CCAFS site atlas

Bihar / Vaishali
India

CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)
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Titles in this series aim to disseminate interim climate change, agriculture and food security research and practices and stimulate feedback from the scientific community.

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Introduction

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

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

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

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

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

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

This Atlas was developed for the CCAFS site at Bihar / Vaishali in India, in South Asia Region.
CCAFS Sites: South Asia

Bangladesh: Khulna (BA04)
India: Bihar (IN16)
India: Haryana (IN17)
Nepal: Mid-Western Terrai (NE03)

Citation: GeoMapa (2013a)
Topography Bihar

CCAFS Site IN16, Bihar / Vaishali, India

 Coordinates of the CCAFS Baseline
 Sampling frame
 85.393E 25.804N
 85.393E 25.713N
 85.295E 25.713N
 85.295E 25.804N

Sampling frame size: 10km x 10km
Aridity Index indicates the level of dryness, taking evapotranspiration into account, at a given location of known rainfall.
Altitude indicates the height above sea level in meters.
Soil Type

Soil Type refers to the soil group as per the FAO classification. Soil groups are defined by their parent material and morphogenetic characteristics in terms of structural properties and texture (sand, silt and clay content), as well as organic matter content.

Citation: FAO et al (2009)
Agro-Ecological Zones

Corresponds to the map on the left

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

Legend corresponds to left map

Landcover:
- Irrigated croplands
- Rainfed croplands
- Mosaic Croplands/ marched
- Mosaic Vegetation/Croplands
- Closed to open grassland
- Bare areas
- Urban area

* Legend corresponds to left map

Citation: Arno et al. (2009)
Landuse is a description of how people utilize the land. It involves socio-economic activity, i.e., the management and modification of the natural environment into built environment, such as agricultural fields and settlements. At any place, there may be multiple land uses, the dominant one is presented here.

Legend corresponds to left map

Landuse *

- Rainfed crops (Subsistence/Commercial)
- Crops and high livestock density
- Crops, large-scale irrigated, moderate or higher livestock density
- Agriculture large scale Irrigation
- Urban area
- Open Water - Inland Fisheries

* Legend corresponds to left map

Scale 1:10,000,000

Citation: Natchigoe et al (2010)
The Length of Growing Period (LGP) is defined as the number of days in a year during which there is available rainfed soil moisture supply for plant growth.
The Length of Growing Period (LGP) is defined as the number of days in a year during which there is available rainfed soil moisture supply for plant growth; here modeled for 2030.
Crop Suitability refers to the land resource assessment that considers agricultural land use options with relevant cropping activities.
Livestock Production Systems

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

Citation: FAO (2007)
Livestock Density is measured in numbers of livestock, including cattle, goats and sheep, per km².
Travel time is a measure of accessibility determined by the time (hours) taken to reach the nearest urban centre, town or city of a population of 50,000 people or more (taking different means of transportation into account).
CIESIN constructed global data sets of poverty that are based on estimates of subnational infant mortality and child malnutrition data, and child malnutrition data, and recognizing that both are proxies for poverty and welfare rather than direct measures.
Conservation Areas

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

Citation: UNEP and WCMC (2012)
References and Data Sources

Regional Map

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

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

Annual Rainfall

Annual Rainfall Graph

Annual Temperature

Annual Temperature Graph

Aridity Index

Altitude

Soil Type

Agro-Ecological Zones

Landcover

Landuse

Length of Growing Period 2000

Length of Growing Period 2030

**Crop Suitability**

**Livestock Production Systems**

**Livestock Density**

**Human Population Density**

**Market Access**

**Poverty**

**Conservation Areas**
UNEP-WCMC (2012). Data Standards for the World Database on Protected Areas. UNEP-WCMC: Cambridge, UK.
The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) brings together the world’s best researchers in agricultural science, development research, climate science and Earth System science, to identify and address the most important interactions, synergies and tradeoffs between climate change, agriculture and food security. CCAFS is a strategic partnership of CGIAR and Future Earth, led by the International Center for Tropical Agriculture (CIAT).

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