

Ashish Manandhar

PERSONAL DATA

Assistant Professor
School of Civil and Environmental Engineering and
Earth Sciences
Clemson University
Clemson, SC 29634
864-656-0351

EDUCATION

Ph.D. in Food, Agricultural and Biological Engineering The Ohio State University, Columbus, OH	2019
M.S. in Sustainable Energy Engineering KTH Royal Institute of Technology, Stockholm, Sweden	2011
B.E. in Agricultural Engineering Tribhuvan University, Institute of Engineering, Nepal	2006

PROFESSIONAL EXPERIENCE

Assistant Professor , Clemson University, SC, USA BioSystems Engineering, Department of Environmental Engineering and Earth Sciences	Aug 2025 - Present
Research Scientist , The Ohio State University (OSU), OH, USA	Oct 2021 – Jul 2025
Post-doctoral Researcher , The Ohio State University, OH, USA	May 2019 – Sep 2021
Research Scholar , Palo Alto Research Centre (Xerox PARC), Palo Alto, CA	Oct 2011 – Mar 2015
Research Assistant , Fraunhofer Institute for Solar Energy Systems, Germany	Jan 2010 – Aug 2011
Research and Teaching Assistant , KTH Royal Institute of Technology, Sweden	Dec 2008 – Dec 2009
Technical Officer , United Nations Development Program (UNDP), Nepal	Jan 2006 – Oct 2008

TEACHING EXPERIENCE

Course Co-instructor Department of Food, Agricultural and Biological Engineering (FABE), OSU <i>Course title: Biomass Conversion to Bioenergy. 3 cr.</i> Topics: Biomass feedstocks; biomass harvest and post-harvest logistics; biomass conversion through biochemical and thermochemical routes; technoeconomic analysis (TEA) and life cycle assessment (LCA)	Spr. 2020 and Spr. 2023
Guest lecturer Department of Food, Science and Technology, OSU <i>Course title: Sustainability of the Food Supply Chain. 3 cr.</i>	Spr. and Aut. 2023, Spr. And Aut. 2024
Guest lecturer Department of Food, Science and Technology, OSU <i>Course title: Alternative Packaging for a Greener Planet. 4 cr.</i> Lectured (6 hrs) on TEA and LCA of alternative packaging systems	Aut. 2024

Guest Lecturer

Spring 2020-2024

Department of Food, Agricultural and Biological Engineering
(FABE), OSU

Course title: Unmanned Aerial Systems and Remote Sensing. 3 cr.

- o Lectured on conducting TEA and LCA of using unmanned aerial systems and remote sensing technologies for agricultural and logistics applications

CompEdu Assistant

2008 - 2009

KTH Royal Institute of Technology, Sweden

Sustainable Energy Engineering (SEE) Distance Learning Initiative (CompEdu)

PUBLICATIONS

Peer-reviewed publications

1. Ansari, A., Timilsina, A.P., Shah, A., **Manandhar, A.**, Khanal, S., 2025. Switchgrass for abandoned mine lands reclamation: A SWAT-based hydrological and water quality assessment. *Agricultural Water Management*, 318, p.109730.
2. Dhakal, S., **Manandhar, A.**, Shah, A., & Khanal, S. 2025. Integrating UAS remote sensing and edge detection for accurate coal stockpile volume estimation. *Remote Sensing*, 17(18), 3136.
3. Shrestha, E., **Manandhar, A.** and Shah, A., 2024. Adsorption of phosphate from aqueous solution using hydrochar produced from agricultural wastes. *Sustainability*, 16(21), p.9259.
4. **Manandhar, A.** and Shah, A., 2023. Techno-economic analysis of the production of lactic acid from lignocellulosic biomass. *Fermentation*, 9(7), p.641.
5. Sivaprasad, S., Jayaseelan, A., Kannappan Panchamoorthy, G., Gautam, R., **Manandhar, A.**, Shah, A., 2022. Biomass as source for hydrochar and biochar production to recover phosphates from wastewater: A review on challenges, commercialization, and future perspectives. *Chemosphere* 286, p.131490.
6. Khanal, A., **Manandhar, A.**, Adhikari, S. and Shah, A., 2021. Techno-economic analysis of novolac resin production by partial substitution of petroleum-derived phenol with bio-oil phenol. *Biofuels, Bioproducts and Biorefining*, 15(6), pp.1611-1620.
7. Shah, A., **Manandhar, A.** and Darr, M.J., 2021. Near-term practical strategies to improve the life cycle techno-economics, energy use and greenhouse gas emissions of corn stover supply system for biobased industries. *Biofuels, Bioproducts and Biorefining*, 15(3), p.793-803.
8. **Manandhar, A.**, Zhu, H., Ozkan, E. and Shah, A., 2020. Techno-economic impacts of using a laser-guided variable-rate spraying system to retrofit conventional constant-rate sprayers. *Precision Agriculture*, pp.1-16.
9. **Manandhar, A.** and Shah, A., 2020. Techno-economic analysis of bio-based lactic acid production utilizing corn grain as feedstock. *Processes*, 8(2), p.199.
10. Khanal, A., **Manandhar, A.** and Shah, A., 2019. Physicochemical and structural characteristics of corn stover and cobs after physiological maturity. *BioEnergy Research*, p.1-10.
11. **Manandhar, A.**, Milindi, P. and Shah, A., 2018. An overview of the post-harvest grain storage practices of smallholder farmers in developing countries. *Agriculture*, 8(4), p.57.
12. Li, Y., **Manandhar, A.**, Li, G. and Shah, A., 2018. Life cycle assessment of integrated solid-state anaerobic digestion and composting for on-farm organic residues treatment. *Waste Management*, 76, p.294-305.
13. **Manandhar, A.** and Shah, A., 2017. Life cycle assessment of feedstock supply systems for cellulosic biorefineries using corn stover transported in conventional bale and densified pellet formats. *Journal of Cleaner Production*, 166, p.601-614.
14. Vasco-Correa, J., Khanal, S., **Manandhar, A.** and Shah, A., 2017. Anaerobic digestion for bioenergy production: Global status, environmental and techno-economic implications, and government policies. *Bioresource technology*, 247, p.1015-1026.
15. Bae, C.J., **Manandhar, A.**, Kiesel, P. and Raghavan, A., 2016. Monitoring the strain evolution of lithium-ion battery electrodes using an optical fiber bragg grating sensor. *Energy Technology*, 4(7), p.851-855.

Patent

1. Bae, C.J., Shrader, E.J. and **Manandhar, A.**, Palo Alto Research Center Inc, 2018. High energy and power Li-ion battery having low stress and long-term cycling capacity. U.S. Patent 9,882,200.

Book chapters

1. Shah, A., Baral, N.R. and **Manandhar, A.**, 2016. Techno-economic analysis and life cycle assessment of bioenergy systems. In Advances in Bioenergy (Vol. 1, pp. 189-247). Elsevier.
2. **Manandhar, A.**, Mousavi-Avval, S.H., Tatum, J., Shrestha, E., Nazemi, P. and Shah, A. Shah, 2022. Solid biofuels. Biomass, Biofuels, Biochemicals, Green-Economy: Systems analysis for sustainability. pp.343-370. Elsevier.

Encyclopedia chapters

1. Shah, A. and **Manandhar, A.**, 2016. Lignocellulosic biomass feedstock logistics. In: Encyclopedia of Agricultural, Food, and Biological Engineering (Second Edition). Edited by: D. Heldman and C. Moraru. Taylor and Francis LLC Encyclopedia Program.
2. **Manandhar, A.**, Mousavi-Avval, S.H., and Shah, A. 2018. Sustainability Assessment for Production Agriculture, Encyclopedia of Agricultural, Food, and Biological Engineering (In review).

Factsheets

1. **Manandhar, A.** and Shah, A. 2021. Improving biomass properties via densification and upgrading. Factsheet No. FABE-660.5. Ohio State University Extension.
2. Sivaprasad, S., **Manandhar, A.** and Shah, A. 2021. Hydrothermal carbonization: Upgrading waste biomass to char, Factsheet No. FABE-662.2, Ohio State University Extension.
3. Mousavi-Avval, S.H., **Manandhar, A.** and Shah, A. 2018. Fundamentals of energy analysis for crop production agriculture, Factsheet No. FABE-662.1, Ohio State University Extension.
4. Vasco-Correa, J., **Manandhar, A.** and Shah, A. 2018. Economic implications of anaerobic digestion for bioenergy production and waste management, Factsheet No. FABE-661.1, Ohio State University Extension.
5. **Manandhar, A.** and Shah, A. 2018. Feedstock Logistics for Agricultural Residues and Energy Crops: Moving biomass from the field to biorefinery gate, Factsheet No. FABE-660.4, Ohio State University Extension.
6. Shah, A. and **Manandhar, A.**, 2017. Torrefaction: Upgrading Biomass to "Green Coal", Factsheet No. FABE 660.3, Ohio State University Extension.
7. Shah, A., **Manandhar, A.**, Khanal, S. and Ozkan, E. 2017. Status of Biorefineries in Ohio, Factsheet No. FABE-660.2, Ohio State University Extension.

Trade journal/Magazine articles

1. **Manandhar, A.** and Shah, A. 2021. Hydrothermal carbonization – Upgrading organic waste to char. Ohio's Country Journal.
2. Shah, A., Wicks, M. and **Manandhar, A.** 2018. Pipeline to commercialization. Ohio's Country Journal.

Industry research reports

1. Heldman, D.R., Shah, A., Gummalla, S. and **Manandhar, A.** 2022. Sustainability of the frozen mango supply chain. National Mango Board.
2. **Manandhar, A.**, Antin, K., Roncalli, J., Davis, M., Han, L., Hagström, P. 2010. Techno-economic analysis of poly-generation options for combined heat and power plant in Uppsala, Vattenfall AB, Uppsala, Sweden
 - Investigated the techno-economic feasibility of a poly-generation system producing heat, electricity and ethanol from lignocellulosic biomass and municipal waste.

SCHOLARLY PRESENTATIONS

Conference presentations

1. Ansari, A., Timilsina, A. P., Shah, A., **Manandhar, A.**, Khanal, S. 2025. Assessing switchgrass efficacy in reclaiming abandoned mine lands using SWAT model. The Ohio State University - CFAES Research Forum, April 10, Columbus, OH. (Poster)
2. Bevers, N., Timilsina, A. P., **Manandhar, A.**, Witter, J., Shah, A., Khanal, S. 2025. A soil mesocosm experiment for comparing greenhouse gas emissions resulting from the application of hydrochar soil

amendments for growing corn. The Ohio State University - CFAES Research Forum, April 10, Columbus, OH. (Poster)

3. **Manandhar, A.**, Witter, J., Mecklenburg, D. Shah, A. 2025. Techno-economic evaluation of self-forming two-stage (conservation) ditches. The Ohio State University - CFAES Research Forum, April 10, Columbus, OH. (Poster)
4. **Manandhar, A.**, North, J., Hamel, P. and Shah, A. 2024. Technoeconomic analysis of renewable hydrogen and ethylene production via biological pathway using corn stover. American Society of Agricultural and Biological Engineers (ASABE) Annual International Meeting, July 28-31, Anaheim, CA. (Oral)
5. **Manandhar, A.**, Dey, S., Hatzakis, E., Vodovotz, Y. and Shah, A. 2024. Life cycle assessment of biobased coating material derived from spent coffee grounds. ASABE Annual International Meeting, July 28-31, Anaheim, CA. (Poster)
6. Jokar, R., Jahromi, H., **Manandhar, A.**, Adhikari, S., Nepal, P., Bergman, R., Rajendiran, N. and Shah, A. 2024. Sustainable hydrogen production: Assessing the environmental impact of methane decomposition using biochar catalysts. American Society of Agricultural and Biological Engineers (ASABE) Annual International Meeting (AIM), July 28-31, Anaheim, CA. (Oral)
7. Dhakal, S., Khanal, S., **Manandhar, A.** and Shah, A. 2024. Mapping waste coal piles using remote sensing – A regional scale study. The Ohio State University CFAES Annual Research Conference, April 9, Columbus, OH. (Poster)
8. Shrestha, E., **Manandhar, A.** and Shah, A. 2024. Adsorption of phosphorus from agricultural runoff using hydrochar produced from agricultural wastes. The Ohio State University CFAES Annual Research Conference, April 9, Columbus, OH. (Poster)
9. Bhoi, P., Abotsi, D., Ortegón, D. O., **Manandhar, A.** and Shah, A. 2023. Performance assessment of switchgrass and waste coal co-fired power plant, American Society of Mechanical Engineers, International Mechanical Engineering Congress and Exposition, Oct. 29 – Nov. 2, New Orleans, LA. (Oral)
10. **Manandhar, A.**, Dami, I. and Shah, A. 2023. Techno-economic analysis of using biomass mulches for winter protection of vineyards in Ohio. ASABE Annual International Meeting (AIM), July 9-12, Omaha, NE. (Poster)
11. **Manandhar, A.**, Khanal, S. & Shah, A. 2023. Techno-economic analysis of implementing UAV technologies for crop health monitoring. ASABE Annual International Meeting, July 9-12, Omaha, NE. (Poster)
12. **Manandhar, A.**, Dami, I. and Shah, A. 2023. Techno-economic analysis of using biomass mulches for winter protection of vineyards in Ohio. The Ohio State University CFAES Research Conference 2023, April 27-30, Columbus, OH. (Poster)
13. Dhakal, S., Khanal, S., **Manandhar, A.**, and Shah, A., 2023. Monitoring surface coal mine areas using remote sensing. The Ohio State University CFAES Research Conference 2023, April 27-30, Columbus, OH. (Poster)
14. **Manandhar, A.**, Dami, I. and Shah, A. 2023. Techno-economic analysis of using biomass mulches for winter protection of vineyards in Ohio. The Ohio State University Plant Sciences Symposium 2023, March 2-3, Columbus, OH. (Poster)
15. **Manandhar, A.** Heldman, D. and Shah, A. 2022. Life cycle assessment of the logistics of frozen and fresh mango from Peru to Ohio. ASABE Annual International Meeting 2022, July 17-20, Houston, TX. (Oral)
16. **Manandhar, A.** and Shah, A. 2022. Life cycle assessment of biodegradable plastic film production for packaging using biobased feedstocks. ASABE Annual International Meeting 2022, July 17-20, Houston, TX. (Poster)
17. Michel, F., Shrestha, E., **Manandhar, A.**, Floom, M., Curtis, K., Sweeney, G., Rodriguez, M., Altland, J. and Shah, A. 2022. Sustainable urban agriculture in the post-industrial Midwestern USA, The International Horticultural Congress – 2022, August 14-20, Angers, France. (Poster)
18. **Manandhar, A.**, Akula, A., Dami, I. and Shah, A. 2022. Evaluation of mulcher equipment for winter vine protection. Vineyard Field Day 2022, August 11, Kingsville, OH. (Poster)
19. **Manandhar, A.**, Dami, I. and Shah, A. 2022. Preliminary techno-economic analysis of vineyard mulching. Vineyard Mulching Workshop: Benefits beyond Winter Protection. June 2, 2022, Virtual. (Oral)
20. **Manandhar, A.**, Khanal, S. & Shah, A. 2021. Techno-economic analysis of implementing UAV technologies for crop health monitoring. ASABE Annual International Meeting 2021, July 12-16, Virtual Conference. (Oral)

21. **Manandhar, A.**, Khanal, S. and Shah, A. 2021. Techno-economic analysis of switchgrass based combined heat and power system. ASABE Annual International Meeting 2021, July 12-16, Virtual Conference. (Oral)
22. Shah, A. **Manandhar, A.** and Sivaprasad, S. 2021. Remediation of methylene blue from water using hydrochar produced from anaerobically digested effluent from sewage sludge. ASABE Annual International Meeting 2021, July 12-16, Virtual Conference. (Poster)
23. **Manandhar, A.**, Khanal, S. & Shah, A. 2021. Techno-economic analysis of implementing unmanned aerial systems for corn crop health monitoring. The Ohio State University - College of Food, Agricultural and Environmental Sciences (CFAES) Annual Research Conference 2021, April 8. Virtual Conference. (Poster)
24. Shrestha, E., **Manandhar, A.** and Shah, A. 2021. Life cycle assessment of spinach grown in an urban farm in Mansfield, Ohio. CFAES Annual Research Conference 2021, April 8. Virtual Conference. (Poster)
25. Sivaprasad, S., **Manandhar, A.** and Shah, A. 2021. Fixed-bed continuous remediation of methylene blue dye using hydrochar derived from sewage sludge digestate. The CFAES Annual Research Conference, April 8, virtual. (Poster)
26. **Manandhar, A.**, Zhu, H., Ozkan, E. and Shah, A. 2020. Techno-economic impacts of laser-guided variable-rate pesticide application for maintaining the health of nursery crops. Ohio State University Plant Sciences Symposium 2020. (Poster)
27. **Manandhar, A.** and Shah, A. 2020. Techno-economic and life cycle analyses of biobased lactic acid production. CFAES Annual Research Conference 2020, April 24, Columbus, OH. (Poster)
28. Shrestha, E., **Manandhar, A.** and Shah, A. 2020. Greenhouse gas emissions analysis of lettuce grown in an urban farm in Ohio. CFAES Annual Research Conference 2020, April 24, Columbus, OH. (Poster)
29. Sivaprasad, S., **Manandhar, A.** and Shah, A. 2020. Adsorptive removal of dyes using char derived from anerobic digestate. CFAES Annual Research Conference 2020, April 24, Columbus, OH. (Poster)
30. **Manandhar, A.** and Shah, A. 2019. Evaluating uncertainties in feedstock supply systems for a lignocellulosic biorefinery. ASABE Annual International Meeting 2019, July 7-10, Boston, MA. (Oral)
31. **Manandhar, A.** and Shah, A. 2019. Process-based life cycle assessment of lactic acid production from corn grain and corn stover. ASABE Annual International Meeting 2019, July 7-10, Boston, MA. (Poster)
32. **Manandhar, A.** and Shah, A. 2018. Process-based life cycle assessment of lactic acid production from corn stover and miscanthus, CFAES Annual Research Conference at The Ohio State University 2018, April 22, Columbus, OH. (Poster)
33. **Manandhar, A.** and Shah, A. 2018. Life cycle assessment of lactic acid production from corn stover and switchgrass, 10th Tripartite Meeting 2018, October 27, Columbus, OH. (Oral)
34. **Manandhar, A.** and Shah, A. 2018. Techno-economic analysis of using a conventional sprayer retrofitted with intelligent control functions for pesticide application in nursery crops, ASABE Annual International Meeting 2018, July 29- August 1, Detroit, MI. (Oral)
35. **Manandhar, A.** and Shah, A. 2018. Feedstock logistics for an integrated corn stover and energy crop based lignocellulosic biorefinery, ASABE Annual International Meeting 2018, July 29- August 1, Detroit, MI. (Oral)
36. Khanal A, **Manandhar A.** and Shah A. 2018. Techno-economic analysis of the production of novolac resin by partial substitution of petroleum based phenol with phenolic compounds present in bio-oil derived from fast pyrolysis of pine-wood. (Oral) Presented at:
 - ASABE Annual International Meeting, July 29- August 1, 2018, Detroit, MI.
 - 2018 Northeast Agricultural and Biological Engineering Conference (NABEC), July 15-18, 2018, Morgantown, WV.
37. **Manandhar, A.** and Shah, A. 2018. Techno-economic analysis of lactic acid production from lignocellulosic biomass, S1041 Annual Meeting and Symposium, 2018, July 9-10, Madison, WI. (Poster)
38. **Manandhar, A.** and Shah, A. 2018. Techno-economic analysis of corn grain logistics from the field to biorefinery, S1041 Annual Meeting and Symposium, 2018, July 9-10, Madison, WI. (Poster)
39. **Manandhar, A.**, Zhu, H., Ozkan, E. and Shah, A. 2018. Evaluating techno-economic impacts of using conventional sprayer retrofitted with intelligent control functions for pesticide application in apple orchards. (Poster) Presented at:
 - Plant Sciences Symposium at The Ohio State University 2018, April 6-7, Wooster, OH.
 - CFAES Annual Research Conference at The Ohio State University 2018, April 27, Wooster, OH. (Poster)

40. Khanal, A., **Manandhar, A.** and Shah, A. Evaluating the distribution of biomass composition and nutrients in corn plant after physiological maturity for sustainable biofuel production. (Poster) Presented at:
 - Plant Sciences Symposium at The Ohio State University 2018, April 6-7, 2018 Wooster, OH.
 - CFAES Annual Research Conference at The Ohio State University, April 27, 2018, Wooster, OH.
41. **Manandhar, A.**, Shah, A., Zhu, H. and Ozkan, E. 2017. Techno-economic analysis of implementing the intelligent pesticide sprayer for specialty crop production. ASABE Annual International Meeting 2017, July 16-19, Spokane, WA. (Oral)
42. **Manandhar, A.** and Shah, A. 2017. Techno-economic analysis of corn stover pelletization for cellulosic biorefinery feedstock transportation. ASABE Annual International Meeting 2017, July 16-19, Spokane, WA. (Poster)
43. Khanal, A., **Manandhar, A.**, Shah, A. 2017. Evaluating impacts of corn stover collection on nutrients, organic matter and soil erosion levels. ASABE Annual International Meeting 2017, July 16-19, Spokane, WA. (Oral)
44. Li, Y.Y., **Manandhar, A.**, Lu, J.X., Li, G., Zhang, X.H. and Shah, A. 2017. Life cycle assessment of value-addition to on-farm organic residues through anaerobic digestion and composting. ASABE Annual International Meeting 2017, July 16-19, Spokane, WA. (Oral)
45. **Manandhar, A.** and Shah, A. 2017. Life cycle environmental impacts of cellulosic feedstock supply in baled and pelletized formats. OARDC Annual Research Conference 2017, April 20, Columbus, OH. (Poster)
46. Li, Y.Y., **Manandhar, A.** and Shah, A. 2017. Life cycle assessment of integrated solid-state anaerobic digestion and composting for on-farm organic residues treatment. OARDC Annual Research Conference 2017, April 20, Columbus, OH. (Poster)
47. **Manandhar, A.**, P. Milindi, H. Keener, A. Shah. 2016. Techno-economic analysis of maize value chain for smallholder farmers in Tanzania. ASABE Annual International Meeting 2016, July 17-20, Orlando, FL. (Oral)
48. **Manandhar, A.** and Shah, A. 2016. Life cycle assessment of biomass densification during feedstock logistics for a biorefinery. ASABE Annual International Meeting 2016, July 17-20, Orlando, FL. (Poster)
49. Amador, I., **Manandhar, A.** and Shah, A. 2016. Life cycle assessment of corn stover fed torrefaction system. Ohio State University SROP Annual Poster Session, July 22, Wooster, OH. (Poster)
50. **Manandhar, A.** and Shah, A. 2016. Economic and environmental impacts of logistics for exported Ohio grown grains. OARDC Annual Research Conference 2016, April 21, Wooster, OH. (Poster)
51. Milindi, P., **Manandhar, A.**, Keener, H., Silayo, V. and Shah, A. 2016. An improved hermetic grain storage system for smallholder farmers in Tanzania. CFAES Annual Research Conference 2016, April 21, Wooster, OH. (Poster)
52. **Manandhar, A.** and Shah, A. 2015. Environmental and economic impacts of logistics for Ohio grown soybean exported to China. S-1041 Symposium 2015, August 10-11, Wooster, OH. (Poster)
53. Bae, C.J., **Manandhar, A.**, Riba, J., Rao, R.B., Cobb, C., Rodkin, A. and Shrader, E. 2012. Advanced battery electrode for high performance lithium-ion batteries. 2012 NASA Aerospace Battery Workshop. Huntsville, AL. 2012. (Oral)
54. Bae, C.J., **Manandhar, A.**, Riba, J., Rao, R.B., Cobb, C., Rodkin, A. and Shrader, E. 2012. Co-extrusion for advanced battery electrodes. Annual Poster Presentation. PARC, Palo Alto, CA. (Poster)

Invited talks and seminars

1. Shah, A., Baral, N., **Manandhar, A.** and Milindi, P. 2016. Cellulosic biofuels production in the United States Context. iAGRI/Sokoine University of Agriculture, April 12, Morogoro, Tanzania.
2. Shah, A. and **Manandhar, A.** 2016. Economic analysis: Parameters to be included in analysis and models. USDA-SCRI Project Initiation Meeting, January 15, Wooster, OH. (~70 stakeholders from different communities and agencies, including USDA, academicians, researchers, and specialty crop growers)
3. Shah, A. and **Manandhar, A.** 2016. Problems associated with economic analysis for specialty crops. USDA-SCRI Project Initiation Meeting, January 14, Wooster, OH. (~70 stakeholders from different communities and agencies, including USDA, academicians, researchers, and specialty crop growers)

RESEARCH GRANTS

Funded grants

1. Khanal, S., **Manandhar, A.**, Witter, J., Shah, A. and Reza, T. 2022. PARTNERSHIP: Sustainable hydrothermal manure management practice to improve nutrient use efficiency for enhanced agroecosystem services. USDA NIFA AFRI. \$799,996.
2. Shah, A., **Manandhar, A.**, Khanal, S. and Bhoi, P. 2022. Co-firing switchgrass and waste coal in a power plant: A techno-economic and life cycle evaluation for the Ohio River Valley (SWITCH), US Department of Energy. \$399,869.
3. **Manandhar, A.** and Witter, J. 2022. Hydrothermally carbonized agricultural wastes as adsorbent for minimizing nutrient runoff and improving soil quality. CFAES Research Competitive Grants Program 2022. \$50,000 plus support for graduate student tuition for 6 semesters.
4. Shah, A., **Manandhar, A.** and Doan-Nguyen, V. 2021. Sustainability assessment of upcycling anaerobically digested organic waste into sustainable Na-ion battery materials for distributed power solutions. Sustainability Institute at Ohio State University. \$32,875.
5. **Manandhar, A.** 2016. Ohio Agricultural Research and Development Center (OARDC) SEEDS Graduate Research Award. \$5,000 for independent research work and conference travel.
6. **Manandhar, A.** 2005. GIS based modeling of land use and land cover changes in Dharan-Biratnagar industrial corridor. Research Grant for Undergraduate Thesis. \$500 Grant provided by Strengthening Environment and Management at Local Level (SEAM-N), A partnership project of Government of Nepal and Finland, Nepal.
7. **Manandhar, A.**, Adhikari, A. and Karki, S. 2004. Development and testing of improved cookstoves for rural impoverished people in eastern Nepal. \$1,000. Research Grant (Renewable Energy for Pro-poor) provided by Center for Rural Technology-Nepal.

PROFESSIONAL DEVELOPMENT GRANTS

1. **Manandhar, A.** 2023. Professional Development Grant to be used toward(s) costs to attend the 2023 Annual International Meeting of the American Society of Agricultural and Biological Engineers (ASABE AIM) to be held in Omaha, NE. College of Engineering - Engineering Staff Advisory Committee. OSU. \$1,000.
2. **Manandhar, A.** 2022. Staff Career Development Grant to be used toward(s) costs to attend the 2022 ASABE AIM held in Houston, TX. The Ohio State University. \$1,250

AWARDS AND HONORS

Merit-based awards and honors

1. Reverend P.T. Taiganides-Professor R.E. Steward Memorial Award-FABE Graduate Student of the Year Award. 2019. Department of Food, Agricultural and Biological Engineering, The Ohio State University, Columbus, OH.
2. ASABE Educational Blue-Ribbon Awards for factsheet 'Status of Biorefineries in Ohio'. 2018. ASABE Annual International Meeting, Detroit, MI.
3. NSF I-Corps Sites program awardee. 2016. Entrepreneurial lead for the project "Improved grain storage structure for smallholder farmers in developing countries". University of Akron. \$2,500.
4. Student grant to present research poster. 2015. S-1041 Annual Meeting and Symposium intended for brainstorming and collaborations in science and engineering for a biobased economy, Wooster, OH.
5. Swedish Scholarship for International Students to pursue graduate study (M.S.) at KTH Royal Institute of Technology, Sweden. 2008-2010.
6. Top Undergraduate Student in Agricultural Engineering. 2006. Tribhuvan University, Nepal.
7. National Engineering Excellence Scholarship. 2001-2005. Meritorious government scholarship to pursue undergraduate education at Institute of Engineering, Tribhuvan University, Nepal.

Awards for presentations and papers

1. Third position in poster competition under 'M.S. Student' category. 2024. CFAES Annual Research Conference for poster: Dhakal, S., Khanal, S., **Manandhar, A.** and Shah, A. 2024. Mapping waste coal piles using remote sensing – A regional scale study. The Ohio State University CFAES Annual Research Conference, April 9, Columbus, OH.

2. Second position in poster competition under 'Research Staff' category. 2023. CFAES Annual Research Conference for poster: **Manandhar, A.**, Dami, I. and Shah, A. 2023. Techno-economic analysis of using biomass mulches for winter protection of vineyards in Ohio. Ohio State University CFAES Research Conference 2023, April 27-30, Columbus, OH.
3. Third position in poster competition under 'Postdoctoral researcher' category. 2021. CFAES Annual Research Conference for poster: **Manandhar, A.**, Khanal, S., Shah, A. 2021. Techno-economic analysis of implementing unmanned aerial systems for corn crop health monitoring. CFAES Annual Research Conference 2021, April 8. Virtual Conference.
4. Second position in poster competition under 'Research Staff' category. 2021. CFAES Annual Research Conference for poster: Shrestha, E., **Manandhar, A.** and Shah, A. 2021. Life cycle assessment of spinach grown in an urban farm in Mansfield, Ohio. CFAES Annual Research Conference 2021, April 8. Virtual Conference.
5. Second position in poster competition under 'Professional Researcher' category. 2020. The Ohio State University Plant Sciences Symposium for poster: **Manandhar, A.**, Zhu, H., Ozkan, E. and Shah, A. 2020. Techno-economic impacts of laser-guided variable-rate pesticide application for maintaining the health of nursery crops. Ohio State University Plant Sciences Symposium 2020.
6. First position in poster competition under 'Postdoctoral researcher' category. 2020. CFAES Annual Research Conference for poster: **Manandhar, A.** and Shah, A. 2020. Techno-economic and life cycle analyses of biobased lactic acid production. CFAES Annual Research Conference 2020, April 24, Columbus, OH.
7. Scientific Publication Award. 2018. Department of Food, Agricultural and Biological Engineering, The Ohio State University, Columbus, OH.
8. Graduate Research Award, 'Ph. D.' category. 2018. Department of Food, Agricultural and Biological Engineering, The Ohio State University, Columbus, OH.
9. Third position in poster competition. 2018. Plant Sciences Symposium at The Ohio State University, Wooster, OH for poster: **Manandhar, A.**, Zhu, H., Ozkan, E. and Shah, A. 2018. Evaluating techno-economic impacts of using conventional sprayer retrofitted with intelligent control functions for pesticide application in apple orchards. Plant Sciences Symposium at The Ohio State University 2018, April 6-7, Wooster, OH.
10. Scientific Publication Award. 2017. Department of Food, Agricultural and Biological Engineering, The Ohio State University, Columbus, OH.
11. Third position in poster competition under 'Ph. D.' category. 2017. OARDC Annual Research Conference, Columbus, OH for poster: **Manandhar, A.** and Shah, A. 2017. Life cycle environmental impacts of cellulosic feedstock supply in baled and pelletized formats. OARDC Annual Research Conference 2017, April 20, Columbus, OH.
12. First position in poster competition under 'Ph. D.' category. 2017. OARDC Annual Research Conference, Columbus, OH for poster: Li, Y.Y., **Manandhar, A.** and Shah, A. 2017. Life cycle assessment of integrated solid-state anaerobic digestion and composting for on-farm organic residues treatment. OARDC Annual Research Conference 2017, April 20, Columbus, OH.

REVIEWER EXPERIENCE

Journal papers: Applied Sciences, Energies, Journal of American Society of Agricultural and Biological Engineers, Journal of Cleaner Production, PLOS ONE, Scientific Reports.

Research grants, paper and poster competition

◦ ASABE, K. K. Barnes Student Paper Competition Review Committee	2022 - present
◦ ASABE AIM Energy Systems Poster Competition	2024
◦ MakeOHIO 2024	2024
◦ OSU CFAES Research Conference Poster Competition	2024
◦ Foundation for Food and Agriculture Research (FFAR), Seeding Solutions Grant	2022, 2023
◦ The Ohio State University, Hayes Graduate Research Forum	2019 - 2022
◦ The Ohio State University, SEEDS Graduate Research Award Review Panel	2017, 2018

AFFILIATIONS

◦ American Society of Agricultural and Biological Engineers (ASABE)	2015 - present
---	----------------

PROFESSIONAL SOCIETY SERVICE

- o Chair, 2024 - present. PRS-280 Bioconversion and Bioprocesses Committee, ASABE
- o Vice-chair, 2022 - 2024. PRS-280 Bioconversion and Bioprocesses Committee, ASABE
- o Organizer and Moderator, 2023. 'Biomass Feedstock Supply Logistics and Modeling', Oral Technical Session. ASABE AIM 2023
- o Organizer and Moderator, 2024. 'Life cycle assessment of biofuels and bioproducts', Oral Technical Session. ASABE AIM 2024
- o Committee member, 2022 - present. PRS-01 Processing Systems Executive Committee, ASABE
- o Committee member, 2022 - present. P-123 K.K. Barnes Undergraduate Paper Competition Committee, ASABE
- o Committee member and Liaison, 2016 - present. ES-220 Biobased Energy, Fuels, and Products, ASABE
- o Committee member and Liaison, 2017 - present. MS-23/7/2 Forage & Biomass Engineering Committee, ASABE
- o Committee member, 2023 - present. ASE-16 Sustainability Committee, ASABE
- o Committee member, 2024 - present, ASE-12 Engineering for Sustainability Committee, ASABE
- o Member, 2023 - present. Working Team 'Develop Circular Metrics, Models, Methods and Standards', ASABE Circular Bioeconomy Systems Institute

STUDENT MENTORSHIP EXPERIENCE

Awards won by mentees

1. Third position in poster competition under 'Research Staff' category. 2025. The Ohio State University - CFAES Research Forum for poster: Ansari, A., Timilsina, A. P., Shah, A., Manandhar, A., Khanal. S. 2025. Assessing switchgrass efficacy in reclaiming abandoned mine lands using SWAT model. The Ohio State University - CFAES Research Forum, April 10, Columbus, OH.
2. Third position in poster competition under 'M.S. Student' category. 2024. CFAES Annual Research Conference for poster: Dhakal, S., Khanal, S., **Manandhar, A.** and Shah, A. 2024. Mapping waste coal piles using remote sensing – A regional scale study. The Ohio State University CFAES Annual Research Conference, April 9, Columbus, OH.
3. Second position in poster competition under 'Research Staff' category. 2021. CFAES Annual Research Conference for poster: Shrestha, E., **Manandhar, A.** and Shah, A. 2021. Life cycle assessment of spinach grown in an urban farm in Mansfield, Ohio. CFAES Annual Research Conference 2021, April 8. Virtual Conference.
4. Sivaprasad, S. Graduate Research Award, 'M.S.' category. 2021. Department of Food, Agricultural and Biological Engineering, The Ohio State University, Columbus, OH.

OTHER ACTIVITIES

- o Member of the Executive Committee. 2022 - 2024. The Ohio State University. Celebration of Nations. Annual event celebrating the diversity of the students representing more than 30 countries.