



K.Trautman/CAAFS



CAAFS site atlas

Albertine Rift / Hoima Uganda

CGIAR Research Program on Climate Change, Agriculture and Food Security (CAAFS)

Site Atlas

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Titles in this series aim to disseminate interim climate change, agriculture and food security research and practices and stimulate feedback from the scientific community.

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Introduction

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) seeks to promote a food-secure world through the provision of science-based efforts that support sustainable agriculture and enhance livelihoods while adapting to climate change and conserving natural resources and environmental services.

Climate change is an unprecedented threat to the food security of hundreds of millions of people who depend on small-scale agriculture for their livelihoods. Climate change affects agriculture and food security, and likewise, agriculture and natural resource management affect the climate system.

CCAFS has initially focused on three regions; East Africa (EA), West Africa (WA) and South Asia (SA) to carry out its research. The 15 CCAFS sites in these areas represent areas that are becoming both drier and wetter, and are focal locations that will generate results that can be applied and adapted to other regions worldwide. In this year, 2013, CCAFS is expanding its portfolio to additional sites in Latin America and South-East Asia.

These sites serve as the initial focus of CCAFS partnership-building and long-term research activities falling within the following CCAFS Research Themes; Adaptation to Progressive Climate Change, Adaptation through Managing Climate Risk, Pro-Poor Climate Change Mitigation and Integration for Decision Making. At all 15 CCAFS sites, baseline surveys have been conducted, including three levels of data collection and analysis at household, village and organizational levels (see: <http://ccaafs.cgiar.org/resources/baseline-surveys>).

More information on CCAFS work in all the three regions can be accessed at www.ccaafs.cgiar.org

To better understand the CCAFS sites' characteristics, a list of geospatial indicators for climate variability, bio-physical characteristics and socio-economic variables have been mapped into site atlases.

This Atlas was developed for the CCAFS site at Albertine Rift / Hoima in Uganda, in East Africa Region.

CCAFS Sites: East Africa



- Ethiopia: Borana (ET01)
- Kenya: Nyando (KE01)
- Kenya: Makueni (KE02)
- Uganda: Albertine Rift (UG01)
- Uganda: Kagera Basin (UG02)
- Tanzania: Usambara (TZ01)

CCAFS Country Sites

Citation: GeoMapa (2013a)

Topography Albertine Rift

CCAFS Site UG01, Albertine Rift / Hoima, Uganda

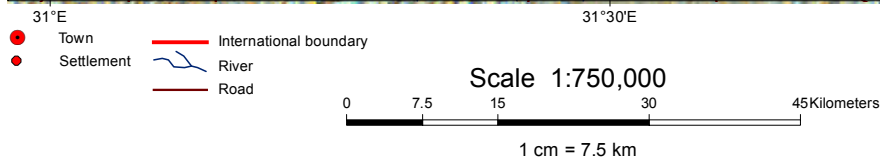


Coordinates of the CCAFS Baseline Sampling frame

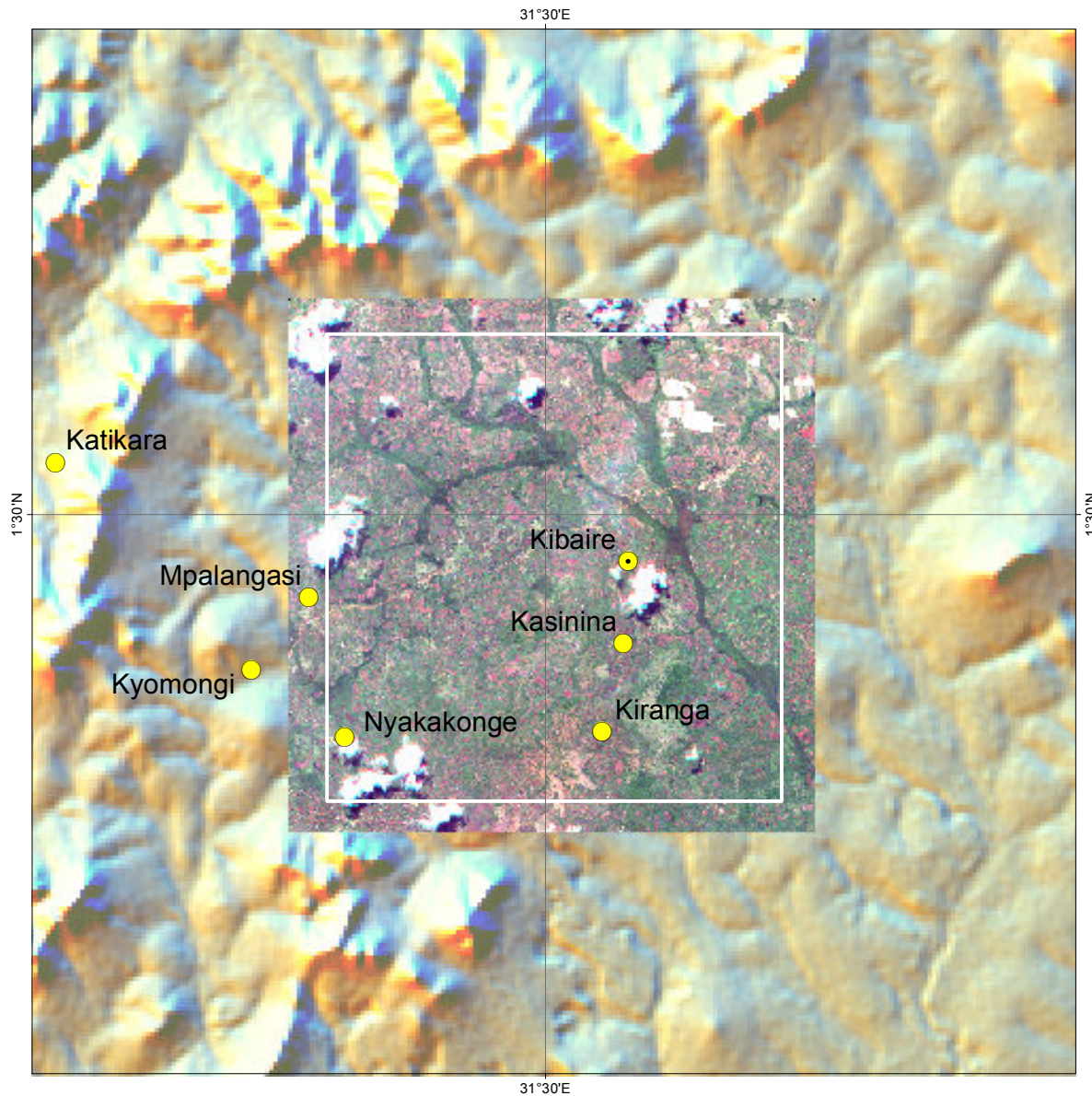
31.546E 1.445N
 31.546E 1.535N
 31.457E 1.535N
 31.457E 1.445N



Sampling frame size: 10km x 10km



Satellite Image Hoima



RapidEye imagery from 18-04-2011
at 5m ground resolution

HBS= Household Baseline
Survey

VBS= Village Baseline
Survey

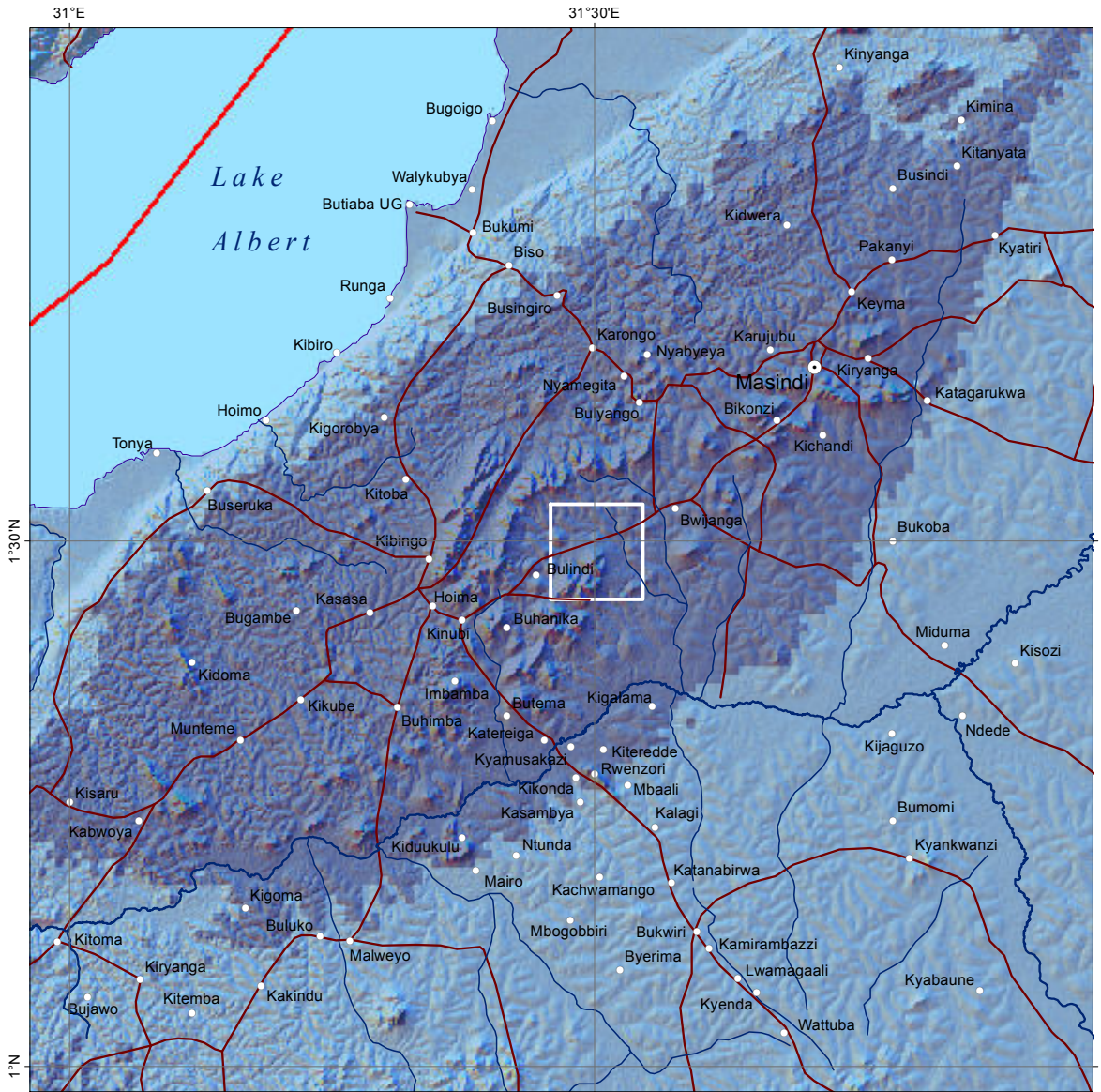
OBS= Organizational Baseline
Survey

- CCAFS VBS/OBS village
- CCAFS HBS village



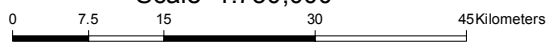
CCAFS Baseline
Sampling Frame

Annual Rainfall

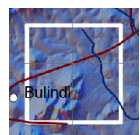


- Town
- Settlement
- International boundary
- River
- Road

Scale 1:750,000

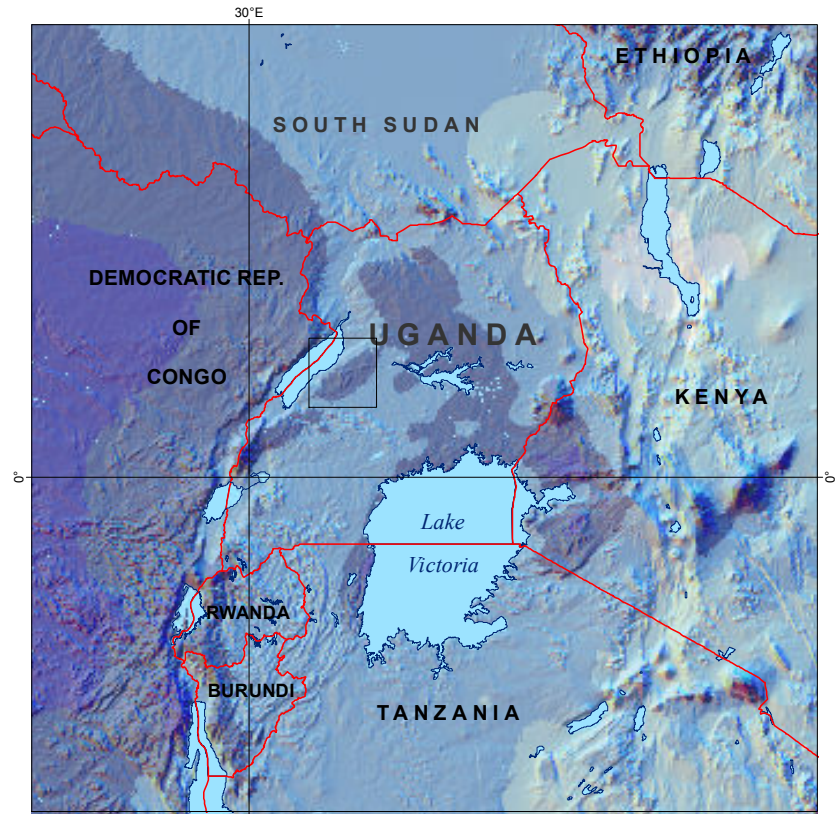


1 cm = 7.5 km



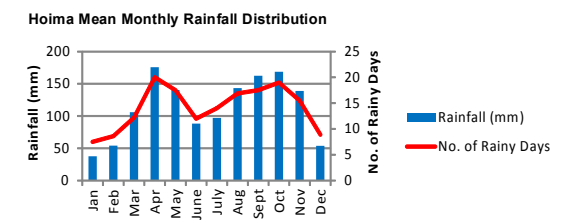
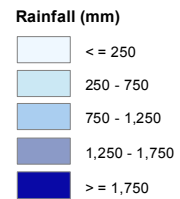
Hoima CCAFS sampling frame

Annual Rainfall data of current interpolations of observed data, representative of 1950 - 2000



Scale 1:12,500,000

— International boundary
 □ Corresponds to the map on the left

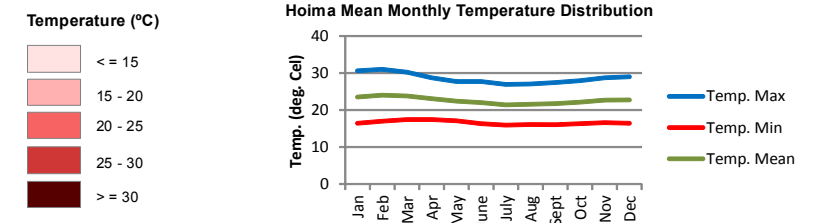
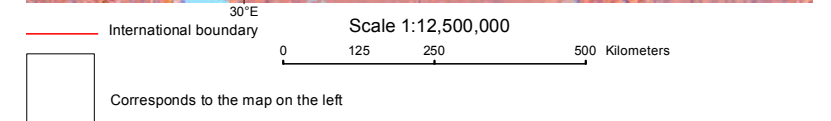
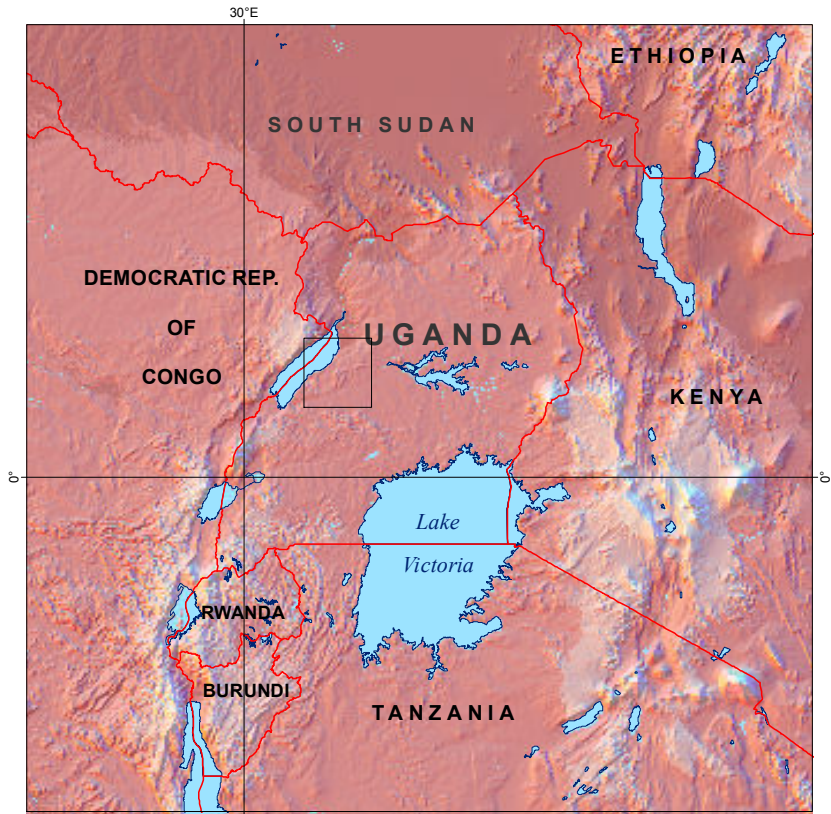
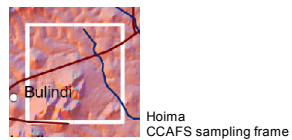
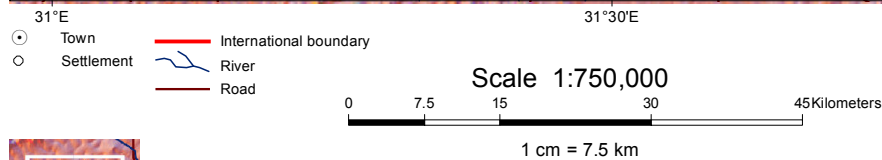


Citation:

Citation: Jones et al (2002)

Citation: Hijmans et al (2005)

Annual Temperature



Citation: Jones et al (2002)

Annual Temperature represents annual temperature data of current interpolations of observed data, averaged for 1950 - 2000

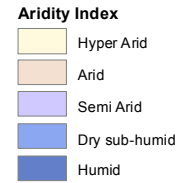
Citation: Hijmans et al (2005)

Aridity Index



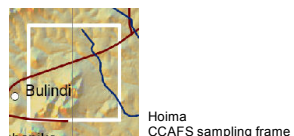
International boundary

Corresponds to the map on the left



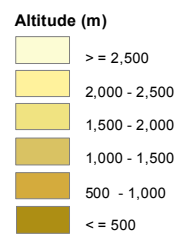
Aridity Index indicates the level of dryness, taking evapotranspiration into account, at a given location of known rainfall

Altitude



International boundary

Corresponds to the map on the left



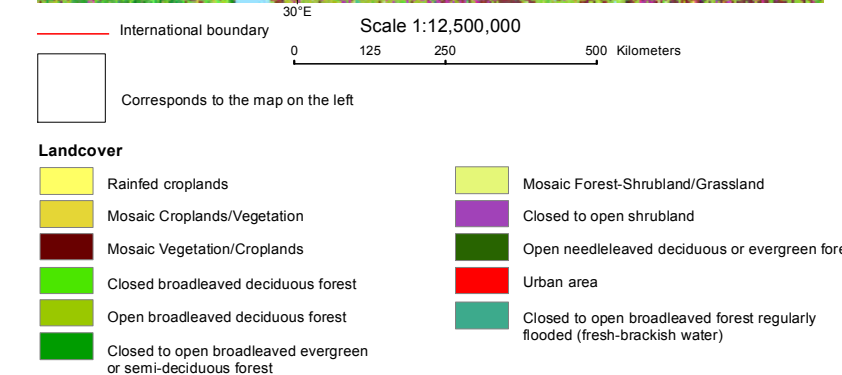
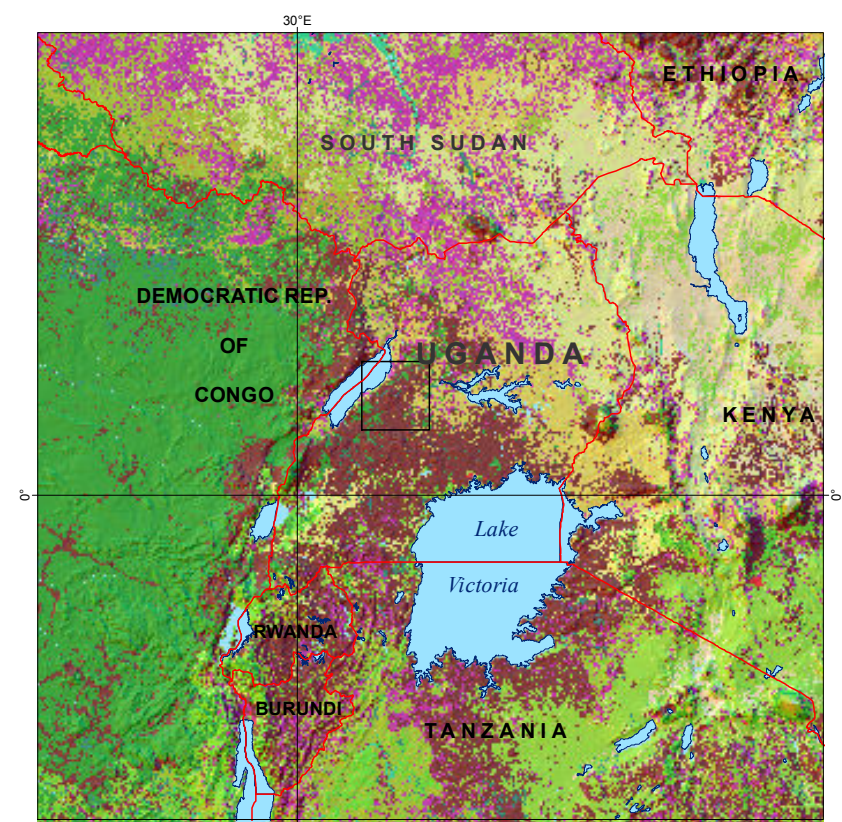
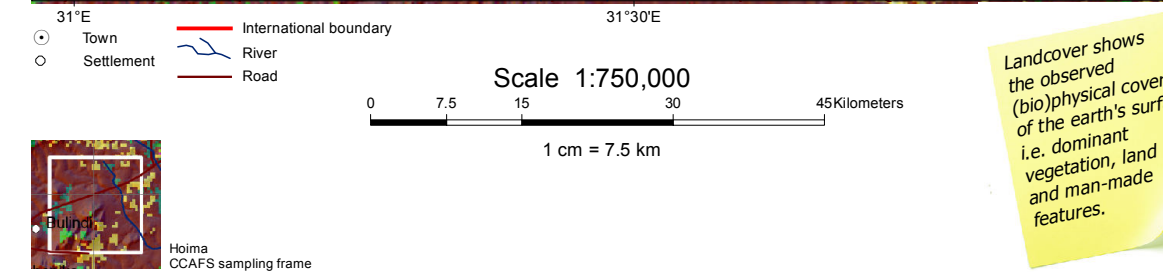
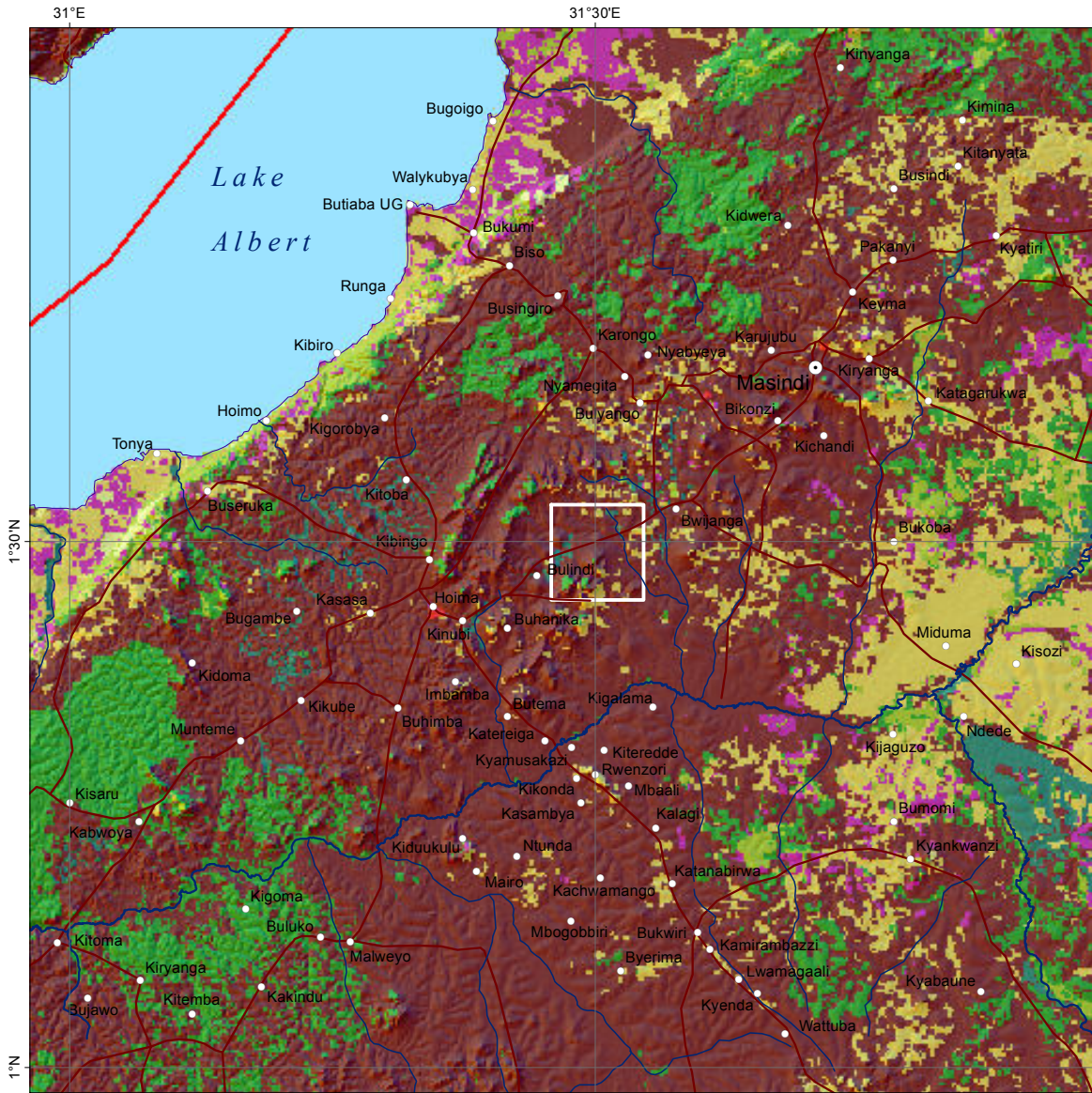
Altitude indicates the height above sea level in meters

Citation: Jarvis et al (2008)

Agro-Ecological Zones

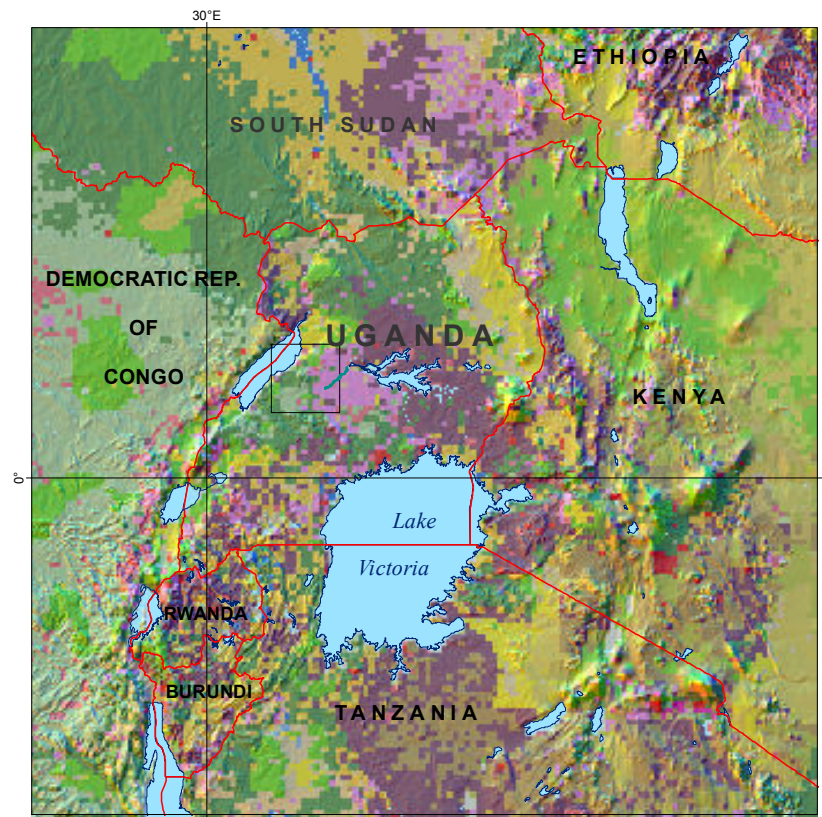
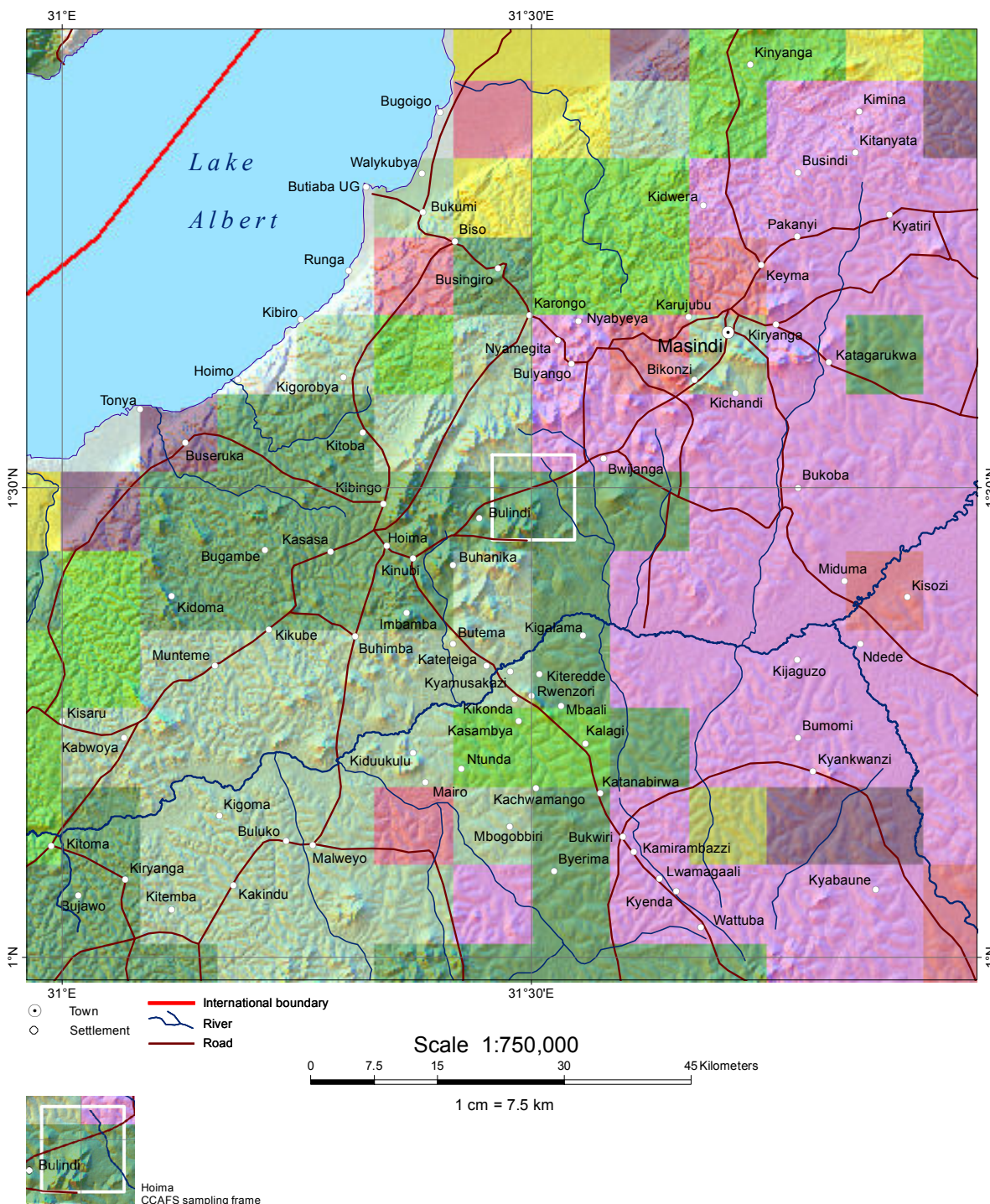


Agro-Ecological Zones indicate the division of land areas that have similar characteristics related to land suitability, potential agricultural production and environmental impact.



Landcover shows the observed (bio)physical cover of the earth's surface, i.e. dominant vegetation, land use and man-made features.

Citation: Arino et al (2009)



— International boundary

□ Corresponds to the map on the left

- Landuse**
- Forest protected
 - Forest with moderate or higher livestock density
 - Forest with agricultural activities
 - Grasslands moderate livestock density
 - Rainfed crops Subsistence/Commercial
 - Crops and moderate intensive livestock density
 - Crops and high livestock density
 - Agriculture protected

* Legend corresponds to left map

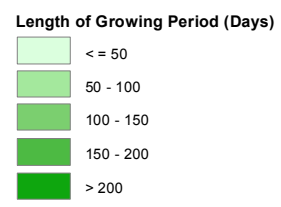
Landuse is a description of how people utilize the land. It involves socio-economic activity, i.e. the management and modification of the natural environment into built environment, such as agricultural fields and settlements. At any place, there may be multiple land uses, the dominant one is presented here.

Length of Growing Period 2000



Scale 1:12,500,000
0 125 250 500 Kilometers

Legend:
 — International boundary
 □ Corresponds to the map on the left



The Length of Growing Period (LGP) is defined as the number of days in a year during which there is available rainfed soil moisture supply for plant growth.

Citation: Thornton et al (2006)

Length of Growing Period 2030

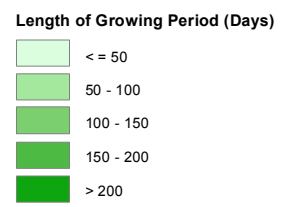


Scale 1:12,500,000

0 125 250 500 Kilometers

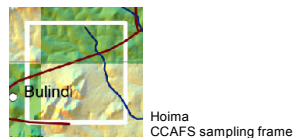
— International boundary

□ Corresponds to the map on the left



The Length of Growing Period (LGP) is defined as the number of days in a year during which there is available rainfed soil moisture supply for plant growth; here modeled for 2030.

Livestock Production Systems



— International boundary

□ Corresponds to the map on the left

Mixed Rainfed

- Light Green: Arid / Semi-arid
- Medium Green: Humid / sub-humid
- Dark Green: Temperate / highland

Mixed Irrigated

- Light Blue: Arid / semi-arid
- Blue: Humid / sub-humid
- Dark Blue: Temperate / highland

Livestock only

- Light Yellow: Arid / semi-arid
- Yellow-Green: Temperate / high
- Dark Yellow-Green: Closed to open

- Red: Urban area
- Grey: Other

Livestock Production Systems as part of agricultural systems take agro-climatic conditions into account and are classified in terms of feed and livestock resources; livestock commodities produced; production technology; product use and livestock functions; area covered; geographic locations; and human populations supported.

Livelihood Zones



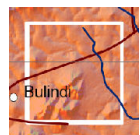
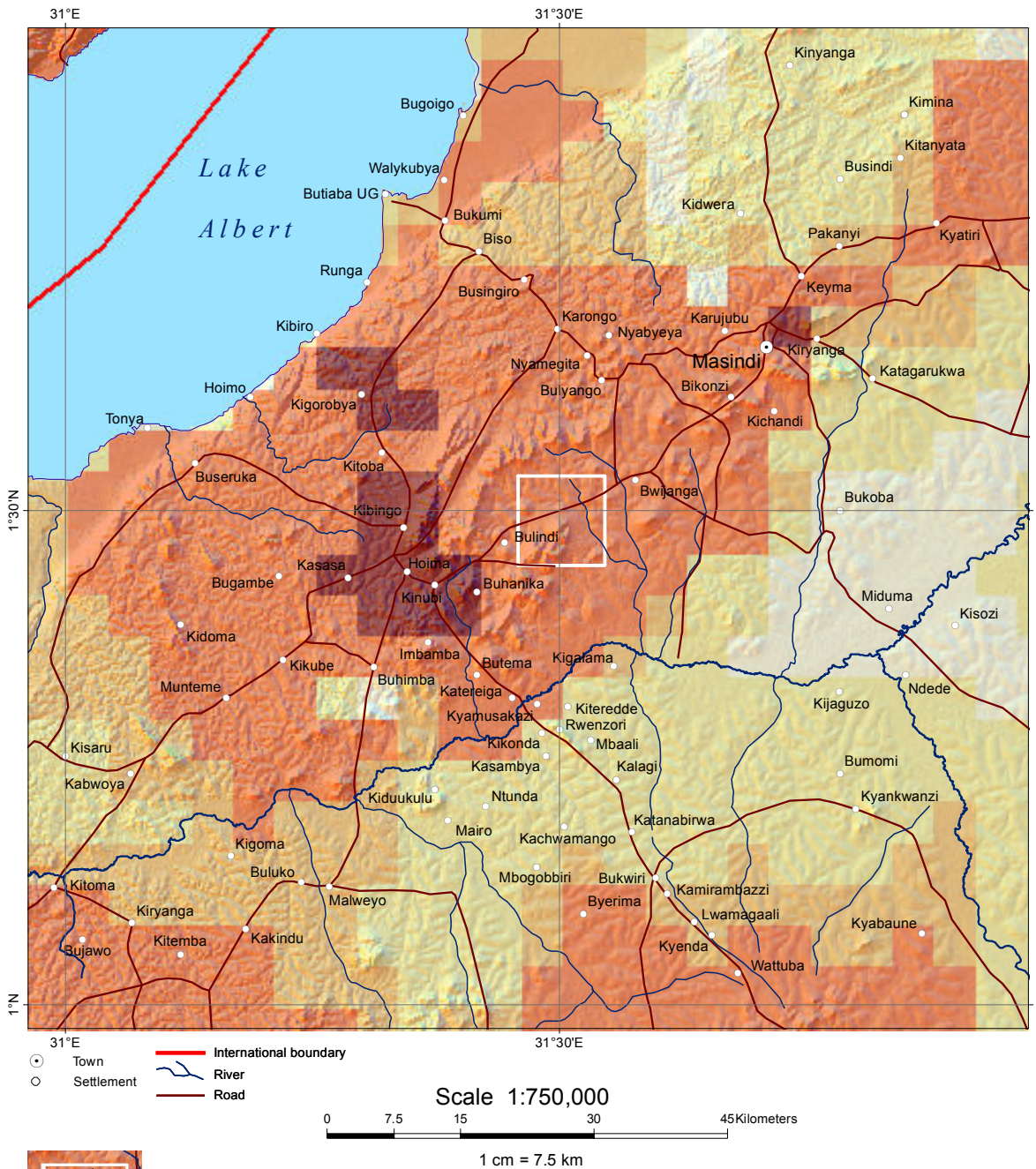
— International boundary
 □ Corresponds to the map on the left

- Livelihood Zones ***
- Albertine Escarpment Cotton Cassava Zone
 - Albertine West Nile Lowland Cattle Zone
 - Bwijanga Pakanyi Sugarcane Maize Cassava Zone
 - Central and Southern Cattle Cassava Maize Zone
 - Kafu Muzizi Maize Upland Rice Cassava Zone
 - Karuma Masindi Oyam Tobacco Maize Cassava Zone
 - Lakeshore and Riverbank Fishing Zone
 - National Park
 - Urban Area
 - Midwest Central and Lake Victoria Crescent Robusta Coffee Banana Maize and Cattle Zone

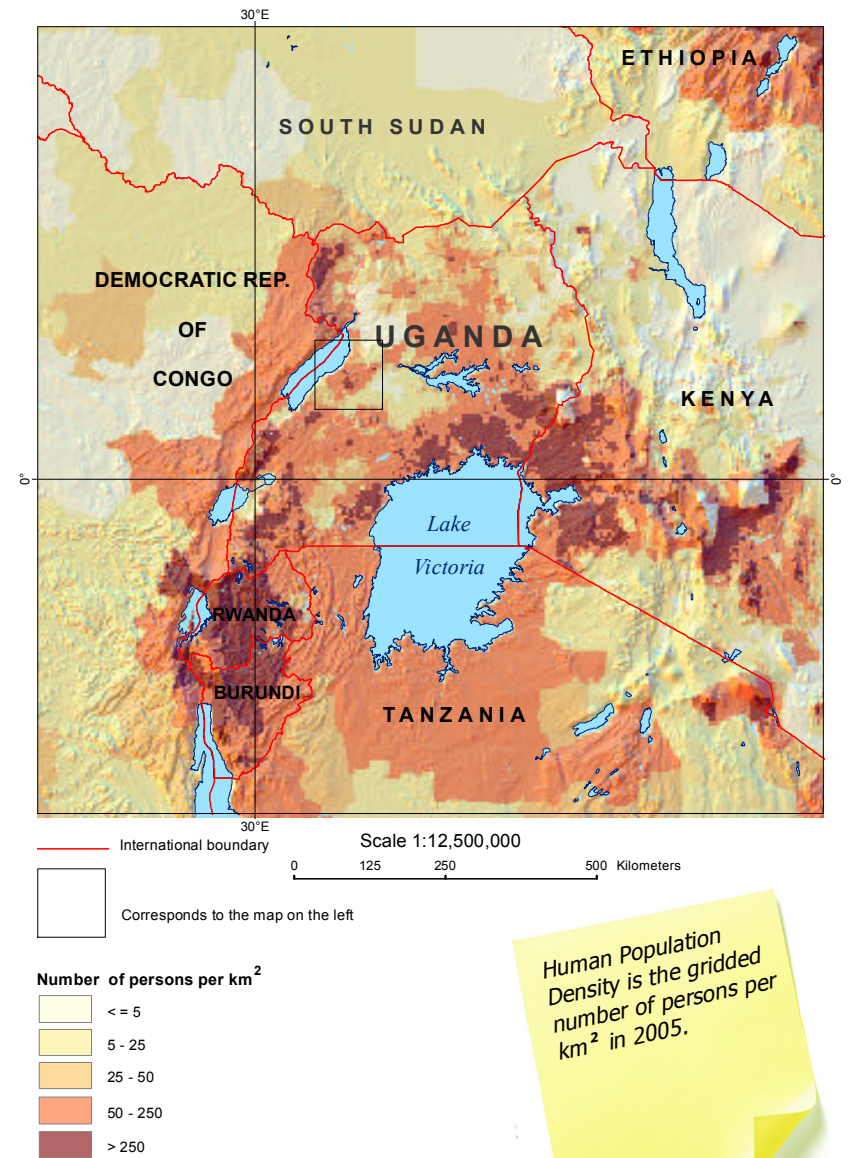
Livelihoods are complex and shaped by a variety of factors. These livelihood zone maps delineate geographic areas within which people broadly share the same livelihood patterns including access to food, income, and markets.

* Legend corresponds to left map

Human Population Density

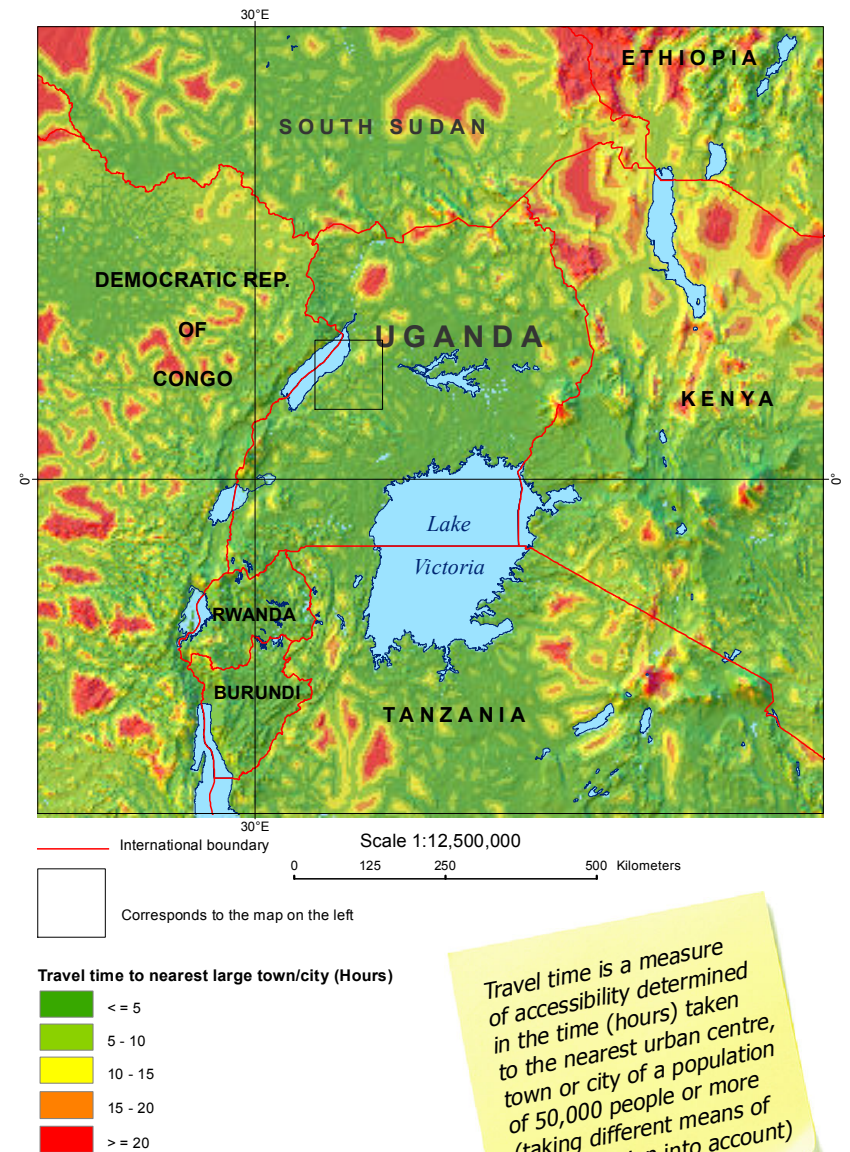


Hoima CCAFS sampling frame



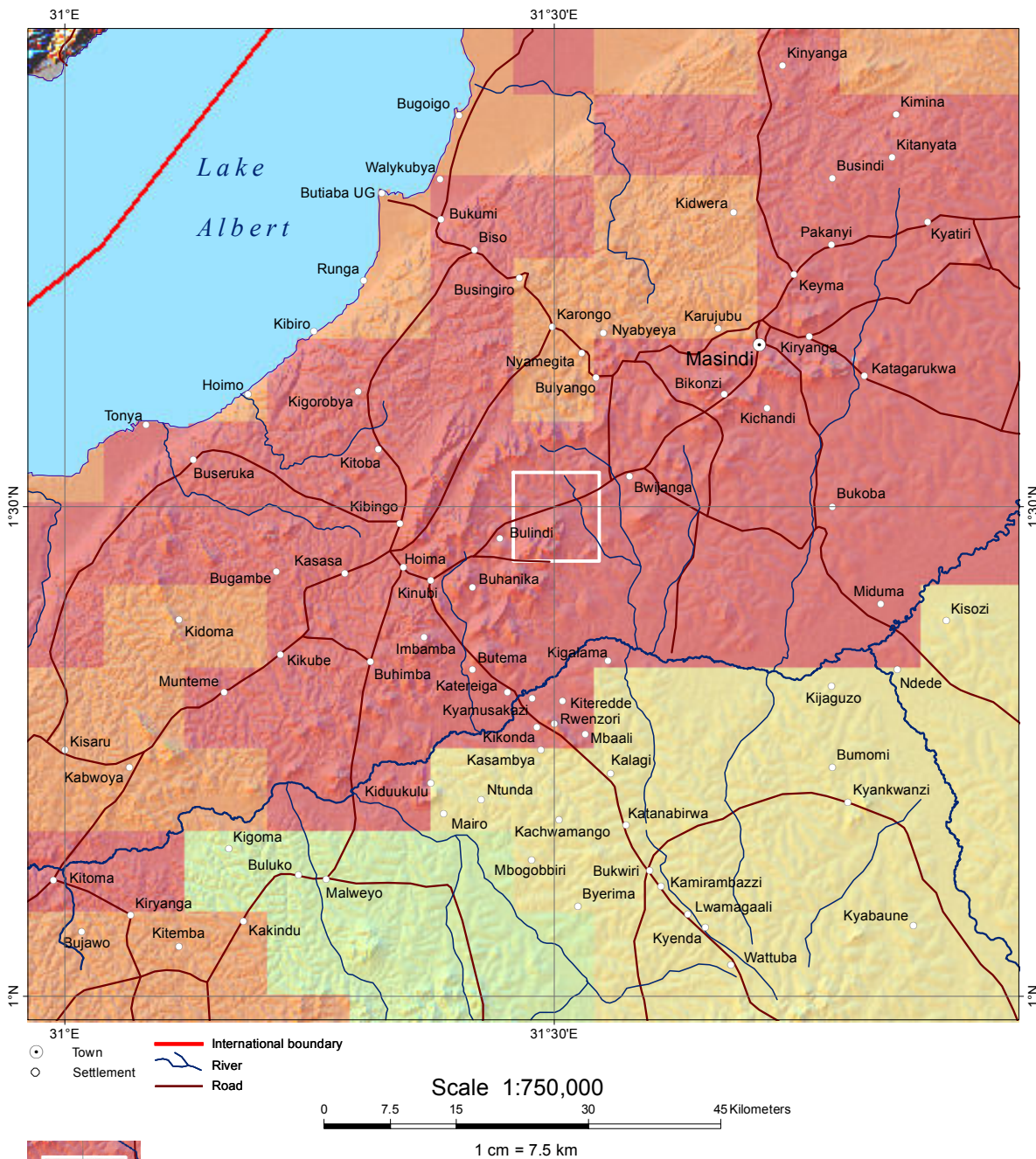
Human Population Density is the gridded number of persons per km² in 2005.

Market Access



Travel time is a measure of accessibility determined in the time (hours) taken to the nearest urban centre, town or city of a population of 50,000 people or more (taking different means of transportation into account)

Poverty

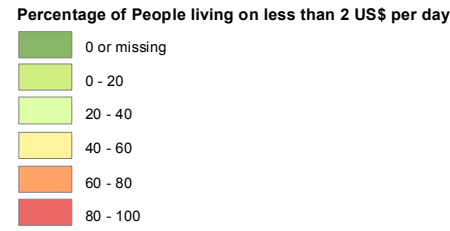


— International boundary

Scale 1:12,500,000

0 125 250 500 Kilometers

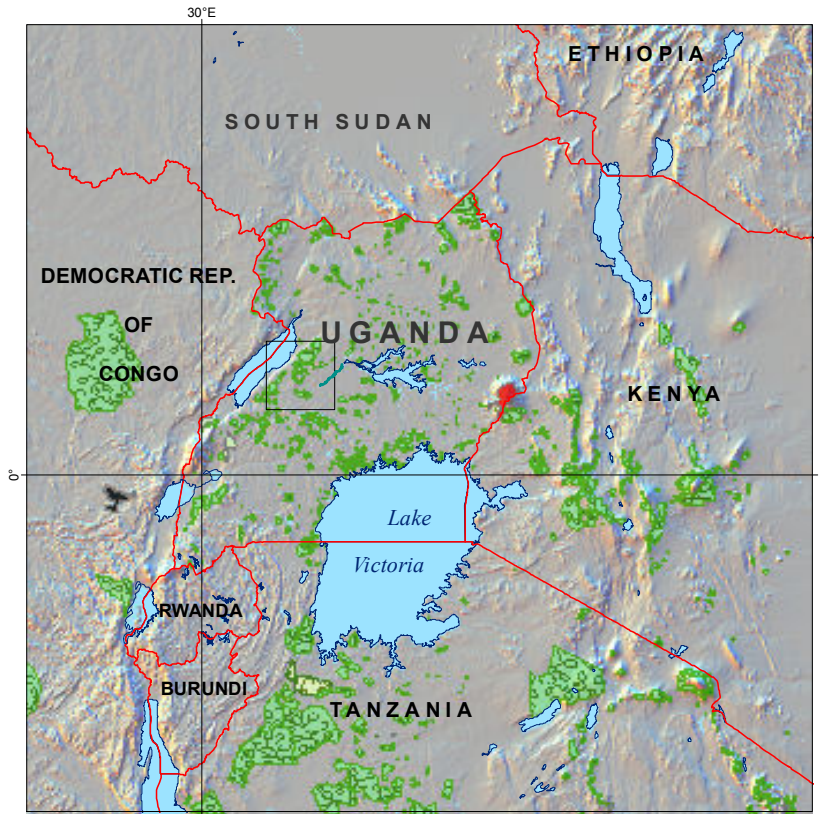
Corresponds to the map on the left



CIESIN constructed global data sets of poverty that are based on estimates of subnational infant mortality and child malnutrition data, recognizing that both are proxies for poverty and welfare rather than direct measures.

Citation: CIESIN (2005)

Conservation Areas



Corresponds to the map on the left

- Conservation Areas**
- State Forest Reserve (green grid pattern)
 - Forest Reserve (solid green)
 - Nature Reserve (solid red)
 - Gorilla Reserve (solid black)

Conservation Areas represent protected areas that, according to IUCN, are clearly defined geographic spaces, recognized through legal or other effective means, to achieve long-term conservation of nature with associated ecosystem services and cultural value.

Citation: UNEP-WCMC (2012).

References and Data Sources

Regional Map

Sijmons K. 2013a. Digital Satellite Image based on, MODIS (Moderate Resolution Imaging Spectroradiometer) NASA, 2009, Ground resolution : 1 Kilometer. GTOPO30, (DEM) Global Digital Elevation Model U.S Geological Survey, Ground resolution: 1 Kilometer. Topographic Features derived from: Global GIS, U.S. Geological Survey and Google Earth. Projection: Geographic, Lat/Long, WGS84

Topographic Map

Sijmons K. 2013b. Relief representation derived from Digital Elevation Model (DEM) of SRTM (Shuttle Radar Topographic Mission) 2000, Ground resolution 90 meter and ASTER GDEM, Ground resolution 30 meter, NASA. Topographic Features digitized from Google Earth Projection: Geographic, Lat/Long, WGS84

Satellite Image

RapidEye Satellite Image, 5 meter ground resolution, Image acquisition, 17-01-2011

Annual Rainfall

Hijmans, R.J., S.E. Cameron, J.L. Parra, P.G. Jones and A. Jarvis, 2005. Very high resolution interpolated climate surfaces for global land areas. *International Journal of Climatology* 25: 1965-1978.

Annual Rainfall Graph

Jones P G, Thornton P K, Diaz W and Wilkens P W. 2002. MarkSim, a computer tool that generates simulated weather data for crop modeling and risk assessment. Version 1, 2002. CD-ROM and Users Manual. CIAT, AA6713, Cali, Colombia, 87 pp.

Annual Temperature

Hijmans, R.J., S.E. Cameron, J.L. Parra, P.G. Jones and A. Jarvis, 2005. Very high resolution interpolated climate surfaces for global land areas. *International Journal of Climatology* 25: 1965-1978.

Annual Temperature Graph

Jones P G, Thornton P K, Diaz W and Wilkens P W. 2002. MarkSim, a computer tool that generates simulated weather data for crop modeling and risk

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Landcover

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Landuse

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Length of Growing Period 2000

Thornton P K, Jones P G, Owiyo T, Kruska R L, Herrero M, Kristjanson P, Notenbaert A, Bekele N and Omolo A, with contributions from Orindi V, Adwerah A, Otiende B, Bhadwal S, Anantram K, Nair S and Kumar V. 2006. Mapping climate vulnerability and poverty in Africa. Report to the Department for International Development, International Livestock Research Institute, Nairobi, Kenya, 200 p.

Length of Growing Period 2030

Thornton P K, Jones P G, Owiyo T, Kruska R L, Herrero M, Kristjanson P, Notenbaert A, Bekele N and Omolo and Kumar V. 2006. Mapping climate vulnerability and poverty in Africa. Report to the

Department for International Development, International Livestock Research Institute, Nairobi, Kenya, 200 p.

Crop Suitability

FAO-IIASA 2007. Mapping biophysical factors that influence agricultural production and rural vulnerability. Food and Agriculture Organization and International Institute for Applied Systems Analysis, Rome 2007.

Livestock Production Systems

FAO. 2007. Gridded livestock of the world 2007, by G.R.W. Wint and T.P. Robinson. Rome, pp 131.

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Wint W, Robinson T, 2007. Gridded Livestock of the World. FAO, 131 pp.

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Livelihood Zone Products. Famine Early Warning Systems Network (FEWS NET). Accessed at <http://www.fews.net/pages/livelihoods.aspx?loc=6&l=en>.

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Nelson, A. (2008) Estimated travel time to the nearest city of 50,000 or more people in year 2000. Global Environment Monitoring Unit - Joint Research Centre of the European Commission, Ispra Italy. Available at <http://www.tem.jrc.it/accessibility> (accessed 06/03/2004)

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Conservation Areas

UNEP-WCMC (2012). Data Standards for the World Database on Protected Areas. UNEP-WCMC: Cambridge, UK.

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) brings together the world's best researchers in agricultural science, development research, climate science and Earth System science, to identify and address the most important interactions, synergies and tradeoffs between climate change, agriculture and food security. CCAFS is a strategic partnership of CGIAR and Future Earth, led by the International Center for Tropical Agriculture (CIAT).

For more information, visit www.ccafs.cgiar.org and www.geomapa.nl



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