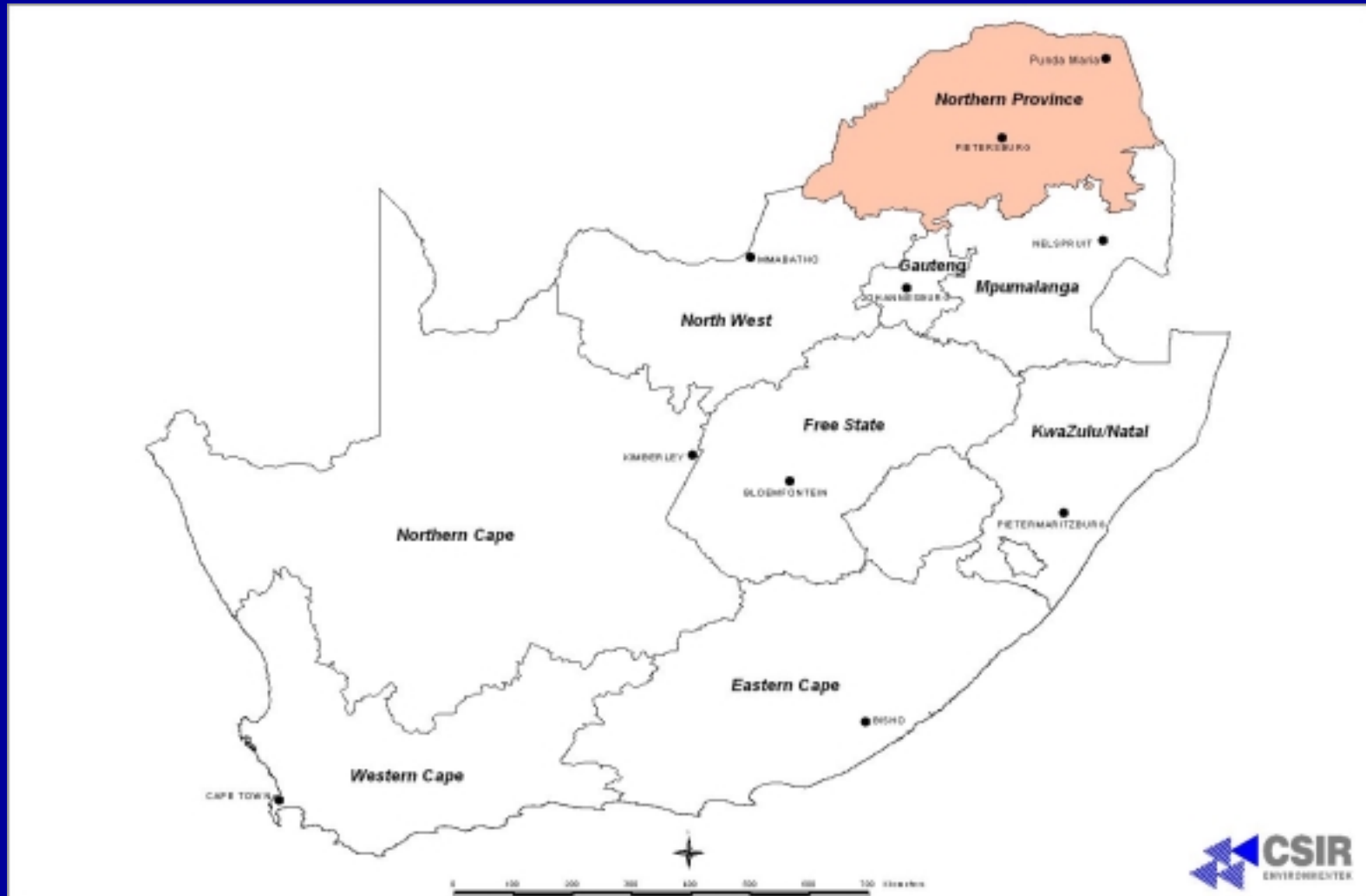


CAMP PROJECT CASE STUDY SELECTION

SOUTH AFRICA

Dineo Moshe & Sue McClintock

Case study – Northern Province



Case study overview

Introduction

Levuvhu river

- Location & demography
- Land use
- Water supply and demand

Lake Fundudzi

- Location
- Available data
- Possible threats
- Spiritual or cultural value

Research initiatives

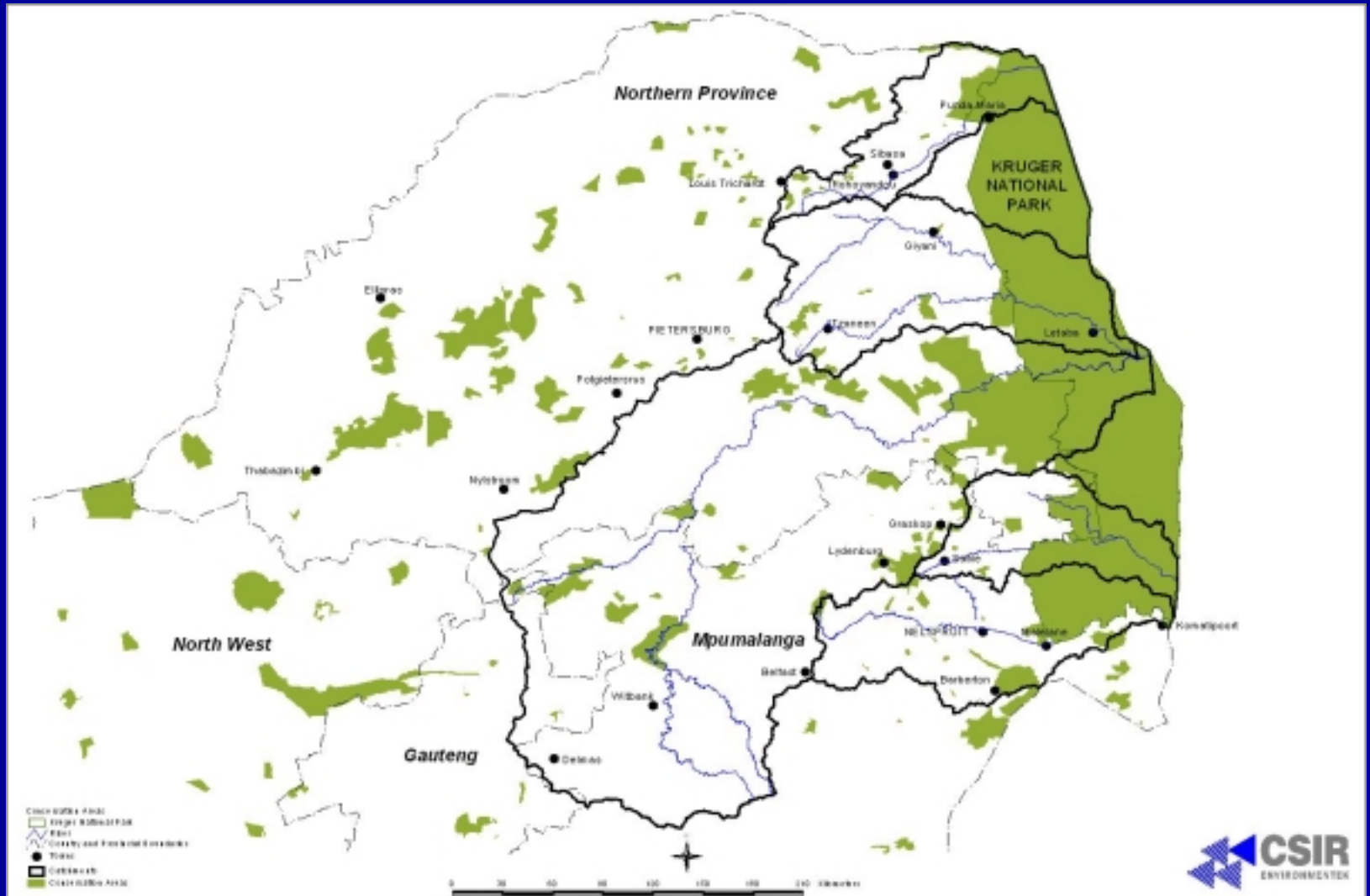
Introduction

Two proposed study areas:

➤ Luvuvhu river

➤ Lake Funduzi

Location

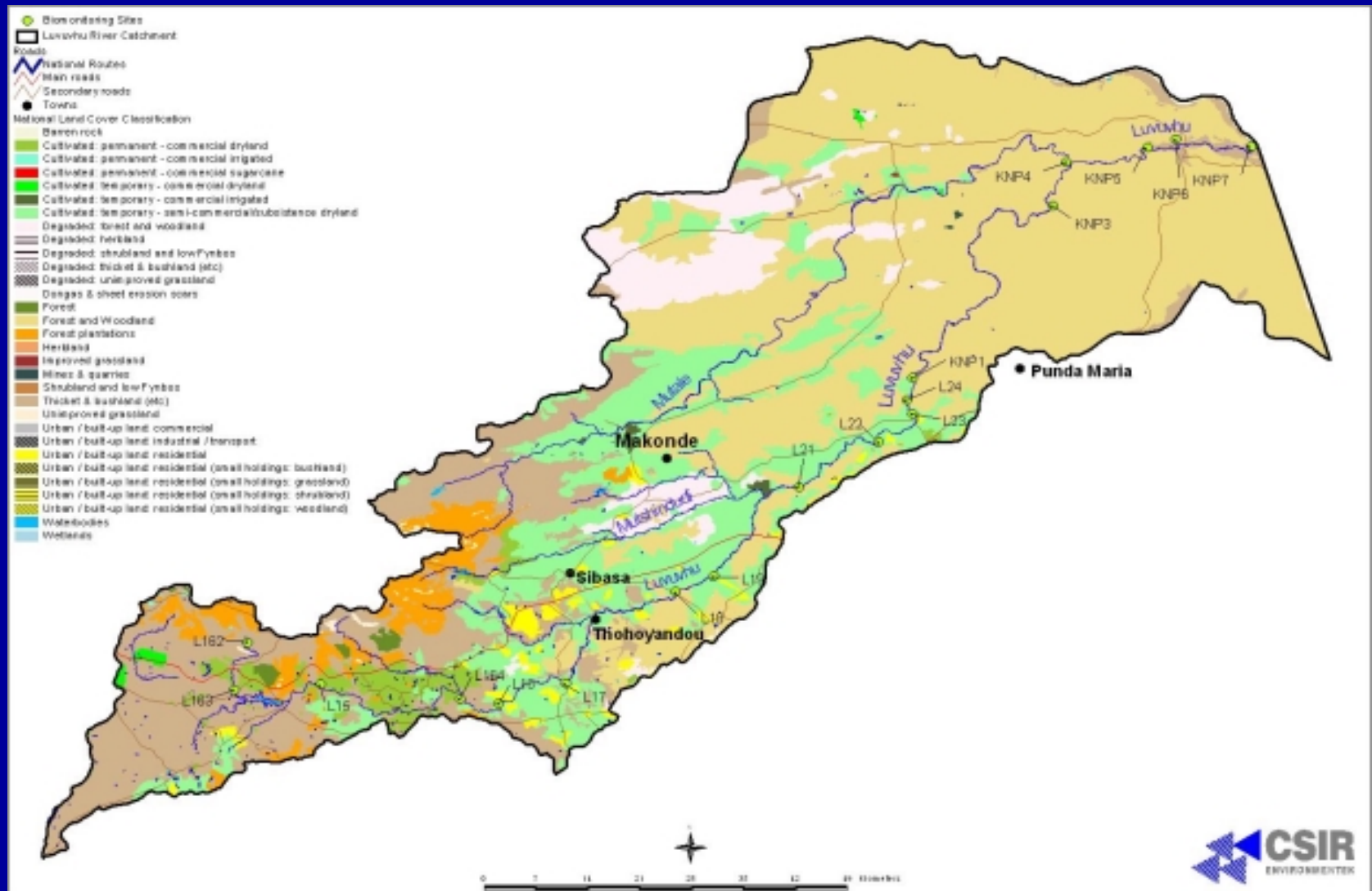


Luvuvhu river basin

Location and demography

- located in the northern part of South Africa
- tributary of the Limpopo river
- rises immediately east of Louis Trichardt on the southern slopes of the Soutpansberg mountain range.
- the catchment, excluding the Mutale river tributary, an area of approximately 3 568km².

Luvuvhu river basin



Land use

- commercial forestry estates - 4%
- subsistence agriculture and grazing
- cultivated lands - 13% (including irrigated lands representing 3%)
- protected game reserve areas - 30% of the landscape
- urban areas - 3% of the basin (Hill *et al.*, 1991)

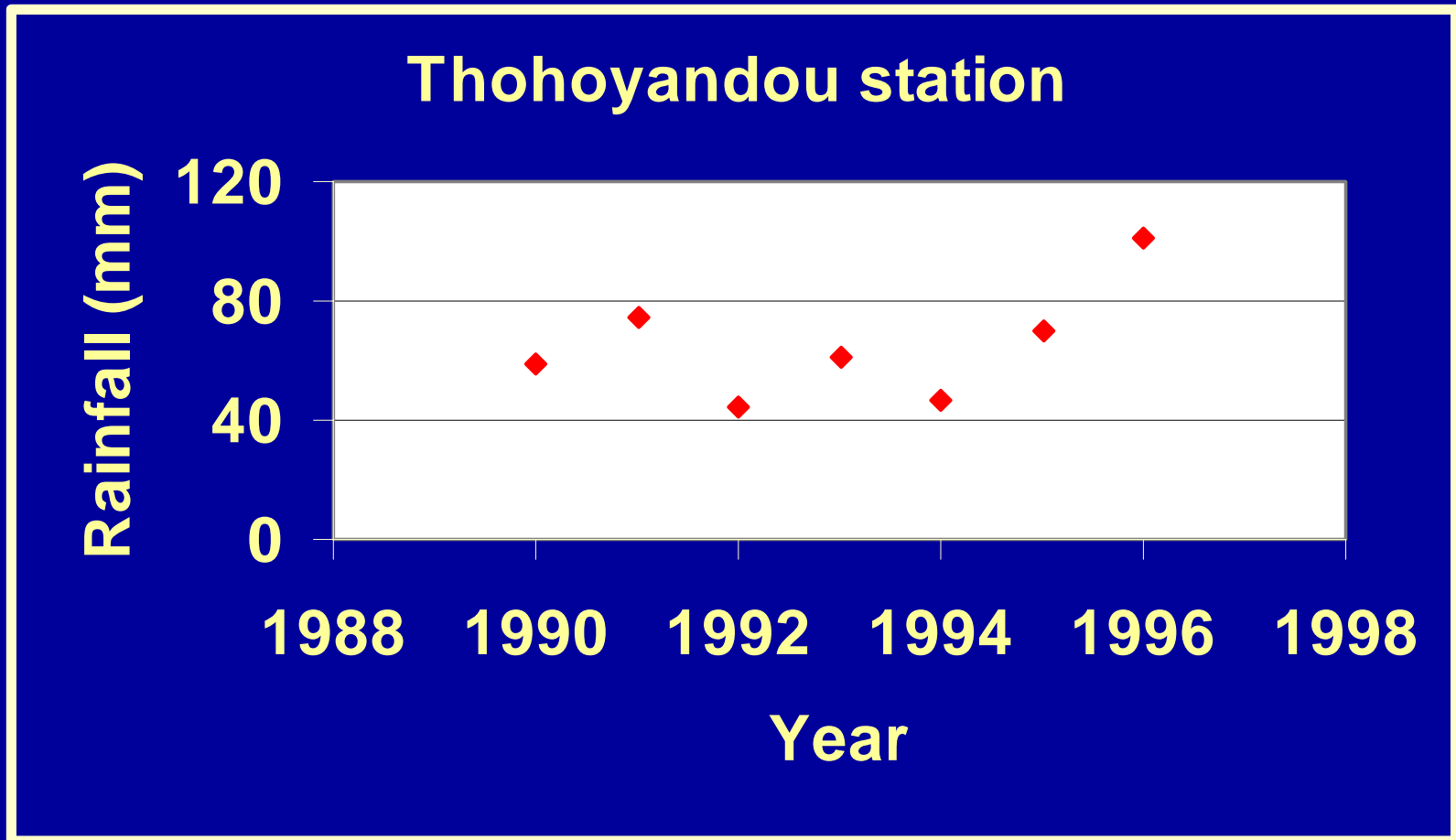
Afforestation

- 17% of the soils of the basins (960 280 ha) - potentially suitable for afforestation
- only (14%) of the basin (14 750 ha) - planted for commercial production.
- a portion of the basin declared as Class 1 afforestation area - further afforestation development is not permitted.

Plantations

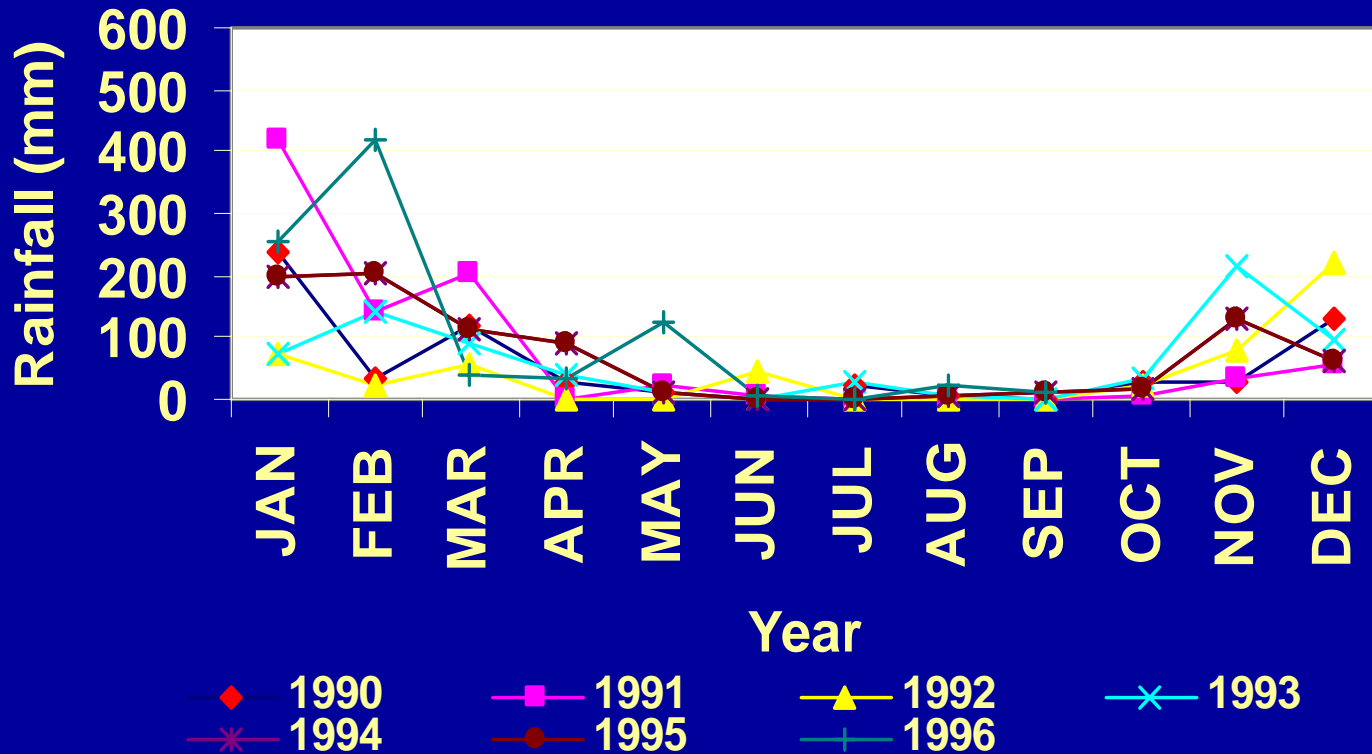


Rainfall



Rainfall

Thohoyandou station



Water supply

Runoff:

- unevenly distributed - 3% mean annual precipitation (MAP) to 38% of MAP
- the mean annual runoff (MAR) from the catchment (excluding the Mutale river) estimated to be 395 million m³/a
- commercial plantations reduces the MAR to 376 million m³/a

Water supply

Dams:

- regulate 55 million m³ of the 395 million m³ MAR
- four major dams - combined capacity of 40 million m³ (11% of the basin MAR)
- high utilization and over-extension of the water yields of the dams
 - ❖ Vondo dam
 - ❖ Tshakhuma dam
 - ❖ Albasini

Water quality:

- agricultural purposes and for domestic supply after the standard type of treatment

Water demand

Domestic and Industrial

- people dependent on the basin for water - 317 000 (1985)
- major towns supplied with water from the basin
 - Thohoyandou (130 00, 1985 population),
 - Louis Trichardt (88 000)
 - Malamulele (2000).
- urban and industrial use is 6% (1997) of the total water demand and could grow to 13% over the period to 2010
- forestry uses 10%
- ecological purposes requires 42%

Water demand



Irrigation and Agriculture

- irrigation water supplied either from the Albasiri Government Water Scheme, from private dams or from ground water
- most schemes utilize run-of-river flow and do not have any impounded water supply
- combined abstractions utilize all of the low flows in the river, particularly during the critically dry period of August to November.
- high potential for further irrigation development
- potentially suitable for crop production under irrigation

Irrigation and Agriculture

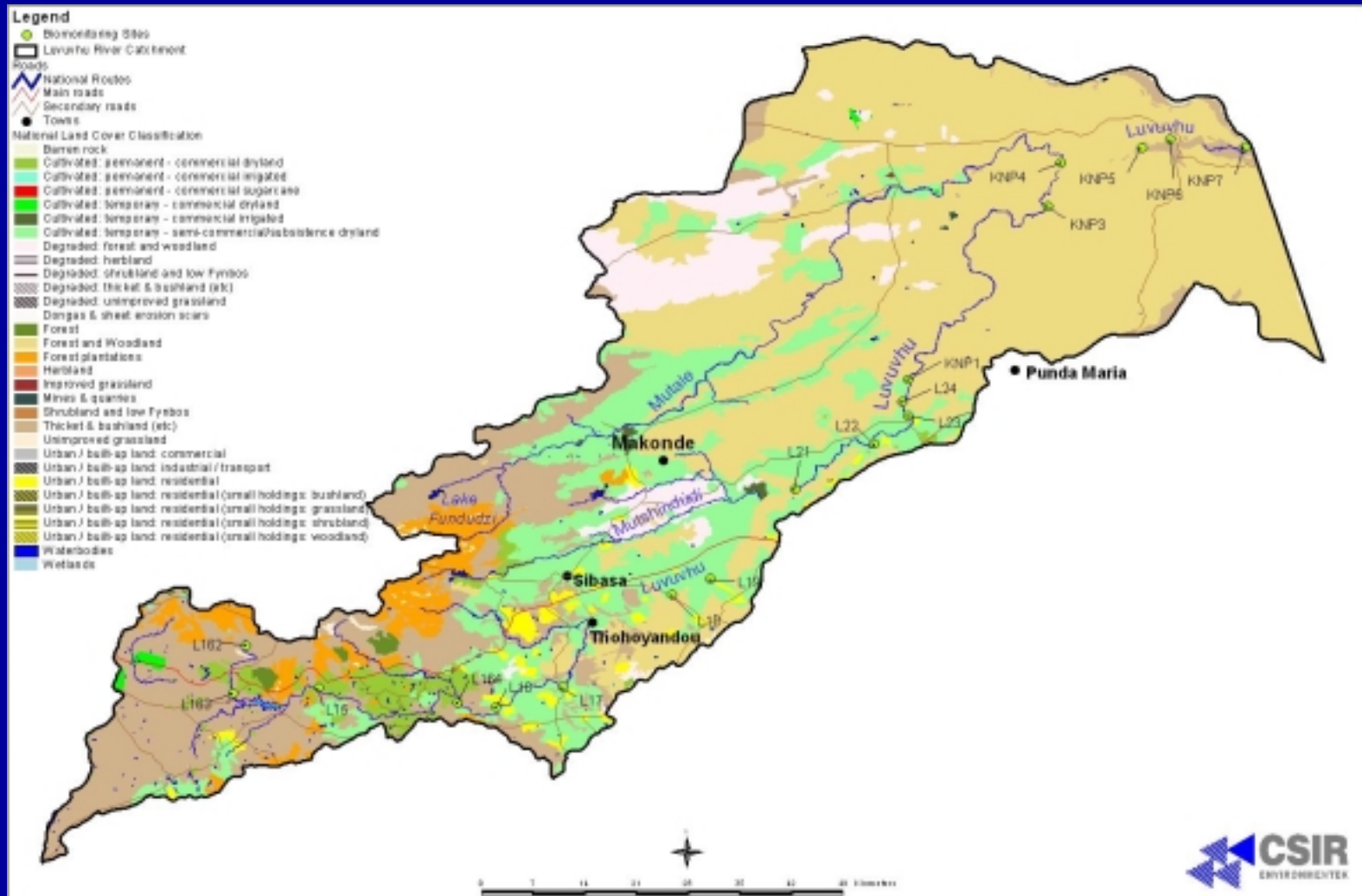


Lake Fundudzi

Locality

- situated in the upper catchment of the Mutale river
- surface area of 144 ha, max depth of 27 m
- one of the very few lakes in the world
- **only true lake in South Africa**
- lake is fed by three streams:
 - Mutale
 - Godoni
 - Muiladi

Lake Fundudzi



Available data

- water quality-1931 (Janisch 1935), 1959, 1965
- conductivity and ph values - 1988, 1997
- temperature and oxygen - 1959, 1988, 1990
- fish species – 1988, 1996

Lake Fundudzi



The only natural lake in Southern Africa, Lake Fundudzi,

Value

- spiritual and cultural
- fish
- fuelwood

Possible threats

- transformation of the catchment
- degradation of rivers feeding the lake
- increased sedimentation rate
- over-utilization of natural resources

Possible threats

Transformation of the catchment

- grasslands – settlements and maize fields
- 42% transformed by human activities
- 63% changed into pine plantations
- pine plantations are planted within 10m of minor and major streams (Scotts 1987)
- land cleared for plant crops and fruit trees
- collection of firewood
- unrestricted fishing

Possible threats

Degradation of rivers feeding the lake

- conservation survey – Kleynhans *et al.* 1988
- results – Mutale river in better condition than Godoni river
- only upper parts of Mutale showed no serious impacts
- chemical enrichment from fertilizers, regular washing

Spiritual & Cultural value

- sacred lake
- only *Gota* (headman) Netshiavha gives permission to visit lake
- respected by everyone approaching the lake by using a special bow (Richard 1969)
- annual thanksgiving ritual
- healing properties

Research initiatives

Luvuvhu & Letaba

- State of the Rivers Report

Lake Fundudzi

- Management options

Luvuvhu & Letaba

State of the Rivers Report

- Overview of the study area
- Land cover and land use
- Climate , terrain
- Population
- Economic profile
- Development priorities
- Indicators and indices
- River health indices

Luvuvhu River system

- Ecoregions and river characteristics
- Present ecological state
- Drivers of ecological change
- Desired ecological state

Lake Fundudzi Management options

Northern Province Dept. of Environmental Affairs

Community public participation on best land management options to prevent further siltation

- Land management
- Protection options
- Heritage site recognition at a provincial level
- World Heritage Site