

Personal:

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Date of Birth: 08/12/1980
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Education:

2011-2015:

Energy and Process Engineering, Norwegian University of Science and Technology, Norway.

2007-2009:

M.Tech, Machine Design Engineering, Mechanical Engineering, Indian Institute of Technology Roorkee, India.

2000-2005:

BSc, Mechanical Engineering, Mekelle University, Faculty of Science and Technology, Ethiopia.

1997-2000:

Technical Certification, Machine Technology, Don Bosco Technical School, Mekelle

Selected Certificates and special trainings:

Master the Fundamentals of Power Sector Regulation (2019)
Industrial Policy in the 21st Century, The Challenge for Africa, SDG Academy (2019)
Renewable energy, Energy efficiency and cooperation project, Italian Agency for Development Cooperation AICS and ENEA, Addis Ababa (2019)
Sediment management in Hydropower Development and Operation, International Centre for Hydropower, Nepal (2018)
Small Hydro Operation and Maintenance, Environment, Health and Safety; General Hydro Technical Training (2018)
The art of stakeholder Collaboration 1, Collective Leadership Institute (2017)
Engineering educator, Engineering capacity building, Ethiopia (2010)
Higher Diploma of pedagogy, Mekelle University, Ethiopia, (2006)

Language:

Mother language: Tigrigna
Professional fluent: English, Amharic,
Beginner: Norwegian

Professional membership:

Member of International Solar Energy Society (ISES)
Ethiopian Society of Mechanical Engineers (ESME)

Employment and Experiences:

2024-: Visiting researcher

Research on transient and flexibility of hydropower, Department of civil and environmental engineering, Norwegian University of Science and Technology, Norway.

2019-2023: Associate professor

Teaching & supervising graduate students,
Leading research in renewable energy technologies, and
Involved in academic leadership as Director of the Institute of Energy, School of Mechanical and Industrial Engineering, Mekelle University

2015-2019: Assistant Professor

Teaching and supervising graduate students,
Leading research in renewable energy technologies, and
Involved in academic leadership as head of Research Publication and Outreach (RPO) of Engineering,
School of Mechanical and Industrial Engineering, Mekelle University

2017: Visiting Researcher

Solar energy based postharvest management “solar tunnel dryer”, Department of Mechanical Engineering, Katholieke Universiteit Leuven, KU Leuven, Belgium.

2011-2015: PhD researcher

Research on Solar Thermal Energy Collection, Transportation, Storage, and Application.
Involved in supervision of master students, Department of Energy and Process Engineering, Norwegian University of Science and Technology, Norway.

2005-2010: Lecturer, assistant lecturer, and Graduate assistant

Teaching and supervision of undergraduate students,
Involved in academic leadership as Head of Mechanical Engineering, and
Lead research on farm mechanization and rural energy, department of mechanical engineering, Mekelle University, Ethiopia.

2005: Apprentice Mechanical Engineer

Division head for Volvo dry and liquid transport, Trans Ethiopia Pvt. Ltd. Co, Ethiopia.

2000: Machinist

Certified machinist, Messebo Building Materials Production Pvt. Ltd. Co, Ethiopia.

Teaching Experiences:

PhD program: - I taught experimental methods and research methodology to Sustainable Energy Systems program.

MSc Program: - I taught courses including advanced heat transfer, solar energy (PV + Thermal), Renewable energy, experimental methods for engineers, Thermal system modeling, power generation to energy technology and thermos fluid engineering programs.

Undergraduate program: - Machine design (I & II), Vibration, Material Handling Equipment, Mechatronics, Fluid power system, Thermodynamics, and machine technology (I&II) to mechanical engineering program, and Engineering Mechanics (dynamics) and engineering Drawing to engineering (Mechanical, Civil, Electrical, and Industrial) programs

Supervision Experiences:

PhD theses Supervision: - 4 main supervisor and 1 co-supervisor (undergoing)

MSc theses Supervision: - more than 27 completed, 1 undergoing.

Undergraduate Theses Supervision: - more than 7 completed

Program and Curriculum Development Experiences:

Led and involved in designing of two PhD programs, Energy Technology and Sustainable Energy Systems, Mekelle University, Ethiopia,

Led and involved in the design of three MSc programs, Product Design Development, Energy Technology and Thermofluid Engineering, Department of Mechanical Engineering Mekelle University, Ethiopia,

Involved in the Revision of mechanical Engineering Undergraduate program, Department of Mechanical Engineering, Mekelle University, Ethiopia.

Developed solar energy (PV) TVET programs, Federal TVET Program, Ethiopia.

Consultancy and project development Experiences:**2021-2022: senior mechanical engineer consultant**

Lead engineer in hydropower design retrofit, operation and maintenance, vibration monitoring, Dam safety, Tekeze hydropower plant, Ethiopia.

Lead engineer in windfarm operation and maintenance, synchronized operation in isolated grid, Ashegoda wind farm, Ethiopia.

2017-2020: Engineering Services,

CEO and Lead Engineer for Mechanical Engineering services, Horizon Engineering Pvt. Ltd. Co, Ethiopia

2017-2020: hydropower developer
Resource assessment, feasibility study, design, manufacturing, and construction of Small-scale hydropower plant development for rural community (150kW pilot project), School of Mechanical and Industrial Engineering, Mekelle University, Ethiopia

2016-2018: Wind farm development
Feasibility study and project development of 120 MW wind farm with a PPP scheme, School of Mechanical and Industrial Engineering, Mekelle University, Ethiopia

2016-2020: Government adviser
Member of a Steering Committee for Renewable Energy development in Tigray,
Leading the energy sector think tank of Tigray, and
Participated in the planning of long-term energy planning of Tigray, government of Tigray Region, Ethiopia

2015-2018: Supervision of Solar PV Installation
Installation of Solar PV Systems for more than 100 rural health centers and 1000 health posts as off-grid electrification of rural health institutions in Ethiopia, School of Mechanical and Industrial Engineering, Mekelle University, Ethiopia.

Research project and funding:

2020-2026:
Hydraulic Research and Education Laboratory and Dam Safety in Ethiopia, project budget 19.7 million Kroner, NORAD Norway.
Project coordinator for Mekelle university (2020-2024), Initiated and involved in proposal writing for the team of Mekelle university, Main supervisor of three PhDs sponsored by the project.

2020-2026:
Energy Technology Network (ENET) of universities from Ethiopia, Malawi, Mozambique, South Sudan, Tanzania, Uganda and Norway, Project budget 22 million Nok, NORAD Norway.
Involved in the proposal development and project management (2020-2024)

2020-2024:
University Network of PhD Programs in Energy (UNET), project budget 987, 935 Euro, European Union,
Involved in project development, lead PhD course developer for experimental methods, contributed chapters to the developments of PhD courses for solar energy and energy storage.
Involved in project management and Supervisor two PhD students participated as exchange students.

2020:
Technological Innovations to combat COVID19, Development of Mechanical Ventilator, project budget 220,000.00 Birr, Mekelle University
Led the project as Principal Investigator and Developed a mechanical ventilator.

2017-2020:
Development of Pilot Site for Small Scale Hydro Electric Power Plant in Tigray Region, project budget 7 million Birr, Mekelle University.
Led the proposal development and project development as a Principal Investigator

2015-2020:
Establishing center of excellence in Renewable energy with focus on wind and solar energy (CoE in RE-WISE) at Mekelle University, Ethiopia, project budget 1.35 million Euro, KFW, Germany.
Coordinate and led proposal development, work as focal person of the project, develop institutional development plan of the project.

2016-2020:
Renewable Energy Technology Transfer: resource assessment and Small-scale wind Turbine Technology Development, project budget 5 million Birr, Ministry of Science and Technology Ethiopia.
Coordinated and involved in the proposal development, worked as Co-Principal investigator, involved in project management and technology development.

2016-2019:
Improving Drying Technologies with Reverse Engineering and Innovation for Minimizing Post Harvest Losses in Ethiopia, project budget 100, 000 Euro, VLIROUS Belgium.
Led and Involved in the proposal writing, led the project as local coordinator of the project (Principal

- Investigator), involved in supervision of two MSc students sponsored by the project, develop technologies.
- 2016-2019:**
Heat Storage Integrated Solar Injera “Mitad” For Indoor and Nighttime Application, project budget 249,500 Birr, Ministry of Water, Irrigation and Electricity, Ethiopia, (Principal Investigator)
- 2016-2019:**
Livelihood Improvement Through Efficient Injera Mitad Technology in Ethiopia, Characterization, Technology Development, Optimization, Standardization, and Impact Assessment, project budget 150,000.00 NOK, Mekelle University.
Coordinate and led proposal writing, involved as a Principal Investigator, Supervised three MSc theses sponsored by the project, developed scalable technologies.
- 2015-2018:**
Capacity Building in Renewable Energy Education and Research (EnPe 2), Project budget 12,000,000 NoK, NORAD Norway
Involved in project management and supervision of PhD student.
- 2015-2016:**
Design, Development and Performance Evaluation of Jatropha oil Fueled Cooking Stove, project budget, 71,250.00, Mekelle University
Coordinated proposal development and involved as MSc thesis supervisor.
- 2011-2014:**
Norad’s Master program for Energy and Petroleum (EnPe I), 8,000,000 NoK, NORAD, Norway.
Involved in project development and as PhD researcher sponsored by the project.

Registered Technologies:

Three solar Injera stoves (two use sensible heat storage and one uses latent heat storage)
Three biomass Injera stove (they use clay, aluminum, and borosilicate glass pans)
Biogas Injera stove
Electric Injera stove
Cross flow turbine
Indirect solar dryer
Peanut pod remover and trimer
Solar juice and ketchup processor

Honors and Distinctions:

- 2015:**
Best paper Award, Energy and fuel, ICMER 2015, Malaysia
- 2005:**
Ethiopia society of Mechanical Engineering (ESME) Award, Best thesis award, 2005, Ethiopia

Publications:

1. Preprint: A New Surge Tank Design Approach to Boost Hydropower Flexibility
2. Ephrem Yohannes Assefa and Asfaw Haileselassie Tesfay, Effect of Blade Number on Internal Flow and Performance Characteristics in Low-Head Crossflow Turbines, *Energies* 2025, 18(2), 318; <https://doi.org/10.3390/en18020318>
3. Mulualem G. Gebreslassie and Asfaw H. Tesfay, (2024), Unlocking wind power potential to improve energy security in Ethiopia, *Sustainable Energy Research* 2024, Vol 11 (43), <https://doi.org/10.1186/s40807-024-00137-9>
4. Mesele Hayelom Hailu, Mulu Bayray Kahsay, Asfaw Haileselassie Tesfay and Ole Jørgen Nydal, (2024), An Experimental Comparative Study of Large-Sized Direct Solar Fryers for Injera Baking Applications, *Energies* 2024, Vol. 17(19), P.4949, <https://doi.org/10.3390/en17194949>
5. Angesom Gebrezgabiher Tesfay, Asfaw Haileselassie Tesfay and Muiyiwa Samuel Adaramola, (2024), Quantifying Agricultural Residues Biomass Resources and the Energy Potentials with Characterization of Their Nature and Ethiopian Case Consumption Inference, *Energies*, 2024, Vol.17(18), p.4736, <https://doi.org/10.3390/en17184736>
6. T. Wgezahegn et al. (2024), Does membership in seed producer cooperatives improve smallholders’ teff

- productivity? A comparative analysis in North Ethiopia, Wiley, <https://doi.org/10.1111/apce.12466>
7. Tesfay, A.H, Gebregiorigs, M.G, and Lia, L., (2024), Sustainability challenges of hydropower and its implication on Ethiopia's Economy, International Journal of Sustainable Engineering, 2024, VOL. 17, NO. 1, 1–14, <https://doi.org/10.1080/19397038.2024.2318780>
 8. Tesfay, A.; Kahsay, M.B.;Geleta, A.B. (2024), Improved Cook stoves to Meet Sustainable Development Goal in Ethiopia. Energies 2024, 17, 1011. <https://doi.org/10.3390/en17051011>
 9. Tesfay, A.H., Tsegay, K., Kahsay, M.B. et al. Performance comparison of three prototype biomass stoves with traditional and Mirt stoves for baking Injera. Energy Sustainability and Society 14, 11 (2024). <https://doi.org/10.1186/s13705-024-00443-6>
 10. Dawit, A. T., Asfaw, T. H and Muiyiwa (2022), Pumped Hydro- Energy Storage System in Ethiopia: Challenges and Opportunities, Momona Ethiopian Journal of Science (MEJS) 14 (i), 32-47 (2022), <http://dx.doi.org/10.4314/mejs.v14i1.2>
 11. M. Bayray, Y. Gebreyohannes and H. Gebrehiwot et al. (2022), Measured solar irradiance data for resource assessment at four sites in Geba catchment, Tigray, North Ethiopia, Volume 40, 107836, <https://doi.org/10.1016/j.dib.2022.107836>
 12. M. Bayray et al. (2021), Temporal and spatial solar resource variation by analysis of measured irradiance in Geba catchment, North Ethiopia, Sustainable Energy Technologies and Assessments 44, 101110, <https://doi.org/10.1016/j.seta.2021.101110>
 13. AH Tesfay, MH Hailu, FA Gebrerufael, MS Adaramola (2020), Implementation and status of biogas technology in Ethiopia-Case of Tigray region, Momona Ethiopian Journal of Science 12 (2), 257-273, <https://doi.org/10.4314/mejs.v12i2.7>
 14. Tesfay, A.H., Asfaw, S.H. & Bidir, M.G. (2019), Comparative evaluation of biodiesel production and engine characteristics of Jatropa and Argemone Mexicana oils. SN Appl. Sci. 1, 1075. <https://doi.org/10.1007/s42452-019-1075-2>
 15. Petros Demissie, Mesele Hayelom, Amanuel Kassaye, Asfaw Hailesilassie, Mekonnen Gebrehiwot, Maarten Vanierschot (2019), Design, development and CFD modeling of indirect solar food dryer, Energy Procedia, 158, 1128-1134, <https://doi.org/10.1016/j.egypro.2019.01.278>
 16. AH Tesfay, MB Kahsay, OJ Nydal (2019), Numerical and experimental analysis of solar injera baking with a PCM heat storage, Momona Ethiopian Journal of Science 11 (1), 1-13, <https://doi.org/10.4314/mejs.v11i1.1>
 17. Asfaw H. Tesfay, Teklebrhan W. Atsbha, Mesele H. Hailu, Maarten Vanierschot & Mekonnen G. Gebrehiwot (2019), PHL management of guava fruit by using locally developed solar pasteurizer technology, Cogent Food & Agriculture, 5 (1), 1673057, <https://doi.org/10.1080/23311932.2019.1673057>
 18. AH Tesfay, MB Kahsay, OJ Nydal (2018), Steam-based charging-discharging of a PCM heat storage, Momona Ethiopian Journal of Science 10 (1), 15-27, <https://doi.org/10.4314/mejs.v10i1.2>
 19. Mesele H. Hailu, Mulu B. Kahsay, Asfaw H. Tesfay, Ole J. Nydal, An oil based indirect solar fryer for injera baking application, Proceedings of Solar Conference and Exhibition, p 109-118, 2018, ISBN: 978-605-65469-8-3,
 20. Asfaw, H., Ashenafi, K and Endalkachew M. (2018), Performance Analysis of Solar Autoclave for Rural Health Center, Momona Ethiopian Journal of Science (MEJS), V10(2):163-179, 2018 ©CNCS, Mekelle University, ISSN: 2220-184X, <http://dx.doi.org/10.4314/mejs.v10i2.1>
 21. Tesfay, A.H., Abrha, A.K., Aregawi, B., Nurhusein, F.F (2017), Solar Dryer and post-harvest management in Ethiopia: Design and CFD simulation, Proceedings of ISES Solar World Congress, swc2017-0164-Tesfay, doi:10.18086/swc.2017.26.12, <http://proceedings.ises.org/>
 22. MH Hailu, MB Kahsay, AH Tesfay, OI Dawud (2017), Energy consumption performance analysis of electrical mitad at mekelle city, Momona Ethiopian Journal of Science 9 (1), 43-65, <https://doi.org/10.4314/mejs.v9i1.4>
 23. MH Hailu, OJ Nydal, MB Kahsay, AH Tesfay (2017), A direct solar fryer for injera baking application, Proceedings of ISES Solar World Congress, swc2017-0150-Hailu, doi:10.18086/swc.2017.24.02, <https://proceedings.ises.org>
 24. A H Tesfay and V K Goel (2015), A H Tesfay and V K Goel (2015), Analysis of semi-active vehicle suspension system using airspring and MR damper, IOP Conference Series: Materials Science and Engineering, Volume 100, DOI: 10.1088/1757-899X/100/1/012020
 25. OJ Nydal, A Tesfay (2015), Ray Tracing for Evaluation of the SK14 Solar Concentrator as a Solar Fryer,

- Conference Proceedings, ISES Solar World Congress, Daegu, Korea, 8–12, doi:10.18086/swc.2015.03.06, <http://proceedings.ises.org>
26. AH Tesfay, FY Hagos, KG Yohannes, OJ Nydal, MB Kahsay (2015), Preparing side charging of PCM storage: theoretical and experimental investigation, IOP Conference Series: Materials Science and Engineering 100 (1), 012021, DOI 10.1088/1757-899X/100/1/012021
 27. AH Tesfay, MB Kahsay, OJ Nydal (2015), Solar cookers with latent heat storage for intensive cooking application, ISES Solar World Congress Proceedings, doi:10.18086/swc.2015.10.09, <http://proceedings.ises.org>
 28. Asfaw Haileselassie Tesfay, Experimental Investigation of a Concentrating Solar Fryer with Heat Storage, Doctoral Thesis, 2015, <http://hdl.handle.net/11250/281376>
 29. AH Tesfay, OJ Nydal, MB Kahsay (2014), Energy storage integrated solar stove: A case of solar Injera baking in Ethiopia, IEEE Global Humanitarian Technology Conference (GHTC 2014), 659-666, <https://doi.org/10.1109/GHTC.2014.6970353>
 30. MB Kahsay, J Paintin, A Mustefa, A Haileselassie, M Tesfay, B Gebray (2014), Theoretical and experimental comparison of box solar cookers with and without internal reflector, Energy Procedia 57, 1613-1622, <https://doi.org/10.1016/j.egypro.2014.10.153>
 31. AH Tesfay, MB Kahsay, OJ Nydal (2014), Design and development of solar thermal Injera baking: steam based direct baking, Energy Procedia 57, 2946-2955, <https://doi.org/10.1016/j.egypro.2014.10.330>
 32. AH Tesfay, MB Kahsay, OJ Nydal (2014), Solar powered heat storage for Injera baking in Ethiopia, Energy Procedia 57, 1603-1612, <https://doi.org/10.1016/j.egypro.2014.10.152>
 33. M. Bayray et al. (2013), Wind Energy Data Analysis and Resource Mapping of Geba Catchment, North Ethiopia, Wind Engineering, 37, 4, 333–346, <https://doi.org/10.1260/0309-524X.37.4.333>

International Presentations:

2017:

Solar Dryer and Post-Harvest Management in Ethiopia: Design and CFD Simulation, ISES Solar World congress 2017, Abu Dhabi, UAE, 29 October-02 November 2017.

2015:

Analysis of semi-active vehicle suspension system using air spring and MR damper, international conference on mechanical engineering, research, 18-19 August 2015, Kuantan, Pahang, Malaysia.
 Side charging of PCM Storage: Theoretical and Experimental Investigation, International conference on mechanical engineering, research, 18-19 August 2015, Kuantan, Pahang, Malaysia.
 Solar Cookers with Latent Heat Storage for Intensive Cooking Application, ISES Solar World congress 2015, EXCO, Daegu, Korea, 8-12 November 2015.
 Steam Based Charging-Discharging of A PCM Heat Storage, ISES Solar World congress 2015, EXCO, Daegu, Korea, 8-12 November 2015.

2014:

Storage Integrated Solar Stove: A case of solar Injera baking in Ethiopia, IEEE Global Humanitarian Technology Conference (GHTC) October 13, 2014, San Jose, USA.
 Storage integrated solar stove and its perspectives in Ethiopia, Renewable Energy Research Conference, Oslo, Norway, 16-18 September 2014.

2013:

Design and development of solar thermal Injera baking: steam based direct baking, ISES Solar World Congress, Cancun, Mexico, 3-7 November 2013.
 Solar powered heat storage for Injera baking in Ethiopia, ISES Solar World Congress Nov 5, 2013, Cancun, Mexico.

Technical reports:

2023:

Tigray Power Supply in a Siege Situation, Operation of Tekeze Hydropower Plant and Ashegoda Wind Farm in a Decentralized Grid System
 Tekeze Hydropower Vibration Diagnosis Report

2017:

Assessment of potential sites for Pico and Micro Hydropower Generation in Tigray region, Part one: Partial assessment.

2013:

Wind and solar energy resource assessment in Geba Catchment, North Ethiopia, 2012 annual technical report.

2012:

Wind and solar energy resource assessment in Geba Catchment, North Ethiopia, 2010 annual technical report.

Wind and solar energy resource assessment in Geba Catchment, North Ethiopia, 2011 annual technical report.

Strategic Documents:

2017:

Institutional Document for establishing the Institute of energy at Mekelle University, Ethiopia.

2015:

Institutional Development Plan for Establishing Center of Excellence in Renewable Energy Focus on Wind and Solar Energy (IDP of COE in RE-WISE) in Ethiopia, Mekelle University, Ethiopia.