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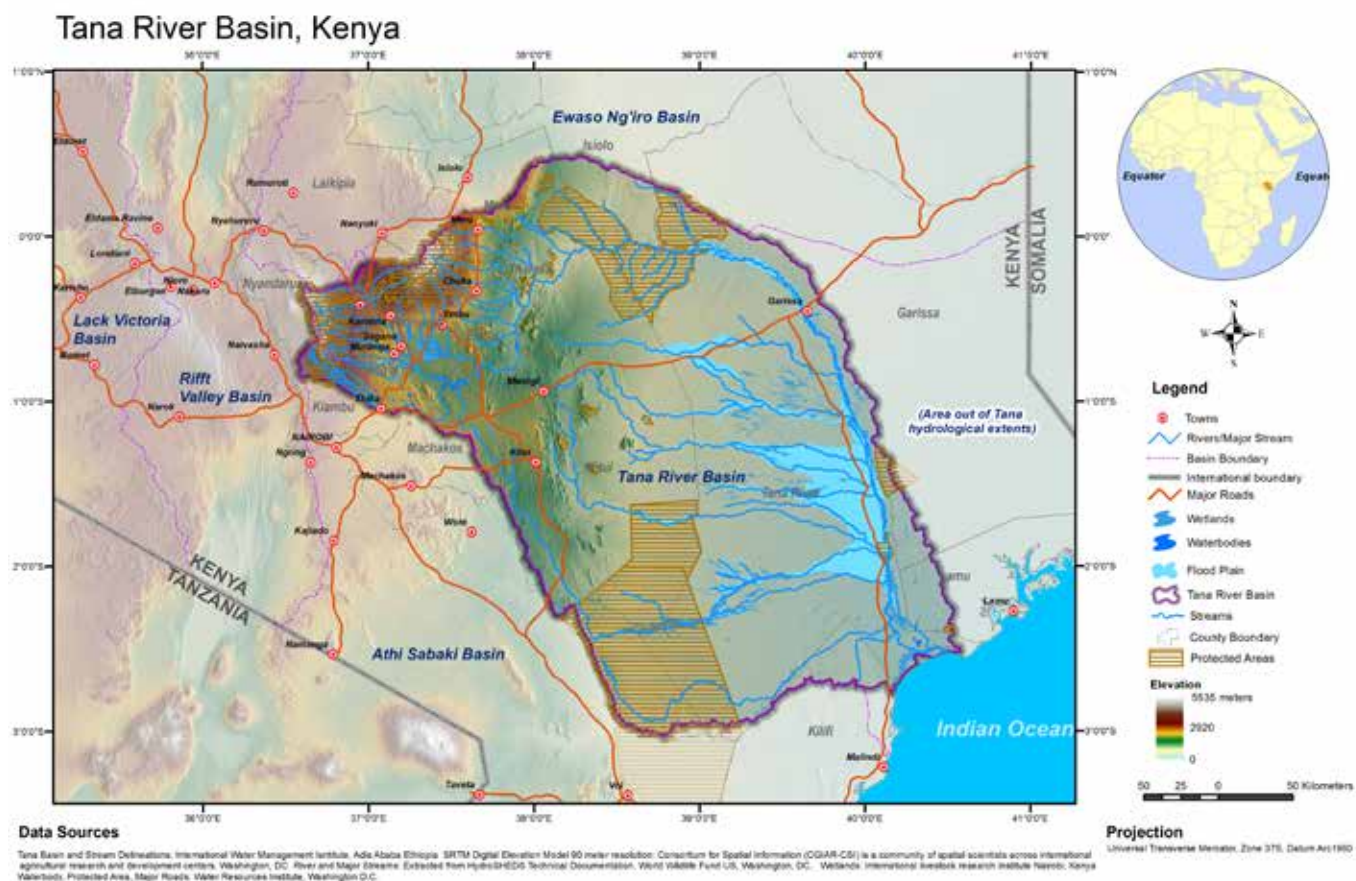
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# Tana River Basin, Kenya: Geodatabase and Mapping Tool



## User Guide

Asghar Hussain and Tracy Baker



# **Tana River Basin, Kenya: Geodatabase and Mapping Tool**

## **User Guide**

Asghar Hussain and Tracy Baker

**International Water Management Institute**

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Hussain, A.; Baker, T. 2016. *Tana River Basin, Kenya: geodatabase and mapping tool. User guide*. Colombo, Sri Lanka: International Water Management Institute (IWMI). 138p. doi: 10.5337/2016.210

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ISBN 978-92-9090-840-1

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*Front cover photograph* shows rice fields and forest near Vang Vieng, Lao PDR (photo: Matthew McCartney, IWMI).

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## Acknowledgments

This user guide is intended to provide instructions and background information on the use of the Tana River Basin geodatabase and mapping tool. It is based on data and information obtained from published and grey literature as well as spatial analyses carried out using publicly available sources.

### Project



This work was undertaken as part of the Water Infrastructure Solutions from Ecosystem Services Underpinning Climate Resilient Policies and Programmes (WISE-UP to Climate) project. The project is generating knowledge on how to implement mixed portfolios of built water infrastructure (e.g., dams, levees, irrigation channels) and 'natural infrastructure' (e.g., wetlands, floodplains, forests) that contribute to poverty reduction; water, energy and food security; biodiversity conservation; and climate resilience at a landscape scale. 'WISE-UP to Climate' aims to demonstrate the application of optimal portfolios of built and natural infrastructure developed through dialogue with stakeholders and decision-makers at multiple levels (local to national) to identify and find consensus on trade-offs. The project also seeks to link ecosystem services to water infrastructural development in the Volta River Basin (Ghana principally, and also Burkina Faso) as well as the Tana River Basin in Kenya.

The project is led by the International Union for Conservation of Nature (IUCN) and involves the Council for Scientific and Industrial Research - Water Research Institute (CSIR-WRI); African Collaborative Centre for Earth System Science (ACCESS), University of Nairobi; International Water Management Institute (IWMI); Overseas Development Institute (ODI); University of Manchester; and the Basque Centre for Climate Change (BC3). This project is part of the International Climate Initiative. Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB) (Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety), Germany, support this initiative on the basis of a decision adopted by the German Bundestag.

For further details about the project, visit: [www.waterandnature.org](http://www.waterandnature.org) or [www.iucn.org/water\\_wiseup](http://www.iucn.org/water_wiseup)

### Donors

This project is funded by the following:

Supported by:



Federal Ministry for the  
Environment, Nature Conservation,  
Building and Nuclear Safety

based on a decision of the German Bundestag

Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB) (Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety), Germany.



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This research was carried out as part of the CGIAR Program on Water, Land and Ecosystems (WLE), and supported by CGIAR Fund Donors (<http://www.cgiar.org/whoweare/cgiar-fund/fund-donors-2>).



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## Acronyms

ACT	Almanac Characterization Tool
CIAT	Centro Internacional de Agricultura Tropical (International Center for Tropical Agriculture)
CIESIN	Center for International Earth Science Information Network
DESFIL	Development Strategies for Fragile Lands project
DEM	Digital Elevation Model
ESRI	Environmental Systems Research Institute
FAO	Food and Agriculture Organization of the United Nations
FEWS NET	Famine Early Warning Systems Network
GIS	Geographic Information System
GPS	Global Positioning System
IEBC	Independent Electoral and Boundaries Commission, Kenya
ILRI	International Livestock Research Institute
JICA	Japan International Cooperation Agency
KARI	Kenya Agricultural Research Institute
KETRI	Kenya Trypanosomiasis Research Institute
KMD	Kenya Meteorological Department
KNBS	Kenya National Bureau of Statistics
KSS	Kenya Soil Survey
LCCS	Land Cover Classification System
SEDAC	Socioeconomic Data and Applications Center
TSBF	Tropical Soil and Biological Fertility Institute
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
WFP	World Food Programme
WRI	World Resources Institute
WRMA	Water Resources Management Authority

## Introduction

This user guide contains information about using the Tana River Basin file geodatabase and associated mapping tool. The tool contains a set of spatial data layers that describe several biophysical, environmental and social aspects of Kenya's Tana River Basin. Many of the layers are derived from national-level datasets and subsets to the Tana for ease of use. Most data layers were derived from secondary sources as outlined below. The layers selected for inclusion in this geodatabase and mapping tool are intended to cover a range of information, which is as current as possible, to support the increased understanding of ecosystem services within the Tana River Basin.

This geodatabase is intended to work as a companion to the report titled *Baseline review and ecosystem services assessment of the Tana River Basin, Kenya* (Baker et al. 2015). All the maps found in this report, as well as additional maps suited to the user, can be reproduced using this geodatabase and mapping tool. This geodatabase and associated map were originally created to allow team members from the WISE-UP to Climate project to explore and query data in an interactive way, as well as to offer them the opportunity to create their own cartographic products. The map package consists of an ArcReader published map file (.pmf) and associated data files. Alternatively, the Tana River Geodatabase can be downloaded along with a basemap .mxd file.

This user guide is divided into the following sections:

Part I: Geodatabase Overview

Part II: ArcReader Users

Part III: ArcMap Users

Appendix I: Data Layers

Appendix II: Metadata and Layer Descriptions

## Part I: Geodatabase Overview

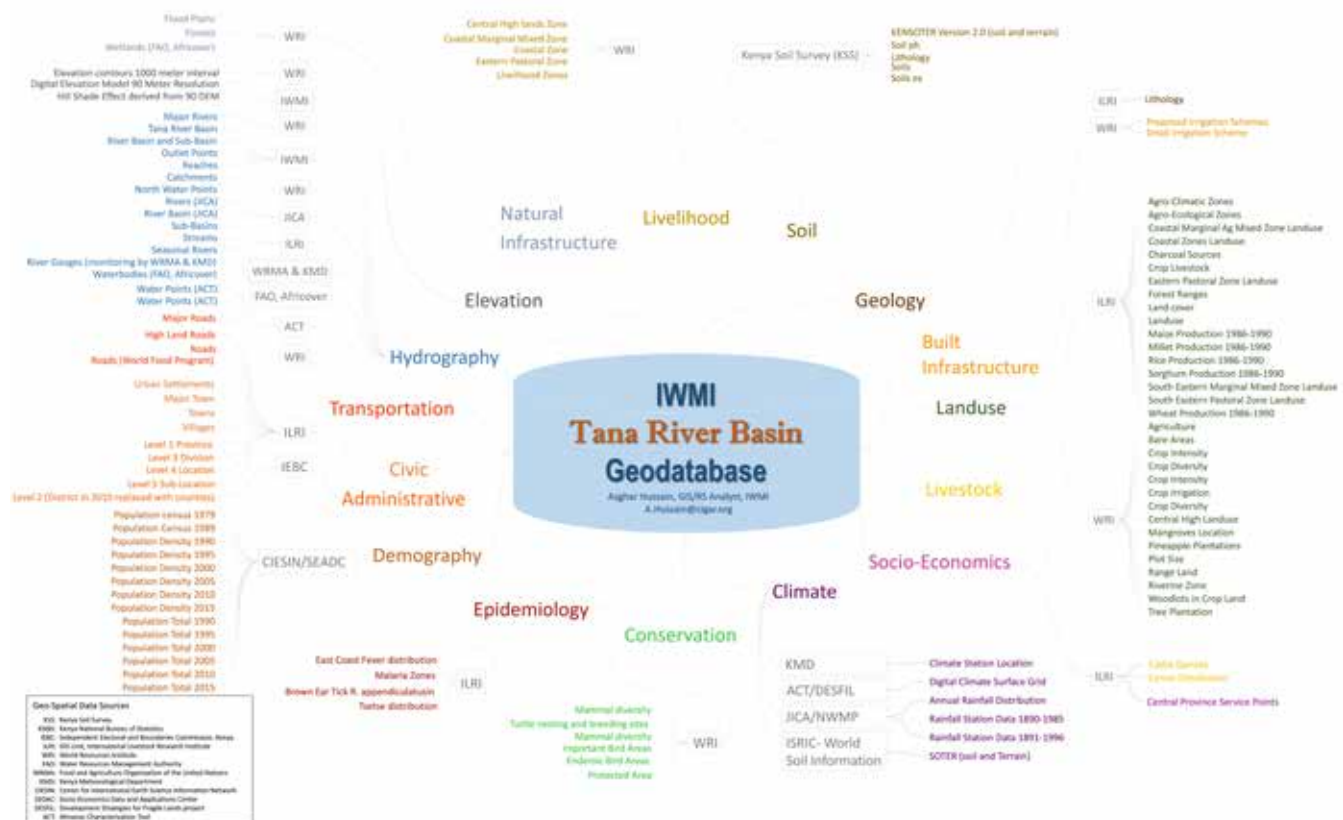
The Tana River Basin geodatabase has been designed based on a thematic structure that integrates geographic information from different sources. This thematic structure helps us to understand the roles of different organizations working within the basin and the key objective of producing their spatial data. The credibility of information and their contribution towards research and development are also recorded in metadata. Thus, the geodatabase comprises a complete package that specifies the content, and representation of each thematic layer, including its source of information, originator, scale and credibility.

The geodatabase data structure consists of different types of geographic information system (GIS) data, including attribute data, geographic features, Raster Images, surface modeling three-dimensional (3D) data, utility and transportation network systems, Global Positioning System (GPS) coordinates and survey measurements.

### Geodatabase Mind Map

The mind map (Figure 1) provides an overview of the GIS data collected from different organizations. The key objective of this map is to assist users in spatial analysis and modelling, while also providing them with a sufficient understanding and vision of the information available.

Figure 1. Mind map - Thematic and collaborative structure of the Tana River Basin geodatabase.



To achieve the objective of identifying optimal configurations of natural and built infrastructure on landscapes in the Tana River Basin, a comprehensive coverage of themes, along with a wide range of GIS layers, have been collected from different organizations within the basin. A geodatabase thematic layer index and description are provided in **Appendixes 1 and 2**.

### Administrative and Civic Information

Administrative units play a key role in policy implementation within the basin. GIS information on the administrative units crossing the Tana River Basin was obtained from the Kenya National Bureau of Statistics (KNBS) and the Independent Electoral and Boundaries Commission (IEBC). Geospatial data from urban centers and built-up areas, such as major towns, towns and villages, were collected from the GIS Unit at the International Livestock Research Institute (ILRI). Spatial layers of vertical and horizontal population expansion were extracted from the global datasets archive produced by the Center for International Earth Science Information Network (CIESIN) and the Socioeconomic Data and Applications Center (SEDAC).

### Natural and Built Infrastructure

Overall, the concept of differentiating among types of infrastructure is rooted in the idea that, while humankind may alter natural ecosystems to support their needs and livelihoods, the condition of ecosystems must be maintained to sustainably produce the basic services humanity requires for survival. GIS information of natural infrastructure, such as rivers, streams, floodplains, forests and wetlands, was obtained from the World Resources Institute (WRI). GIS information of built infrastructure, such as hydraulic and hydrographic structures (e.g., irrigation schemes, dams, monitoring instruments), and transport infrastructure (major roads, high roads and small roads), was obtained from the organizations listed below:

- World Resources Institute (WRI)
- Japan International Cooperation Agency (JICA)
- GIS Unit, International Livestock Research Institute (ILRI)

- Water Resources Management Authority (WRMA)
- Food and Agriculture Organization of the United Nations (FAO)
- Kenya Meteorological Department (KMD)
- International Water Management Institute (IWMI)

### Physical Geography

The Tana River Basin has a diverse physical geography, spanning upland forests and agricultural lands through the vast Tana Plains. The geodatabase of the basin has a wide range of physical parameters - geology, topography, soils and climatic conditions. Based on the physiography and climatic conditions, the basin is divided into different climatic and ecological zones. GIS information on these aspects was collected from different organizations such as Kenya Soil Survey (KSS), the GIS Unit at ILRI and WRI.

### Land Use and Livelihoods

Within the Tana River Basin, livelihoods are clearly and inextricably linked to the natural environment in a co-evolving way whereby people influence and are influenced by land cover. The geodatabase of the basin has livelihood zones, including land use and land cover classification. GIS information on human activities, such as agricultural land-use practices, and horizontal and vertical growth and productivity of livestock and cropping systems was collected from the organizations list below:

- World Resources Institute (WRI)
- Famine Early Warning Systems Network (FEWS NET)
- GIS Unit, ILRI

### Data Accuracy and Reliability

The Tana River Basin geodatabase was created using GIS information which had already been published by world-renowned organizations, and used in public projects and scientific research certified by international agencies. Standard metadata information is provided with the geospatial data.

### Software Employed

This geodatabase and the associated maps were created on a machine running Windows 7 Professional and using ArcMap 10.3. End users should download the files that are most appropriate for the version of ArcGIS software that they are using. Further details on this are provided in the sections below. It is important to note that ArcMap is not required to make use of the map package and the associated geodatabase.

### Data Sources



Food and Agriculture Organization of the United Nations (FAO)



Independent Electoral and Boundaries Commission (IEBC)



Centro Internacional de Agricultura Tropical (International Center for Tropical Agriculture) (CIAT)



International Livestock Research Institute (ILRI)



Kenya Agricultural Research Institute (KARI)



Kenya National Bureau of Statistics (KNBS)



Tropical Soil and Biological Fertility (TSBF) Institute, CIAT



United Nations Environment Programme (UNEP)



United States Agency for International Development (USAID)



World Food Programme (WFP)



World Resources Institute (WRI)

## Map Projection and Coordinate System

Map projections describe the technique that represent the Earth's curved surface on a flat map. Coordinate systems describe the grid referenced and measurement units, effectively translating the map projection. In order to overlay the GIS layers on each other, a single data frame is required. In the geodatabase, the layers are projected into a common projection system Arc1960 Universal Transverse Mercator (UTM) Zone 37 South.

## Accessing the Tana River Basin Geodatabase and Mapping Tool

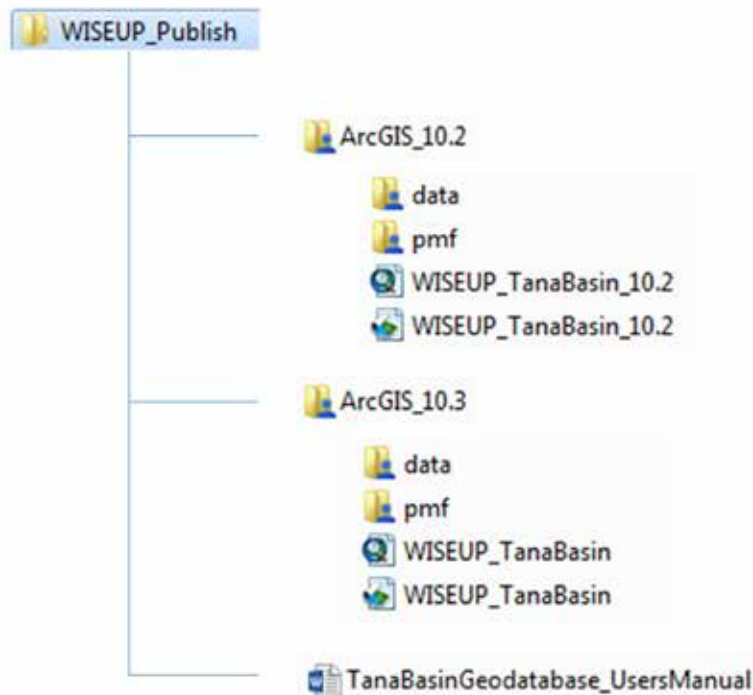
The geodatabase can be downloaded and used in two ways. First, any user may download the ArcReader project to their local machine for generating basic cartographic representations and for exploring the geodatabase. More advanced users with access to ArcMap and its associated extensions may prefer to download the file geodatabase and carry out a variety of spatial analyses with or without the associated .mxd file.

Version 1 of the Tana River Basin geodatabase was used when conducting the baseline review and assessment of ecosystem services of the basin (Baker et al. 2015). A copy of this geodatabase, the maps and associated documentation can be downloaded from the IWMI Water Data Portal (<http://waterdata.iwmi.org/>).

The Tana River Basin geodatabase package is also available on a Universal Serial Bus (USB) device for distribution.

### Which files should I download?

We provide two sets of files for the commonly used ArcGIS version 10.2 and the recently updated version 10.3. It is important that the user selects the relevant folder according to the software that is installed on their machine.



## Part II: ArcReader Users

For non-GIS users, the Environmental Systems Research Institute (ESRI) provides free software known as ArcReader which allows the user to explore prepackaged spatial datasets and generate maps for general use. This software provides the simplest access to the WISE-UP to Climate project Tana River Basin geodatabase and mapping tool.

### Installing ArcReader

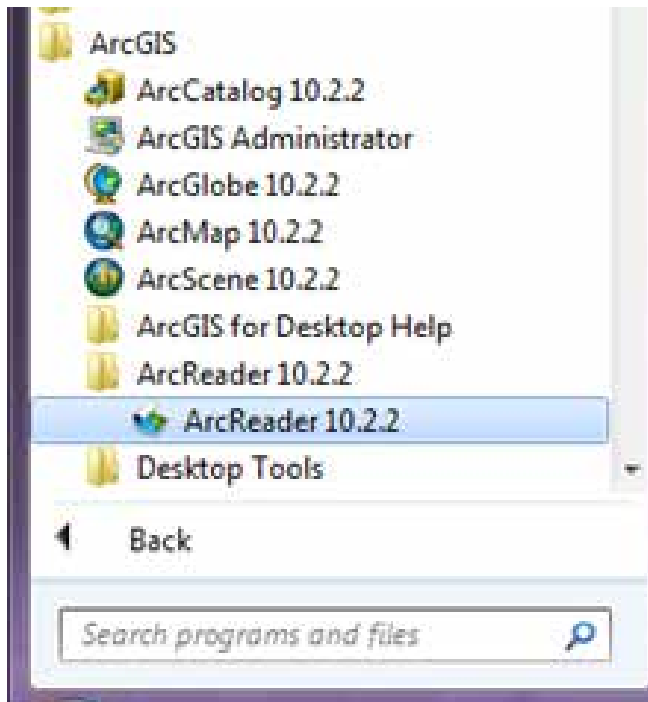
If you do not have ArcReader already installed on your computer then first go to the ESRI website and download version 10.3 (<http://www.esri.com/software/arcgis/arcreader/download>). You will have to register with ESRI to download the software. Please note that the installation file is more than 400 MB in size and may take over one hour to download for those with low bandwidth internet packages.

To install and use ArcReader, you will need to have the correct version of the Microsoft .NET Framework Service Pack 1. For complete details on the system requirements, please visit the ESRI ArcReader web page (<http://desktop.arcgis.com/en/desktop/latest/get-started/system-requirements/arcreader-system-requirements.htm>).

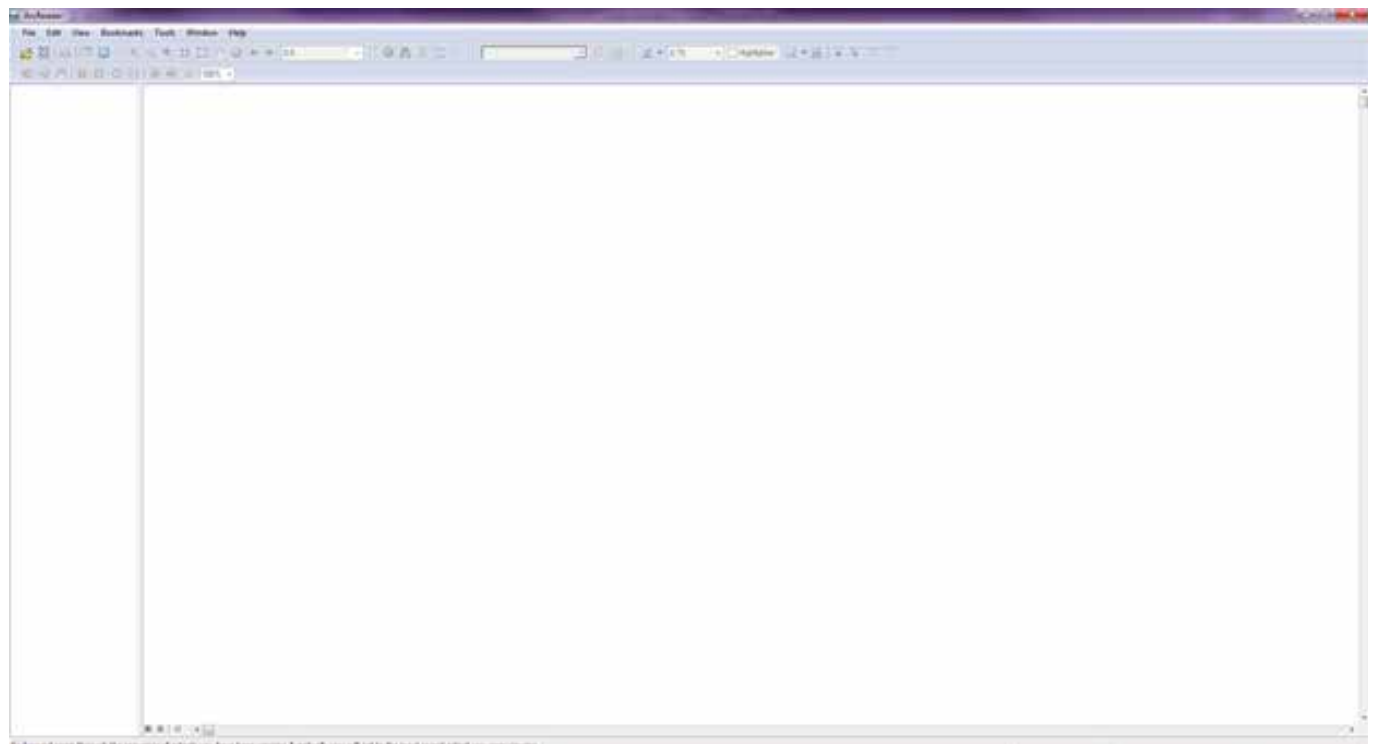
Once the installation file has been downloaded, unzip the file (if necessary) and then double-click the Setup (.exe) application file to begin the installation process using the default installation settings provided. If you have questions regarding installation then please visit the ESRI ArcReader web page (<http://www.esri.com/software/arcgis/arcreader>).

## Using ArcReader

To open ArcReader on your computer, go to your Windows start menu and navigate to **All Programs > ArcGIS > ArcReader 10.x** and click on the program. **Note:** The version of ArcReader installed on your machine will appear here.



When ArcReader opens, the following screen will be displayed:





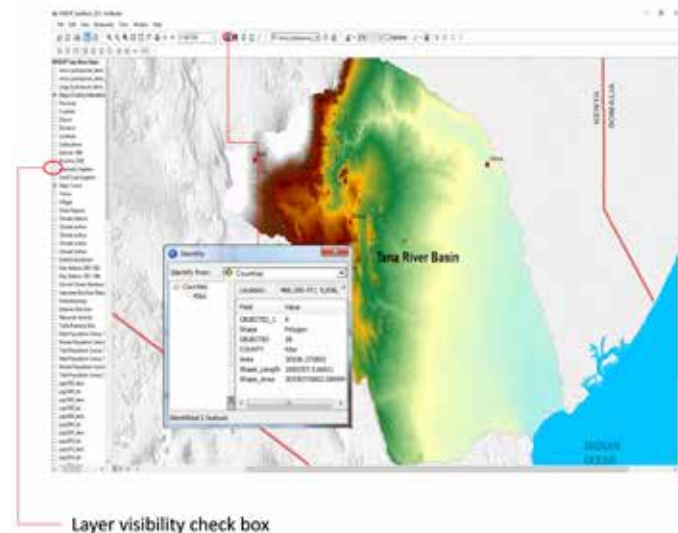
To open the Tana River Basin geodatabase and mapping tool, click **File > Open** and navigate to the folder where you saved the WISEUP\_TanaBasin\_10.2.pmf file. Select the file and click **Open**.

## Exploring the Tana River Basin Data

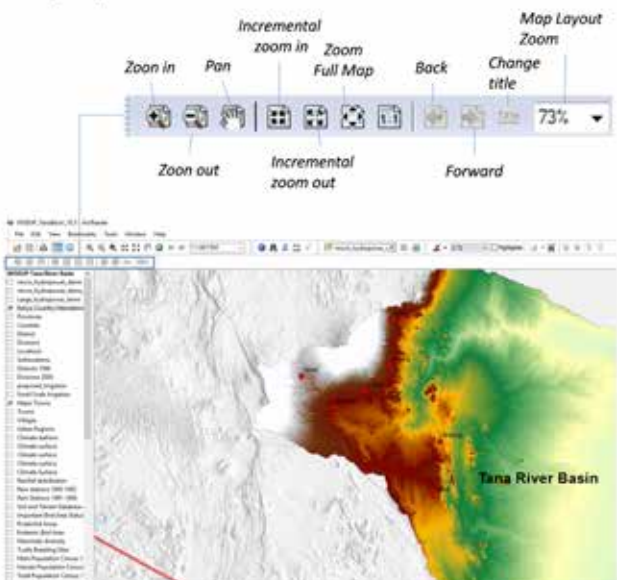
### Creating Maps

#### Data View

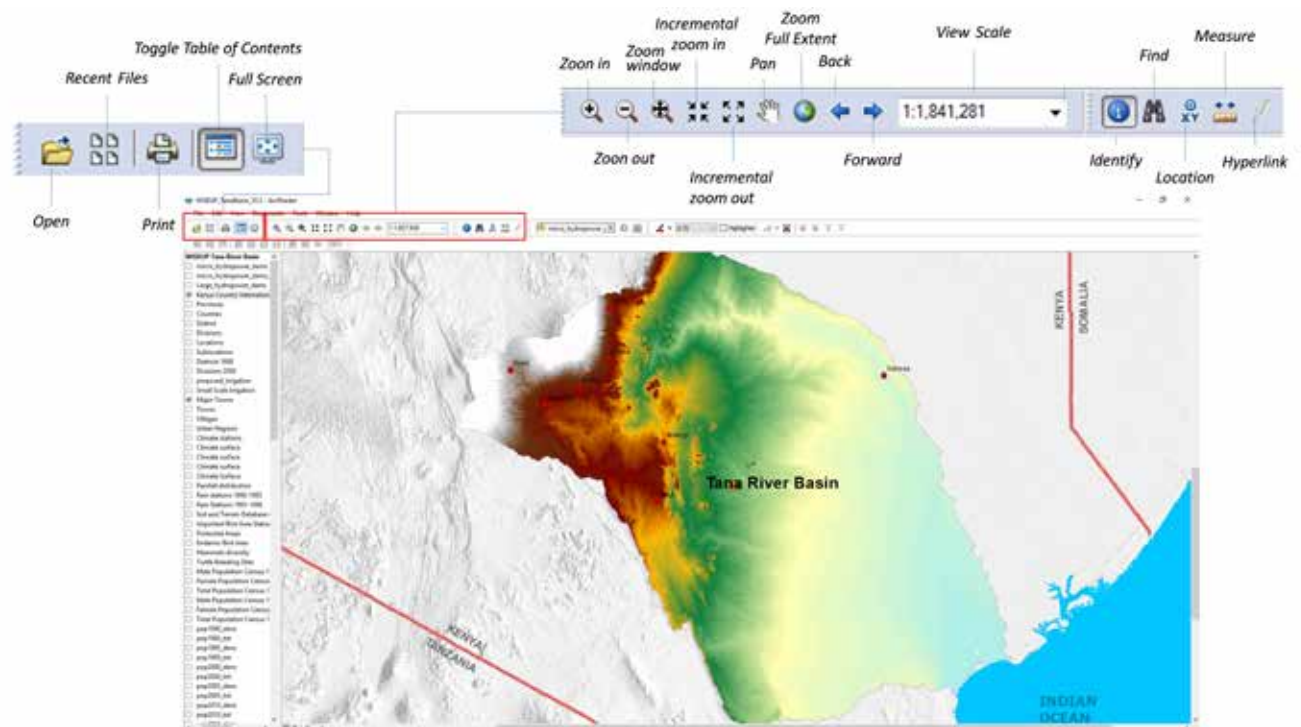
Exploring data Maps are not static displays; they're interactive. You can browse a map—taking a closer look at a particular area—and point at features to find out more about them.



#### Map Layout View



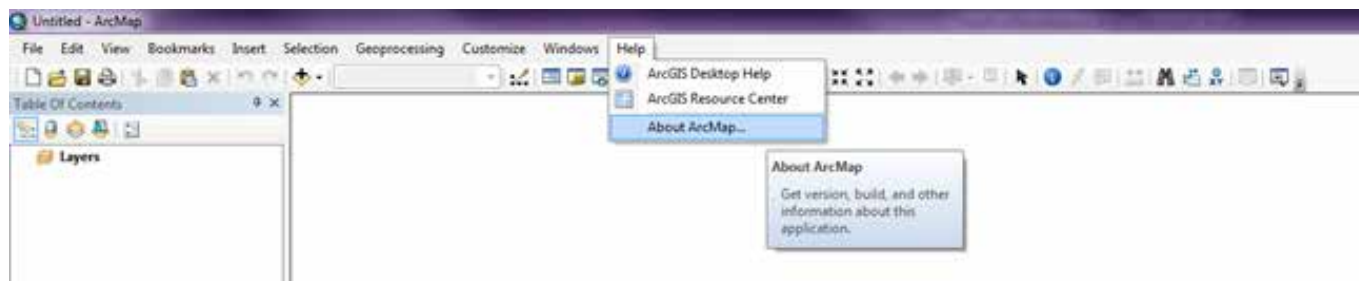
Data exploration, map navigation and utilities:



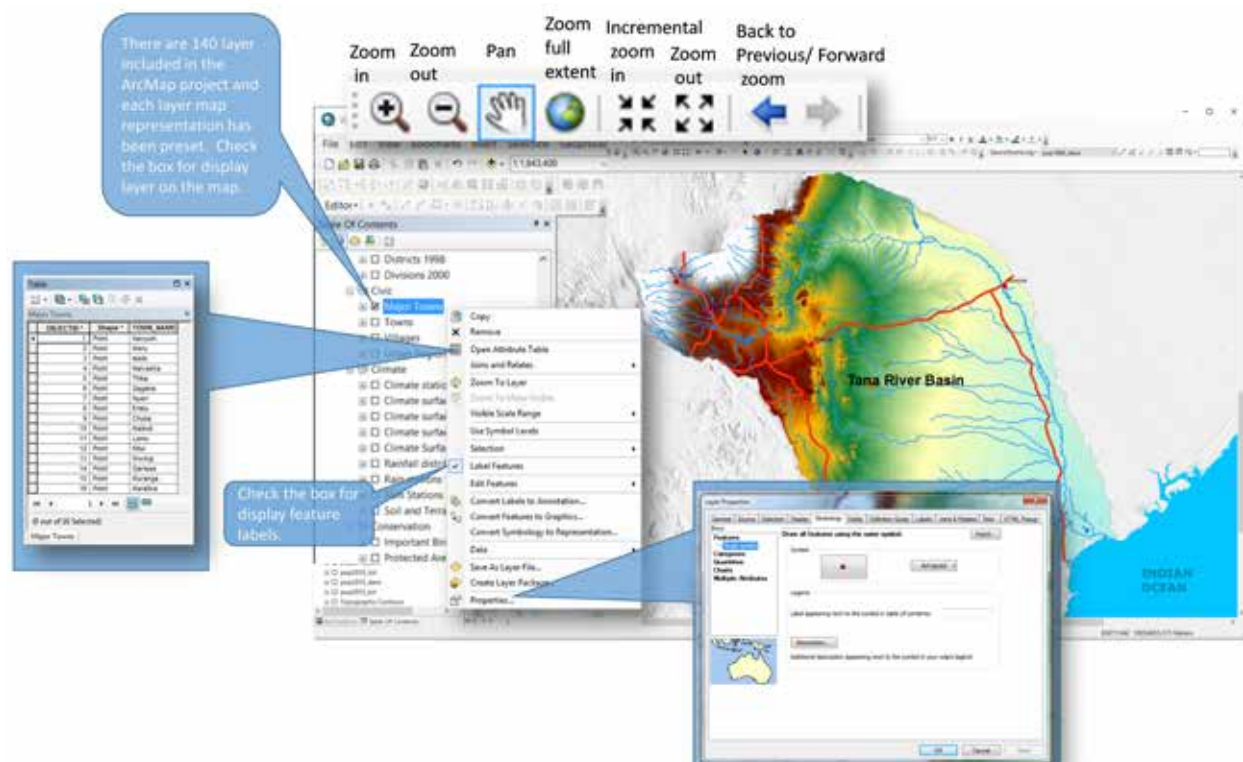
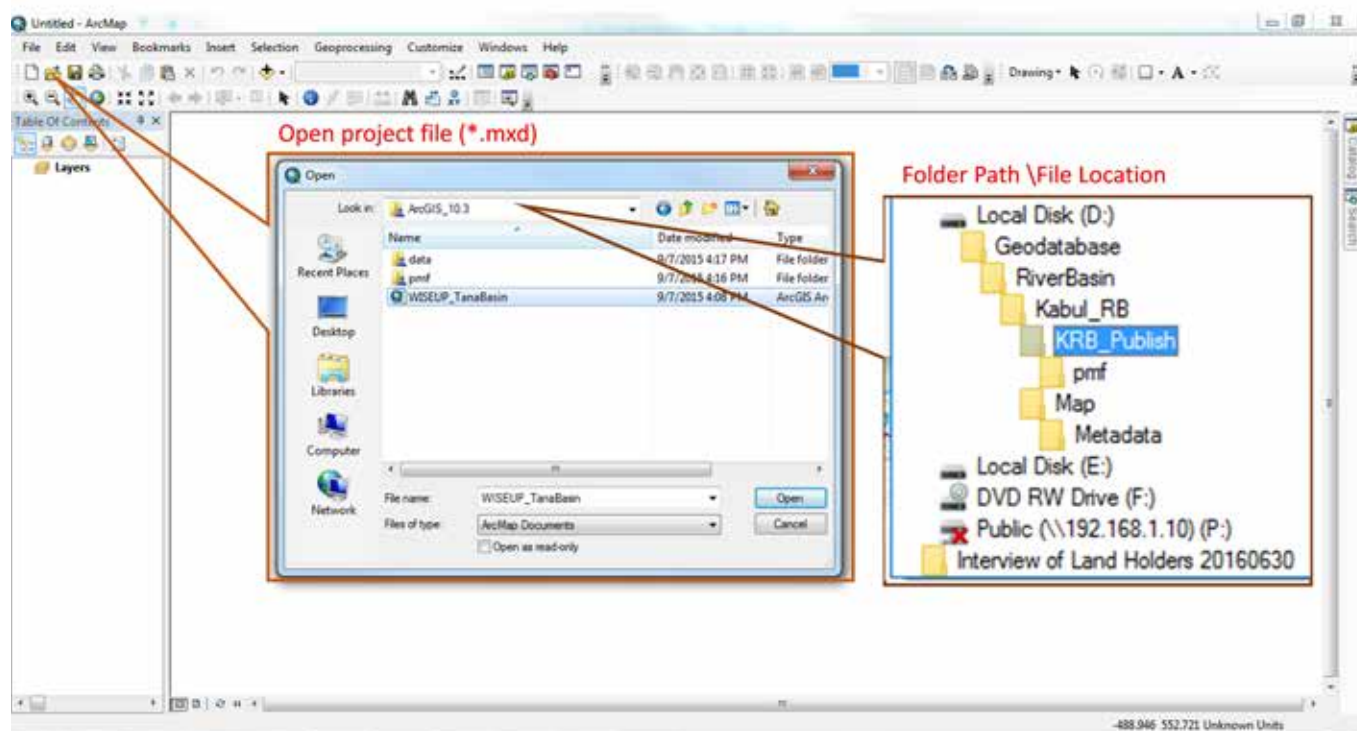


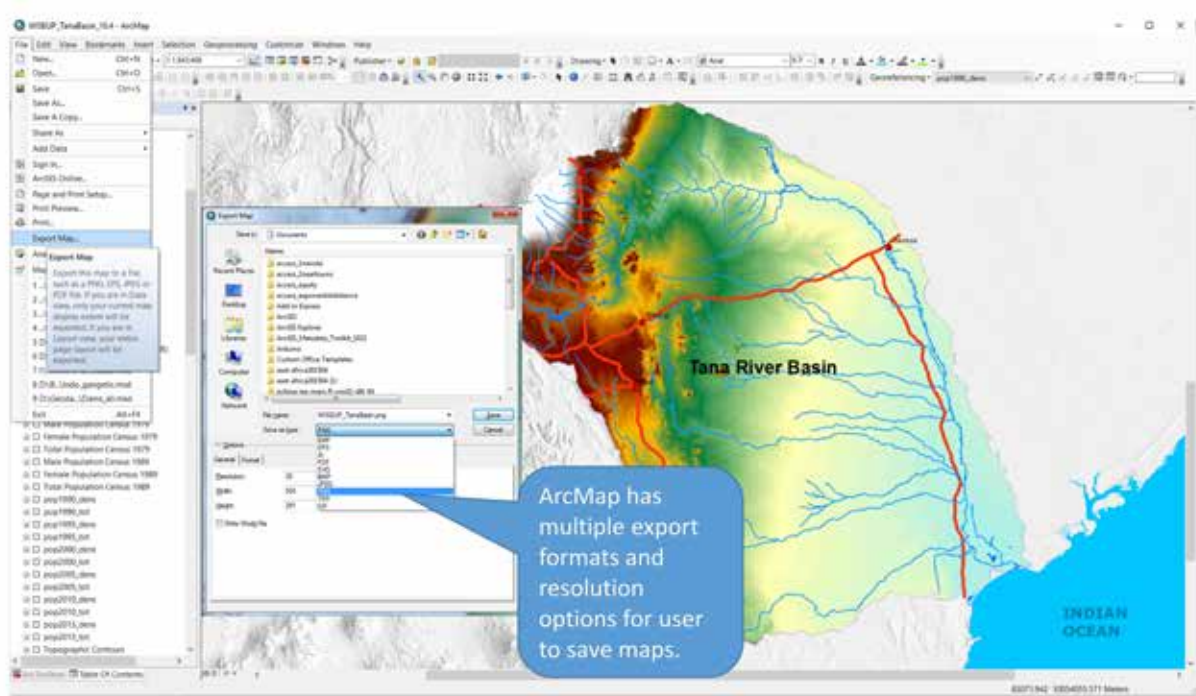
### Part III: ArcMap Users

ArcMap users may download and use the full Tana River Basin geodatabase (.gdb) file and associated .mxd file. This option provides the highest functionality for users interested in carrying out spatial analyses processes. The .mxd document is available for ArcMap 10.2, which may also be used with ArcMap 10.2.2, and ArcMap 10.3. To ensure you download the correct .mxd file, first verify your ArcMap version. To do this, go to **Help > About ArcMap**:



Instructions for opening the ArcMap project file:





## References

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## Appendix 1. Data Layers

The WISE-UP to Climate TanaBasin.pmf file and ArcMap project were created to serve as an interface for the Tana River Basin geodatabase. Users of this geodatabase are assumed to have only basic GIS skills and will, in many cases, be new to GIS. The thematic structure of the geodatabase is replicated throughout this project to manage the structure of the spatial layers and includes the layers listed below. More detailed metadata for each layer are included in Appendix 2.

### **Administration**

- CountryBND: Administration Level 0 Kenya Country International Boundary
- Provinces: Administration Level 1 Provinces within the Tana River Basin
- Counties: Administration Level 2 Counties within the Tana River Basin
- Divisions: Administration Level 3 Divisions within the Tana River Basin
- Locations: Administration Level 4 Locations within the Tana River Basin
- Sublocations: Administration Level 5 Sub-locations within the Tana River Basin
- Districts: Administration Level 2 (Districts replaced with Counties in 2010) within the Tana River Basin
- Districts98: Administration Level 2 District in 1998 within the Tana River Basin
- Divisions2000: Administration Level 3 Division state in 2000 within the Tana River Basin

### **Built Infrastructure**

- proposed\_irrigation: Proposed irrigation schemes
- small\_scale\_irrigation: Small irrigation schemes
- Large\_hydropower\_dams: Large hydropower dams
- SevenForksDams: Seven Forks Dams (large hydropower dams) reservoirs
- micro\_hydropower\_dams: Micro-hydropower dams
- micro\_hydropower\_dams\_proposed: Proposed micro-hydropower dams

### **Civic**

- Majortowns: Major towns
- Towns: Small towns
- Villages: Villages
- Urbansettlement: Urban regions

### **Climate**

- Climate\_stations: Climate station location
- Climate\_surface: Digital climate surface grid
- Rainfall\_distribution: Annual rainfall distribution
- Rainstations18901985: Rainfall station data 1890-1985
- Rainstations19911996: Rainfall station data 1991-1996
- TanaRB\_soter: Soil and Terrain Database (SOTER), Kenya

### **Conservation**

- ImportantBirdAreas: Important bird areas
- ProtectedAreas: Protected areas
- eba: Endemic bird areas
- Mammals\_Diversity: Mammal diversity
- Turtle\_Breeding\_Site: Turtle nesting and breeding sites

## **Demography**

- pop\_census1979: Population census 1979
- pop\_census1989: Population census 1989
- pop1990\_dens: Population density 1990
- pop1990\_tot: Population total 1990
- pop1995\_dens: Population density 1995
- pop1995\_tot: Population total 1995
- pop2000\_dens: Population density 2000
- pop2000\_tot: Population total 2000
- pop2005\_dens: Population density 2005
- pop2005\_tot: Population total 2005
- pop2010\_dens: Population density 2010
- pop2010\_tot: Population total 2010
- pop2015\_dens: Population density 2015
- pop2015\_tot: Population total 2015

## **Elevation**

- contours: Elevation contours 1,000-meter interval
- dem90m: Digital Elevation Model (DEM) 90-meter resolution
- hillshade: Hill Shade Effect derived from DEM 90-meter resolution

## **Epidemiology**

- ecf\_distribution: East coast fever distribution
- malaria\_zones: Malaria zones
- r\_appendiculatus: Brown ear tick (R. appendiculatus)
- tsetse\_distribution: Tsetse distribution

## **Geology**

- lithology: Lithology

## **Hydrography**

- TanaRiverBasin: Tana River Basin boundary
- Streams: Streams
- StreamGauges: River gauges (monitoring by WRMA and KMD)
- Water\_Bodies: Waterbodies (FAO, Africover)
- WaterPoints: Water points (Almanac Characterization Tool [ACT])

## **Land Use**

- AgroEcologicalZones: Agro-ecological zones
- Aczones: Agro-climatic zones
- bare\_areas: Bare areas
- charcoal\_sources: Charcoal sources
- CentralHighlandsZone\_LU: Central Highlands zone
- CoastalMarginalAgMixedZone\_LU: Coastal marginal agricultural mixed farming zone
- CoastalZone\_LU: Coastal zone
- crops\_diversity: Crop diversity
- crops\_intensity: Crop intensity
- crops\_irrig: Crop irrigation

- crops\_livestock: Crop livestock
- CropSize: Plot size
- EasternPastoralZone\_LU: Eastern pastoral zone
- forest\_ranges: Forest ranges
- landcover\_ge: Land cover
- landuse: Land use Tana River Basin
- maize\_prod\_86\_90: Maize production 1986-1990
- mangroves: Mangroves location
- millet\_prod\_86\_90: Millet production 1986-1990
- Pineapple\_plantations: Pineapple plantations
- rangeland: Rangeland
- rice\_prod\_86\_90: Rice production 1986-1990
- sorghum\_prod\_86\_90: Sorghum production 1986-1990
- SoutheasternMarginalMixedZone\_LU: Southeastern marginal mixed farming zone
- SoutheasternPastoralZone\_LU: Southeastern pastoral zone
- TanaAgriculture: Agriculture
- TanaRiverineZone\_LU: Riverine zone
- Tree\_plantations: Tree plantation
- wheat\_prod\_86\_90: Wheat production 1986-1990
- woodlots\_in\_cropland: Woodlots in cropland

#### **Livelihood**

- CentralHighlandsZone: Central highlands zone
- CoastalMarginalMixedZone: Coastal marginal agricultural mixed farming zone
- CoastalZone: Coastal zone
- EasternPastoralZone: Eastern pastoral zone
- LivelihoodZones: Livelihood zones

#### **Livestock**

- Cattle\_density: Cattle density (ZEBU Density, DAIRY Density)
- camel\_distribution: Camel distribution

#### **MyComposition**

- line\_3D: Line 3D
- Sea: Sea mask for Tana River Basin map composition
- White\_wash: Mask outside the Tana River Basin area for map composition

#### **Natural Infrastructure**

- Forests: Forests
- FloodPlains: Floodplains
- Wetlands: Wetlands

#### **Socioeconomics**

- centralprov\_servicepoints: Central Province service points

#### **Soil**

- soil\_ph: Soil ph

## **Transportation**

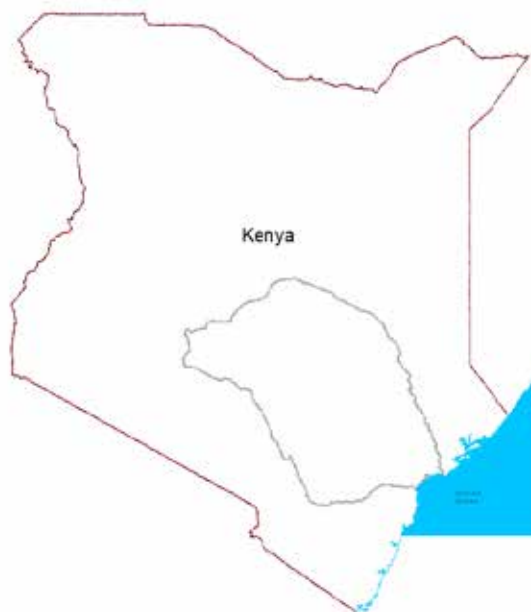
- highland\_roads: Highland roads
- major\_roads: Major roads
- Roads: Other roads
- roads\_wfp: World Food Programme (WFP) roads

## Appendix 2. Metadata and Layer Descriptions

**Theme: Administration**

**CountryBND**

File Geodatabase Feature Class



Tags

Kenya, country, international boundary

Summary

This layer shows the Kenya international border and coastal line

Description

Kenya country in East Africa

Credits

KNBS, IEBC



## Provinces

File Geodatabase Feature Class



### Tags

Province, administrative unit, first level

### Summary

Province (first level of political administration) boundaries extracted for the Tana River Basin area

### Description

This coverage shows the first level administrative boundaries (provinces) of Kenya and their respective names

### Credits

UNEP (originally called Kenprov.shp), ILRI

## Counties

File Geodatabase Feature Class



## Tags

County, second level

## Summary

County (second level of political administration) boundaries extracted for the Tana River Basin area

## Description

This coverage shows the second level administrative boundaries (counties) of Kenya and their respective names

## Credits

KNBS, IEBC, ILRI

## Divisions

File Geodatabase Feature Class



### Tags

Third level, districts, administrative boundary, Tana River Basin

### Summary

Division (third level of political administration) boundaries extracted for the Tana River Basin area

### Description

This coverage shows the third level administrative boundaries (divisions) of Kenya and their respective names

### Credits

ILRI

## Locations

File Geodatabase Feature Class



### Tags

Location, administrative unit level 4

### Summary

Division (fourth level of political administration) boundaries extracted for the Tana River Basin area

### Description

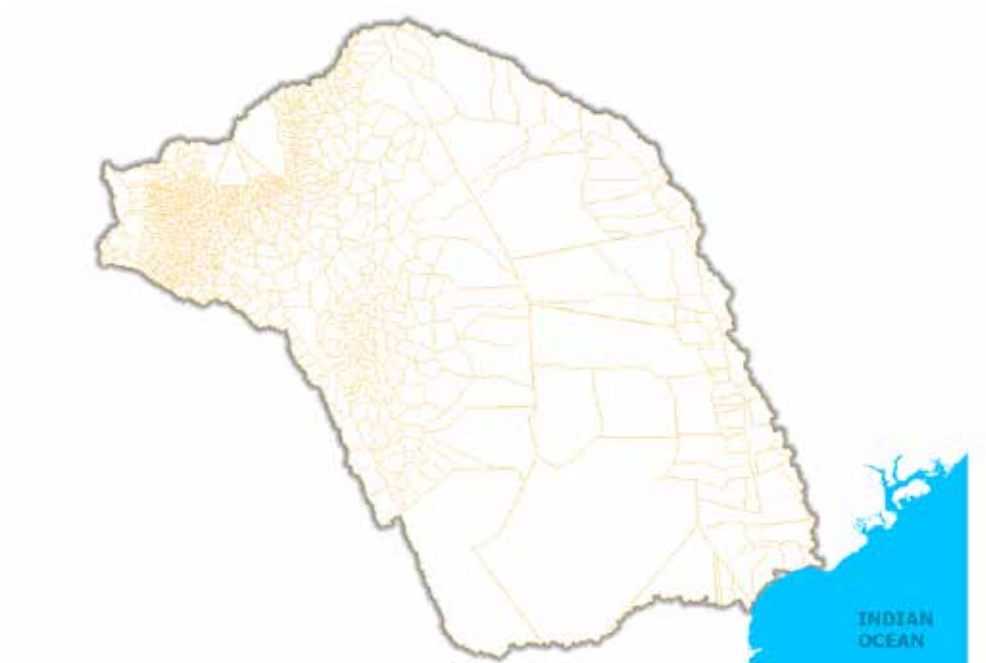
This coverage shows the fourth level administrative boundaries (locations) of Kenya and their respective names

### Credits

ILRI

## Sublocations

File Geodatabase Feature Class



### Tags

Administrative, fifth level, sublocation

### Summary

Sublocation (fifth level of political administration) boundaries extracted for the Tana River basin area

### Description

This coverage shows the fifth level administrative boundaries (sub-locations) of Kenya and their respective names

### Credits

KNBS, IEBC, ILRI

## Districts

File Geodatabase Feature Class



### Tags

Administrative boundaries, boundaries

### Summary

These data were used in maps throughout the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

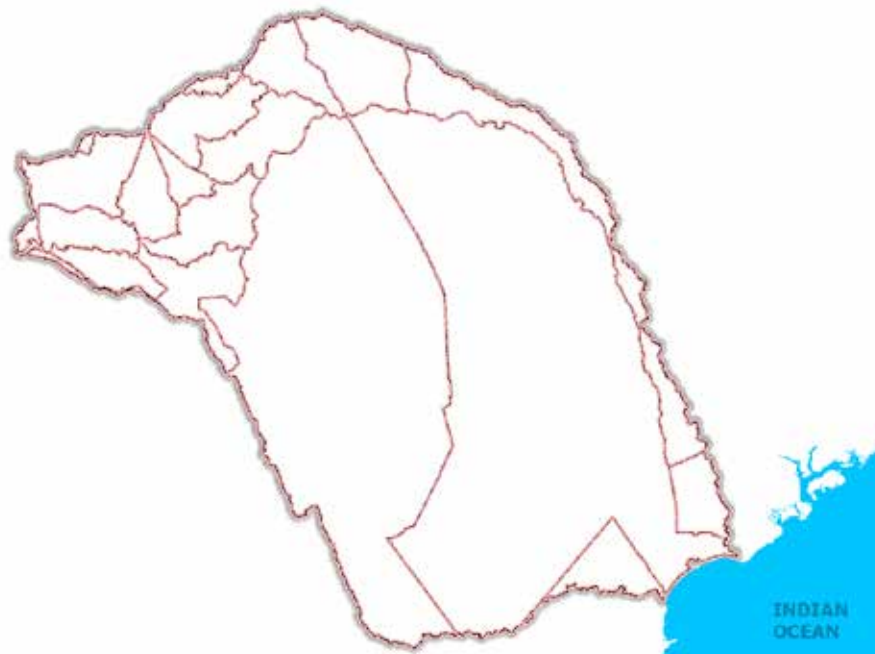
This dataset outlines Kenya's District administrative boundaries

### Credits

ILRI

## Districts98

File Geodatabase Feature Class



### Tags

District, political change, boundary, Tana River Basin

### Summary

District (second level of political administration) boundaries extracted for the Tana River Basin area

### Description

Coverage represents second level administrative boundaries (districts) in Kenya as in 1998 and their respective names. It does not contain the districts created after 1998

### Credits

Originally called district98.shp and created in 1998 by the GIS Unit at ILRI. Digitized by ILRI

## Divisions2000

File Geodatabase Feature Class



### Tags

Third level, districts, administrative boundary, Tana River Basin

### Summary

Division (third level of political administration) boundaries extracted for the Tana River Basin area

### Description

The coverage shows the Kenya divisional boundaries as in the year 2000 created by the Wellcome Trust, Nairobi, Kenya. The new districts were carved out using the District Development Plan reports and the 1999 Central Bureau of Statistics (CBS) maps

### Credits

Created in 2000 by Wellcome Trust and previously called kendivisions.shp, ILRI



## Theme: Built Infrastructure

### proposed\_irrigation

File Geodatabase Feature Class



### Tags

Irrigation, proposed, farming, infrastructure

### Summary

This dataset was extracted for the Tana River Basin area. These data were used in Map 3.12 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset portrays the proposed large-scale irrigation schemes in Kenya.

### Credits

WRI

## small\_scale\_irrigation

File Geodatabase Feature Class



### Tags

Irrigation, small-scale, farming, utilitiesCommunication, infrastructure

### Summary

This dataset was extracted for Tana River Basin area. These data were used in Map 3.12 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset portrays the locations of existing small-scale irrigation and drainage points in Kenya.

### Credits

WRI

## Large\_hydropower\_dams

File Geodatabase Feature Class



### Tags

hydropower, dams, infrastructure, economy, inlandWaters, utilitiesCommunication

### Summary

These data were used in Map 3.11 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset portrays locations of large hydropower dams in Kenya.

### Credits

WRI

## SevenForksDams

File Geodatabase Feature Class



### Tags

Reservoirs, waterbodies, imageryBaseMapsEarthCover, inlandWaters

### Summary

These data were used in maps throughout the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset portrays water bodies in Kenya from FAO's Africover dataset. The location and shape of existing large hydropower reservoirs in the Tana River Basin were extracted from the waterbodies layer.

### Credits

FAO's Africover

## micro\_hydropower\_dams

File Geodatabase Feature Class



### Tags

micro-hydropower, dams, infrastructure, utilities, Communication

### Summary

These data were used in Map 3.11 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

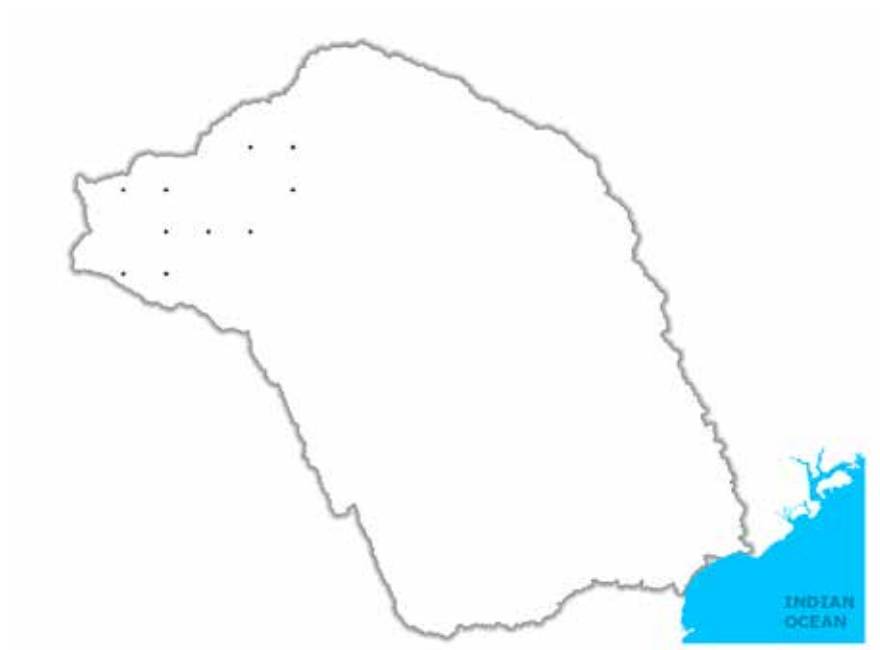
This dataset portrays locations of micro-hydropower sites in Kenya. The definition of micro-hydropower is not given in the source data but it is usually categorized as 5 kW to 100 kW.

### Credits

WRI

## micro\_hydropower\_dams\_proposed

File Geodatabase Feature Class



### Tags

micro-hydropower, dams, infrastructure, utilitiesCommunication

### Summary

These data were used in Map 3.11 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset portrays locations of proposed micro-hydropower sites in Kenya. The definition of micro-hydropower is not given in the source data, but it is usually categorized as 5 kW to 100 kW.

### Credits

WRI

Theme: Civic

## Majortowns

File Geodatabase Feature Class



### Tags

Towns, cities, structure, Tana River Basin

### Summary

Major towns extracted for the Tana River Basin area. These data were used in maps throughout the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset shows major towns in Kenya

### Credits

ILRI

## Towns

File Geodatabase Feature Class



### Tags

Town, urban settlement, urban center, Tana River Basin

### Summary

Towns extracted for the Tana River Basin area

### Description

The coverage shows the towns and urban centers in Kenya derived from the Kenya topographic sheets of scale, 1:250,000 for Northern Kenya and 1:50,000 for the rest of Kenya. There are approximately 1,620 towns and urban centers captured in this layer

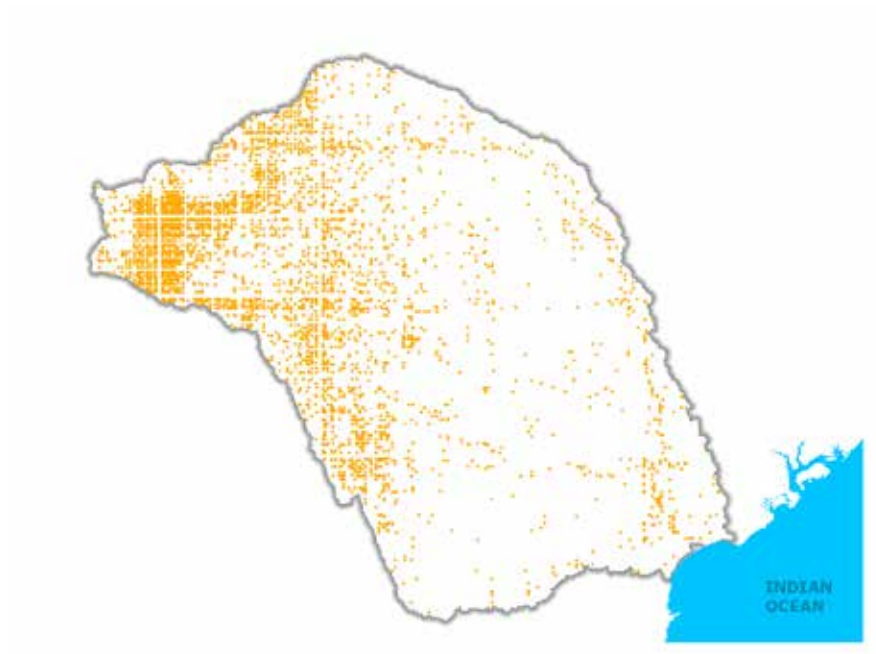
### Credits

Digitized by the GIS Unit at ILRI from Kenya topographic sheets of scale - 1:250,000 for Northern Kenya and 1:50,000 for rest of Kenya from Survey of Kenya. Created in August 2000 from the Kenya topographic sheets by GIS Unit at ILRI. Originally known as Kentowns.shp



## Villages

File Geodatabase Feature Class



### Tags

Village, rural settlement, Tana River Basin

### Summary

Villages extracted for the Tana River Basin area

### Description

This is a point coverage showing the villages in Kenya according to ACT database

### Credits

Russell Kruska ([r.kruska@cgiar.org](mailto:r.kruska@cgiar.org)), ILRI

## Urban settlement

File Geodatabase Feature Class



### Tags

Urban areas, imageryBaseMapsEarthCover, structure

### Summary

This dataset was extracted for the Tana River Basin area. These data were used in Map 1.3 and in other maps throughout the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset portrays urban areas in Kenya, from FAO's Africover dataset

### Credits

WRI

**Theme: Climate**

**Climate\_stations**

File Geodatabase Feature Class



Tags

Climate station, weather station, Tana, Kenya

Summary

Climate station location and temporal coverage history for the Tana River Basin area

Description

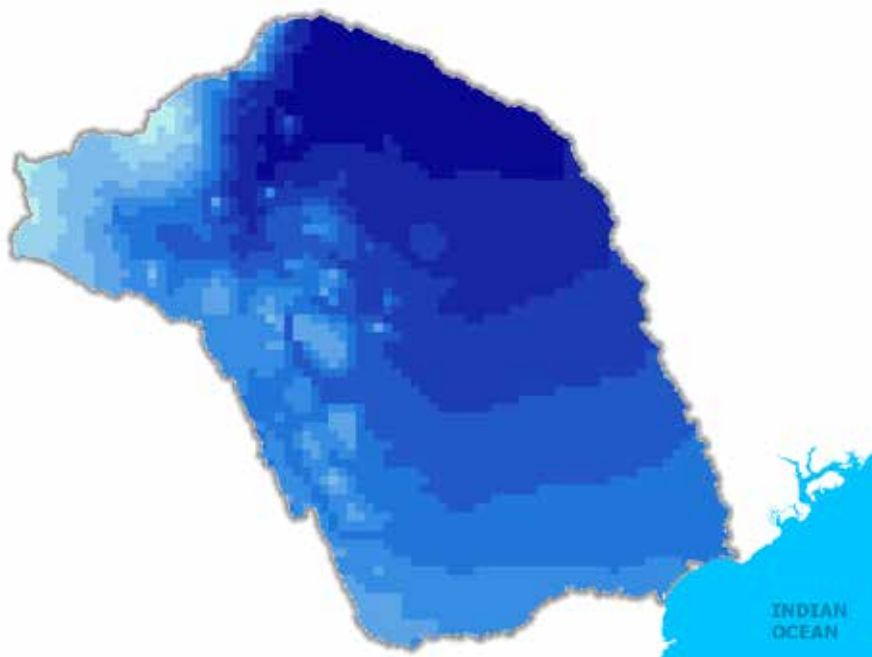
Location of climate station covering the Tana River basin area

Credits

Not available

## Climate\_surface

File Geodatabase Feature Class



### Tags

Climate, temperature, minimum, mean, maximum, ET, PET, Tana River Basin

### Summary

This dataset was extracted for the Tana River Basin area

### Description

This is a digital climate surface that combines a series of digital climate databases. It is a subset of a report produced by USAID's Development Strategies for Fragile Lands (DESFIL) project for USAID's Office of U. S. Foreign Disaster Assistance (OFDA) on the use of crop seed in disaster mitigation. It was intended for use by nongovernmental organizations (NGOs) that distribute seed, and donor agencies that support development and disaster assistance in the region, for accurate targeting of germplasm to appropriate areas

It lays a foundation for a decision support system for agriculture and natural resource management priority setting.

### Software

Annpre: Annual precipitation

Annpet: Annual evapotranspiration

Annppe: Annual P/PE

Annxt: Annual mean maximum temperature

Annit: Annual mean minimum temperature

Annmaxxt: Annual absolute maximum temperature

Annminit: Annual absolute minimum temperature

T05s1pre: First trigger season precipitation

T05s1pet: First trigger season evapotranspiration

T05s1ppe: First trigger season P/PE

T05s1xt: First trigger season mean maximum temperature

T05s1it: First trigger season mean minimum temperature

T05s1run: Number of months in the first trigger season

T05m1s1: First month of best trigger season

T05s2pre: second trigger season precipitation

T05s2pet: second trigger season evapotranspiration

T05s2ppe: second trigger season P/PE

T05s2xt: second trigger season mean maximum temperature

T05s2it: second trigger season mean minimum temperature

T05s2run: Number of months in the second trigger season

T05m1s2: First month of second best trigger season

Opt5mpre: Five-month optimum precipitation

Opt5mpet: Five-month optimum evapotranspiration

Opt5mppe: Five-month optimum P/PE

Opt5mxt: Five-month optimum mean maximum temperature

Opt5mit: Five-month optimum mean minimum temperature

Opt5mm1: First month of highest P/PE season

D05s1pre: Dry season precipitation

D05s1pet: Dry season evapotranspiration

D05s1ppe: Dry season P/PE

D05s1xt: Dry season mean maximum temperature

D05s1it: Dry season mean minimum temperature

D05s1run: Number of months in the first dry season

D05m1s1: 1st month of the first dry season

D05s2pre: Dry season precipitation

D05s2pet: Dry season evapotranspiration

D05s2ppe: Dry season P/PE

D05s2xt: Dry season mean maximum temperature

D05s2it: Dry season mean minimum temperature

D05s2run: Number of months in second dry season

D05m1s2: First month of the second dry season

Qdrypre: Driest quarter precipitation

Qdrypet: Driest quarter evapotranspiration

Qdryppe: Driest quarter P/PE

Qdryxt: Driest quarter mean maximum temperature

Qdryit: Driest quarter mean minimum temperature

Qdrym1: First month of driest quarter

Qcoolpre: Coolest quarter precipitation

Qcoolpet: Coolest quarter evapotranspiration

Qcoolppe: Coolest quarter P/PE

Qcoolxt: Coolest quarter mean maximum temperature

Qcoolit: Coolest quarter mean minimum temperature

Qcoolm1: First month of coolest quarter

Qwetpre: Wettest quarter precipitation

Qwetpet: Wettest quarter evapotranspiration

Qwetppe: Wettest quarter P/PE

Qwetxt: Wettest quarter mean maximum temperature

Qwetit: Wettest quarter mean minimum temperature

Qwetm1: First month of wettest quarter

Qwarmpre: Warmest quarter precipitation

Qwarmpet: Warmest quarter evapotranspiration

Qwarmppe: Warmest quarter P/PE

Qwarmxt: Warmest quarter mean maximum temperature

Qwarmit: Warmest quarter mean minimum temperature

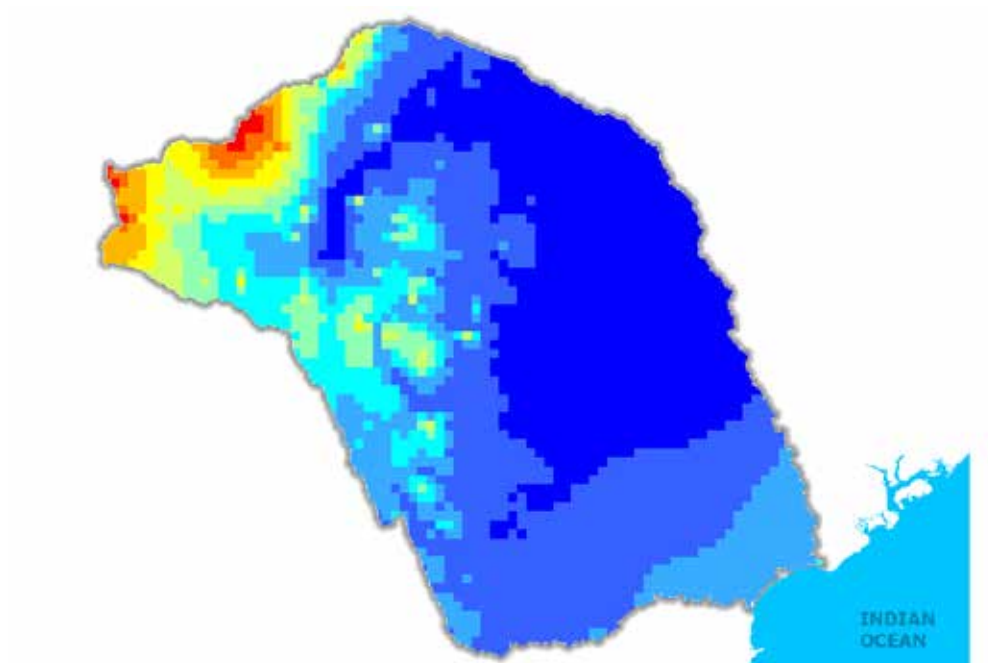
Qwarmm1: First month of warmest quarter

Credits

ACT database, originally called climod.shp. It is based on a report produced by USAID's DESFIL project

## Rainfall\_distribution

File Geodatabase Feature Class



### Tags

Rainfall

### Summary

This dataset was extracted for the Tana River Basin area

### Description

This coverage shows the annual rainfall distribution (in millimeters) for Kenya.

It was produced by JICA, National Water Master Plan, Kenya

### Credits

Digitized by JICA, National Water Master Plan, originally called rainfall

## Rainstations18901985

File Geodatabase Feature Class



### Tags

Rainfall station

### Summary

This dataset was extracted for the Tana River Basin

### Description

The coverage shows 110 rainfall stations with data recorded between 1890 and 1985. There are continuous data between 1890 and 1991 for one station and good data for 23 stations between 1961 and 1985

### Credits

Unknown, Originally called kermdata-99.exe



## Rainstations19911996

File Geodatabase Feature Class



### Tags

Rainfall station, temporal, precipitation

### Summary

This dataset was extracted for the Tana River Basin area

### Description

Coverage showing six rainfall stations in Kenya with rainfall data recorded between 1991 and 1996. Each of the stations has been uniquely identified with a code that is standard through the years

There are also datasets available separately in text format for the different stations as shown below

Contact: Philip Thornton ([p.thornton@cgiar.org](mailto:p.thornton@cgiar.org))

Twenty-one stations with data in calendar format from 1977 to 1997. The filenames are WMO<name>.RNF

The rainfall is specified in tenths of millimeters and there is a lot of data missing

Forty-three stations <name>.MET with daily data, solar radiation (in Langley's), maximum and minimum temperatures (in degrees centigrade) and rainfall (in millimeters) up to 1985

*Note:* Some of these data are 10 daily (taken at 10-day intervals) and their sources have been lost with time. Therefore, care has to be taken when working with these data

### Credits

Unknown, originally known as y1991.utm

## TanaRB\_soter

File Geodatabase Feature Class



### Tags

SOTER

### Summary

Point data SOTER

### Description

The Soil and Terrain database for the Upper Tana River Catchment (version 1.1) (SOTER\_UT\_v1.1) at scale 1:250,000 was compiled to support the Green Water Credits (GWC) program by creating a primary SOTER dataset for hydrological assessment of the basin. Kenya Soil Survey (KSS) of the Kenya Agricultural Research Institute (KARI-KSS) and ISRIC-World Soil Information compiled the SOTER\_UT dataset according to the standard SOTER methodology. The dataset includes both data of the original KENSOTER database (1:1M) for the Upper Tana Catchment and new SOTER units and soil profile data taken from other, existing soil surveys mainly at scale 100,000, and from more detailed studies.

### Credits

ISRIC - World Soil Information

## File Geodatabase Feature Class



## WRI

## ProtectedAreas

File Geodatabase Feature Class



### Tags

Parks, protected areas, environment, boundaries, Tana River Basin

### Summary

This dataset was extracted for the Tana River Basin. These data were used in maps throughout the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset shows protected areas in Kenya.

### Credits

WRI

## eba

File Geodatabase Feature Class



### Tags

Endemic bird areas, EBA, birds, biodiversity, environment, Tana River Basin

### Summary

This dataset was extracted for the Tana River Basin area. These data were used in Map 5.3 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

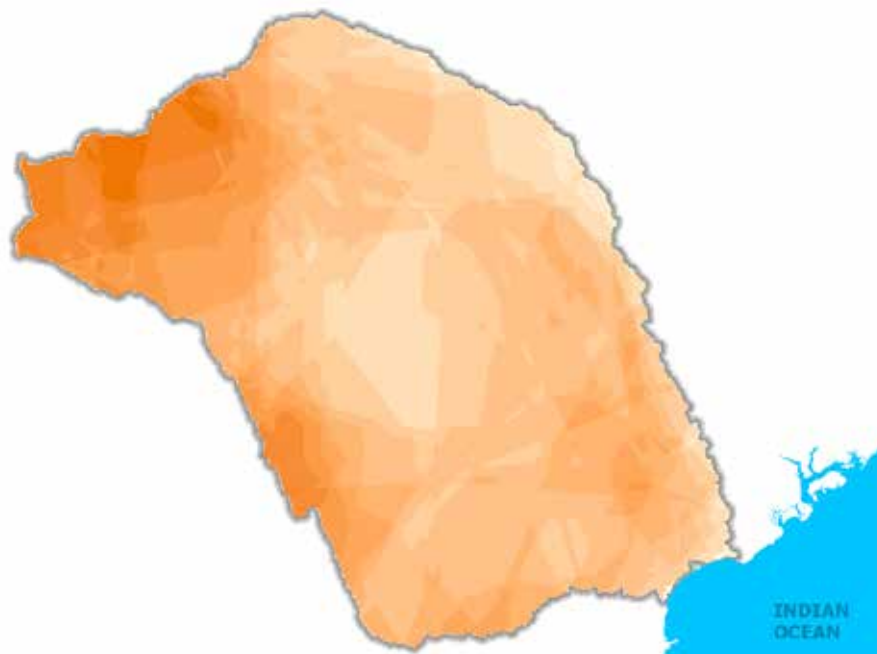
This dataset outlines Endemic Bird Areas (EBAs) in Kenya. EBAs are sites where two or more bird species of 'restricted range' (less than 50,000 km<sup>2</sup>) gather together in the same area

### Credits

WRI

## Mammals\_Diversity

File Geodatabase Feature Class



### Tags

Mammals, biodiversity, biota, environment, Tana River Basin

### Summary

This dataset was extracted for the Tana River Basin area. These data were used in Map 5.2 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset portrays the predicted mammal diversity (or the total number of mammal species) in Kenya

### Credits

WRI

## Turtle\_Breeding\_Site

File Geodatabase Feature Class



### Tags

Turtles, coastal, biodiversity, biota, environment, Tana River Basin

### Summary

This dataset was extracted for the Tana River Basin area. These data were used in Maps 6.4 and 6.5 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset portrays locations of turtle nesting and breeding sites on the eastern coast of Kenya

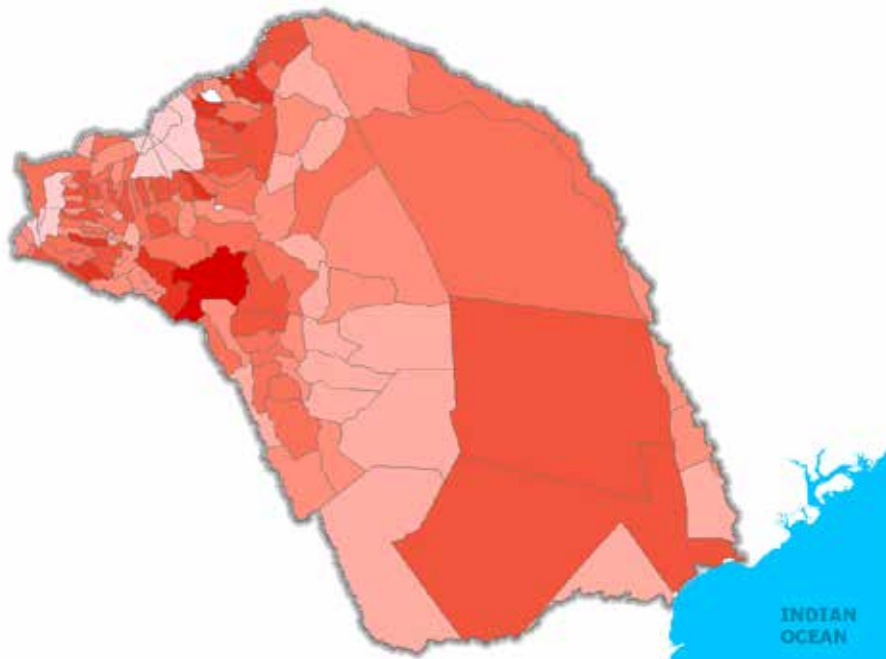
### Credits

WRI

**Theme: Demography**

**pop\_census1979**

File Geodatabase Feature Class



Tags

Population, density, demography, male, female, Tana River Basin

Summary

This dataset was extracted for the Tana River Basin area

Description

Coverage showing the 1979 population census carried out at the fourth administrative (location) level

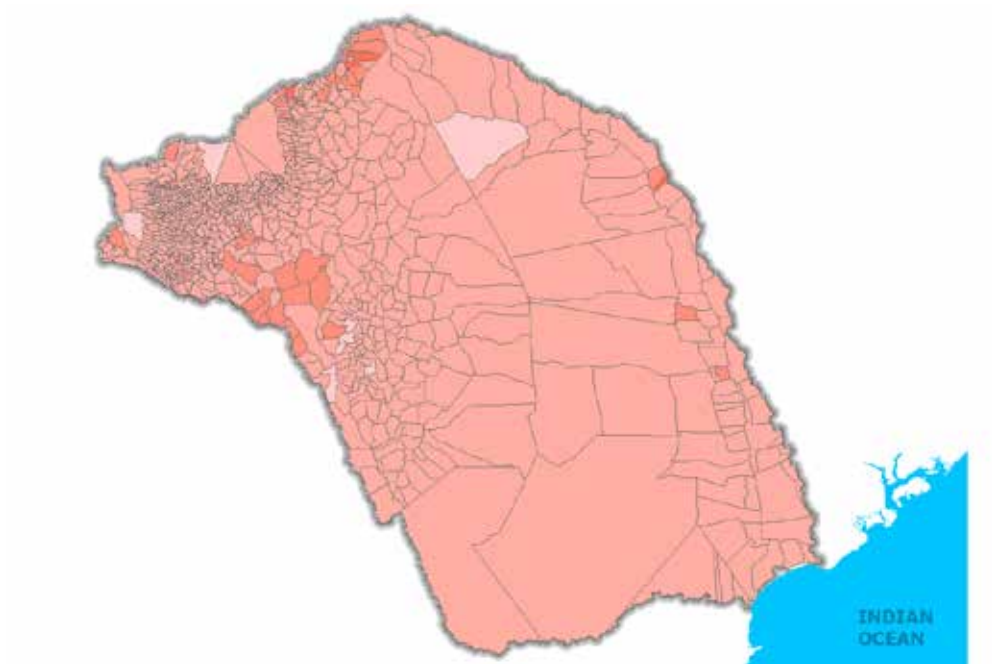
Credits

CBS, and Tropical Soil and Biological Fertility (TSBF) Institute, Nairobi, Kenya. Originally called kenloc79. ILRI



## pop\_census1989

File Geodatabase Feature Class



### Tags

Population, density, demography, male, female, Tana River Basin

### Summary

This dataset was extracted for the Tana River Basin

### Description

The coverage showing total population numbers and population density, as well as households and household densities carried out up to the fifth administrative level (sub-location) in 1989 for Kenya

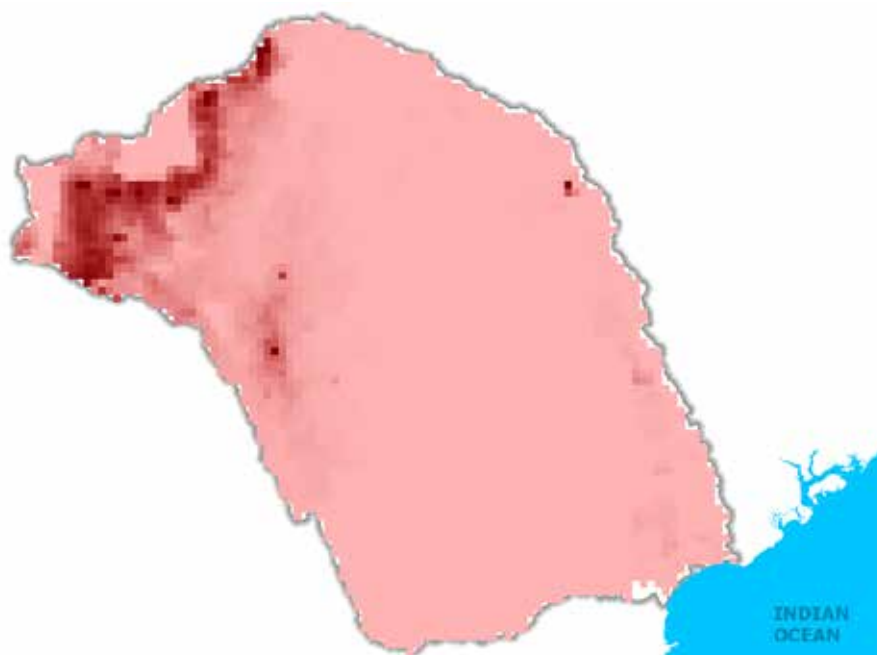
### Credits

Kenya Population Census of 1989 from CBS. This coverage was created at the GIS Unit at ILRI, Famine Early Warning Systems Network (FEWS NET) and TSBF, Nairobi, Kenya

Originally known as Kns189g.shp. ILRI

## pop1990\_dens

File Geodatabase Raster Dataset



### Tags

Population, density, demography

### Summary

This dataset was extracted for the Tana River Basin area

### Description

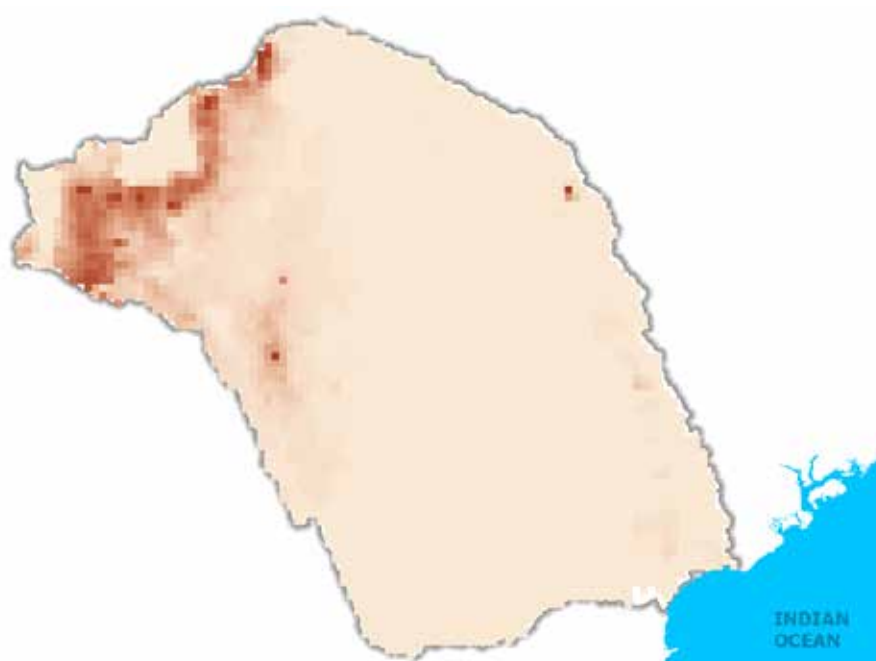
Gridded Population of the World, Version 3 (GPWv3), Future Estimates consists of estimates of human population for the years 2005, 2010 and 2015 by 2.5 arc-minute grid cells. A proportional allocation gridding algorithm, utilizing more than 300,000 national and sub-national administrative units, is used to assign population values to grid cells. The future estimate population values are extrapolated based on a combination of sub-national growth rates from census dates and national growth rates from United Nations statistics. All of the grids have been adjusted to match United Nations national-level population estimates. The population density grids are derived by dividing the population count grids by the land area grid and represent persons per square kilometer. The grids are available in various GIS-compatible data formats and geographic extents (global, continent [Antarctica not included] and country levels).

### Credits

GPWv3 is produced by the Center for International Earth Science Information Network (CIESIN), Columbia University, in collaboration with CIAT.

## pop1990\_tot

File Geodatabase Raster Dataset



### Tags

Population, density, demography

### Summary

This dataset was extracted for the Tana River Basin area

### Description

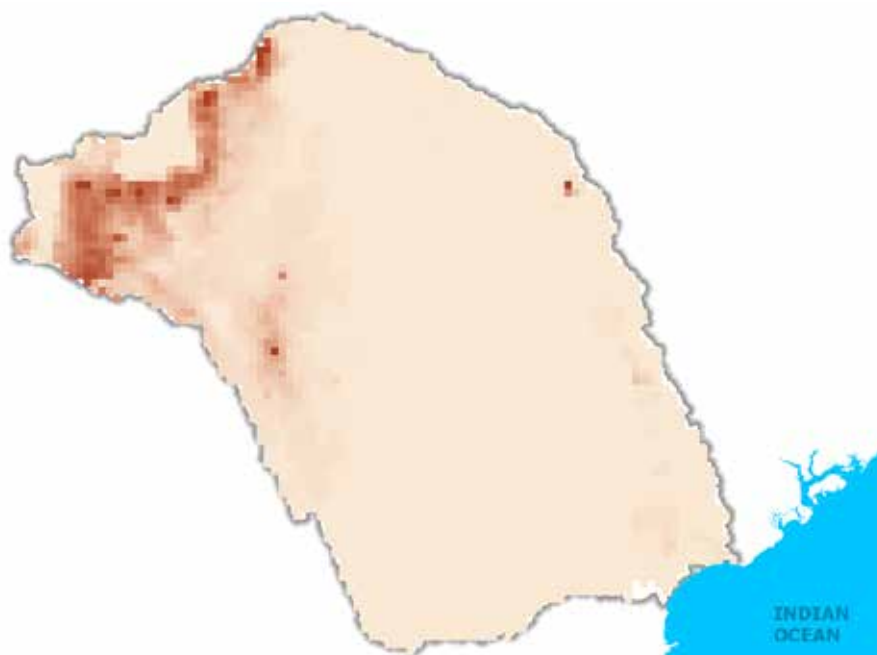
Gridded Population of the World, Version 3 (GPWv3) consists of estimates of human population for the years 1990, 1995 and 2000 by 2.5 arc-minute grid cells and associated datasets dated circa 2000. A proportional allocation gridding algorithm, utilizing more than 300,000 national and sub-national administrative units, is used to assign population values to grid cells. The population count grids contain estimates of the number of persons per grid cell. The grids are available in various GIS-compatible data formats and geographic extents (global, continent [Antarctica not included], and country levels). GPWv3 is produced by CIESIN, Columbia University, in collaboration with CIAT.

### Credits

CIESIN, Columbia University; FAO and CIAT

## pop1995\_dens

File Geodatabase Raster Dataset



### Tags

Population, density, demography

### Summary

This dataset was extracted for the Tana River Basin area

### Description

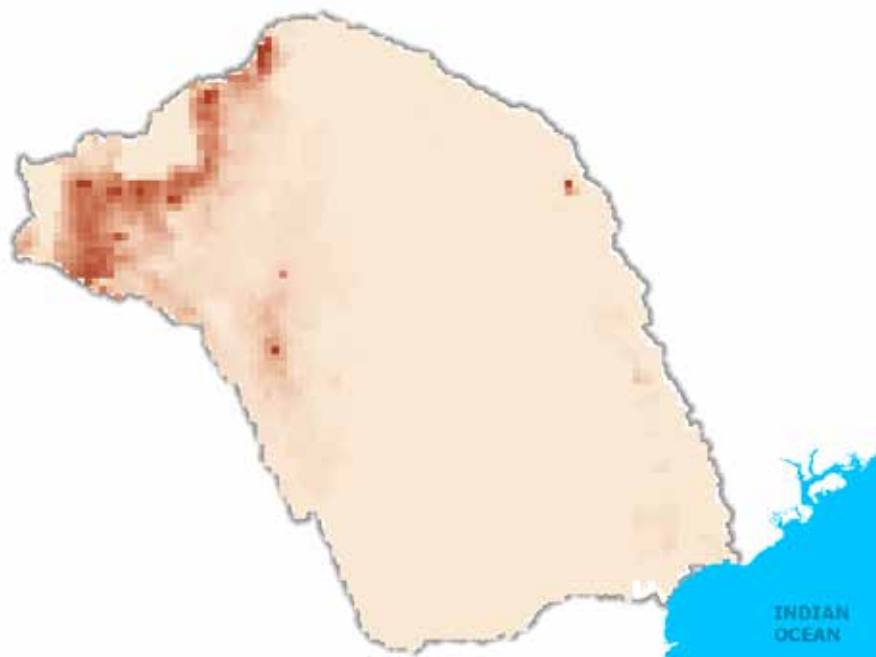
Gridded Population of the World, Version 3 (GPWv3), Future Estimates consists of estimates of human population for the years 2005, 2010 and 2015 by 2.5 arc-minute grid cells. A proportional allocation gridding algorithm, utilizing more than 300,000 national and sub-national administrative units, is used to assign population values to grid cells. The future estimate population values are extrapolated based on a combination of sub-national growth rates from census dates and national growth rates from United Nations statistics. All of the grids have been adjusted to match United Nations national-level population estimates. The population density grids are derived by dividing the population count grids by the land area grid and represent persons per square kilometer. The grids are available in various GIS-compatible data formats and geographic extents (global, continent [Antarctica not included], and country levels). GPWv3 is produced by CIESIN, Columbia University, in collaboration with CIAT.

### Credits

GPWv3 is produced by the CIESIN, Columbia University, in collaboration with CIAT

## Pop1995\_tot

File Geodatabase Raster Dataset



### Tags

Population, density, demography

### Summary

This dataset was extracted for the Tana River Basin area

### Description

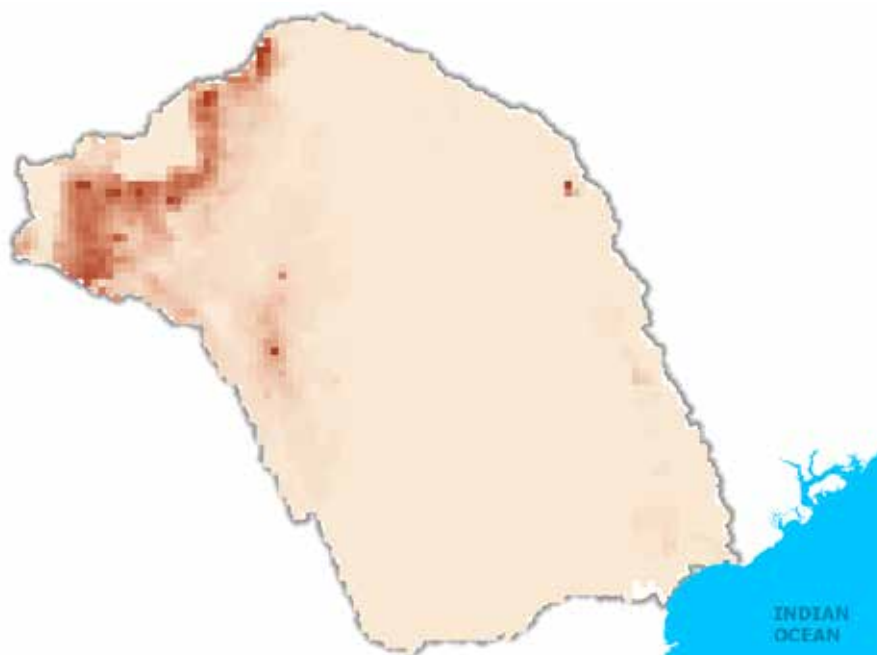
Gridded Population of the World, Version 3 (GPWv3) consists of estimates of human population for the years 1990, 1995 and 2000 by 2.5 arc-minute grid cells and associated datasets dated circa 2000. A proportional allocation gridding algorithm, utilizing more than 300,000 national and sub-national administrative units, is used to assign population values to grid cells. The population count grids contain estimates of the number of persons per grid cell. The grids are available in various GIS-compatible data formats and geographic extents (global, continent [Antarctica not included], and country levels). GPWv3 is produced by CIESIN, Columbia University, in collaboration with CIAT.

### Credits

CIESIN, Columbia University; FAO; and CIAT

## pop2000\_dens

File Geodatabase Raster Dataset



### Tags

Population, density, demography

### Summary

This dataset was extracted for the Tana River Basin area

### Description

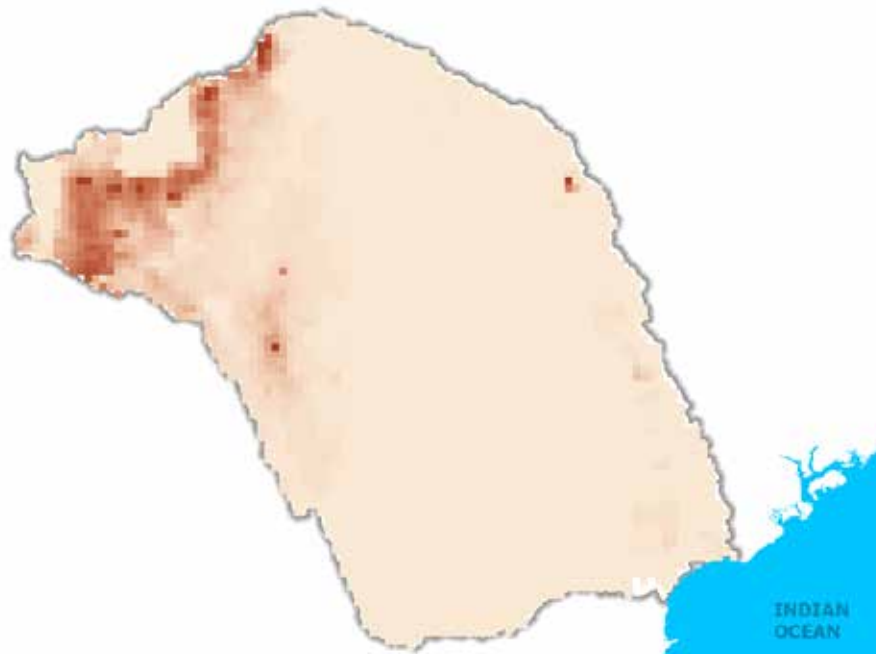
Gridded Population of the World, Version 3 (GPWv3), Future Estimates consists of estimates of human population for the years 2005, 2010 and 2015 by 2.5 arc-minute grid cells. A proportional allocation gridding algorithm, utilizing more than 300,000 national and sub-national administrative units, is used to assign population values to grid cells. The future estimate population values are extrapolated based on a combination of sub-national growth rates from census dates and national growth rates from United Nations statistics. All of the grids have been adjusted to match United Nations national-level population estimates. The population density grids are derived by dividing the population count grids by the land area grid and represent persons per square kilometer. The grids are available in various GIS-compatible data formats and geographic extents (global, continent [Antarctica not included], and country levels). GPWv3 is produced by CIESIN, Columbia University, in collaboration with CIAT.

### Credits

GPWv3 is produced by CIESIN, Columbia University, in collaboration with CIAT

## pop2000\_tot

File Geodatabase Raster Dataset



### Tags

Population, density, demography

### Summary

This dataset was extracted for the Tana River Basin area

### Description

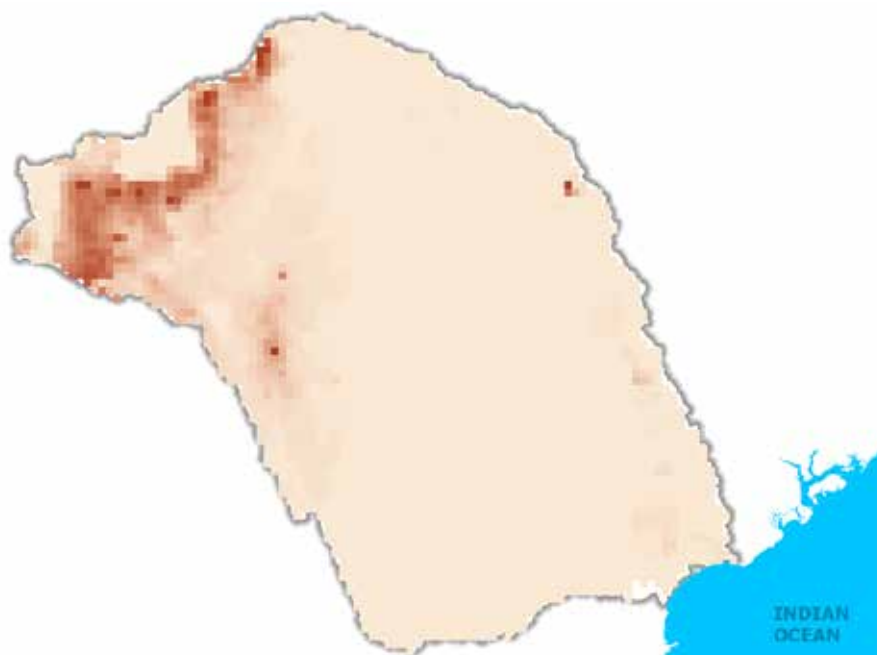
Gridded Population of the World, Version 3 (GPWv3) consists of estimates of human population for the years 1990, 1995 and 2000 by 2.5 arc-minute grid cells and associated datasets dated circa 2000. A proportional allocation gridding algorithm, utilizing more than 300,000 national and sub-national administrative units, is used to assign population values to grid cells. The population count grids contain estimates of the number of persons per grid cell. The grids are available in various GIS-compatible data formats and geographic extents (global, continent [Antarctica not included], and country levels). GPWv3 is produced by CIESIN, Columbia University, in collaboration with CIAT.

### Credits

CIESIN, Columbia University; FAO; and CIAT

## pop2005\_dens

File Geodatabase Raster Dataset



### Tags

Population, density, demography

### Summary

This dataset was extracted for the Tana River Basin area

### Description

Gridded Population of the World, Version 3 (GPWv3), Future Estimates consists of estimates of human population for the years 2005, 2010 and 2015 by 2.5 arc-minute grid cells. A proportional allocation gridding algorithm, utilizing more than 300,000 national and sub-national administrative units, is used to assign population values to grid cells. The future estimate population values are extrapolated based on a combination of sub-national growth rates from census dates and national growth rates from United Nations statistics. All of the grids have been adjusted to match United Nations national-level population estimates. The population density grids are derived by dividing the population count grids by the land area grid and represent persons per square kilometer. The grids are available in various GIS-compatible data formats and geographic extents (global, continent [Antarctica not included], and country levels). GPWv3 is produced by CIESIN, Columbia University, in collaboration with CIAT.

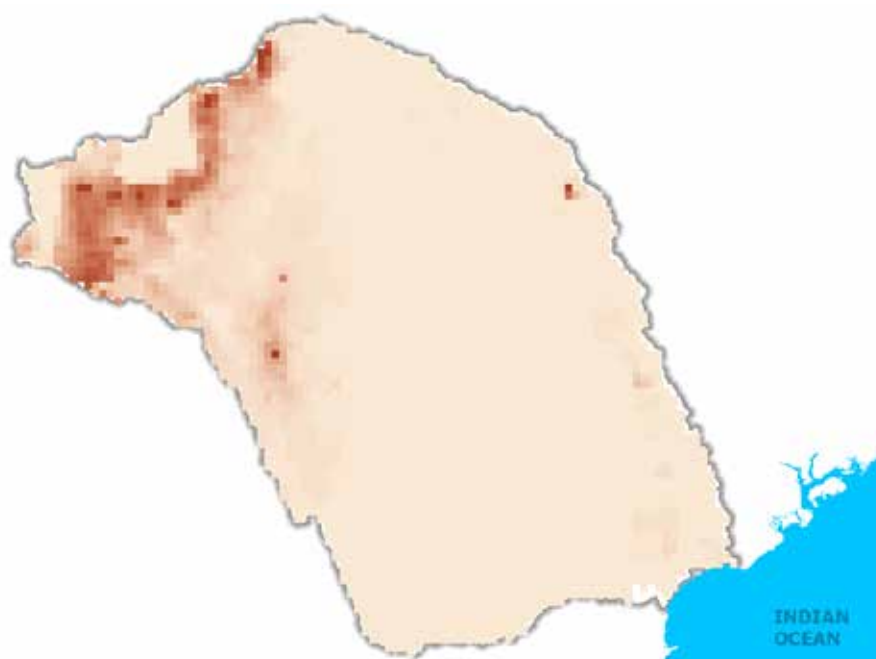
### Credits

GPWv3 is produced by CIESIN, Columbia University, in collaboration with CIAT



## pop2005\_tot

File Geodatabase Raster Dataset



### Tags

Population, density, demography

### Summary

This dataset was extracted for the Tana River Basin area

### Description

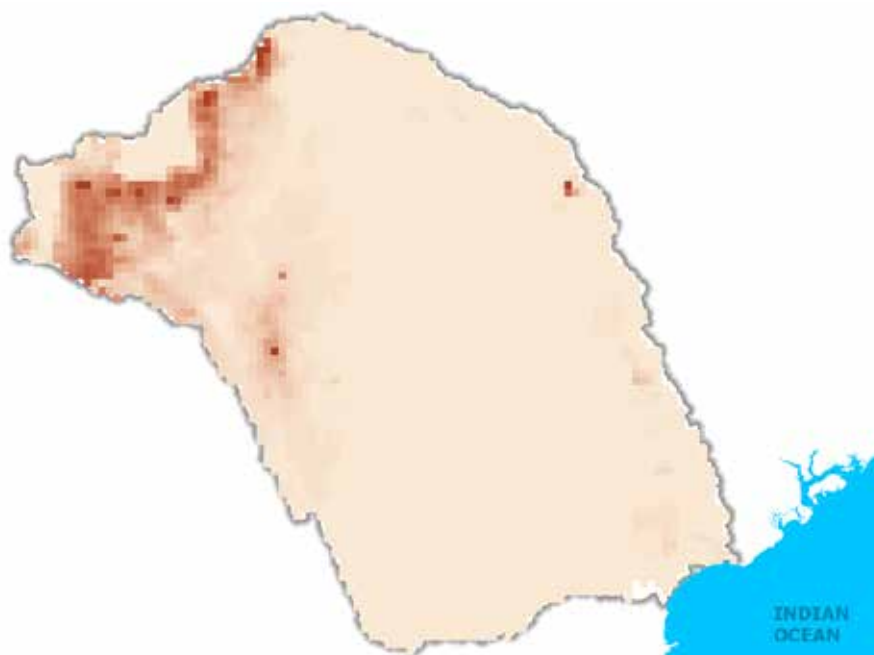
Gridded Population of the World, Version 3 (GPWv3) consists of estimates of human population for the years 1990, 1995 and 2000 by 2.5 arc-minute grid cells and associated datasets dated circa 2000. A proportional allocation gridding algorithm, utilizing more than 300,000 national and sub-national administrative units, is used to assign population values to grid cells. The population count grids contain estimates of the number of persons per grid cell. The grids are available in various GIS-compatible data formats and geographic extents (global, continent [Antarctica not included], and country levels). GPWv3 is produced CIESIN, Columbia University, in collaboration with CIAT.

### Credits

CIESIN, Columbia University; FAO; and CIAT

## pop2010\_dens

File Geodatabase Raster Dataset



### Tags

Population, density, demography

### Summary

This dataset was extracted for the Tana River Basin area

### Description

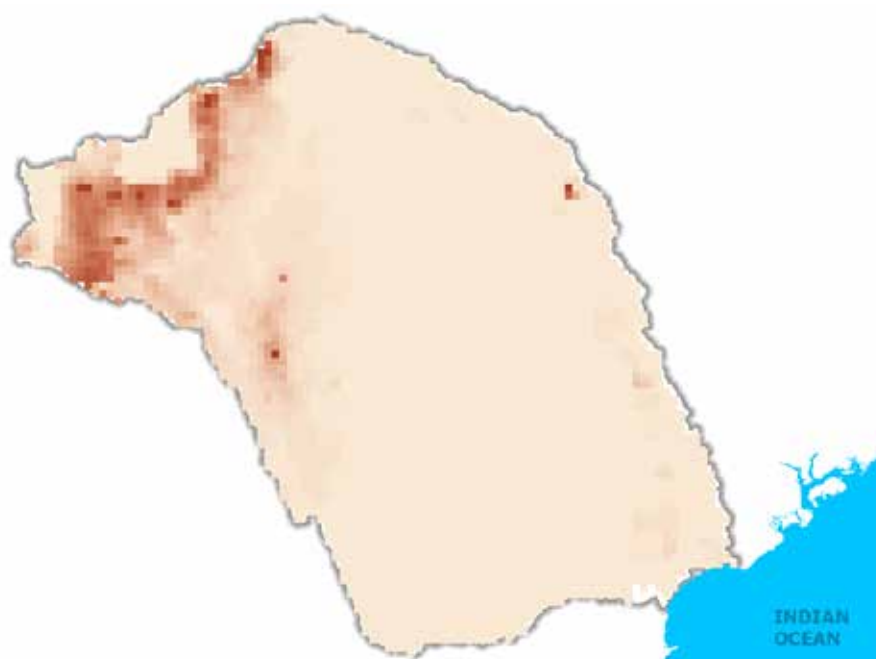
Gridded Population of the World, Version 3 (GPWv3), Future Estimates consists of estimates of human population for the years 2005, 2010 and 2015 by 2.5 arc-minute grid cells. A proportional allocation gridding algorithm, utilizing more than 300,000 national and sub-national administrative units, is used to assign population values to grid cells. The future estimate population values are extrapolated based on a combination of sub-national growth rates from census dates and national growth rates from United Nations statistics. All of the grids have been adjusted to match United Nations national-level population estimates. The population density grids are derived by dividing the population count grids by the land area grid and represent persons per square kilometer. The grids are available in various GIS-compatible data formats and geographic extents (global, continent [Antarctica not included], and country levels). GPWv3 is produced by CIESIN, Columbia University, in collaboration with CIAT.

### Credits

CIESIN, Columbia University, in collaboration with CIAT

## pop2010\_tot

File Geodatabase Raster Dataset



### Tags

Population, density, demography

### Summary

This dataset was extracted for the Tana River Basin area

### Description

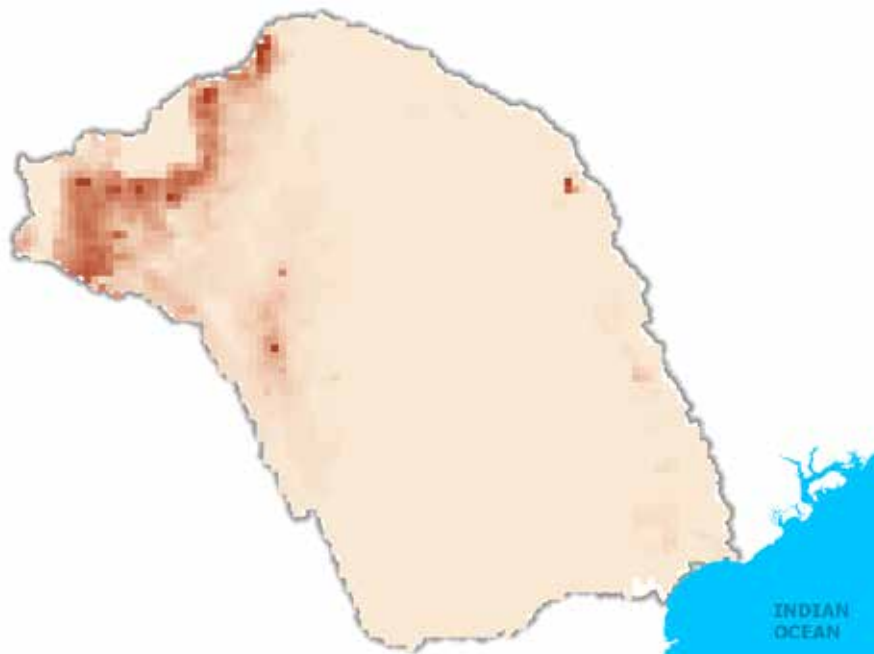
Gridded Population of the World, Version 3 (GPWv3) consists of estimates of human population for the years 1990, 1995 and 2000 by 2.5 arc-minute grid cells and associated datasets dated circa 2000. A proportional allocation gridding algorithm, utilizing more than 300,000 national and sub-national administrative units, is used to assign population values to grid cells. The population count grids contain estimates of the number of persons per grid cell. The grids are available in various GIS-compatible data formats and geographic extents (global, continent [Antarctica not included], and country levels). GPWv3 is produced by CIESIN, Columbia University, in collaboration with CIAT.

### Credits

CIESIN, Columbia University; FAO; and CIAT

## pop2015\_dens

File Geodatabase Raster Dataset



### Tags

Population, density, demography

### Summary

This dataset was extracted for the Tana River Basin area

### Description

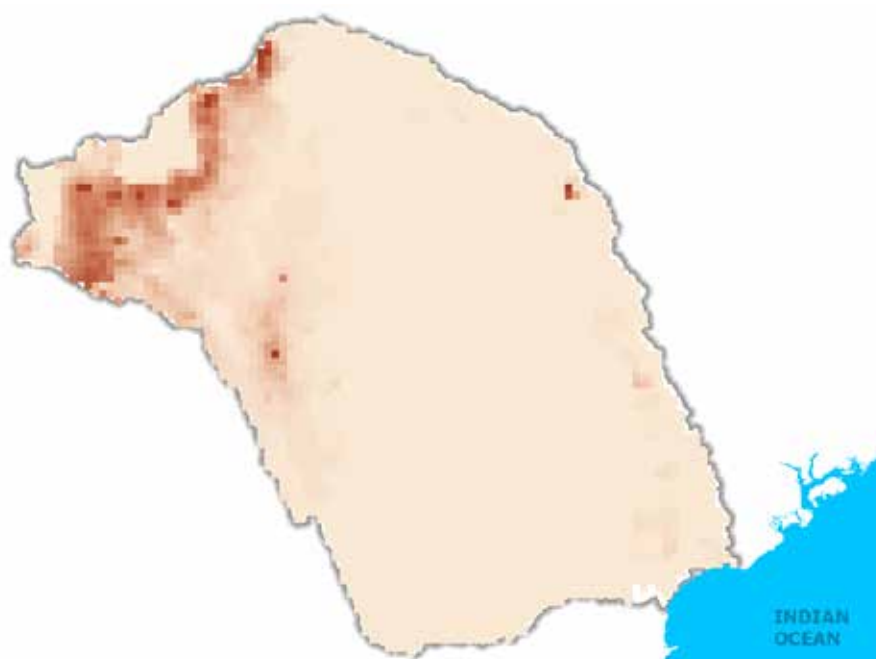
Gridded Population of the World, Version 3 (GPWv3), Future Estimates consists of estimates of human population for the years 2005, 2010 and 2015 by 2.5 arc-minute grid cells. A proportional allocation gridding algorithm, utilizing more than 300,000 national and sub-national administrative units, is used to assign population values to grid cells. The future estimate population values are extrapolated based on a combination of sub-national growth rates from census dates and national growth rates from United Nations statistics. All of the grids have been adjusted to match United Nations national-level population estimates. The population density grids are derived by dividing the population count grids by the land area grid and represent persons per square kilometer. The grids are available in various GIS-compatible data formats and geographic extents (global, continent [Antarctica not included], and country levels). GPWv3 is produced by CIESIN, Columbia University, in collaboration with CIAT.

### Credits

GPWv3 is produced by CIESIN, Columbia University, in collaboration with CIAT

## pop2015\_tot

File Geodatabase Raster Dataset



### Tags

Population, density, demography

### Summary

This dataset was extracted for the Tana River Basin area

### Description

Gridded Population of the World, Version 3 (GPWv3) consists of estimates of human population for the years 1990, 1995 and 2000 by 2.5 arc-minute grid cells and associated datasets dated circa 2000. A proportional allocation gridding algorithm, utilizing more than 300,000 national and sub-national administrative units, is used to assign population values to grid cells. The population count grids contain estimates of the number of persons per grid cell. The grids are available in various GIS-compatible data formats and geographic extents (global, continent [Antarctica not included], and country levels). GPWv3 is produced by CIESIN, Columbia University, in collaboration with CIAT.

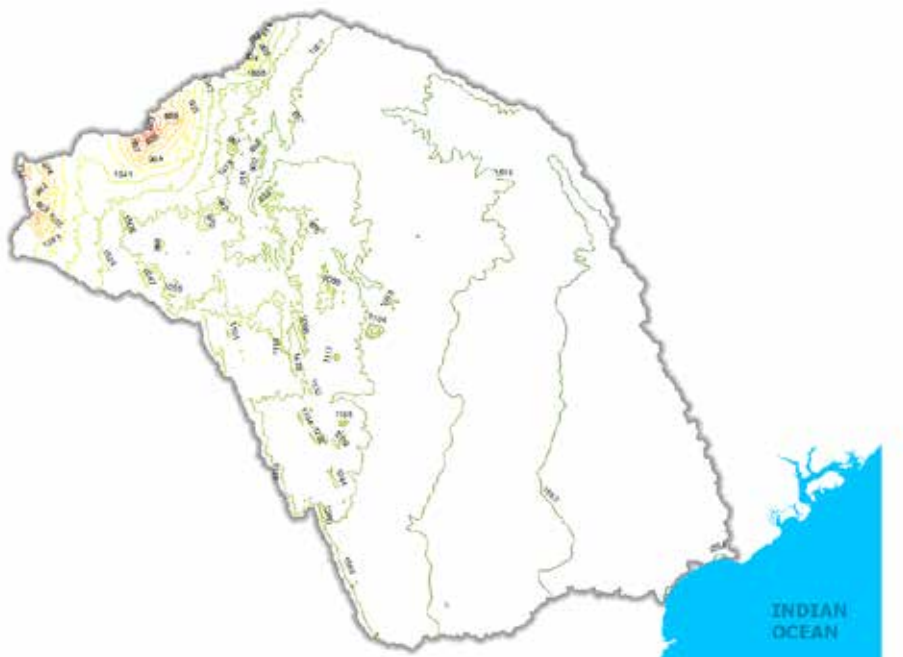
### Credits

CIESIN, Columbia University; FAO; and CIAT

## Theme: Elevation

### contours

File Geodatabase Feature Class



### Tags

contour, elevation, topography, Tana River Basin

### Summary

This dataset was extracted for the Tana River Basin

### Description

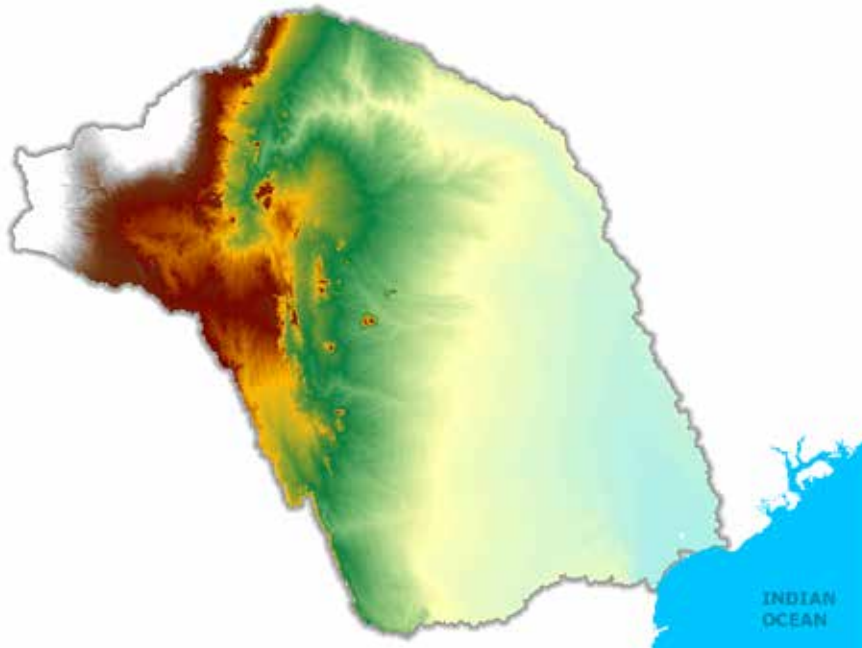
The coverage shows the elevation of Kenya according to the ACT database. It is at an interval of 1,000 meters.

### Credits

ACT database, originally called contours.shp, GIS Unit at ILRI

## dem90m

File Geodatabase Raster Dataset



### Tags

Digital elevation model, topography

### Summary

This dataset was extracted for the Tana River Basin area

### Description

PROCESSED SHUTTLE RADAR TOPOGRAPHY MISSION (SRTM) DATA VERSION 4.1

The data distributed here are in ARC GRID, ARC ASCII and GeoTIFF formats, in decimal degrees and datum World Geodetic System (WGS) 84. They are derived from the United States Geological Survey (USGS)/National Aeronautics and Space Administration (NASA) SRTM data.

CIAT has processed these data to provide seamless, continuous topography surfaces. Areas of regions with no data in the original SRTM data have been filled using interpolation methods described by Jarvis et al. (2008).

Version 4.1 has the following enhancements over V4.0:

- Improved ocean mask used, which includes some small islands previously lost in the cut data.
- Single no-data line of pixels along meridians fixed.
- All GeoTIFFs with 6,000 x 6,000 pixels.
- For ASCII format files, the projection definition is included in .prj files.
- For GeoTIFF format files, the projection definition is in the .tfw (ESRI TIFF World) and a .hdr file that reports PROJ.4 equivalent projection definitions.

### Credits

Jarvis A.; Reuter, H.I.; Nelson, A.; Guevara, E. 2008. Hole-filled seamless SRTM data V4. International Center for Tropical Agriculture (CIAT). Available at <http://srtm.csi.cgiar.org> (accessed on May 11, 2016).

## hillshade

File Geodatabase Raster Dataset



### Tags

Hillshade

### Summary

This dataset was extracted into a subset for the Tana River Basin area.

Hillshade layer derived from SRTM DEM 90 meter by using the ArcGIS spatial analyst surface hillshade tool.

### Credits

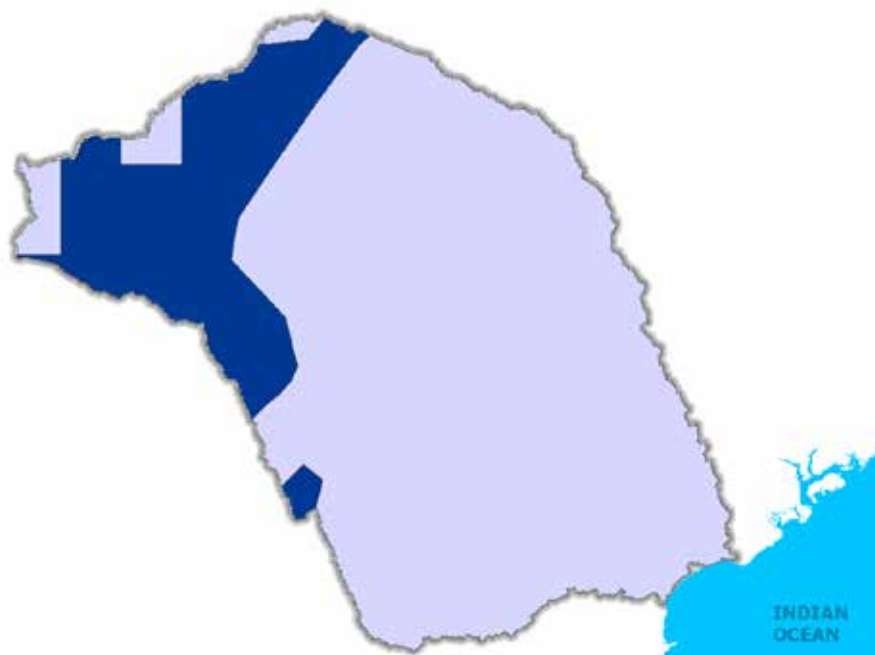
International Water Management Institute (IWMI)



## Theme: Epidemiology

### ecf\_distribution

File Geodatabase Feature Class



#### Tags

East Coast Fever, Tana River Basin

#### Summary

This dataset was extracted for the Tana River Basin area

#### Description

Coverage showing the distribution of East Coast Fever (ECF) in Kenya. The distribution of *Theileria parva* based on epidemiological surveys (FAO 1975) have been compiled and mapped by Lessard et al. (1990). The map also includes 'expert opinion' based on an extensive survey of local experts.

#### Credits

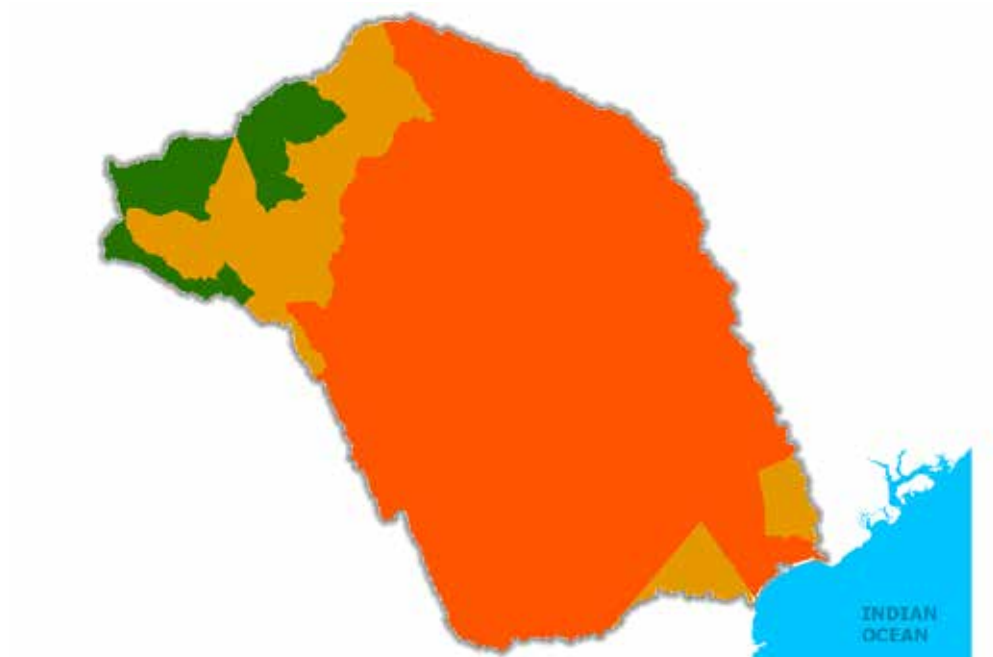
FAO (Food and Agriculture Organization of the United Nations). 1975. *Kenya: Epizootological survey of tick-borne cattle diseases*. AG: RWA/77/006. Rome: Food and Agriculture Organization of the United Nations (FAO).

Lessard, P.; L'Eplattenier, R.; Norval, R.A.; Kundert, K.; Dolan, T.T.; Croze, H.; Walker, J.B.; Irvin, A.D.; Perry, B.D. 1990. Geographical information systems for studying the epidemiology of cattle diseases caused by *Theileria parva*. *The Veterinary Record* 126(11): 255-262.

Digitized by the GIS Unit at ILRI

## malaria\_zones

File Geodatabase Feature Class



### Tags

Malaria, health, disease, Tana River Basin

### Summary

This dataset was extracted for the Tana River Basin

### Description

This coverage shows the classification of malarial endemicity in Kenya carried out at district level by Wellcome Trust.

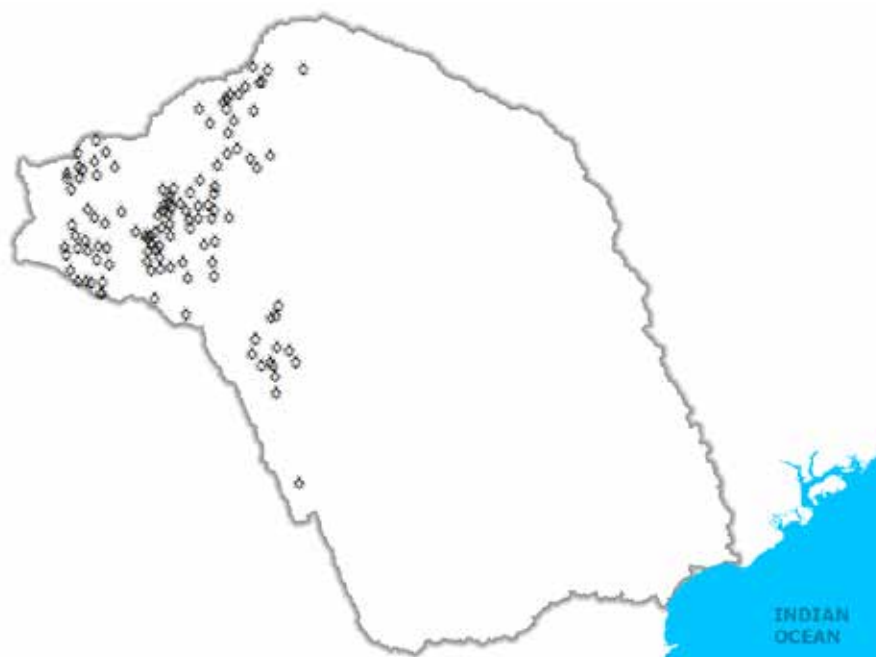
Some of the districts represented in this shape file, which are not in the Kenya\_district98, were carved out using the District Development Plan reports and the 1999 CBS maps.

### Credits

A Noor at Wellcome Trust

## r\_appendiculatus

File Geodatabase Feature Class



### Tags

Brown ear tick, R. appendiculatus

### Summary

This dataset was extracted for the Tana River Basin area

### Description

Recorded occurrence of the Brown Ear Tick (*R. appendiculatus*) in Kenya (and 14 other African countries) has been compiled by Lessard et al. 1990. For Kenya, these data are based primarily on collections by Walker 1974. Lessard's dataset comprises 894 records of *R. appendiculatus* and reference to the source of data is available with Brian Perry.

### Credits

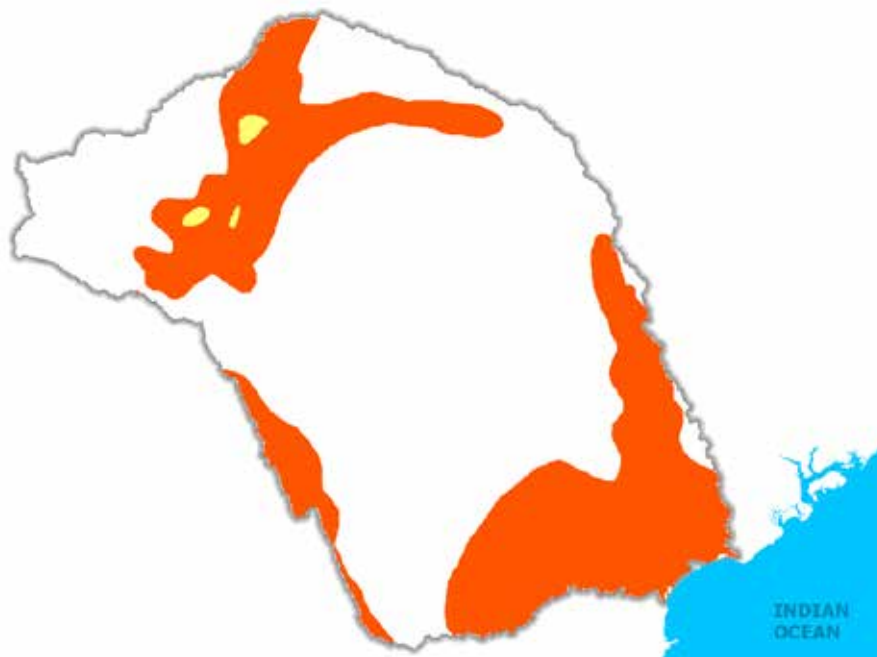
Lessard, P.; L'Eplattenier, R.; Norval, R.A.; Kundert, K.; Dolan, T.T.; Croze, H.; Walker, J.B.; Irvin, A.D.; Perry, B.D. 1990. Geographical information systems for studying the epidemiology of cattle diseases caused by *Theileria parva*. *The Veterinary Record* 126(11): 255-262.

Walker, J.B. 1974. *The ixodid ticks of Kenya: A review of present knowledge of their hosts and distribution*. London: Commonwealth Institute of Entomology.

Digitized by the GIS Unit at ILRI. Originally called krapnts.

## tsetse\_distribution

File Geodatabase Feature Class



### Tags

Tsetse distribution

### Summary

This dataset was extracted for the Tana River Basin

### Description

This coverage shows tsetse distribution in Kenya. The original map is based on Ford and Katondo's (1977) distribution maps – modified with data generated by Kenya Trypanosomiasis Research Institute (KETRI).

### Credits

Ford, J.; Katondo, K.M. 1977. Maps of tsetse fly (*Glossina*) distribution in Africa, 1973, according to sub-generic groups on a scale of 1:5,000,000. *Bulletin of Animal Health and Production in Africa* 15: 188-193. Nairobi: Organization of African Unity/Scientific and Technical Research Commission (OAU/STRC). (Map). Originally called ken\_tst, GIS Unit at ILRI.

## Theme: Geology

### lithology

File Geodatabase Feature Class



### Tags

Kenya lithology, Tana River Basin

### Summary

This dataset was extracted for the Tana River Basin area. Used for the soil study.

### Description

Coverage showing the lithology of Kenya, based on Kenya\_SOTER. For each SOTER unit, a generalized description of the consolidated or unconsolidated surface material, underlying the larger part of the terrain, is given. Major differentiating criteria are petrology and mineralogical composition.

### Credits

GIS Unit, ILRI

## Theme: Hydrography

### TanaRiverBasin

File Geodatabase Feature Class



#### Tags

River basin, watershed, catchment, Tana

#### Summary

Tana River Basin hydrological boundary

#### Description

Tana River Basin boundary delineated based on SRTM DEM 90-meter resolution by using the Soil and Water Assessment Tool (SWAT) model. Dr. Tracy Baker, formerly Researcher – Hydrology/Hydrological Modeling, International Water Management Institute (IWMI)

#### Credits

International Water Management Institute (IWMI)

## Streams

File Geodatabase Feature Class



### Tags

stream network, natural drainage

### Summary

Tana River Basin streams

### Description

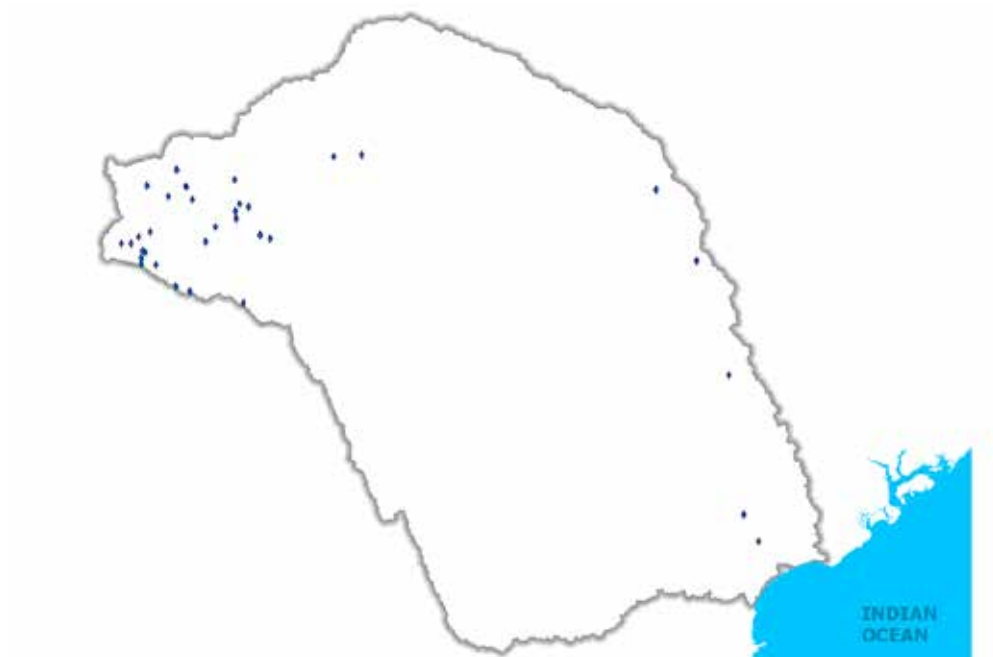
Streams in the Tana River Basin are generated from SRTM DEM 90 meter resolution by using the SWAT model. Dr. Tracy Baker, Researcher – Hydrology/Hydrological Modeling, International Water Management Institute (IWMI)

### Credits

International Water Management Institute (IWMI)

## StreamGauges

File Geodatabase Feature Class



### Tags

Gauging station, monitoring flow, measuring discharge

### Summary

Tana River gauging stations, where total accumulated flow is measured for a catchment.

### Description

There are 159 river gauging stations (RGS) run by WRMA and KMD stations are currently working

### Credits

International Water Management Institute (IWMI)



## Water\_Bodies

File Geodatabase Feature Class



### Tags

waterbodies, lakes, imageryBaseMapsEarthCover, inlandWaters

### Summary

These data were used in maps throughout the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

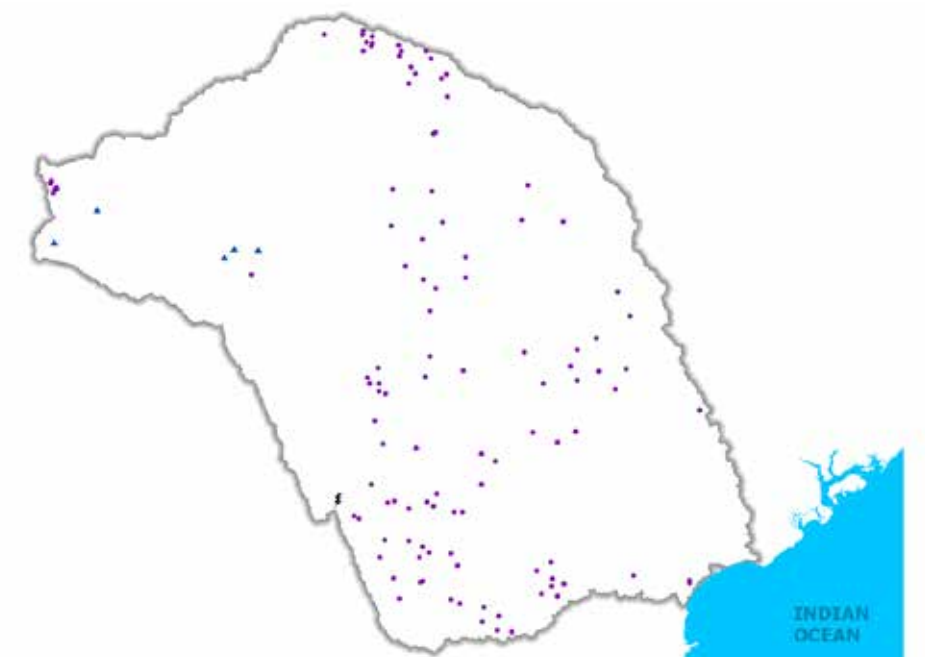
This dataset portrays waterbodies in Kenya, from FAO's Africover dataset.

### Credits

WRI

## WaterPoints

File Geodatabase Feature Class



### Tags

Dams, falls, rapids, springs, wells and water holes

### Summary

This dataset was extracted for the Tana River Basin area

### Description

The coverage shows the distribution of water points and related features in Kenya as described in the ACT database. The water points in this coverage include dams, falls, rapids, springs, wells and water holes.

### Credits

ACT database map history: Originally called hyddnpoint, ILRI

## Theme: Land Use

### AgroEcologicalZones

File Geodatabase Feature Class



#### Tags

Agro-ecological zone, per humid, humid, sub-humid, semi-humid, transitional, semi-arid, arid, per arid

#### Summary

Agro-ecological zones, Tana River Basin

#### Description

Coverage showing the agro-ecological zones of Kenya based on temperature belts (maximum temperature limits within which the main crops of Kenya can flourish) and the main zones (probability of meeting the temperature and water requirements of the leading crops, i.e., the climatic yield potential). Its aim is to provide the framework for ecological land-use potential.

This coverage does not include information on the non-cultivated (pastoralist) areas. There is, however, a grid layer - Kenya\_LGP\_Aez - based on the length of the growing period prepared by FAO, which has information on the whole country and is available in the database.

Aezone: The agro-ecological zone

#### Main zones

(0) per humid, (1) humid, (2) sub-humid, (3) semi-humid, (4) transitional, (5) semi-arid, (6) arid, and (7) per arid

#### Temperature belts

(TA) Tropical alpine (annual mean temperature, 2-10 degrees)

(UH) Upper highland (annual mean temperature, 10-15 degrees, occasional night frost)

(LH) Lower highland (annual mean temperature, 15-18 degrees, M.min 8-11, normal, no frost)

(UM) Upper midland (annual mean temperature, 18-21 degrees, M.min 11-14)

(LM) Lower midland (annual mean temperature, 21-24 degrees, M.mean > 14 degrees)

(IL) Inner lowland (annual mean temperature > 24 degrees, M.maximum > 31 degrees)

(CL) Coastal lowland (annual mean temperature > 24, M.maximum < 31 degrees)

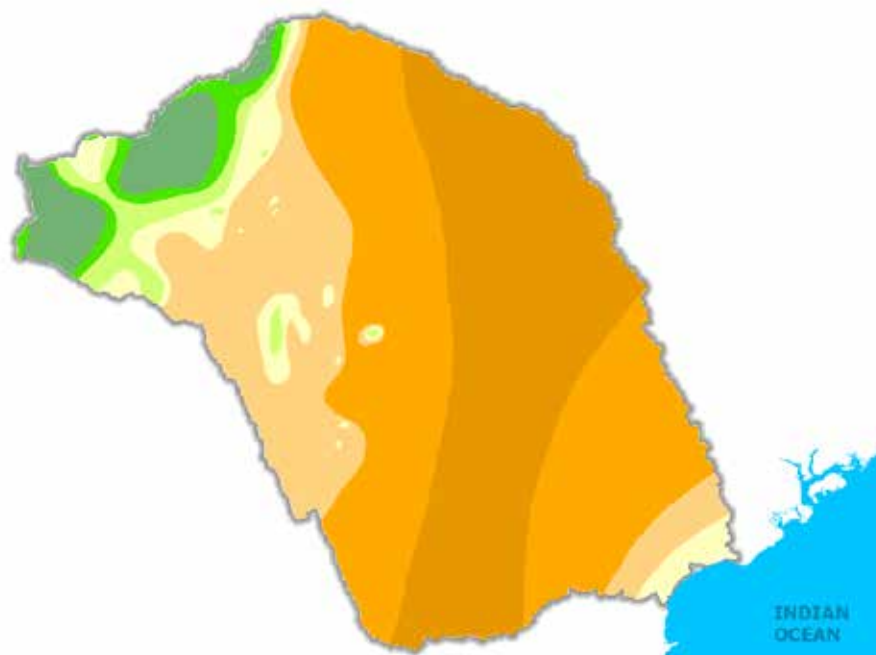
#### Credits

Agro-ecological zones are based on the *Farm management handbook of Kenya*, Digitized by Kenya Soil Survey (KSS) and Kenya Agricultural Research Institute (KARI)

Ralph Jaetzold and Helmut Schmidt, volumes 1-3, Ministry of Agriculture, Nairobi, Kenya, and the German Agricultural Team of Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, 1983, ILRI

## Aczones

File Geodatabase Feature Class



### Tags

Agro-climatic zones

### Summary

Agro-climatic zone, Tana River Basin

### Description

This coverage is derived from the Exploratory Soil Survey Report number E1, Kenya Soil survey, Nairobi, 1982, and shows the principle agro-climatic zones of Kenya based on a combination of both moisture availability zones (I-IV) and temperature zones (1-9).

### Additional attribute information

Shape: Internally generated by Arc/info

Area: Internally generated by Arc/info

Perimeter: Internally generated by Arc/info

Kacz\_: Internally generated by Arc/info

Kacz\_Id: Internally generated by Arc/info

Zone: Agro-climatic zone based on temperature zones (1-9) and moisture availability zone (I-VII) as shown below

The first digit (translated from the roman numbers) represents the moisture availability zones, e.g., VII becomes 7

The second digit represents the temperature zones. Therefore, 71 in the coverage represents Zone VII-1.

The moisture availability and temperature zones are outlined below:

Moisture availability zones

(I) > 80-humid, (II) 65-80-sub-humid, (III) 50-65-semi-humid, (IV) 40-50-semi-humid to semi-arid, (V) 25-40-semi-arid, (VI) 15-25-arid, and (VII) < 15-very arid

Temperature zones (degrees centigrade)

(1) 24-30, (2) 22-24, (3) 20-22, (4) 18-20, (5) 16-18, (6) 14-16, (7) 12-14, (8) 10-12, and (9) less than 10

Credits

UNEP/GRID database derived from the Exploratory Soil Survey Report number E1, Kenya Soil Survey, Nairobi, 1982, ILRI

## bare\_areas

File Geodatabase Feature Class



### Tags

bare areas, imageryBaseMapsEarthCover

### Summary

This dataset was extracted for the Tana River Basin area. These data were used in Map 1.3 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

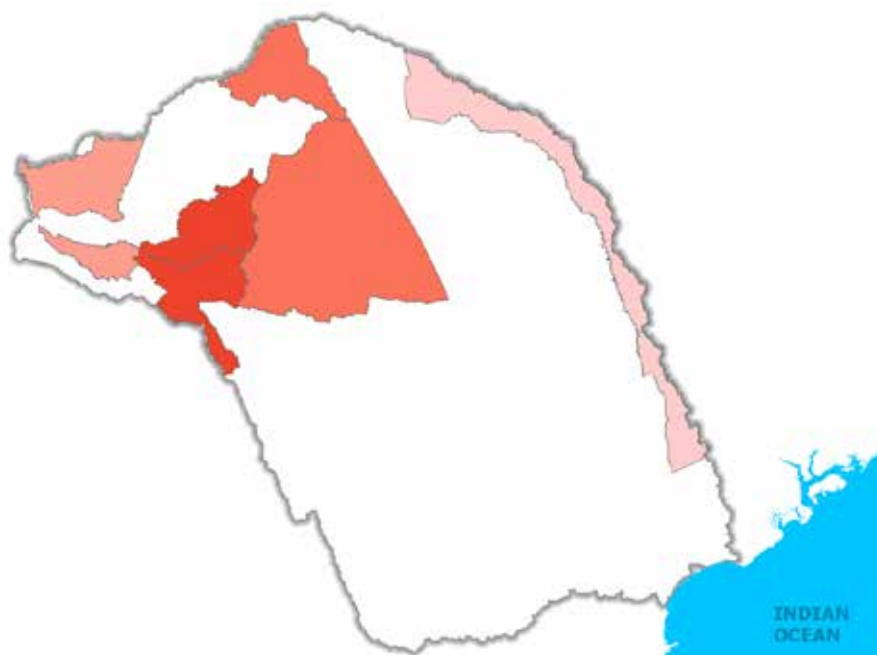
This dataset portrays bare areas (areas naturally devoid of vegetation) in Kenya, from FAO's Africover dataset.

### Credits

WRI

## charcoal\_sources

File Geodatabase Feature Class



### Tags

charcoal, energy, environment, economy

### Summary

These data were used in Map 7.5 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset portrays sources of wood for charcoal in selected administrative districts of Kenya, 2004

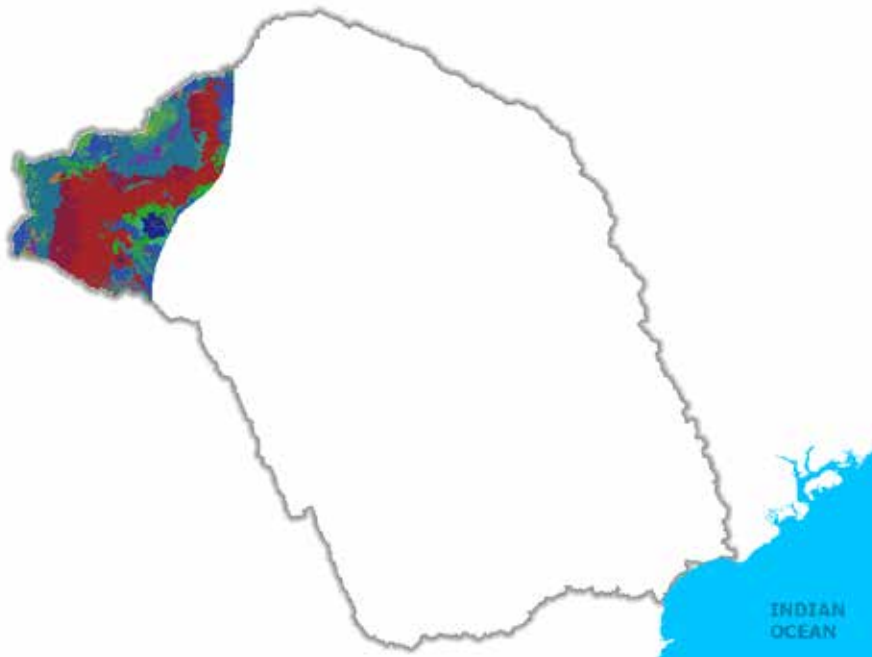
### Credits

WRI



## CentralHighlandsZone\_LU

File Geodatabase Feature Class



### Tags

landcover, environment, natural resources, agriculture, forest, rangeland, management, AFRICOVER, land cover

### Summary

The purpose of the Africover land cover database is to provide the information required for natural resource assessment and management, environmental modelling and decision making.

### Description

This dataset is a spatially re-aggregated version of the original national Africover multipurpose database. The original full resolution land cover has been produced from visual interpretation of digitally enhanced LANDSAT TM images (Bands 4, 3, 2) acquired mainly in the year 1999. The data was aggregated by eliminating polygons below a certain area threshold to give priority to the classes belonging to agriculture. This threshold corresponds to approximately a 30% reduction in the polygon count. The dataset was then re-aggregated based on area threshold values. For more information on the area thresholds used to spatially aggregate the land cover data, please see the 'spatial-agg-procedure' document included in the zip file available here for download.

The land cover classes have been developed using the FAO/UNEP international standard Land Cover Classification System (LCCS).

The dataset is intended for free public access.

The shape main attributes correspond to the following fields:

- ID
- HECTARES
- USERLABEL
- LCCCODE (unique LCCS code)
- CODE1
- CODE2

-CODE3

-LC

You can download a zip archive containing:

-the dataset ke-spatial-agg (.shp)

-the Kenya Classifiers Used (.pdf)

-the Kenya legend (.pdf and .xls)

-the Kenya Legend - LCCS Import file (.xls)

-the spatial-agg-procedure (.pdf)

-the Userlabel Definitions (.pdf)

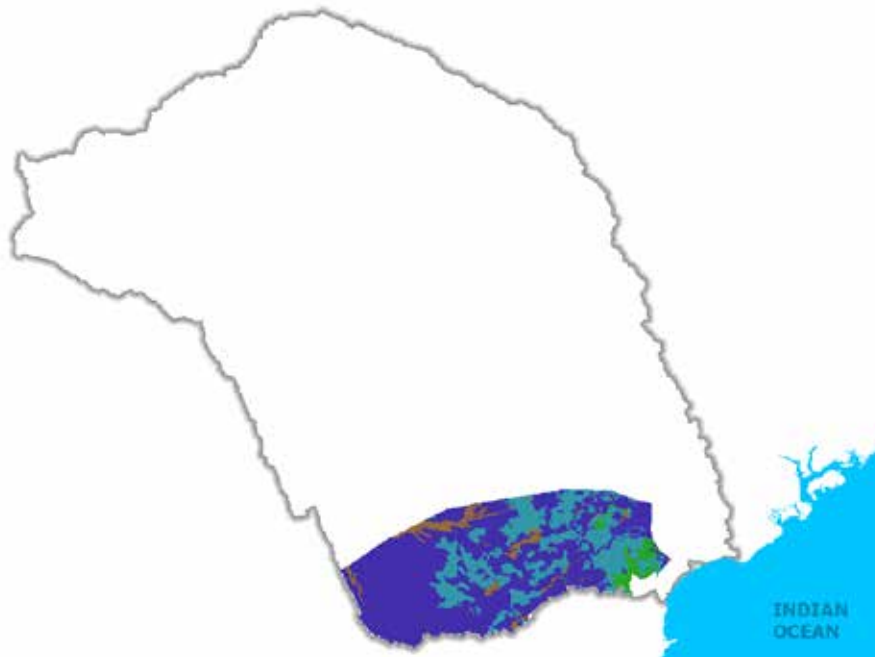
*Note:* the document Kenya Classifiers Used.pdf is a list of all the LCCS classifiers used in the study area. They are grouped under the eight major land cover types. In addition to the standard classifiers contained in LCCS, the user may find 'user defined' classifiers used by the map producer to add additional information to a specific class, which is not available in LCCS. The user-defined attributes are always coded with the letter 'Z'.

Credits

FAO, ILRI

## CoastalMarginalAgMixedZone\_LU

File Geodatabase Feature Class



### Tags

landcover, environment, natural resources, agriculture, forest, rangeland, management, AFRICOVER, land cover

### Summary

The purpose of the Africover land cover database is to provide the information required for natural resource assessment and management, environmental modelling and decision making.

### Description

This dataset is a spatially re-aggregated version of the original national Africover multipurpose database. The original full resolution land cover has been produced from visual interpretation of digitally enhanced LANDSAT TM images (bands 4, 3, 2) acquired mainly in the year 1999. The data was aggregated by eliminating polygons below a certain area threshold to give priority to the classes belonging to agriculture. This threshold corresponds to approximately a 30% reduction in the polygon count. The dataset was then re-aggregated based on area threshold values. For more information on the area thresholds used to spatially aggregate the land cover data, please see the 'spatial-agg-procedure' document included in the zip file available here for download.

The land cover classes have been developed using the FAO/UNEP international standard LCCS.

The dataset is intended for free public access.

The shape main attributes correspond to the following fields:

- ID
- HECTARES
- USERLABEL
- LCCCODE (unique LCCS code)
- CODE1
- CODE2

-CODE3

-LC

You can download a zip archive containing:

-the dataset ke-spatial-agg (.shp)

-the Kenya Classifiers Used (.pdf)

-the Kenya legend (.pdf and .xls)

-the Kenya Legend - LCCS Import file (.xls)

-the spatial-agg-procedure (.pdf)

-the Userlabel Definitions (.pdf)

*Note:* the document Kenya Classifiers Used.pdf is a list of all the LCCS classifiers used in the study area. They are grouped under the eight major land cover types. In addition to the standard classifiers contained in LCCS, the user may find 'user defined' classifiers used by the map producer to add additional information to a specific class, which is not available in LCCS. The user-defined attributes are always coded with the letter 'Z'.

Credits

FAO, ILRI

## CoastalZone\_LU

File Geodatabase Feature Class



### Tags

landcover, environment, natural resources, agriculture, forest, rangeland, management, AFRICOVER, land cover

### Summary

The purpose of the Africover land cover database is to provide the information required for natural resource assessment and management, environmental modelling and decision-making.

### Description

This dataset is a spatially re-aggregated version of the original national Africover multipurpose database. The original full resolution land cover has been produced from visual interpretation of digitally enhanced LANDSAT TM images (bands 4, 3, 2) acquired mainly in the year 1999. The data was aggregated by eliminating polygons below a certain area threshold to give priority to the classes belonging to agriculture. This threshold corresponds to approximately a 30% reduction in the polygon count. The dataset was then re-aggregated based on area threshold values. For more information on the area thresholds used to spatially aggregate the land cover data, please see the 'spatial-agg-procedure' document included in the zip file available here for download.

The land cover classes have been developed using the FAO/UNEP international standard LCCS.

The dataset is intended for free public access.

The shape main attributes correspond to the following fields:

- ID
- HECTARES
- USERLABEL
- LCCCODE (unique LCCS code)
- CODE1
- CODE2

-CODE3

-LC

You can download a zip archive containing:

-the dataset ke-spatial-agg (.shp)

-the Kenya Classifiers Used (.pdf)

-the Kenya legend (.pdf and .xls)

-the Kenya Legend - LCCS Import file (.xls)

-the spatial-agg-procedure (.pdf)

-the Userlabel Definitions (.pdf)

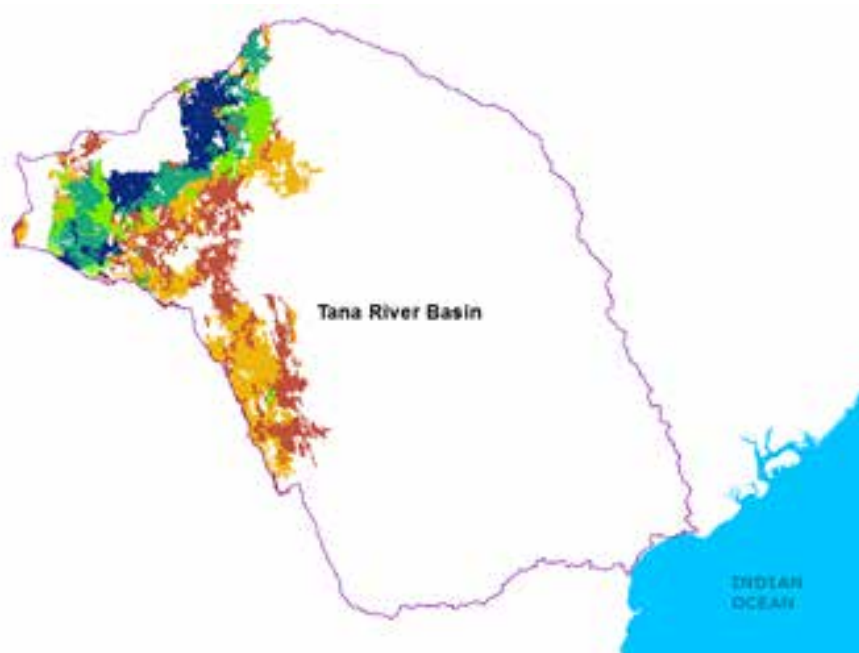
*Note:* the document Kenya Classifiers Used.pdf is a list of all the LCCS classifiers used in the study area. They are grouped under the eight major land cover types. In addition to the standard classifiers contained in LCCS, the user may find 'user defined' classifiers used by the map producer to add additional information to a specific class, which is not available in LCCS. The user-defined attributes are always coded with the letter 'Z'.

Credits

FAO, ILRI

## crops\_diversity

File Geodatabase Feature Class



### Tags

croplands, farming

### Summary

Crop diversity details were extracted for the Tana River Basin area. These data were used in Map 5.5 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

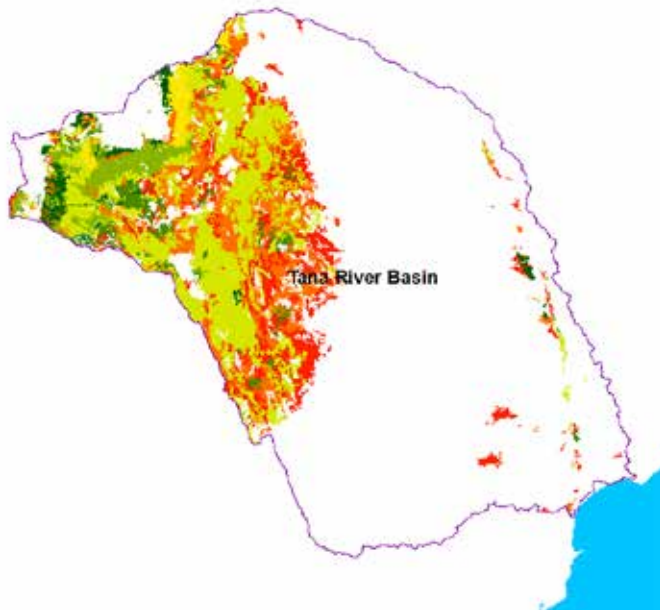
This dataset portrays the average number of crops grown in croplands of central and western Kenya, 1997

### Credits

WRI

## crops\_intensity

File Geodatabase Feature Class



### Tags

Agriculture, farming

### Summary

These data were used in Map 5.4 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset portrays the percentage of land under cultivation in Kenya, taken from FAO's Africover dataset.

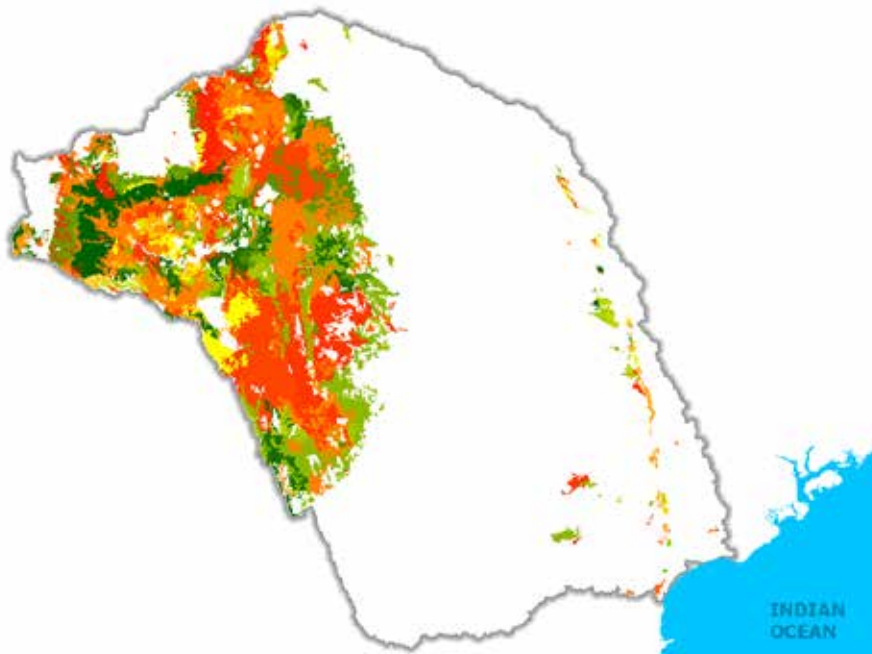
### Credits

WRI



## crops\_irrig

File Geodatabase Feature Class



### Tags

Agriculture, irrigation, farming, Tana River Basin

### Summary

These data were extracted for the Tana River Basin area. These data were used in Map 3.12 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

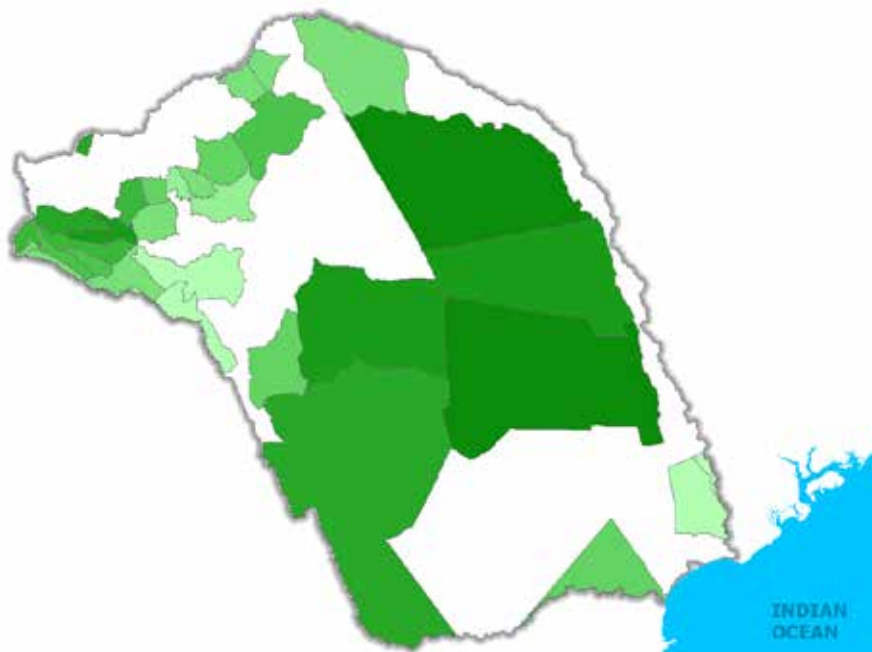
This dataset shows large-scale irrigation in Kenya, taken from FAO's Africover dataset.

### Credits

WRI

## crops\_livestock

File Geodatabase Feature Class



### Tags

Millet, sorghum, beans, area, production, livestock, population

### Summary

This dataset was extracted for the Tana River Basin area

### Description

This coverage shows data on crop yield and area planted for major crops, as well as livestock populations in Kenya between 1993 and 1999 prepared up to the third administrative level (divisions). All target crops are covered and livestock data is reported as exotic and local cattle.

Class3: Third level administrative boundary (division) identification

Unicode: Unique identification for the division as shown below

The 1<sup>st</sup> 4 digits represent the country code

The 4<sup>th</sup> and 5<sup>th</sup> digits represent the province code

The 6<sup>th</sup> and 7<sup>th</sup> digits represent the district code

The 8<sup>th</sup> and 9<sup>th</sup> digits represent the division code

Province: Name of province

District: Name of district

Division: Name of division

Mz\_pro98: Total maize production per division in tonnes for the year 1998

Mz\_ha98: Total number of hectares per constituency under maize for the year 1998

Mz\_pro97: Total maize production per division in tonnes for the year 1997

Mz\_ha97: Total number of hectares per division under maize for the year 1997

Mz\_pro96: Total maize production per division in tonnes for the year 1996

Mz\_ha96: Total number of hectares per division under maize for the year 1996

Mz\_pro95: Total maize production per division in tonnes for the year 1995

Mz\_ha95: Total number of hectares per division under maize for the year 1995

Mz\_pro94: Total maize production per division in tonnes for the year 1994

Mz\_ha94: Total number of hectares per division under maize for the year 1994

Mi\_pro98: Total millet production per division in tonnes for the year 1998

Mi\_ha98: Total number of hectares per division under millet for the year 1998

Mi\_pro97: Total millet production per division in tonnes for the year 1997

Mi\_ha97: Total number of hectares per division under millet for the year 1997

Mi\_pro96: Total millet production per division in tonnes for the year 1996

Mi\_ha96: Total number of hectares per division under millet for the year 1996

Mi\_pro95: Total millet production per division in tonnes for the year 1995

Mi\_ha95: Total number of hectares per division under millet for the year 1995

Mi\_pro94: Total millet production per division in tonnes for the year 1994

Mi\_ha94: Total number of hectares per division under millet for the year 1994

So\_pro98: Total sorghum production per division in tonnes for the year 1998

So\_ha98: Total number of hectares per division under sorghum for the year 1998

So\_pro97: Total sorghum production per division in tonnes for the year 1997

So\_ha97: Total number of hectares per division under sorghum for the year 1997

So\_pro96: Total sorghum production per division in tonnes for the year 1996

So\_ha96: Total number of hectares per division under sorghum for the year 1996

So\_pro95: Total sorghum production per division in tonnes for the year 1995

So\_ha95: Total number of hectares per division under sorghum for the year 1995

So\_pro94: Total sorghum production per division in tonnes for the year 1994

So\_ha94: Total number of hectares per division under sorghum for the year 1994

Bn\_pro98: Total bean production per division in tonnes for the year 1998

Bn\_ha98: Total number of hectares per division under beans for the year 1998

Bn\_pro97: Total bean production per division in tonnes for the year 1997

Bn\_ha97: Total number of hectares per division under beans for the year 1997

Bn\_pro96: Total bean production per division in tonnes for the year 1996

Bn\_ha96: Total number of hectares per division under beans for the year 1996

Bn\_pro95: Total bean production per division in tonnes for the year 1995

Bn\_ha95: Total number of hectares per division under beans for the year 1995

Bn\_pro94: Total bean production per division in tonnes for the year 1994

Bn\_ha94: Total number of hectares per division under beans for the year 1994

Ca\_pro98: Total number of cattle per division in 1998

Ca\_ha98: Total number of hectares under cattle production in 1998

Ca\_pro97: Total number of cattle per division in 1997

Ca\_ha97: Total number of hectares under cattle production in 1997

Ca\_pro96: Total number of cattle per division in 1996

Ca\_ha96: Total number of hectares under cattle production in 1996

Ca\_pro95: Total number of cattle per division in 1995

Ca\_ha95: Total number of hectares under cattle production in 1995

Ca\_pro94: Total number of cattle per division in 1994

Ca\_ha94: Total number of hectares under cattle production in 1994

Excatt98: Total number of exotic cattle per division in 1998

Excatt97: Total number of exotic cattle per division in 1997

Excatt96: Total number of exotic cattle per division in 1996

Excatt95: Total number of exotic cattle per division in 1995

Excatt94: Total number of exotic cattle per division in 1994

Locatt98: Total number of local cattle per division in 1998

Locatt97: Total number of local cattle per division in 1997

Locatt96: Total number of local cattle per division in 1996

Locatt95: Total number of local cattle per division in 1995

Locatt94: Total number of local cattle per division in 1994

Tocatt98: Total number of both local and exotic cattle per division in 1998

Tocatt97: Total number of both local and exotic cattle per division in 1997

Tocatt96: Total number of both local and exotic cattle per division in 1996

Tocatt95: Total number of both local and exotic cattle per division in 1995

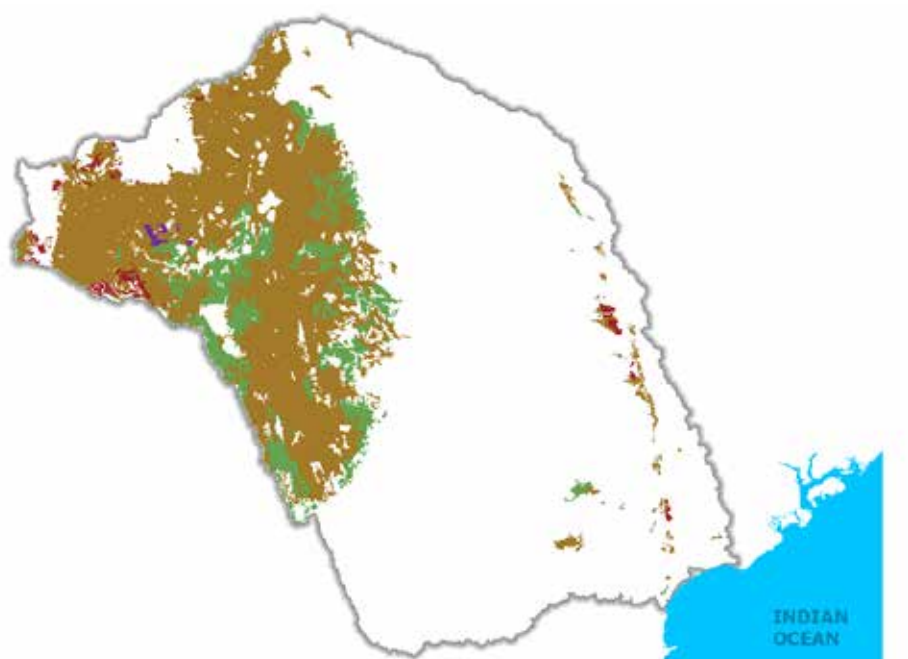
Tocatt94: Total number of both local and exotic cattle per division in 1994

#### Credits

ILRI, originally called Kenprod.shp. Since Kenya's administrative boundaries have undergone major changes in the last five years with the number of districts rising from 54 to 71, the available coverage which showed boundaries as they were in 1989 was overlaid with the new district coverage (which is available) at the sub-location level (sixth level) to help identify which administrative units belong to new districts.

## CropSize

File Geodatabase Feature Class



### Tags

Agriculture, farming

### Summary

These data were used in Map 5.7 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset portrays the size of agricultural fields in Kenya, taken from FAO's Africover dataset.

### Credits

WRI

## EasternPastoralZone\_LU

File Geodatabase Feature Class



### Tags

landcover, environment, natural resources, agriculture, forest, rangeland, management, AFRICOVER, land cover

### Summary

The purpose of the Africover land cover database is to provide the information required for natural resource assessment and management, environmental modelling and decision making.

### Description

This dataset is a spatially re-aggregated version of the original national Africover multipurpose database. The original full resolution land cover has been produced from visual interpretation of digitally enhanced LANDSAT TM images (bands 4, 3, 2) acquired mainly in the year 1999. The data was aggregated by eliminating polygons below a certain area threshold to give priority to the classes belonging to agriculture. This threshold corresponds to approximately a 30% reduction in the polygon count. The dataset was then re-aggregated based on area threshold values. For more information on the area thresholds used to spatially aggregate the land cover data, please see the 'spatial-agg-procedure' document included in the zip file available here for download.

The land cover classes have been developed using the FAO/UNEP international standard LCCS.

The dataset is intended for free public access.

The shape main attributes correspond to the following fields:

- ID
- HECTARES
- USERLABEL
- LCCCODE (unique LCCS code)
- CODE1
- CODE2

-CODE3

-LC

You can download a zip archive containing:

-the dataset ke-spatial-agg (.shp)

-the Kenya Classifiers Used (.pdf)

-the Kenya legend (.pdf and .xls)

-the Kenya Legend - LCCS Import file (.xls)

-the spatial-agg-procedure (.pdf)

-the Userlabel Definitions (.pdf)

*Note:* the document Kenya Classifiers Used.pdf is a list of all the LCCS classifiers used in the study area. They are grouped under the eight major land cover types. In addition to the standard classifiers contained in LCCS, the user may find 'user defined' classifiers used by the map producer to add additional information to a specific class, which is not available in LCCS. The user-defined attributes are always coded with the letter 'Z'.

Credits

FAO, ILRI

## forest\_ranges

File Geodatabase Feature Class



### Tags

forest, ranges

### Summary

Forest ranges, Tana River Basin

### Description

This coverage shows the major forest ranges in Kenya according to International Union for Conservation of Nature (IUCN). There is also a supplemental coverage called Kenya\_forests.shp prepared by FAO, which only shows the actual forests within Kenya as opposed to the forest ranges shown in this coverage.

This coverage shows the forest ranges that, in many cases, cover more than one forest.

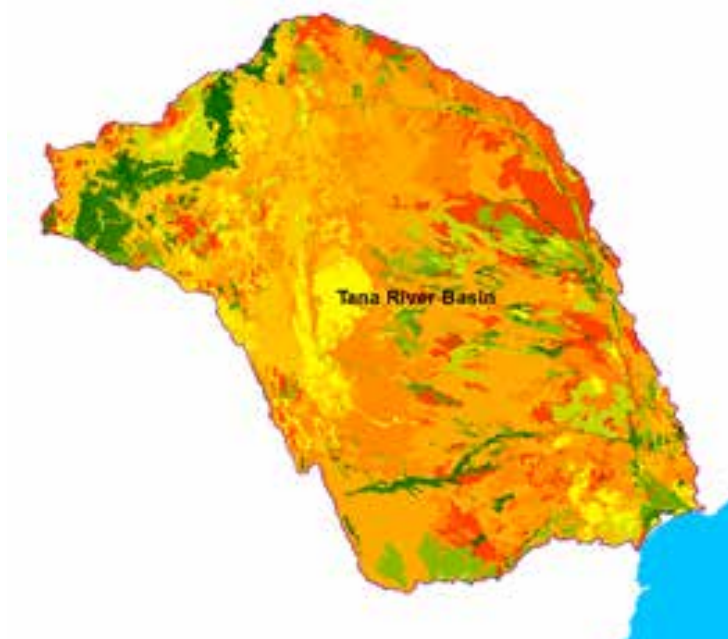
### Credits

International Union for the Conservation of Nature (IUCN), ILRI



## landcover\_ge

File Geodatabase Feature Class



### Tags

landcover, environment, natural resources, agriculture, forest, rangeland, management, AFRICOVER, land cover

### Summary

The purpose of the Africover land cover database is to provide the information required for natural resource assessment and management, environmental modelling and decision making.

### Description

This dataset is a spatially re-aggregated version of the original national Africover multipurpose database. The original full resolution land cover has been produced from visual interpretation of digitally enhanced LANDSAT TM images (bands 4, 3, 2) acquired mainly in the year 1999. The data was aggregated by eliminating polygons below a certain area threshold to give priority to the classes belonging to agriculture. This threshold corresponds to approximately a 30% reduction in the polygon count. The dataset was then re-aggregated based on area threshold values. For more information on the area thresholds used to spatially aggregate the land cover data, please see the 'spatial-agg-procedure' document included in the zip file available here for download.

The land cover classes have been developed using the FAO/UNEP international standard LCCS.

The dataset is intended for free public access.

The shape main attributes correspond to the following fields:

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- HECTARES
- USERLABEL
- LCCCODE (unique LCCS code)
- CODE1
- CODE2

-CODE3

-LC

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-the spatial-agg-procedure (.pdf)

-the Userlabel Definitions (.pdf)

*Note:* the document Kenya Classifiers Used.pdf is a list of all the LCCS classifiers used in the study area. They are grouped under the eight major land cover types. In addition to the standard classifiers contained in LCCS, the user may find 'user defined' classifiers used by the map producer to add additional information to a specific class, which is not available in LCCS. The user-defined attributes are always coded with the letter 'Z'.

Credits

FAO, ILRI

## landuse

File Geodatabase Feature Class



### Tags

landuse, forest, woodland, bushland (dense), bushland (sparse), grassland, barren land, swamp, water body, water (artificial), agriculture (dense), agriculture (sparse), plantation, town

### Summary

This dataset was extracted for the Tana River Basin area

### Description

Coverage showing general land-use classes derived from 1980 landsat data by JICA, National Water Master Plan, Kenya

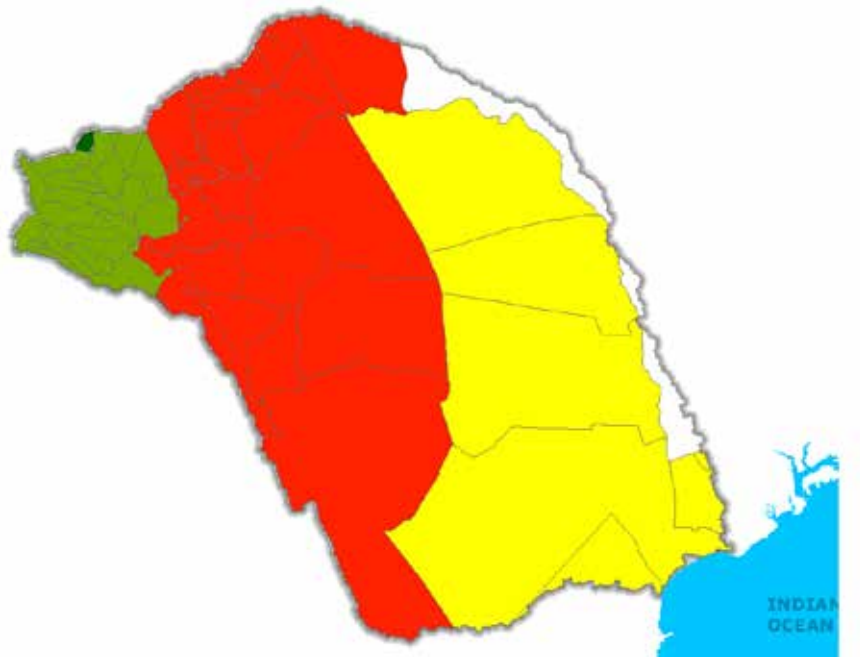
### Credits

JICA, National Water Master Plan, Kenya

Map history: prepared in 1987 from Landsat data by JICA, ILRI

## maize\_prod\_86\_90

File Geodatabase Feature Class



### Tags

Maize, area, production, Tana River Basin

### Summary

This dataset was extracted for the Tana River Basin area

### Description

This coverage shows the total maize production in tonnes for Kenya between 1986 and 1990, according to a study conducted by FAO and published in 1998 at a scale of 1:1,000,000.

### Credits

FAO, originally called AGRmaize.shp and created by FAO. Published in 1998 under the title 'FAOSTAT agriculture data'.

## mangroves

File Geodatabase Feature Class



### Tags

mangroves, coastal, imageryBaseMapsEarthCover, environment

### Summary

These data were used in Maps 6.4 and 6.5 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset portrays locations of mangroves on the eastern coast of Kenya.

### Credits

WRI

## millet\_prod\_86\_90

File Geodatabase Feature Class



### Tags

Millet, area, production, Tana River Basin

### Summary

This dataset was extracted for the Tana River Basin

### Description

This coverage shows the total millet production in tonnes for Kenya between 1986 and 1990, according to a study conducted by FAO and published in 1998 at a scale of 1:1,000,000.

### Credits

FAO, originally called AGRmillet.shp and created by FAO. Published in 1998 under the title 'FAOSTAT agriculture data'; ILRI

## Pineapple\_plantations

File Geodatabase Feature Class



### Tags

agriculture, pineapple, imageryBaseMapsEarthCover

### Summary

This dataset was extracted for the Tana River Basin area. These data were used in Map 3.9 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

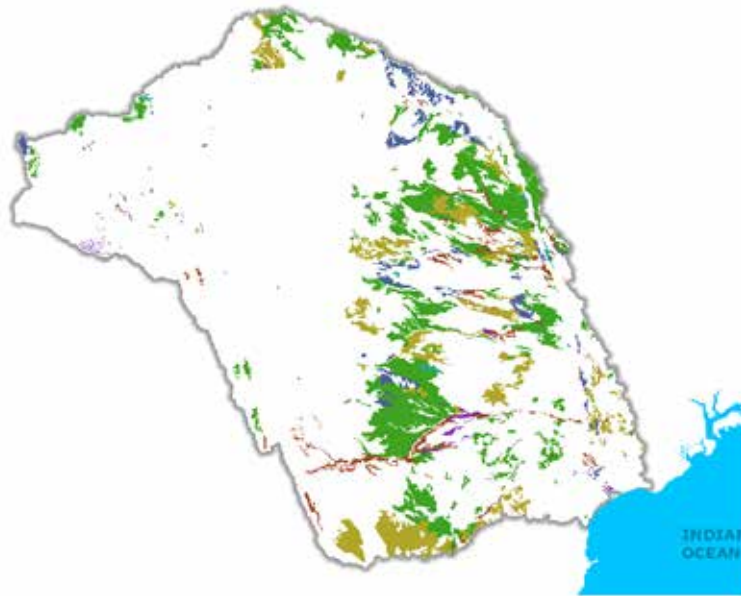
This dataset portrays locations of pineapple plantations in Kenya, from FAO's Africover dataset.

### Credits

WRI

## rangeland

File Geodatabase Feature Class



### Tags

savanna, grassland, imageryBaseMapsEarthCover

### Summary

These data were used in Map 1.3 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset portrays areas of savanna and grassland in Kenya, from FAO's Africover dataset.

### Credits

WRI



## rice\_prod\_86\_90

File Geodatabase Feature Class



### Tags

Rice, area, yield, production, Tana River Basin

### Summary

This dataset was extracted for the Tana River Basin area.

### Description

This coverage shows the total rice production statistics for each province in Kenya between 1986 and 1990, and published in 1998 by FAO at a scale of 1:1,000,000.

### Credits

FAO, originally called AGRice.shp and created by FAO. Published in 1998 under the title 'FAOSTAT agriculture data', ILRI

## sorghum\_prod\_86\_90

File Geodatabase Feature Class



### Tags

Sorghum, production, yield, area, Tana River Basin

### Summary

This dataset was extracted for the Tana River Basin area

### Description

This coverage shows the total sorghum production statistics for each province in Kenya between 1986 and 1990, and published in 1998 by the Food and Agriculture Organization of the United Nations (FAO) at a scale of 1:1,000,000.

### Credits

FAO, originally called AGRsorghum.shp and created by FAO. Published in 1998 under the title 'FAOSTAT agriculture data', ILRI

## SoutheasternMarginalMixedZone\_LU

File Geodatabase Feature Class



### Tags

landcover, environment, natural resources, agriculture, forest, rangeland, management, AFRICOVER, land cover

### Summary

The purpose of the Africover land cover database is to provide the information required for natural resource assessment and management, environmental modelling and decision making.

### Description

This dataset is a spatially re-aggregated version of the original national Africover multipurpose database. The original full resolution land cover has been produced from visual interpretation of digitally enhanced LANDSAT TM images (bands 4, 3, 2) acquired mainly in the year 1999. The data was aggregated by eliminating polygons below a certain area threshold to give priority to the classes belonging to agriculture. This threshold corresponds to approximately a 30% reduction in the polygon count. The dataset was then re-aggregated based on area threshold values. For more information on the area thresholds used to spatially aggregate the land cover data, please see the 'spatial-agg-procedure' document included in the zip file available here for download.

The land cover classes have been developed using the FAO/UNEP international standard LCCS.

The dataset is intended for free public access.

The shape main attributes correspond to the following fields:

- ID
- HECTARES
- USERLABEL
- LCCCODE (unique LCCS code)
- CODE1
- CODE2

-CODE3

-LC

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-the Kenya Classifiers Used (.pdf)

-the Kenya legend (.pdf and .xls)

-the Kenya Legend - LCCS Import file (.xls)

-the spatial-agg-procedure (.pdf)

-the Userlabel Definitions (.pdf)

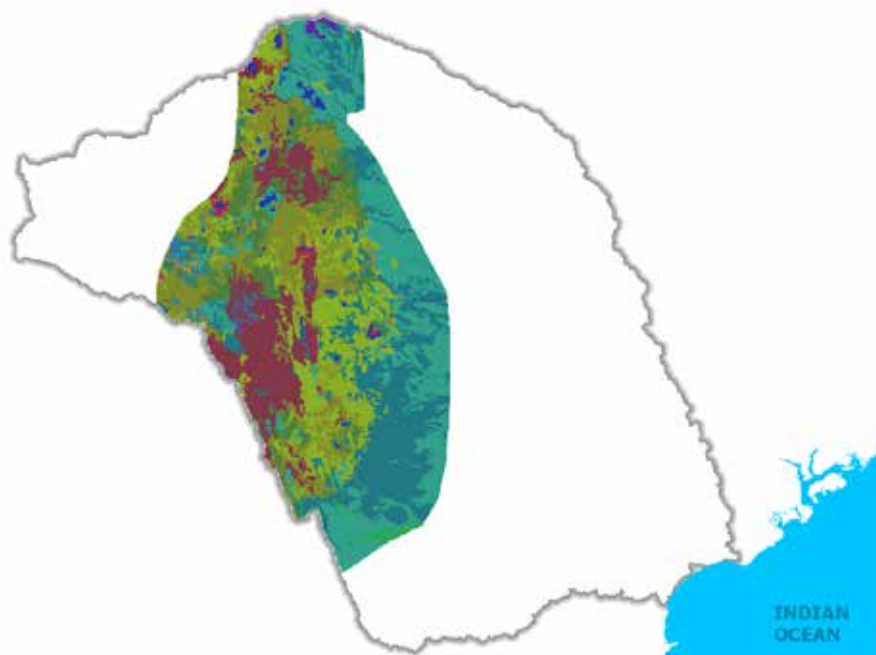
*Note:* the document Kenya Classifiers Used.pdf is a list of all the LCCS classifiers used in the study area. They are grouped under the eight major land cover types. In addition to the standard classifiers contained in LCCS, the user may find 'user defined' classifiers used by the map producer to add additional information to a specific class, which is not available in LCCS. The user-defined attributes are always coded with the letter 'Z'.

Credits

FAO, ILRI

## SoutheasternPastoralZone\_LU

File Geodatabase Feature Class



### Tags

landcover, environment, natural resources, agriculture, forest, rangeland, management, AFRICOVER, land cover

### Summary

The purpose of the Africover land cover database is to provide the information required for natural resource assessment and management, environmental modelling and decision making.

### Description

This dataset is a spatially re-aggregated version of the original national Africover multipurpose database. The original full resolution land cover has been produced from visual interpretation of digitally enhanced LANDSAT TM images (bands 4, 3, 2) acquired mainly in the year 1999. The data was aggregated by eliminating polygons below a certain area threshold to give priority to the classes belonging to agriculture. This threshold corresponds to approximately a 30 % reduction in the polygon count. The dataset was then re-aggregated based on area threshold values. For more information on the area thresholds used to spatially aggregate the land cover data, please see the 'spatial-agg-procedure' document included in the zip file available here for download.

The land cover classes have been developed using the FAO/UNEP international standard LCCS.

The dataset is intended for free public access.

The shape main attributes correspond to the following fields:

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- HECTARES
- USERLABEL
- LCCCODE (unique LCCS code)
- CODE1
- CODE2

-CODE3

-LC

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-the Kenya Classifiers Used (.pdf)

-the Kenya legend (.pdf and .xls)

-the Kenya Legend - LCCS Import file (.xls)

-the spatial-agg-procedure (.pdf)

-the Userlabel Definitions (.pdf)

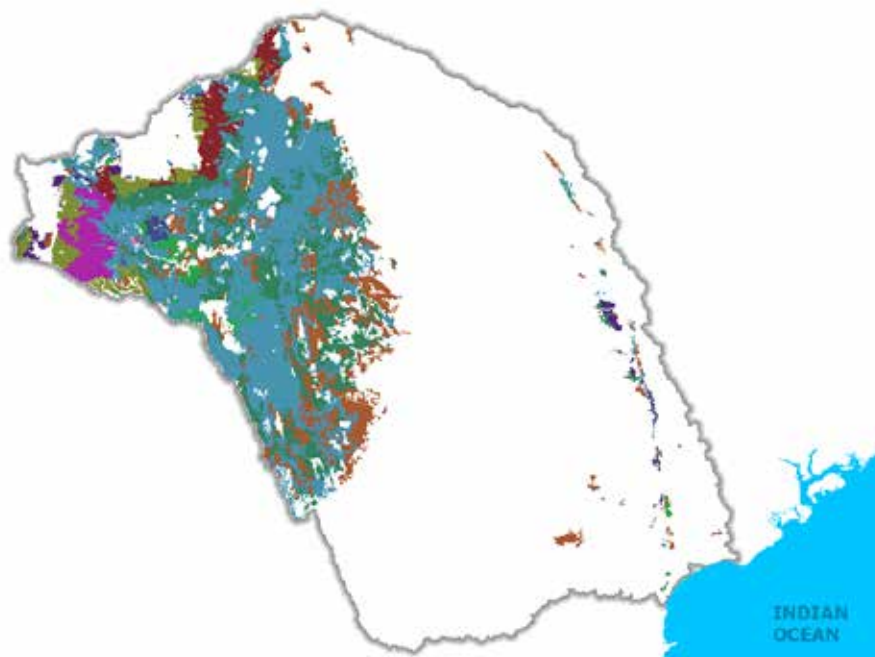
*Note:* the document Kenya Classifiers Used.pdf is a list of all the LCCS classifiers used in the study area. They are grouped under the eight major land cover types. In addition to the standard classifiers contained in LCCS, the user may find 'user defined' classifiers used by the map producer to add additional information to a specific class, which is not available in LCCS. The user-defined attributes are always coded with the letter 'Z'.

Credits

FAO, ILRI

## TanaAgriculture

File Geodatabase Feature Class



### Tags

agriculture, farming

### Summary

These data were extracted for the Tana River Basin area. These data were used in Map 1.3 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset portrays areas of agriculture in Kenya, from FAO's Africover dataset.

### Credits

WRI

## TanaRiverineZone\_LU

File Geodatabase Feature Class



### Tags

landcover, environment, natural resources, agriculture, forest, rangeland, management, AFRICOVER, land cover

### Summary

The purpose of the Africover land cover database is to provide the information required for natural resource assessment and management, environmental modelling and decision making.

### Description

This dataset is a spatially re-aggregated version of the original national Africover multipurpose database. The original full resolution land cover has been produced from visual interpretation of digitally enhanced LANDSAT TM images (bands 4, 3, 2) acquired mainly in the year 1999. The data was aggregated by eliminating polygons below a certain area threshold to give priority to the classes belonging to agriculture. This threshold corresponds to approximately a 30% reduction in the polygon count. The dataset was then re-aggregated based on area threshold values. For more information on the area thresholds used to spatially aggregate the land cover data, please see the 'spatial-agg-procedure' document included in the zip file available here for download.

The land cover classes have been developed using the FAO/UNEP international standard LCCS.

The data set is intended for free public access.

The shape main attributes correspond to the following fields:

- ID
- HECTARES
- USERLABEL
- LCCCODE (unique LCCS code)
- CODE1
- CODE2



-CODE3

-LC

You can download a zip archive containing:

-the dataset ke-spatial-agg (.shp)

-the Kenya Classifiers Used (.pdf)

-the Kenya legend (.pdf and .xls)

-the Kenya Legend - LCCS Import file (.xls)

-the spatial-agg-procedure (.pdf)

-the Userlabel Definitions (.pdf)

*Note:* the document Kenya Classifiers Used.pdf is a list of all the LCCS classifiers used in the study area. They are grouped under the eight major land cover types. In addition to the standard classifiers contained in LCCS, the user may find 'user defined' classifiers used by the map producer to add additional information to a specific class, which is not available in LCCS. The user-defined attributes are always coded with the letter 'Z'.

Credits

FAO, ILRI

## Tree\_plantations

File Geodatabase Feature Class



### Tags

tree plantations, imageryBaseMapsEarthCover, farming, Tana River Basin

### Summary

These data were extracted for the Tana River Basin area. These data were used in Map 7.3 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset portrays locations of tree plantations in Kenya, from FAO's Africover dataset.

### Credits

WRI

## wheat\_prod\_86\_90

File Geodatabase Feature Class



### Tags

Wheat, area, production, yield, Tana River Basin

### Summary

This dataset was extracted for the Tana River Basin

### Description

This coverage shows the total wheat production statistics for each province in Kenya between 1986 and 1990, and published in 1998 by FAO at a scale of 1:1,000,000.

### Credits

FAO, originally called AGRwheat.shp and created by FAO. Published in 1998 under the title 'FAOSTAT agriculture data', ILRI

## woodlots\_in\_cropland

File Geodatabase Feature Class



### Tags

woodlots, agriculture, farming, Tana River Basin

### Summary

This dataset was extracted for the Tana River Basin area. These data were used in Map 7.3 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset portrays percentage of woodlots in sampled cropland in central and western Kenya, 1997

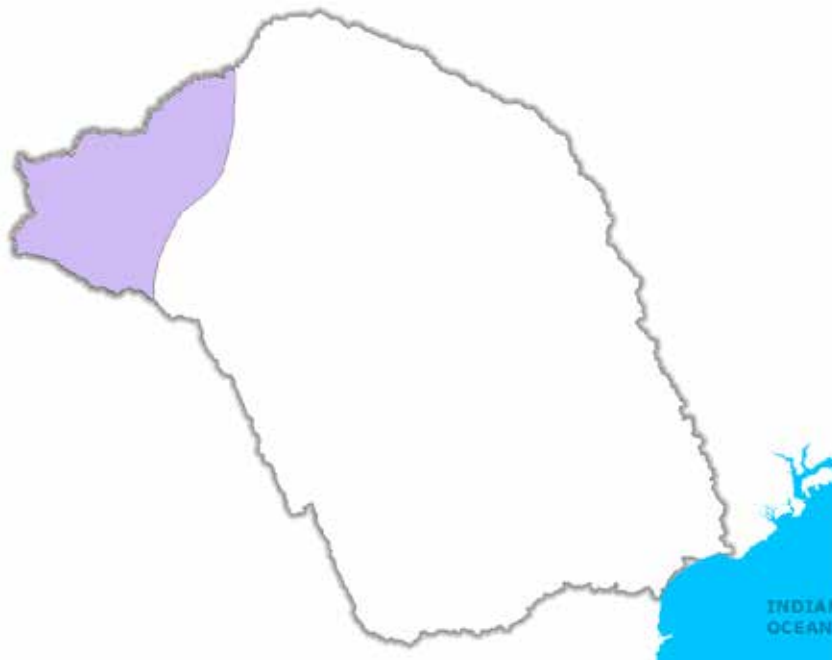
### Credits

There are no credits for this item.

**Theme: Livelihood**

## **CentralHighlandsZone**

File Geodatabase Feature Class



### Tags

Pastoral zone, riverine zone, agropastoral zone, fishing zone, farming zone

### Summary

This dataset was extracted for the Tana River Basin area. The dataset provides geographic orientation of livelihood systems to inform food security analysis and assistance targeting.

It provides the basis for identifying geographically relevant food security monitoring indicators.

It provides a sampling frame for future on-the-ground assessments.

Livelihood patterns clearly vary from one geographic area to another, which is why the preparation of a Livelihood Zone Map is a logical first step for livelihood-based analysis.

### Description

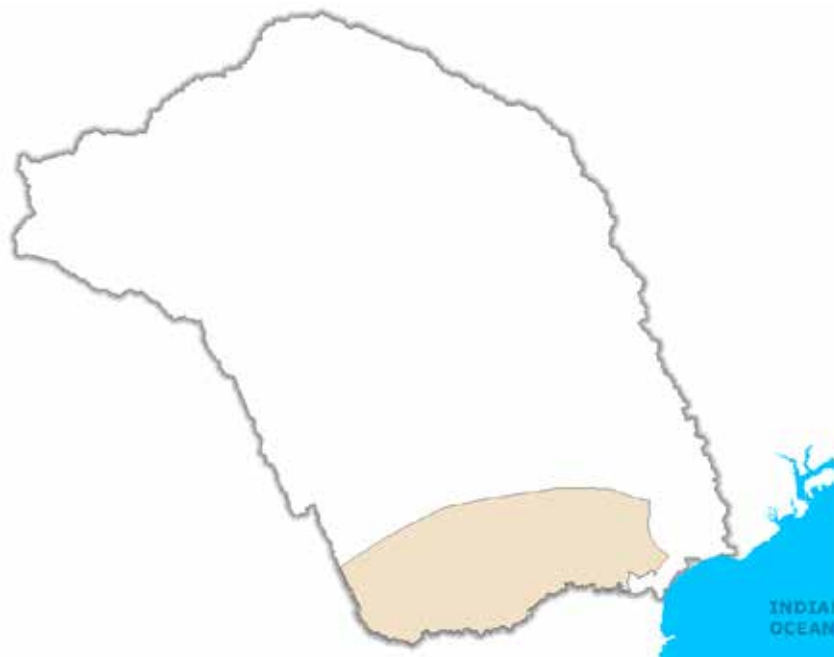
A livelihood zone is an area within which people share broadly the same pattern of livelihood, including options for obtaining food and income, and market opportunities. Livelihood zoning is essential for the following reasons:  
[KE\\_livelihood\\_profiles.pdf](#)

### Credits

WRI

## CoastalMarginalMixedZone

File Geodatabase Feature Class



### Tags

Pastoral zone, riverine zone, agropastoral zone, fishing zone, farming zone

### Summary

This dataset was extracted for the Tana River Basin area. The dataset provides geographic orientation of livelihood systems to inform food security analysis and assistance targeting.

It provides the basis for identifying geographically relevant food security monitoring indicators.

It provides a sampling frame for future on-the-ground assessments.

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### Credits

WRI

## CoastalZone

File Geodatabase Feature Class



### Tags

Pastoral zone, riverine zone, agropastoral zone, fishing zone, farming zone

### Summary

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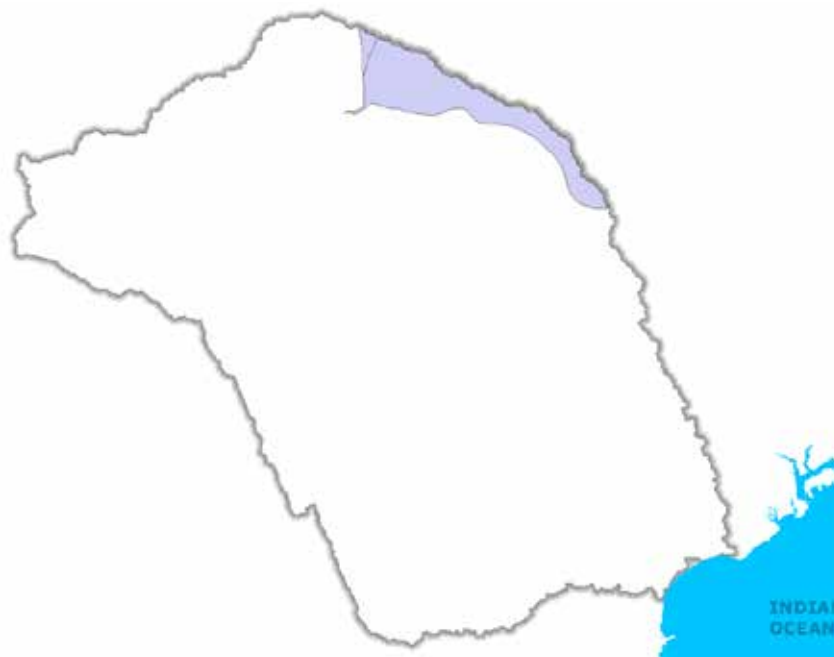
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[KE\\_livelihood\\_profiles.pdf](#)

### Credits

WRI

## EasternPastoralZone

File Geodatabase Feature Class



### Tags

Pastoral zone, riverine zone, agropastoral zone, fishing zone, farming zone

### Summary

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### Description

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[KE\\_livelihood\\_profiles.pdf](#)

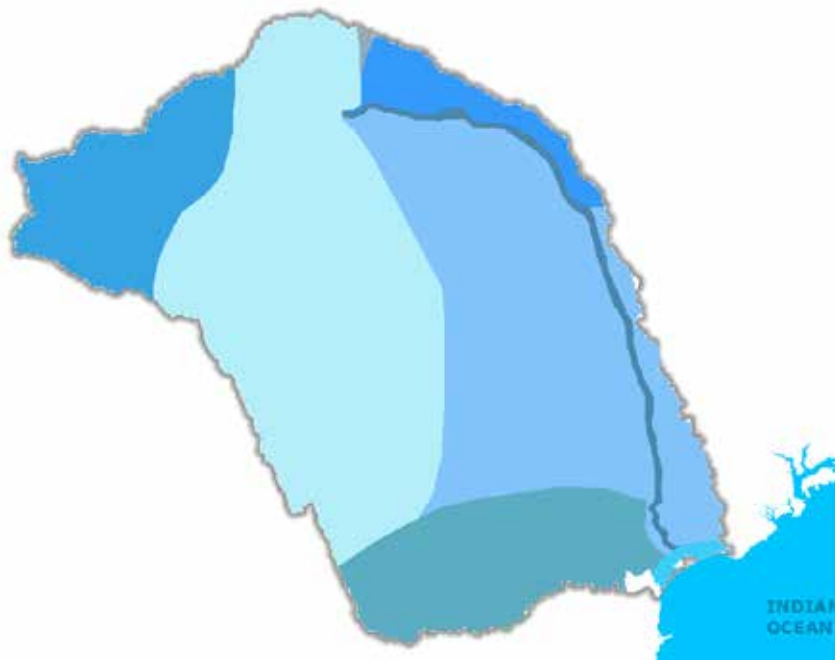
### Credits

WRI



## LivelihoodZones

File Geodatabase Feature Class



### Tags

Pastoral zone, riverine zone, agropastoral zone, fishing zone, farming zone

### Summary

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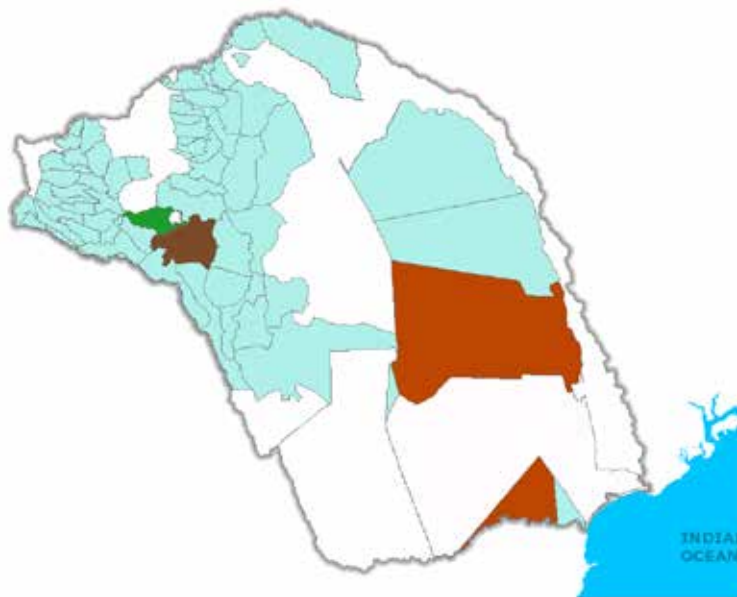
### Credits

WRI

**Theme: Livestock**

**Cattle\_density**

File Geodatabase Feature Class



Tags

cattle, density, ZEBU, dairy

Summary

Cattle density, Tana River Basin

Description

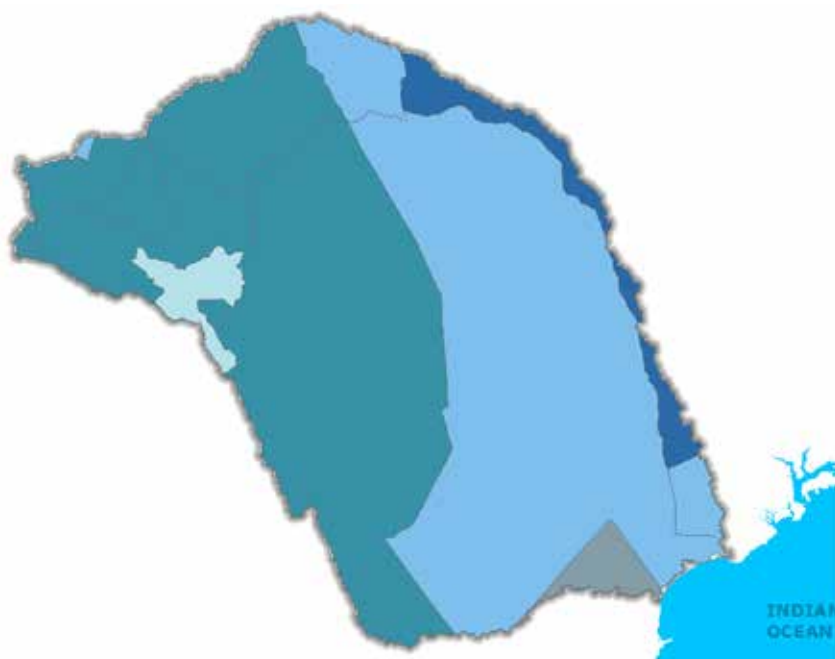
Dairy and zebu cattle density data prepared at the third administrative level, and derived from the 1995-1997 divisional-level dairy and zebu cattle density reports from the Ministry of Agriculture, Livestock Development and Marketing (MALDM).

Credits

The 1995-1997 divisional-level dairy and zebu animal density reports from the MALDM. The reports are based on data collected by District Livestock Officers and prepared in 2000, but reflect cattle numbers from 1995. Previously called 'dairy-no-negs', ILRI

## camel\_distribution

File Geodatabase Feature Class



### Tags

Camel, distribution

### Summary

Camel distribution between 1989 and 1994

### Description

The coverage shows the camel distribution in Kenya according to Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

It is based on an aerial sample census between 1989 and 1994. The figures indicated do not reflect actual numbers of animals per district per year, but the numbers within the sampled area.

### Credits

GTZ, Map history: Originally called Camels

ILRI

Theme: MyComposition

line\_3D

File Geodatabase Raster Dataset



Tags

Special effect, Tana River Basin boundary

Summary

This raster was created to show the special effects of the Tana River boundary within a 5-km buffer. This creates a three-dimensional (3d) effect of the boundary with 40% transparency.

Description

This raster was created to show the special effects of the Tana River boundary within a 5-km buffer. This creates a 3d effect of the boundary with 40% transparency.

Credits

Jarvis A.; Reuter, H.I.; Nelson, A.; Guevara, E. 2008. Hole-filled seamless SRTM data V4. International Center for Tropical Agriculture (CIAT). Available at <http://srtm.csi.cgiar.org> (accessed on May 11, 2016).

## Sea

File Geodatabase Feature Class



## Tags

Sea

## Summary

This layer has the mask of the sea for map composition

## Description

This layer is for the Tana River Basin map composition

## Credits

IWMI

## White\_wash

File Geodatabase Feature Class



### Tags

Mask, whitewash

### Summary

The purpose of this layer is to mask the outside area of Tana River Basin for special effects.

### Description

The purpose of this layer is to mask the outside area of the Tana River Basin.

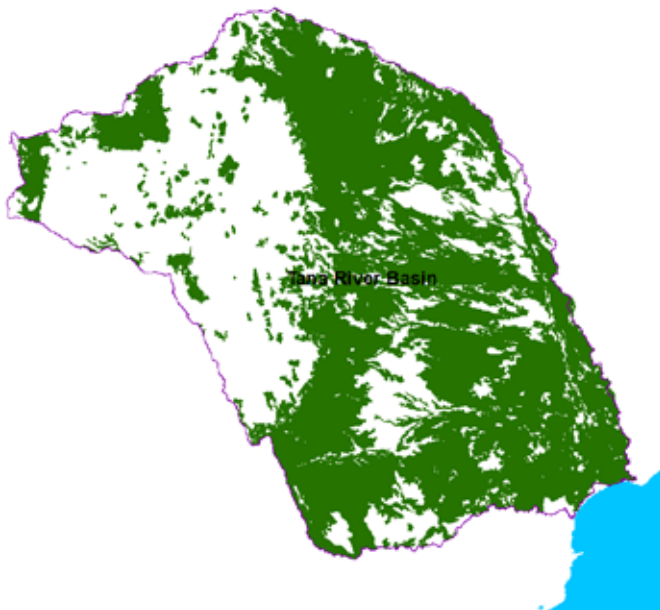
### Credits

IWMI

## Theme: Natural Infrastructure

### Forests

File Geodatabase Feature Class



### Tags

forests, trees, imageryBaseMapsEarthCover

### Summary

These data were used in Maps 1.3 and 7.1 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset portrays forest types in Kenya, from FAO's Africover dataset.

### Credits

WRI

## FloodPlains

File Geodatabase Feature Class



### Tags

landform, floodplains, valley bottoms, geoscientific Information

### Summary

These data were used in Maps 3.14 and 3.15 in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset portrays floodplains and valley bottoms in Kenya, extracted from FAO's Africover landform dataset.

### Credits

WRI



## Wetlands

File Geodatabase Feature Class



### Tags

wetlands, biodiversity, imageryBaseMapsEarthCover, environment, inlandWaters

### Summary

These data were used in selected maps in the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset portrays wetlands areas in Kenya, from FAO's Africover dataset.

### Credits

WRI

**Theme: Socioeconomics**

**centralprov\_servicepoints**

File Geodatabase Feature Class



Tags

Service point

Summary

Central Province service points, Tana River Basin

Description

This is a point coverage showing the service providers in three districts - Kiambu, Nakuru and Nyandarua. The locations selected were based on the characterization of livestock farmers analyzed by the Smallholder Dairy Project (SDP), in which particular farmers were identified based on this characterization and their service providers were then mapped out.

Credits

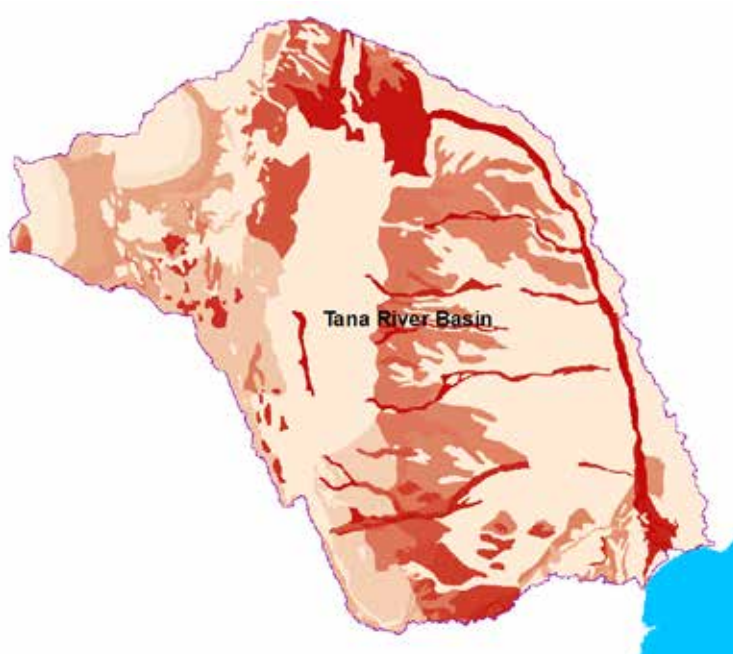
GIS Unit, ILRI

The map was originally called servicep37.utm and was created at ILRI by georeferencing GPS points collected from the field.

## Theme: Soil

### soil\_ph

File Geodatabase Feature Class



#### Tags

There are no tags for this item.

#### Summary

There is no summary for this item.

#### Description

This coverage shows the pH (the negative logarithm of the hydrogen ion concentration) of soils in Kenya according to Kenya Soil Survey (KSS).

Soil pH is determined by measuring the activity of  $H^+$  in a soil-water suspension.

The pH-water (Phaq) is used as an index of soil suitability for crops or plants in general. Low pH-water (acidic condition) from 4.5 to 5.5 normally decreases crop yields or even prevents it. The same with alkaline soils (pH-water over 8.0) optimal pH (neutral) for the majority of crops ranges between 6.5 and 7.5 in pH-water.

The difference between pH-water and pH-KCl (potassium chloride solution) gives information on the TOTAL ACIDITY in the soil.

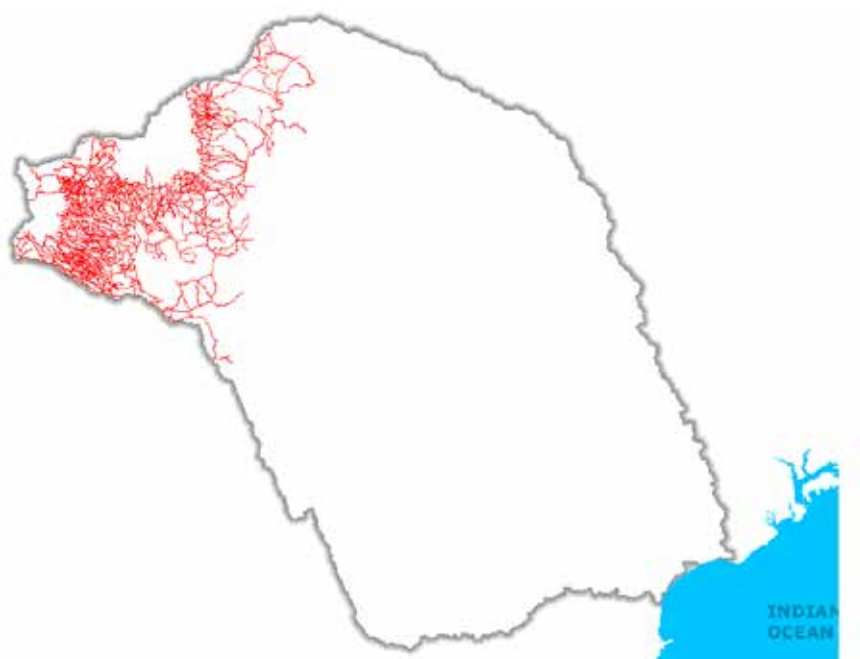
#### Credits

KSS, this coverage was originally called Ken2

## Theme: Transportation

### highland\_roads

File Geodatabase Feature Class



#### Tags

There are no tags for this item.

#### Summary

There is no summary for this item.

#### Description

The coverage shows road networks in the Kenya highlands digitized from topographic map sheets of scale 1:50,000. The road classes here are based on surface types.

#### Credits

ILRI

## major\_roads

File Geodatabase Feature Class



### Tags

transportation, roads, infrastructure

### Summary

These data were used in maps throughout the following publication:

World Resources Institute; Department of Resource Surveys and Remote Sensing, Ministry of Environment and Natural Resources, Kenya; Central Bureau of Statistics, Ministry of Planning and National Development, Kenya; International Livestock Research Institute. 2007. *Nature's benefits in Kenya: An atlas of ecosystems and human well-being*. Washington, DC, and Nairobi: World Resources Institute.

### Description

This dataset shows major roads in Kenya.

### Credits

WRI

## Roads

File Geodatabase Feature Class



### Tags

transportation, road, infrastructure

### Summary

Road network, Tana River Basin

### Description

This coverage shows the road networks of Kenya derived from topographic map sheets (1978-1997) of scale 1:50,000

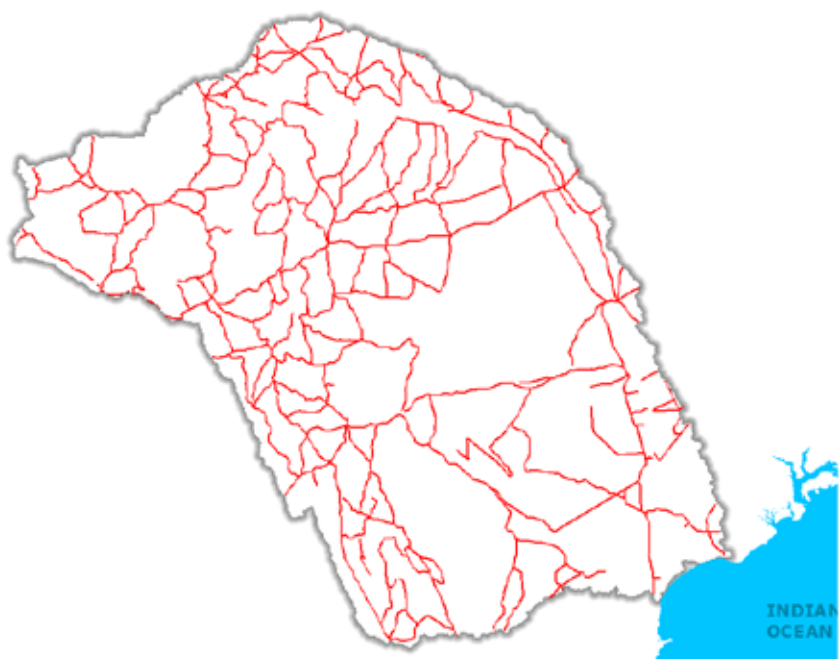
### Credits

Survey of Kenya (SoK)

Map history: Originally called Kenroads, ILRI

## roads\_wfp

File Geodatabase Feature Class



### Tags

There are no tags for this item.

### Summary

There is no summary for this item.

### Description

This coverage shows the road network of Kenya, excluding western Kenya. It was created by the World Food Programme (WFP).

### Credits

WFP, ILRI





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ISBN 978-92-9090-840-1