

Community perceptions and responses to change: Findings from Bhutan, India and Nepal



Media Workshop

18th May, 2011

Dhulikhel, Nepal

International Centre for Integrated Mountain Development

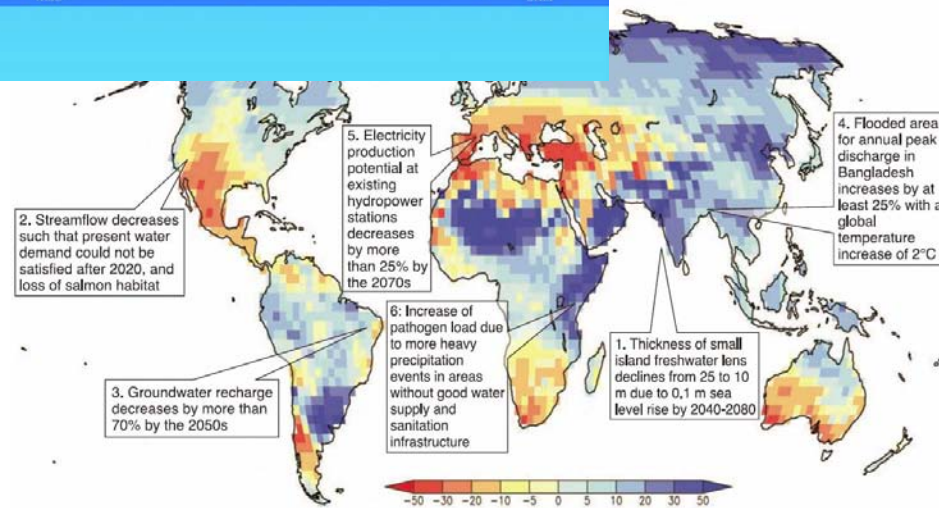
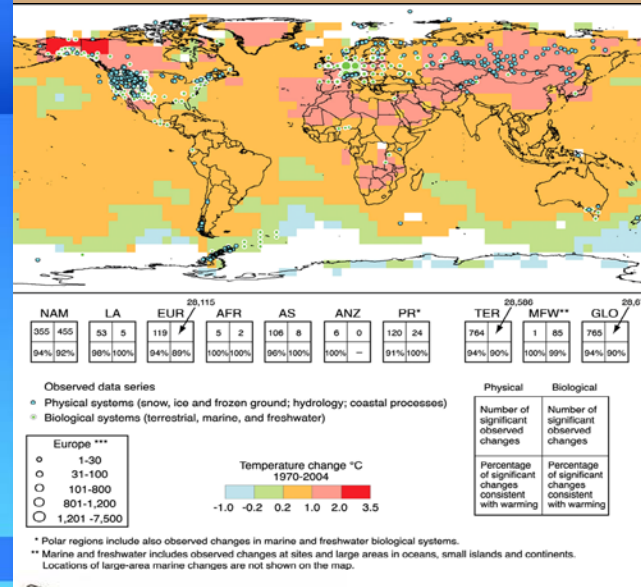
Kathmandu, Nepal

Climate change....

CLIMATE CHANGE 2007 SYNTHESIS REPORT



A Report of the Intergovernmental Panel on Climate Change



What does it mean for the rural poor?

- Is climate change perceived by the rural communities?
- If so, what do they perceive?
- How is it affecting their livelihoods?
- How are they responding?
- What support is required by the poor?
- From whom?



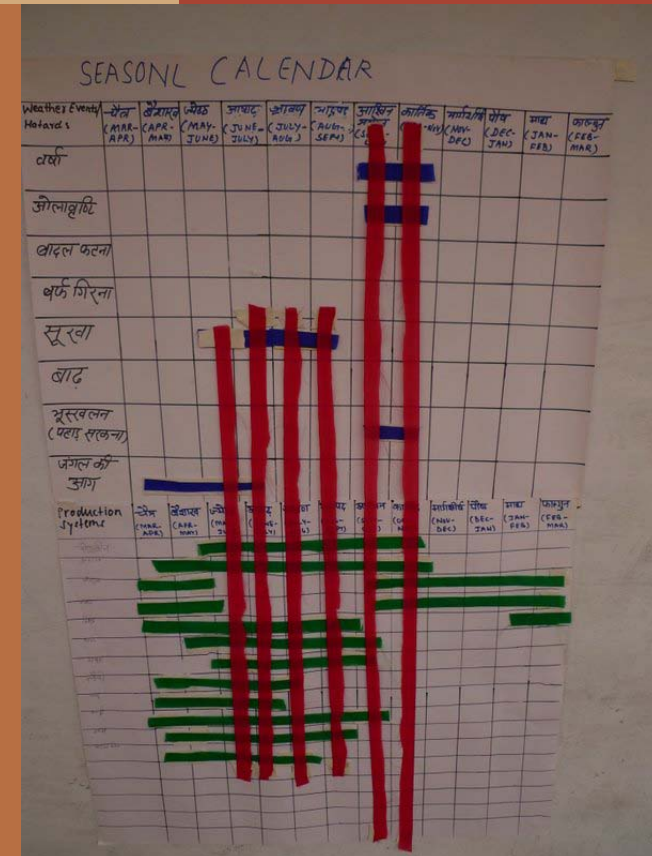
Community perceptions on climate change, impacts and responses : Approach & methodology (How..)

Approach: Participatory Rural Appraisal

- *Based on ICIMOD Strategic Framework on Climate Change Adaptation*
- *Community based Vulnerability and Capacity Assessment Framework*

Methodology

- *PRA Toolkit*
 - o Seasonal Dependency (Support systems, Resource diversity & availability)
 - o Seasonal Calendar (Seasonal activities)
 - o Weather perceptions (Seasonality, duration, change)
 - o Hazard Ranking (Weather & weather induced)
 - o Venn diagram (Institutional dependency)

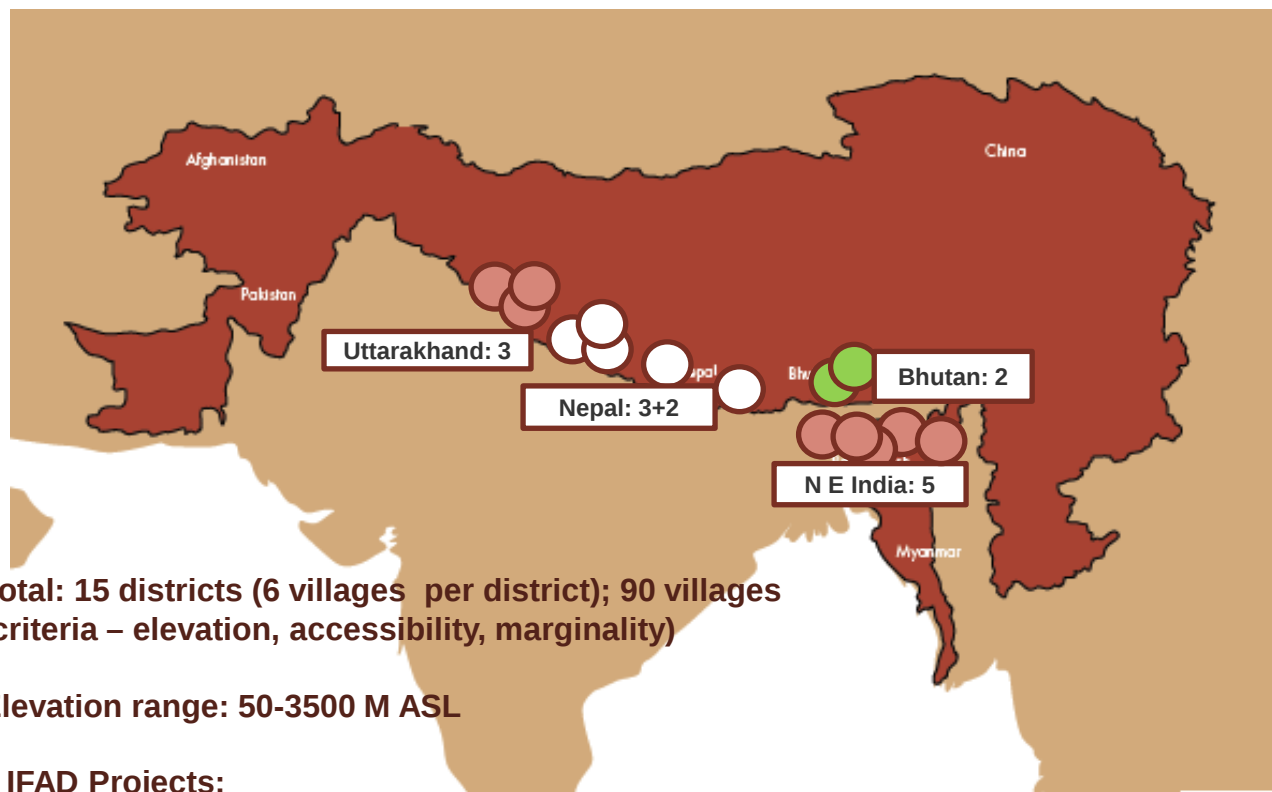


*Participatory interpretation of PRA results :
Impacts, coping/adaptive mechanisms*

Documentations: The canvas....(where and with whom)

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Total: 15 districts (6 villages per district); 90 villages
(criteria – elevation, accessibility, marginality)

Elevation range: 50-3500 M ASL

6 IFAD Projects:

Bhutan: AMEPP

India: Aajeevika, MRDS & NERCORMP

Nepal: WUPAP & LFLP

Survey districts



Bhutan

Pemagatshel

Trashigang



India

Uttarakhand

Almora

Bageshwar

Tehri

NE India

W Garo Hills

E Garo Hills

Ri Bhoi

Karbi Anglong

Ukhrul



Nepal

(Mid-west)

Humla

Bajhang

Dailekh

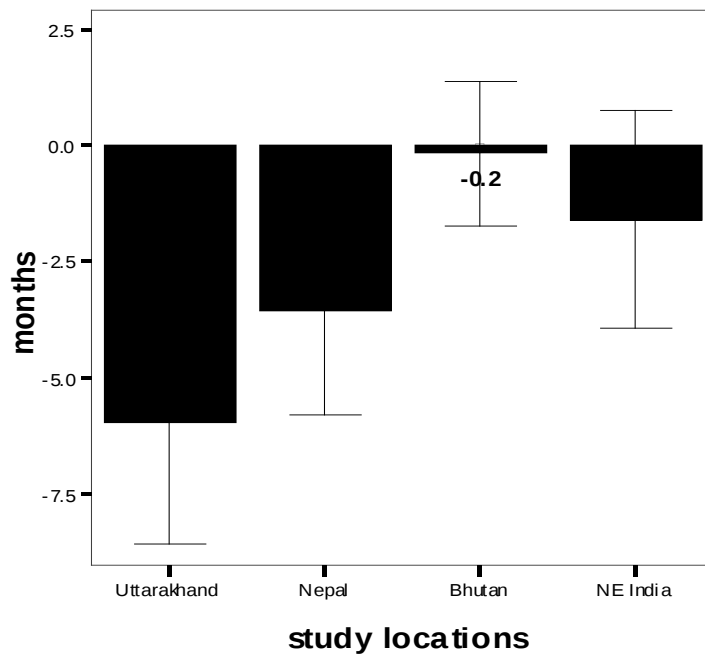
(West & East)

Tanahu

Terathum

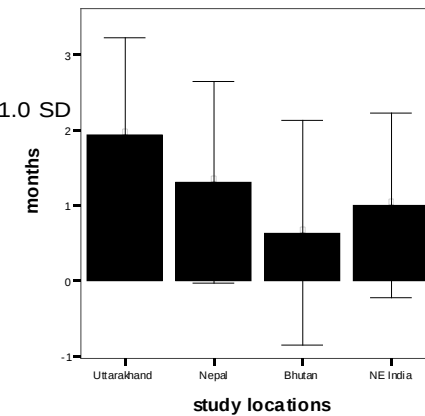
Community perceptions: Rainfall duration (2009 base year)

annual rainfall (duration change)



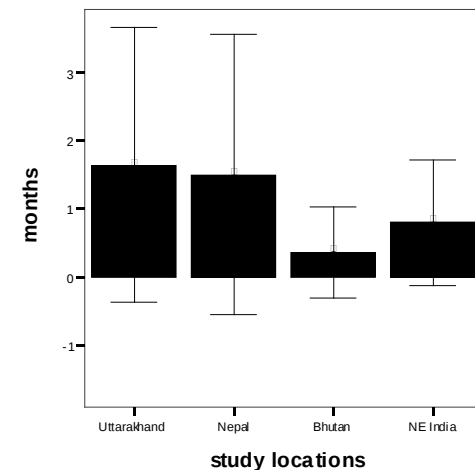
Delayed onset (rainfall)

Error Bars show Mean $\pm$ 1.0 SD
Bars show Means



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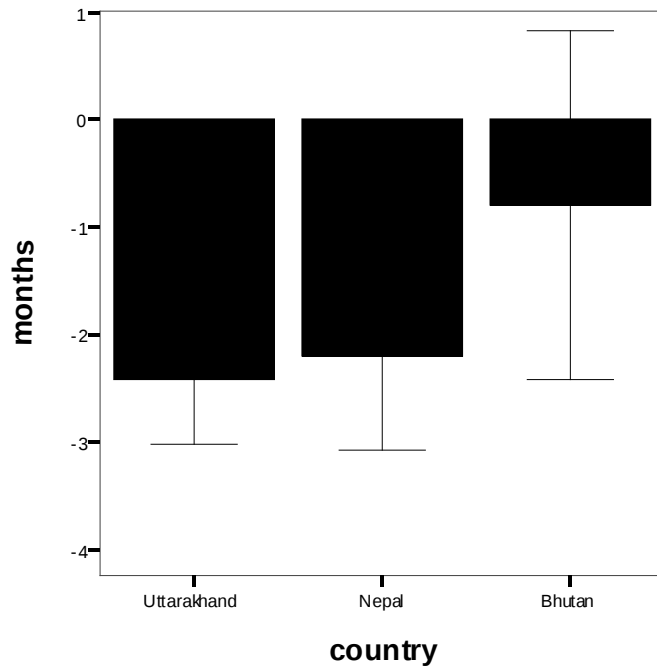
early completion (rainfall)



Error Bars show Mean $\pm$ 1.0 SD
Bars show Means

Community perceptions: Snowfall duration (2009 base year)

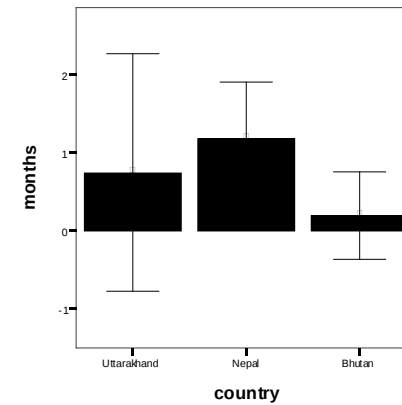
duration change (snowfall)



Error Bars show 95.0% CI of Mean

Bars show Means

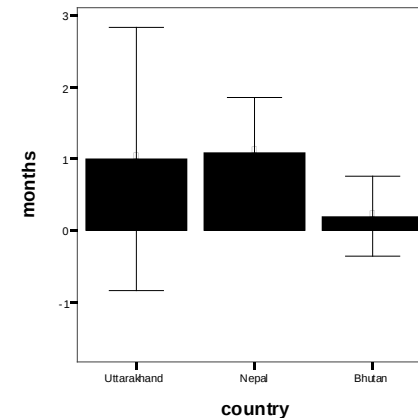
delayed onset (snowfall)



Error Bars show 95.0% CI of Mean

Bars show Means

Early completion (snowfall)

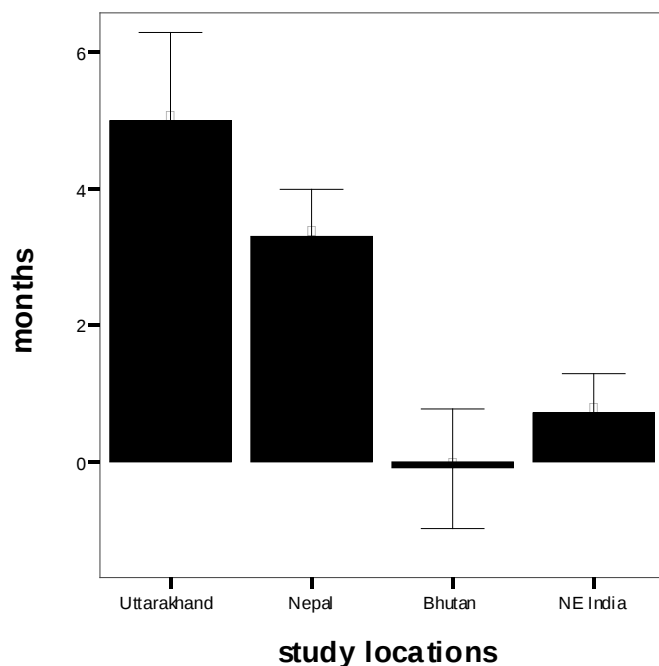


Error Bars show 95.0% CI of Mean

Bars show Means

Community perceptions: Dry spells (duration) (2009 base year)

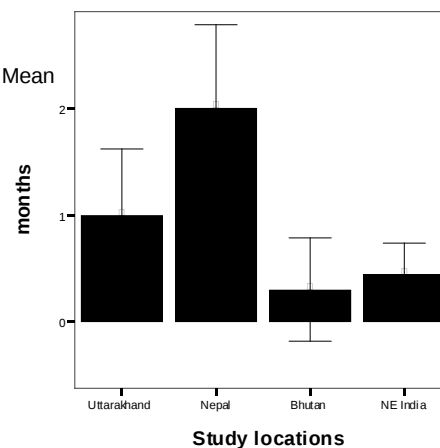
Dryspell (duration change)



Error Bars show 95.0% CI of Mean

Bars show Means

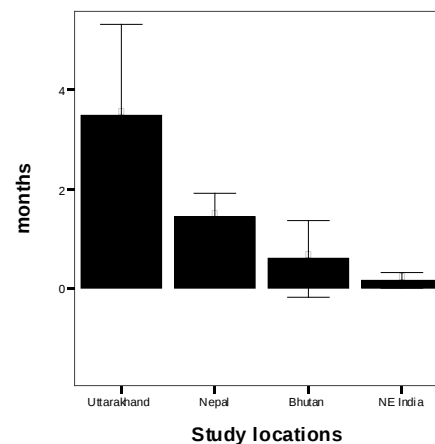
early onset (dryspell)



Error Bars show 95.0% CI of Mean

Bars show Means

extended completion (dryspell)



Error Bars show 95.0% CI of Mean

Bars show Means

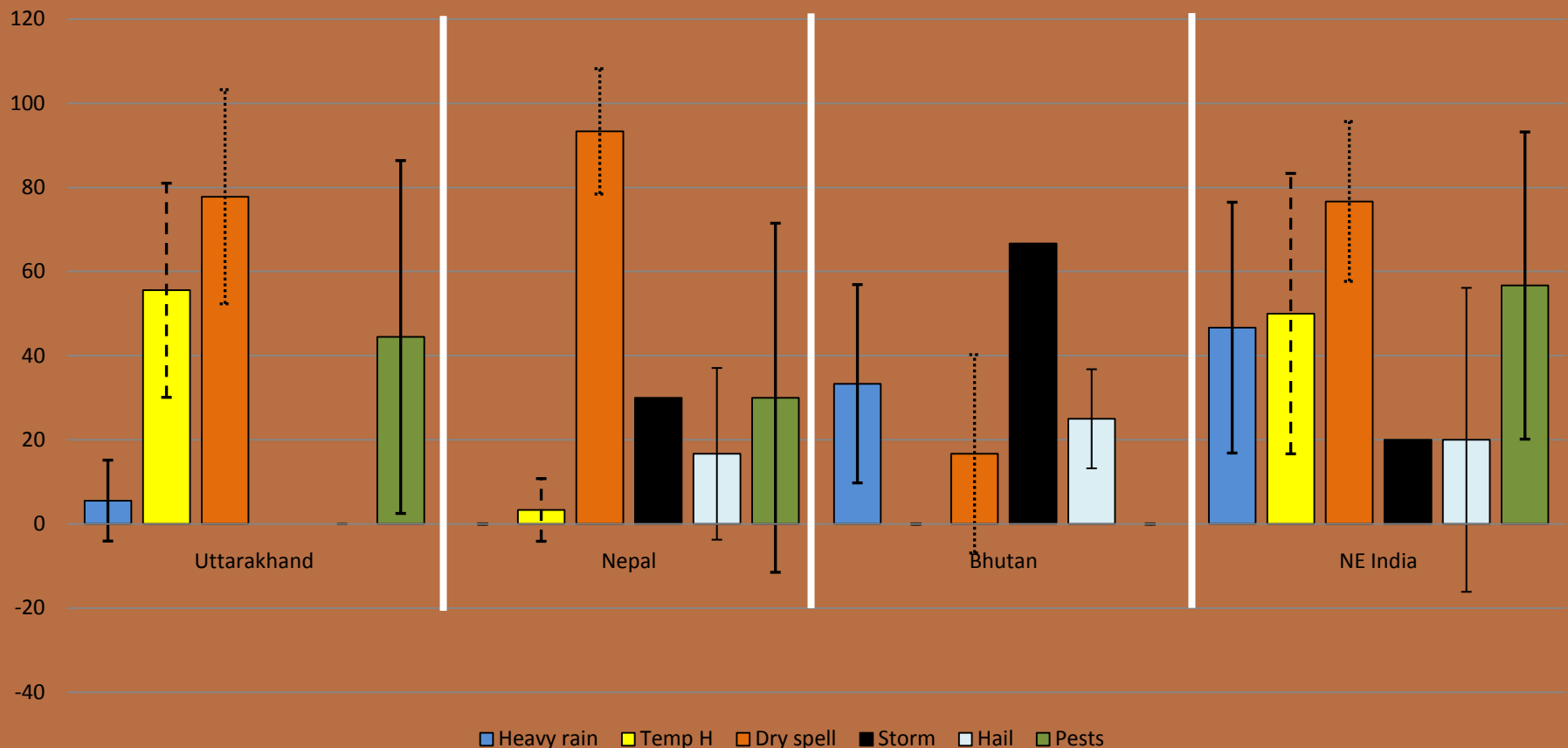
Hazard Ranking Profile

(Weather and weather induced hazards in scale of 5;
hazards ranked 4-5)

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Percentage of villages ranking specific hazard at 4-5



Community perceptions: Major impacts

Uttarakhand:

Delayed and reduced snowfall:

- Impact on winter crops
- Increased pests (particularly white grub)

New crop opportunities

Delayed rainfall, prolonged dry spells:

- Sowing delayed, seedlings wilt
- Yield effected
- Reduced forage
- Increased pests

Early maturing of some crops; new cropping opportunity

Severe water scarcity (drinking & irrigation)



Nepal

Delayed rainfall, Increased temperatures, increased water scarcity

- Sowing and transplantation delayed,
- germination of crops affected;
- Seedlings wilt
- increased pests
- yields reduced

Storms, Hailstorms

Food grains (cereals)

- Standing crop damage
- lodging, ripe grains damaged

horticulture crops (cash & vegetable crops)

- flowers & fruit fall
- Yield drastically effected

Pests

- Vegetables, cereals

Food and income effected



Community responses: Coping mechanisms

Responses	Uttarakhand	Nepal
Coping mechanisms	• Cropping delayed - o 15 days – 1 month - o Sown seeds covered with litter, FYM • Replanting alternative crops : - o Rice – pulses, soya, sesame, coarse grains (<i>mandua/ragi</i>) or <i>madira</i> (fodder) - o <i>Mandua</i> – <i>madira</i> or ginger, soya, urad (pulse) or potato	• Cropping delayed - o 1 month - o Seeds soaked prior to sowing; deep sown - o Dry seed beds (rice) – seeds wet, wrapped in litter to germinate - o Mixed cropping – maize, beans; millet, blackgram • Replanting alternative crops: - o Millet – maize, upland rice, black gram, chino, mustard, <i>Philunge</i> (beans) - o Wheat, barley - buckwheat - o Buckwheat – turnip, mustard, green leafy vegetables,

Community responses: Adaptive mechanisms

Responses	Uttarakhand	Nepal
Adaptive (Crops & Livestock)	•Crop replacements - Wheat – ginger, tumeric, mustard - Maize – cauliflower, peas, soya, vegetable climbers - Cereals – potato - Groundnut – ginger - Cereals – horticulture •New opportunities (due to warmer weather): - Groundnut, beans - Peas, cauliflower (after potato harvest – additional income) •Livestock: reduced numbers, smaller ruminants	•Crop replacements - Wheat, barley – potato - Apple - potato - Groundnut – blackgram & horsegram - Maize – banana - Rice – maize/ginger •Varietal replacements - Wheat: <i>Daudkhani</i> by <i>Jhuse</i> - Rice: <i>Chhiti/Jwali</i> by <i>Laidiya/Rui/Anjana</i> <i>Marso, Darnali</i> by <i>Munyasonali/Jhyali</i> • Livestock: reduced numbers, smaller ruminants
Adaptive (Occupational shifts)	- Non-farm (carpentry, masonry) - Wage earning - Migration	- Non-farm (carpet weaving, carpentry) - Wage earning - Seasonal migration (lean months – to India; long-term – Gulf, SE Asia or Korea)

- Responses reactive, seem inadequate for effective long-term adaptation
- Requires further assessment of capacities
 - Appraisal of
 - Systems dependency
 - Resource bases and availability
 - Institutional dependency and delivery mechanisms

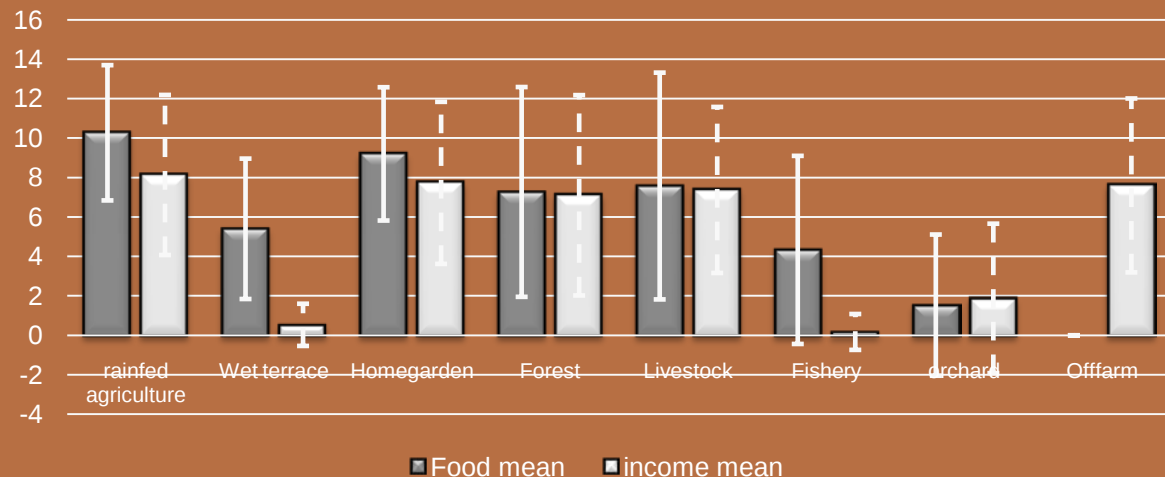
Natural Endowment: Duration of resource availability from support systems (months)

- Resource availability from multiple systems; but limited in Nepal
- Rainfed agriculture critical for food resources in Nepal
- Pronounced importance of forest system in Nepal for income resources
- Income opportunities limited in Nepal
- ***System dependency highly sensitive to precipitation events in Nepal (= high vulnerability)***

Resources availability (food & income) from various systems (Nepal)

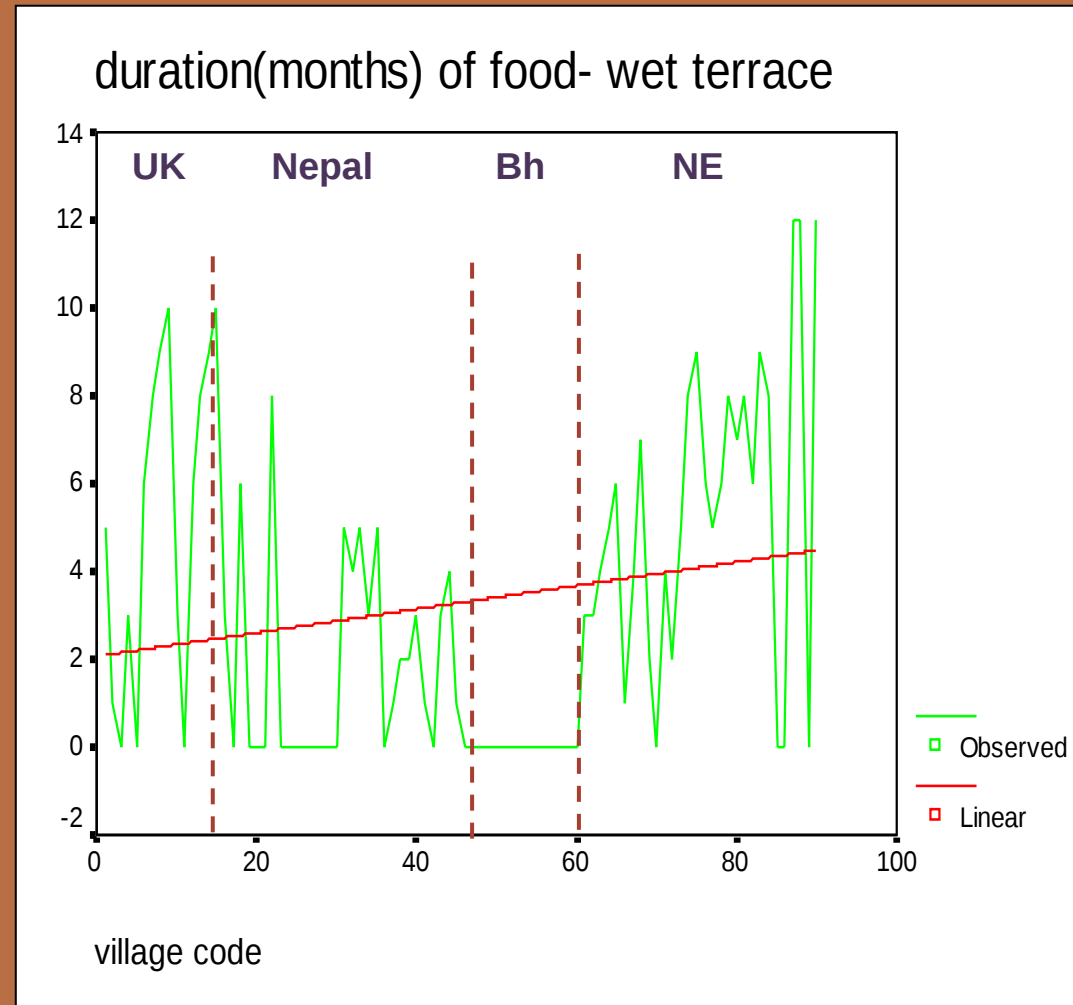


Resources availability (food & income) from various systems (NE India)



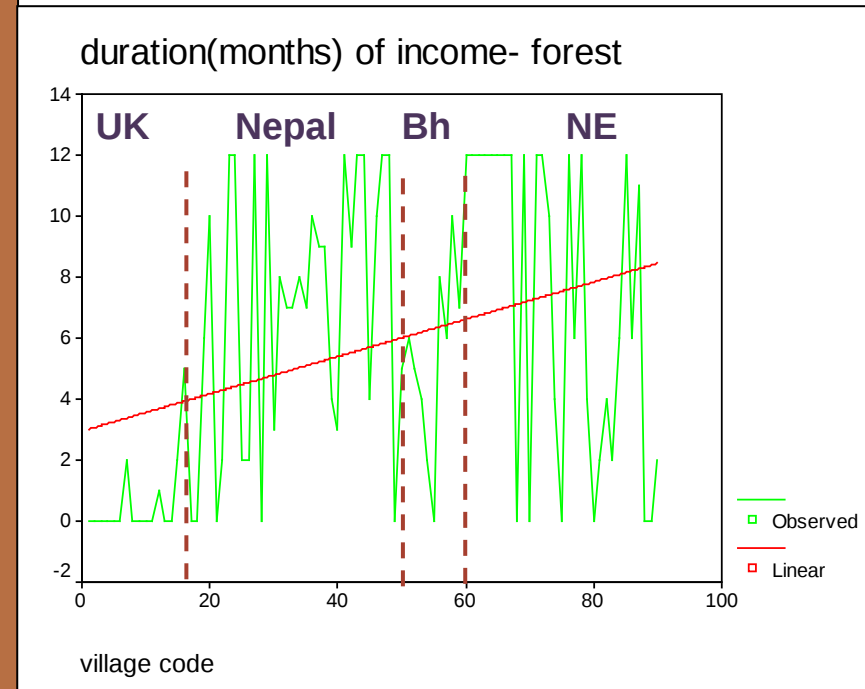
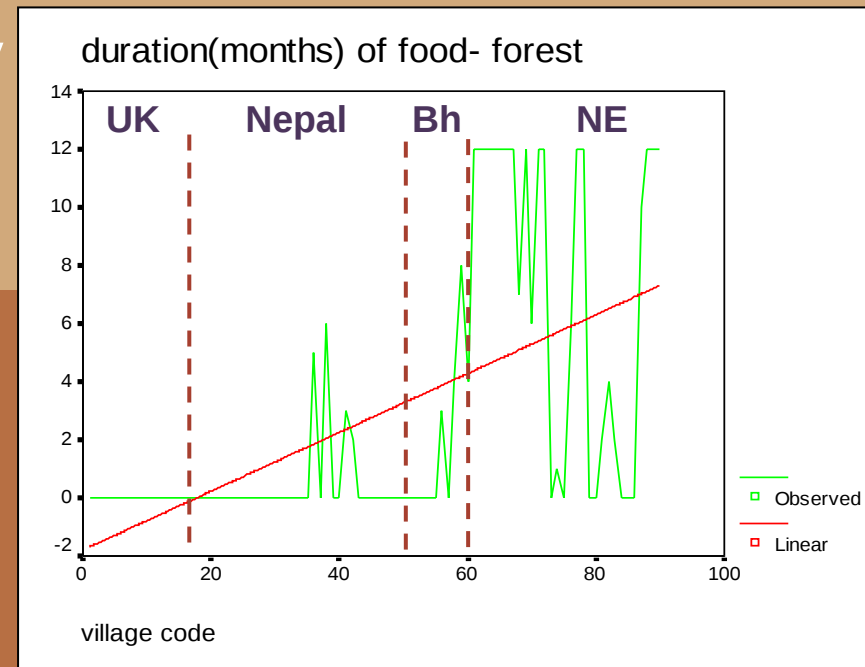
Food Availability (Wet Rice Systems)

- Duration of food availability (staples) shows wide inter-village variation
- Average food availability between 2-4 months, although some villages reported availability of more than 6 months



Food & Income Availability (Forest systems)

- Forest systems are not a source of food resources in Uttarakhand, western Nepal
- In sharp contrast, they are a critical support system for food resources in NE India
- Duration of income resource availability increases significantly from west to east
- Forests are important support systems for income in Nepal, Bhutan and NE India



Institutional Dependency

Venn diagram

- Institutions within the village as well as outside village
- Size – criticality
- Nearness – importance, accessibility of institution



Institutional Dependency

Support required	Uttarakhand	Nepal
Immediate relief, credit	Neighbours, relatives	LFUGs (project groups) CFUG (Community Forest User Groups)
Relief	<i>Pradhan</i> (Elected Headman) Gram Sabha/Panchayat	Mothers groups LFUGs (project groups) CFUG (Community Forest User Groups) Village Women Development Committee
Food	PDS Atta Chakki (village mill)	WFP/PAF/USAID
Peer help, Credit	SHGs, Moneylenders	Moneylender Shopkeeper
Credit, IGA support	Aajeevika, Swajal	NGOs INGOs
Credit	Bank	Moneylender Shopkeeper
Support from schemes, programmes	Block office PHC/hospital	DADO/DLSO DDC DFO NGOs INGOs

In conclusion....

- **High dependency on support systems that are sensitive to weather induced stress (water stress, pests), suggests high vulnerability**
- **Support systems important, but not adequate for enhancing adaptive capacities**
- **Income generation options inadequate in Nepal**
- **Social capital, support systems extremely poor in Nepal**
- **Institutional support systems not easily accessible or adequately responsive**
- **Resultant out-migration, particularly labour migration**

For enhancing adaptive capacities....

- Food production enhancement measures, particularly in rainfed systems need immediate attention – to ensure year-long food availability
- Food security – more effective and responsive public distribution system required
- Diversification of income generation options and organised access to markets critical
- Welfare measures not sufficient to address need for income generation options
- Improved and effective access to programmes and a responsive delivery mechanisms required
- Effective insurance and credit mechanisms

ICIMOD initiatives (with partners).....

- **Adaptation Learning Highways:** Bridging the gap between autonomous and planned adaptation (C2C Knowledge exchange fora, Community-Scientist Interfaces, Policymakers-community Interaction Fora)
- **Action Research**
 - Stress tolerant crop varieties
 - Risk assessment and climate proofing value chains
- **Strengthening Delivery Mechanisms** – access to market information, technical services
- **Strengthening local governance** – Participatory perspective landuse planning and convergence of interventions by different agencies

Thank you

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Natural Endowments: Resources per system and availability

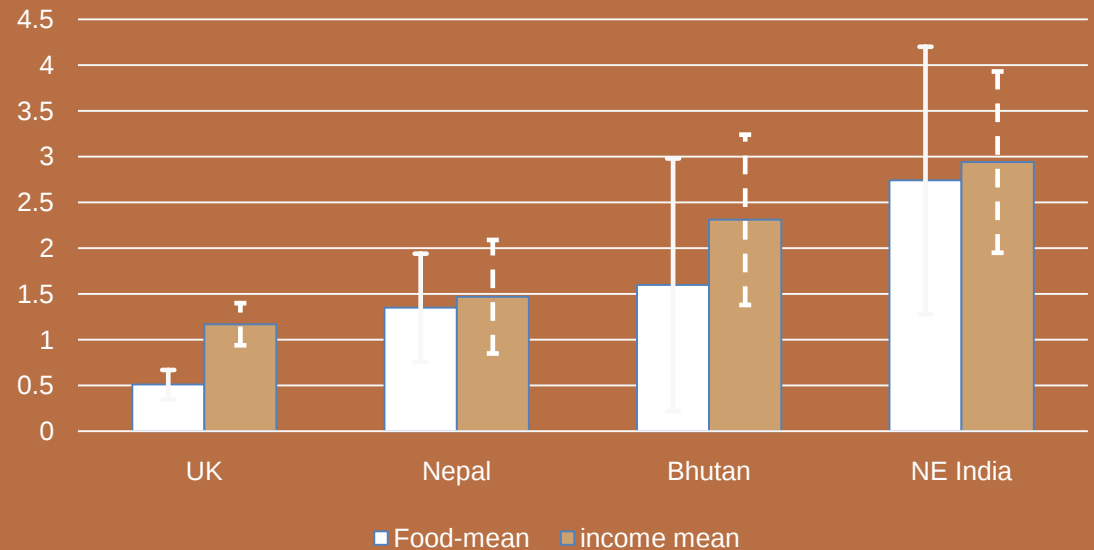
Average diversity of resources (richness of systems) for both food and income increases from west (semi-arid) to east (wet, monsoon)

More income resources compared to food resources

Average food resource availability shows longest duration in NE India

(Quantification of volume and measurable income required for increased robustness of assessment)

Mean number of resources per support system



Mean duration of resource availability

