



**Social Dimensions in
Environmental Science:
Methodologies and Practices**

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Social Perspectives

- Ethnics;
- Religion;
- Culture;
- Customary organizations;
- Norms and traditions;
- Policies and Institution;
- NGO (INGO)



Subjects in social dimensions

- Effects of ethnic culture and customary traditions on eco-environment;
- Effects of community institutions on eco-environment;
- Effects of production and livelihood patterns on eco-environment;
- Effects of policies and regulations on eco-environment



Major methodologies in social study



Information inquiry :

Information collected from publications and reports

Professional conference and Seminars:

Information collected from professional conferences and seminars

Questionnaire survey:

Open, semi-open and closed Questionnaire

PRA:

Participatory rural appraisal

Key-person interview:

Interview on key professionals, stakeholders etc.

Case study: sustainable management on rangeland resources in Northern Nepal





Hypothesis

Sustainable management of rangeland resources will not be possible without the involvement of all stakeholders and institutions. Social aspects of rangeland resource and rangeland ecosystem management in Nepal can be emphasized on implication of indigenous knowledge and adjustment of policies.

Overall Objective

to search the effective managerial measures at nation, district and community levels to resolve the problems in sustainable rangeland resource and ecosystem management in Nepal



Specific Objectives

to document and incorporate the indigenous knowledge of local residents into sustainable rangeland management;

to better understand the linkages of social, economic and ecological variables in sustainable rangeland management;

to assess the effectiveness of present and past management strategies at national, district and community levels in sustainable rangeland development;

to explore beyond the conventional wisdom of rangeland management concepts to manage rangeland resources and ecosystems more effectively.

Research Contents

1. Indigenous knowledge :

- Traditional strategies, farmers' knowledge and experiences in rangeland management;
- Incorporation of indigenous knowledge and experiences into rangeland management practice



2. Past management strategies:

- Past management strategies at nation, district, community levels;
- Changes and progress of these management strategies;
- Driving forces for these changes and progress



3. Present management strategies:

- current managerial measures, management plans and policies;**
- practical problems existing in their applications;**
- possible approaches to improve the strategies**



4. Assessments and comparison:

- assessing the contribution of managerial measures;
- recommending applicable strategies for Nepali rangeland resource and ecosystem management



Research Methodologies and Activities

Information inquiry :

Basic information on Nepal's rangeland resources are collected from publications and reports

Distribution of rangelands in Nepal (km²)

Physiographic Region	Total Land Area		Rangeland		
	ha (,000,000)	%	ha (,000)	% of Total Land	% of Rangeland
Tarai	2.1	14.4	49.7	0.3	2.9
Siwaliks	1.9	12.7	20.6	0.1	1.2
Middle Mountains	4.4	29.5	292.8	2.0	17.2
High Mountains	2.9	19.7	507.1	3.4	29.8
High Himal	3.5	23.7	831.5	5.6	48.9
TOTAL	14.8	100.0	1701.7	11.4	100

Source: Land Resource Mapping Project (1986)

Workshops and Seminars:
Three workshops and six seminars related to indigenous natural resources management and policy-making in Nepal and HKH countries, which is held at ICIMOD, host institution.



Information from presentation and posters

The Regional Rangeland Programme (RRP)

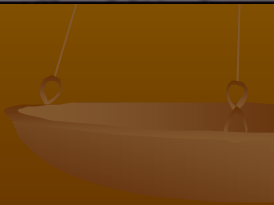
Project Mission: to develop and support a process for co-management of rangeland resources in HOD, in cooperation with regional and international partners, which foster action and change for overcoming rangeland dependent mountain communities' economic, social and physical vulnerability.

Key issues, barriers, weaknesses	Root Causes	Doable actions, recommendations
Socio-economic		

REGIONAL CULMINATION WORKSHOP FOR THE ASSESSMENT OF THE DECADE OF INDIGENOUS PEOPLES IN ASIA, 1995 - 2004
27-29, NOVEMBER 2006
KATHMANDU, NEPAL

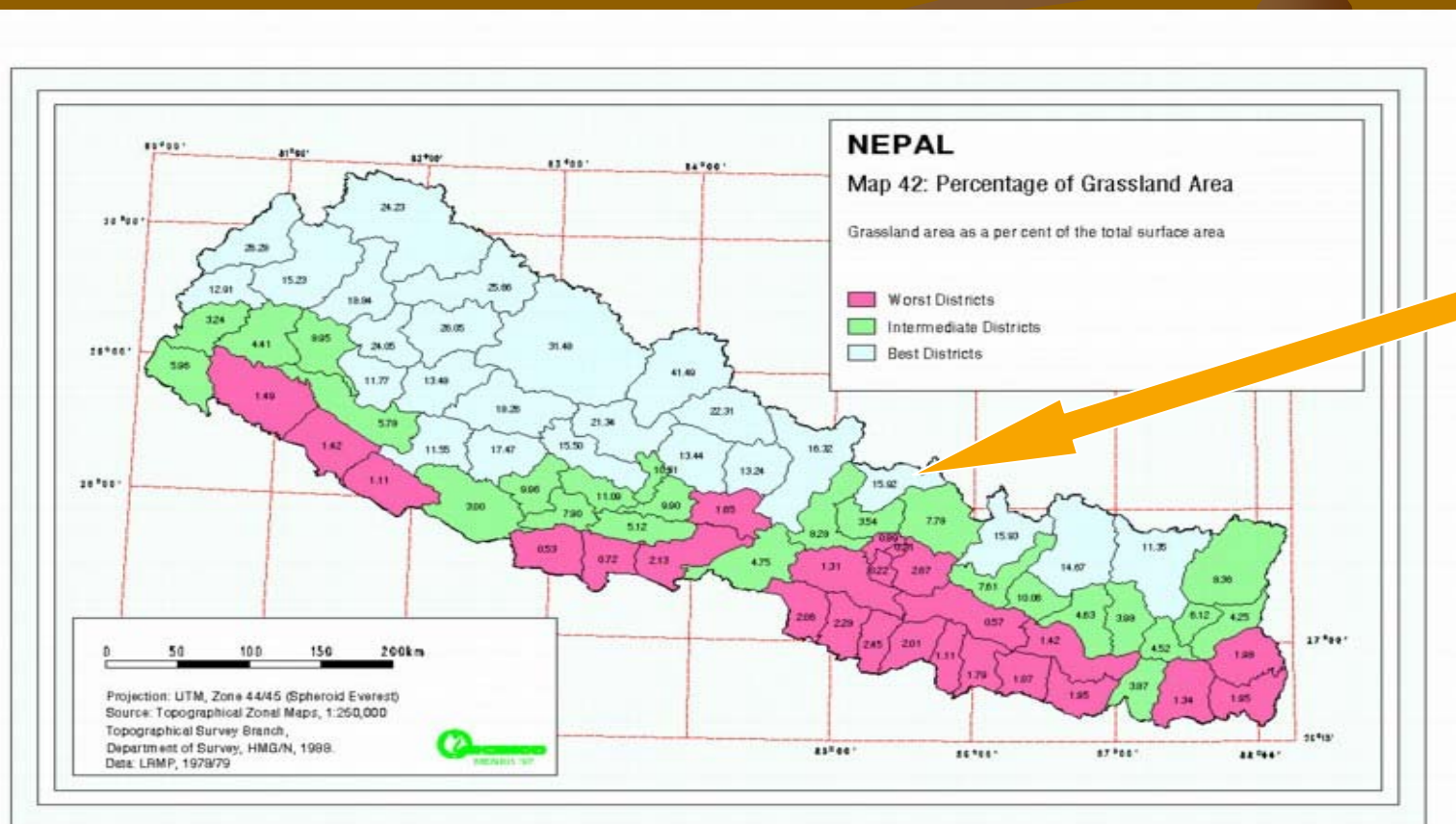
LIFAD

- ① Awareness Campaign; advocacy space
 - ② Exposure trips
 - ③ Clarity on conservation issues
- Alternate



Study site selection:

Three VDCs from Rasuwa district, “grazing land for sheep and cattle” were selected as representative of pastoral areas in Nepal in light of indigenous production system and ecoclimatic location



Case site

General information about case study sites

Items	Dhunche VDCs	Gatlang VDCs	Langtang VDCs
Geographic location (elevation)	Lowland (1900 m)	Midland (2200 m)	High Mountain (3300 m)
Climatic zone	Subtropical-temperature transition zone	Temperature zone	Subalpine zone
Farming systems	Multiple farming of livestock, crop, fodder and vegetable	Crop-livestock mixture farming	Livestock farming (tourism)
Total households	164	223	61
Livestock composition in individual household	1-2 cattle, 2-3 buffalo, 4-5 sheep and goats, 10-15 yak and chauri (only 10% of households keep yak farming)	1-2 cattle, 10-20 sheep and goats, 10-15 yak and chauri (half of households keep yak farming)	20-30 sheep, 2-3 horses, 10-15 yak and chauri (80% of households keep yak farming)

Farmers' Surveys:

Questionnaire surveys on 25 farmer households,
Interviewing 20 key persons, PRA and Open
discssion with 3 users' group (of 47 pepole)



General information about farmer interviewees

Items	Dhunche VDCs	Gatlang VDCs	Langtang VDCs
Interviewees' numbers			
Questionnaire survey	10	14	11
Keyperson interview	6	6	8
PRA	21	14	12
Average age			
Questionnaire survey	41.5	36.5	33.2
Keyperson interview	54.5	55.4	57.2
PRA	34.7	37.1	38.4
Average education level			
Questionnaire survey	Primary school	Primary school	Primary school
Keyperson interview	Illiteracy	Illiteracy	Illiteracy
PRA	Primary school	Primary school	Primary school
Proportion of female interviewee			
Questionnaire survey	60%	21.4%	27.2%
Keyperson interview	33.3%	16.7%	37.5%
PRA	61.9%	28.6%	33.3%



Information collected: Indigenous practices and strategies in grazing/feeding management, rangeland improvement and production, rangeland conservation and development, problems and barriers in pastoral economy and livelihoods, land tenure and ownership, rangeland institution and governance were gathered through general reconnaissance, informal survey and interview of key persons. Supplemental information on the problems, constraints, challenges, opportunities and changes in indigenous rangeland management systems, external public supports and partnerships were and recorded through group discussion and communication (PRA).

I Grazing management (please use “√” to tick the answer)

Which kind of grazing systems are you using?

- a) Traditional transhumance from highland pasture in summer in to lowland community forestry in winter**
- b) Migratory grazing within different areas of rangeland**
- c) Forestry grazing whole year round**
- d) Stall feeding**
- e) Others (specified)**

II Rangeland improvement (please use “√” to tick the answer)

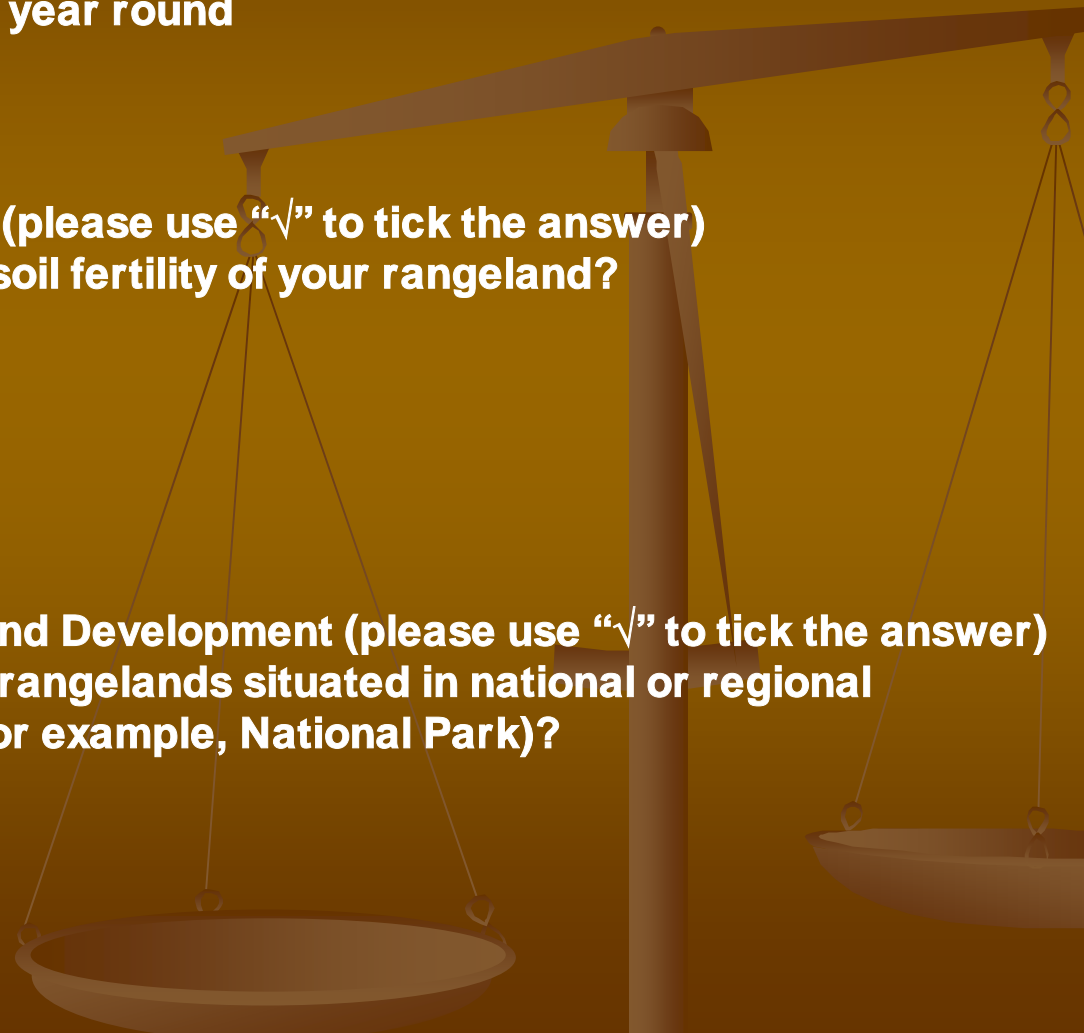
16. How do you maintain soil fertility of your rangeland?

- a) Chemical Fertilizer**
- b) Livestock manure**
- c) No attention**
- d) Others (specified)**

III Resource Protection and Development (please use “√” to tick the answer)

33. Are part or all of your rangelands situated in national or regional conservation areas (for example, National Park)?

- a) Yes**
- b) No**



IV Pastoral Economy and Marketing (please use “√” to tick the answer)

52. What are the major factors limiting the pastoral production in your case?

- a) Poor herd and pasture management**
- b) Malnutrition due to feed deficiency in winter season**
- c) High loss of animal production due to poor housing in winter season**
- d) High mortality due to poor health care**
- e) Others (specified)**

V Land Tenure and Ownership (please use “√” to tick the answer)

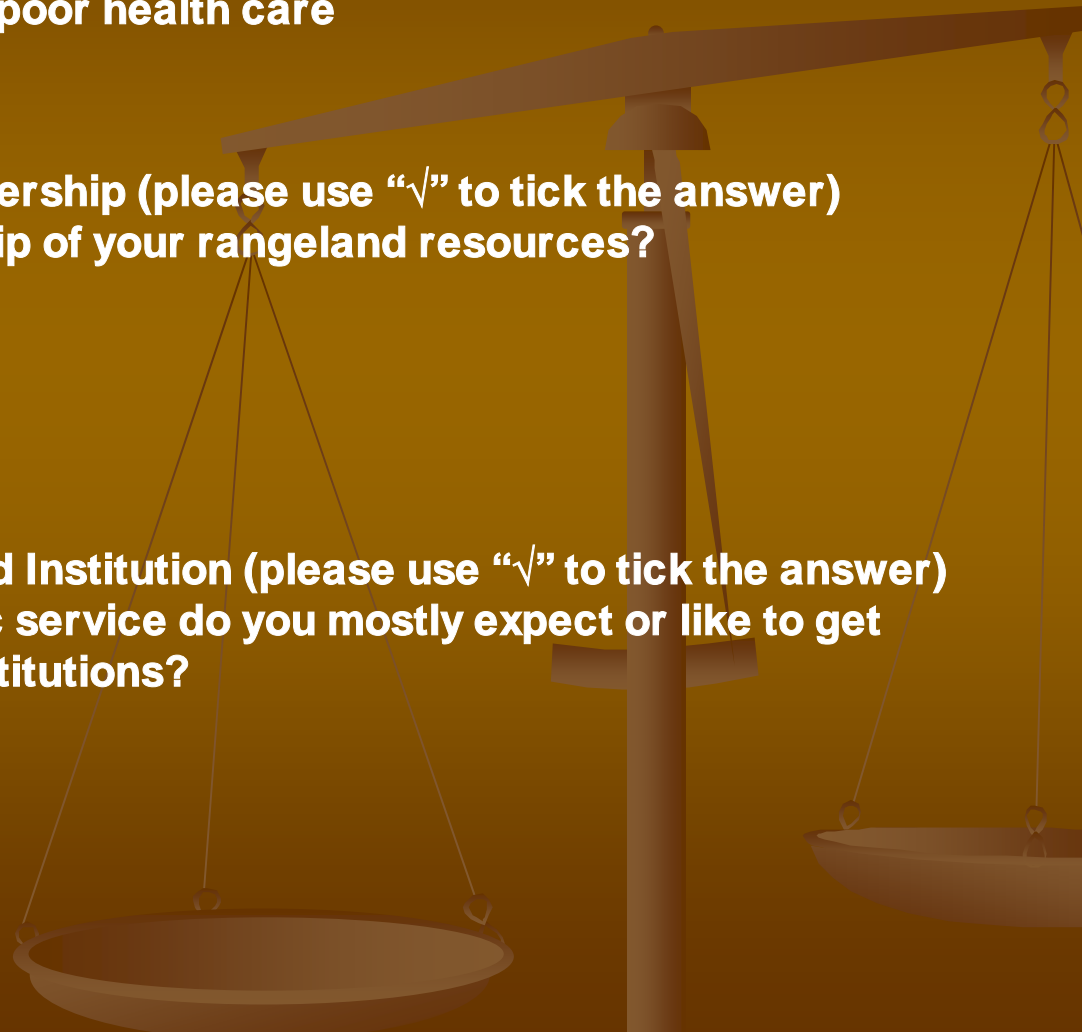
66. What is the ownership of your rangeland resources?

- a) Public/government**
- b) Community**
- c) Private**
- d) Religious authority**

VI Rangeland Policy and Institution (please use “√” to tick the answer)

95. Which kind of public service do you mostly expect or like to get from government or institutions?

- a) Technology**
- b) Subsidies**
- c) Trainings**
- d) Others (specified)**



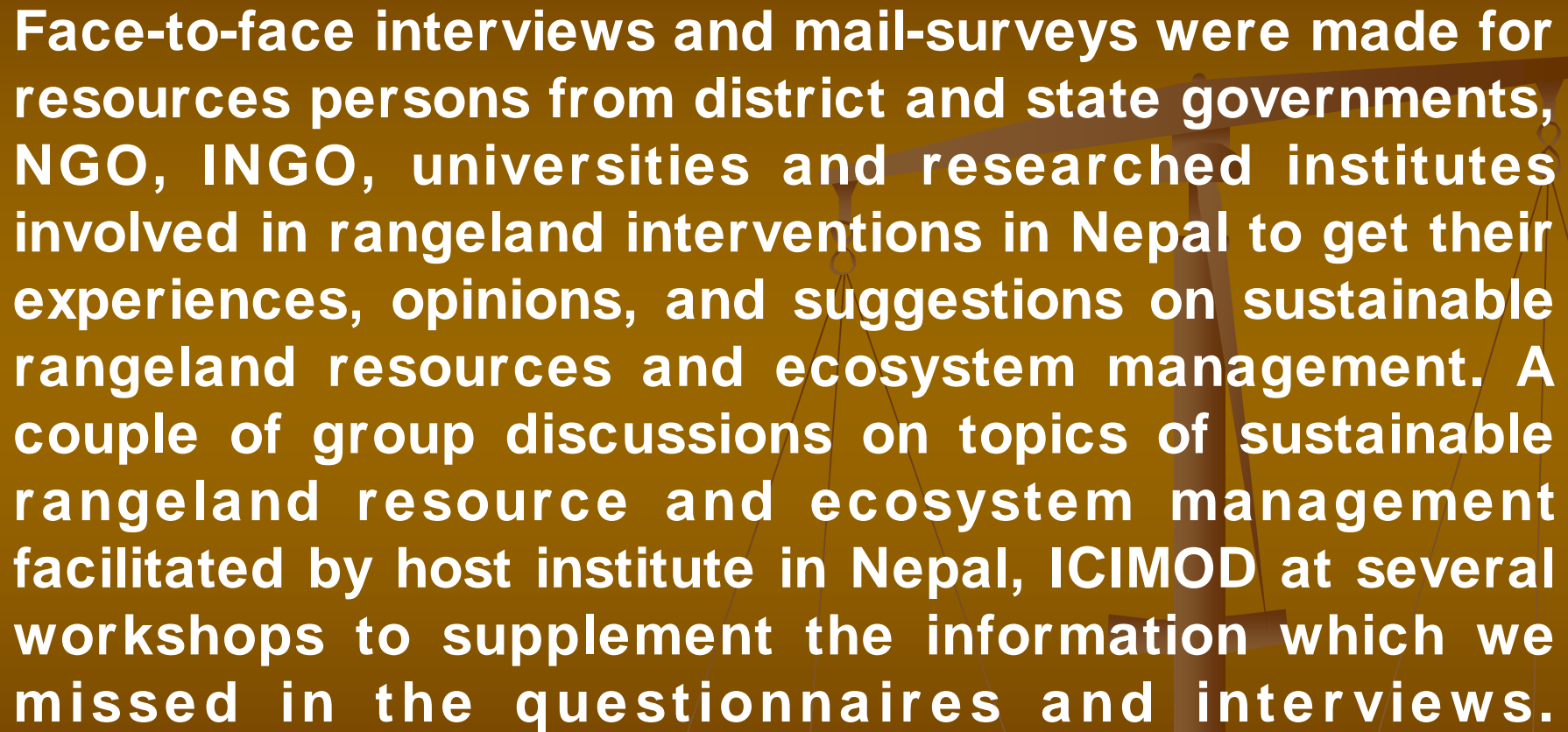
Professionals' Surveys:

Questionnaire surveys on 13 and 16 district and state professionals from universities, research institutes and NGOs etc.



General information about professional interviewees

Items	District Level	State level
Numbers (persons)	13	16
Working organizations		
Government offices (%)	38.5	43.7
Universities and Institutions (%)	38.5	18.8
NGO(%)	23.0	37.5
Positions		
Division head/chief (%)	38.5	43.7
Ordinary staff (%)	61.5	56.3
Ages		
<20 yrs (%)	0	0
21-30 yrs (%)	15.4	0
31-40 yrs (%)	53.8	31.3
41-50 yrs (%)	23.1	43.7
>51 yrs (%)	7.7	25.0
Education level		
High School (%)	38.5	0
College (%)	38.5	31.3
Graduate (%)	23.0	68.7



Face-to-face interviews and mail-surveys were made for resources persons from district and state governments, NGO, INGO, universities and researched institutes involved in rangeland interventions in Nepal to get their experiences, opinions, and suggestions on sustainable rangeland resources and ecosystem management. A couple of group discussions on topics of sustainable rangeland resource and ecosystem management facilitated by host institute in Nepal, ICIMOD at several workshops to supplement the information which we missed in the questionnaires and interviews.

I General Information (please use “√” to tick the answer)

How do you think grazing management system can be improved? (you can choose multiple answers and give the order of importance at the end of each answer in numbers: 1, the most important; 2, the secondary important; 3, third important....)

- a) Increase policy support for grazing management**
- b) Strengthen institutional cooperation/technical transfer**
- c) Integrate indigenous knowledge with advanced technology**
- d) Mitigate illiteracy and improve infrastructure**
- e) Others (specified)**

II Public Service and Institutional Support (please use “√” to tick the answer)

21 Which kind of public service related to rangeland management, conservation and development do your organization provide to herders?

- a) Technical transfer and extension**
- b) Technology consultation and demonstration**
- c) Financial subside and income generation**
- d) Support and services of policy and planning**
- e) Training and education**
- f) Others (specified)**

III Rangeland Policy and Land Tenure (please use “√” to tick the answer)

39. Do you know these policies are effective in rangeland resources management and conservation?

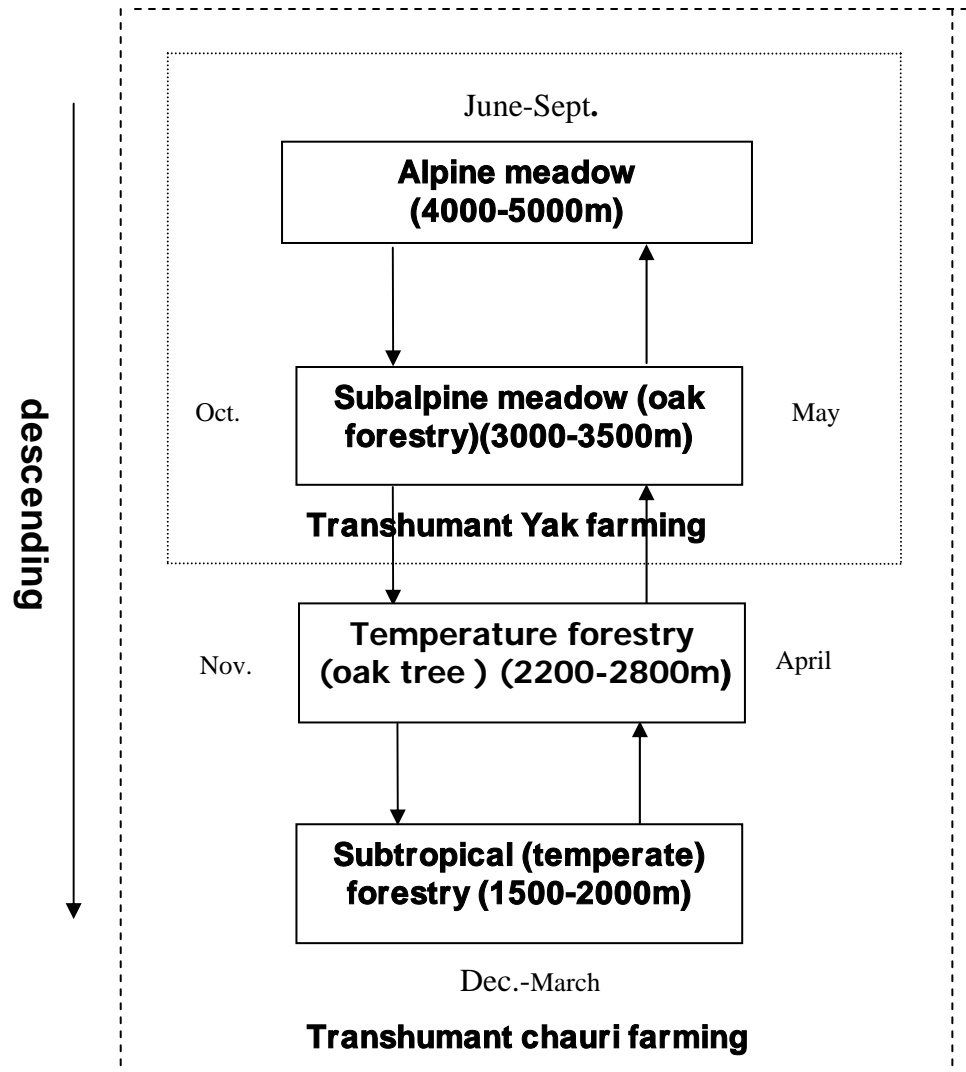
- a) Yes**
- b) No**

Research findings

1. Farmers' perspectives

1. Indigenous grazing practices:

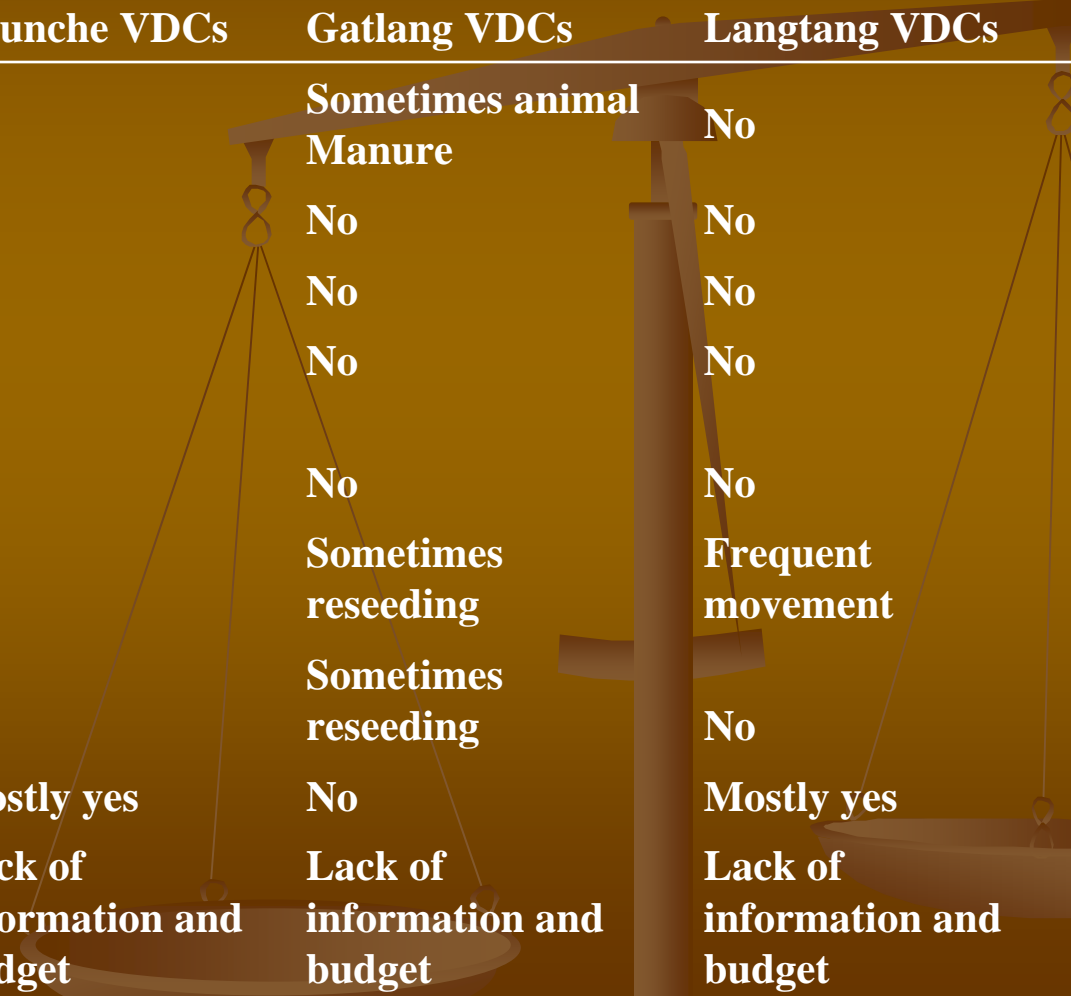
- *Upland meadow – lowland forestry*
Transhumance
- *Rotational grazing*
- *Carrying capacity estimation*
- *grazing intensity control*



Indigenous transhumant yak (...) and chauri (-) farming systems in Rasuwa District, Northern Nepal

2. Rangeland improvement and production strategies


Indigenous rangeland improvement and production practices



Interventions	Dhunche VDCs	Gatlang VDCs	Langtang VDCs
Fertilization	No	Sometimes animal Manure	No
Irrigation	No	No	No
Weeds control	No	No	No
Pest control	No	No	No
Animal and plant disease control	No	No	No
Campsite destroy control	No	Sometimes reseeded	Frequent movement
Rangeland degradation mitigation	No	Sometimes reseeded	No
Winter feed Cultivation	Mostly yes	No	Mostly yes
Problems in forage improvement	Lack of information and budget	Lack of information and budget	Lack of information and budget

3. Rangeland conservation and development strategies

Farmers' indigenous rangeland conservation and development practices



Items	Dhunche VDCs	Gatlang VDCs	Langtang VDCs
Conflicts between conservation and development	Mostly yes	Half yes, half no	Yes
Measures to mitigate these conflicts	Mostly no, sometimes regulations	Mostly regulations	regulations
Benefit got from conservation project	More feed resources	More feed resources, more eco-tourism	more eco-tourism
Farmer's attitude to conservation plans	Support	Support	Half support, half reject
Any wildlife-livestock Conflicts	Yes	Half yes, half no	Mostly no
Wildlife and habitat protection	Committee-based	Household-based	Committee-based
Rangeland eco-tourism	No	At beginning	yes
Influence of eco-tourism	Improve livelihood	No influence or improve livelihood	Improve livelihood
Non-timber collection	Mostly no	Half yes, half no	No
Influence of non-timber collection	No	Reducing forage resources	No
Measures to control eco-tourism and plant collection	Community regulations	Tax, Community regulations	Community regulations

4. Pastoral economy and marketing

Local herder's view on pastoral economy and marketing systems



Items	Dhunche VDCs	Gatlang VDCs	Langtang VDCs
Major limits for pastoral production	Poor herd management, animal malnutrition	Animal malnutrition	Animal malnutrition
Measures to improve pastoral productions	Consulting Professional	Consulting Professional	Consulting Professional
Primary trading for pastoral products	Local markets, contracted companies	Middle man, retailer	Middle man, goods exchanging
Problems in pastoral marketing	-	No markets	Unstable marketing, poor marketing information
Possible solutions to marketing problems	Public support	Public support, institution cooperation	Public support, multi-market development
Other incomes besides pastoralism	Cash crop, vegetables	Sometimes non-timber collection	Rangeland eco-tourism
Major use of additional incomes	Subsiding pastoral production	Subsiding pastoral production	Subsiding pastoral production
Solutions to improve pastoral economy	More public supports	Multi-market development	Market institution development

5. Rangeland tenure and ownership

Local herders' views on land tenure and ownership

Items	Dhunchhe VDCs	Gatlang VDCs	Langtang VDCs
Ownership of rangeland	Public/government	Public/government	Public/government
Major rangeland decision-maker	Government officials, community committee	Sometimes community committee	Community committee
Way of sharing public pastures within community	Self negotiating	Self negotiating, guided by community committee	Guided by community committee
Conflicts at sharing pastures within community	Sometimes	Sometimes	Never
Litigation of community conflict at sharing pastures	Self negotiation	Self negotiation	Self negotiation
Attitude to other community sharing public pastures	Accepted with agreement	Accepted with agreement	Accepted with agreement
Agreements of rangeland sharing with outside community	Free use as friendship	Oral/documente statement, free use as friendship	Mostly Oral/documente statement
Communal forestry grazing	Yes	Yes	Mostly no
Ownership of communal forestry	Other community	Own community	Other community
Communal forestry management and livestock	No	No	No


6. Rangeland policy and Institution

Local herders' views on rangeland institution and policy

Items	Dhunche VDCs	Gatlang VDCs	Langtang VDCs
Have national rangeland policies heard	No	No	Mostly no
Effectiveness of policies in sustaining rangeland	Effective	Effective	Effective
Necessity of policies in sustaining rangeland	Necessary	Necessary	Necessary
Herders' involvement in rangeland policy-making	Never	Sometimes	Never
Policy makers' attitude at herders' suggestions	Ignoring	Sometimes accepting	Ignoring
Your suggestion to better rangeland policymaking	Full involvement and Knowledge sharing of different stakeholders	Full involvement and Knowledge sharing of different stakeholders	Full involvement and Knowledge sharing of different stakeholders
Herders' involvement in research and development	Sometimes	Sometimes	Never
Satisfaction with these involvements	Half satisfied	Half satisfied	Unsatisfied
Suggestion to improve rangeland institutions	More practical research and extension	More involvement of different stakeholders, More practical research and extension	More involvement of different stakeholders, More practical research and extension
Herders' involvement in training programs	Sometimes	Rare	Seldom
Training programs needed	Animal feeding, grazing management, fodder production and conservation	Animal feeding, animal health care, fodder production and conservation	Grazing management, animal health care, fodder production and conservation
Availability of public services	Sometimes available	Sometimes available	Mostly available
Public services from government or institutions	Technology transfer, financial subsidies, trainings	Technology transfer, financial subsidies, trainings	Technology transfer, financial subsidies, trainings
Involvement of NGOs in rangeland development	Sometimes	Never	Never

7. Changes in Rangeland Management

Local herders' views on changes in rangeland management in past 10 years



Items	Dhunche VDCs	Gatlang VDCs	Langtang VDCs
Changes of rangeland conditions	Deteriorated	Deteriorated	Deteriorated or no change
Changes in grazing practices	From grazing to stall feeding or no change	No change	No change
Driving forces for grazing practices change	Self decision	-	-
Changes in rangeland improvement and production	Half no, half yes	No	No
Driving forces for rangeland improvement change	Changes in state planning and policy or self decision		
Changes in rangeland conservation and development	Mostly increased pastoral production	Increased pastoral production or no change	Increased eco-tourism
Driving forces for rangeland conservation and development changes	National/regional planning and policy change, national economic development	National/regional planning and policy change, national economic development	National/regional planning and policy change, national economic development
Changes in pastoral economy and marketing	Developed pastoral economy but deteriorated marketing system, or no change	Developed pastoral economy but deteriorated marketing system, or no change	Mostly deteriorated pastoral economy but improved marketing system
Major causes for pastoral economy and marketing changes	Changes in national/regional planning and policy or unknown	Changes in national/regional planning and policy	Changes in community planning and management strategies
Changes in land tenure and ownership	No	No	No
Changes in rangeland management	Mostly no	No	No

II. Professionals' perspectives

1. Constraints and opportunities in rangeland management

Professional' views on indigenous rangeland management practices

Items	Percent of professionals' response at different importance order								
	I			II			III		
	D	C	O	D	C	O	D	C	O
Limits for improving grazing management									
Lack of public/government support	53.9	60	57.1	7.7	26.7	17.9	15.4	13.3	14.3
Inadequate institutional cooperation	7.7	13.3	10.7	53.9	26.7	39.3	23.1	53.3	39.3
Ignoring indigenous knowledge	23.1	13.3	17.9	7.7	0	21.4	38.5	6.7	21.4
Illiteracy and poor infrastructure	15.4	13.3	14.3	30.8	26.7	10.7	15.4	6.7	10.7
Others	0	6.7	3.6	0	13.3	0	0	0	0
Ways to improve grazing management									
Increasing policy support	53.9	26.7	39.3	7.7	20	14.3	15.4	20	17.9
Strengthening institutional cooperation	0	13.3	7.1	53.8	33.3	42.9	30.8	46.7	39.3
Integrating indigenous knowledge	23.1	46.7	35.7	7.7	13.3	10.7	46.2	6.7	25
Mitigating illiteracy and improving infrastructure	23.1	13.3	17.9	23.1	26.7	25	0	13.3	7.1
Others	0	6.7	3.6	0	6.7	7.1	0	0	0
Major limits in rangeland improvement									
Inadequate public/government support	15.4	46.7	32.1	38.5	33.3	35.7	15.4	6.7	10.7
Inadequate institutional cooperation	23.1	20	21.4	15.4	46.7	32.1	15.4	20	17.9
Ignoring indigenous knowledge	23.1	13.3	17.9	0	13.3	7.1	23.1	33.3	28.9
Illiteracy and poor infrastructure	30.8	20	25	15.4	0	7.1	15.4	26.7	21.4
Others	7.7	6.7	7.1	7.7	0	3.6	0	0	0
Ways to improve rangeland improvement									
Increasing public support	30.8	26.7	28.6	23.1	26.7	25	7.7	20	14.3
Strengthening institutional cooperation	23.1	26.7	25	7.7	40	25	23.1	20	21.4
Integrating indigenous knowledge	23.1	26.7	25	7.7	13.3	10.7	15.4	26.7	21.4
Mitigating illiteracy and improving infrastructure	15.4	6.7	10.7	23.1	6.7	14.3	15.4	20	17.9
Others	7.7	13.3	10.7	0	0	0	0	0	0

Note: Importance order: I, most important; II, moderately important; III, important

Professional' views on indigenous rangeland management practices (cont)

Items	Percent of professionals' response at importance order								
	I			II			III		
	D	C	O	D	C	O	D	C	O
Limits for rangeland conservation and development									
Poor policy implementation	38.5	53.3	46.4	15.4	33.3	25	7.7	13.3	10.7
Poor planning	23.1	13.3	17.9	7.7	13.3	10.7	15.4	33.3	25
Lack of multi-stakeholders participation	7.7	26.7	17.9	38.5	33.3	35.7	15.4	6.7	10.7
Illiteracy and poor infrastructure	23.1	6.7	14.3	7.7	0	3.6	15.4	13.3	14.3
Others	0	6.7	3.6	0	0	0	7.7	0	3.6
Ways to improve rangeland conservation and development									
Increasing policy support	46.2	33.3	39.3	15.4	53.3	35.7	7.7	13.3	10.7
Strengthening capacity-building	38.5	60	50	30.8	33.3	32.1	23.1	0	10.7
Involving multi-stakeholders	38.5	60	50	30.8	33.3	32.1	23.1	0	10.7
Mitigating illiteracy and improving infrastructure	7.7	0	3.4	23.1	0	10.7	30.8	60	46.4
Others	0	13.3	7.1	0	0	0	0	13.3	7.1
Limits for pastoral economy and marketing development									
Low pastoral production and poor processing	23.1	46.7	35.7	23.1	40	32.1	7.7	0	3.6
Poor policy/government support	46.2	33.3	39.3	23.1	20	21.4	15.4	26.7	21.4
Influence of declined national economy	7.7	0	3.6	0	20	10.7	7.7	26.7	17.9
Poor infrastructure	15.4	20	17.9	15.4	20	17.9	23.1	40	32.1

Note: Importance order: I, most important; II, moderately important; III, important
Interviewees: D, district professionals; S, State professionals; O; overall/average.


2. Public services, rangeland institution and policy development

Problems and solutions on public service and institutional support

Professionals' response at different importance order

Problems	District professionals			State professionals		
	I	II	III	I	II	III
Problems for work efficiency	Low salary	No incentives	Poor group cooperation	No incentives	Poor group cooperation	Low salary
Problems for public support for farmers	Technical transfer	Consultation and demonstration	Policy and planning	Training and education	Subside and income-generation	Technical transfer
Problems in spreading public services	Poor infrastructure	Lack of finance	Illiteracy	Lack of finance	Poor infrastructure	Illiteracy
Solutions to overcome these limitations	Creating financial resources	Capacity-building, multi-stakeholder involvement	More incentive and motivations	Incentive and motivations	Capacity-building, multi-stakeholder involvement	Mitigating illiteracy
Reasons of failure of the projects	Gap between projects and farmers' needs	Poor communication with farmers	Instability and discontinue of the project	Discontinue of the project	Gap between projects and farmers' needs	Poor communication with farmers
Problems in extending research results	Poor infrastructure	Lack of financial support	Shortage of researchers/extensionists	Lack of financial support	Poor infrastructure	Illiteracy, poor communication
Solutions to overcome these problems	More practical projects	More financial resource	Strengthening capacity-building	More practical projects	More resources persons and incentive	More financial resource

Professional' attitude toward institutional development of civil society



Items	District professionals	State professionals
Investigation on farmers before project design	Sometime	Sometime
Importance of farmers' involvement in decision-making	Very important	Very important
Government cooperation with NGOs	Sometime	Sometime
Importance of cooperation with NGOs	Very important	Very important
Policy Efficiency in rangeland development	Mostly effective	Mostly effective
Farmers' involve in decision making	Sometimes	Sometimes
Importance of farmers' involvement in decision making	Very important	Very important
Importance of indigenous knowledge in rangeland management	Very important	Very important
Invitation of farmers to decision making	Often	Often
Importance of NGOs' involvement in decision making	Very important	Very important
Which land tenure would be more efficient in pastoral production	Community	Community
Which land tenure would be more efficient in economic-social development	Community	Community

3. Changes in rangeland management

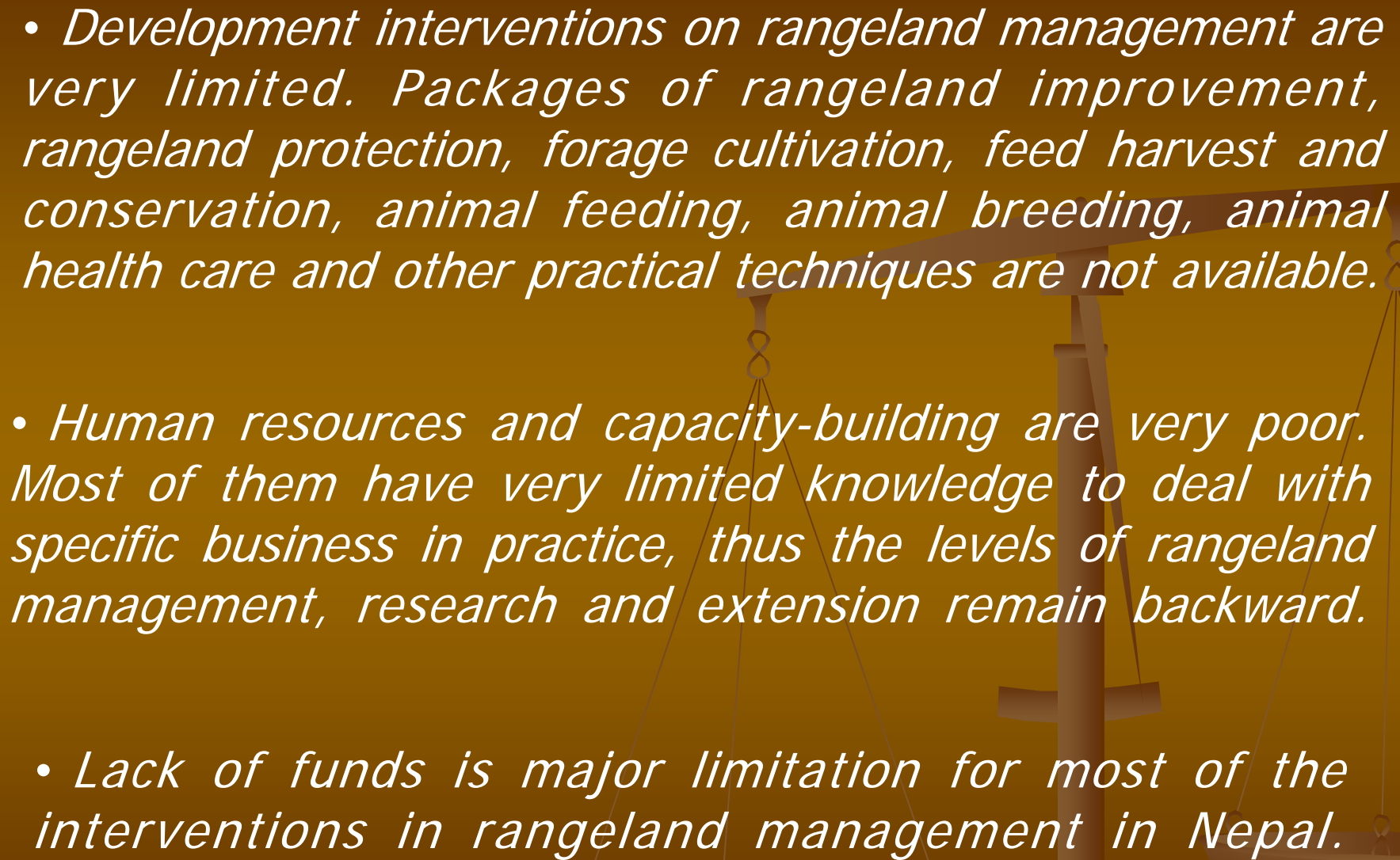
Professionals' views on changes in rangeland management in past 10 years

Items	Professionals' response at different importance order					
	District professionals			State professionals		
	I	II	III	I	II	III
Change in public service and institutional support	More efficient			More efficient		
Driving forces for public, institutional service changes	National/regional policy and planning change	National social-economic development	Global change	National social-economic development	National/regional policy and planning change	Global change
Changes in rangeland policy-making	No significant change			More rangeland policies		
Driving forces for policy-making change				National/regional planning and policy change	Development of NGO and farmer group	Other
Changes in land tenure and ownership	No change			More communal rangeland		
Major causes for land tenure and ownership changes				Changes in management systems	National/regional planning and policy change	Other

III. Other findings from my observation and perception

In addition to poor public service and technical support, policy and regulations scarcity, poor institutional development and governance, other limitations are should be stressed

- *marginalization of pastoralists living in remote, isolated mountainous areas, i.e., poor access to media, outside policy-maker and professionals is a serious problem which hinders the sustainable rangeland development in Nepal.*
- *Basic researches or surveys are too weak. Database of rangeland size, rangeland type, rangeland primary productivity, feeds (forage, fodder, crop residues, concentrates) availability and seasonality, forage species and feeding values, rangeland condition, livestock number and composition, livestock productivity, animal nutrition are blank.*

- 
- *Development interventions on rangeland management are very limited. Packages of rangeland improvement, rangeland protection, forage cultivation, feed harvest and conservation, animal feeding, animal breeding, animal health care and other practical techniques are not available.*
 - *Human resources and capacity-building are very poor. Most of them have very limited knowledge to deal with specific business in practice, thus the levels of rangeland management, research and extension remain backward.*
 - *Lack of funds is major limitation for most of the interventions in rangeland management in Nepal.*

Recommendation and conclusion

To develop sustainable rangeland management of in Nepal:

First, socioeconomic variables must be recognized in their complex interaction with technical factors in the solutions to rangeland management problems. Such an understanding calls for a multi-disciplinary and holistic approach.

Second, indigenous practices and knowledge of rangeland management adapted by local herders need to be integrated into modern technology transfer and policy/decision making.

Third, interventions of research, development and extension need to be initiated for marginalized pastoralists.

Fourth, institutional development and imposition of organizations of rangeland management need to be stressed.

Fifth, governance reform and policy development need to be formulated through internal and external driving forces.

Sixth, financial resources all interventions and programs in rangeland management need to be created through national and international channels.





Thank you for
your comments and suggestions

