HAIMANOTE BAYABIL

Post-Doctoral Researcher
College of Agriculture and Human Sciences
Prairie View A&M University
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EDUCATION

2015 **Ph.D., Cornell University,** Agricultural and Biological Engineering. Committee: Tammo Steenhuis (major advisor), Johannes Lehmann (co-advisor), Todd Walter (co-adviser).

2009 **M.P.S., Cornell University,** Environmental Engineering. Committee: Tammo Steenhuis (major advisor) and Mike Walter (co-adviser).

2003 **B.Sc., Alemaya University,** Ethiopia, Plant Science, Committee: Nigussie Dechassa (major advisor).

FELLOWSHIPS

2013 Cornell University Richard Bradfield Research Award.
2011 The Borlaug Leadership Enhancement in Agriculture Program (LEAP) Fellowship.
2010 Cornell University African Fellowship Award.
2008 International Water Management Institute (IWMI) Field Research Award.

GRANTS

1. Fares A., R. Awal, P. Ampim, **H. Bayabil**, R. Ray, and B. Lawton. Integrated Approach to Develop, Test, and Disseminate Optimum Water and Nitrogen Practices for a Sustainable Environment in a Changing Climate Texas A&M University System Research Grant. 2017. ($57, 190) (*funded*)

2. Fares A., A. Parks, R. Awal, P. Ampim, and **H. Bayabil**. Evaluation and Dissemination of Sustainable Organic Cultural Practices for Southeast Texas. USDA-NIFA/ CBG. 2017. ($600,000) *(pending)*

3. Griffin R., R. Ray, A.James, N. Estwick, R. Awal, and **H. Bayabil**. Soil Health Assessment and Monitoring on the PVAMU Farm in East Central Texas. USDA-NIFA/ CBG. 2017. ($300,000) *(pending)*

PEER REVIEWED PUBLICATIONS

1. **Bayabil, H.K.,** B.Yitaferu, and T.S. Steenhuis. (2017). Shift from Sediment TransportLimitation to Supply Limitation with Monsoon Progression in the Upper Blue Nile Basin, *Earth Surface Processes and Landforms.* DOI:10.1002/esp.4103.

2. Lal R., R. H. Mohtar, A. T. Assi, R. Ray, **H.K. Bayabil**, and M. Jahn. (2017). Soil as a Basic Nexus Tool: Soils at the center of the Food Energy Water Nexus. Journal of Current Sustainable/Renewable Energy Reports. DOI 10.1007/s40518-017-0082-4.

3. Fares A., **H.K. Bayabil**, M. Zekri, D.de Mattos, and R. Awal. (2017). Impacts of Climate Change on Citrus Water Requirements across Major Citrus Producing Areas in the World. Journal of Water and Climate Change (in print).

4. Fares, A., A. Bensley, **H.K. Bayabil**, R. Awal, S. Fares, H. Valenzuela, and F. Abbas. (2017). Carbon Dioxide Emission in Relation with Irrigation and Organic Amendments. *Journal of Environmental Science and Health, Part B. DOI:* 10.1080/03601234.2017.1292094.

5. **Bayabil, H.K.,** T.Y. Tebebu, C.R. Stoof, and T.S. Steenhuis. (2016). Effects of a deep-rooted crop and soil amended with charcoal on spatial and temporal runoff patterns in a degrading tropical highland watershed, Hydrol. Earth Syst. Sci., 20, 875-885, doi: 10.5194/hess-20-875-2016.

6. **Bayabil, H.K.,** C.R. Stoof., C. Mason., B.K. Richards., and T. S. Steenhuis. (2016). Nitrous Oxide and Methane Fluxes from Smallholder Farms: A Scoping Study in the Anjeni Watershed. *Climate*. 4 (4), 62; doi: 10.3390/cli4040062.

7. Tebebu Y.T, **H.K. Bayabil**, C.R. Stoof, S.K. Giri, A.A. Gessess, S.A. Tilahun, T.S. Steenhuis. (2016). Characterization of Degraded Soils in the Humid Ethiopian Highlands. *Land Degradation & Development*. DOI: 10.1002/ldr.2687.

8. Ripendra Awal, **H.K. Bayabil**, and A. Fares. (2016). Analysis of Potential Future Climate and Climate Extremes in the Brazos Headwaters Basin. *Water* 2016, 8(12), 603; doi: 10.3390/w8120603.

9. Guzman C.D., M. Elkamil, T.Tebebu, **H.K. Bayabil**., S. Tilahun, B. Yitaferu, T. Rientjes, T.S. Steenhuis. (2016). Modeling Discharge and Sediment Concentrations after Landscape Interventions in a Humid Monsoon Climate: The Anjeni Watershed in the Highlands of Ethiopia. *Hydrological Processes.* DOI: 10.1002/hyp.11092.

10. Fares, A., R. Awal, and **H.K. Bayabil**. (2016). Soil Water Content Sensor Response to Organic Matter Content under Laboratory Conditions. Sensors. 16(8), 1239; doi: 10.3390/s16081239.
11. Ghebreyesus D., M. Temimi, A. Fares, **H.K. Bayabil**. (2016). A Multi-Satellite Approach for Water Storage Monitoring in an Arid Watershed. Geosciences 6(3), 33; doi: 10.3390/geosciences6030033.

12. **Bayabil, H.K.,** Stoof, C.R., Lehmann, J.C., Yitaferu, B., Steenhuis, T.S. (2015). Assessing the potential of biochar and charcoal to improve soil hydraulic properties in the humid Ethiopian Highlands: The Anjeni watershed. Geoderma 243-244, 115–123. doi:10.1016/j.geoderma.2014.12.015.

13. **Bayabil, H.K.,** Tigist Y. Tebebu, C. Stoof, Birru Yitaferu, and T. S. Steenhuis. (2015). Spatial and Temporal Runoff Processes in the Degraded Ethiopian Highlands. Hydrol. Earth Syst. Sci. Discuss.19, 1–25, 2015, doi: 10.5194/hessd-19-1-2015.

14. Tebebu Y.T, T.S. Steenhuis, D.C. Dagnew, C.D Guzman, **H.K. Bayabil**, A.D.Zegeye, A.S. Collick, S. Langan, C. McAllister, E.J. Langendoen and S.A. Tilahun. (2015). Improving efficacy of landscape interventions in the (sub) humid Ethiopian highlands. Hypothesis & Theory, Frontiers in Earth Science. Hydrosphere. 3:49. doi: 10.3389/feart.2015.00049.

15. **Bayabil, H. K.,** S.A. Tilahun, .A.S. Collick, B. Yitaferu, T.S. Steenhuis (2010). Are Runoff Processes Ecologically or Topographically Driven in the (Sub) Humid Ethiopian Highlands? The Case of the Maybar Watershed. Ecohydrology. 3: 457-466. DOI: 10.1002/eco.170.

16. Steenhuis, T.S., A.S. Collick, Z.M. Easton, E.S. Leggesse, **H.K. Bayabil**, E.D. White, S.B. Awulachew, E. Adgo, and A.A. Ahmed. (2009). Predicting discharge and erosion for the Abay (Blue Nile) with a simple model. Hydrol. Proc. 23: 3728-3737. doi: 10.1.1002/hyp.751.

BOOK CONTRIBUTIONS

1. Ghebreyesus D., M. Temimi, A. Fares, **H.K. Bayabil**. (2016). Remote sensing applications for monitoring water resources in the UAE using Lake Zakher as a water storage gauge. In A. Fares (ed.), Advances in Water Security: Emerging Issues in Groundwater Resources. Springer International Publishing, New York, USA. DOI: 10.1007/978-3-319-32008-3.

2. Engda, T.A., **H.K. Bayabil**, E.S. Legesse, E. K. Ayana, S.A. Tilahun, A.S. Collick, Z.M. Easton, A. Rimmer, S.B. Awulachew, and T.S. Steenhuis. (2011). Watershed hydrology of the (semi) humid Ethiopian Highlands. In Nile River: Hydrology, Climate and Land Use. 145-162. A. Melesse, ed., New York, NY: Springer Science.

MANUSCRIPTS SUBMITTED OR IN PREPARATION

1. **Bayabil H.K.**, A. Fares, M. Zekri, and R. Mohtar. (2017). Water Footprint of Citrus Production in the Arab World. International Journal of Water Resources Development (in review).

2. **H.K. Bayabil**, A. Fares, H. Sharif. (2017). Robustness of the Multi-Radar Multi-Sensor System in Estimating Precipitation. (in preparation)

3. Ripendra Awal, **H.K. Bayabil**, and A. Fares. (2017). Potential Impact of Climate Change on Crop Irrigation Water Requirements at the Brazos Headwaters Basin, Texas. (in preparation).

SELECTED ABSTRACTS AND CONFERENCE PROCEEDINGS

1. **Bayabil H.K.**, H. Sharif, A. Fares., R. Awal,and E. Risch.:Performance of the Multi-Radar Multi-Sensor System over the Lower Colorado River, Texas. American Geophysical Union Fall 2017 Meeting, New Orleans, LA, December 11-15, 2017

2. Ali F., Awal, R., **H.K. Bayabil.** and El Hassan, A.: Developing soil calibration equation for Sentek's new Drill & Drop™ capacitance probe, ASA, CSSA & SSSA International Annual Meeting, October 22-55, 2017, Tampa, FL (submitted).

3. **Bayabil H.K**., A. Fares, and R. Awal, A. Hassan, and K. Y.A.M. Kablan. (2016). Streamflow Prediction under Potential Climate Change Scenarios in the Lower Colorado River Basin. Associations of 1890 Research Directors (ARD) Research Symposium 2017, April 1-4, 2017, Atlanta, Georgia.

4. **Bayabil H.K**., A. Fares, and R. Awal, A. Hassan, and K. Y. A. M. Kablan. (2016). Assessing Climate Change Effects on Surface Water Resources in The Lower Basin Watershed of The Colorado River. The Geological Society of America South-Central Section - 51st Annual Meeting, March 13-17, 2017, San Antonio, TX, USA.

5. Fares A., **H.K. Bayabil**, and R. Awal. (2016). Water, Energy, and CO_2 Footprints of Citrus Production in Texas, Florida, and California under a Changing Climate. Association of 1890 Research Directors (ARD) Research Symposium 2017, April 1-4, 2017, Atlanta, Georgia.

6. El Hassan A., R. Awal, **H.K. Bayabil**, R. L. Ray, E. Risch, and A. Fares. (2016). Modeling The Effect of Landuse Change on Hydrologic Response of a Semi Urbanized Watershed Using a Physically-Based Distributed Model. The Geological Society of America South-Central Section - 51st Annual Meeting, March 13-17, 2017, San Antonio, TX, USA.

7. El Hassan A., E. Risch, R. Awal, R. L. Ray, **H.K. Bayabil**, and A. Fares. (2016). Lumped and Physically Based Model Performances in Simulating The Runoff Response from Urbanized Watershed due to Landuse Change in The Hill Country, Texas. Association of 1890 Research Directors (ARD) Research Symposium 2017, April 1-4, 2017, Atlanta, Georgia.

8. Ali S., **H.K. Bayabil**., A. Fares., and R. Awal. (2016). Current and Future Water, Energy, and CO_2 Footprints of Citrus Production in Brownsville, Texas. The 13th

Annual Texas A&M University System Pathways Student Research Symposium, Prairie View A&M University, Prairie View, TX.

9. Kablan K.Y.A. M., **H.K. Bayabil**., R. Awal., and A. Fares. (2016). Projection of Climate Extremes in the Brazos Headwaters Basin, Texas. The 13th Annual Texas A&M University System Pathways Student Research Symposium, Prairie View A&M University, Prairie View, TX.

10. James A., A. Fares, **H.K. Bayabil**, R. Awal, and Y. Cherif. (2016). Evaluation of the Electromagnetic Induction Sensor, Em38-Mk2, In Monitoring Soil Moisture. The 13th Annual Texas A&M University System Pathways Student Research Symposium, Prairie View A&M University, Prairie View, TX.

11. Fares A., **H.K. Bayabil**, M. Zekri and R. Awal. (2016). Impacts of Climate Change on Citrus Water Requirements across Major Citrus Producing Areas in the World. International Citrus Congress, Foz Do Iguaçu, PR – Brazil.

12. Ghebreyesus D., M. Temimi, A. Fares, **H.K. Bayabil**. (2016). Monitoring Water Resources from Space in an Arid Watershed of Al Ain City. EGU General Assembly Conference Abstracts, Vienna, Austria.

13. Mbia, M., R. Awal, **H.K. Bayabil**, and A. Fares. (2015). Irrigation Water Requirements for different Crops in Prairie View Texas, 12th Annual Texas A&M University System Pathways, Student Research Symposium, Texas A&M University-Corpus Christi, Corpus Christi, TX.

14. **Bayabil, H.K.,** and T. S. Steenhuis. (2015). Understanding Hillslope Hydrology for Planning Effective Landscape Interventions in the Ethiopia Highlands. Soil and Water Lab Seminar Series, Cornell University, Ithaca, NY.

15. Steenhuis Tammo, T.Y. Tebebu, G.K. Ayale, C.Guzman, **H.K. Bayabil**, A. Zegeye, M. Mogus, D. Chanie, C. Stoof, and S. A.Tilahun. (2014). Prioritizing landscape interventions in the Ethiopian highlands. EGU General Assembly, 27 April – 02 May 2014, Vienna, Austria.

16. **Bayabil, H.K.,** J.C. Lehmann, B. Yitaferu, C. Stoof, and T. S. Steenhuis. (2013). Spatial Variability of Soil Physical and Hydraulic Properties Affecting Runoff and Moisture Retention Characteristics of Tropical Soils: The Case of Anjeni Watershed in Proceedings of Science and Technology towards the Development of East Africa, Bahir Dar University Institute of Technology, Bahir Dar, Ethiopia.

17. **Bayabil, H.K.,** J.C. Lehmann, B. Yitaferu, Stoof, C. and Steenhuis, T.S. Hydraulic properties of clay soils as affected by biochar and charcoal amendments. In: Wolde Mekuria. (ed). (2013). Rainwater management for resilient livelihoods in Ethiopia: Proceedings of the Nile Basin Development Challenge Science Meeting, Addis

Ababa, NBDC Technical Report, International Livestock Research Institute, Nairobi, Kenya.

18. Steenhuis, T.S., S.A. Tilahun, C. MacAlister, E.K. Ayana, T.Y. Tebebu1, **H.K. Bayabil1**, A.D. Zegeye, A.W. Worqlul. 2012. Scaling-up watershed discharge and sediment concentrations to regional scale: The Blue Nile Basin. AGU Fall Meeting, San Francisco, 3-7 December 2012.

19. Steenhuis, T.S., **H.K. Bayabil**, T. Ashagrie, E. Sime, B. Brook, A.S. Collick, S.B. Awulachew, Y.G. Selassie, A. Ahmed, and Z.M. Easton. (2009). Modeling Discharge Erosion and Sedimentation in the Upper Blue Nile. International water management institute (IWMI) upstream-downstream workshop, Addis Ababa, Ethiopia.

SELECTED PRESENTATIONS

1. Streamflow Prediction under Potential Climate Change Scenarios in the Lower Colorado River Basin. Associations of 1890 Research Directors (ARD) Research Symposium 2017, April 1-4, 2017, Atlanta, Georgia.

2. Assessing Climate Change Effects on Surface Water Resources in The Lower Basin Watershed of The Colorado River. The Geological Society of America South-Central Section - 51st Annual Meeting, March 13-17, 2017, San Antonio, TX, USA.

3. Water, Energy, and CO_2 Footprints of Citrus Production in Texas, Florida, and California under a Changing Climate. Association of 1890 Research Directors (ARD) Research Symposium 2017, April 1-4, 2017, Atlanta, Georgia

4. Irrigation Water Requirements for different Crops in Prairie View Texas, 12th Annual Texas A&M University System Pathways Student Research Symposium, Texas A&M University-Corpus Christi, October 22-23, 2015, Corpus Christi, TX.

5. Hillslope erosion processes and scaling issues in the Ethiopian highlands, 7th Annual Biological and Environmental Engineering Research Symposium, February 6, 2015, Cornell University, Ithaca New York.

6. Can Charcoal Improve Green Water Use in Ethiopia? World Food Prize Symposium, October 15-17, 2014, Des Moines, IA USA.

7. Modeling rainfall and runoff relationships at Maybar watershed. International Water Management Institute (IWMI) Upstream Downstream Workshop, February 5-6, 2009. Addis Ababa, Ethiopia.

PROFESSIONAL EXPERIENCE

2015–present Postdoctoral Fellow. Prairie View A&M University, Prairie View, TX.
Watershed Hydrology.

Supervisor: Dr. Ali Fares.

2014 Teaching Assistant. Cornell University, Ithaca NY.
Mentor: Dr. Tammo Steenhuis.

2010–2015 Graduate Research Assistant, Cornell University, Ithaca NY.
Mentor: Dr. Tammo Steenhuis.

2009–2010 Irrigated Agriculture Advisor, Canadian International Development Agency (CIDA), Ethiopia.
Supervisor: Dr. Selamyihun Kidanu.

2004–2007 Plantation Section Manager, Finchaa Sugar Factory, Ethiopia.
Supervisor: Mr. Abrham Negash.

TEACHING EXPERIENCE

Research Mentor

2015–present Provided training and supervision to two graduate (M.S.) students, CARC, Prairie View A&M University, Prairie View, Texas.

2015–present Provided training to six undergraduate students, CARC, Prairie View A&M University, Prairie View, Texas. One of the undergraduate students, Michelle Mbia won 1st place for the best student poster presentation at 12th Annual Texas A&M University System Pathways Student Research Symposium, Texas A&M University-Corpus Christi, October 22-23, 2015, Corpus Christi, Texas.

2015 Provided guest lecture and hands-on training on Identifying Ideal Site for New Wastewater Treatment Plant in Harris County to six students in the class *"Fundamentals of Agricultural Engineering: AGEG 1413*", Prairie View A&M University, Prairie View, Texas.

Teaching and Invited Lecturer

2015 Guest lectured **"**Quantifying components of the hydrologic cycle and interpretation of results", guest lecture to the class "Fundamentals of Agricultural Engineering: AGEG 1413", Prairie View A&M University, Prairie View, Texas.

2013 Taught **"**Statistical data analysis techniques using R", Bahir Dar University, Bahir Dar, Ethiopia.

2013 Co-taught "Advanced research methods", Bahir Dar University, Bahir Dar, Ethiopia.

Teaching Assistant

2014 Water Measurement and Analysis Methods (BEE 4270), Cornell University, Ithaca, New York.

RESEARCH EXPERIENCE

2015– Post-Doctoral Research: Prairie View A&M University Prairie View, Texas.

- Crop irrigation requirement, water resource management, watershed hydrology, and soil moisture sensing.
- Application of Unmanned Aerial Vehicles (e.g., drones) for smart agriculture and natural resource management.
- Climate change impacts on water resources, extreme climate events, and crop irrigation requirements.
- Downscaling of Global Circulation Model (GCM) outputs

2010–2015 Doctoral Research, Cornell University, Ithaca New York.

- Modeling spatial and temporal hillslope runoff and erosion processes
- Effect of biochar-charcoal and deep-rooted biofuel crops on soil hydraulic properties and rainfall-erosion processes of degraded soils.
- Greenhouse gas emission from biochar and charcoal amended agricultural fields in sub-humid climates.

2008–2009 Masters Research, Cornell University, Ithaca, New York.

- Modeling rainfall-runoff relationship and assessing impacts of soil and water conservation interventions on soil physical and chemical properties in the Ethiopian highlands.

EXTENSION AND OUTREACH SERVICES

2017 Hands-on demonstration of different irrigation system and the linkages between Water, Food, and Energy, July 18, 2017, Youth Leadership Laboratory, Cho-Yeh Camp & Conference Center, Livingston, Texas.

2017 **H**ands-on demonstrations on water quality and contaminant transport in a watershed for high school juniors and seniors, Research Extension Apprentice Program (REAP), June 7-9, 2017, Prairie View A&M University, Prairie View, Texas.

2016 Hands-on demonstrations on water quality and contaminant transport in a watershed for high school juniors and seniors, Research Extension Apprentice Program (REAP), June 5-17, 2016, Prairie View A&M University, Prairie View, Texas.

2014 Hands-on training to the New York State's Department of Environmental Conservation (DEC) staffs on pesticide leaching processes along the soil profile using the LEACHP model, August 19-20, Albany, New York.

2009-2010 Provided technical support on irrigation efficiencies and cropping sequencing to farmers by organizing field days and demonstration site visits, Kobo, Ethiopia.

CONFERENCE SESSIONS CO-ORGANIZED

2017 Smart Agriculture: Drones, Robotics, and Other Technologies, Associations Of 1890 Research Directors (Ard) Research Symposium 2017, April 1-4, 2017, Atlanta, Georgia.

TRAININGS AND WORKSHOPS

2017 Sensor Network Bootcamp in an Urban Environment, University of Michigan, Ann Arbor, MI.

2017 Beginners and Advanced Soil and Water Assessment Tool (SWAT) Workshop, Texas A&M University, College Station, Texas.

2016 Operation of Unmanned Aerial Vehicles: Assimilation of Drone Parts, Pre-Flight Checking, Flight Mission Planning, Flying, and Data Extraction for Analysis, Monarch Inc., Ridgecrest, California.

2016 Field installation and calibration of capacitance sensors, Prairie View A&M University, Prairie View, Texas.

2015 Statistical Downscaling of Global Climate Models using SDSM 5.2, Smithsonian-Mason School of Conservation, Front Royal, Virginia.

2015 Operation of Ground Penetration Radar, Prairie View A&M University, Prairie View, Texas.

PROFESSIONAL SERVICES

2016–present Associate Technical Editor of the Journal of Sustainable Watershed Science and Management.

2015–present Reviewer of several journals (e.g., Vadose Zone, HESS, J. Hydrology).

2017 Session Moderator, 1890 ARD Research Symposium 2017, April 1-4, Atlanta, Georgia.

2017 Panelist for the Agricultural Research Service (ARS) Office of Scientific Quality Review (OSQR) that evaluates the scientific quality of the National Program (NP) 211 Water Availability and Watershed

Management panel subtitled NP 211 Panel 6. Computational Tool Development (2016).

2017 Served as an internal reviewer for Abstracts submitted by the College of Agriculture and Human Sciences' Scientists and students at Prairie View A&M University for the 1890 ARD Symposium, April 1-4, 2017.

2016 Served as a judge in the 13th Annual Texas A&M University System Pathways Student Research Symposium, Prairie View A&M University, Prairie View, TX.

SCIENTIFIC SOCIETIES

- American Geophysical Union (AGU)
- Soil Science Society of America (SSSA)
- American Society of Agronomy (ASA)
- Crop Science Society of America (CSSA)
- Alpha Epsilon: Honor Society of Agricultural, Food, and Biological Engineering