

Summarized Information of Institute of Climate and Society (ICS) Activities

Institute of Climate and Society (ICS) strives to enhance society's capability to understand, anticipate, and manage the impacts of climate, in order to improve human welfare and the environment through research, long and short-term trainings at different levels, and dissemination of best practices to influence policy.

Climate and society is a cross-cutting issues and demands multi-disciplinary expertise. Thus, ICS is a hub consists of relevant staff from various colleges and institute in MU. The Institute has senior and young professional researchers at PhD and MSc level with diversified knowledge's and skills in area of climate, environment, hydrology, agriculture, livestock, land management, modeling, legal issues, and economics in relation with climate issues. Currently, ICS has 13 PhD and 8 MSc professionals in the area of climate issues engaged in teaching and research, and 14 PhD candidates on study leave from various departments of MU. Besides, the institute has also an opportunity of bringing (inter)national professionals through its network, such as Open Society foundation (OSF)- Africa Climate Change Adaptation Initiative (ACCAI I & II), AU/EU Intra-ACP/Intra-Africa Academic Mobility Scheme Africa, Transdisciplinary Training for Resource Efficiency and Climate Change Adaptation in Africa (TreccAfrica I & II), Columbia University (CCB), Colorado University (IRI), Agricultural Transformation Agency (ATA), Ethiopian Institute of Agricultural Research (EIAR), CASCAPes Project-Ethiopia, Tigray Science and Technology.

Some of the activities related to research, education and outreach are as follows:

1) Research

ICS has been working to be a forefront and centre of excellence in research on climate and climate applications in Ethiopia and Africa drawing on the superb educational and research facilities in order to generate leading, policy-relevant research on climate change and its effects on the environment. The ongoing research focused on:

- a) **Climate and water:** impact of climate change and variability on stream flow, sediment yield (soil erosion & reservoir sedimentation), irrigation schemes (such as spate irrigation, sprinkler, furrow) using various climate and hydrological models
- b) **Climate and agriculture:** impact of Climate Change and variability on different crop types (including sowing date, growth and yield) using various climate and crop models. It also works on drought and vegetation monitoring using high temporal resolution satellite images
- c) **Climate and livestock:** impact of Climate Change and variability on livestock feed, vector spread and animal health
- d) **Climate and human health:** Impact of climate change and variability on the spread of vectors and human health

e) **Climate policy, finance and economics:** related to crop and livestock insurance, Households 'or peoples willingness to pay for Climate Change Mitigation, and climate change trend with livelihood change of the society

2) Education

The ICS offers M.Sc. degree in Climate and Society with two specializations: M.Sc. degree in Climate and Society specialization in applied Climate Science and Climate Affairs and different short courses for students from Ethiopia and other African countries such as Uganda, Tanzania, Ghana, Nigeria, Liberia, Malawi, South Africa. It also hosts national and international PhD and MSc exchange students from partner Universities

3) Community Services

ICS offers short-term training to academicians, professionals and decision makers. ICS together with its partners organizes national and international workshop related with climate issues to share experiences on best practices and to take lessons from different peoples and countries.

External granted Project

No.	Project Title	Participants	Current Status
1	Evaluation of the impact of land degradation on reservoir sedimentation of Tekeze hydro-power dam in the northern Ethiopian highlands	Dr. Amanuel Z(LaRMEP),Prof. Miteku H Prof. KindayaG,Dr. Girmay G, Dr. Kassa T,& Prof. Jean P(KU Leuven)	On going
2	Integrated geographical research for sustainable land management in the closed basins along the Rift Valley in Northern Ethiopia, project with Ghent and KU Leuven Universities	Dr. Amanuel Z (leader), Dr. Tesfalem G(Geography and Environmental Science)(Member), &Prof. Jan N (Ghent University)(Member)	On going
3	Capacity Building towards Climate Resilient Food Systems in the Drylands of North and North eastern Ethiopia	Dr. Amanuel Z(leader), Dr. Girmay G(Member),Dr. Derge A(Member), &	On going

		Dr. Haftamu T(Member)	
4	Co-producing knowledge on food systems for development in Africa in collaboration University of Ghana, University of Dare-Salaam (Tanzania), Stellenbosch University (South Africa), University of Nsuka (Nigeria) and University of Witwatersrand (South Africa)	Dr. Amanuel Z(Leader), Dr. Girmay,G(Member)&Dr. Derge A(Member)	On going
5	Developing a Climate Affairs Program for Capacity Building of Mekelle University in Climate Change Adaptation, Ethiopia.	Dr. Amanuel Z (Leader),Dr. Girmay G(Member), Dr. Haftamu T(Member) Dr. Derge A (Member),&Dr. Araya A(Member)	Completed

Research done by Institution of Climate and Society (ICS)

No.	Research Title	Current Status
1	EskinderGidey, Dikinya,O., Sebego,R., Segosebe, E., AmanuelZenebe , 2017. Cellular automata and Markov Chain (CA_Markov) model-based predictions of future land use and land cover scenarios (2015–2033) in Raya, northern Ethiopia, J. Model. Earth Syst. Environ. DOI 10.1007/s40808-017-0397-6	Published
2	FlorentNoulekoun, EmiruBirhane, Stella Chude, AmanuelZenebe, 2017. Characterization of Faidherbiaalbida (Del.) A. Chev. Population in agroforestry parklands in the highlands of Northern Ethiopia: impact of conservation, environmental factors and human disturbances. Agrofor. Syst. 2017, 91, 123-135.	Published

3	EmiruBirhane, Fatumah,N., KidaneGidey, AmanuelZenebe , Mohammed, S., 2017. Vegetation cover density and disturbance affected arbuscular mycorrhiza fungi spore density and root colonization in a dry Afromontane forest, northern Ethiopia, J. Res. DOI 10.1007/s11676-017-0493-5	Published
4	EskinderGidey, Dikinya,O., Sebego,R., Segosebe, E., AmanuelZenebe , 2017. Modeling the Spatio-temporal dynamics and evolution of land use and land cover (1984–2015) using remote sensing and GIS in Raya, Northern Ethiopia, J. Model. Earth Syst. Environ. DOI 10.1007/s40808-017-0375-z	Published
5	TadesseMucheYe, BirruYitaferu, AmanuelZenebe , 2017. Significance of wetlands for sediment and nutrient reduction in Lake Tana Sub-Basin, Upper Blue Nile Basin, Ethiopia, J Sustain. Water Resour. Manag. DOI 10.1007/s40899-017-0140-5	Published
6	HailemariamMeaza, Frankl, A., Poesen, J., AmanuelZenebe , Deckers, J., Vaneetvelde, V., BiadgilgnDemissie, TesfaalemGhebreyohannes, Nyssen, J., 2017. Natural resource opportunities and challenges for rural development in marginal grabens – The state of the art with implications for the Rift Valley system in Ethiopia. Journal of Arid Environments, 147: 1-16. DOI 10.1016/j.jaridenvi.2017.08.003	Published
7	Nyssen, J., BirhanuBiruk, ZbeloTefamariam, Frankl, A., BiadgilgnDemissie, TesfaalemGhebreyohannes, HailemariamMeaza, Poesen, J., Van Eetvelde, V., AmanuelZenebe , Deckers, J., Mitiku Haile, 2017. Geographical determinants of inorganic fertiliser sales and of resale prices in north Ethiopia. Agriculture, Ecosystems and Environment, 249: 256-268. IF (4.099)	Published
8	For those of you who are into statistics. The journal has an Impact Factor of 4.099.Gebremedhin, M.A., Abraha, A.Z. &Fenta, A.A., 2017. Changes in future climate indices using Statistical Downscaling Model in the upper Baro basin of Ethiopia TheorAppl Climatol.doi:10.1007/s00704-017-2151-4	Published
9	Berihu,T., Girmay,G., Sebhatleab, M., Berhane, E., Zenebe, A. &Sigua, G.C., 2017. Soil carbon and nitrogen losses following deforestation in Ethiopia, J Agron. Sustain. Dev.: 37(1): 1-12. DOI 10.1007/s13593-016-0408-4.	Published
10	Guyassa, E., Frankl, A., Zenebe, A. , Poesen, J., Nyssen, J., 2017. Effects of check dams on runoff characteristics along gully reaches, the case of Northern Ethiopia Journal of Hydrology 545:299–309. DOI:10.1016/j.jhydrol.2016.12.019.	Published
11	Chiemela, S.N., Noulekoun, F., Zenebe, A. , Abadi, N., Birhane, E., 2017. Transformation of degraded farmlands to agroforestry in Zongi Village, Ethiopia, Agroforest Syst. 1-12.DOI: 10.1007/s10457-017-0076-7.	Published

12	Zekarias, A., Taddele, H., Zenebe, A. 2017. Influence of Climate Variables on Vector and Prevalence of Bovine Trypanosomosis in Tselemti District, North West Tigray, Ethiopia. In: Walter Leal Filho, W.L., Belay,S., Kalangu, J., Menas, W., Munishi, P., Musiyiwa, K., (ed.), Climate Change Adaptation in Africa. Dordrecht, Springer: 303-32. ISBN 978-3-319-49520-0. DOI: 10.1007/978-3-319-49520-0_19. (Book chapter)	Published
13	Henok, S., (2015), Characterizing Climate for Agricultural Production and Best Sowing Dates to Minimize Crop Failure: The Case of Kelte-Awelalo Woreda, Tigray, Northern Ethiopia Int.J. of Multidisciplinary and Current research, Vol.3(May/June 2015).	Published
14	Bezabh, T., Tadesse, T., Shiferaw, H., & Gebremedhin, A. (2015). Role of Rural Institutions in Determining Farmers Adaptation to Climate Change: The case of Kilte-Awlaelo District, Northern Ethiopia. International Journal of Multidisciplinary and Current Research, 3, 479-85, ISSN: 2321-3124.	Published
15	Gebremedhin, A., Shiferaw, H., Zenebe, A., Gebresamuel, G., Habtu, S., Gebretsadkan, T. 2017. Impact of climate change on net irrigation water requirements of major crops in the semiarid regions of Northern Ethiopia. Published in book of Abstract of annual research review day of Mekelle University.	Book of abstract
16	Shiferaw, H, Gebremedhin, A., Taye, G., Solomon N., Zenebe A., and Gebresamuel G., 2017. Spatial variability of soil moisture and carbon stocks as influenced by soil and water conservation structures and land use types in Tigray, N. Ethiopia. Published in book of Abstract of annual research review day of Mekelle University	Book of abstract
17	Haftu A., Haftom H., Emiru B., Amanuel Z., and Ashenafi M., 2017 Predicting suitable habitats of threatened and endangered Juniperus procera tree under climate change in Northern Ethiopia	Book of abstract
18	Haftu A., Haftom H., Emiru B., Mewcha A., Meseret H., Hailemariam G., Girma M., and Amanuel Z. Modeling the influence of climatic change on current and future malaria expansion in Northern Ethiopia	Book of abstract
19	Haftu A., Emiru B., Amanuel Z., Atkilt G., Haftom H., Ermias A., and Arya A. Modeling the impacts of climate change and cochineal (Dactylopius coccus) invasion on the future distribution of Cactus (Opuntia ficus-indica) in Northern Ethiopia	Book of abstract
20	Modelling the Cochineal (Dactylopius coccus) and Climate change induced factors on the future distribution of Cactus (Opuntia ficus-indica) in Northern Ethiopia	Under review
21	Modelling the influence of climatic change on current and future malaria expansion in Northern Ethiopia	Under review

22	Predicting Suitable Habitat for Threatened and Endangered Juniperusprocera tree in Tigray Region, Northern Ethiopia	Under review
23	Emnet, N., Girmay, G., Amanuel, Z. 2017. Climate and Land-cover Change in Dryland Catchments, and their Effect on Spate-hydrology of Farming Community in the lowlands of Raya-valley, Ethiopia	Manuscript development