Workshop Report 2017

ICIMOD

FOR MOUNTAINS AND PEOPLE

Development of Research Protocol for Rangeland Use Survey in HKPL

About ICIMOD

The International Centre for Integrated Mountain Development (ICIMOD) is a regional knowledge development and learning centre serving the eight regional member countries of the Hindu Kush Himalaya (HKH) – Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan – based in Kathmandu, Nepal. Globalization and climate change have an increasing influence on the stability of fragile mountain ecosystems and the livelihoods of mountain people. ICIMOD aims to assist mountain people to understand these changes, adapt to them, and make the most of new opportunities, while addressing upstream and downstream issues. ICIMOD supports regional transboundary programmes through partnerships with regional partner institutions, facilitates the exchange of experiences, and serves as a regional knowledge hub. We strengthen networking among regional and global centres of excellence. Overall, we are working to develop economically and environmentally-sound mountain ecosystems to improve the living standards of mountain populations and to sustain vital ecosystem services for the billions of people living downstream – now and in the future.

Workshop Report

Development of Research Protocol for Rangeland Use Survey in HKPL

28–29 April 2016, Kathmandu, Nepal

Disclaimer

This document summarizes the workshop based on the individual presentations, group work.

Note

This publication is available in electronic form at www.icimod.org/himaldoc

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Background

Based on recommendations made by partners in the programme designing workshop organized in December 2015 in Kathmandu, the Hindu Kush Karakoram Pamir Landscape (HKPL) Initiative initiated a regional survey on rangeland resources and use across the landscape in its work plan for 2016. The International Centre for integrated mountain Development (ICIMOD) organized a two-day meeting in Kathmandu from 28 to 29 April 2016 to finalize the survey protocol and work plan with different country partners to ensure that fieldwork carried out with common methodologies and within an agreed plan of action.

The objectives of the survey include:

1. The quantity, quality and spatial-temporal distribution of rangeland resources in the HKPL assessed through a rapid survey.
2. Information on the pattern and dynamics of rangeland uses by domestic animals and wildlife collected.
3. Trend and drivers of change of the rangeland ecosystem in HKPL identified.
4. National and local policies and institutions governing rangeland resources management reviewed.
5. Key areas of rangeland management (for both conservation and development) identified.

The field studies will be carried out by partners in four countries with coordination, technical backup and financial input from ICIMOD.

Workshop objectives

- To reach a common understanding on the objectives, methodologies, and outputs of the survey.
- To work out a work plan for the survey.
- To discuss the financial aspects of the study and letter of agreement (LoA) terms.

Expected workshop outputs

- Rangeland survey protocol finalized.
- Work plan (plan of action with deadlines) and LoA agreed upon.

Workshop Proceedings

The workshop was organized over a two-day period. It was structured more as a discussion forum rather than a platform where presentations are made on specific subjects. The ICIMOD team had prepared some steps and possible approaches that could be adopted for the study. These were presented to the participants on day one and open to suggestions and discussions. Day two was dedicated exclusively to discussions on finalizing the approach for the study and the kind of data that will have to be collected during field survey, to setting deadlines for different tasks, and timelines for completion.

1. Opening Session

Muhammad Ismail, Associate Coordinator, HKPL, ICIMOD

- Welcomed all the participants.
- Rangelands are the most important resources in HKPL.
- Wished that a final protocol for research would be developed by the end of the workshop.

Faizul Bari, Pakistan:

- Appreciated ICIMOD's support for the ongoing activities in Pakistan, particularly the rangeland management policy and capacity building trainings and workshops.
- Very happy to be a part of the workshop and looking forward to the workshop outcome.
- Will start work in Pakistan as soon as possible.

Yang Weikang, Xinjiang Institute of Ecology and Geography, Chinese Academy of Sciences (CAS), China

- CAS has been working in the region along with ICIMOD.
- Looking forward to working in the entire region of Pamir with a holistic ecosystem management and transboundary approach.
- Happy to see something ground breaking is going to happen after many years of discussions.

Munnavar Alidodov, Tajikistan

- Appreciated the first transboundary landscape meeting of HKPL (December 2015) to discuss regional issues.
- Eager to explore the idea of reintroducing the Urial in Tajikistan with collaboration from ICIMOD. Tajikistan partners would be happy to be part of the HKPL initiative and will be working in Zorkul Nature Reserve. Tajikistan partners would like to collaborate with partners in Afghanistan to resolve issues of rangeland resource use amongst wildlife and livestock use. A clear pathway with partners from other regions through a common programme would be useful.

Marc Foggin, University of Central Asia, Tajikistan

- ICIMODs extraordinary work in mountain research, transboundary initiatives, and promoting policies is highly appreciated. HKPL is an opportunity to strengthen collaboration and work in the region.

Long Ruijun, ICIMOD

- Rangelands are major ecosystems in the landscape. We need to use common methodologies across landscapes to come up with complementary studies.

2. Presentations on Proposed Protocols and Discussions

Presentation Title	Presentation Summary	Key Comments, Questions, and Discussion Points
Rangeland Resources	- GIS technologies will be used to map rangeland cover, support site selection, and extract sample site information. - GIS will be used to develop products study results. - Predefined methodologies will be used to collect community data and information on community structure, species composition, life form, forage productivity, rangeland quality and nutrition, carrying capacity, stocking rate, etc.	- It is important that local communities are involved. Their traditional ecological knowledge (TEK) and their rules and institutional management are important for rangeland management. - Is there actual usefulness of life form classification in the Pamir? - Invaders and the ecological succession process shall be considered. Are they related to grazing? - How shall a sampling site be selected? GIS can be used for rangeland classification. Stratified random sampling can be used to decide on a site for field measurement. - Oven-dried and air-dried samples are both important. - Data on shrubs and small trees not just herbs shall also be collected, but they are missing from the presentation. (Methodology should be clear for collecting information on shrubs and small trees.) - Field sampling study should be coordinated with remote sensing (RS) study; ground work to be determined after GIS. - Do we monitor all species or just look at the dominant species? Especially looking at the resource constraint and the study objectives: - Identifying 4-5 key indicator species will be enough; - We need to look at the biomass and productivity and palatability. If we only use coverage and productivity to determine dominant species, we may find that some unpalatable species can give high production. - Structural stratification (difficult to do from a RS aspect)
Rangeland Utilization	- Information on contribution of rangeland use to household economy will be collected through a case study using household interview. - Data on major pastures and seasonal use of the pastures by local communities will be collected through participatory mapping and using geospatial technologies, group discussions, key informant interview and field observation. - Data and information on wildlife use of rangelands will be collected through participatory mapping, focused discussions, and key informant interview.	- It is not a wildlife inventory. It is a rapid survey or a participatory mapping of the presence of wildlife and their use of rangelands resources across the lands, making existing experts knowledge and local information; - The study on the contribution of rangeland use to household economy is more a case study, not an overall survey of the whole landscape; - For wildlife we can do it valley focused but for livestock we need to do in the larger area; - Using RS and GIS, we can produce information on rangeland area, develop maps showing major classification-vegetation or bio-climatic type and produce one with associated species (using ecologists); - Partners can already consult the existing literature on the resources specific to the site. For social interviews-demographic data; look at the family details; - We need to get information as to what kind of expectation local communities have and what do they plan to do in future; - We need to understand the future trends of socioeconomic conditions; - Look at the family network to see the influence; - It is a quick appraisal of the resources; not an in-depth ecological or social exploration; - Constrained by resources , we can't aim very high but need to produce meaningful results; - Afghanistan not invited-they have already generated such studies; will update their information that can be used by us to get a more TL; - Use Google Earth to help mapping, but at a specific scale so that we all get similar information.

Trends of Changes and Geospatial Support	Geospatial technologies can be used to develop maps on vegetation type and biomass, rangelands productivity and degradation, and spatial interaction between pastoralists and rangeland resources. It can also be used to identify sampling sites for field studies and integrate that data to produce maps, and for mapping resource utilization—livestock and wildlife—using participatory tools.	• Wildlife maps- community/ local institutions identify the habitat use area of the wildlife. From the bigger polygons, smaller polygons will be selected using threshold values. • Use recent datasets to map the resources; • While designing the study, discuss with people with a technical background, subject specialists; • We can develop maps without going to field, who has the resources to develop the map and provide it to our partners for further use in the field assessment; • RS and GIS can be used to produce the most information without going to the field; • ICIMOD will develop working maps and partners can have a look and see the degree of accuracy and then decide with technical staff on what else can be done and what we can use this map for; • Decide on what we should do? should we do extensive study or intensive study-to develop a model for pasture management
Institutions/Policies	There are international, regional, national, and local institutions and regulations that help govern and manage these resources. Review existing policies and documents that are relevant to rangeland use and management. Some work has already been done, but now need to look into policies and strategies, particularly for Tajikistan, provincial policies, and customary institutions for all countries.	
Overall Discussions and Clarifications	• Discussions on ecology, rangeland resource, etc. What ground work is required to implement and execute this study? • Where can this study be done? • How to improve these questionnaires? • What field measurements should be taken? • What steps should be taken from here to the field? • To what extent can GIS aid in meeting the objectives? What kind of field work will be required for added information? • Need to segregate socio-economic data collection and natural resource data (including GIS).	

3. Key Questions, Data/Information Needed, and Fieldwork Methodologies

Subjects	What data/information are needed?	Field measurement design needed
1. Range resources	- Rangeland area, types, and geographical distribution - Key seasonal pastures - Cover of rangelands - Productivity and temporospatial distribution - Rangeland carrying capacity - Decadal changes in rangelands type and cover - Climate data over the years/future climatic scenarios - Landuse - Hydrology - Climatic data - Community features of rangelands - Utilization (stocking+carrying capacity) - Soil moisture, nutrient	- Geospatial technologies (for mapping, trend and scenario analysis) - Field survey using transects sampling/ quadrat survey, etc.) for height, cover, species composition, biomass, productivity and basal cover, foliar cover - Lab analysis for soil properties, and fodder productivity and nutrients. - Field observation - Secondary information collection;
2. Resources utilization	- Major users of rangeland resources (herders from local and outside areas, protection management, mining companies, etc) - Key stakeholders in rangeland use and management - Demographic data of the survey area and the surveyed community(ies) - Socioeconomic data: education, medical service infrastructure, social service, out-migration of the villages - Accessibility to roads, markets, electricity, medical service, agricultural input, schools, clinics, drinking water, internet - Gender role in rangeland use and trends of changes - Area of rangelands each village can have access to (owned land, rented land, communal land, and open access) - Number and type of livestock owned by each household - Changes in livestock management: objectives, types, and number of domestic animals and feeding techniques - Livestock management patterns(nomadic, semi-nomadic or sedentary) - Fodder/forage sources: percentage from natural and cultivated/ purchased fodder - Number and location of pastures - Total livestock number in each pasture at different seasons - Number of animals from local communities using each pasture - Number of animals from external communities using each pasture and their migration routes - Route of seasonal migration for each village or household group - Pasture availability in each villages - Winter fodder demand and supply - Amount of fuelwood, medicinal plants, hay, and other material collected by households from rangelands each year; time of collection and information on who collected them - Converted market-value of non-grazing rangeland products consumed by each household - Realized market value of non-grazing rangeland products for each household	- Secondary data/ document; - Field observation; - Field survey with questionnaires - Participatory resources GIS mapping; - Focused group discussions - Key informant meetings;

Subjects	What data/information are needed?	Field measurement design needed
	• Market and non-market value of livestock management to household economy; • Total incomes of households, including subsidies from governments and non-government agencies • Key distribution area of wildlife by species • Key habitats and fodder sources for wildlife by species • Key corridor for wildlife by species • Number and type of wildlife in key habitat areas (pastures) and their length of use • Wildlife migration routes • Livestock-wildlife conflict areas • Key issues faced by PA management; • key issues faced by local communities in terms of wildlife • Herders' perspectives on problems and issues facing livestock management and rangeland management • Government support/programmes for herders • Herders' perspectives on changing environments • Traditional knowledge in rangeland use • Market linkages	
3. Resources governance/ policies	Policies and strategies related to rangeland resources use and the government at all levels; customary setup at the community level • Tajikistan – National and provincial level policies, legislations, etc • For China – Provincial and prefecture level policies • For Afghanistan – Provincial level policies • All countries: Study of customary institutions • 5. All countries: Review of appropriateness of existing policies	• Literature review • Group discussions • Key informants interview • FGD/KII/Questionnaire • Horizontal policy analysis

See Annex for details.

4. Timeline and Responsibilities

Subjects	What data/information are needed?	Field measurement design needed
1. Range resources	• Rangeland area, types, and geographical distribution • Key seasonal pastures • Cover of rangelands • Productivity and temporospatial distribution • Rangeland carrying capacity • Decadal changes in rangelands type and cover • Climate data over the years/future climatic scenarios • Landuse • Hydrology • Climatic data • Community features of rangelands • Utilization (stocking+carrying capacity) • Soil moisture, nutrient	• Geospatial technologies (for mapping, trend and scenario analysis) • Field survey using transects sampling/ quadrat survey, etc.) for height, cover, species composition, biomass, productivity and basal cover, foliar cover • Lab analysis for soil properties, and fodder productivity and nutrients. • Field observation • Secondary information collection;
2. Resources utilization	• Major users of rangeland resources (herders from local and outside areas, protection management, mining companies, etc) • Key stakeholders in rangeland use and management • Demographic data of the survey area and the surveyed community(ies) • Socioeconomic data: education, medical service infrastructure, social service, out-migration of the villages • Accessibility to roads, markets, electricity, medical service, agricultural input, schools, clinics, drinking water, internet • Gender role in rangeland use and trends of changes • Area of rangelands each village can have access to (owned land, rented land, communal land, and open access) • Number and type of livestock owned by each household • Changes in livestock management: objectives, types, and number of domestic animals and feeding techniques • Livestock management patterns(nomadic, semi-nomadic or sedentary) • Fodder/forage sources: percentage from natural and cultivated/ purchased fodder • Number and location of pastures • Total livestock number in each pasture at different seasons • Number of animals from local communities using each pasture • Number of animals from external communities using each pasture and their migration routes • Route of seasonal migration for each village or household group • Pasture availability in each villages • Winter fodder demand and supply • Amount of fuelwood, medicinal plants, hay, and other material collected by households from rangelands each year; time of collection and information on who collected them • Converted market-value of non-grazing rangeland products consumed by each household	• Secondary data/ document; • Field observation; • Field survey with questionnaires • Participatory resources GIS mapping; • Focused group discussions • Key informant meetings;

Subjects	What data/information are needed?	Field measurement design needed
	• Realized market value of non-grazing rangeland products for each household • Market and non-market value of livestock management to household economy; • Total incomes of households, including subsidies from governments and non-government agencies • Key distribution area of wildlife by species • Key habitats and fodder sources for wildlife by species • Key corridor for wildlife by species • Number and type of wildlife in key habitat areas (pastures) and their length of use • Wildlife migration routes • Livestock-wildlife conflict areas • Key issues faced by PA management; • key issues faced by local communities in terms of wildlife • Herders' perspectives on problems and issues facing livestock management and rangeland management • Government support/programmes for herders • Herders' perspectives on changing environments • Traditional knowledge in rangeland use • Market linkages	
3. Resources governance/ policies	Policies and strategies related to rangeland resources use and the government at all levels; customary setup at the community level • Tajikistan – National and provincial level policies, legislations, etc • For China – Provincial and prefecture level policies • For Afghanistan – Provincial level policies • All countries: Study of customary institutions • 5. All countries: Review of appropriateness of existing policies	• Literature review • Group discussions • Key informants interview • FGD/KII/Questionnaire • Horizontal policy analysis

5. Closing Session

During the closing session, Wu Ning thanked participants for their active participation. He said that the workshop had achieved its set objective of finalizing the survey protocol and work plan for rangeland survey with the partners for fieldwork. Representatives from HKPL member countries were grateful that the workshop had been organized and gave their overall impression regarding the outcome of the workshop. Muhammad Ismail thanked the participants for making the two-day event a success through their participation and dedicated effort.

Annexes

Annex 1: **Workshop Agenda**

27 April 2016: Arrival of Participants at Patleban Hotel	
28 April 2016 (Facilitator: Muhammad Ismail)	
08:30-09:00	Registration
09:00-09:15	Introduction of Participants
09:15-09:25	Opening remarks(ICIMOD & partners)
09:25-09:50	Workshop background/objectives/Principles(Yi Shaoliang)
09:50-10:10	Tea Break/Group Photo
Technical Session 1	Presentation of Proposed Protocol (25 minutes presentation and 25-35 minutes questions) (Dr. Long Ruijun)
10:10-11:00	1. Rangeland Resources (Wang Jinniu/Srijana Joshi)
11:00-12:00	2. Rangeland Utilization (Yi Shaoliang/Neha Bisht)
12:00-13:30	Lunch
13:30-14:30	3. Trends of Changes & Geospatial support(Faisal)
14:30-15:00	4. Institution/Policies (Karma Phunsho+Yi Shaoliang)-15 +15 minutes
15:00-15:20	Tea Break
15:20-16:00	5. ICIMOD Rangeland Monitoring Guidebook(Wang Jinniu)
16:00-17:00	Open Discussions & Clarifications(Muhammad Ismail)
17:00-17:30	Summary and Grouping for Next Day(Yi Shaoliang)
18:30-20:30	Dinner and Activities
29 April 2016	
09:00-09:20	Recapturing of Day 1/Briefing on the Agenda of the Day(Yi Shaoliang)
09:30-11:00	Group work (in 4 Groups) on protocol finalization/improvement
11:00-11:20	Tea Break
11:20-12:20	Group Presentation (2 groups)(Muhammad Ismail)
12:20-13:30	Lunch
13:30-14:10	Group Presentation and Discussions(2 groups) (Muhammad Ismail)
14:10-14:30	Work Plan & LoA(Yi Shaoliang)
14:30-16:00	Group work on work plans & presentations
16:00-16:10	TEABREAK
16:10-16:40	Next Steps & Closing Session(Muhammad Ismail)
17:00	ICIMOD staff leaving for Valley
30 April 2016: Participants from RMC leaving for home	

Annex 2: **Participants List**

China	
1.	Professor Yang Weikang Xinjiang Institute of Ecology and Geography, Chinese Academy of Sciences Urumqi, Xinjiang, China Tel.: 0086-991-7885358 Fax.: 0086-991-7885320 Email: yangwk@ms.xjb.ac.cn
2.	Dr Zhang Chi Professor, Xinjiang Institute of Ecology and Geography, Chinese Academy of Sciences, South Beijing Road, No.818, Urumqi, Xinjiang, 830011 P.R.China Email: zc@ms.xjb.ac.cn
Tajikistan	
3.	Dr Marc Foggin, Associate Director, Mountain Societies Research Institute University of Central Asia 138 Toktogul Street 720001, Bishkek, Kyrgyz Republic Bishkek, Kyrgyzstan Email: marc.foggin@ucentralasia.org
4.	Mr. Munavvar Alidodov Director, Community-based Conservancy of "Yoquti Darshay" 2 Azizbek Street, 736000, Khorog, GBAO, Tajikistan Phone : +992 93 538 9183 Email: tung_72@mail.ru
5.	Mr Qobiljon Shokirov PhD Candidate, Tajikistan, Human Geography Unit, Dept. of Geography University of Zurich - Irchel, Winterthurerstr. 190 CH-8057 Zurich, Switzerland Email: qobiljon.shokirov@geo.uzh.ch
Pakistan	
6.	Dr Faizul Bari Ex-conservator Forest KPK Government of Pakistan Email: faizulbari12@gmail.com
7.	Mr Ajaz Ahmed District In-charge, Non-Timber Forest Products Directorate of Non-Timber Forest products ISU KP Forest Department, Secretariat Road , Irrigation Building, Chitral 17200 Email: ajaz.ntfp@hotmail.com
8.	Mr Muhammad Essa SDFO, Forest Wildlife & Parks Dept. GB Government of Pakistan Email: essaglt@hotmail.com
9.	Dr Zafeer Saqib (HEC Approved Supervisor) Assistant Professor, Ph.D (Q.A.U) Specialization: GIS, Ecology Email: zafeer@iiu.edu.pk; Zafeersaqib@yahoo.com

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11.	Dr Long Ruijun Senior Ecologist, Ecosystem Services Theme Email: ruijun.long@icimod.org
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13.	Yi Shaoliang Sr. Natural Resource Management Specialist Email: yi.shaoliang@icimod.org
14.	Qamer Faisal Mueen Remote Sensing Specialist Email: faisal.qamer@icimod.org
15.	Wang Jinniu Ecosystem Analyst/CAS Professional Programme Email: wang.jinniu@icimod.org
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21	Dr. Kamala Gurung Gender and Natural Resource Management Specialist Kamala.Gurung@icimod.org

Annex 3: Summary Table for Range Use Survey

Subjects	Key Questions to be answered by the survey	What data/information shall be collected?	What can GIS generate?	What need to be measured from the field	Field measurement design/methodology)
1. Range resources	1. What is the total rangeland area in HKPL working area? 2. What types of rangelands (by seasonal uses, vegetative types, and dominant species) and their respective area in the HKPL? 3. What are the productivity (total biomass, and fodder productivity) of different rangeland types? 4. Where are the key seasonal pastures of the communities in the HKPL? 5. Where are the areas with good fodder productivity and areas with severe degradation? 6. What are the trends of changes over the past three decades? 7. What are the future scenarios?	Rangeland area, types and geographical distribution Key seasonal pastures; Cover of rangelands; productivity and tempo-spatial distribution; Rangeland carrying capacity Decadal changes in rangelands types and cover; Climate data over the years/Future climatic scenarios Landuse; Hydrology Climatic data; Community features of Rangelands; Utilization (Stocking + Carrying capacity) Soil moisture, nutrient	**Without field work** Land use maps; Hydrology maps; Administrative borders; Eco-regions; Climate modelling and downscaling; **With fieldwork on the right column** Vegetation map; Maps on pasture types and uses	1. Foliar cover & Basal cover 2. Species composition 3. Biomass /air dried & oven dried (dominant species and community) 4. Soil property (SWC, SOM, total N&P) 5. Height (dominant species and community) 6. Forage palatability 7. Stocking rate Carrying capacity	Geospatial technologies (for mapping, trend and scenario analysis) Field survey using transects sampling/ quadrat survey, etc.) for height, cover, species composition, biomass, productivity and basal cover, foliar cover Lab analysis for soil properties, and fodder productivity and nutrients. Field observation Secondary information collection;
2. Resources utilization	1. What are the key direct services and goods people get from rangelands? 2. What are the people and animals using the rangeland resources? 3. What is the seasonal pattern of pasture usage by domestic animals? 4. What is the grazing intensity/stocking rates on seasonal pastures? 5. What is the importance of pastoralism to households? 6. What is the pattern of seasonal use of rangeland resources by the wildlife? 7. Where are the key areas (habitats and corridors) of importance for wildlife? 8. What and where are the conflicts between wildlife and domestic animals? 9. What are the trends of change in pasture uses over the years? 10. What are the gaps and management recommendations?	**Rangeland Utilization** - major users of rangeland resources (herders from local and outside, protection management, mining companies, etc.) - key stakeholders in rangeland use and management - demographic data of the survey area and the surveyed community(ies); - socioeconomic data: education, medical service, infrastructure, social service, out-migration, etc of the villages; - accessibility to roads, markets, clinics, drinking water, internet, etc. agricultural inputs, schools, clinics, drinking water, internet, etc. - gender role in rangeland use and trends of changes; - area of rangelands each village can have access (owns, rents, communal lands and open access) - #&type of livestock owned by each households; - changes in livestock management: objectives, types and no. of domestic animals and feeding techniques; - livestock management patterns(nomadic, semi-nomadic or sedentary) - fodder/forage sources: percentage from natural and cultivated/ purchased fodder; - no. and location of pastures; - total livestock no. in each pastures at different seasons - no. of animals from local communities using each pastures - no. of animals from external communities using each pastures and their migration routes - route of seasonal migration for each village or household groups; - pasture availability of each villages; - winter fodder demand and supply;	**Without field work** - working maps of the study area; - Key pasture area **With field work on the right column** - maps of seasonal pastures of the communities; - seasonal use and migration maps - village pasture maps; - wildlife distribution area; - maps of activity areas of wildlife by season and types; - maps of corridors of wildlife migration; - maps on human-wildlife conflicts areas;	- Socioeconomic data of the households and communities; contribution of rangeland use to households economy; - Migration routes; - Seasonal pastures and their uses; - Wildlife habitats and corridors; - Pastures of each villages; - Wildlife distribution areas; - Verification of information collected from participatory mapping;	- Secondary data/document; - Field observation; - Field survey with questionnaires - Participatory resources GIS mapping; - Focused group discussions - Key informant meetings;

Subjects	Key Questions to be answered by the survey	What data/information shall be collected?	What can GIS generate?	What need to be measured from the field	Field measurement design/methodology
		Contribution of Rangeland Use to Household Economy - amount of fuelwood, medicinal plants, hay, and others collected by households from the rangelands each year and time of collection, by whom - converted market-value of non-grazing rangeland products consumed by each household; - realized market value of non-grazing rangeland products for each households; - market and non-market value of livestock management to household economy; - total incomes of households, including subsidies from governments and non-government agencies; **Wildlife Utilization** - key distribution area of wildlife by species; - key habitats and fodder sources for wildlife by species; - key corridor for wildlife by species; - no. and type of wildlife in key habitat areas (pastures) and their length of use - wildlife migration routes; - boundaries of protected areas as perceived by pastoral communities; - boundaries of protected areas as perceived by PA staff; Key Issues Faced by Local Communities in Rangeland Use - Livestock-wildlife conflict areas; - key issues faced by PA management; - key issues faced by local communities in terms of wildlife - herders perspectives on problems and issues facing livestock management and rangeland management; - government support/programmes to herders - herders perspectives on changing environments; - traditional knowledge in rangeland use - market linkages - opportunities for rangeland use & management;			
3. Resources governance/ policies	1. What are the policies and statutory legal framework governing rangelands resources management in the respective area? 2. What are the functioning customary institutions governing resources management at community level? 3. What are the key government programmes/strategies on rangeland management being implemented in the area?	- policies and strategies related to rangeland resources uses and government at all levels; - -customary setups at community level			Literature review; Group discussions; Key Informants Interview visit