Nepal
REDD - Forestry and Climate Change Cell

Development of a Measurement, Reporting and Verification (MRV) System for Emissions and Removals

Contract No.: FCPF/REDD/S/QCBS-7

MRV Geographic Information System
Data catalog
Working Paper N.1
October 2013

Authors:
Saroj K Sharma
Gehendra Karki
Antonio Marzoli

AGRICONSULTING S.p.A.

Catalogue Outline

➢ Developed a systematic description of collected and organized data for MRV database system

➢ Standardized data formats in terms of nomenclature, projections and to produce adequate metadata

➢ Quality checked of available dataset by extracting information from it in order to examine for the use of MRV

Catalogue Outline……

➢ Developed data schema/attribute to Integrate into the unique, multi-user, client/server framework (based on PostgreSQL/PostGIS)

➢ create a systematic catalogue of the existing available layers for MRV use

Data Types:

A) Spatial: **Dataset** which are directly or indirectly **referenced to a location** on the surface of the earth (Image-Raster, geo-referenced vector dataset)

B) Non-Spatial: dataset that **is not referenced to a location** on the surface of the earth (Tabular)

Summary of data available

- Spatial Data Raster: 7 types
- Spatial Data Vector: 31 types
- Tabular Data: 18 types

Classification of MRV Database System on the basis of Thematic Elements
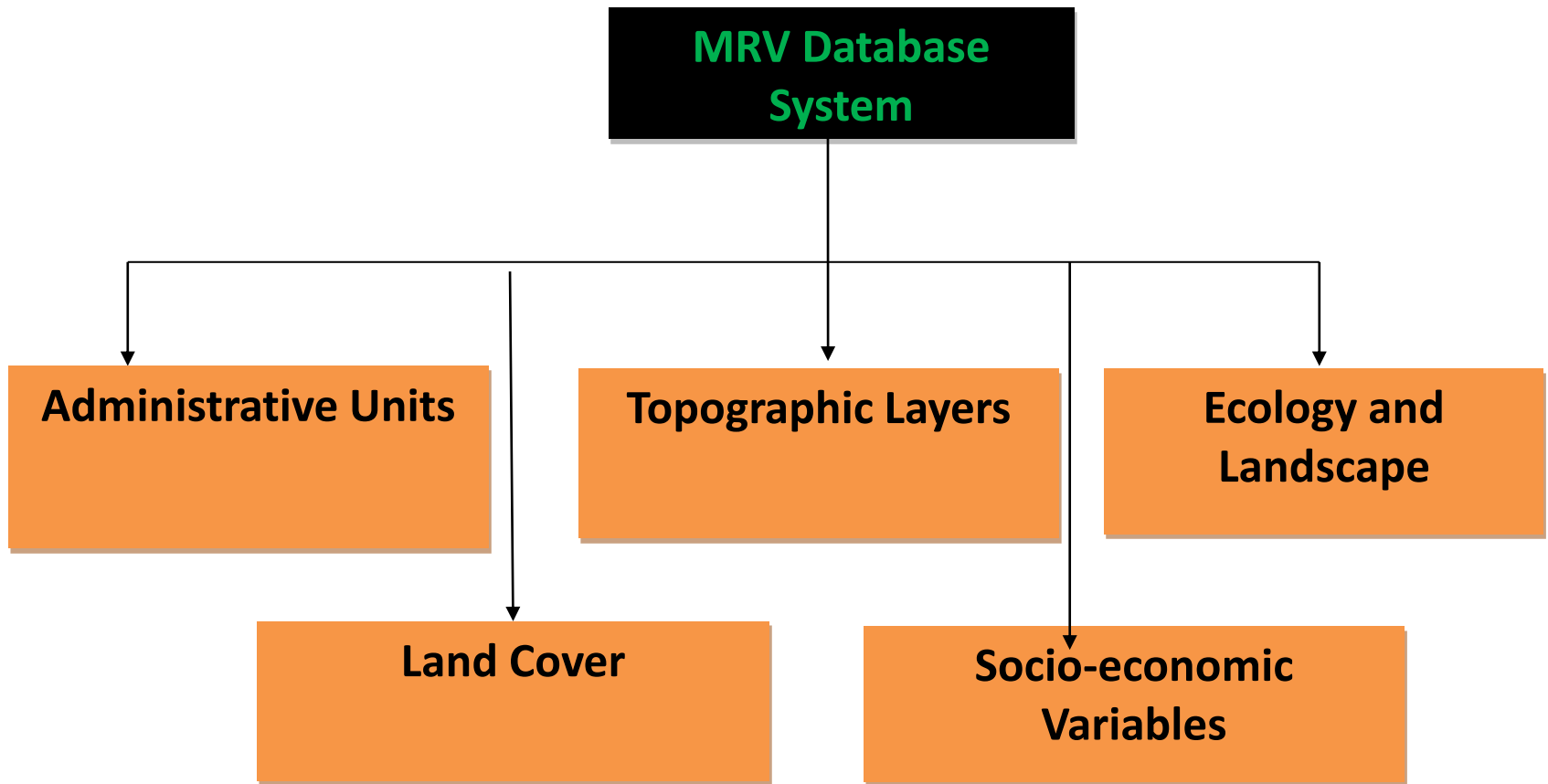
Administrative Unit Vector Dataset

- Development Regions
- Regional headquarters
- Districts,
- Village Development Committees

Topographic Dataset

- Contour lines
- Spot height
- Roads
- Rivers
- Airports
- Dataset for 3 watershed of REDD+ Pilot project area (ANSAB/FECOFUN)

Ecology and landscape

- Physiographic region
- Digital Elevation Model
- Slope
- Precipitation
- Soil
- Geology
- Ecological zones
- National Parks and Reserves

Socio-Economic Variables (Tabular Data)

- ❑ Population census by District/VDC wise (CBS, 2011/2001/1981)
- ❑ Households by usual type of fuel used for cooking (CBS, 2012)
- ❑ Community Forest Users Group Data (CFD/DoF, 2013)
- ❑ Status of encroachment in 24 Terai and Siwalik districts of Nepal (DFRS, Report)
- ❑ Poverty Rates on District level (CBS 2011/2001)
- ❑ Agricultural crops production by year (MoAD, 2011/12)
- ❑ Annual Growth Rate of GDP by Economic Activities (Living standard survey, 2003/4)
- ❑ Indices and Indicators Poverty and Deprivation Index by district wise (CBS, 2001)
- ❑ Socioeconomic and Infrastructural Development Index by District wise (CBS, 2001)
- ❑ Farm Size by District level (CBS, 2001)
- ❑ Livestock per Farm Household by District Level (CBS, 2001)
- ❑ Percentage of Forest User Households (CBS, 2001)
- ❑ Fuel Wood production by district, (CBS, 2007/8, 2008/9)
- ❑ Fuel Wood use by district, (MoAD, 2012)
- ❑ Livestock distribution by district (MoAD, 2012)
- ❑ Protected Areas of Nepal's National Parks, Wildlife Reserves, Hunting Reserve, Conservation Area, Buffer Zones and Wetlands (CBS, 2001)
- ❑ Revenue from forest product (CBS, 2001)
- ❑ Sectorial Energy Consumption (Living Standard Survey, 2003/4)

Available data source

Landcover: DoF, FRA, ICIMOD, WWF, DoS

Administrative Boundry: DoS, ICIMOD

Topography:DoS, ICIMOD

Ecology and landscape: ICIMOD

Socio-economic variables: CBS, DoF, DOA etc.

Examples of Database schema

Village Development Committee (VDC) Map of Nepal

Name: NEPAL_VDC

Geometry Type: Polygon

Geographic Coordinate System: GCS_WGS_1984

Source: Survey Department of Nepal

Attribute Table

Field Name	Data Type	Description
DCODE	Text	District Code
ZCODE	Text	Zone Code
VDC_NAME	Text	VDC Name
DIST_NAME	Text	District Name
ZONE_NAME	Text	Zone Name

Examples of Database schema contd…

National Population Census 2011 by VDC Level

Name: CENSUS2011_VDC

Source: Central Bureau of Statistics

Attribute Table

Field Name	Data Type	Description
VCODE	Double	VDC Code
VDC_NO	Double	Number of VDC in particular District
DCODE	Double	District Code
TOTAL_HH	Double	Total number of households
TOTAL_POP	Double	Total Population
MALE	Double	Male Population
FEMALE	Double	Female Population

Difficulties faced

- Unavailability of updated national forest cover and inventory data

- Unavailability of Metadata

- Data inconsistency in Format

- Lack of time series data of regular interval

- Lack of detail VDC/ward level data

- Inconsistency of boundary line and data schema for spatial data produced by different sources

Further Data Requirements

Expected contribution from REL Project

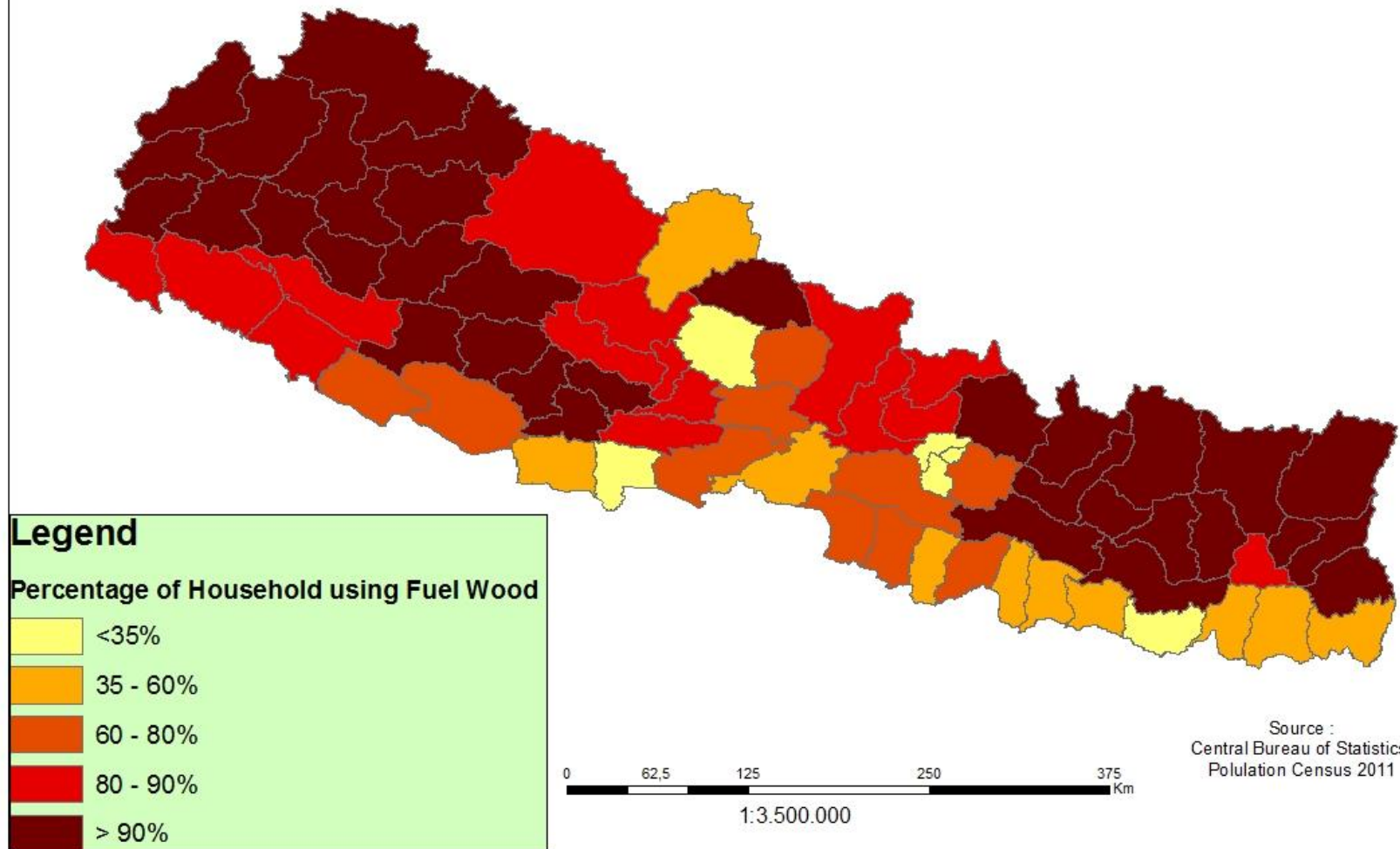**The following outputs generated under REL Project that will be fed into the MRV system**

- **Land use and forest cover estimation**

- **Forest carbon density (emission factors)**
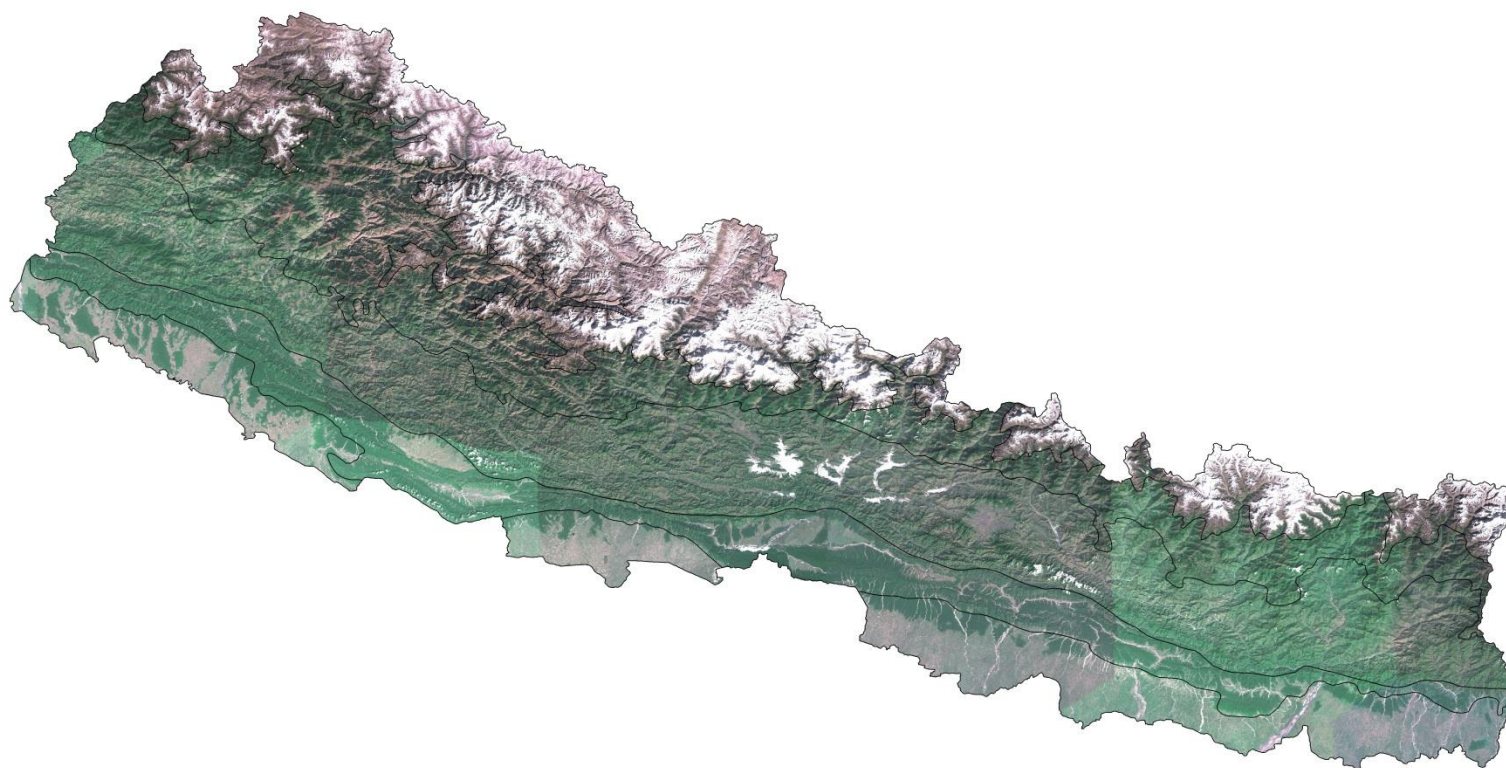
Types of Forest inventory data under FRA Project:

❑ **forest cover and tree characteristics,**

❑ **Dead wood,**

❑ **Forest and soil carbon,**

❑ **Trees Outside Forests (ToFs),**

❑ **Human impacts,**

❑ **Biodiversity variables including NTFPs and other vascular plants, macro fungi and flagship mammals**

Thematic Maps

Percentage of Household using Fuel Wood

N

Legend

Percentage of Household using Fuel Wood

- <35%
- 35 - 60%
- 60 - 80%
- 80 - 90%
- > 90%

0   62,5   125   250   375
Km

1:3.500.000

Source :
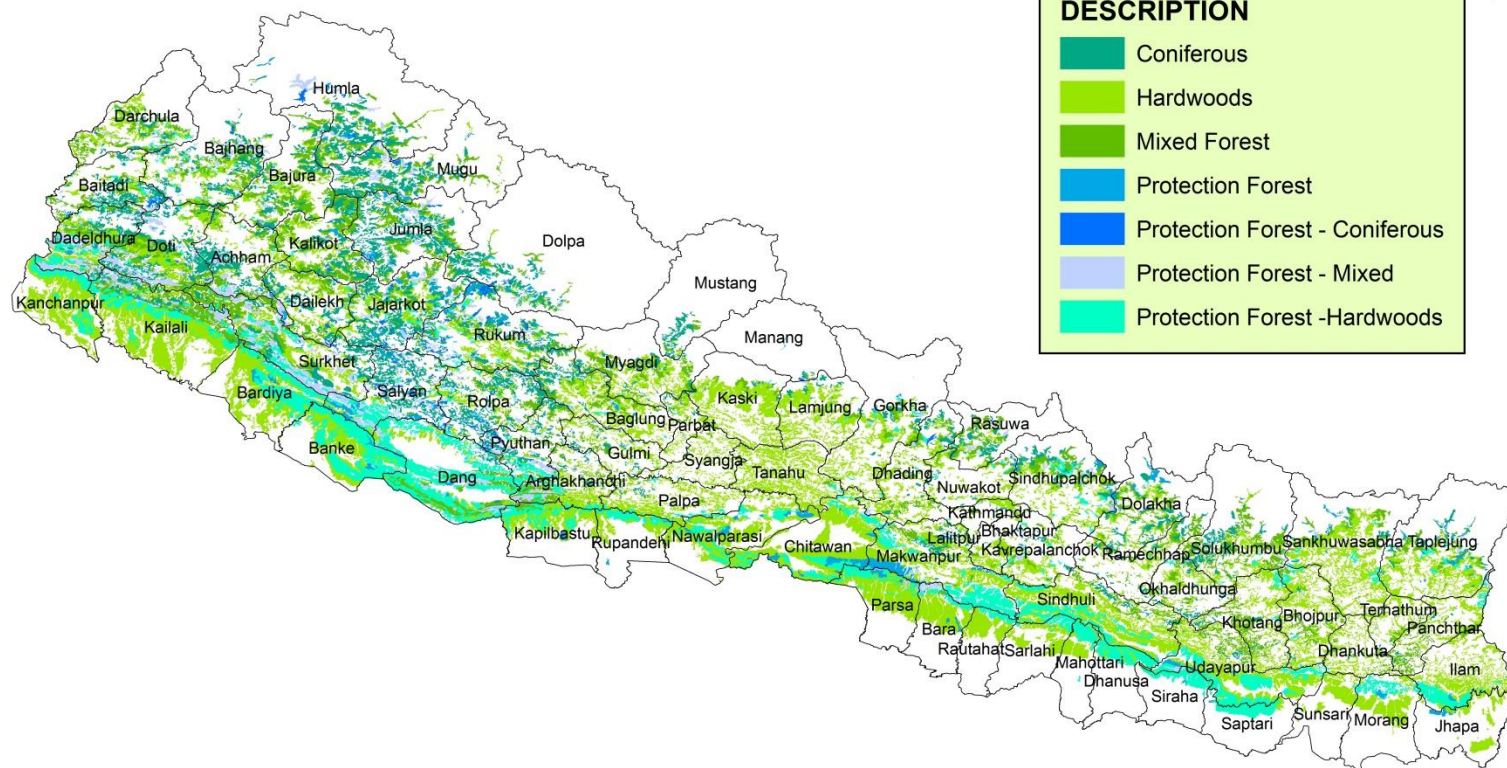Central Bureau of Statistics
Polulation Census 2011

Mosaic of Landsat imageries 2010

N

1:3,500,000   Soutce: Elaboration of MRV Project

Forest cover map, 1979
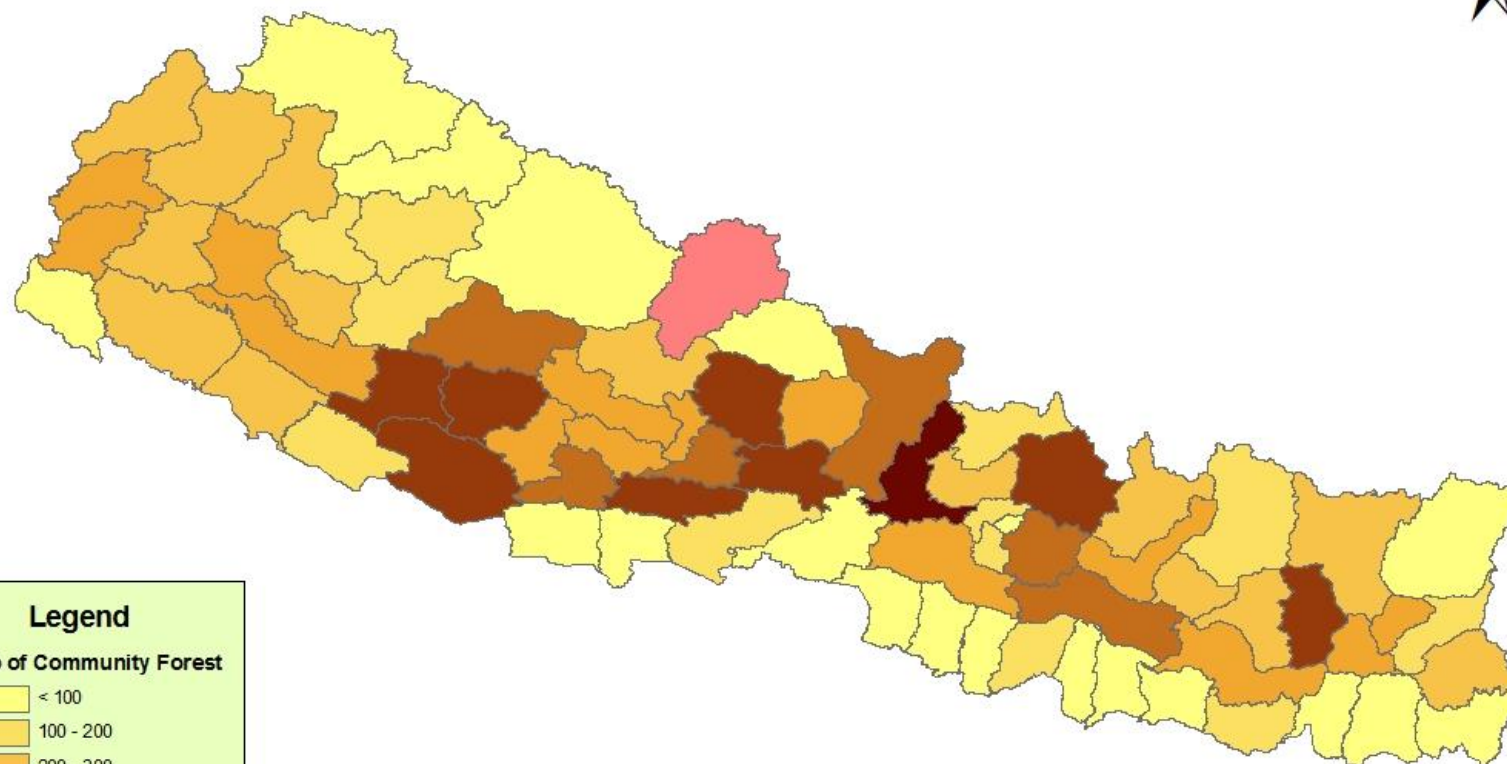
Legend

LRMP_LANDUSE

DESCRIPTION

- Coniferous
- Hardwoods
- Mixed Forest
- Protection Forest
- Protection Forest - Coniferous
- Protection Forest - Mixed
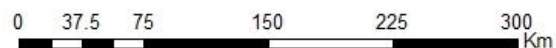- Protection Forest -Hardwoods

N

1:3,500,000

Source: LRMP, 1979

Darchula
Bajhang
Baitadi
Bajura
Humla
Mugu
Dadeldhura
Doti
Achham
Kalikot
Jumla
Dolpa
Kanchanpur
Dailekh
Jajarkot
Mustang
Kailali
Rukum
Manang
Bardiya
Surkhet
Salyan
Myagdi
Banke
Rolpa
Baglung
Kaski
Lamjung
Gorkha
Rasuwa
Dang
Pyuthan
Parbat
Arghakhanchi
Gulmi
Syangja
Tanahu
Dhading
Nuwakot
Sindhupalchok
Dolakha
Palpa
Kathmandu
Kapilbastu
Rupandehi
Nawalparasi
Chitawan
Lalitpur
Bhaktapur
Kavrepalanchok
Ramechhap
Solukhumbu
Sankhuwasabha
Taplejung
Makwanpur
Sindhuli
Okhaldhunga
Parsa
Bara
Rautahat
Sarlahi
Mahottari
Udayapur
Khotang
Bhojpur
Terhathum
Dhankuta
Panchthar
Dhanusa
Siraha
Saptari
Sunsari
Morang
Ilam
Jhapa

Total Number of Community Forest by District

N

Legend

No of Community Forest
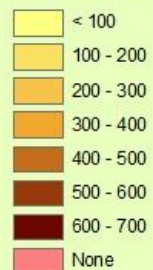
- < 100
- 100 - 200
- 200 - 300
- 300 - 400
- 400 - 500
- 500 - 600
- 600 - 700
- None

0   37.5   75   150   225   300
Km

1:3,500,000

Source:
Nepal Government
Ministry of Forest and Soil Conservation
Department of Forest
Community Forest Division

Number of Forest Community Households by District

Legend

No of Households

- <20000
- 20000-40000
- 40000-60000
- 60000-80000
- 80000-100000
- None

N

0   37.5   75   150   225   300
Km
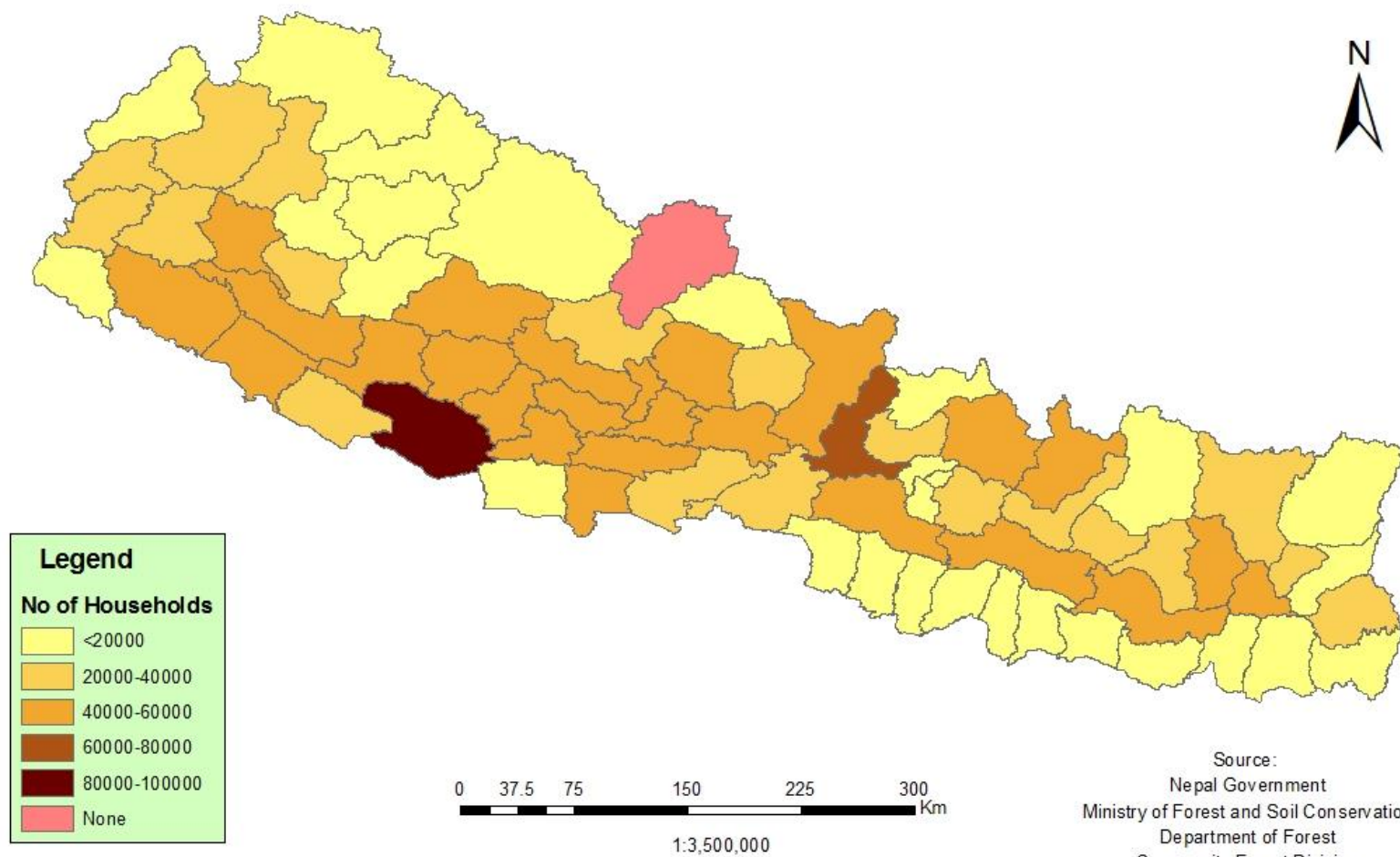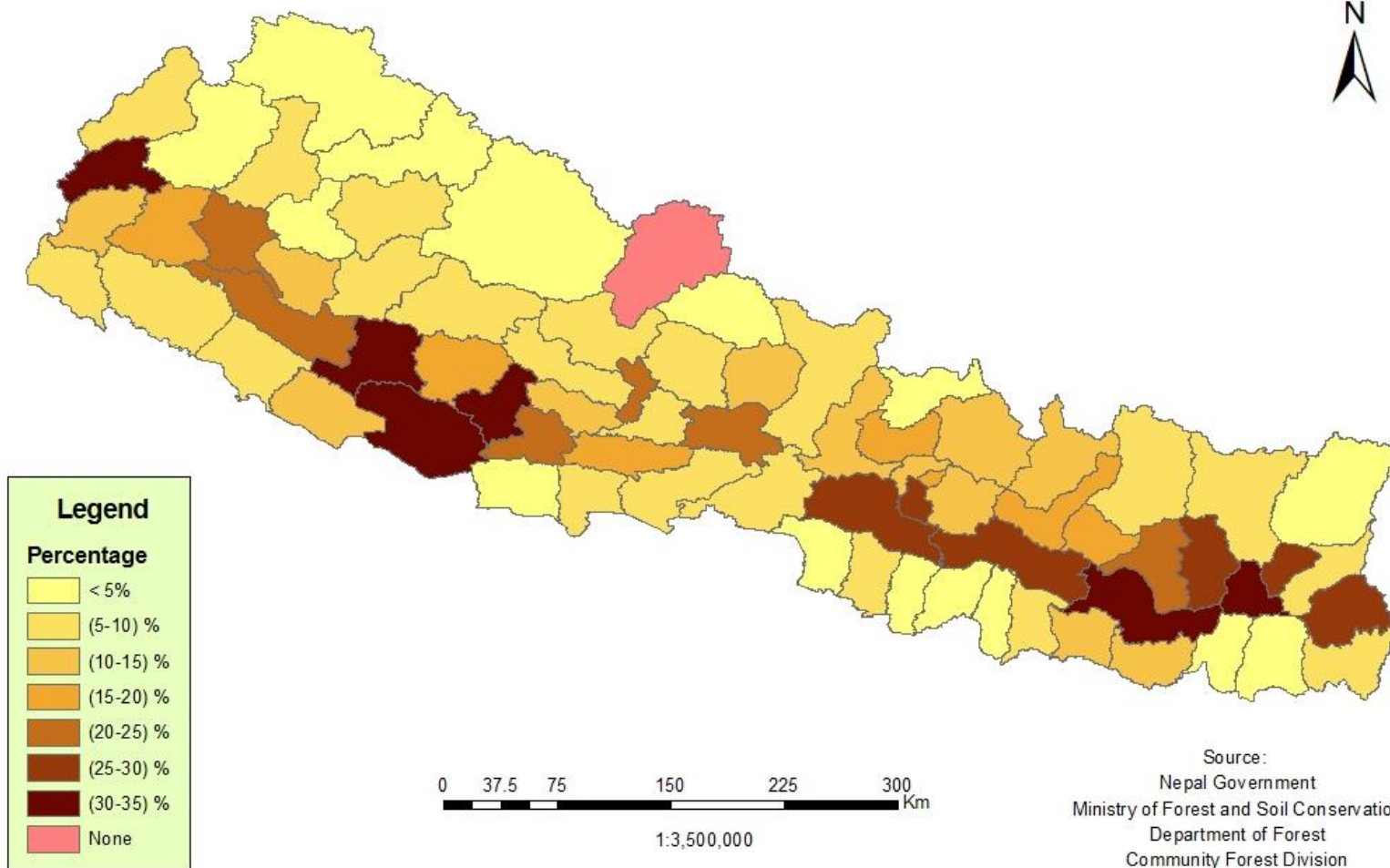
1:3,500,000

Source:
Nepal Government
Ministry of Forest and Soil Conservation
Department of Forest
Community Forest Division

Districtwise Percentage of Community Forest Area

N

Legend

Percentage

- < 5%
- (5-10) %
- (10-15) %
- (15-20) %
- (20-25) %
- (25-30) %
- (30-35) %
- None

0   37.5   75   150   225   300
Km

1:3,500,000

Source:
Nepal Government
Ministry of Forest and Soil Conservation
Department of Forest
Community Forest Division

THANK YOU!