

Burkina Faso - Second National Forest Inventory of Burkina Faso

**Ministry of Environment, Green Economy and Climate Change, through the General
Directorate of Water and Forests (Ministère de l'Environnement, de l'Économie
Verte et du Changement Climatique, à travers la Direction Générale des Eaux et
Forêts, DGEVCC)**

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Identification

SURVEY ID NUMBER

BFA_2014_IFN_v01_M_v01_A_ESS

TITLE

Second National Forest Inventory of Burkina Faso

COUNTRY

Name	Country code
Burkina Faso	BFA

STUDY TYPE

Forest resource survey

SERIES INFORMATION

First National Forest Inventory (1980–1983, with support from FAO)

ABSTRACT

The Second National Forest Inventory of Burkina Faso was conducted between 2010 and 2015 to provide a comprehensive, reliable, and up-to-date assessment of the country's forest resources. The study was based on the collection of quantitative and qualitative data on vegetation formations, particularly woody and herbaceous vegetation, from 5850 sample plots distributed across the national territory.

The results indicate an average density of 110 live trees per hectare, corresponding to an estimated total of 3.001 billion live trees. The average standing volume of green wood is estimated at 17.29 m³/ha, representing a total national volume of 470.94 million m³. The fuelwood potential is estimated at 208.68 million m³.

In terms of carbon, the average carbon stock in aboveground biomass is estimated at 22.76 tonnes of carbon per hectare, corresponding to a national total of 371.68 million tonnes of carbon. The study also highlights an estimated annual decline in wood volume of 7.742 million m³ between 1980 and 2014, reflecting significant anthropogenic and environmental pressures.

This inventory provides an essential strategic tool for the sustainable management of forest resources, efforts to combat deforestation, and the monitoring of the country's international climate commitments.

KIND OF DATA

Sample survey data [ssd]

UNIT OF ANALYSIS

Plots of lands

Scope

NOTES

This study covers the assessment of forest resources in Burkina Faso at the national level. It includes the analysis of woody and herbaceous vegetation, tree density, standing wood volume, fuelwood potential, and carbon stocks in aboveground biomass. The study also considers land use and land cover, forest stand health, and trends in forest resource degradation. Data were collected from sample plots distributed throughout the country, covering different ecosystem types, including forests, savannas, and woodlands.

TOPICS

Topic
Environment and Natural Resources
Forestry
Climate Change

Sustainable Land Management
Biodiversity
Sustainable Development

KEYWORDS

Keyword
Forest
Forest Inventory
Biomass
Carbon
Wood
Natural Resources
Deforestation
Biodiversity

Coverage

GEOGRAPHIC COVERAGE

National coverage.

Producers and sponsors

PRIMARY INVESTIGATORS

Name
Ministry of Environment, Green Economy and Climate Change, through the General Directorate of Water and Forests (Ministère de l'Environnement, de l'Économie Verte et du Changement Climatique, à travers la Direction Générale des Eaux et Forêts, DGEVCC)

PRODUCERS

Name	Abbreviation
National Institute of Statistics and Demography (Institut National de la Statistique et de la Démographie, INSD)	INSD

FUNDING AGENCY/SPONSOR

Name
Grand Duchy of Luxembourg

Sampling

SAMPLING PROCEDURE

The Second National Forest Inventory of Burkina Faso is based on a systematic and stratified sampling design developed to ensure reliable representation of the country's forest resources. The national territory was first divided into homogeneous strata according to land-use and land-cover types identified from satellite imagery, including forests, savannas, agricultural land, and other wooded land. This stratification accounts for the country's ecological heterogeneity and improves the precision of the estimates.

A network of 5850 sample plots was then distributed across the country according to a regular grid. Of these, 1147 were permanent plots and 4703 were temporary plots, with plot allocation taking into account the area and variability of each stratum.

The circular plots, each with a radius of 25 metres, constitute the basic sampling units. They are classified as permanent or temporary plots, allowing both the estimation of forest resources at a given point in time and the monitoring of changes in these resources over time.

In the field, the plots were located using GPS and established by the inventory teams. All vegetation units meeting the defined measurement criteria, including a minimum diameter measured at 1.30 m above ground level, were recorded. The data collected included dendrometric variables, such as diameter and height, information on vegetation health, and observations on land use and land cover.

A shortfall of 5.3 percent relative to the initially planned number of plots was recorded. The plots that could not be inventoried were located in difficult-to-access areas, including inaccessible sites, sacred groves where access was prohibited, disputed border areas, and urban areas.

The sample size and spatial distribution of the plots were determined to ensure an acceptable level of precision for estimates at both national and regional levels. The collected data were subsequently aggregated and extrapolated to the entire national territory using the mean values observed across the sample plots.

Supervision and quality-control procedures were implemented at all stages of the inventory process, including data collection, data entry, and processing, in order to minimize measurement errors and ensure data consistency. This sampling design therefore provides robust estimates of tree density, wood volume, biomass, and carbon stocks.

DEVIATIONS FROM THE SAMPLE DESIGN

A 5.3 percent shortfall relative to the initially planned number of sample plots was recorded, as some plots could not be inventoried due to access constraints, including inaccessible sites, sacred groves, border areas, and urban areas.

The results should be interpreted with caution depending on the scale of analysis. In particular, it would not be scientifically appropriate to directly compare the results of the Second National Forest Inventory (IFN2), which was designed to produce estimates at broader geographic scales, with those of an inventory conducted at a more localized scale, such as within a classified forest in Burkina Faso.

RESPONSE RATE

The concept of a response rate does not directly apply to this forest inventory, as data collection was based on field observations rather than surveys of households or individuals. Therefore, the report does not provide a formal response rate.

However, the report indicates a 5.3 percent shortfall relative to the initially planned number of sample plots, as some plots could not be inventoried due to access constraints, including inaccessible sites, sacred groves, border areas, and urban areas. This indicates that some planned observations were not completed, although no formal response rate was calculated.

In addition, quality-control procedures were implemented: 5 percent of the inventoried sample plots were independently checked in the field. The results showed a high level of agreement between the original and verified data, as well as accurate plot locations, supporting the overall reliability of the data despite the absence of a formal response rate.

WEIGHTING

As part of Burkina Faso's National Forest Inventory, weighting is used to extrapolate the results observed from the sample plots to the entire national territory. Each sample plot represents a defined area based on the distribution of the sampling units and the different land-use and land-cover strata.

The weighting factors take into account the relative area of each stratum, including forests, savannas, other wooded land, and agricultural areas, as well as the density of sample plots within each stratum. The main variables used for weighting include the area of the land-use and land-cover units, the number of sample plots within each stratum, and the ecological characteristics of the areas surveyed.

This approach enables the production of representative estimates at the national level, particularly for the number of trees, wood volume, biomass, and carbon stocks.

Data collection

DATES OF DATA COLLECTION

Start	End	Cycle
2012-10	2013-02	Phase 1: permanent sample plots
2013-02	2014-06	Phase 2: temporary sample plots

DATA COLLECTION MODE

Field measurement [field]

DATA COLLECTION NOTES

The data collected are representative of the state of forest resources during the inventory period (2010-2015). The results reflect the conditions observed during this period, although some analyses may include comparisons with earlier periods.

Data collection for the inventory was carried out in two phases. The first phase involved inventorying the permanent sample plots and took place from late October 2012 to mid-February 2013. The second phase focused on the temporary sample plots and was conducted from mid-February 2013 to June 2014.

Data Processing

DATA EDITING

Data processing for the Second National Forest Inventory of Burkina Faso involved several stages, including data entry, verification, and cleaning of the data collected in the field. Quality-control procedures were carried out both in the field and during office-based processing to assess the consistency, completeness, and reliability of the collected information.

The data were then subjected to statistical analysis to estimate the various forest parameters. Mean parameter values were calculated on a per-hectare basis for each land-use and land-cover type and used as technical coefficients. These coefficients were subsequently weighted according to the corresponding areas derived from the 2012 Land Use and Land Cover Database (BDOT 2012) to produce estimates at the phytogeographical sector level and, subsequently, at the national level.

Where certain forest formations had an insufficient number of sample plots, estimates were derived using technical coefficients from ecologically similar areas with larger sample sizes.

Total parameter values were obtained by extrapolating the technical coefficients to the corresponding areas. The precision of the estimates was assessed using the relative standard error of the estimated parameters, based on ratio estimation methods as described by Cochran (1977). This approach was used to determine the limits of validity of the estimates at a specified probability level.

The parameters estimated from the data included the health status of woody vegetation, standing woody resource potential, total wood volume, carbon stocks in aboveground biomass, herbaceous biomass production, and biodiversity indices.

Wood volumes were estimated using allometric equations developed specifically for the inventory. The volume of standing deadwood was estimated by applying a ratio to the corresponding volumes of live trees. For multi-stemmed trees, an equivalent diameter was calculated before applying the volume equations.

Data Appraisal

ESTIMATES OF SAMPLING ERROR

Quantitative estimates of sampling error are available in the form of relative standard errors associated with the different estimated parameters. These errors are expressed as percentages and calculated at a significance level of 0.05.

Relative standard errors are provided for several indicators, including tree density, wood volume, and carbon stocks, at different geographical levels. For example, a relative standard error of 5.15% is reported for the estimated carbon stock at the national level, while the magnitude of the error varies according to the parameter, land-use and land-cover type, and

geographical level considered.

These estimates provide an indication of the precision of the inventory results. However, sampling errors vary across parameters and levels of analysis, indicating that the degree of uncertainty is not uniform across all estimates.

Access policy

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ACCESS CONDITIONS

The results of the National Forest Inventory are available through official publications issued by the national institutions responsible for the environment and forestry.

CITATION REQUIREMENTS

MEEVCC, 2020: Rapport final du Second Inventaire Forestier National du Burkina Faso, 2ème édition.

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DISCLAIMER

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Metadata production

DDI DOCUMENT ID

DDI_BFA_2014_IFN_v01_M_v01_A_ESS_FAO

PRODUCERS

Name	Abbreviation	Affiliation	Role
Statistics Division	ESS	Food and Agriculture Organization of the United Nations	Metadata adapted for FAM

Data Dictionary

Data file	Cases	Variables
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