



Gitta Shrestha
Transdisciplinary Conference
Peak Perspectives: Navigating
Challenges and Shaping Sustainable
futures in Nepal's Mountain Landscapes
4th October, 2023, Kathmandu.

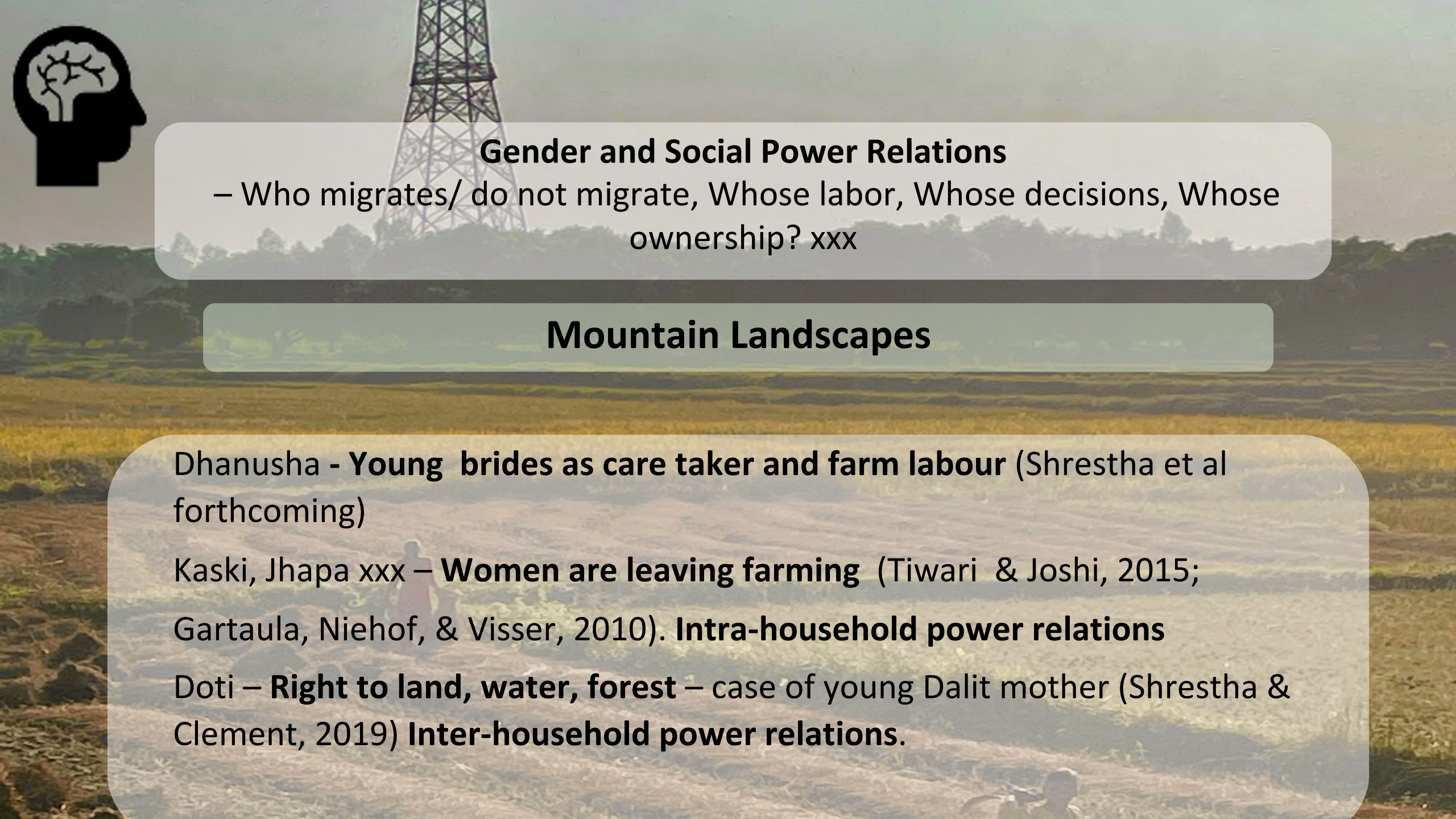
KEY MESSAGES

GESI CONCEPTUALISATION

GESI IN PRACTICE

GESI TRANSFORMATIVE RESEARCH AND ACTION





Gender and Social Power Relations

– Who migrates/ do not migrate, Whose labor, Whose decisions, Whose ownership? xxx

Mountain Landscapes

Dhanusha - **Young brides as care taker and farm labour** (Shrestha et al forthcoming)

Kaski, Jhapa xxx – **Women are leaving farming** (Tiwari & Joshi, 2015;

Gartaula, Niehof, & Visser, 2010). **Intra-household power relations**

Doti – **Right to land, water, forest** – case of young Dalit mother (Shrestha & Clement, 2019) **Inter-household power relations.**



Kaski - **Land abandonment, an increase in forest cover , increased pressure on the land, exposure to flooding** (Jaquet et al 2016).

Doti, Sarlahi – **dysfunctional water systems** (Shrestha et al., 2023).

Kailai- **Women's access to irrigation** (Shrestha et al., 2023)

Capture of **decision making spaces, information, subsidies, technology xxx**

Video – Road, Water Tab, LPG gas

Conceptualisation

GESI: a popular-buzz word, mainstreamed in every project; donor driven (Shrestha et al., 2016; 2019) genuine efforts missing; antagonism

Lack of conceptual clarity:
Gender = women
intersectionality -
disaggregated data (men vs women) = quantity – POWER RELATIONS?

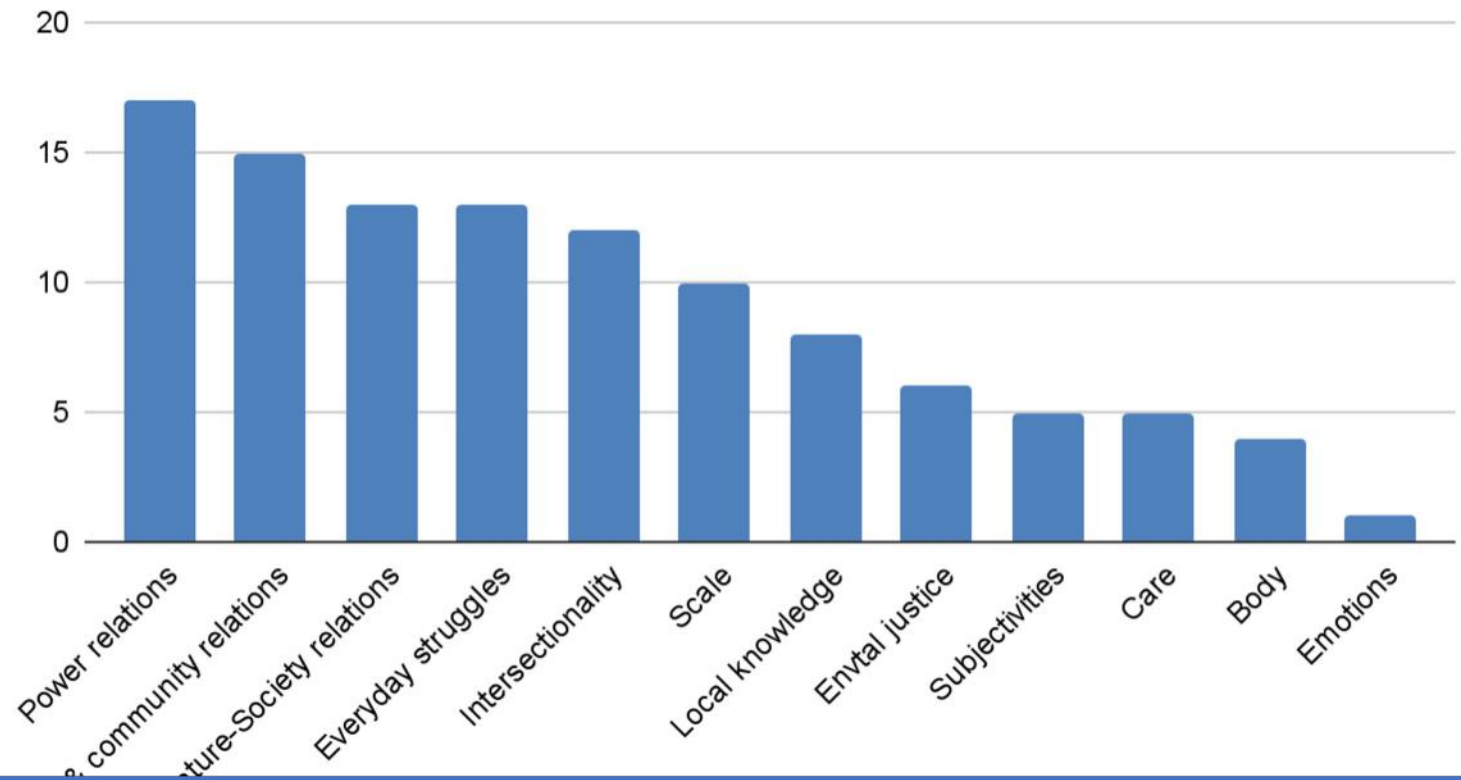
To be addressed at the grassroot level (Shrestha & Clement, 2016; 2019)

Same language
-Which women, What to measure, What to report xxx?

Diverse : Groups, Experience, Needs
= ONE SOLUTION.
REINFORCEMENT OF UNEQUAL POWER RELATIONS
– short term solutions
- sustainable solutions – interest & investment

Irrigation meets Feminist Political Ecology: Exploring Nature-Society Relations in the context of climate change and the global environmental crisis (Shrestha et al., forthcoming)

Components of an FPE approach used





Practice

Gender
mainstreaming -
**Business-As-Usual =
33%**

Walk-the-talk –
Eg. Research
Organisations

**Anyone can do
gender**
– BECOMING GENDER
EXPERTS
-ONE WO/MAN ARMY

Social mobilisers –
**Front line GESI
Mainstreaming
experts (Shrestha,
2016).**

GESI in Organisation = GESI outcomes.

Unravelling gendered practices in the public water sector in Nepal

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Abstract

Despite decades of gender mainstreaming in the water sector, a wide gap between policy commitments and outcomes remains. This study aims at offering a fresh perspective on such policy gaps, by analysing how gendered discourses, institutions and professional culture contribute to policy gaps. We rely on a conceptual framework originally developed for analysing strategic change, which is used to analyse gender in the public water sector in Nepal. Our analysis relies on a review of national water policies and a series of semi-structured interviews with male and female water professionals from several public agencies. Our findings evidence how dominant discourses, formal rules and professional culture intersect to support and reproduce hegemonic masculine attitudes and practices of water professionals. Such attitudes and practices in turn favour a technocratic implementation of policy measures. We argue that gender equality policy initiatives in the water sector have overly focused on local level formal institutions and have not adequately considered the effects of masculine discourses, norms and culture to be effective in making progress towards gender equity. We conclude with policy recommendations.

Keywords: Discourse; Gender; Institutions; Nepal; Professional culture; Water

Masculinities and hydropower in India: a feminist political ecology perspective

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Abstract: Mainstreaming gender in water governance through “how to do gender” toolkits has long been a development focus. It has been widely argued that such toolkits simplify the complex, nuanced realities of inequalities by gender in relation to water and fail to pay attention to the fact that the proposed users of such

Gender Transformative Research & Action

Gender continuum scale (Mullinax et al. 2018; Kabeer and Subrahmanian, 1996)



It implicitly focus on men's needs, interests and priorities in opportunities and resources.

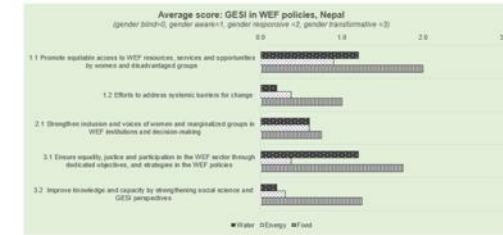
Gender is considered in policy or program or research, but incorporation into actual work processes very limited.

Gender and social inclusion issues analysed and strategies for addressing GESI issues mainly focus on services and technologies and representation without challenging power relations and social norms.

Systemic /deep understanding of root causes behind inequalities. Policy or program or research leads to actual shift in gender relations, interpersonally and/or at a structural level.



Finding 1: Gender-aware Water-Energy-Food policies in Nepal



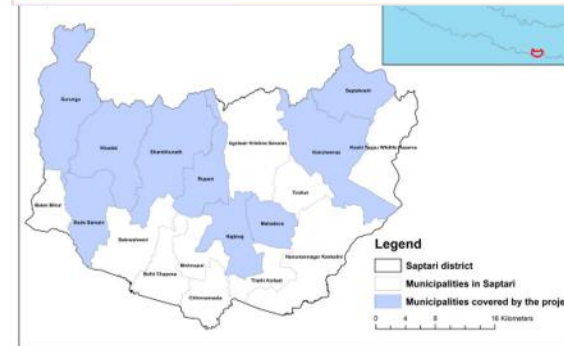
More efforts are required to strengthen knowledge of GESI issues of WEF and integrate GESI measures in WEF policies

Finding 2: SIP subsidy policies lack GESI perspectives

- No GESI specific subsidy policy and financing mechanisms for ensuring SIPs access by women and smallholder farmers

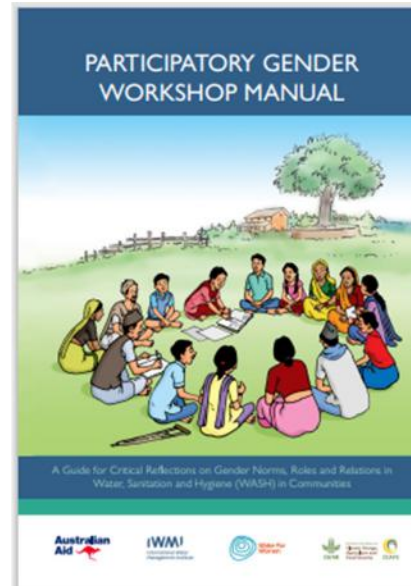


There is a need for developing financing/business model that would facilitate access of SIP and/or water services by women and smallholder farmers





Women in men's spaces – New forms of vulnerabilities (Udas, 2019).



Main takeaways

Conceptualization

- Change in perspectives, discourses, narratives (policy, discussions, internet, media xx)

Practice

- Reflexivity – Walk the talk

Gender transformative outputs

- Number vs. root causes.



Useful Links

Google Scholar:

https://scholar.google.com/citations?user=LjZ_tEoAAAAJ&hl=en

Research Gate:

<https://www.researchgate.net/profile/Gitta-Shrestha>



Sustainable future in mountains: Challenges in Agricultural Land Use Development

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Kishor Atreya

Department of Watershed Management and Environmental Science, Institute of Forestry, Pokhara Campus

Verified email at iofpc.edu.np - [Homepage](#)

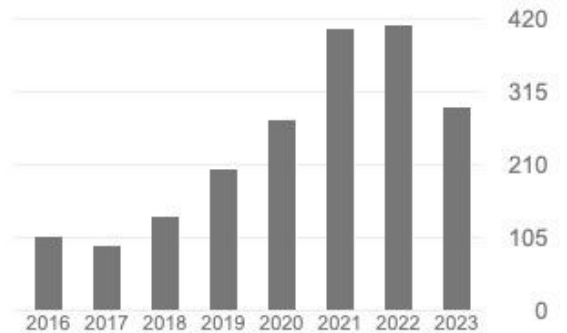
Mountain environment and ... livelihoods and human health!

FOLLOWING

Cited by

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Citations	2341	1724
h-index	25	22
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<input type="checkbox"/>	TITLE		CITED BY	YEAR
<input type="checkbox"/>	Changes in soil organic carbon fractions in abandoned croplands of Nepal RB Ojha, P Kristiansen, K Atreya, B Wilson Geoderma Regional 33, e00633		1	2023
<input type="checkbox"/>	Farming in the mountains of Nepal: crops, soil fertility, livelihoods and farm-forest linkages P Gauli, S Bhatta, SK Singh, K Shrestha, B Nidal, K Atreya Archives of Agriculture and Environmental Science 7 (3), 463-472			2022
<input type="checkbox"/>	A systematic review and gap analysis of drivers, impacts, and restoration options for abandoned croplands in Nepal RB Ojha, K Atreya, P Kristiansen, D Devkota, B Wilson		6	2022

This presentation draws upon my 20y research experience; 5y work in development sector, and recently 3y university teaching to shed light on the key challenges for agricultural land use development in Nepal's mountains.

There are many challenges!!!

Challenges: Agriculture land use in mountains

1. Environmental challenges
2. Infrastructure and resource constraints
3. Land and ownership issues
4. Socioeconomic and demographic challenges
5. Knowledge and skill gaps
6. Market and adaptation challenges

Challenges: Agriculture land use in mountains

Environmental Challenges

Fragile Mountain Ecosystems

Poor Soil Quality and Soil Erosion

Rapid Land Degradation

Climate Challenges

Natural Disasters

Pesticide Contamination of Watersheds

Challenges: Agriculture land use in mountains

Infrastructure and Resource Constraints

Difficult Access

Limited Infrastructure

Limited Arable Land

Land Fragmentation

Subsistence Mountain Agriculture

Unsustainable Land Use

Severe Agro-Resource Quality
Degradation

Challenges: Agriculture land use in mountains

Land and Ownership Issues

Farmland Abandonment

Managing Marginal Land

Diverse Land Tenure Systems

Challenges: Agriculture land use in mountains

Socioeconomic and Demographic Challenges

Shifting Demographic Traits

Threats to Socioeconomic Stability

Persistent Poverty

Women, DAG and Elderly Hardship

Challenges: Agriculture land use in mountains

Knowledge and Skill Gaps

Lack of Knowledge and Skills

Difficulty in Transferring Scientific Knowledge

Challenges: Agriculture land use in mountians

Market and Adaptation Challenges

Rising Demands for Recreation and Biodiversity Concerns

Responding to Changing Markets

Going out of Production or Corporate Operations

How you perceive
these challenges
vary by disciplinary
science



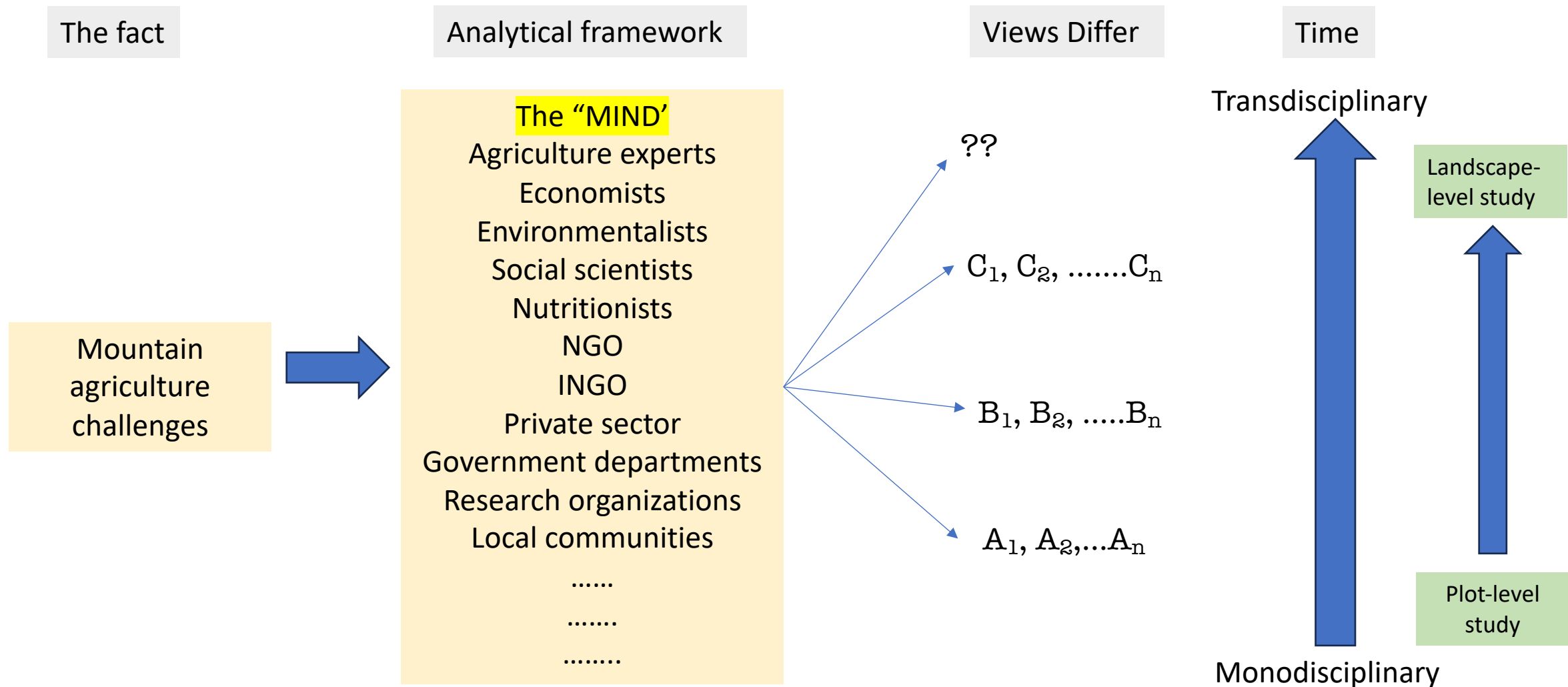


Figure: Interpretations complexity

Understanding food choice of the mountain people is crucial





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Diversified farming in mountains is crucial

= family farming



Diversified farms bolster forest-bird populations despite ongoing declines in tropical forests

J. Nicholas Hendershot^{a,b} , Alejandra Echeverri^{a,b,c} , Luke O. Frishkoff^d , James R. Zook^e, Tadashi Fukami^a , and Gretchen C. Daily^{a,b,c,f,1} 

Contributed by Gretchen C. Daily; received March 8, 2023; accepted August 1, 2023; reviewed by Claire Kremen and Alejandra Martínez-Salinas

Diversified farming practices help sustain
populations of diverse, forest-affiliated species

Benefits of diversified farming practices for
biodiversity can accrue through time

Reason:

Variety of habitats, increases food availability and nesting
options → vital resources for bird population.

But, we need favorable environments

- Production and transfer/diffusion of evidence-based knowledge and innovation
- Identification of socio-technical factors that hinder adoption
- Improved governance systems for coordination among stakeholders

<https://www.nature.com/articles/s43016-023-00837-3>

Conclusion

- A range of challenges that cut across multiple disciplines, so solutions should not be limited to a single perspective (e.g. Yield and Profit).
- The profit-driven commoditization of agriculture, if not balanced with ethical practices, could potentially promote monoculture.
- [Re]establish new institutional setup for effective collaboration between different 'minds' to identify solutions of these challenges.
- [Re]define agriculture and development for mountain people
 - It should promote better nutrition, diversified foods, preserve environment, and enhance spirituality. Also local customs, traditions, and indigenous knowledge systems.

Thank you

Changing social structure in rural Nepal: A gender and caste/ ethnic perspective

Dr. Mahendra Sapkota

[Transdisciplinary Seminar]

Constituents of Nepali society

- **Socio-cultural constructions:** Caste/ethnicity; Gender; and Class (Weberian)
- **Economic constructions:** Class and production systems
- **Political constructions:** Regime and governance



General status
of political
economy??

Basic idea of
the
concepts??

Rural dimension of Nepali society

- How to define rural and urban (Nepal and global trend)
- Urbanization trend in Nepal
- Political administrative provisions (constitutional and legal)
- Changing rural dynamics (continuum vs dichotomy)
- Rural economy, rural livelihood, and rural life-styles

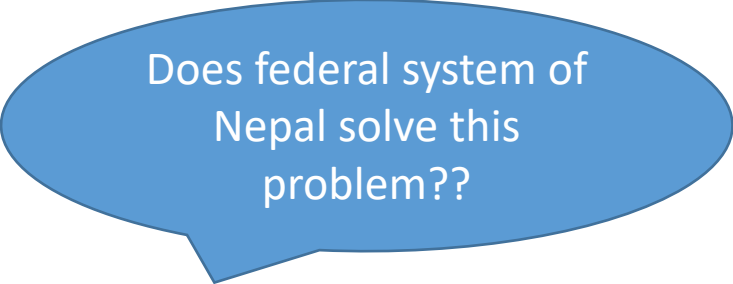
Changing 'rural face' in recent years: 'No distinct'

The causes

- Migration (rural to urban and rural/urban to international)
- Livelihood (no dominance of primary sector; diminishing agricultural returns and exploring the diversification)
- Development trend (heavy investment of government for infrastructure development; but people are not attracted to live at)
- Impact of modernization (induced with modern urban facilities; foreign migration; remittance and globalization)

Critical examples

- RUPP project (rural urban partnership program) in Nepali context
- PURA project (providing urban facilities and rural area) in Indian context



Does federal system of Nepal solve this problem??

Changing caste/ ethnic relations

- Caste/ ethnicity as an **unavoidable construction** of society (being rooted with politics, economics and culture of society)
- Number of caste and ethnic groups are **increasing but losing** the 'identity'
- Discourse and practice of 'identity' in Nepal is '**contested**'
- Caste/ ethnic relations are **changing due to** modernization, migration, and due to education and social awareness
- A massive trend of **acculturation in Nepali society**, e.g. inter-caste marital relations are increasing
- **Do not forget:** gender and other exploitive power hierachies are not only 'inter caste/ ethnic' hegemonies but also 'intra caste/ ethnic' regimes

Changing Gender Constructions

The historicity

- Androcentric and male-biased socio-cultural values (as it is an institution, hard to change)
- Unpaid women; food insecure; feminization of agriculture and feminization of poverty
- **Gender relations:** Women are more confined to biological role rather than economic and political roles
- Elite-captured agenda of women empowerment??

Changing dynamics

- **Positive strength:** Inclusive and representative policy (e.g. electoral and civil service representations) and different international commitments (for women rights and human rights)
- **Changes at household level:** Value of daughter, decision of women, access to property and control over the resources, and increasing trend of female head of families
- **Changes at community level:** Number of socio-cultural and economic groups in society at village levels (women's single or of their significant participation)

Take home message:

- Nepali society is rapidly changing and the pace of change is vital and accelerated in rural areas
- The dynamics of change is multidimensional and it is 'essential' rather than 'natural'
- Neither the social dimension (e.g. gender and caste/ ethnicity) is fundamental nor the economic and political dimension alone (e.g. class and livelihood; policy reforms)
- More research works and academic discussions are needed to analyze the changes of Nepali society in transdisciplinary approach

With Thanks...



Transdisciplinary Conference On

Peak Perspectives: Navigating Challenges and Shaping Sustainable Futures in Nepal's Mountain Landscape

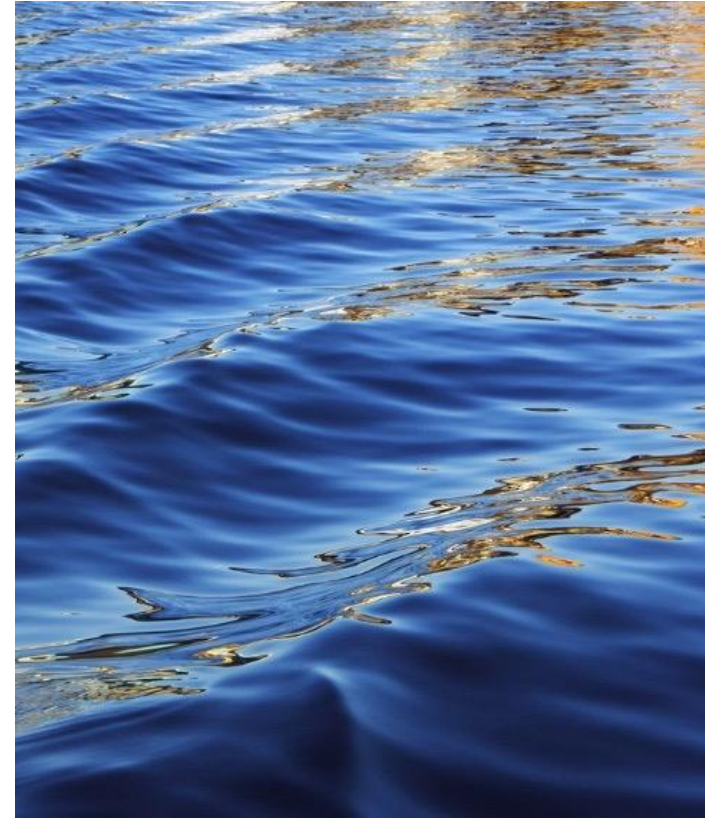


The Rural – urban Energy Access Gap Today and in Nepal's Long- term Strategy for Net Zero Emissions (LTS- NZE) by 2045

Prof. Amrit M Nakarmi PhD

*Coordinator, Energy Systems Planning and Analysis Unit (ESPAU),
Center for Energy Studies (CES), IOE/TU*

04 October 2023



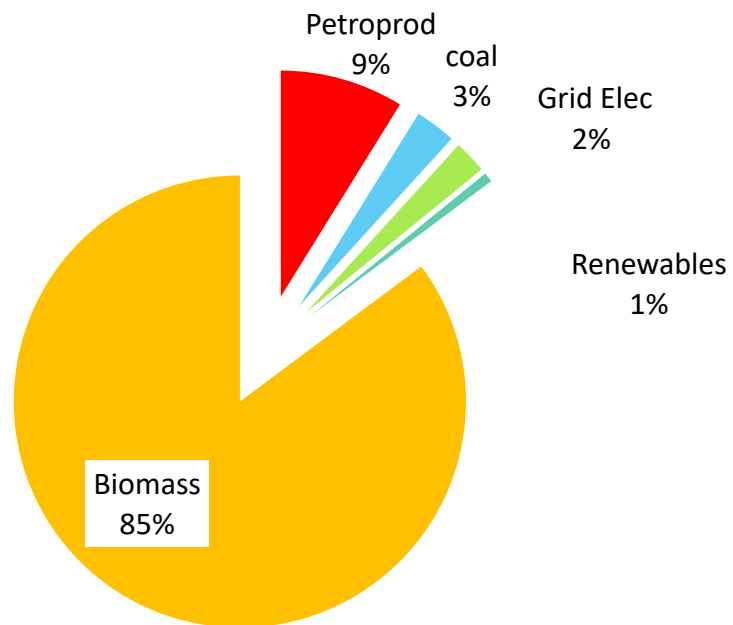
(Presentation based on the CES study, and studies conducted for the Department of Environment and Ministry of Forests and Environment, GoN, and UNDP, 2021; NEA & NOC, 2023; WECS, 2023)

Main Messages

- Imports of fossil fuels increasing as shown in Nepal's national energy consumption pattern in 2010 - 2022
- Status of rural/urban energy consumption as per sample survey of households in the provinces in 2019 and 2022
- Rural/urban energy demand as per Nepal's Long-term Strategy for Net-zero Emissions (LTS – NZE) by 2045
- Can we achieve the targets of LTS – NZE by 2045 based on the current implementation status?

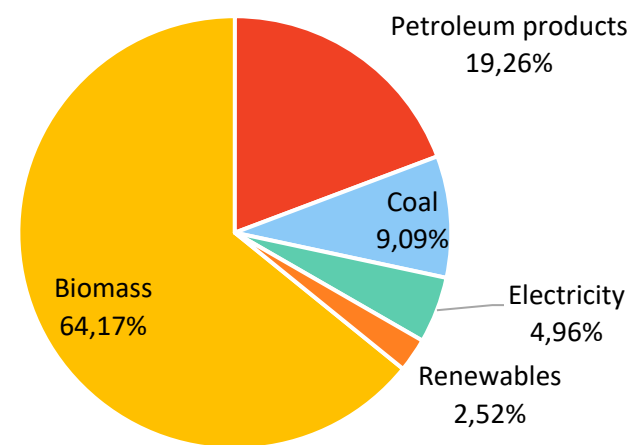
National energy consumption mix in 12 years

2010



410 PJ (144 TWh)

2022



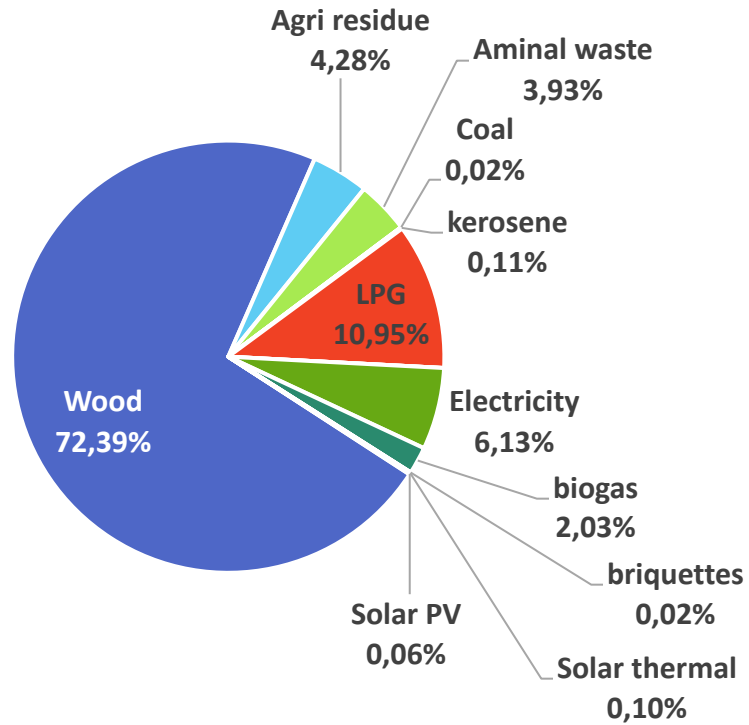
640 PJ (179 TWh)

1 PJ = 23,890 toe

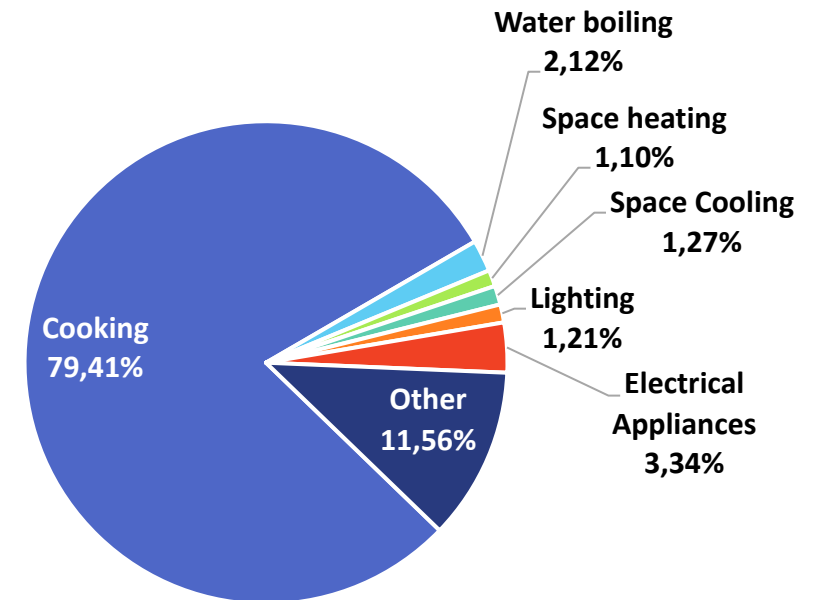
(WECS, 2023)

Residential energy Consumption

Total - 197 PJ



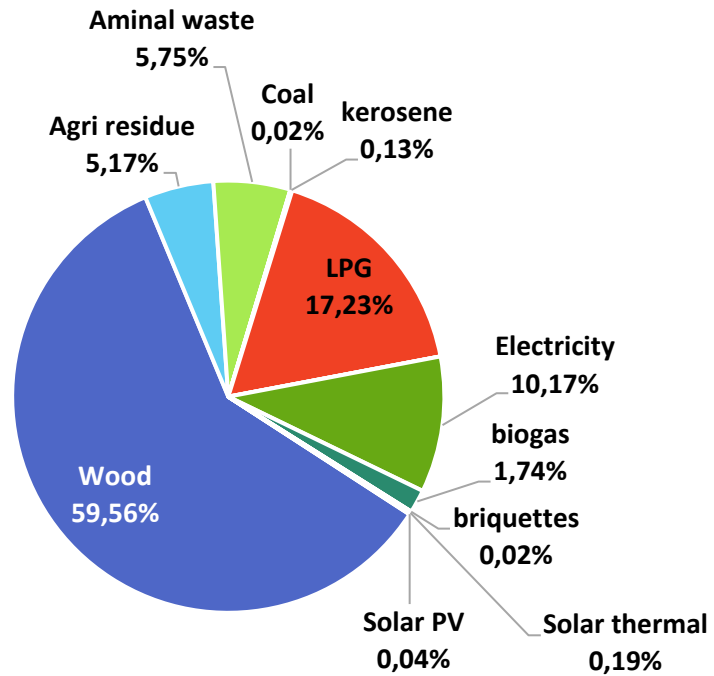
Total - 197 PJ



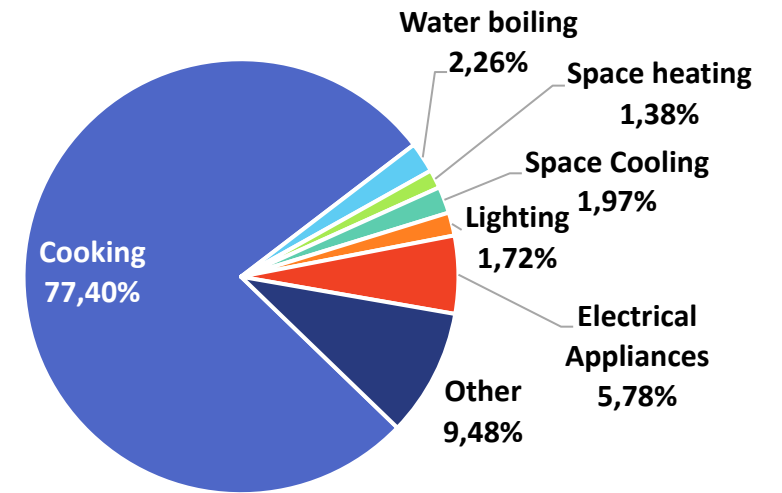
(WECS, 2021, 2022, & calculations)

Urban Households

Urban - 101 PJ



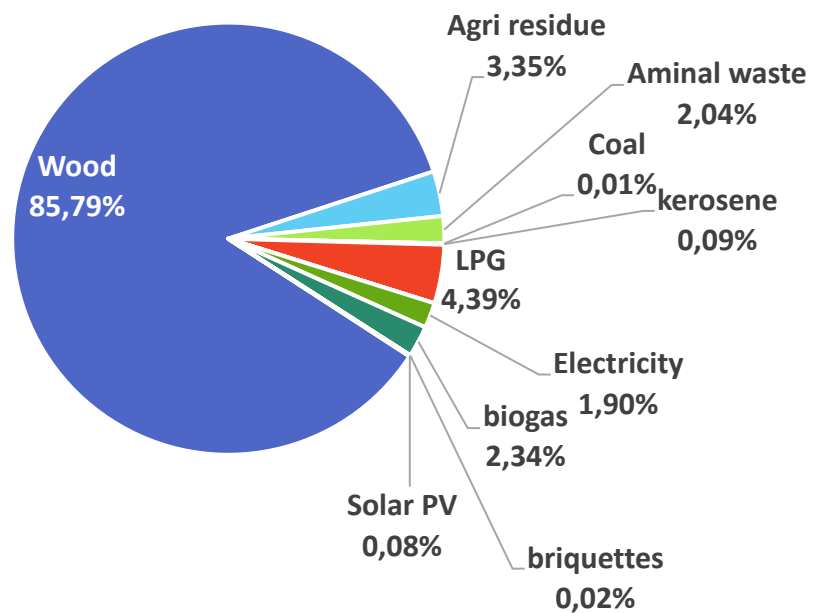
Urban - 101 PJ



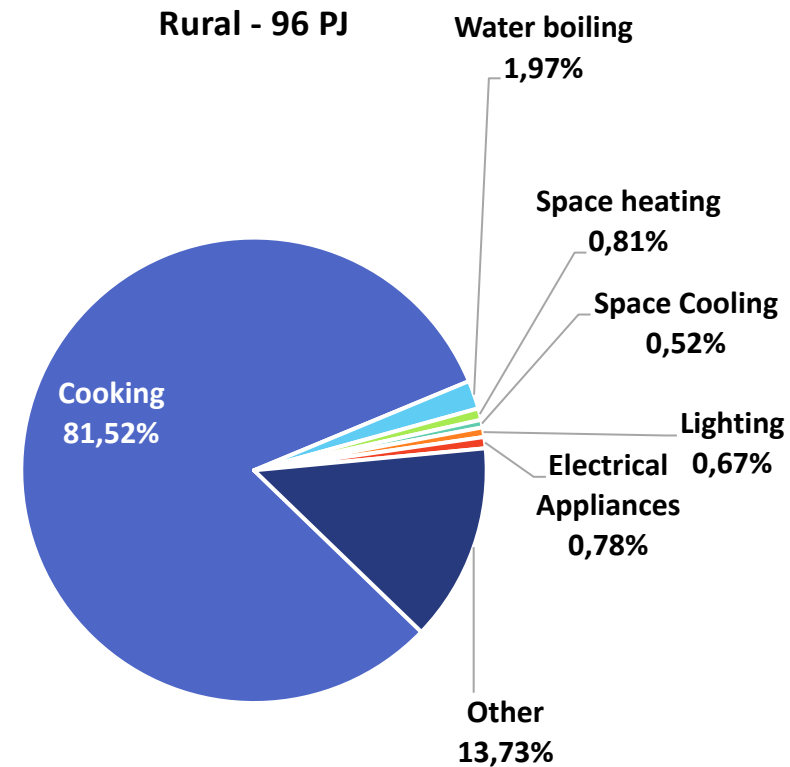
(WECS, 2021, 2022, & calculations)

Rural Households

Rural - 96 PJ



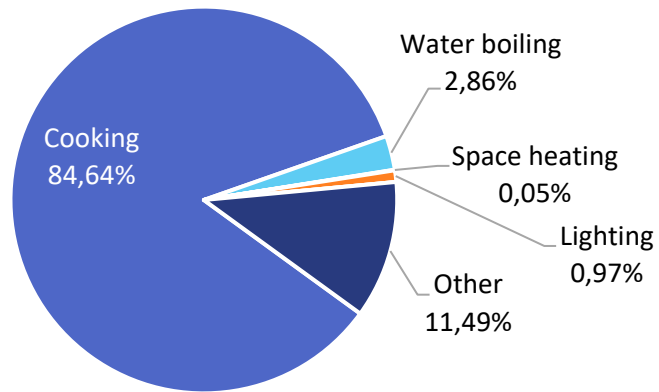
Rural - 96 PJ



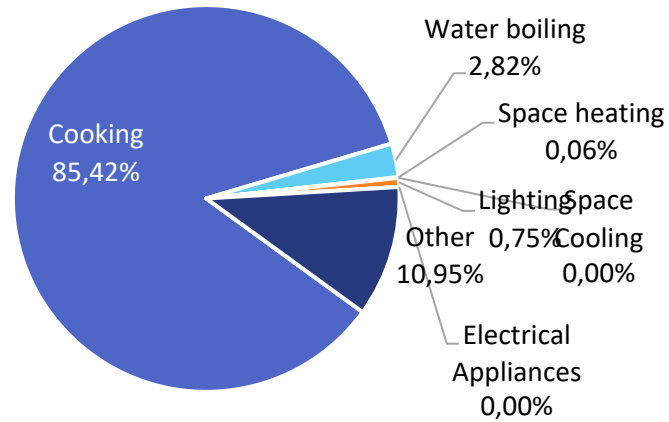
CO2 emissions in 2021

(based on provincial survey estimates from 2019, 2020, & 2022)

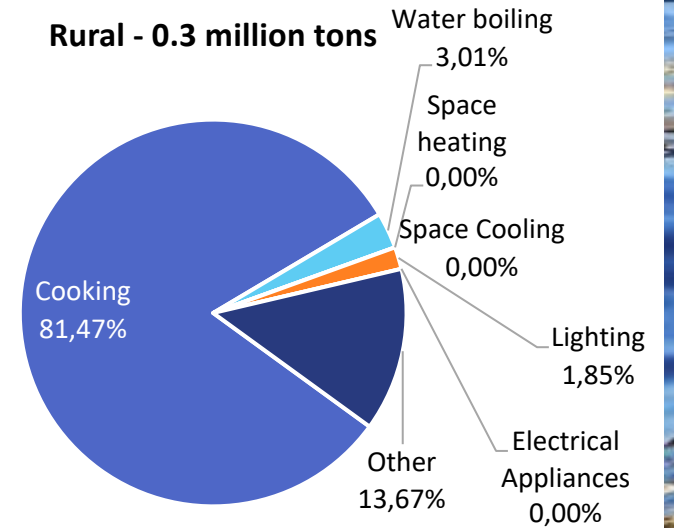
Total CO2 Emissions - 1.4 million tons



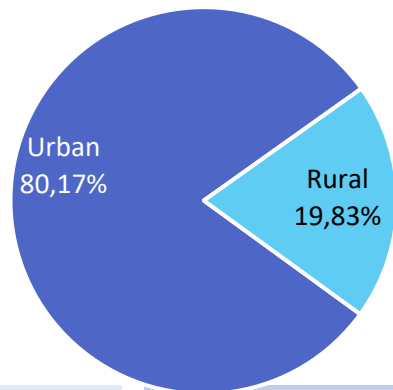
Urban - 1.1 million tons



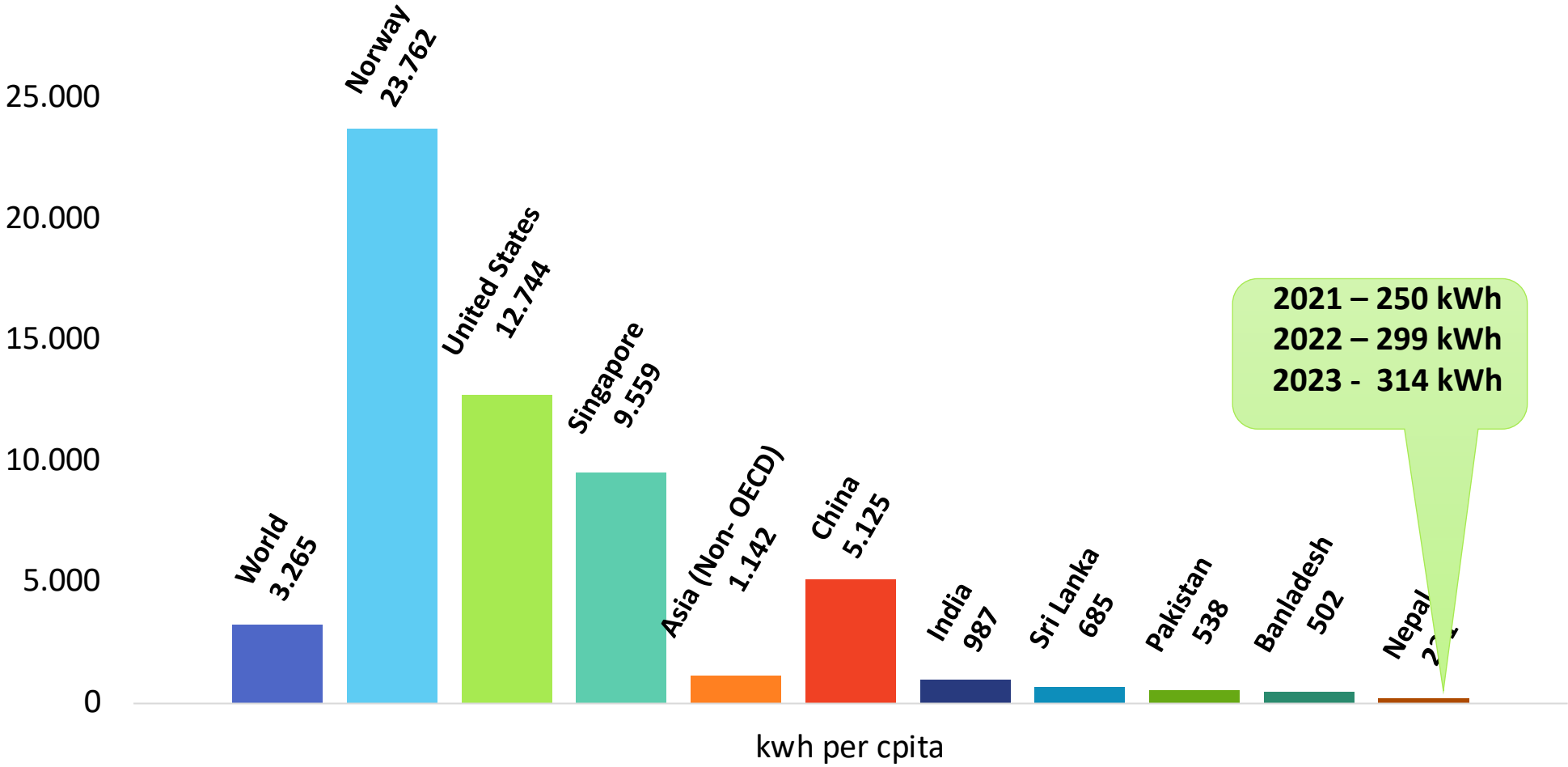
Rural - 0.3 million tons



Total CO2 Emissions - 1.4 million tons



Electricity Consumption (kWh) per capita (2019)



(IEA 2021; NEA 2023; CBS 2021)

Fuel economics of cooking in an average urban household (02 September 2023)

(cost of cooking/month for a household of 5 members)
with electricity tariff adjustment by ERCN/NEA on 27 Oct 2021
and kero/LPG prices on 02 Sept 2023

Year	Kerosene stoves	LPG stoves	Electric hotplates
2000	270	430	680
2003	340	535	790
2014	1,760	1,080	960
2019	1,240	1,450	1,115
2023	2,830	1,966**	1,000

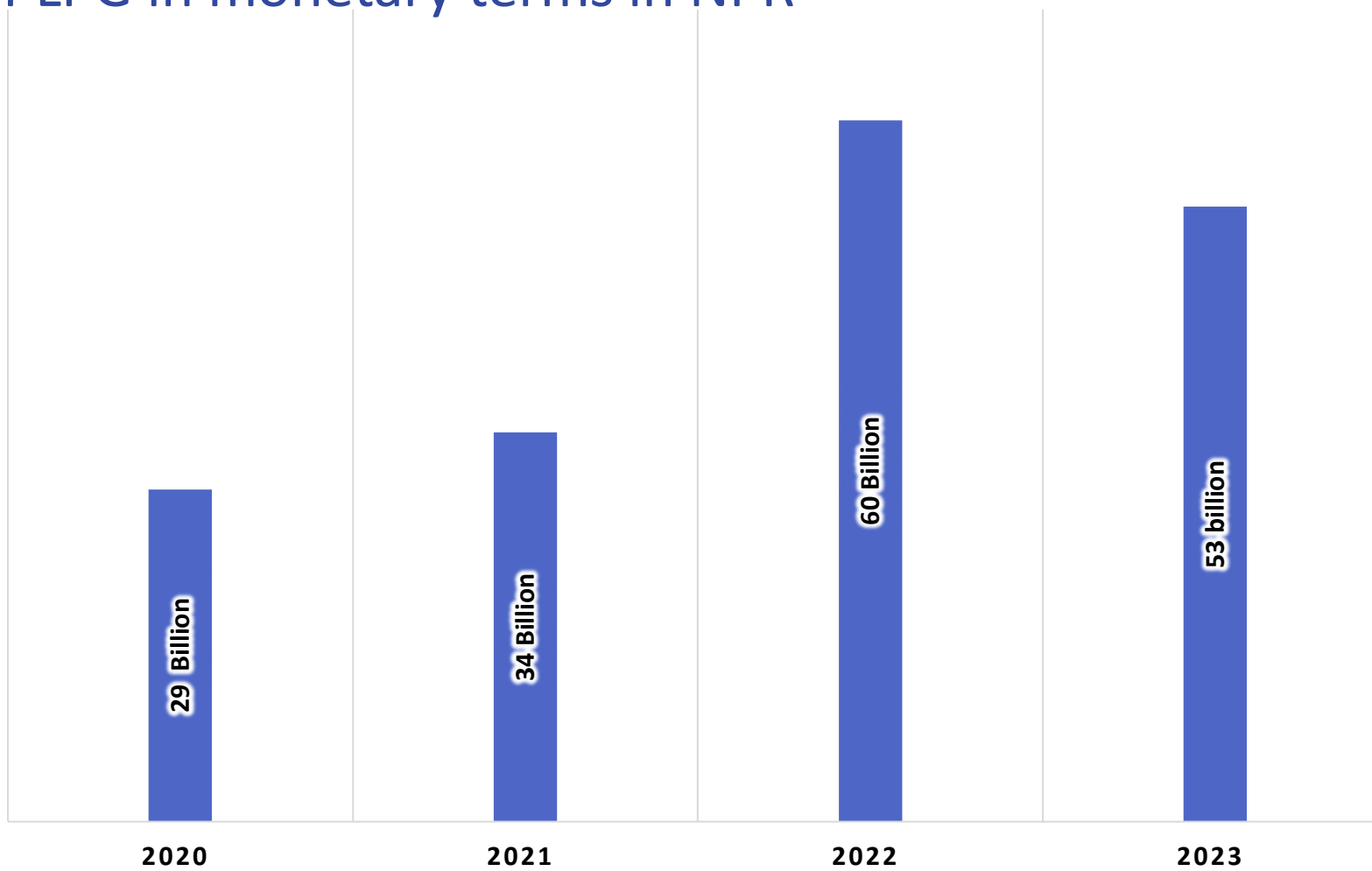
Induction cooktops
NR900/month

**For induction cooktops
NPR 900/month - cheaper by
60% from cooking on LPG**

(CES, 2020; Banerjee, M. et al., 2016; Narasimha Murthy & Antonette D’Ssa, 2004)

(**: Household has at least 2 cylinders in use, and it includes capital/inventory costs of them (02/09/2023, NOC)

Imports of LPG in monetary terms in NPR



(NOC, 2023)

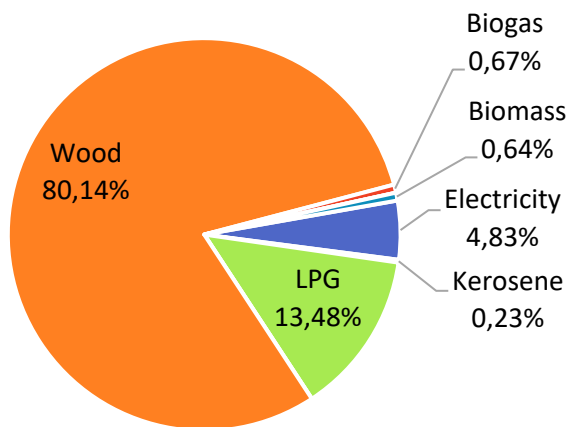
Scenarios developed in LEAP modeling framework for Nepal's LTS – NZE by 2045

- REF – Reference Scenario
- WEM – With Existing Measures Scenario
- WAM – With Additional Measures Scenario

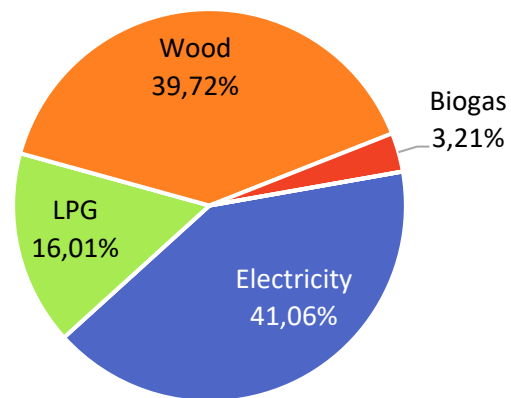
Petajoules	2030	2050
REF	349	506
WEM	243	271
WAM	241	279

Urban Households

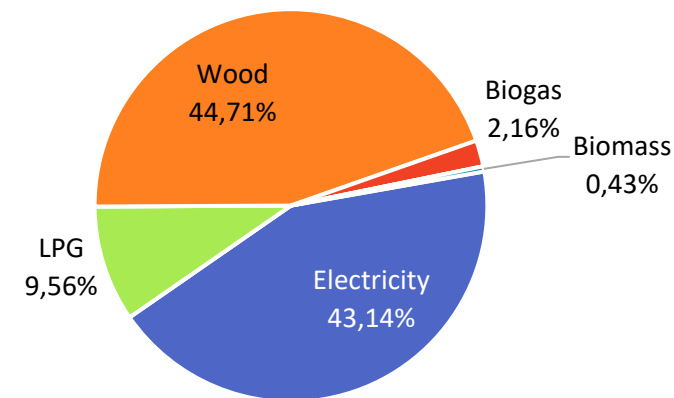
REF - 2030



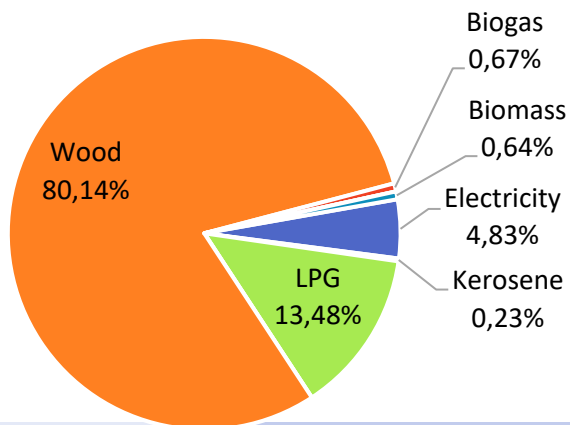
WEM - 2030



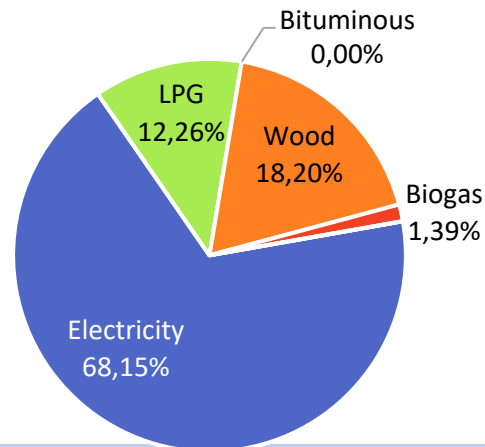
WAM - 2030



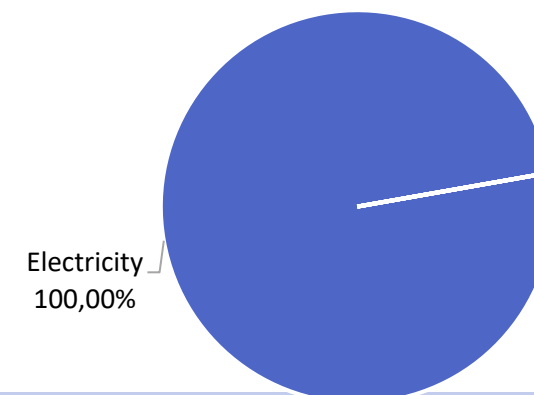
REF - 2050



WEM - 2050

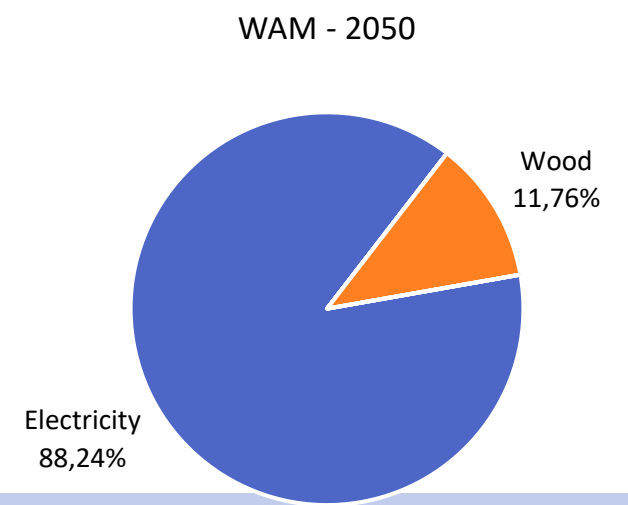
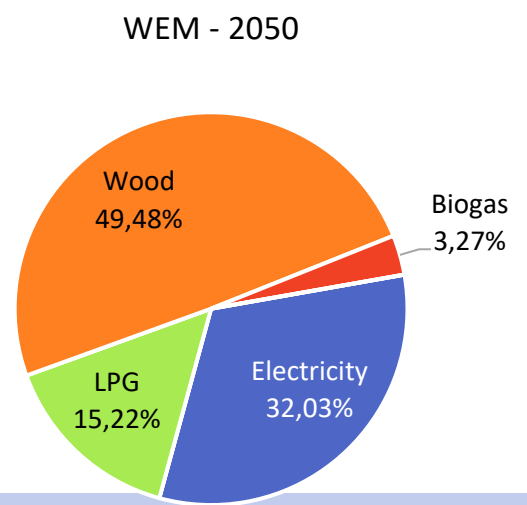
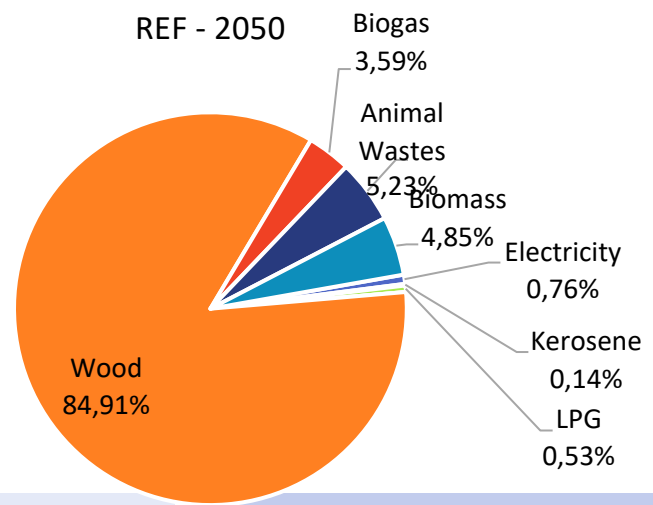
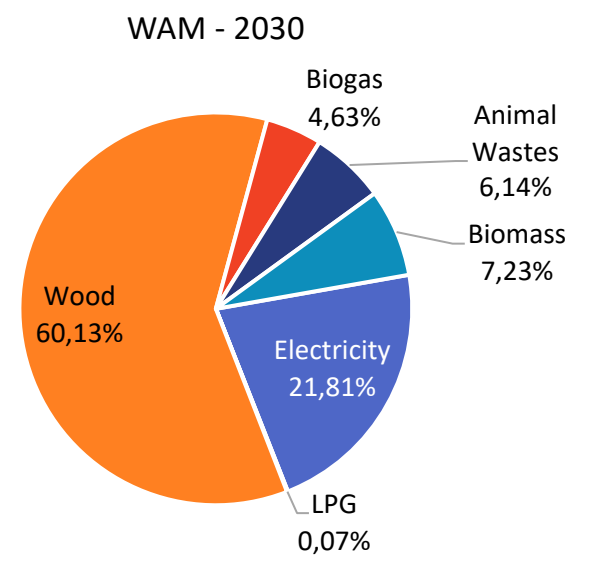
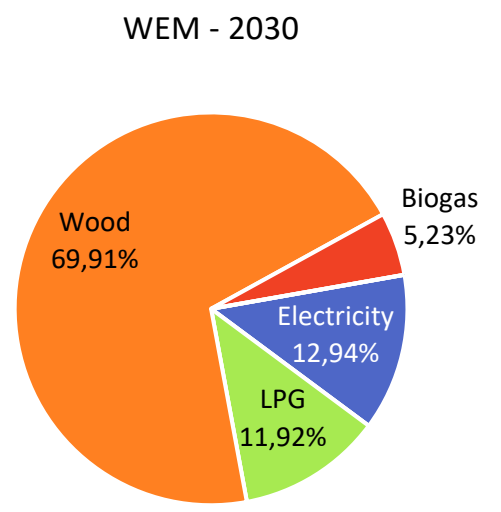
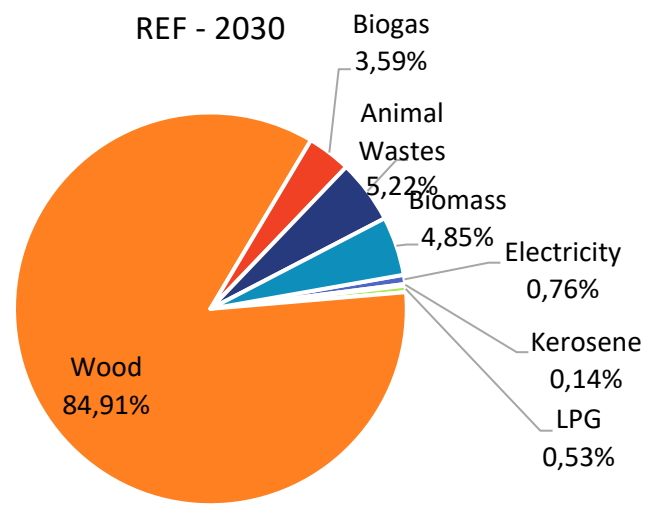


WAM - 2050

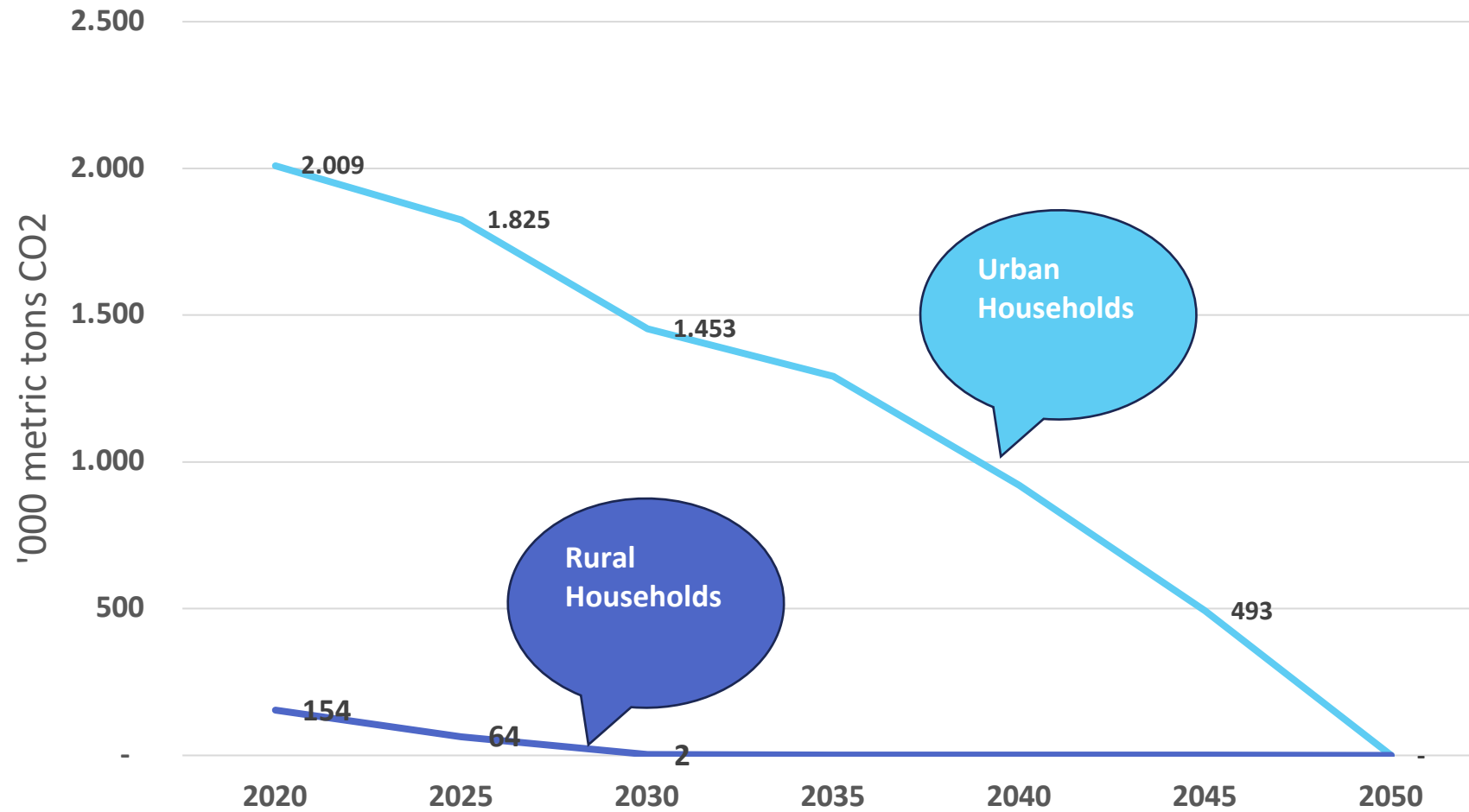


Petajoules	2030	2050
REF	106	74
WEM	50	28
WAM	53	18

Rural Households

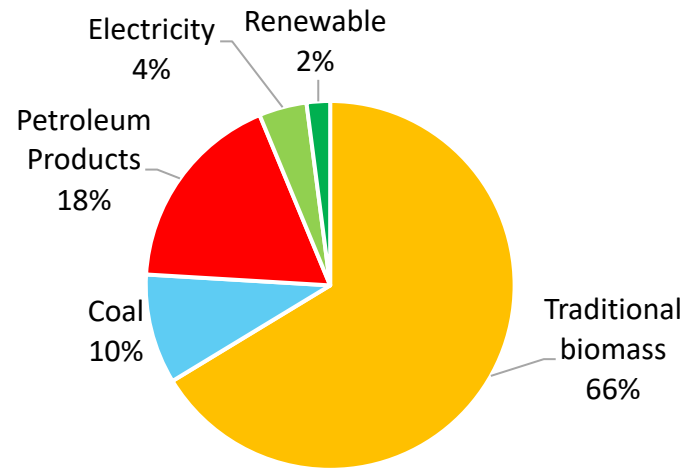


CO₂ Emissions in Households in LTS-NZE Scenario



Energy Mix:

2021

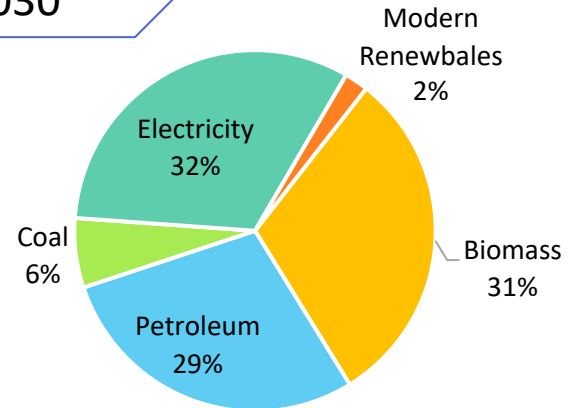


1 PJ = 23,885 toe

626 PJ (173.6 TWh)

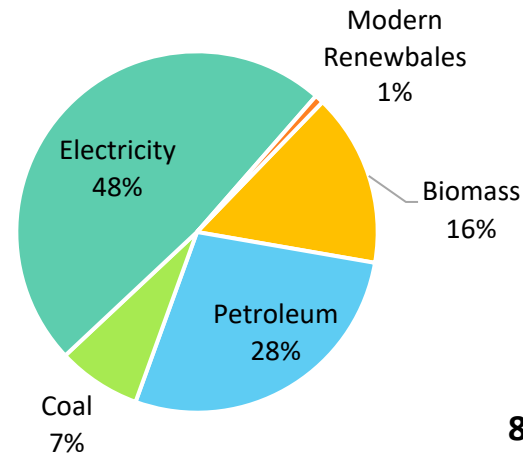
WEM

2030



500 PJ

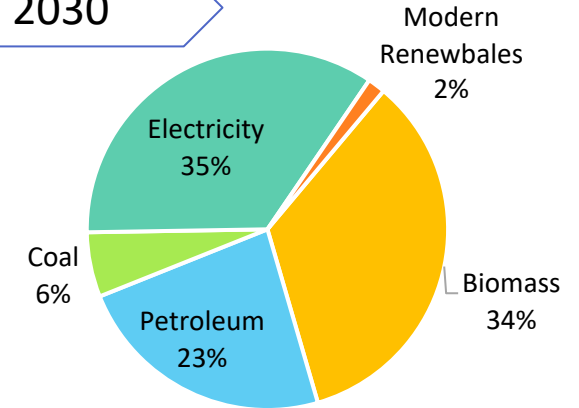
2050



830 PJ

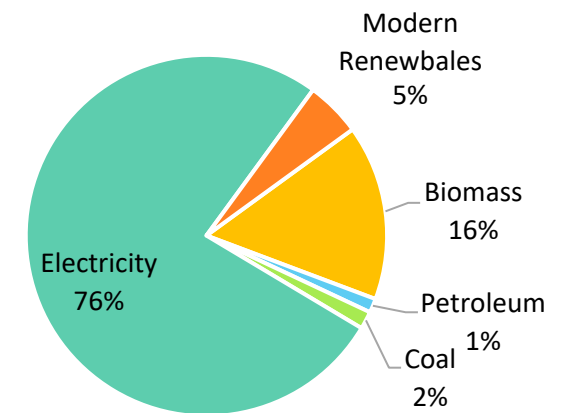
WAM

2030



498 PJ

2050

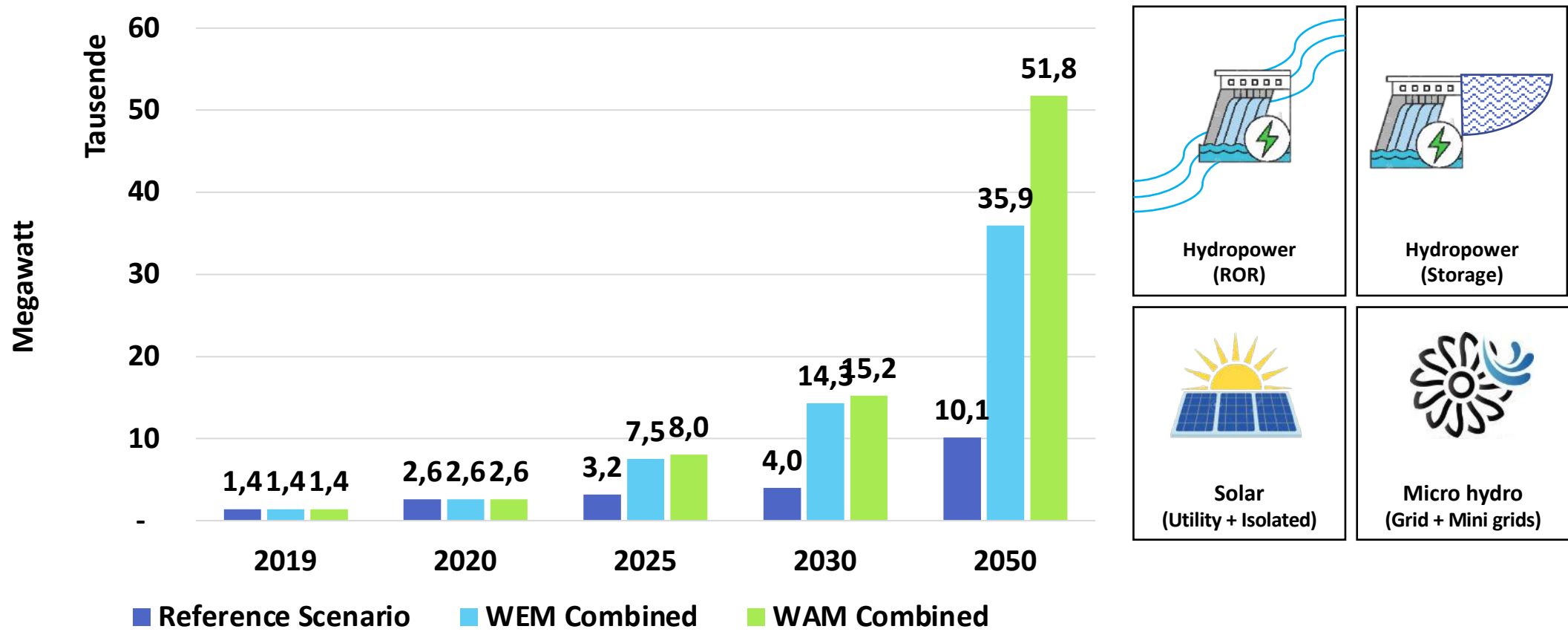


714 PJ



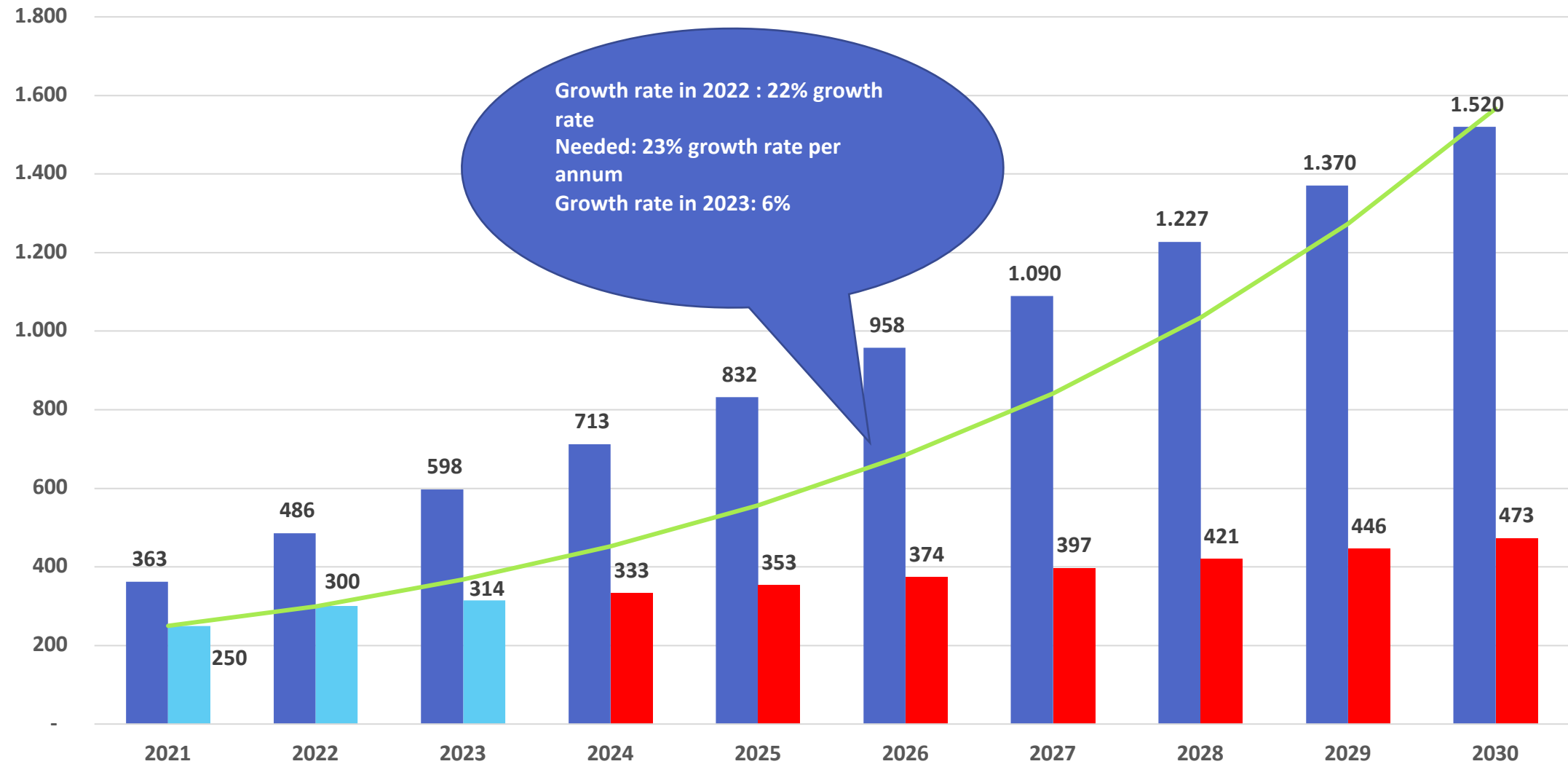
Power plant Requirements* (Hydro + Solar)

(* with 30% Reserve Margin)



By 2050: 2.1 GW – Utility Scale Solar PV, 1 GW Solar Home Systems, 100 MW Micro hydro

Per capita electricity consumption as per NZE and current trend (kWh/capita)
(NSO, 2023; NEA, 2023; Nepal LTS –NZE, 2021)



Some takeaways

- Electricity Supply is increasing
- Electricity consumption has not been able to keep pace with the supply
- Main Hurdles and Challenges
 - Transmission and distribution Infrastructure and its modernization
- Needed Awareness creation in household consumers to electricity for cooking
- Is government/NEA more focused on electricity exports?
- With the current trend, achievement of LTS – NZE targets seems a long way to go.



1. Nepal's long –term strategy for net-zero emissions by 2045
<https://unfccc.int/sites/default/files/resource/NepalLTLEDS.pdf>
2. Energy consumption and supply situation in Federal system of Nepal
<http://www.wecs.gov.np/pages/reports-and-publications>
3. Shree Raj Shakya and Amrit Man Nakarmi et al., 2023. Environmental, energy security, and energy equity (3E) benefits of net-zero emission strategy in a developing country: A case study of Nepal. *Energy Reports*, Elsevier Publications.
<https://doi.org/10.1016/j.egy.2023.01.055>

Thank You

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SUSTAINABILITY OF COMMUNITY-BASED MICRO-HYDRO PLANTS IN NEPAL

Resha Piya
Energy Adviser
British Embassy Kathmandu

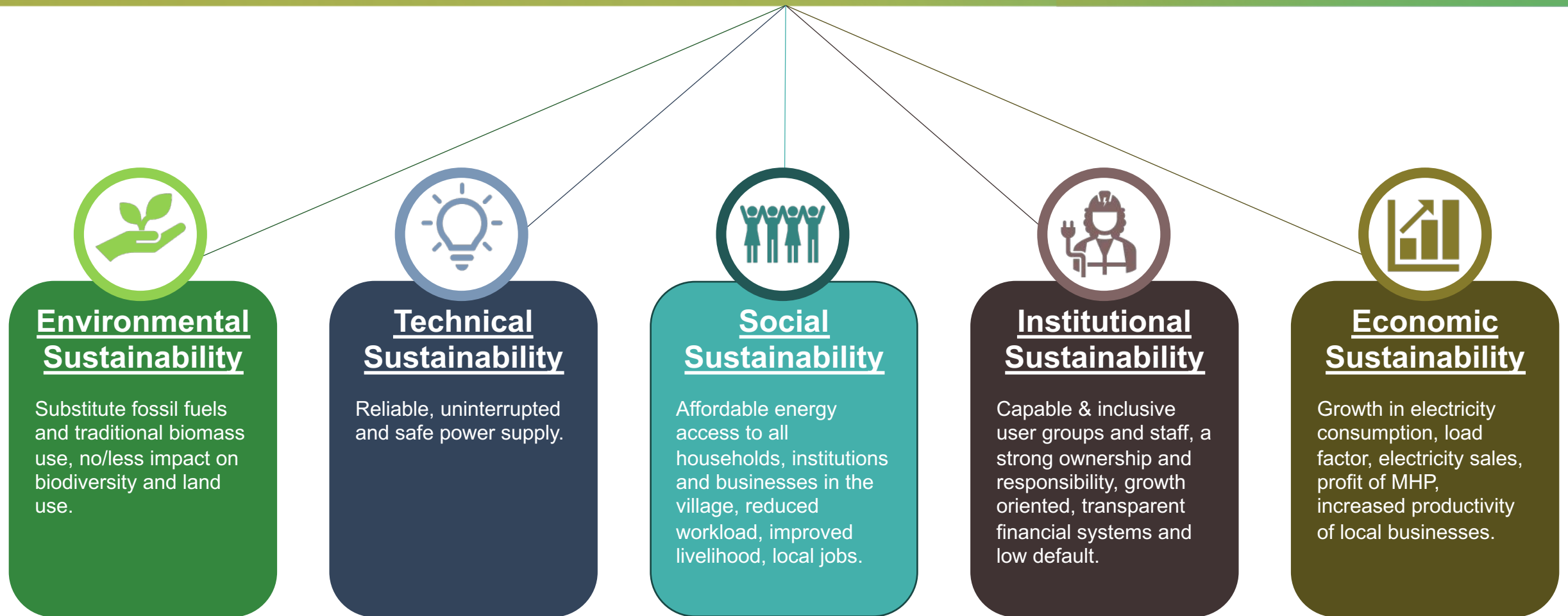


Key messages

1. Micro hydro plants are a promising and proven solution for providing energy access for remote communities, but these projects have often failed to deliver a reliable service.
2. Policy, design, technical and management issues influence the overall performance of micro hydro plants and cause project failures.
3. Improved economic sustainability is crucial for sustainable operation of micro hydro plants as it helps to enable other forms of sustainability (environmental, social, technical and institutional sustainability).



What do you mean by Sustainability of Micro Hydro Plants?



Key Challenges

Design

- Unrealistic (over or under) demand projection.
- In appropriate site selection (landslides)
- Mismatch in equipment sizing.
- Unreliable design parameters (water flow).

Management

- Lack of management capacity to operate MHP as a business.
- Less motivation for user's committee.
- No market segmentation. Not affordable to all.
- Irregular tariff collection.
- Lack of funds for repair and maintenance.



Policy

- High upfront subsidy which is dependent on donor funds.
- Focus on installation only. There is no or limited post-installation support.
- Support for a community-based model- lack of ownership
- Unplanned grid extension.

Technical

- Unskilled operators and managers.
- Low quality equipment/infrastructure.
- Poor system operation and lack of scheduled maintenance and repair.
- Unreliable and poor-quality electricity supply.
- Low plant load factor.

External

- Climate change impacts (floods)
- No/ poor road connectivity and market for local products.
- No/inadequate credit facilities.

What user's want from micro hydro plants?

Reliable and affordable electricity supply to improve quality of life.

Sustainably operating hydropower

Smooth daily operation: proper installation, skilled and sufficient technical staff, regular after-sales services and maintenance, timely repair and post-installation support.

Effective management: standard operating practices, longer operating hours, scientific tariffs and billing systems, a transparent financial management system, suitable payment systems for poor, sufficient spare parts and maintenance funds, better coordination with relevant agencies.



Adequate revenues and profits: timely tariff collection, growth in plant load factors, growth in sales revenue.

Better performing team: business oriented, knowledgeable and inclusive management teams, strive for continuous improvement and growth.

Main takeaway

- If a micro hydro plant has a better performing team that can focus on growth in electricity consumption and translate it into increased electricity sales revenue, then it can be a promising solution for providing energy access for remote communities.



Thank You !

Climate Vulnerability and Resilience of Water Resources in Mountainous Regions

What does climate change mean for mountains?

Dhiraj Pradhananga

Associate Professor, Tribhuvan University (TU), Nepal

General Secretary, TU Alumni Association Nepal

Chairholder, UNESCO Chair in Mountain Water Sustainability

President, The Small Earth Nepal



unesco

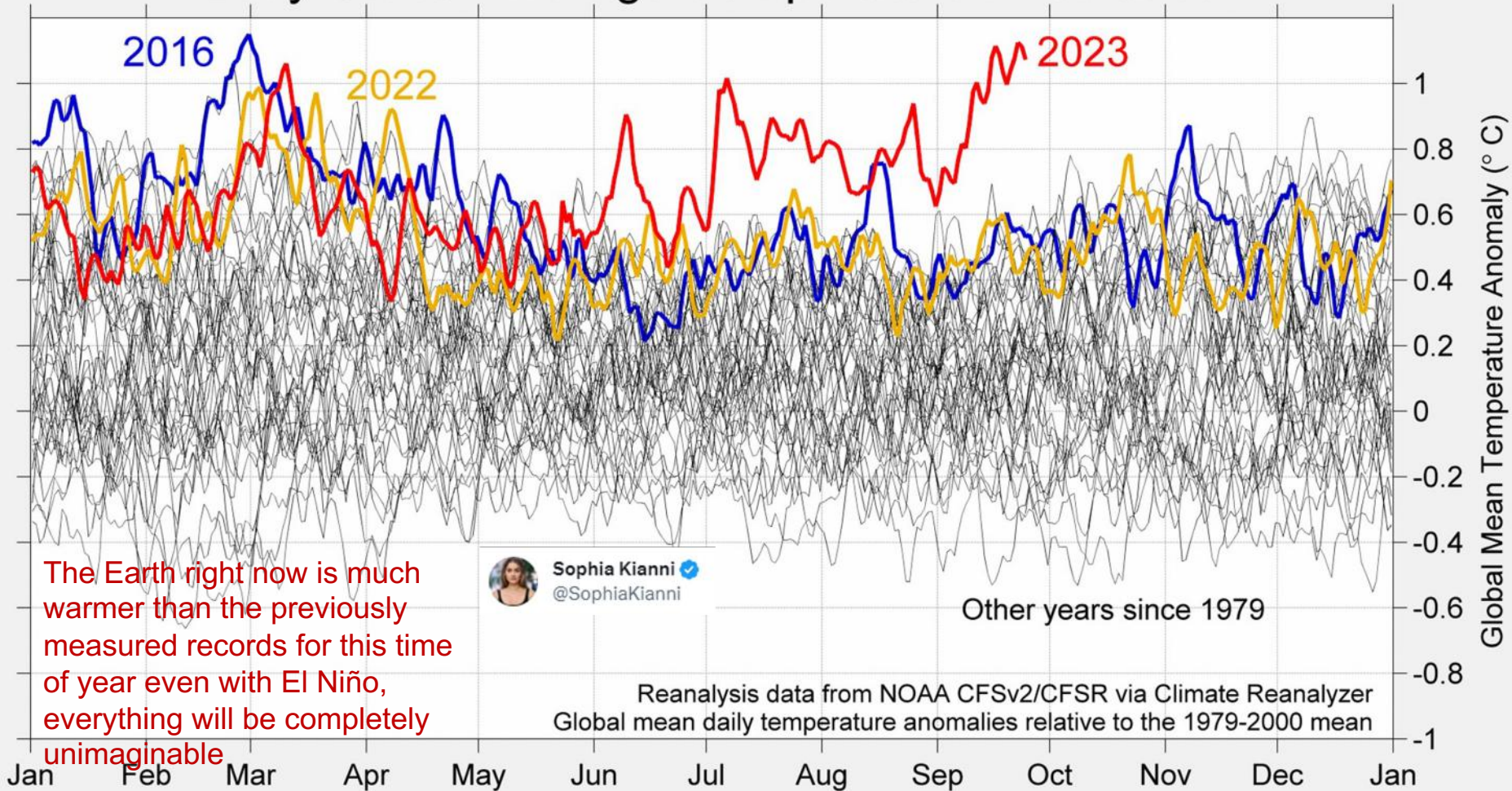
Chair



Three main messages!

1. CHANGE in the precipitation phase could be more important than the change in glaciers!
2. We need a physically based glacial-hydrological model for Cold regions.
3. Collaboration and networking for Research, Capacity Building, and Linking Science-Policy-Society are needed urgently.

Daily Global Average Temperature Anomalies



The Earth right now is much warmer than the previously measured records for this time of year even with El Niño, everything will be completely unimaginable



Sophia Kianni ✓
@SophiaKianni

Warming climate: what does it mean in Nepal? What does it mean to a hydro-meteorologist?

- Mountainous regions consist of over half of the world's freshwater resources – drinking water, biodiversity, irrigation, hydropower, and industries.
- Rising temperatures, changes in precipitation patterns, and intensifying extreme weather events are threatening water resources in these regions.
- Nepal is a mountainous country with a diverse climate and geography, making it particularly vulnerable to the impacts of climate change.
- The Himalayas – Cryospheric Changes: Glaciers are retreating, glacial lakes are expanding, and new glacial lakes are forming.
- Change in precipitation phase?

Introduction

The limited hydroclimatic study in Nepal Himalayas

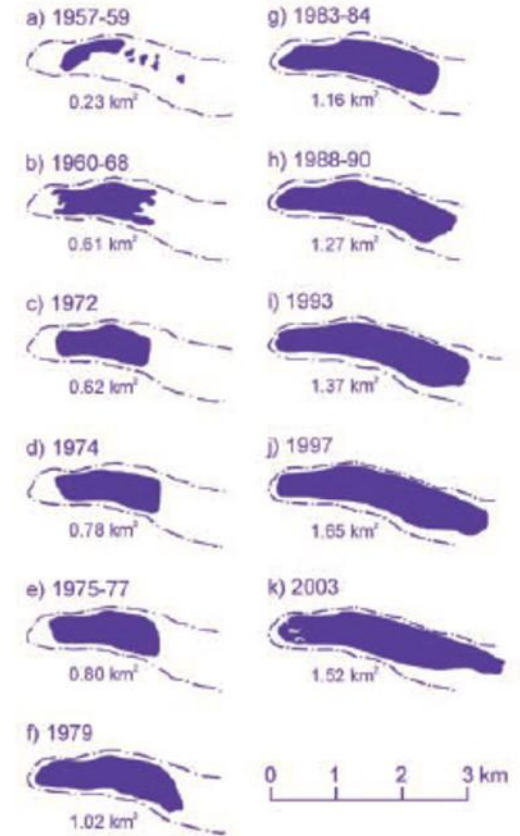


- Northern part of Nepal has a dense distribution of glaciers and glacial lakes.
- Increase rates in air temperature in Nepal are generally higher than the global mean temperature increase.
- Precipitation change is heterogeneous.

- The limited studies in the Himalayas reveals that the glaciers are retreating at a faster rate, and are projected to retreat even faster.
- However, we don't know much about what is going on in many instances as many places are yet to be explored.
- Pronounced warming trend in temperature observation, mountains are experiencing greater warming than southern plains (rate of increase is elevation-dependent, higher in higher elevation).

DHM lowered 2 of the potentially dangerous - Tsho Rolpa and Imja Lakes

- **The Effect of Publicity and Warning of Disaster on Local People: A Case Study of Tsho Rolpa Glacier Lake, October 1998 (Immersion Course on Contemporary Social Issues)**
- Panic is at downstream, not at the upstream



As a result of the melting glacier nearby, the lake has grown six-fold, from an area of 0.23 square kilometres in the late 1950s to 1.5 square kilometres in 2000 (source: RGSL)

(Photo source: Gyawali, WECS)

Voices of People *2010

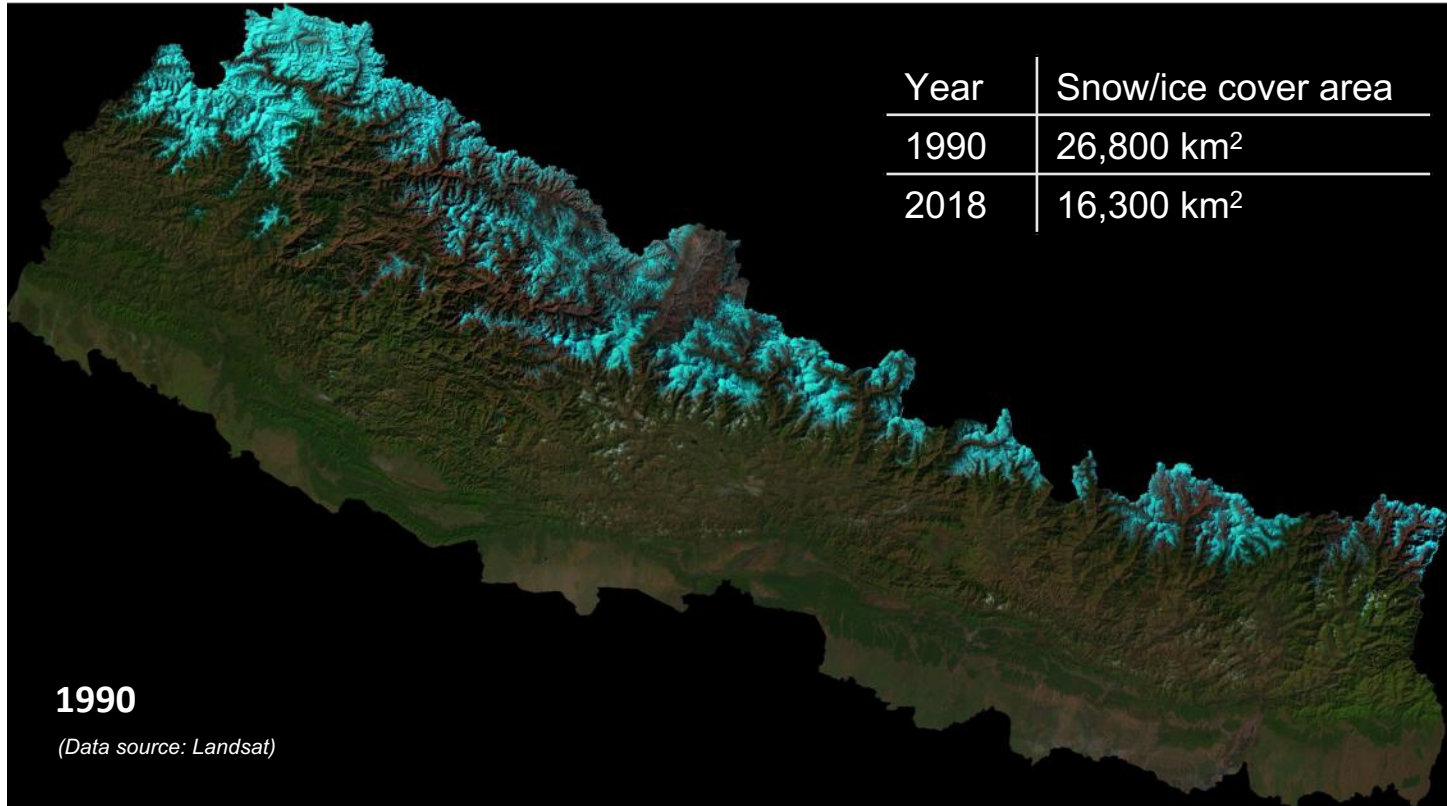
- Based on field observations, information, and interactions with the communities in Nepal
- There are more events of rainfall than snowfall in the mountains resulting in reduced snow deposition
- In the mid-hills, drying up of spring waters
- Drying season much drier than it used to be

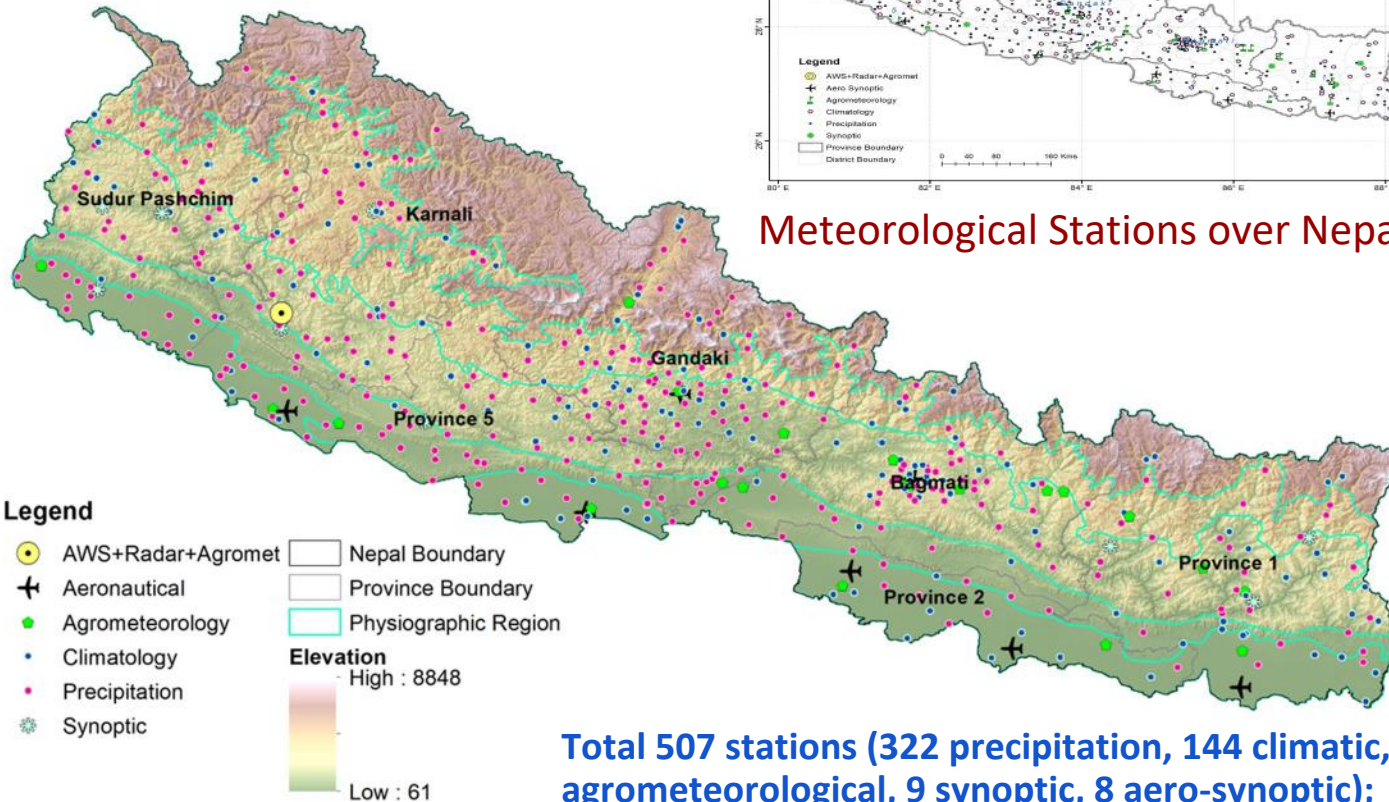


Impacts of Climate Change:
VOICES OF THE PEOPLE



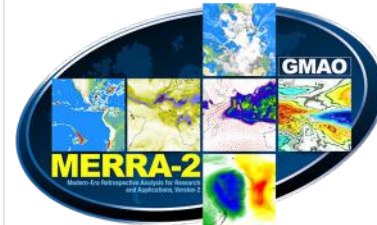
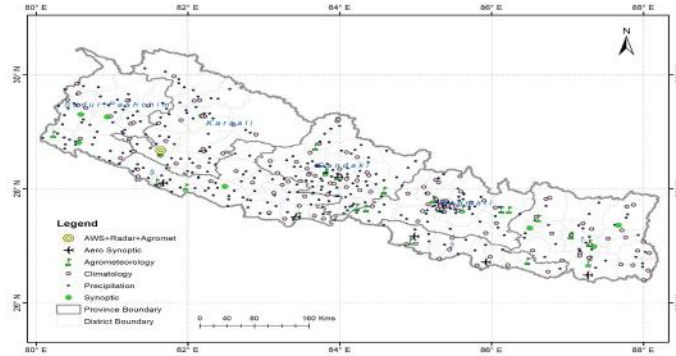
Changes in snow and ice cover area





Meteorological Stations over Nepal

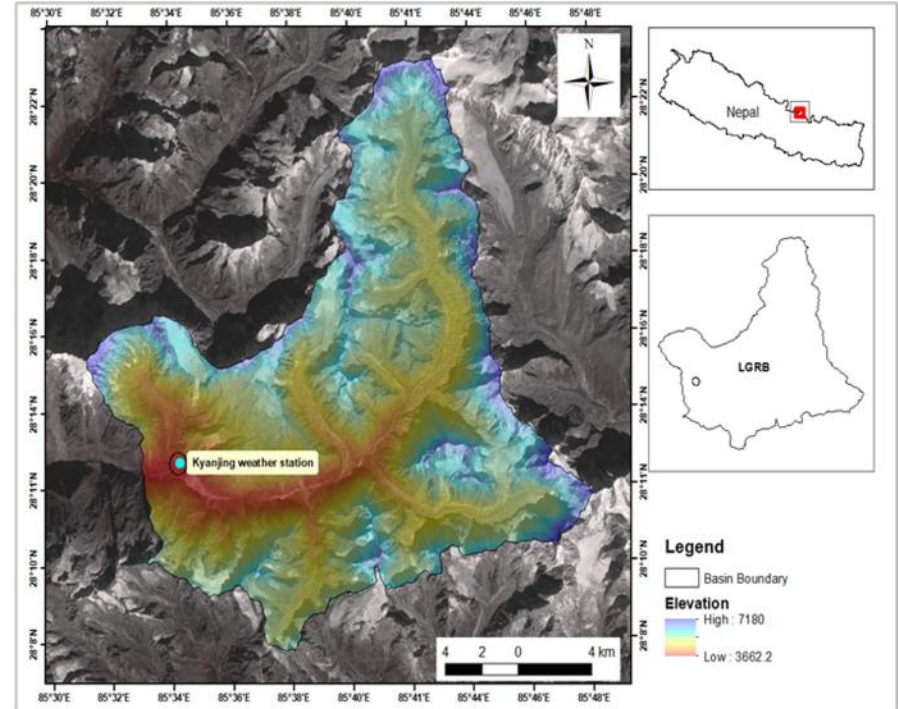
**Total 507 stations (322 precipitation, 144 climatic, 22 agrometeorological, 9 synoptic, 8 aero-synoptic);
Only about 20% of stations are AWS**



Motivation and Three Research Questions

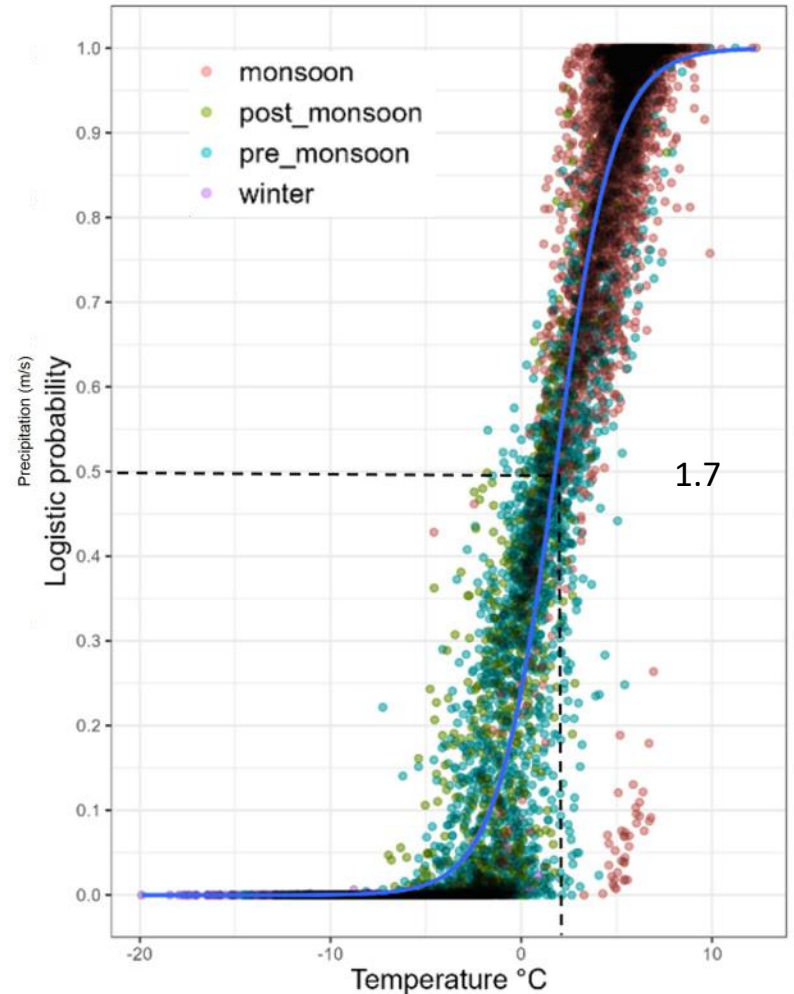
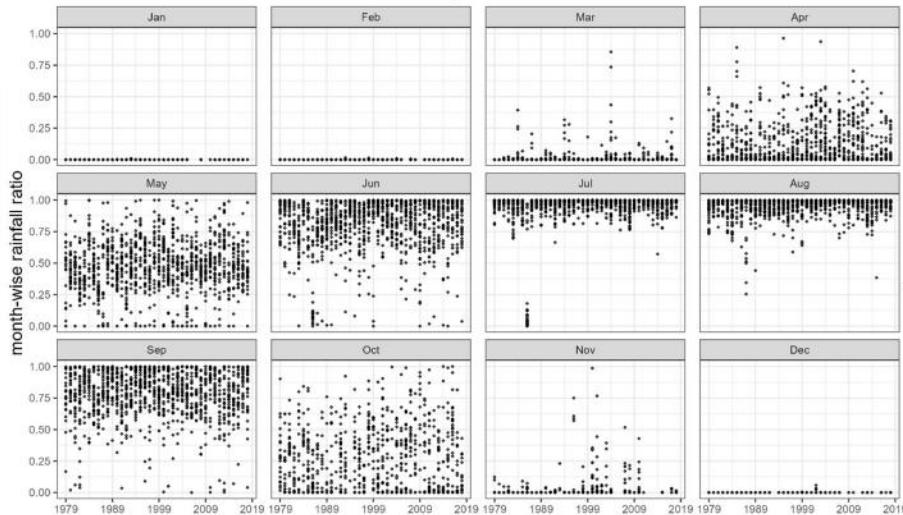
- Capacity Building and Awareness

- Mountain climates are changing, leading to glacier retreat and reduction of snow cover area and changing snow and glacier hydrology
1. Can snow redistribution by wind and gravity to the glacier hydrology model?
 2. How do climate change and transient glacier retreat work together to influence the hydrology of glacierised catchments?
 3. Can we use the physically based model in Nepal Himalayas?

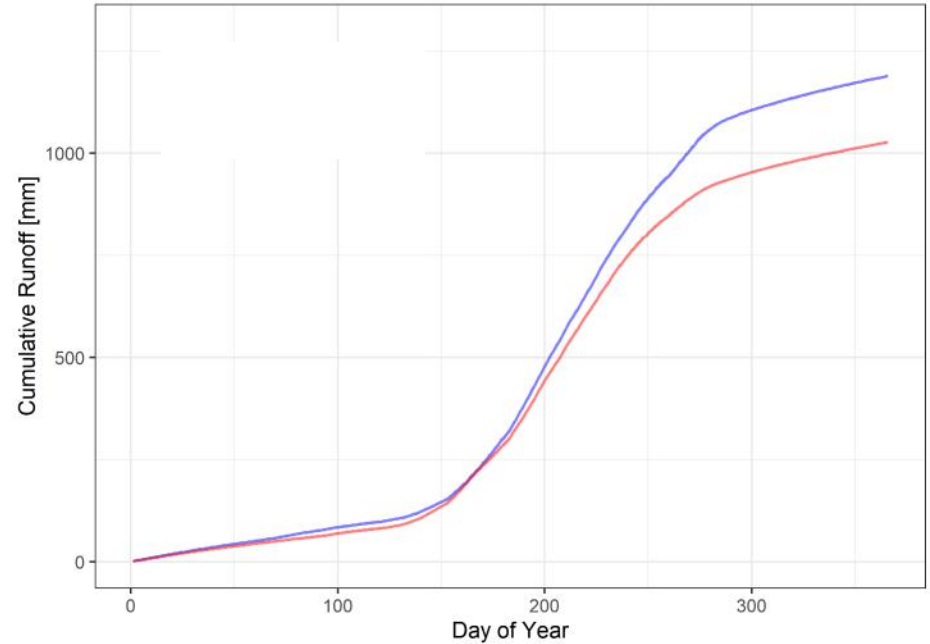
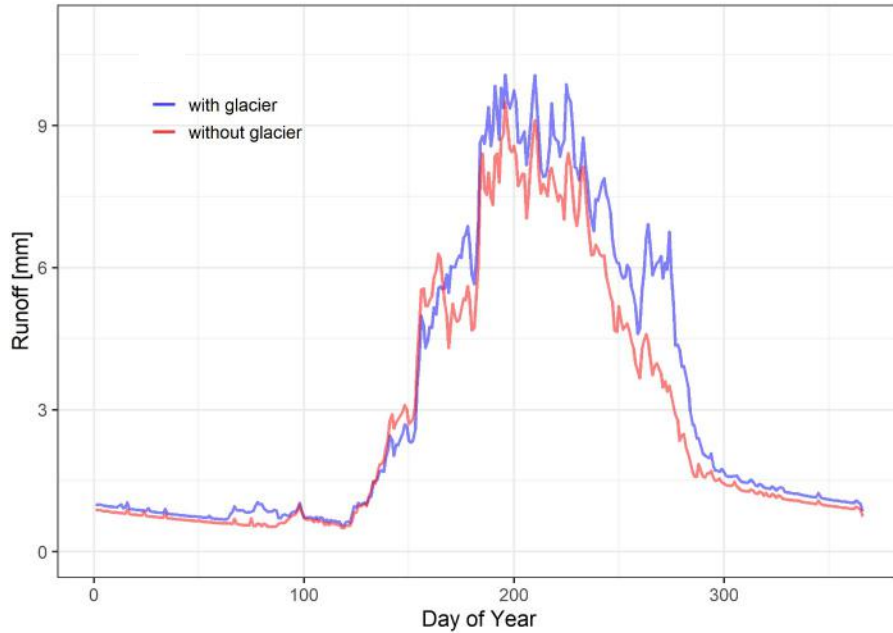


Precipitation Phase

- Rainfall Ratio
- Glacier dynamic is influenced by snow



What would happen if all the glaciers retreat ?



Runoff expected to decrease by around 13.7%.

UNESCO Chair in Mountain Water Sustainability

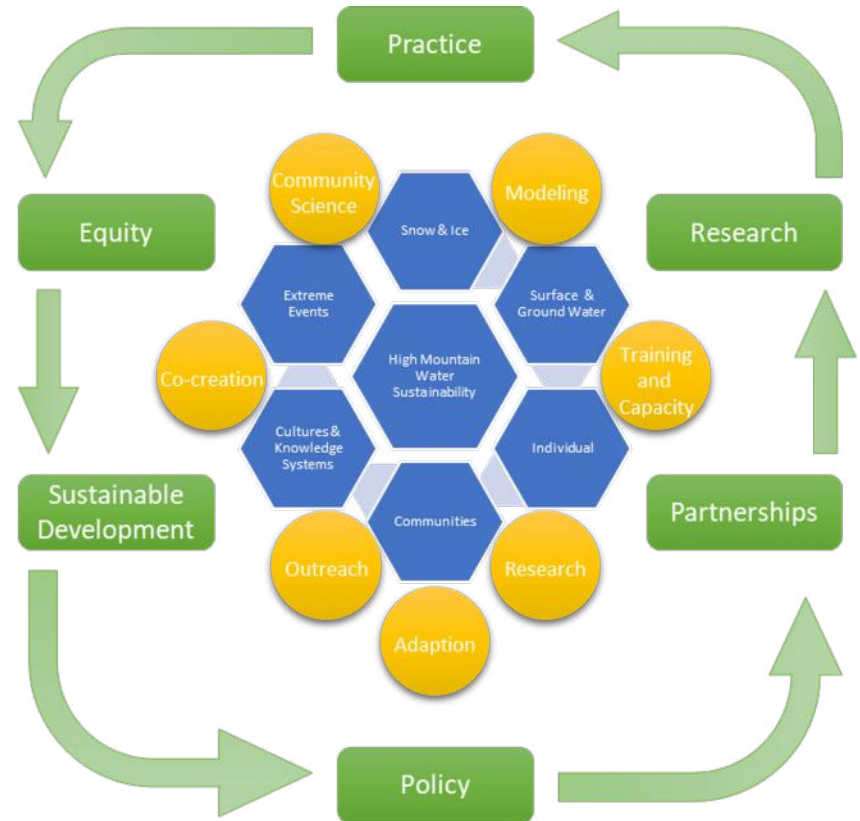


Bridge physical sciences to social and community needs by addressing the following three questions:

1. How will mountain headwater rivers that are currently dominated by snow and glaciers provide secure freshwater for humanity and ecosystems under climate change?
2. How and to what degree are mountain ecosystems and communities impacted by changing climate and hydrological regimes?
3. How can mountain river basins be collaboratively managed to build equitable, sustainable, inclusive and resilient communities, economies and ecosystems whilst respecting and advancing Indigenous rights?

Expected Contributions: Mountain Water Sustainability

1. Promote the interface between science, policy, and social and ethical, and inclusive policies for sustainable development.
2. Collaborative partnership program amongst the universities, research institutes, and scientists in Canada, Chile, and Nepal and their networks in other mountain countries for research, capacity building, and advocacy of water sciences in the mountains.
3. Contribution to advance the achievement of the water-related SDGs in a time of rapid climate change and global development in mountain-based systems.
4. Braiding knowledge systems and linking water sustainability, health, and well-being by utilizing multiple knowledge systems such as indigenous and Western knowledge to address the complex societal and environmental issues associated with mountain-sourced water.
5. Contribution to UNESCO and IHP to achieve equitable and inclusive sustainability in communities dependent on high mountain waters.



International Year/Day of Glaciers

- The year 2025 was declared the **International Year of Glacier Conservation**
- March 21 will be celebrated annually as **World Glacier Day**, beginning in 2025
 - Establishment of a UN Trust Fund in support of activities for glaciers' preservation
 - In 2025, convening the International Conference on Glacier's Preservation in Dushanbe



Intergenerational dialogue on “Achieving Mountain Water Sustainability through Disaster Resilience Practices in Nepal”

Dialogue on “Indigenous and local water management technologies for climate resilient communities”.



What next? Future Direction North-South-South Collaboration

- Education and Training Initiatives
- Developing projects, partnerships, and research initiatives.
- We are committed to continued collaboration and knowledge sharing for sustainable mountain water management.



The poster features a background image of a snow-capped mountain peak. At the top left, there are three logos: a circular emblem with a mountain and water, a triangular emblem with a mountain and water, and a green emblem with a mountain and water. At the top right, there is a red and white logo that says "IAHS YEARS 100 IAHS". The main title is in large yellow text: "International Conference on Mountain Hydrology and Cryosphere (ICMHC-2023)". Below the title, the dates and location are listed: "9 and 10 November 2023" and "Kathmandu and Dhulikhel, Nepal". A URL is provided: "https://www.iahs-nepal.org/icmhc-2023". At the bottom, there are several logos: a globe logo with "CREW", a green and blue logo with "GWF", the text "ICIMOD", the text "IWM International Water Management Institute", a circular emblem with a mountain and water, a blue and red emblem with a mountain and water, and the UNESCO logo.

International Conference on Mountain Hydrology and Cryosphere (ICMHC-2023)

9 and 10 November 2023
Kathmandu and Dhulikhel, Nepal
<https://www.iahs-nepal.org/icmhc-2023>

CREW GWF ICIMOD IWM International Water Management Institute UNESCO

Summary

- Change in precipitation pattern has significant impacts on people's livelihood and biodiversity changes, actions are needed.
- Research needs with physically based hydrological models
- Develop collaboration and partnership among a broader research group in-country and outside; Developing projects, partnerships, and research initiatives, continued collaboration and knowledge sharing for sustainable mountain water management

Thank you!

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+977 9841218296

- UNESCO Chair in Mountain Water Sustainability:
<https://research.ucalgary.ca/unesco-chair-mountain-water-sustainability>
- The Small Earth Nepal: <https://www.smallearth.org.np/>
- International Conference on Mountain Hydrology and Cryosphere:
<https://www.iahs-nepal.org/icmhc-2023>

Question

- What are the focuses of the UNESCO Chair program in Mountain Water Sustainability in transdisciplinary processes and how does this conference complement the Chair Program?

Plans for 2023-2024

- The four universities launch the Chair program and its website in Canada, Chile, and Nepal
- Adoption of research strategies
- Formation of committees (User Advisory and Indigenous Knowledge) and recruitment of students and community-based researchers
- Training courses
 1. physically based cold regions mountain hydrological models
 2. ethical, equitable and inclusive research
- Link to International Network for Alpine Research Catchment Hydrology (INARCH)
- Geospatial analysis of high mountain river basins
- Assessment of the reported societal impacts in the region to understand existing knowledge, attitudes and practices
- Water model development and testing in high mountain basins
- Flood and drought tolerance model selection; Coupled human-natural flood assessment model development and testing
- Developing community-based participatory frameworks for mountain water sustainability

Opportunities for collaboration and partnership

- International Network for Alpine Research Catchment Hydrology (INARCH)
- Prospective programs
 - Climate Impacts on Global Mountain Water Security
 - Mountain Solutions Lab for the Himalayan Region

