrogen management effects on methane and nitrous oxide emission from rice–wheat system of Indian Northwest Indo-Gangetic Plains. J. Integr. Environ. Sci.: 1–16. http://www.tandfonline.com/doi/full/10.1080/1943815X.2015.1110181

Sapkota, T.B., M.L. Jat, J.P. Aryal, R.K. Jat, and A. Khatri-Chhetri. 2015. Climate change adaptation, greenhouse gas mitigation and economic profitability of conservation agriculture:

Some examples from cereal systems of Indo-Gangetic Plains. J. Integr. Agric. 14(8): 1524–1533. http://linkinghub.elsevier.com/retrieve/pii/S2095311915610930

Aryal, J.P., **T.B. Sapkota**, M.L. Jat, and D.K. Bishnoi. 2015. On-Farm Economic and Environmental Impact of Zero-Tillage Wheat: a Case of North-West India. Exp. Agric. 51(11): 1–16. http://www.journals.cambridge.org/abstract_S001447971400012X

2014:

Sapkota, T.B., K. Majumdar, M.L. Jat, A. Kumar, D.K. Bishnoi, A.J. Mcdonald, and M. Pampolino. 2014. Precision nutrient management in conservation agriculture based wheat production of Northwest India : Profitability , nutrient use efficiency and environmental footprint. F. Crop. Res. 155: 233–244. http://www.sciencedirect.com/science/article/pii/S0378429013003079

Jat, R.K., **T.B. Sapkota,** R.G. Singh, M.L. Jat, M. Kumar, and R.K. Gupta. 2014. Seven years of conservation agriculture in a rice–wheat rotation of Eastern Gangetic Plains of South Asia: Yield trends and economic profitability. F. Crop. Res. 164: 199–210. http://linkinghub.elsevier.com/retrieve/pii/S0378429014001099

2012 and older:

Sapkota, T.B., M. Mazzoncini, P. Bàrberi, D. Antichi, and N. Silvestri. 2012. Fifteen years of no till increase soil organic matter, microbial biomass and arthropod diversity in cover crop-based arable cropping systems. Agron. Sustain. Dev. 32(4): 853–863. http://link.springer.com/10.1007/s13593-011-0079-0

Sapkota, T.B., M. Askegaard, M. Lægdsmand, and J.E. Olesen. 2012. Effects of catch crop type and root depth on nitrogen leaching and yield of spring barley. F. Crop. Res. 125: 129–138. http://linkinghub.elsevier.com/retrieve/pii/S0378429011003248

Mazzoncini, M., **T.B. Sapkota,** P. Bàrberi, D. Antichi, and R. Risaliti. 2011. Long-term effect of tillage, nitrogen fertilization and cover crops on soil organic carbon and total nitrogen content. Soil Tillage Res. 114(2): 165–174. http://linkinghub.elsevier.com/retrieve/pii/S0167198711001085

Sapkota T.B., S.M. Shrestha and G.B. Khatri Chettri. 2002. Potential use of nettle (*Urtica dioica* L.) extracts for the management of alternaria blight of radish. Journal of Tropical Agricultural Ressearch, 14: 165-174

Book Chapters:

Sapkota, T.B., Majumdar, K., Khurana, R., Jat, R.K., Stirling, C.M., Jat, M.L., 2016. Precision Nutrient Management under Conservation Agriculture-based Cereal Systems in South Asia, *In*: Nagothu, U.S. (Ed.), Climate Change and Agricultural Development: Improving Resilience through Climate Smart Agriculture, Agroecology and Conservation. Routledge, Taylor & Francis Group, p. 322.

Sapkota, T.B. 2012. Conservation tillage impact on soil aggregation, organic matter turnover and biodiversity. p. 9: 141–160. *In* Lichtfouse, E. (ed.), Sustainable Agriculture Reviews: Organic

Fertilization, Soil Quality and Human Health. Springer. http://link.springer.com/chapter/10.1007/978-94-007-4113-3_6

Sapkota, T.B., Jat, M.L., Jat, R.K., Kapoor, P. and Stirling, C., Yield Estimation of Food and Non--Food Crops in Smallholder Production Systems. In: Rosenstock et al (Eds). Methods for Measuring Greenhouse Gas Balances and Evaluating Mitigation Options in Smallholder Agriculture. Springer Publication. http://link.springer.com/chapter/10.1007%2F978-3-319-29794-1_8

Sapkota, T.B., M. Rai, L.K. Singh, M.K. Gathala, M.L. Jat, J.M. Sutaliya, D. Bijarniya, M.K. Jat, R.K. Jat, C.M. Parihar, P. Kapoor, H.S. Jat, R.S. Dadarwal, P.C. Sharma, and D.K. Sharma. 2014. Greenhouse gas measurement from smallholder production systems: guidelines for static chamber method. International Maize and Wheat Improvement Center (CIMMYT), New Delhi, India. http://repository.cimmyt.org:8080/xmlui/handle/10883/4020

Policy briefs and popular articles:

Sapkota, T. B. 2017. Reports Identifies high-yield, low-emission options for cereal systems in South Asia. https://ccafs.cgiar.org/research-highlight/report-identifies-high-yield-low-emission-options-cereal-systems-south-asia#.WcKxJdFOmM8

Sapkota, T.B. and D. Parthasarthy. 2014. New manual on guidelines to measure greenhouse gas emissions in smallholder systems. https://ccafs.cgiar.org/blog/new-manual-guidelines-measure-greenhouse-gas-emissions-smallholder-systems#.VoQ2JVKUbiQ

Richards MB, **Sapkota TB**, Stirling C, Verhulst N, Friedrich T, Kienzle J. 2014. Conservation agriculture: implementation guidance for policymakers and investors. CCAFS-FAO Climate-Smart Agriculture Practice Brief. Rome, Italy: FAO. http://hdl.handle.net/10568/42431

Richards, M.B., K. Butterbach-bahl, M.L. Jat, B. Lipinski, I. Ortiz-Monasterio, and **T.B. Sapkota**. 2015. Site-Specific Nutrient Management : Implementation guidance for policymakers and investors. Practice brief on CSA https://cgspace.cgiar.org/rest/bitstreams/62439/retrieve

White, J. and **T.B. Sapkota**. 2015. Cereal systems in South Asia show diverse benefits of conservation agriculture. https://ccafs.cgiar.org/blog/cereal-systems-south-asia-show-diverse-benefits-conservation-agriculture#.VoQ2pVKUbiQ