Faculty of Forest, Geo and Hydro Sciences. Department of Forest Sciences. Institute of International of Forestry and Forest Products

ANALYSIS OF LAND USE AND LAND COVER CHANGE DYNAMICS IN COTAPATA (NP-IMNA) NATIONAL PARK-INTEGRATED MANAGEMENT NATURAL AREA, BOLIVIA

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1. Introduction

- During the past three decades, Bolivia has experienced a steadily increment of the rates of land use and land cover change.

- Nowadays, deforestation continues representing 77% of the total land use and cover change:

Most of mechanized farmers, subsistence agriculturalists, and livestock producers, preferentially selected forest landscapes for conversion (Killeen et al., 2008).

Land use and land cover change in the Mountain zones

- On the Bolivian mountain zones, the landscape has been shaped mainly through the agriculture by local peasants and immigrants (Zimmerer, 1999).

- Typically, the ‘zone model” is used to explain the spatial and environmental organization of mountain agriculture and livestock raising in the Central Andean countries and in other inhabited highlands of the world (Brush, 1976a cited in Zimmerer, 1999).

Objectives

- General objective

Analyze the land use and land cover changes (LULC) in Cotapata National Park and integrated Management Natural Area.

- Specific Objectives

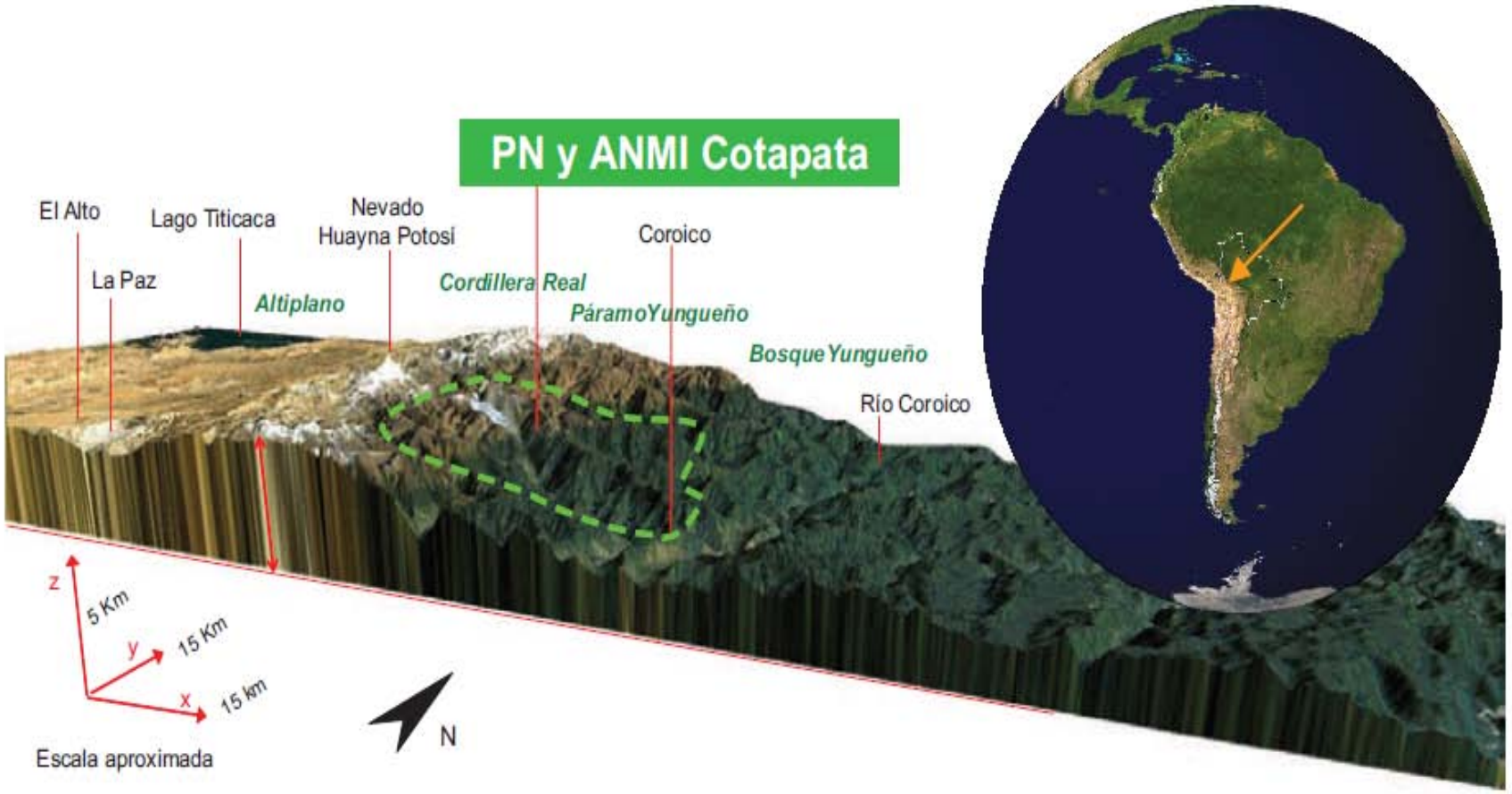
Determine and compare quantitative and qualitative patterns of land use and land cover changes during the following periods:

Before the establishment of the protected, after the establishment of the area (during the construction* of the Cotapata - Santa Barbara road) and current time.

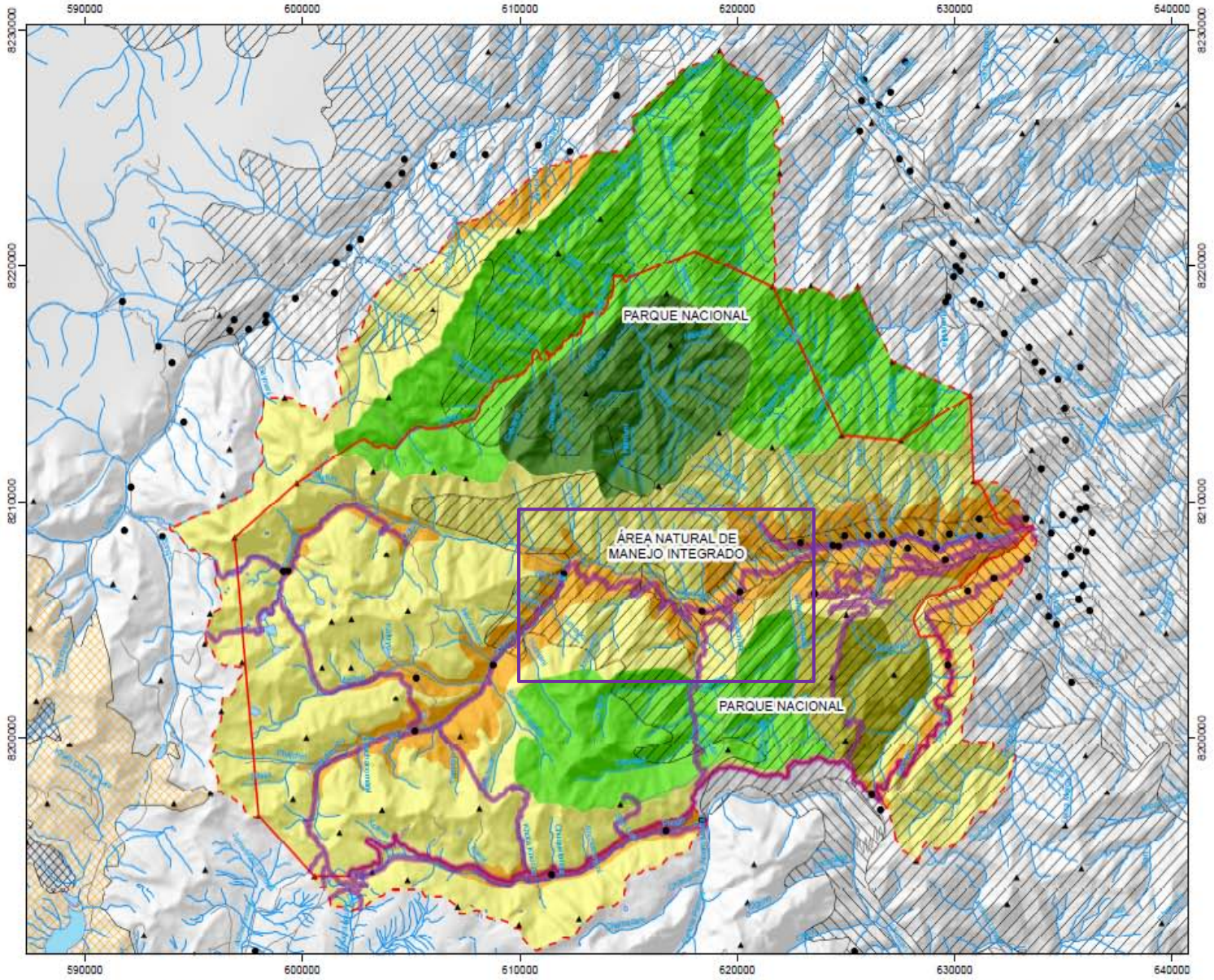
Identify the main causes of change during these periods.

Characteristics of Study Area Cotapata NP-AMNI

- Area located about 80 km northeastern from the city of La Paz, in the provinces of Nor Yungas and Murillo, within the jurisdiction of the municipalities of La Paz and Coroico (Geographical coordinates: 67º43’ – 68º02’ W and 16º10’ – 16º20’ S).
- Size of approximately 610 $km^{2.}$
- Cotapata encompasses a wide range of ecological zones (also called layers), from the snow-covered peaks of the high Andes (5,519 masl) to the humid mountain cloud forests, known as Yungas (1,035 masl).



Source: (Sevilla-Callejo, 2003).

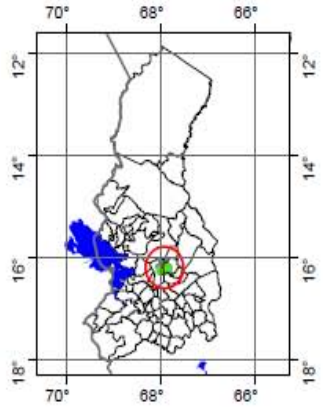


Programa BIAP

Estrategia de Gestión de Tierras

Mapa AP-15_3:

Mapa de Zonificación del PN y ANMI Cotapata



REFERENCIAS

- Cotas
- Lagunas
- Ríos y quebradas
- Caminos
- Localidades INE (Censo 2001)

Planes de usos del suelo

- Reserva de Inmovilizacion
- Forestal Uso Limitado
- Agrisilvopastorial Uso Limitado
- Ganadero Extensivo
- Area sin Estudios

Limites del PN y ANMI

base legal

- DS 23547 del 09/07/1993
- Prop. ampliación PM 2005

Zonificación (PM 2006) *

- Zona núcleo o intangible
- Zona de uso extensivo no extractivo
- Zona de recuperación natural
- Zona de uso extensivo extractivo
- Zona de aprov. recursos naturales
- Zona de uso intensivo

* *Parque Nacional en verde (3 primeras categorías)*
Área Natural de Manejo Integrado en amarillo (2 siguientes)
Categoría especial de uso público intensivo en púrpura

Proyección Universal Transversa de Mercator
Datum WGS84
Zona 19 Sur

Más información y copias de esta cartografía en:
http://www.uam.es/cotapata/

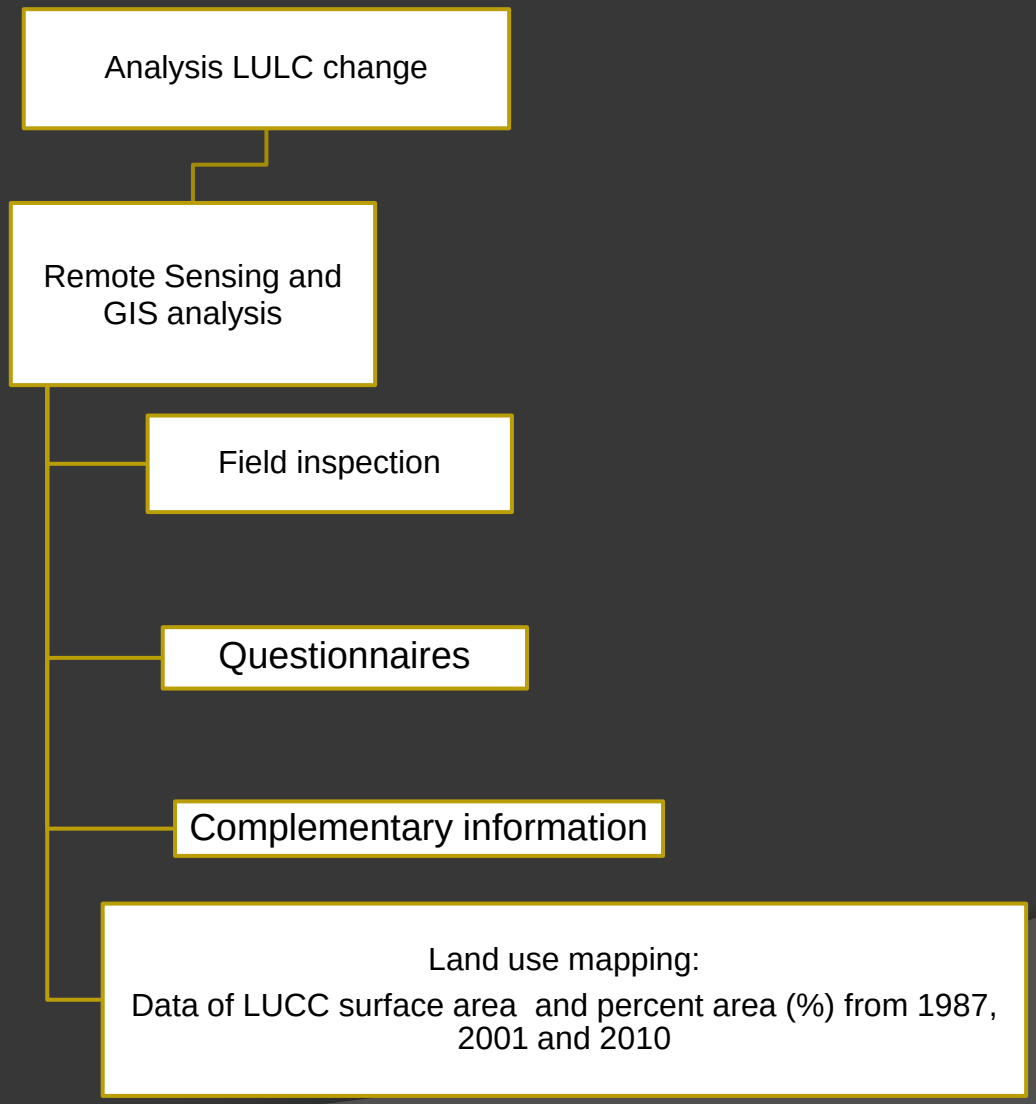
0 2,5 5 10 15 20 Km

Departamento de Geografía

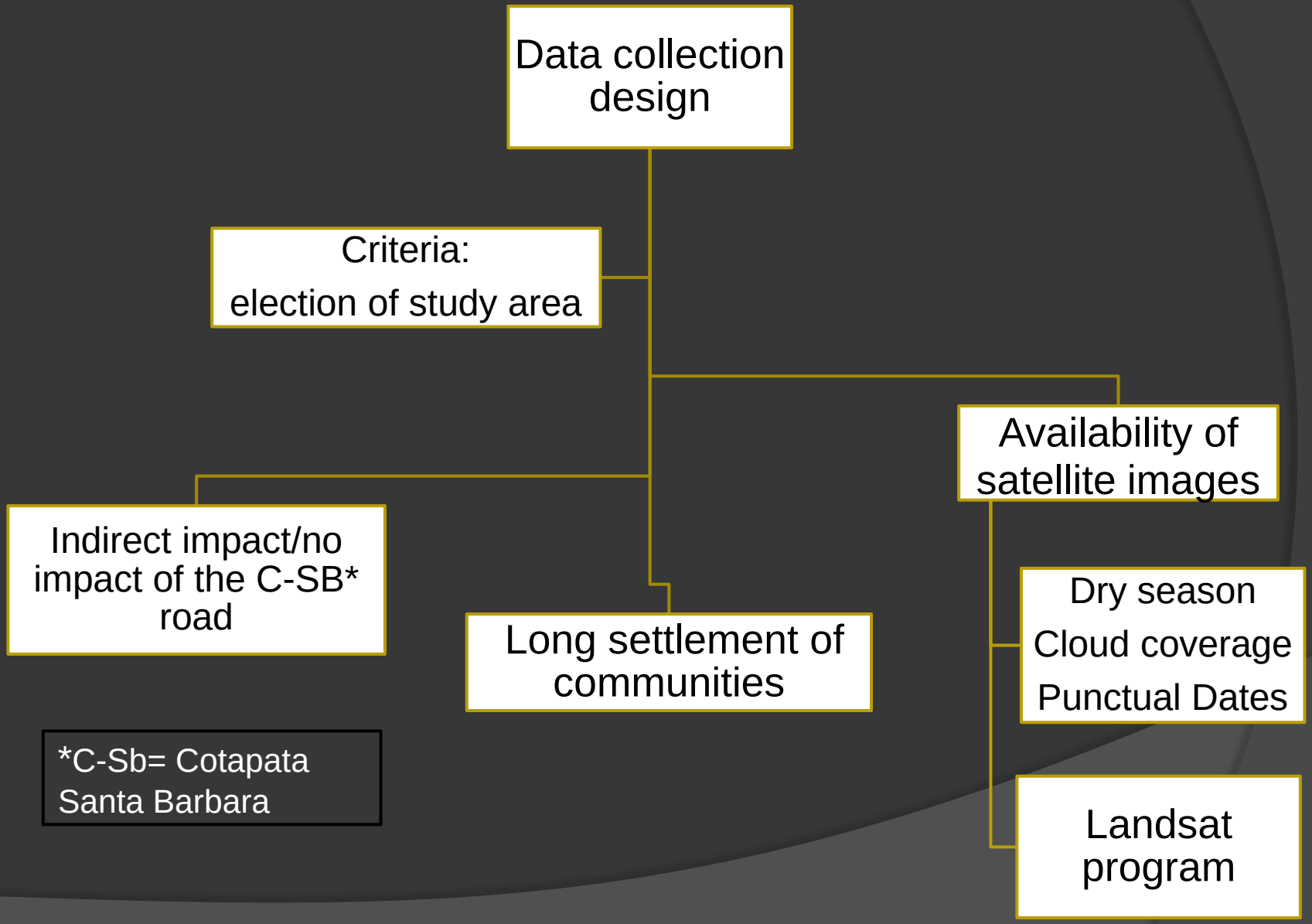
Elaboración:
MSc. Lic. Miguel Sevilla Callejo
Departamento de Geografía
Universidad Autónoma de Madrid

27 de Abril de 2006

Methodology



Methodology

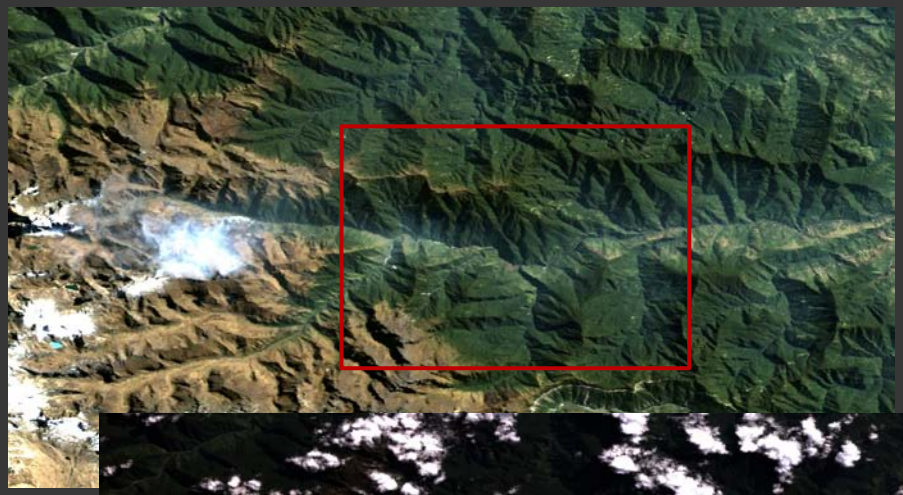


Establishment of the Time series

1987 Before NP-IMNA establishment

2000 - After NP-IMNA establishment

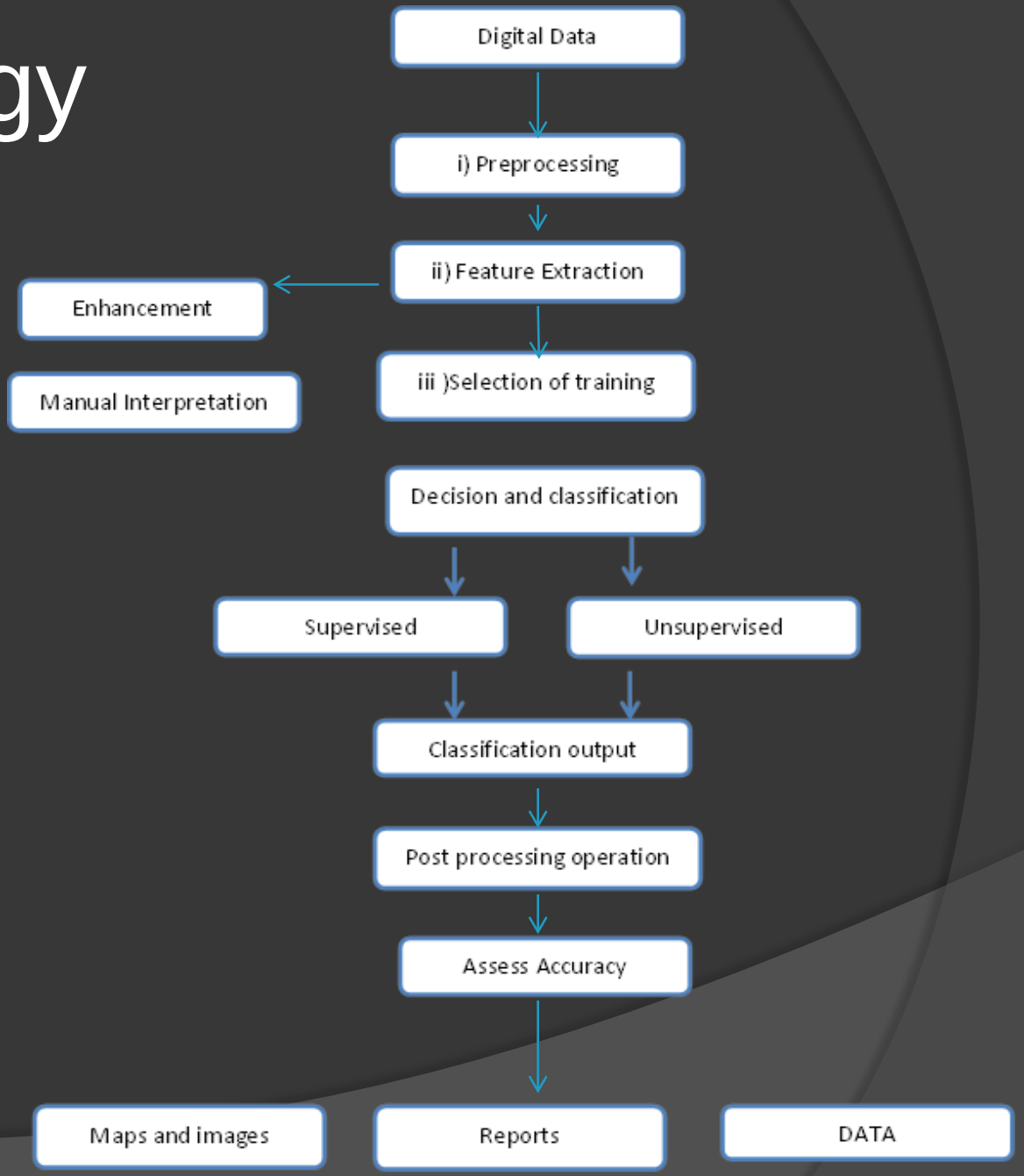
2010 – Current time



LANDSAT IMAGES
Source: landsat.usgs.gov

Methodology

Remote sensing
Image processing



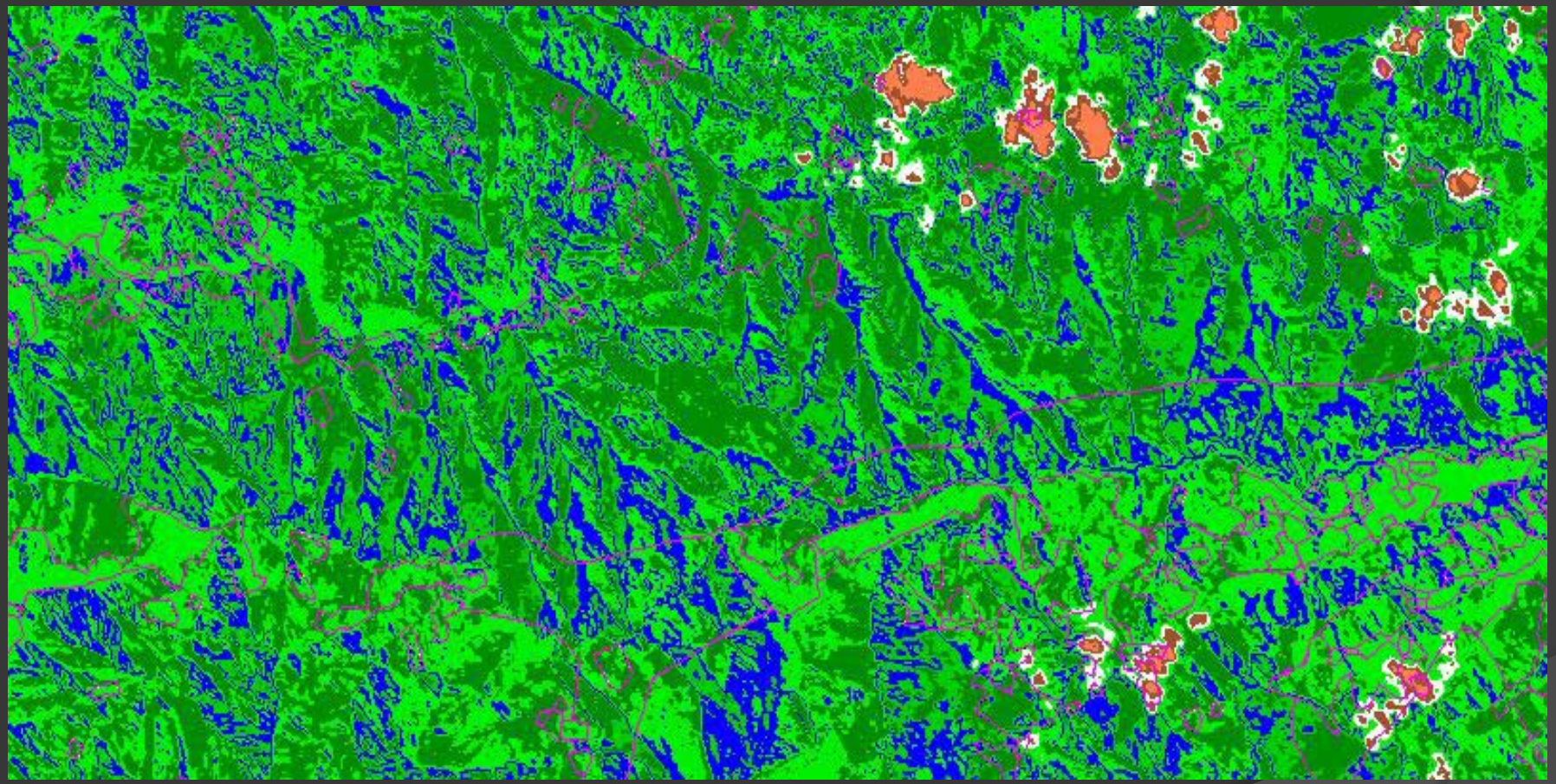
Results

- Determination of land use and land cover

	Land cover and land use	Abbreviation
1	Montane cloud Forest	MCF
2	Forest on rocky substrate	FR
3	Deforestation area without use/livestock	D/L
4	Snow area and rocky tops	S
5	Agricultural	A
6	Ever-green Schurbs and Graminaceous plants	EGR

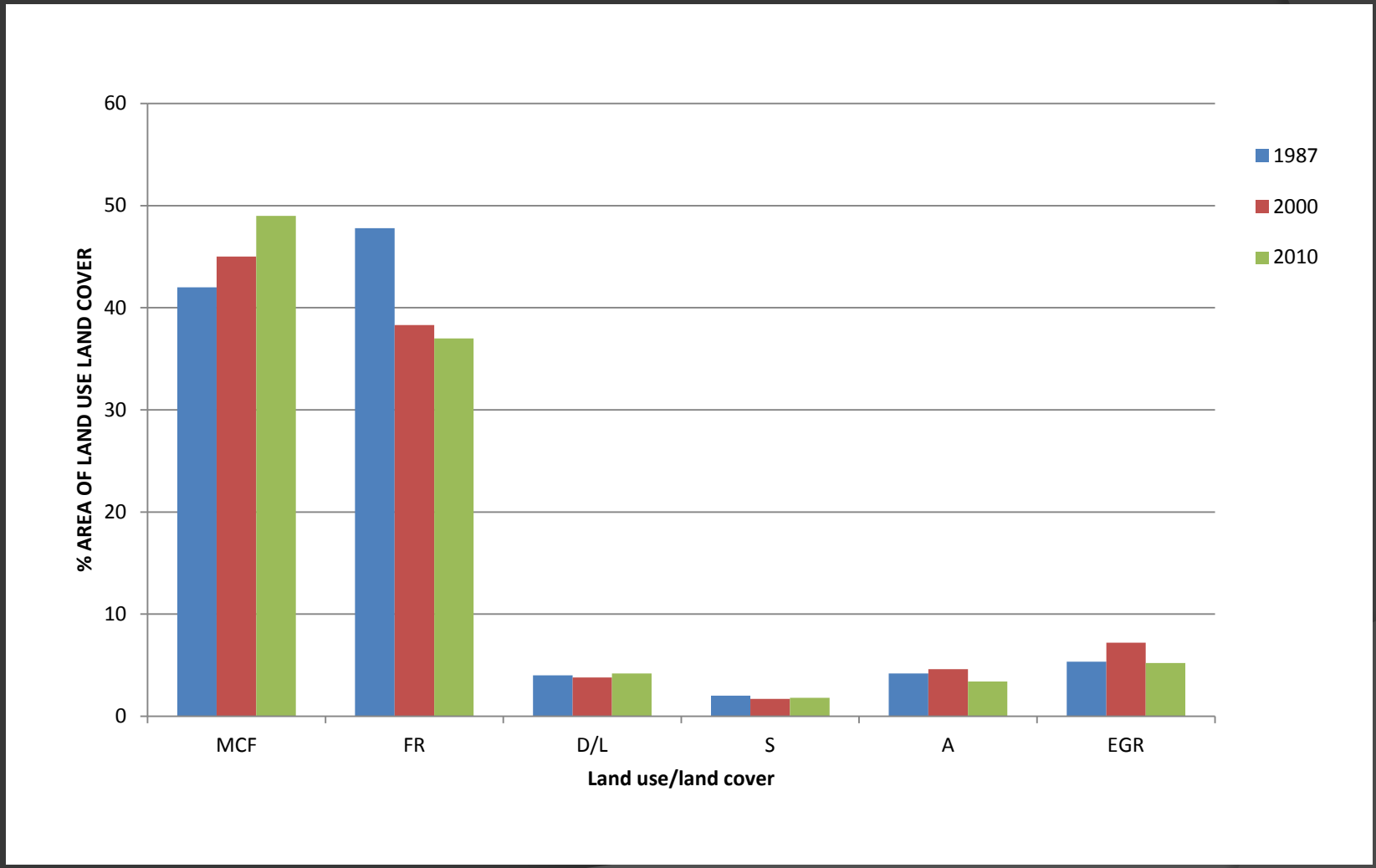
Determination of land use and land cover

Supervised Classification (ENVI 4.5)

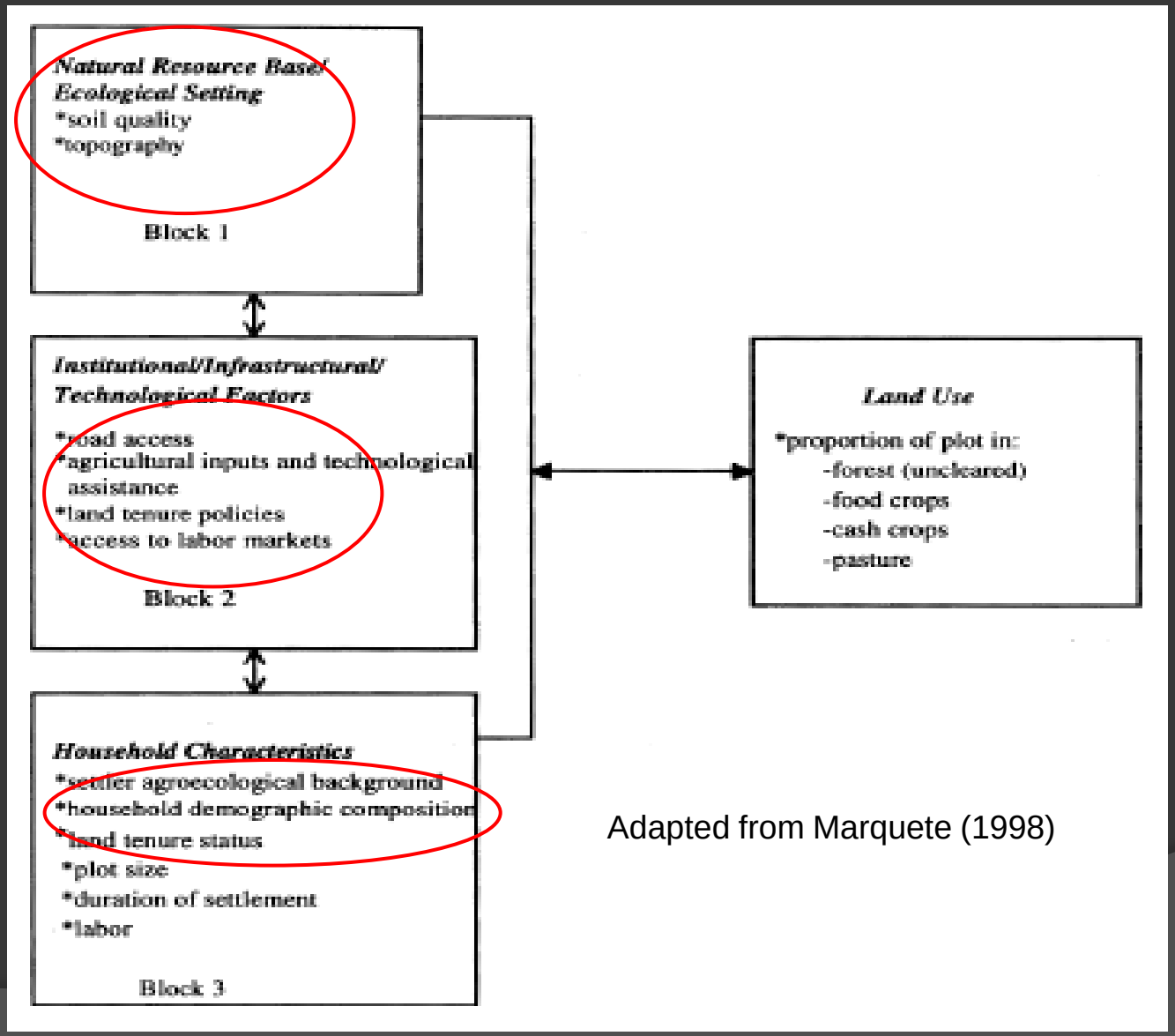


Land use/land cover 2010 image and vector layer

Land use and land cover change dynamics during three periods

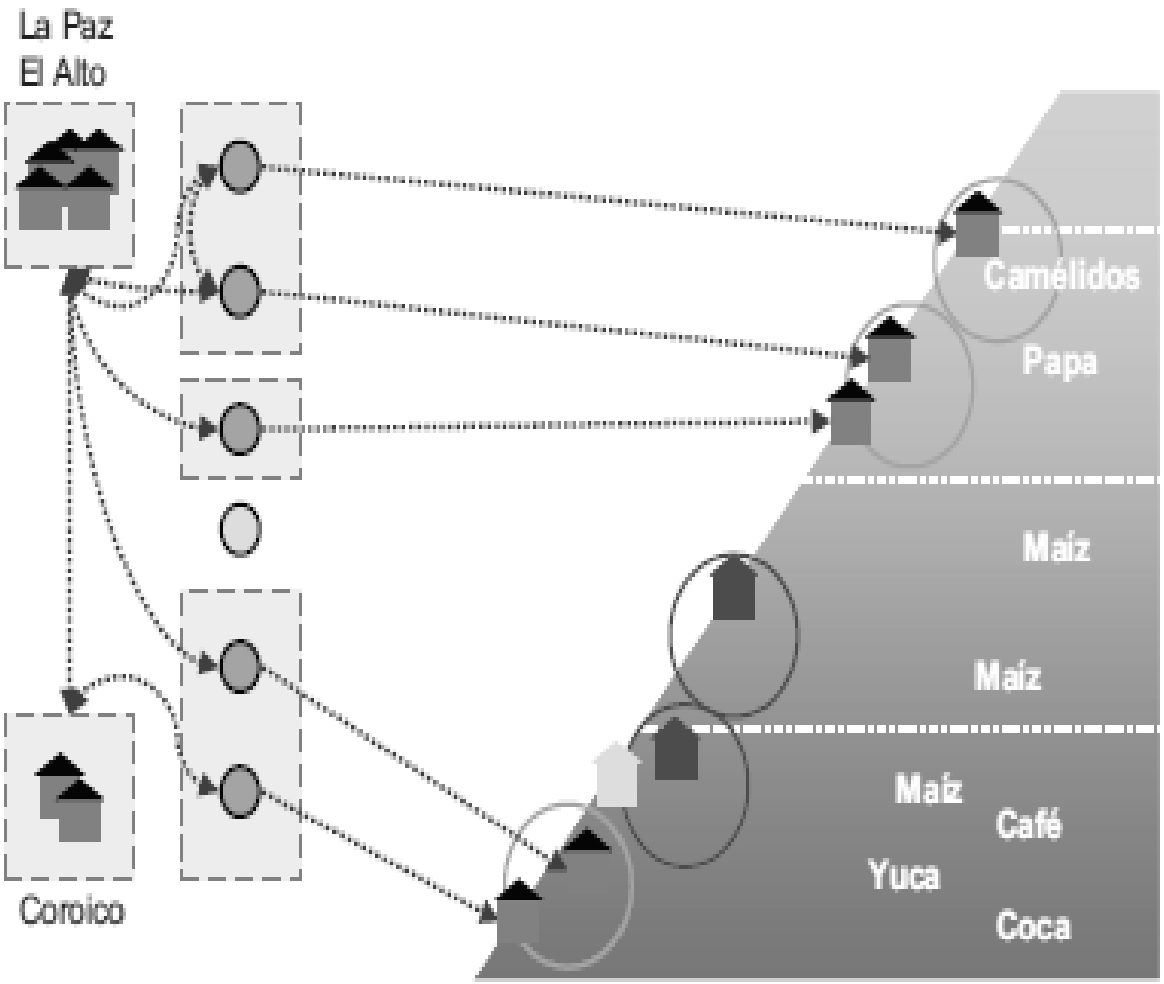


Information from Questionnaires and other sources of information



Adapted from Marquete (1998)

Actual pattern of land use and land cover



Household units

Settlements

Elite Groups

Communities (ayllus)

Labor and products relations

Private farms

Source: Sevilla–Callejo (2009)


Thank you for your attention!!
Gracias por su atención!