

Peru - Peru National Forest and Wildlife Inventory (First Panel)

Servicio Nacional Forestal y de Fauna Silvestre

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Identification

SURVEY ID NUMBER

PER_2013-2022_INFFS_v01_EN_M_v01_A_ESS

TITLE

Peru National Forest and Wildlife Inventory (First Panel)

TRANSLATED TITLE

Inventario Forestal Nacional y de Fauna Silvestre - Perú

COUNTRY

Name	Country code
Peru	PER

STUDY TYPE

Forest resource survey

ABSTRACT

The INFSS is conducted by the National Forest and Wildlife Service (SERFOR) of the Ministry of Agriculture and Irrigation (MINAGRI) and encompasses information on forests and wildlife throughout Peru. It was promoted through the Forestry and Wildlife Law No. 29763 and advances in a continuous process that plans to cover 1854 sample units divided into 5 phases in 6 ecozones (Costa; Sierra; Selva Alta accesible; Selva Alta de difícil acceso; Selva Baja e Hidromórfica). These ecozones were defined based on the particular characteristics of Peruvian forests (physiographic and physiognomic conditions, floristic composition and accessibility) and cover the entire country.

The process for the design and implementation of the INFSS' first panel was supported by technical assistance from the Food and Agriculture Organization of the United Nations (FAO) and with the participation of MINAGRI, the Ministry of Environment (MINAM) and United States Forest Service (USFS). It involved defining and consensus-building with multiple local, regional, national and international stakeholders from both the public sector and civil society. The INFSS methodological framework was socialized with the regional governments, validated in the field and subsequently approved.

The results correspond to Panel 1 comprising 366 sampling units belonging to the six ecozones that represent 20% of the total, and provides data that helps fulfill the country's international commitments; for the reporting of emissions and forest stocks of the Measurement System, Reporting and Verification (MRV) to meet the requirements of the REDD+ mechanism and that feed the National Greenhouse Gas Inventory (INGEI).

KIND OF DATA

Sample survey data [ssd]

UNIT OF ANALYSIS

Fields/plots

Scope

NOTES

The work focuses on these thematic axes:

- State of the Forest,
- Biomass and Carbon
- Wildlife
- Socio-economic Analysis

In addition, each thematic axis presents its development by ecozone.

TOPICS

Topic

Forest Inventory
Forest Assessment
Forest Survey
Timber Production

KEYWORDS

Keyword
Forestry
Forest resources
National Forest Inventories

Coverage

GEOGRAPHIC COVERAGE

National coverage.

UNIVERSE

The population of interest of the INFFS is the entire continental surface of the Peruvian territory, where attributes and changes occurring in relation to forests are estimated. The advantage of this population of interest is the possibility of incorporating measurements in land uses other than forest.

Producers and sponsors

PRIMARY INVESTIGATORS

Name	Affiliation
Servicio Nacional Forestal y de Fauna Silvestre	SERFOR

PRODUCERS

Name
Food and Agriculture Organization
United States Forest Service
AAgencia de los Estados Unidos para el Desarrollo Internacional

FUNDING AGENCY/SPONSOR

Name	Abbreviation
Red del Ministerio de Ambiente	Red MINAM
HELVETAS	
World Wild Foundation	WWF
Banco de Desarrollo del Estado de la República Federal de Alemania	KFW
Banco de Desarrollo de America Latina y el Caribe	Proyecto SERFOR-CAF
Universidad Nacional Agraria La Molina	UNALM

Sampling

SAMPLING PROCEDURE

Combination of systematic and random sampling, spatially unaligned, distributed in five panels defining years in which field samples are taken, with sub-samples clustered in units of unequal size. Each panel represents approximately 20% of the total sample. The total sample size was 7923 sampling units with

Six sub-populations (ecozones) with different sampling sizes were defined based on the analysis of variability of the main ecological attributes, accessibility, costs and precision goals among others.

The geographical selection of sampling points combines features of systematic sampling and random sampling, commonly called systematic non-aligned sampling.

Grids were constructed in each ecozone, with the size of each grid dependent on the number of samples required for that particular ecozone (Marco metodológico del Inventario Nacional Forestal y de Fauna Silvestre- Perú.

https://sniffs.serfor.gob.pe/inventarios/gestor/api/public/api/serfor/files/02.marco_metodologico_del_inffs_Peru.pdf. Chapter 8, Figure 8).

Spatially groups of plots were then systematically defined based on logistic variables such as access roads, watershed delimitation, physiography, hydrography and presence of forest (Marco metodológico del Inventario Nacional Forestal y de Fauna Silvestre- Perú). This resulted in 1854 primary sampling units that included the original 7923 units

(https://sniffs.serfor.gob.pe/inventarios/gestor/api/public/api/serfor/files/02.marco_metodologico_del_inffs_Peru, Chapter 8, Figure 11). Furthermore, within each group, each plot is composed of ten or seven sub-plots depending on the ecozone. This cluster plot design behaves as a two-stage sampling, where the groups of plots are the primary units and measurement plots are the secondary units (Marco metodológico del Inventario Nacional Forestal y de Fauna Silvestre- Perú.

https://sniffs.serfor.gob.pe/inventarios/gestor/api/public/api/serfor/files/02.marco_metodologico_del_inffs_Peru. Chapter 8, page 32-33).

For the ecozones Costa, Sierra, Selva Alta, Selva Alta Difícil, Selva Alta Accesible and Hidromórfica, the sampling unit was defined as a cluster of 10 circular sub-plots arranged in an "L" shape with a north axis and 276.2 meters long and another east axis with the same length.

The total area of the sampling unit is 5000 m² (0.5 ha), divided into 10 circular sub-units of 12.62 m radius, equivalent to 500 m² (0.05 ha) each. The distance between sub-plots is 30 m.

In the Selva Baja ecozone, the sampling unit consists of 7 rectangular sub-units arranged in an 'L' shape with an axis in the North direction of 385 m, and another in the East direction of 425 m. The total surface area is 7,000 m², equivalent to 0.7 ha, and is divided into 7 rectangular sub-plots 50 m long and 20 m wide.

The total area of the plot is 7,000 m², equivalent to 0.7 ha, and is divided into 7 rectangular sub-plots 50 m long and 20 m wide. These are equivalent to 0.1 hectare each, with a distance of 75 m between sub-plots.

The difference between the design of the sampling units in different ecozones, as well as the spatial arrangements, lies in the dimensions of the trees to be measured in each type of subplot. As explained below.

Stages of forest development are established by ecozone as follows:

For Costa and Sierra ecozones:

- Trees: Individuals with DBH \geq 10cm
- Poles: Individuals with DBH \geq 5 cm and $<$ 10cm
- Saplings: Individuals with DBH $<$ 5cm (at 30cm from the ground), and height between 1- 2m
- Seedlings: Young individuals with heights between 0,30 m to 1 m

For Selva Alta (Accesible y de Difícil acceso), Selva Baja e Hidromórfica ecozones:

- Trees: Individuals with DBH \geq 30 cm
- Poles: Individuals with DBH \geq 10 cm and $<$ 30cm
- Saplings: Individuals with DBH $<$ 10 cm and height $>$ 3 m
- Seedlings: Young individuals with heights between 1 m to 3 m

Other measured variables are standing dead trees, lying dead trees, litter and stumps.

For more details on the design of the INFFS see Marco metodológico del Inventario Nacional Forestal y de Fauna Silvestre- Perú. https://sniffs.serfor.gob.pe/inventarios/gestor/api/public/api/serfor/files/02.marco_metodologico_del_inffs_Peru

DEVIATIONS FROM THE SAMPLE DESIGN

The main factor for not being able to complete the implementation of the INFFS according to the planned design of 20% of the total sample in panel 1 on time has been the budgetary factor. Where additional funds have been made available, progress has been made in data collection not only for the sampling units in panel 1, but also for panel 2 and, in some cases, panel 3.

Another influential factor was the inaccessibility of the sampling units due to physiographic factors.

Finally, the social factor, expressed in the lack of permission from the local population to enter their territories, has in some cases prevented the continuation of the initial flow of the INFFS plan.

RESPONSE RATE

Out of 366 sampling units (UM), 258 have been evaluated (70 %), on the other hand 84 UM (23 %) were not evaluated due to geographic inaccessibility and lack of permission from local people to enter their territories; and 7 % are not yet scheduled for implementation due to lack of funds.

The response rate by ecozones is:

Costa: 93 % evaluated, 1 % (*).

Hidromórfica: 100 % evaluated.

Selva alta accesible: 58 % evaluated, 15 % (*) and 27 % (**).

Selva alta de difícil: 21 % evaluated, 68 % (*) and 11 % (**).

Selva baja: 82 % evaluated, 16 % (*) and 2 % (**).

Sierra: 56 % evaluated, 39 % (*) and 5 % (**).

(*) not evaluated due to geographic inaccessibility and lack of permission from local people.

(**) not yet evaluated due to lack of funds.

WEIGHTING

The cluster plot design behaves as a two-stage sampling, where the clusters are the primary units and the measurement plots are the secondary units. For this reason, during the first five years of measurement, an unbiased estimator should be used for subsampling.

Data Collection

DATES OF DATA COLLECTION

Start	End
2013	2022

DATA COLLECTION MODE

Field measurement [field]

Data Processing

DATA EDITING

The data obtained from the INFFS goes through a review process by the professionals of the Inventory Department. For this purpose, there is a standard data cleaning protocol with validation rules for each attribute. Cleansing consists of the identification of empty data, outliers, inconsistencies and data that fall outside the established ranges, as well as records that do not comply with validation and consistency rules. Excel spreadsheets are used for these evaluations.

In addition, a geospatial evaluation is also carried out with GPS track data and the location of the initial point of each sample unit, using ArcGis for this stage.

Data Appraisal

ESTIMATES OF SAMPLING ERROR

Sampling errors were estimated for variable within each ecozone and they are described in the following document:

https://sniffs.serfor.gob.pe/inventarios/gestor/api/public/api/serfor/files/8767177466_05.informe_del_inventario_nacional_forestal_2.pdf

Access policy

CONTACTS

Name	Affiliation	Email
Jorge Luis Carranza Castañeda / Director de Inventario y Valoración	SERFOR	jcarranza@serfor.gob.pe

Germán Alex Sánchez Rojas/Especialista en Base de Datos y Sistematización de la Información de la Dirección de Inventario y Valoración

SERFOR

gsanchez@serfor.gob.pe

CONFIDENTIALITY

Personal data or information linking to personal data is confidential under the law 29733 on the protection of personal data.

ACCESS CONDITIONS

Data available from an external repository.

CITATION REQUIREMENTS

"Servicio Nacional Forestal y de Fauna Silvestre. 2020. Inventario Nacional Forestal y de Fauna Silvestre. Informe de resultados del Panel 1. Lima, Perú."

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Metadata production

DDI DOCUMENT ID

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PRODUCERS

Name	Affiliation	Role
Statistics Division	FAO	Metadata producer

Data Dictionary

Data file	Cases	Variables
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