Livestock Technology Change, Livelihoods Impacts & Policy Lessons

By

Jonathan Rushton, Pradeep Tulachan and Simon Anderson

Email: rushtonjonathan@yahoo.com

Synopsis

- Introduction
- Project, Methodology and Secondary data analysis
- Primary data analysis
- Policy issues
- Key conclusions and recommendations

Introduction

- Project objective is

  "to take an evidence-based analysis approach to the development of strategies for poverty reduction through livestock interventions"

Introduction
- Project Outputs

- Evidence of policies and technologies that work and policies that impede pro-poor impact
- Proven policy analysis methods established
- Findings promoted to multi-stakeholder forum for validation & policy development

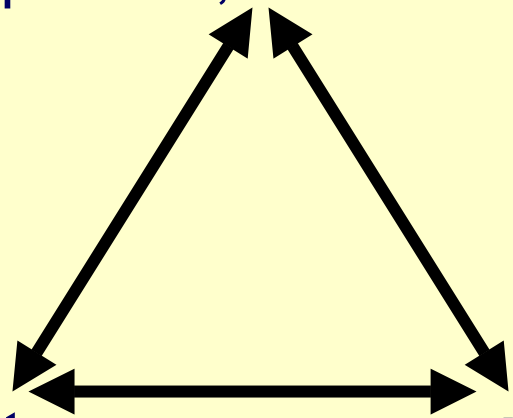
Introduction
– Project activities

- Project has collected
  - secondary data on the livestock sector, policies and technologies.
  - Primary data from livestock keepers in the Districts of
    - Lalitpur
    - Chitwan
    - Mustang
- Project has utilised a number of methods in order to develop an indication of the impact of policies and technologies

Methodology

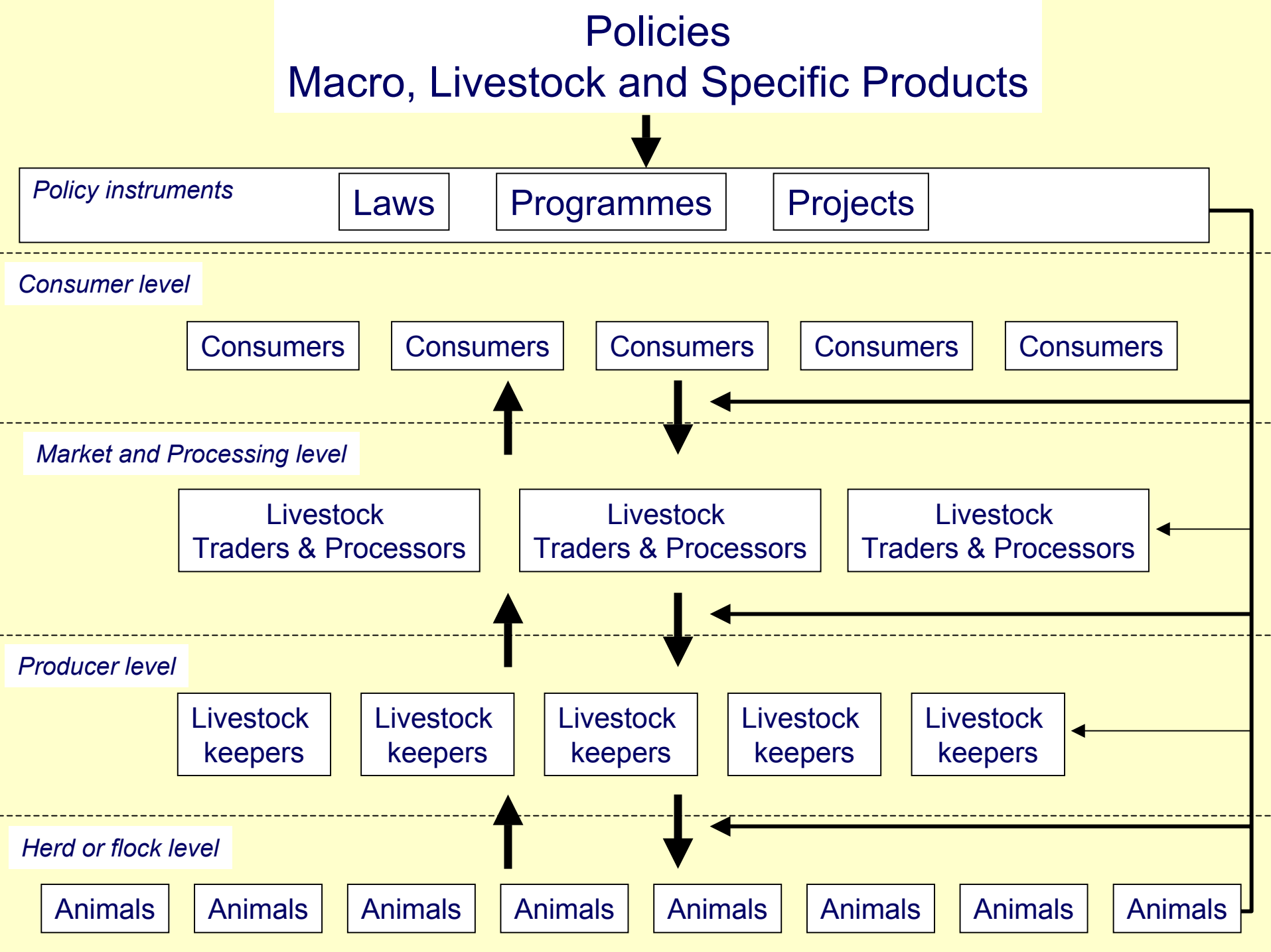
LTIP Nepal - framework

Evidence-based policy advice
policies, institutions



Technology impact assessment
productivity changes, markets, NRM etc.

Livestock & livelihoods evaluation
poverty reduction, gender, equity, food security


Policies
Macro, Livestock and Specific Products
Policy instruments
Laws
Programmes
Projects
Consumer level
Consumers
Consumers
Consumers
Consumers
Consumers
Market and Processing level
Livestock Traders & Processors
Livestock Traders & Processors
Livestock Traders & Processors
Producer level
Livestock keepers
Livestock keepers
Livestock keepers
Livestock keepers
Livestock keepers
Herd or flock level
Animals
Animals
Animals
Animals
Animals
Animals
Animals
Animals

Sampling frame

village study sites

Village Types / Regions	Poor Economy Poor Accessibility	Poor Economy Good Accessibility	Good Economy Poor Accessibility	Good Economy Good Accessibility
Mid hills Lalitpur	Burunchuli	Jhyalungtar	Manegaun & Lekdanda	Seraphat
Lowlands Chitwan	Phujintar	Barowa	Anand chowk	Parashnagar
Mountain Mustang	Ghilling	Syang	Chhusang	Kagbeni

Within each community a wealth ranking has been carried out to identify poor, medium and rich socio-economic groupings

Social diversity

castes & ethnic groups

Village types	PE PA	PE GA	GE PA	GE GA
Mid Hills	Burunchuli	Jhyalungtar	Manegaun & Lekdanda	Seraphat
Lalitpur	Tamang (33)	Dalit (14) Tamang (44) Chhetri (8) Newar (1) Brahmin (2)	Dalit (1) Tamang (24) Chhetri (2) Brahmin (17)	Dalit (2) Tamang (8) Newar (34) Chhetri (1) Brahmin (24)
Lowlands	Phujintar	Barowa	Anandchowk	Parashnagar
Chitwan	Chepang (20) Dalit (7) Newar (4) Chhetri (3) Brahmin (1)	Dalit (2) Tharu (29) Magar (2) Brahmin (10)	Magar (9) Chepang (3) Tamang (4) Gurung (1) Newar (19) Chhetri (2)	Gurung (2) Tamang (6) Chhetri (10) Newar (4) Brahmin (58)
Mountain	Ghilling	Syang	Chhusang	Kagbeni
Mustang	Gurung (59) Dalit (1)	Thakali (132) Gurung (5) Chhetri (5) Dalit (10)	Gurung (34) Magar (2) Dalit (4)	Bista (7) Gurung (66) Dalit (2)

Analysis Methods and Methodology Development

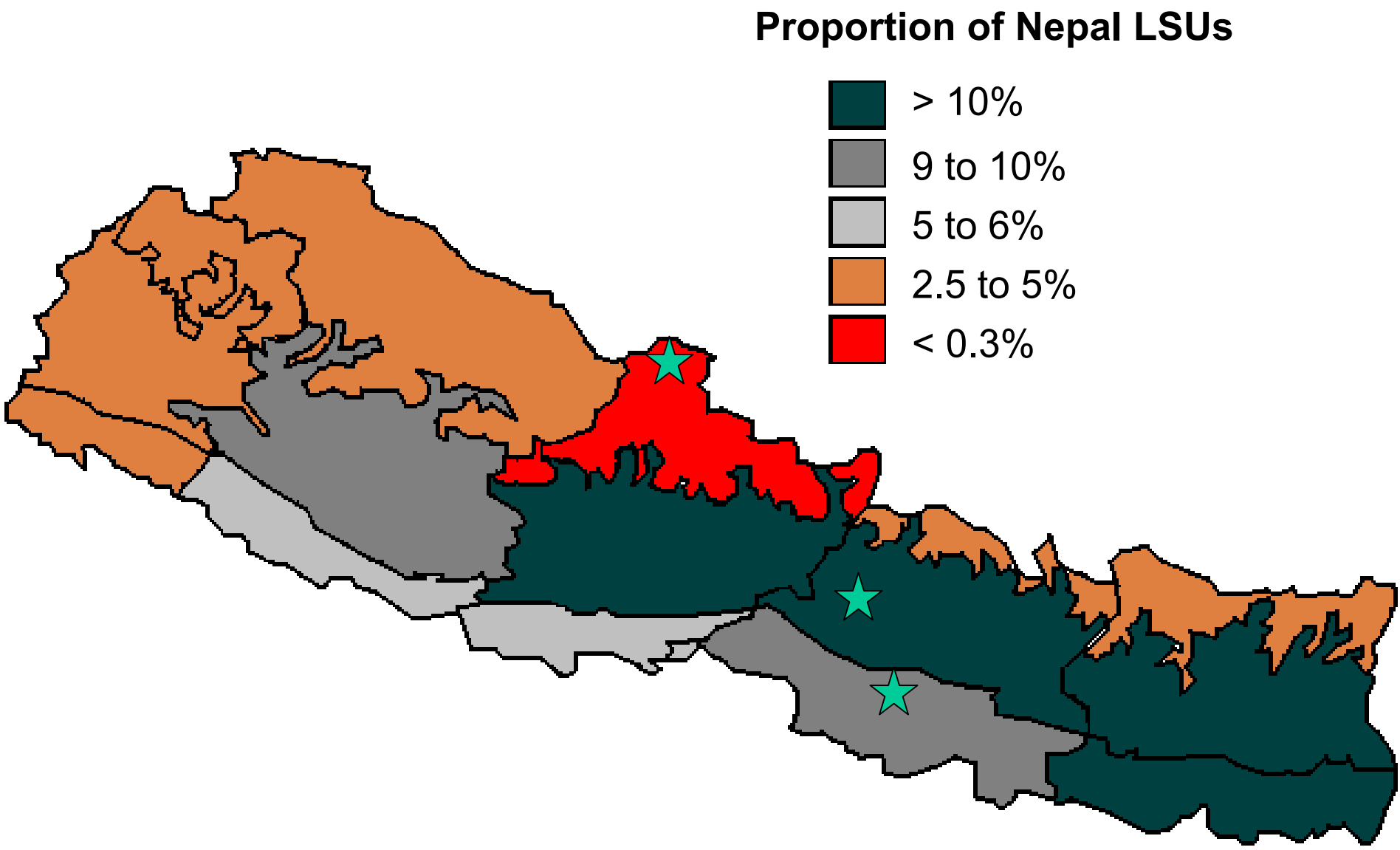
- Livestock ownership patterns
- Livelihood analysis
- Livestock roles
- Timelines
- Limited gender analysis
- Conceptual village economy models
- Policy analysis

Data Analysis

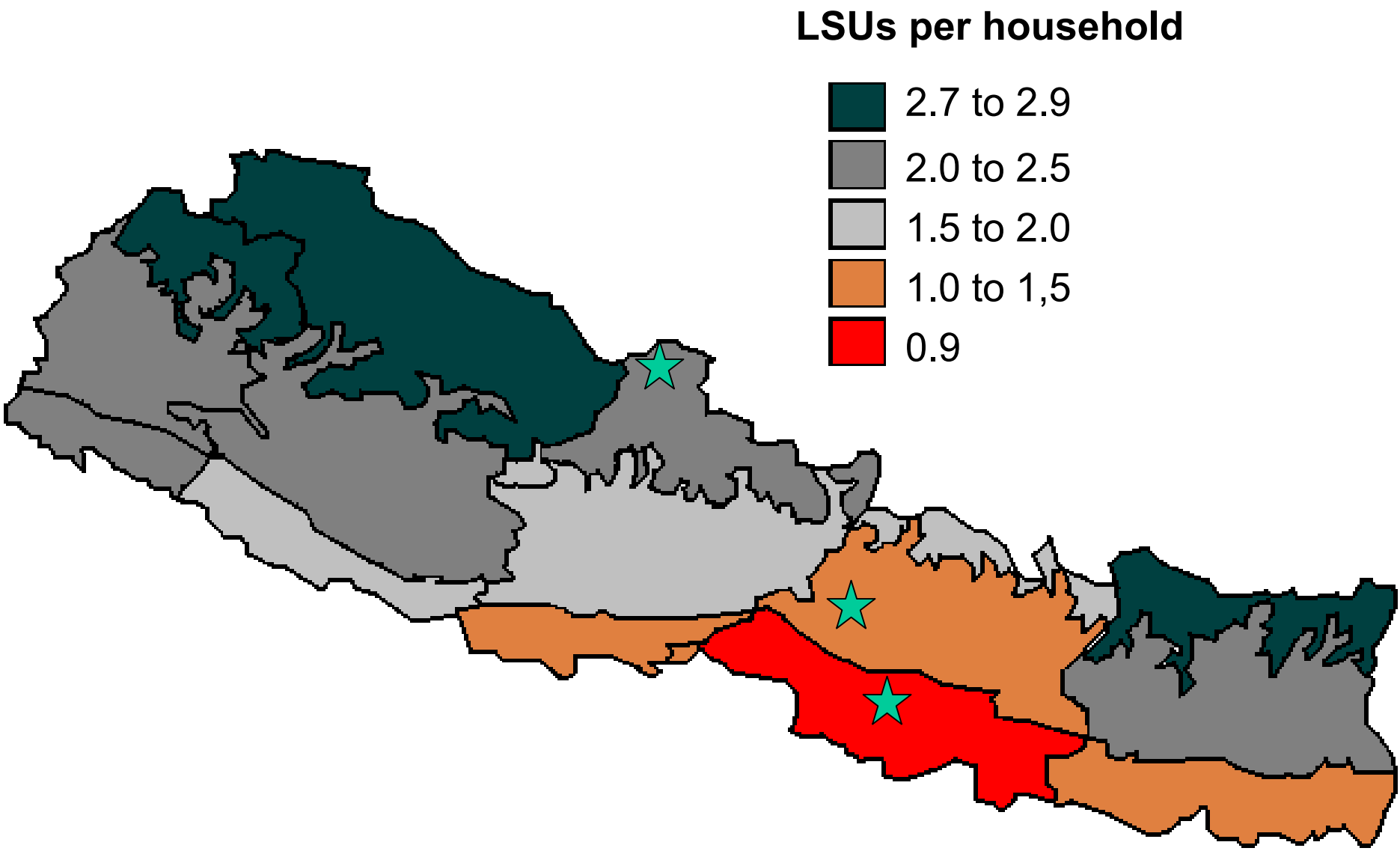
Secondary data analysis

- Strong regional differences in terms of:
  - Livestock numbers and species mixes
  - Livestock economy
  - Livestock dependency
    - Numbers of LSUs per person, per household
  - Relationship of livestock dependency and poverty
  - Investments in livestock development

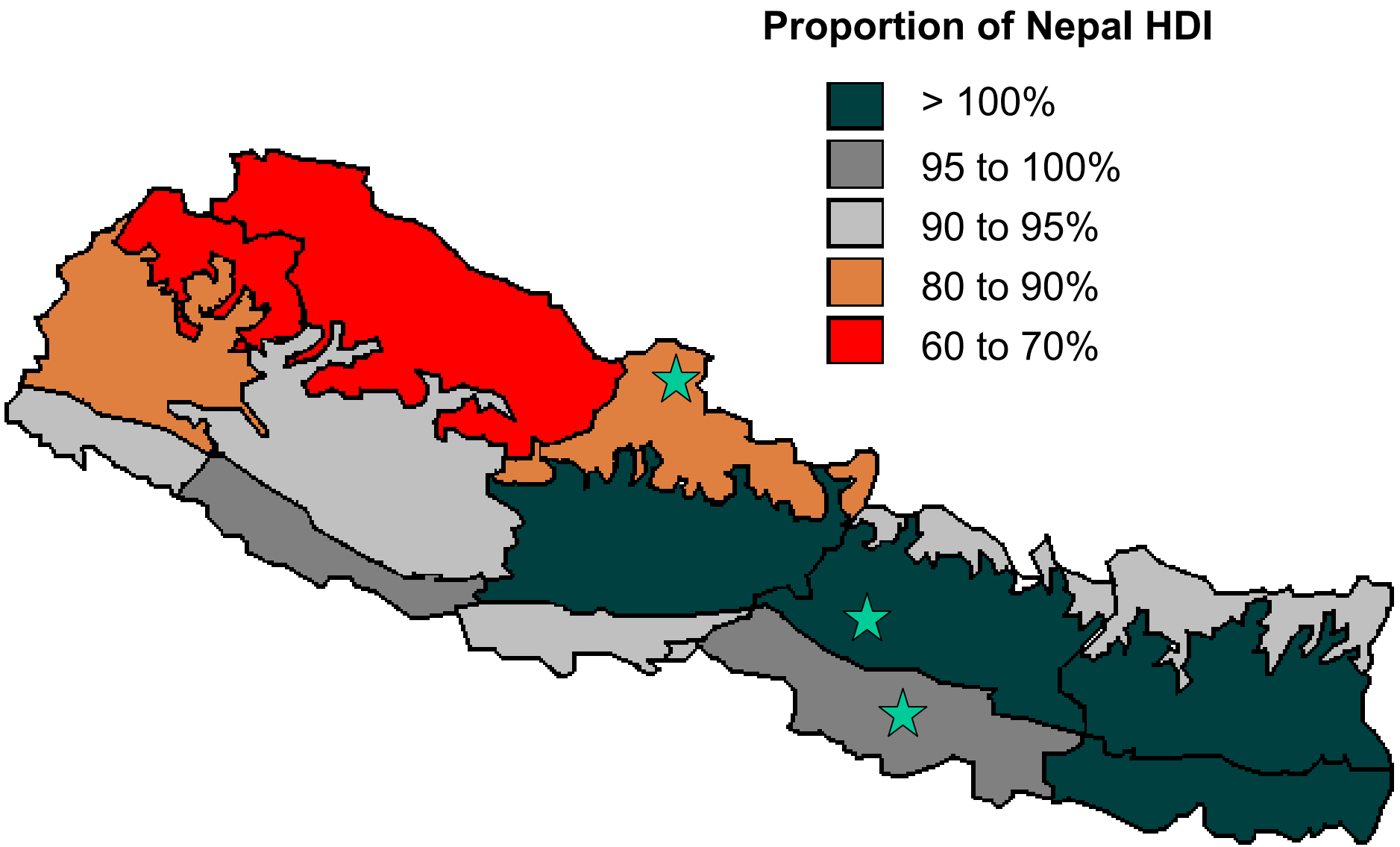
Livestock Units



Livestock Units per Household



Human Development Index



Primary Data Analysis

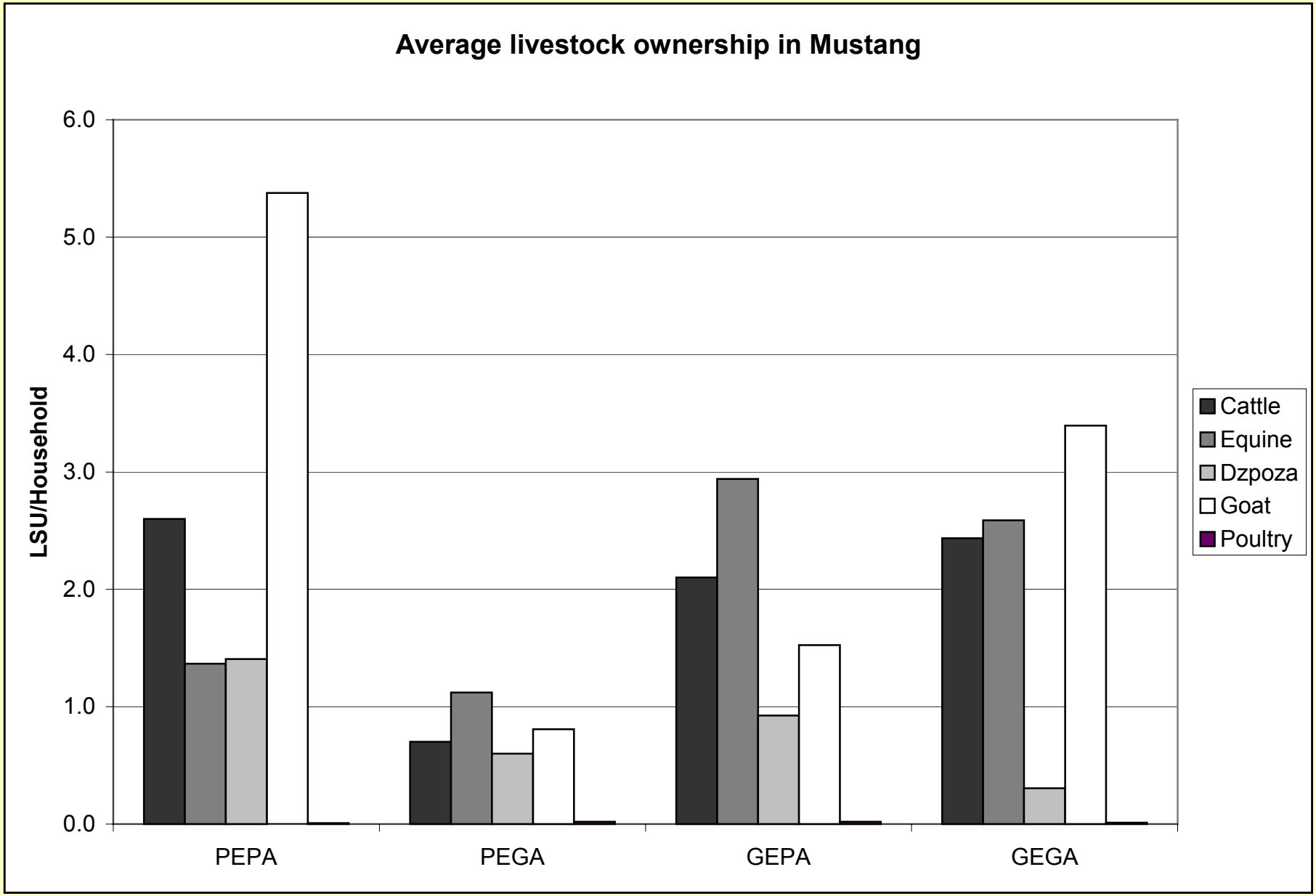
- How does the primary data analysis compare with the secondary data analysis
  - Between study sites there are:
    - Species differences
    - Preference differences for species
    - Differences in adoption
    - Differences in species functions analysis

Main economic activities

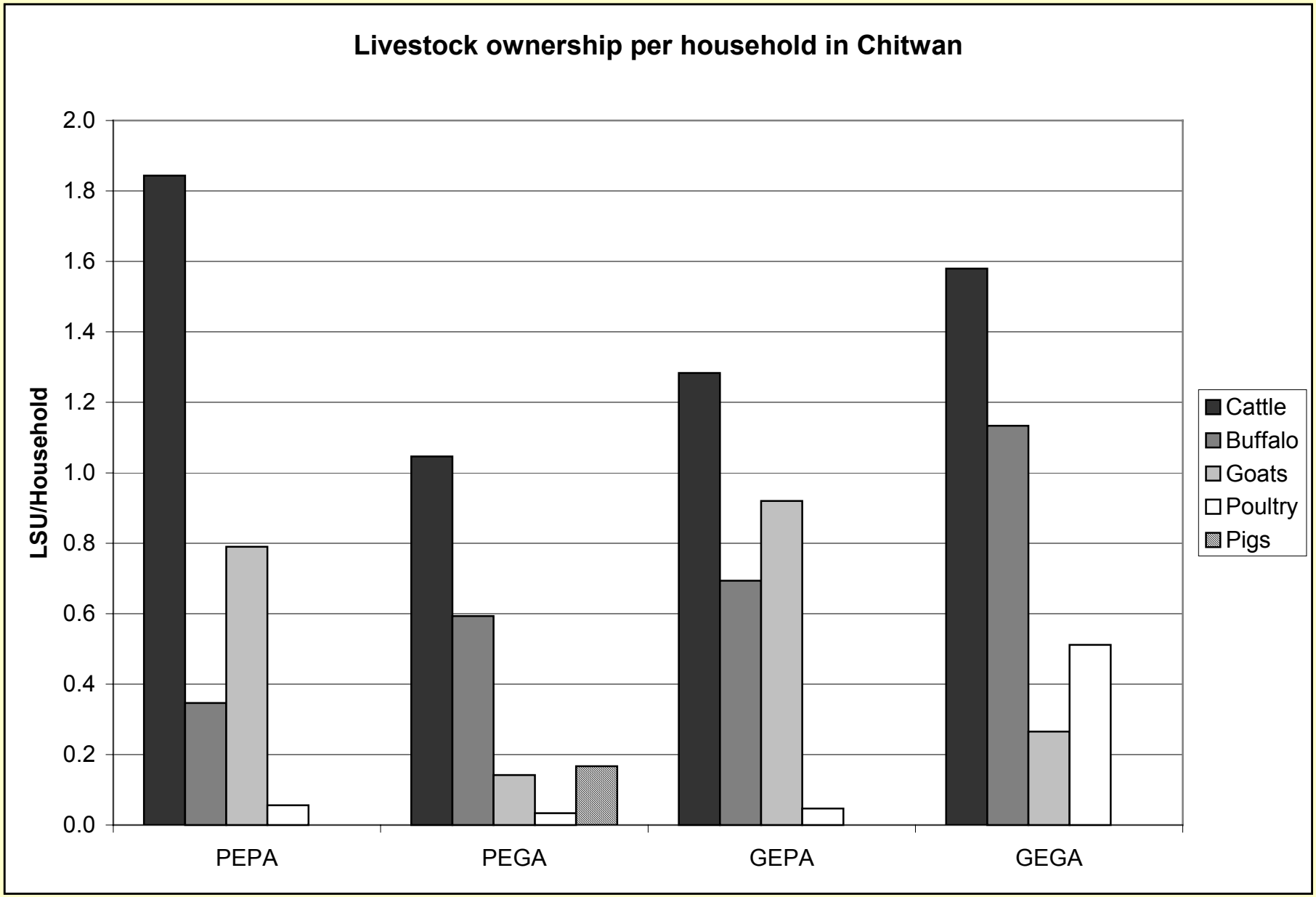
contribution to livelihoods

Village types	PE PA	PE GA	GE PA	GE GA
Mid Hills	Burunchuli	Jhyalungtar	Manegaun & Lekdanda	Seraphat
Lalitpur	Crops Livestock Waged OnF & OfF Business Salaried	Crops, Livestock Salaried Waged OnF & *OfF* Business Caste BP Remittances	*Crops,* *Livestock* Waged OnF Salaried Caste BP	*Crops* Livestock Business Salaried Waged OfF Caste BP
Lowlands	Phujintar	Barowa	Anandchowk	Parashnagar
Chitwan	*Crop, Livestock* *Waged OnF* Waged OfF Salaried	*Crops, Livestock* *Waged OnF* Pensions Salaried Business Waged OfF Caste BP	*Livestock* *Crops* *Waged OnF* Salaried Business Waged OfF Pensions	*Crops* Livestock Salaried *Waged OnF* Business Caste BP
Mountain	Ghilling	Syang	Chhusang	Kagbeni
Mustang	Livestock Crops *Waged OnF & OfF* Business Pension & Rs	*Crops* Livestock Business *Caste BP*	*Crops* *Livestock* Business *Waged OnF & OfF* Pension & Rs	*Crops*, Livestock Business *Waged OfF* *Waged OnF* Pension & Rs

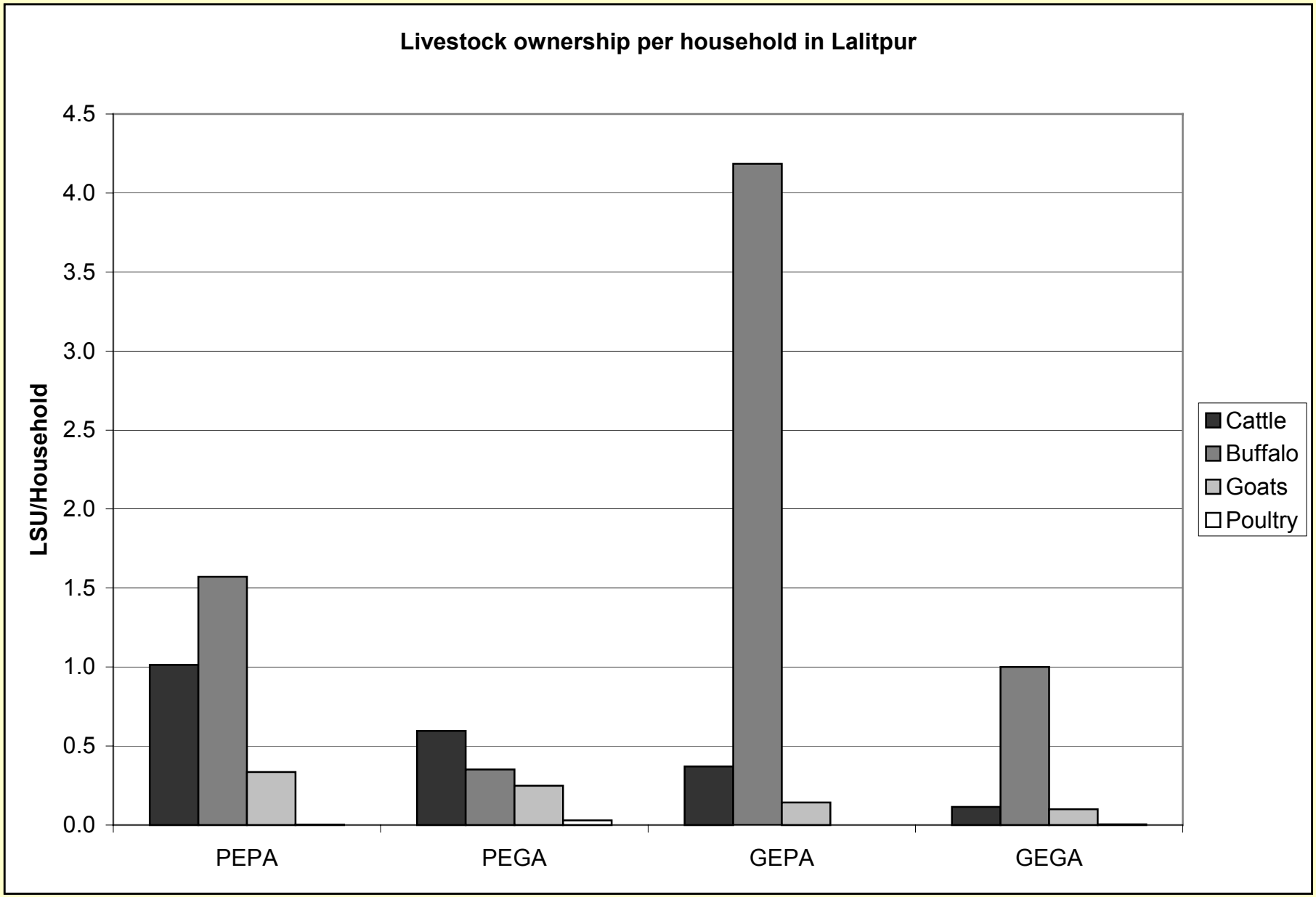
Livestock Holdings



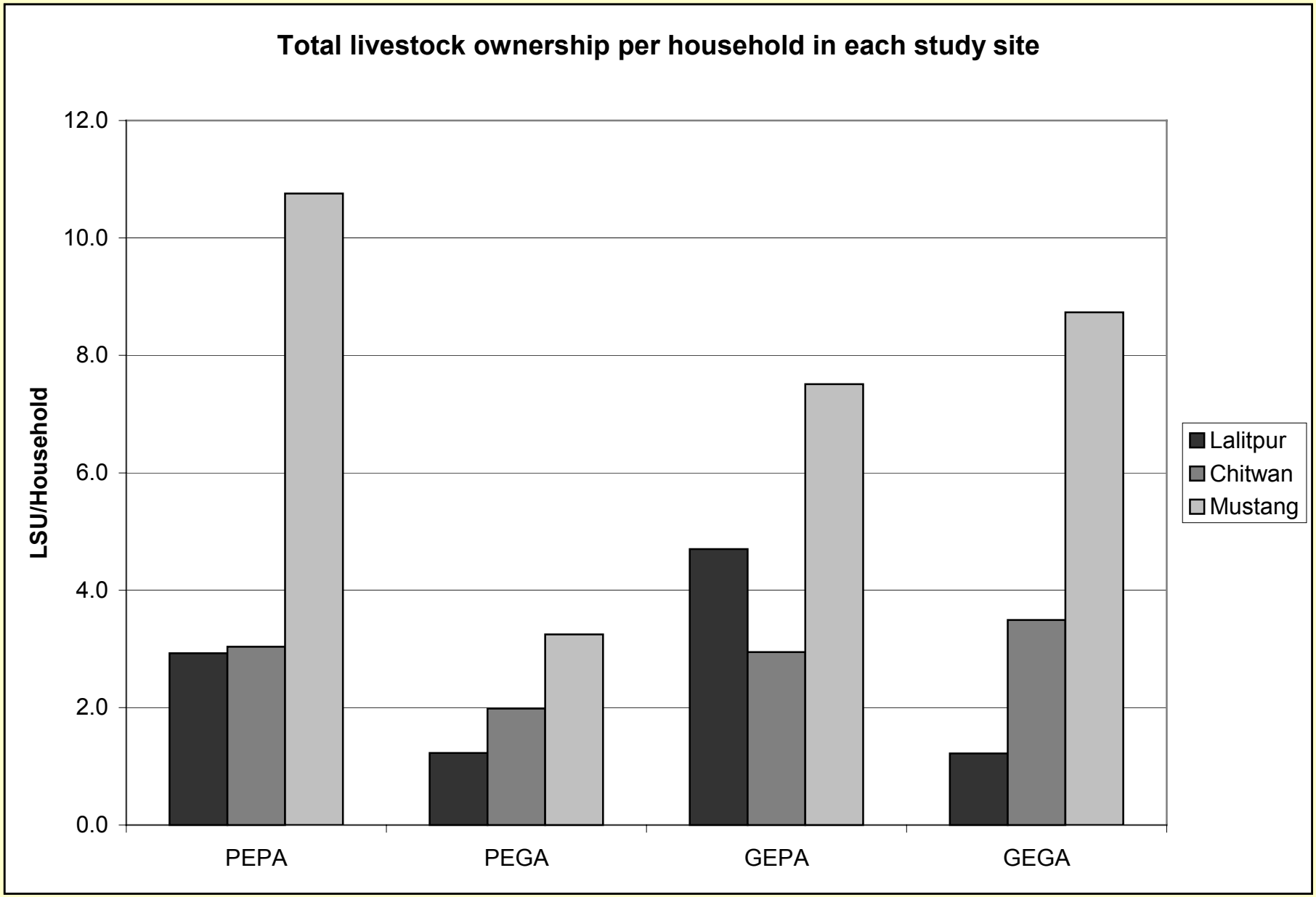
NB Virtually none of the animals are introduced breeds



NB Introduced breeds are concentrated in GEGA and are mainly buffalo followed by cattle. Cattle LSUs are dominated by bullocks.



NB High proportion of cattle and buffalo are introduced breeds.


Total livestock ownership per household in each study site
LSU/Household
12.0
10.0
8.0
6.0
4.0
2.0
0.0
PEPA
PEGA
GEPA
GEGA
Lalitpur
Chitwan
Mustang

Qualitative analysis – livestock functions

- Poor use livestock for consumption and production purposes (mainly manure and urine)
- Very little evidence of income activities in poor households
- Richer households use livestock for a greater range of functions, but in the richest households the use of livestock as an insurance policy is less important as they have other assets.

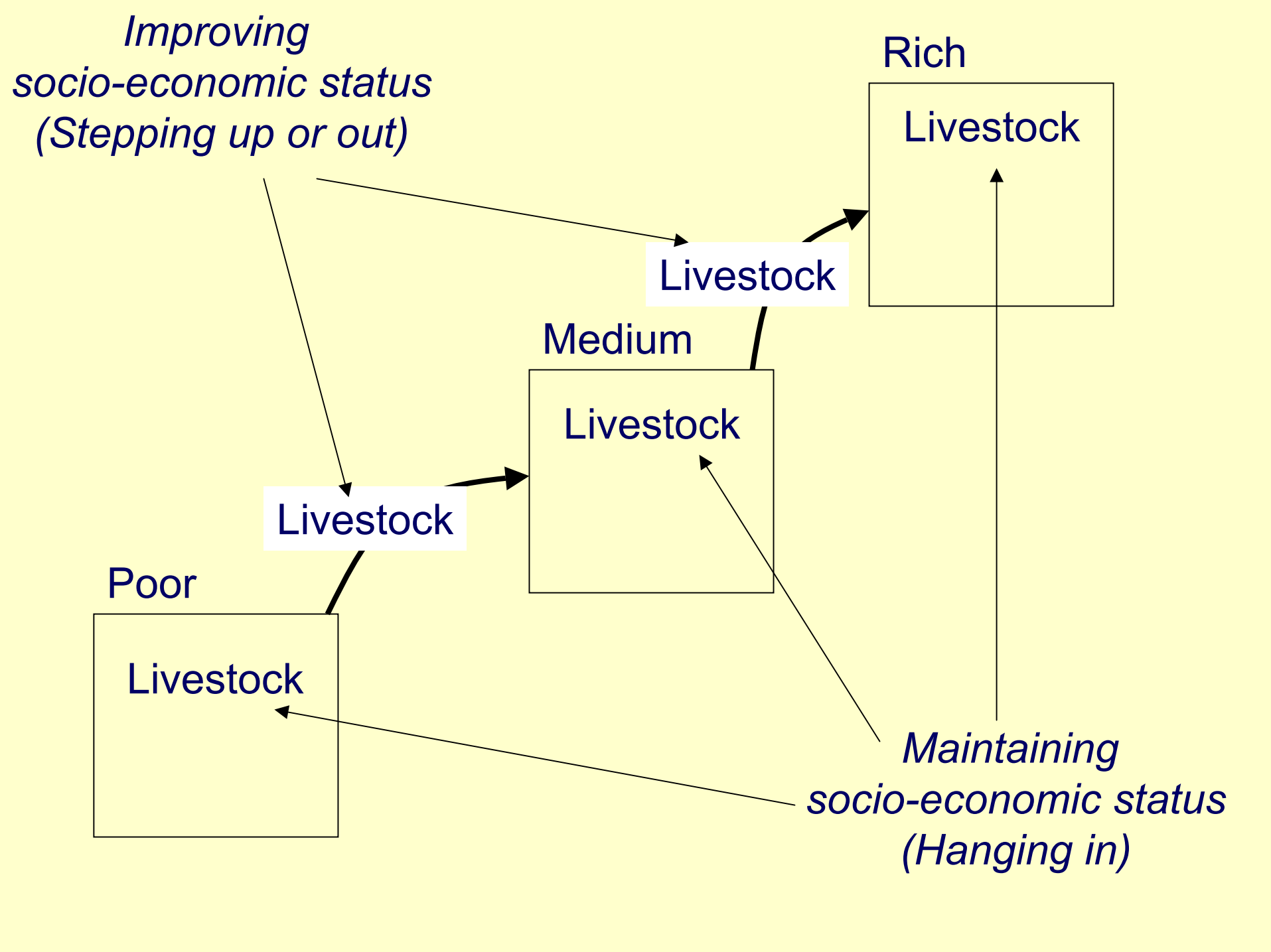
Qualitative analysis – returns and risks of livestock enterprises

- Poor households show a preference for small livestock species
- This preference relates to the quick turnover of these enterprises and lower amounts of time required
- Richer households prefer large species and in particular buffalo
- This preference is related to regular income

Qualitative analysis – returns and risks of livestock enterprises

- Constraints are seen as market access and management in poor groups
- In the richer households the main constraint was feed resources
- In general, there is concern in all household groups about losses due to disease.

Livelihoods Analysis and Technology Adoption


Improving
socio-economic status
(Stepping up or out)
Rich
Livestock
Livestock
Medium
Livestock
Livestock
Poor
Livestock
Maintaining
socio-economic status
(Hanging in)

Livestock related livelihood strategies: summary by SE strata

Socio-economic strata	Hanging-in	Stepping-up	Stepping-out
Poor	**Holdings too small for effective non-income functions.** **Livestock seen as costly, risky & difficult to market**	**Some evidence found as a component of strategies**	**Not an important component of strategies**
Medium	**Central to livelihoods for income, consumption & production.**	**Accummulation in herd.** **Technology changes.** **Market access driver.** **Services – work & transport**	**Buffering (education costs).** **Sales to buy other assets**
Rich	**Not important for non-income functions.** **Consumption important**	**Part of portfolio when complementary to other activities & strategies. Technology changes**	**Not a main component**

Adoption of introduced breeds of animal

HH Status	Study Area		
	Lalitpur	Chitwan	Mustang
Poor	1 non-adopter community	3 non-adopter communities	3 non-adopter communities
	3 adopter communities	1 adopter community	1 adopter community
	2 buffalo (66, 75% HH)	Cow (33% HH)	1 Poultry (28% HH)
	1 Poultry (27%)		
Medium	1 non-adopter community	2 non-adopter communities	1 non-adopter community
	3 adopter communities	2 adopter community	3 adopter communities
	3 Buffalo (44,100,100% HH	2 Buffalo (18,50% HH)	3 Poultry (20,31,66% HH)
	1 Poultry (17% HH)	2 Cow (18, 67% HH)	
	1 Cow (11% HH)	2 Goat (10,33% HH)	
		2 Poultry (8,10% HH)	
Rich	0 non-adopter community	2 non-adopter communities	3 non-adopter communities
	4 adopter communities	2 adopter communities	1 adopter community
	4 Buffalo (25,56,75,100% H	2 Buffalo (12,75% HH)	1 Poultry (29% HH)
	2 Poultry (11,25% HH)	2 Cow (37, 37% HH)	
	1 Cow (50% HH)	1 Goat (12% HH)	
	1 Goat (25% HH)		

Moving from poor to rich economic status:

- number of adopting households and communities increases
- range of species adopted increases.

Timelines

Timeline analysis

Poor to rich using buffalo and cattle

2 years *2 years* *12 years* *5 years* *10 years*

Year	1972	1974	1976	1988	1993	2003
Key events	Migrated to the community - landless	Purchased local breed cow	Purchased Buffalo cow	5-6 buffaloes raised from original buffalo	Purchased Jersey cow	Two improved cattle
		Consumed the milk		Production 6 litres per day per buffalo	Milk yield 10 litre a days	10 litres of milk production
		Sold all the calves	Sold and consumed milk	Sold and consumed milk	8 litres sold	Milk sold
					2 litres sold	
		Money used to buy land		Excess buffalos sold	Money used to educate children	Manure used in biogas plant
Status	Poor	Transition between poor to medium	Medium	Medium	Transition from Medium to Rich	Rich

31 years

Timeline analysis

Poor to medium using goat

Access Improved

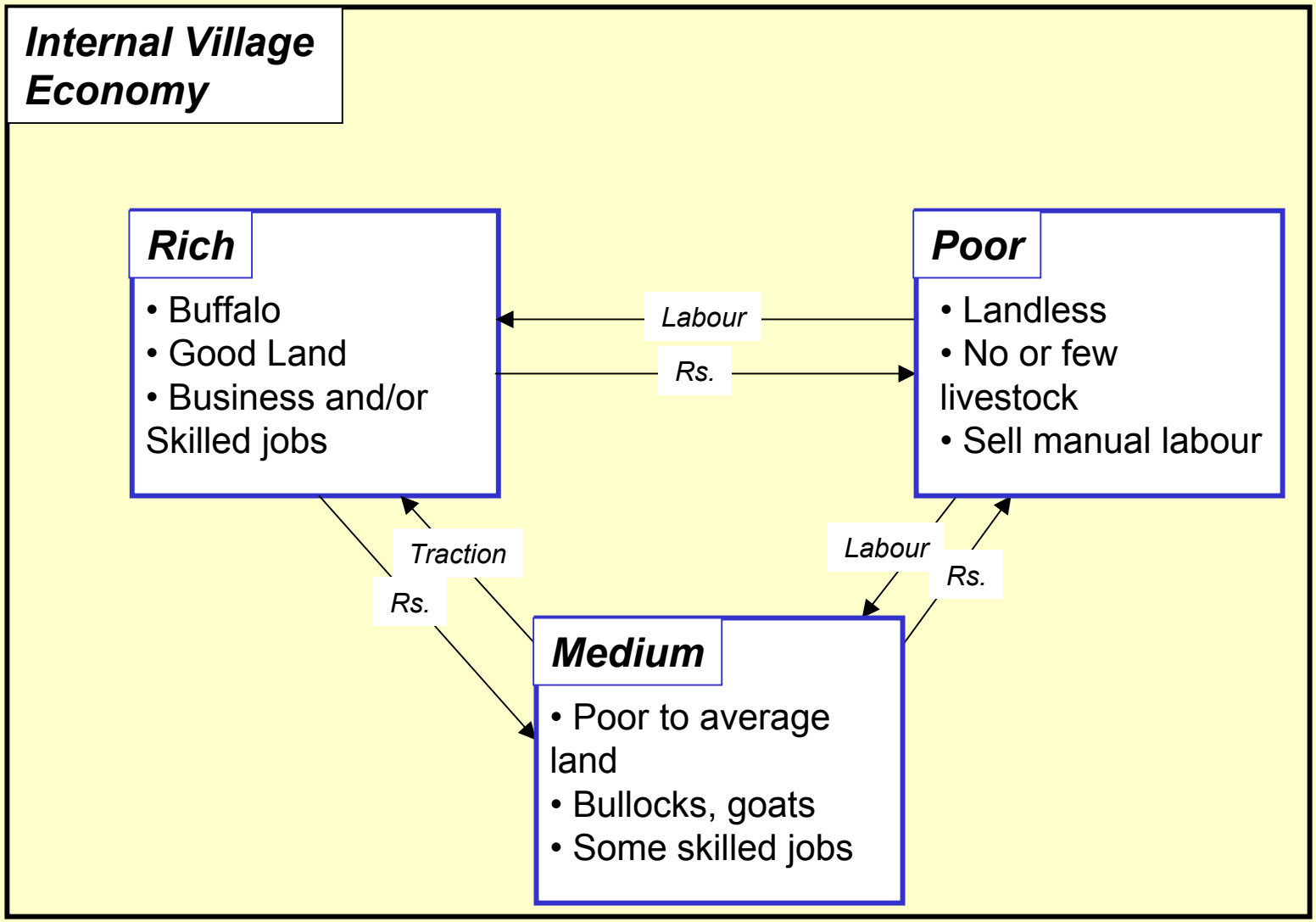
Technologies Improved

Market Access Improved

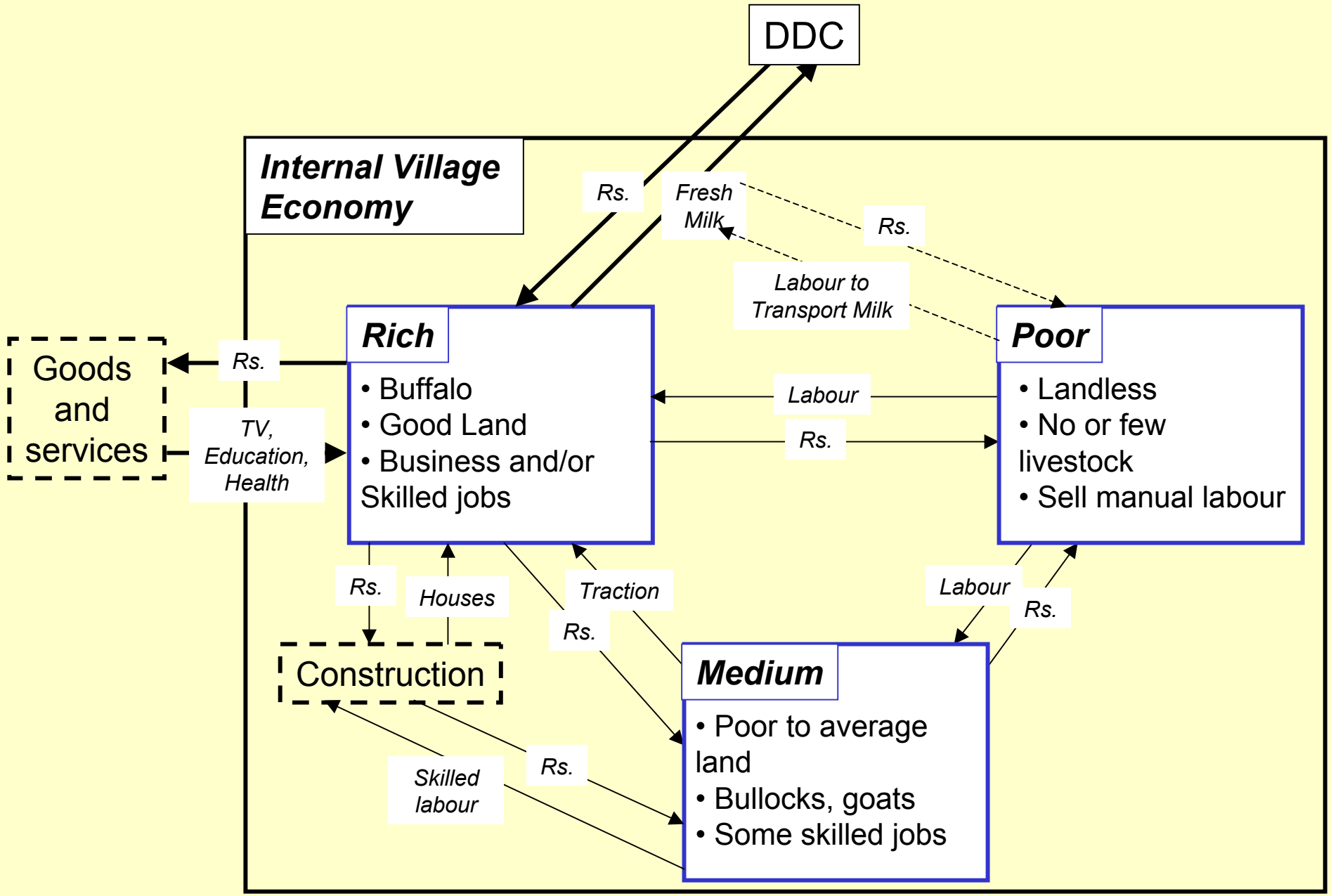
Year	1990	1990	1998	1999	2000	2001	2003
Key events	Family have 2 or 3 goats	Roadhead construction	Forest grazing banned	Goats treated for worms on a regular basis	Different forage grass and fodder trees introduced by livestock services	Traders come to the village and buy goats at a good price	Family have 7 to 8 goats They receive a good price for goats Goat rearing is seen as profitable Money used to cover household expenses
Status	Poor to Medium					Transition from Poor to Medium	Medium

Community Economy Models

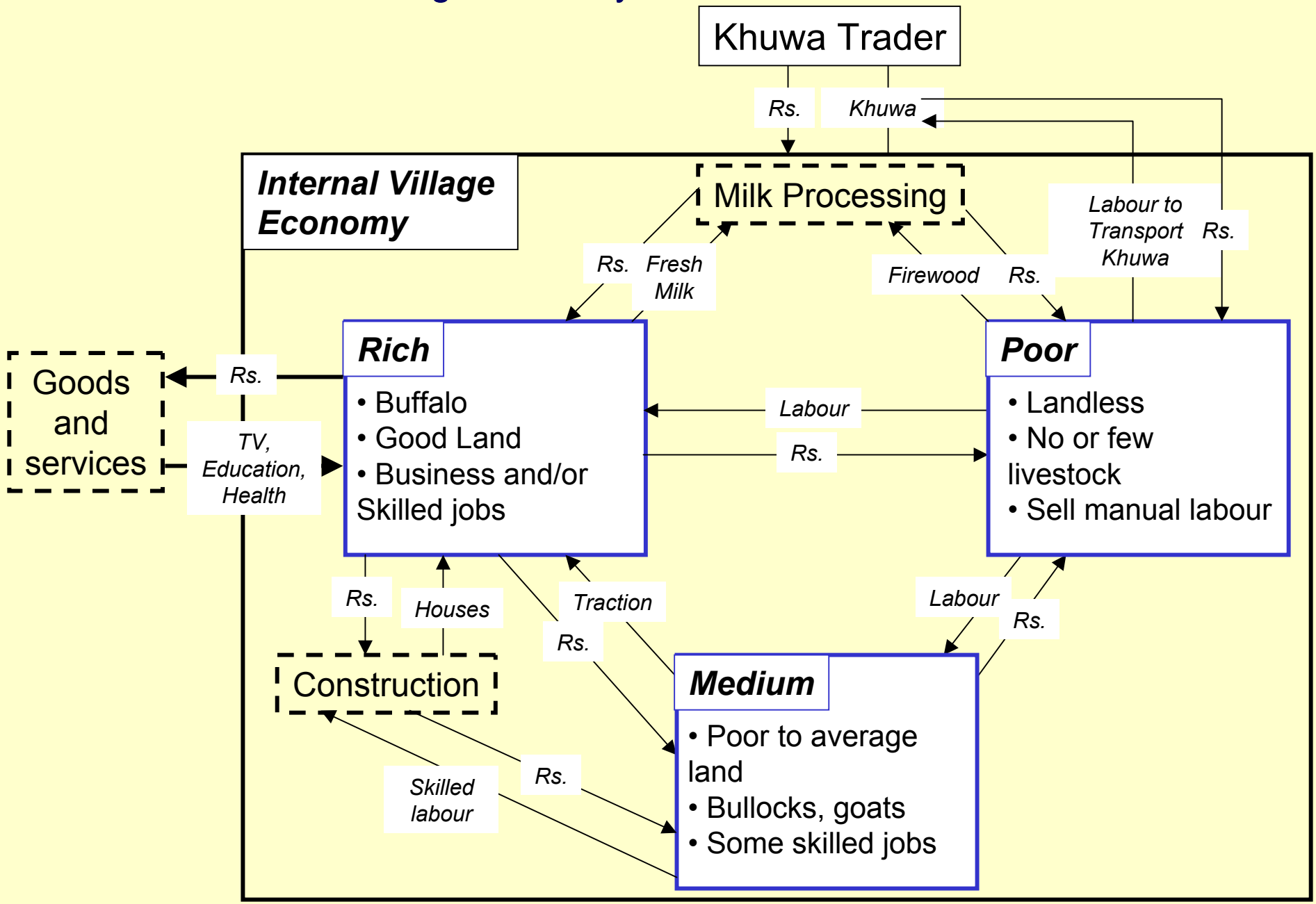
Lalitpur District
– example of the village economy



Lalitpur District – a village economy with Dairy Development Corporation (DDC)



Lalitpur District
– a village economy with Khuwa Trader



Impact of Livestock Technologies and Policies

Livestock Policies

- The Nepal Government has a high regard for planning of its economy.
- At one stage in the 1990s there were as many as five overlapping plans running together: Ninth Plan; Agricultural Perspective Plan; Livestock Master Plan; Dairy Development Plan; and Third Livestock Development Plan

Livestock Policies - Issues

- The role of the livestock in development
  - Supply driven
  - Demand is rarely mentioned and poorly understood
- Production versus a “Productivity” bias
  - Production is the principle focus
  - Only one productivity measure is used which is production per animal
- Monitoring, evaluation and analysis
  - Monitoring is focused on financial and physical targets
  - Evaluation is focused on production
  - Little or no analysis on the observed data

Examples of successful technology adoption in Nepal

Technology	Region	Source and date	Government Role	Comments
Potatoes	Sherpa region, but very widespread	Unknown, possibly 100 to 150 years ago. British Resident?	None	Become an integral part of the farming system. Important food product. Dried product used in trade
Use of draught animals	Sherpa region, but very widespread	Source unknown, but widespread adoption In the last 30 years	None	Change in cultivation practices relate to changes in labour costs since 1950s. When labour was cheaper land was cultivated by hand
Dzopa as a tourist pack animal	Mountain region	Local source, adopted in the last 30 years	None	Access to the areas by tourists requiring transport
Cattle and dzopa	Sherpa region	Local source, adopted in the last 30 years	Government restrictions on the use of forest for goat grazing	In general this has been done by poor people with little land.
Exotic buffalo genetics	Hills and Terai	India, adopted in the last 20 years	Limited	Private traders import mature cows from India

Less Successful Technologies

Technology	Region	Source and date	Government Role	Comments
Exotic milk breed genetics	Hills	International, in the last 20 years	Importation of semen, AI provision	Limited adoption (see later)
Exotic goat genetics	Hills	International, in the last 20 years	Importation of male animals	Economics of these species poorly understood
Exotic grass genetics	All	International, in the last 50 years	Importation of seed, field station testing	Low returns in comparison to other land activities. Sources of fodder
Exotic fodder systems	All	International, in the last 50 years	Field testing of methods	

Comparative table for policy analysis

Policy and private sector initatiatives	Technology	Adoption	Demand for technology	Economic Returns	Comments
Increase milk production and availability	Cattle dairy genetics	Limited	Richer HH buffalo, poorer household goats and poultry	Poor returns where there is no market for cull cows	Policy needs reviewing
	Forage	Limited		Dependent on land-use alternatives	Necessary to review on case by case basis
	Concentrate feed	Limited		Dependent on regularity of supply and product quality	What is the role of the public sector?
	Veterinary services	Limited		Good	
	Milk marketing	Limited		Where milk holidays there are problems	What is the role of the public sector?
Private sector initiative	Buffalo dairy genetics	High		Good	Need for a review of access to this technology by the poor

Hills Leasehold Forestry and Forage Development Project

- Aimed to address poor people's needs and also stop land degradation
- Coordination of four government departments to address issues as diverse as:
  - Land access and tenure
  - Technical support for livestock and pasture
  - Access to credit
- Costs would appear high
  - On average 0.63 hectares assigned to families
  - US$3,061 per hectare of degraded forest, US$1,937 per family or US$13,016 per leasehold group

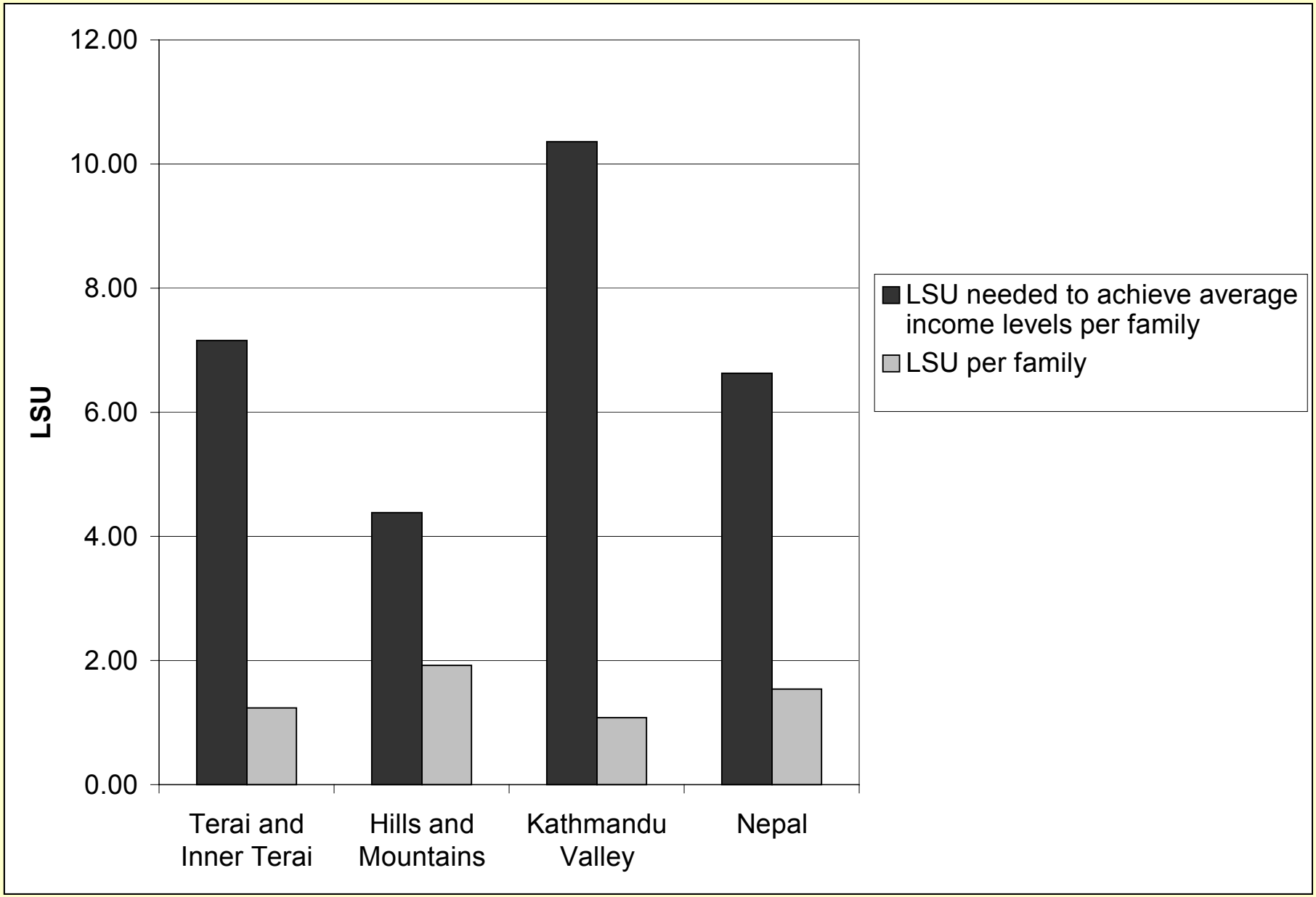
Is there enough land?
Are there enough livestock?

	Terai and Inner Terai	Hills and Mountains	Kathmandu Valley	Nepal
Number in the family	5.75	5.2	5.12	5.45
Average Income per Capita (PPP$)	1,267	858	2,059	1,237
Earnings per LSU (PPP$/LSU)*	1,018	1,018	1,018	1,018
LSU needed to achieve average income levels per family	7.16	4.38	10.36	6.62
LSU per family	1.24	1.92	1.08	1.54
Hectares needed per LSU**	1.22	2.00	1.27	1.61
Hectares required to achieve average income levels per family	8.73	8.75	13.16	10.68
Average cultivated landholding per family	0.70	0.65	0.34	0.62
Average land per family**	1.50	4.17	1.36	2.49
Maximum landholding	16.93	4.07	2.54	

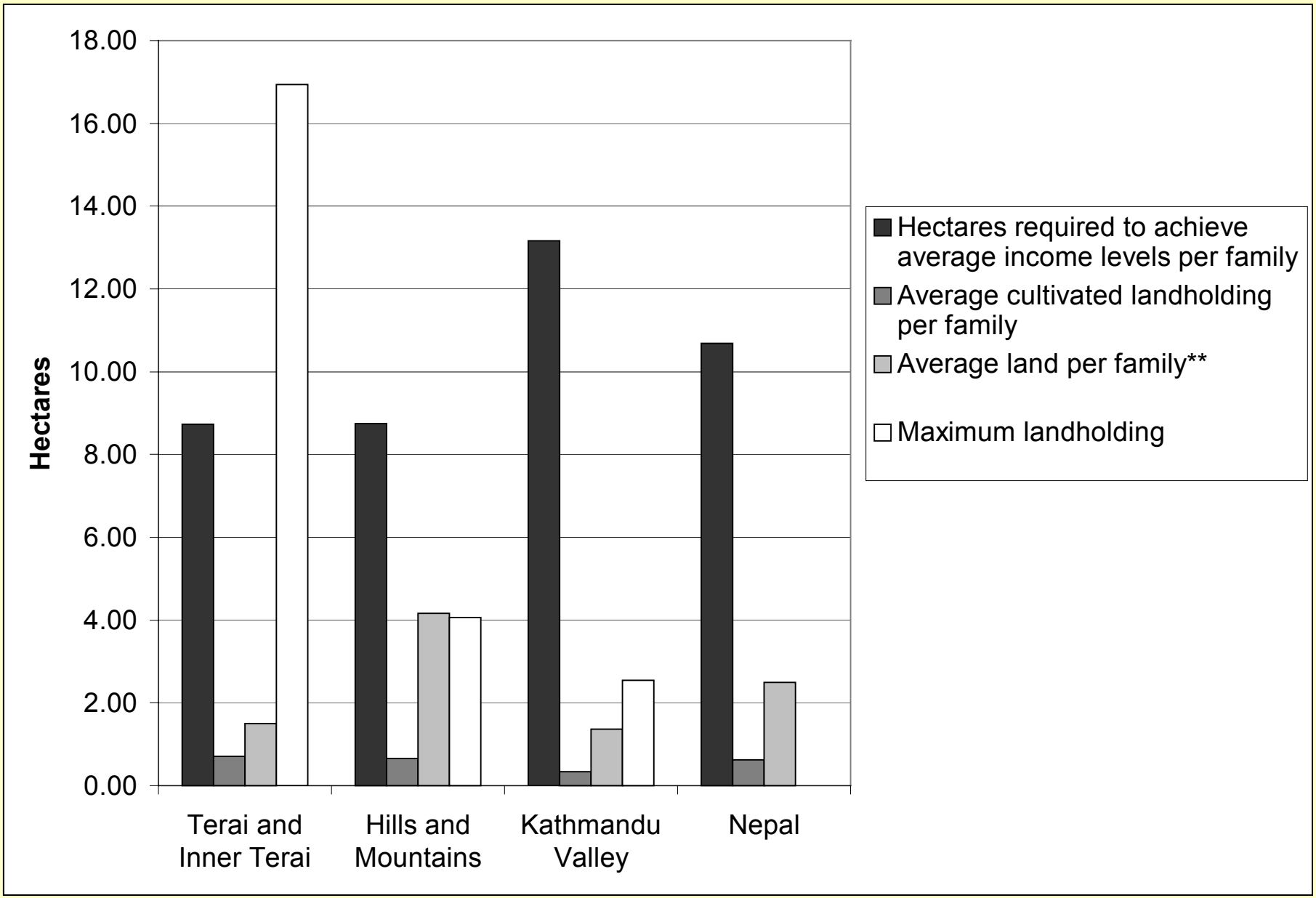
* Estimates exclude family labour

** Includes cultivated land and communal pasture and forest areas

Livestock Unit Analysis

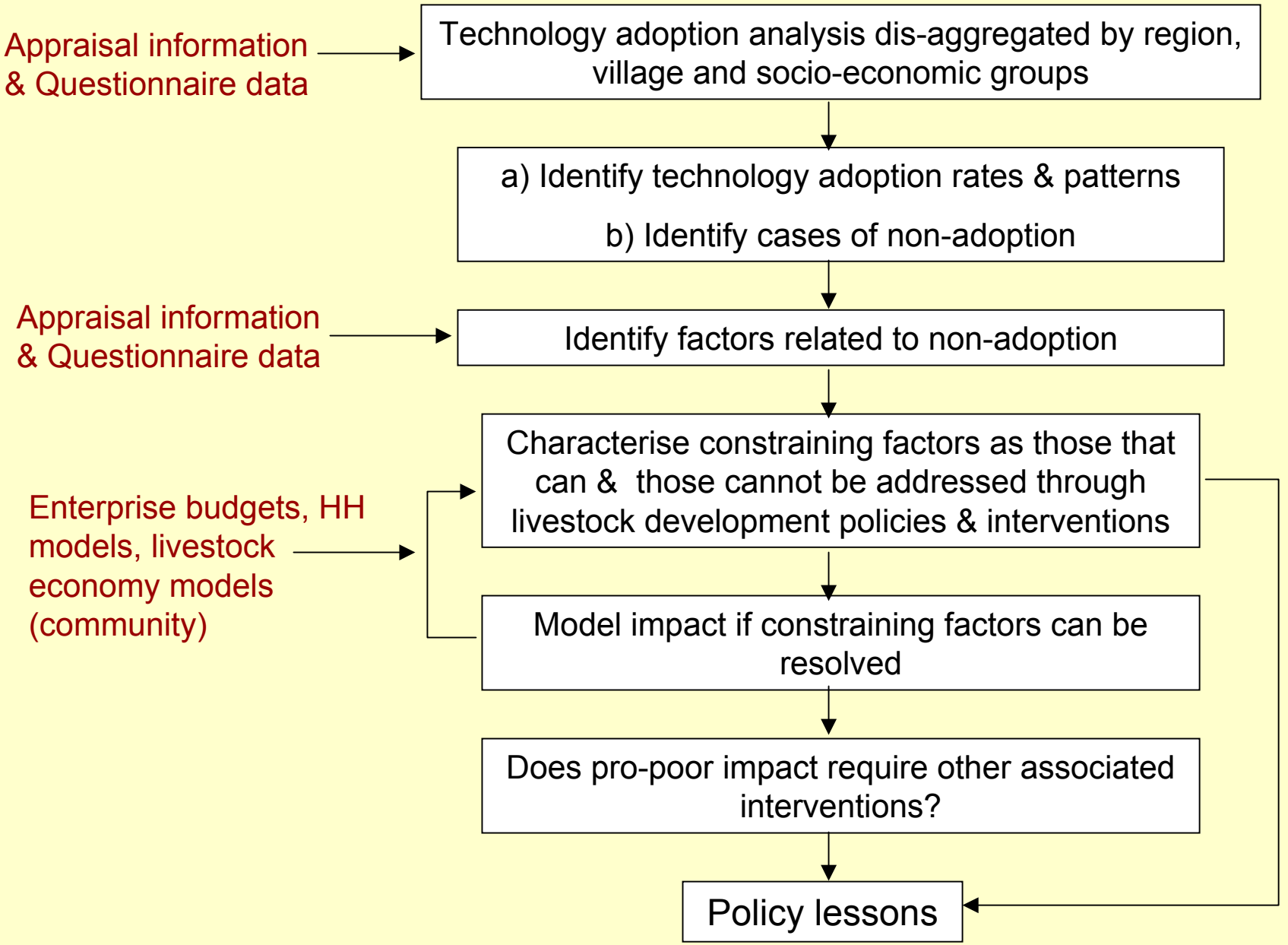


Landholding analysis



Emerging Methodology

Analysis of constraints to pro-poor livestock development



Key Conclusions
- Methodology

- It can be improved
  - Clearer selection of representative households
  - The use of quantitative analysis (SAMs, PAMs)
  - Lessons could be learnt from forestry sector
- It has merits
  - Reference group
  - Secondary data analysis
- Questions
  - Is fieldwork justified in countries such as Nepal where so much has already been studied?
  - How can the methodology be kept simple without losing value?

Key Conclusions
- Livestock and Poverty

- The areas with the highest incidence of poverty have the highest dependence on livestock.
- This reflects the limited alternative economic opportunities in these regions
- Within all regions and communities there are strong differences
  - Poorer households have few livestock and the livestock they have tend to be small species
  - Relatively better off households have livestock and these tend to be both large and small species
- Poorer households would like livestock, but are limited by access to resources and capital

Key Conclusions
– Technologies

- There are clear examples of technology adoption by different ethnic groups, rich and poor
- Government's role in many of these adoption has been very limited
- This indicates that Nepali people are capable and willing to adopt technologies
- There are also clear examples where livestock technologies have been used to improve livelihoods

Key Conclusions – Technologies

- Technologies offered by government services have not always been appropriate
  - Due to the socio-economics of the situation
  - In general a lack of appreciation of working in mixed farming systems
  - A lack of appreciation of competing sectors – tourism and urban based employment
- Enabling environment has not encouraged adoption of some technologies

Key Conclusions
– Agricultural Sector

- Agricultural sector lacks flexibility due to:
  - Land tenure laws (fears of losing land and landholding ceilings)
  - A lack of social mobility
  - A constrained input sector
- In general there is stagnation of the sector due to:
  - Government regulations
  - Incomplete privatisation and liberalisation processes
- In its current state it is unlikely that the livestock sector can have much more than a small impact on poverty alleviation

Key Conclusions
– Policy Issues

- There have been statements of pro-poor poverty plans
- However, there appears to be a lack of targeting of poor regions and poor people within regions and communities
- In general there has been incomplete changes in policy in terms of privatisation, liberalisation and pro-poor focus
- Insurgency issues are not openly discussed, but it appears that the existence of the Maoists has focused minds on pro-poor actions
  - However, the present situation places at risk the poverty impact of livestock interventions

General Recommendations

- There is a strong need for the coordination of livestock policies and actions with other related sectors
  - Forestry is perhaps of greatest importance as access to forest areas is critical to poor people with livestock.
  - Coordination with agricultural policies would merit further work.
  - In the more general context, there is a need for consistent and sound land tenure, infrastructure, credit and business policies in order to support the development of the livestock sector.

General Recommendations

- Each law, regulation and action for the livestock sector needs to be assessed in terms of:
  - public and private responsibility applying concepts of public/private good generation, externalities and moral hazards.
  - increasing the flexibility of the livestock sector to provide opportunities to poor people.

Specific Recommendations

- Flexibility in the provision of technologies could be achieved by:
  - Having less prescriptive lists
  - Field staff who work with families in identifying problems and potential solutions
  - Adequate knowledge and financial support to help families adopt and adapt potential solutions
- A strong focus on the control, and where possible the eradication, of contagious livestock diseases, which would benefit poor livestock farmers through reducing risks.

Specific Recommendations

- Targeting of the poor and their needs in the implementation of the Community Livestock Development Project requires training in:
  - Wealth ranking
  - Livelihoods assessments
  - Community level economic assessments, in particular the impact of interventions
  - Methods to identify technology demands of the poor
  - Methods to supply technology to the poor