

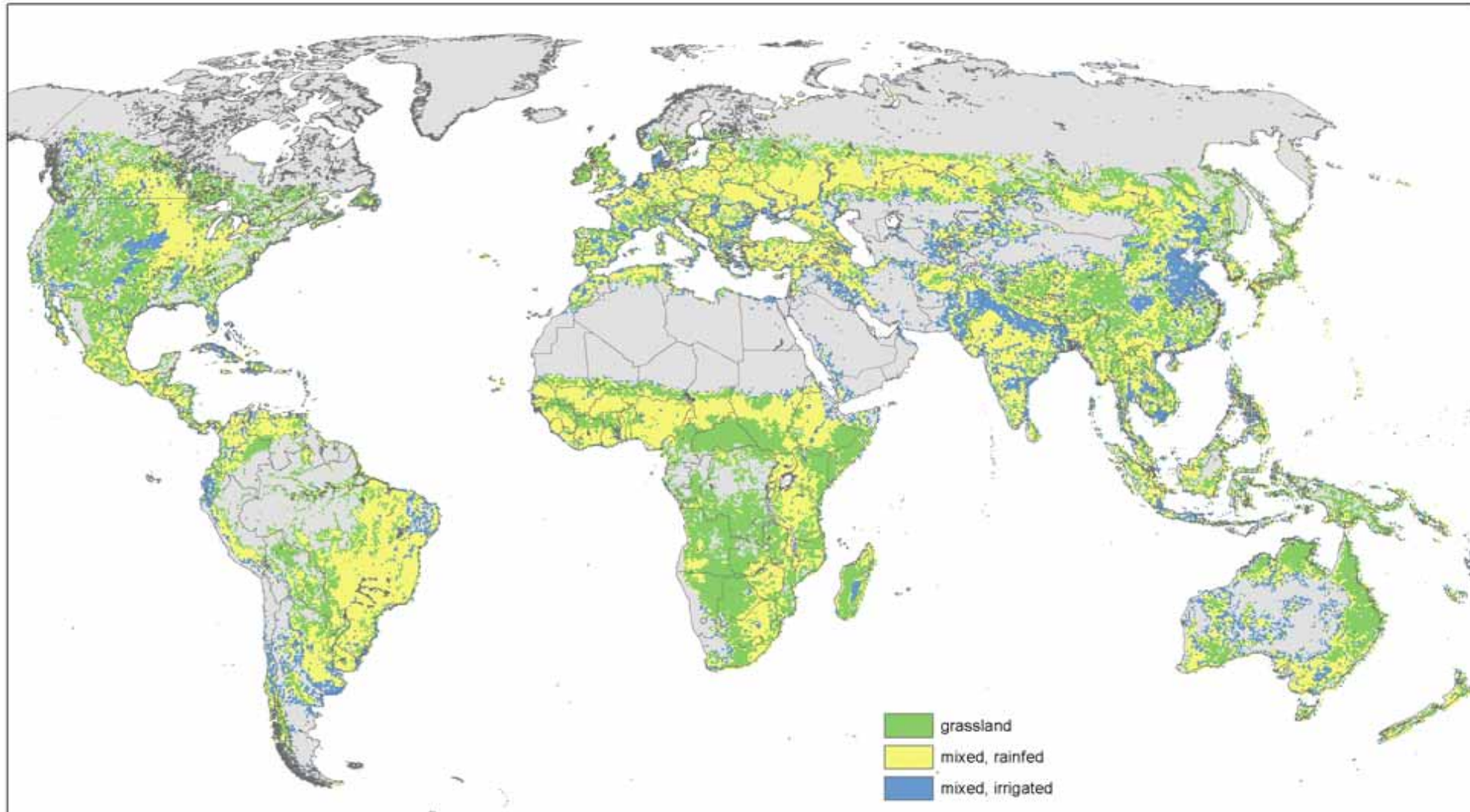


# Livestock's Role in the Deforestation Process

Henning Steinfeld, FAO-AGA



## Livestock Production Systems: Grazing and Mixed Farming





# Grazing Systems

- occupy 27 % of all ice-free land, i.e. the largest land user
- pre-dominant in areas unsuitable for agriculture (dry, humid, cold)
- home to 30 % of cattle worldwide
- produce 20 % of all beef
- produce less than 10 percent of all meat



# Pasture Expansion

- still on-going in South America
- stopped almost everywhere else (except parts of Africa)
- pastures are in decline in OECD countries; forests expand in marginal pasture areas



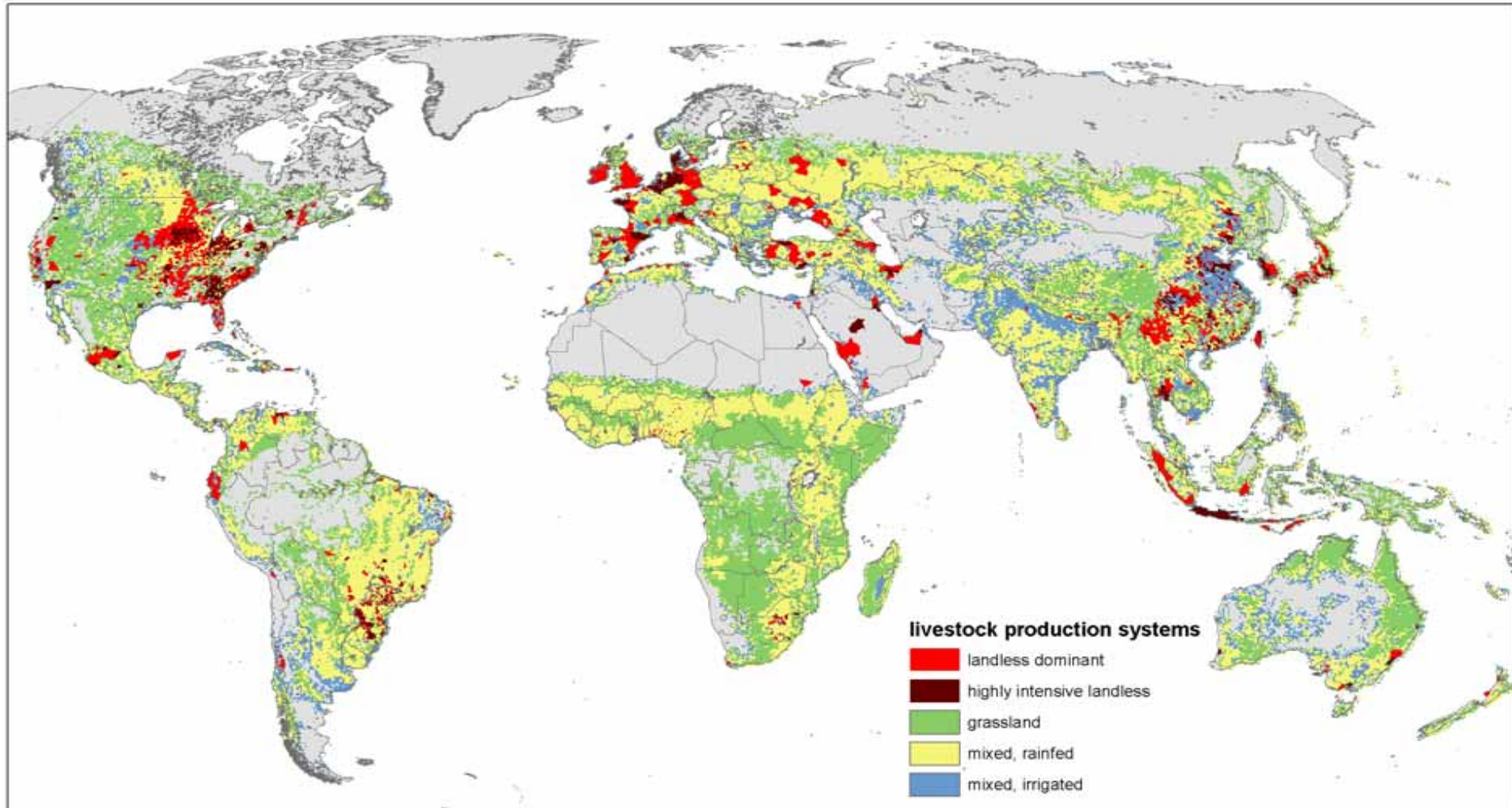
# Pasture Expansion

Driven by

- demand for livestock products (determined by population growth, increases in income)
- land abundance and resultant low prices for land
- past (and current) practices of land titling

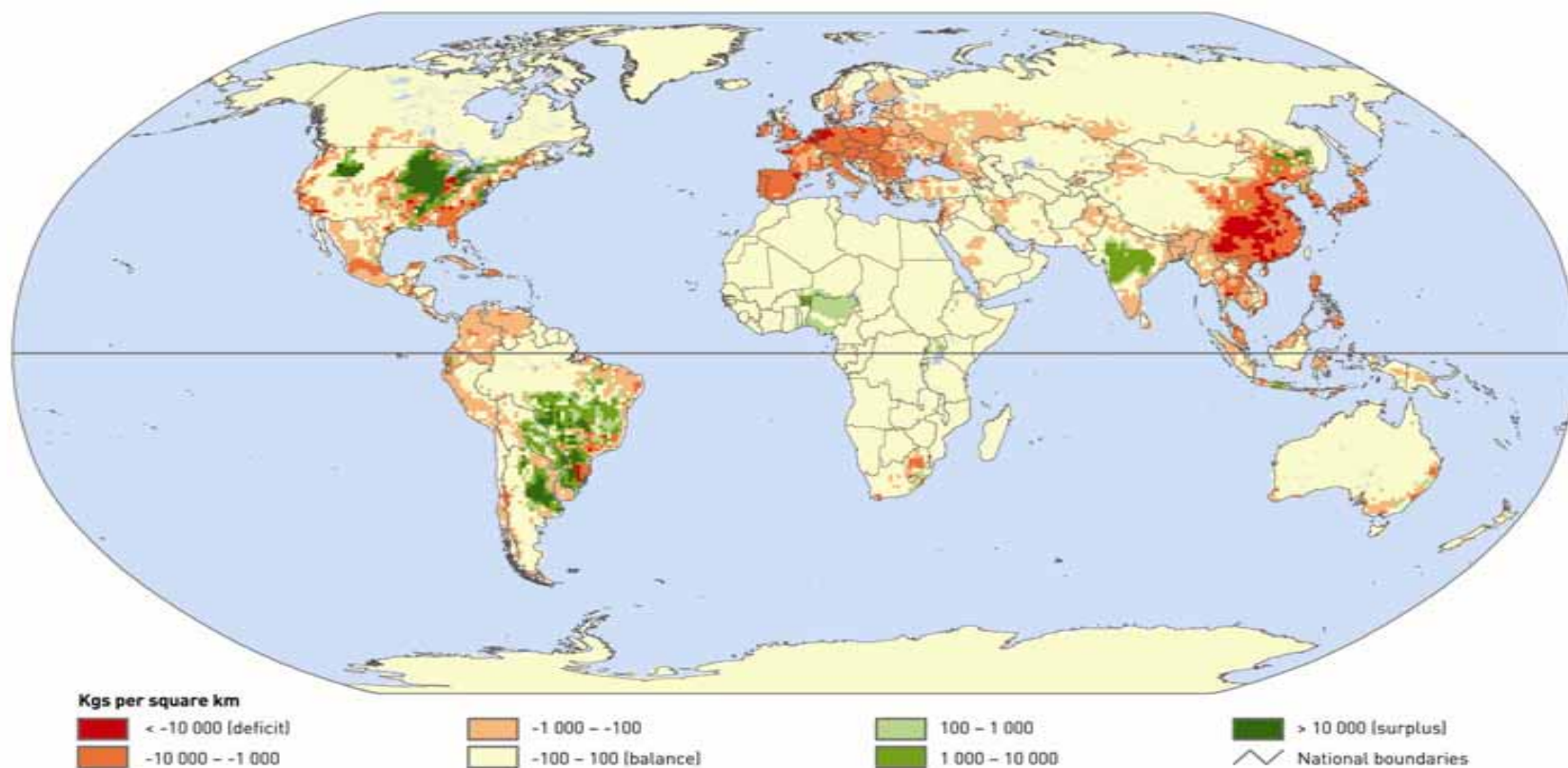


## Global Livestock Production System Map





# Estimated feed surplus/deficit – soymeal (pig and poultry)





In Latin America, livestock are one of the many drivers of deforestation ...

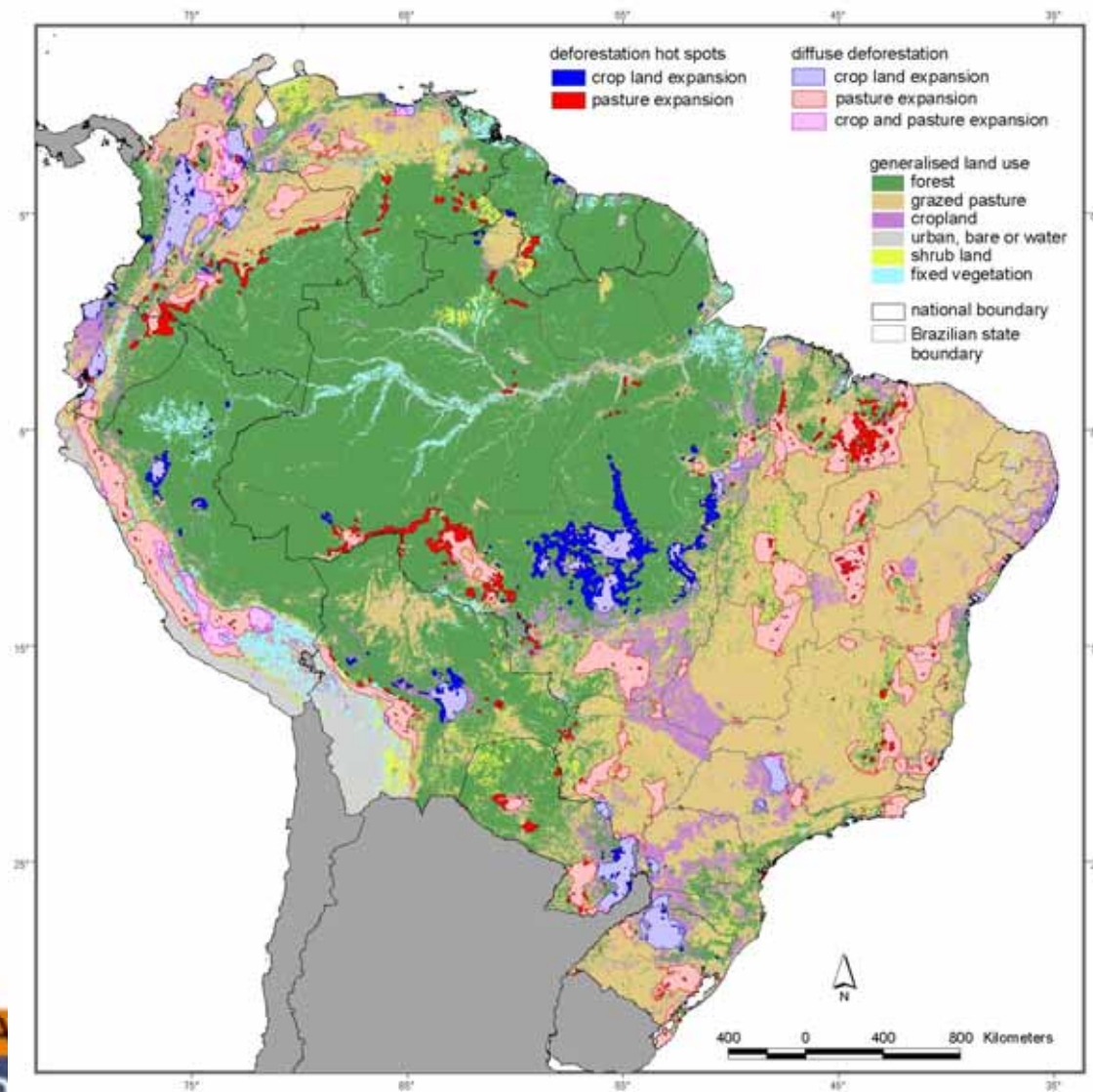
- livestock production, crop production, timber extraction, mining, infrastructure development, land speculation

...but pastures and arable land for feed are the predominant uses of previous forest land

- 70 % is replaced by pastures
- most arable land is for feed crops (soya and maize)



## Predicting land use changes in the Neotropics: the geography of pasture expansion into forest.





## Cattle productivity in the Amazon

Parameter	1985	2003
Carrying capacity (AU/ha)	0.2 – 1	0.9
Fertility rate %	50 – 60	88
Calf mortality %	15 – 20	3
Daily weight gain, g	300	450

Source: Margulis, 2004

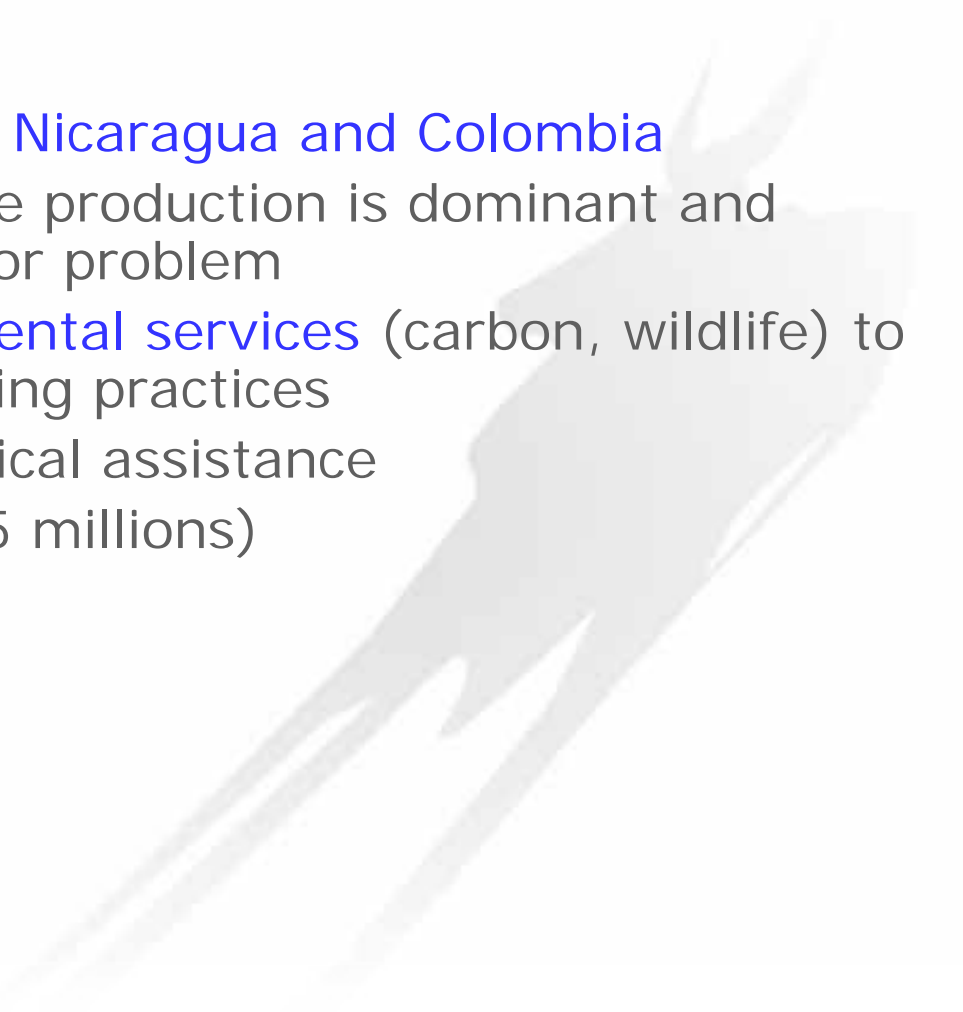


## Policy Requirements

- discourage pasture expansion into areas unsuitable in the long term, facilitate pasture intensification elsewhere
- provide feed-back mechanisms for environmental damage and benefits (including payment for environmental services)
- develop markets for land and water

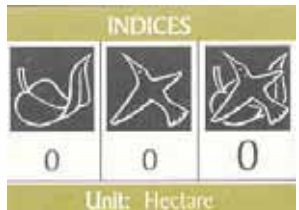
# Integrated silvopastoral approaches to ecosystem management project

## Project design

- Countries: [Costa Rica](#), [Nicaragua](#) and [Colombia](#)
  - Pilot areas where cattle production is dominant and degraded pasture major problem
  - [Payment for environmental services](#) (carbon, wildlife) to induce change in farming practices
  - Project provides technical assistance
  - Funded by [GEF](#) (USD 5 millions)
- 



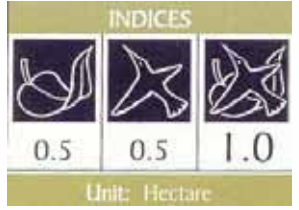
Degraded Pasture



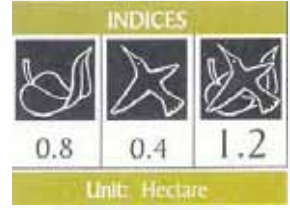
Natural Pasture with Recently Planted Trees



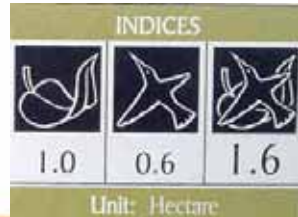
Natural Pasture with High Tree Density



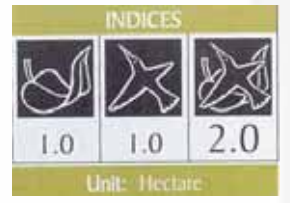
Monoculture Timber Plantation



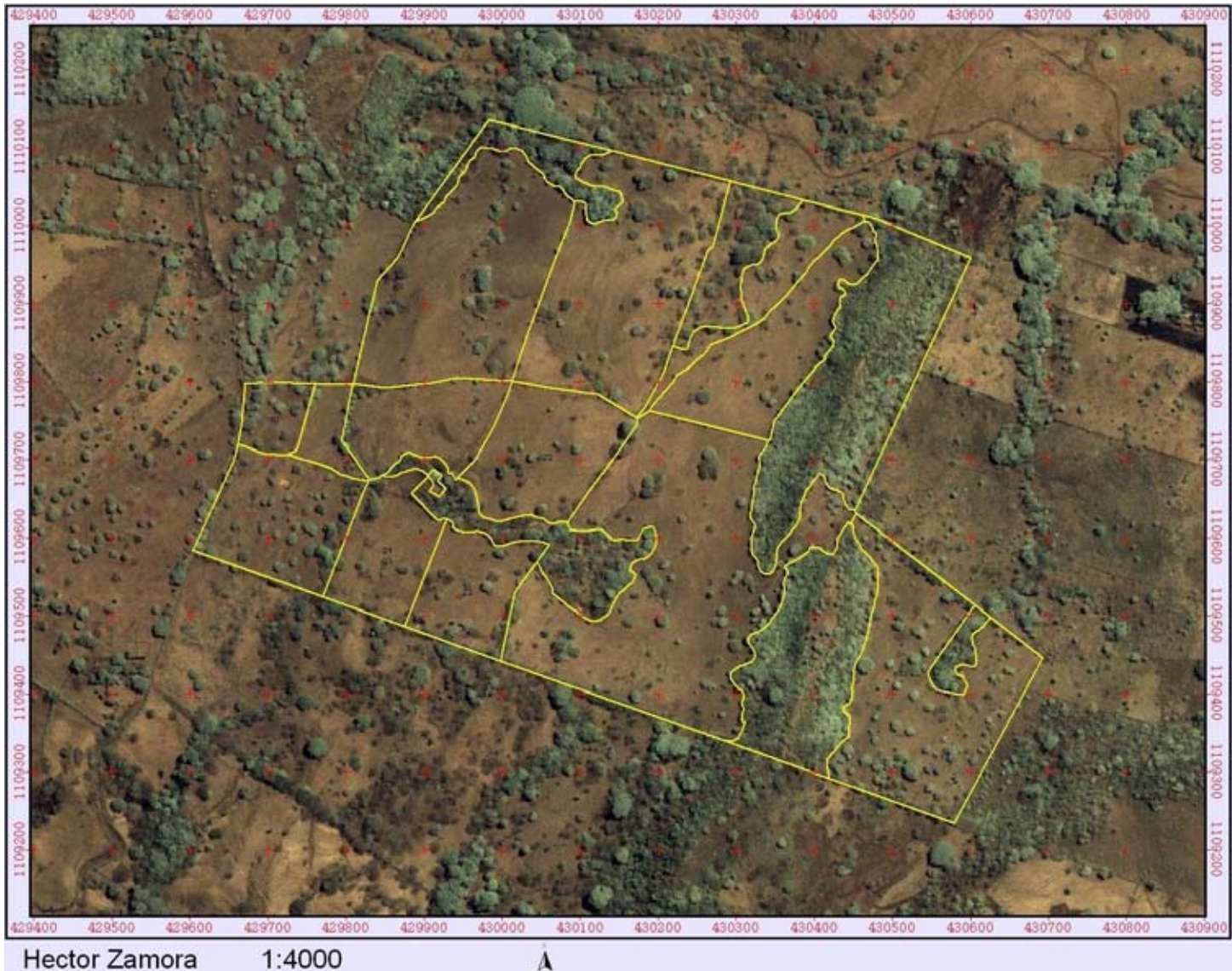
Intensive Silvopastoral System



Mature Forest



# Use of GIS for monitoring land use changes



# Changes in land use in the project area

Land Uses	Base line (2002)	2006	Change (%)
Degraded Pasture	558,7	153,3	-73
Natural Pasture	253,6	3,7	-99
Improved Pasture	62,6	16,2	-74
Natural Past. + Trees	910,6	438,3	-52
Improved Past. + Trees	246,5	1384,4	462
Forest	927,4	954,6	2,9





## Features of Silvopastoral Systems

- No reduction of pasture productivity up to 20 to 30 % tree cover, decline at higher rates
- combination with improved pastures ensures profitability and hedges against degradation
- High investment costs – PES schemes can facilitate
- Significant carbon sequestration (up to 20 tons per ha/year) and biodiversity gains



# Possible environmental services from improved pastoral systems

- water: local demand, immediate, often markets exist
- carbon: global mechanisms; some countries
- biodiversity: no existing markets; most immediate benefits through tourism
- requires certification



# Conclusions

- Livestock-associated deforestation particularly strong in Latin America – expansion of pastures, arable land for feed crops
- Driven by multiple factors
- Required response: sustainable intensification
- Combination of technology/policy mixes is required: intensification of consolidated landscapes – protection of valuable forest areas
- Potential for Payment for environmental services schemes