



Gender and Climate Change in Bhutan

with a Focus on Nationally Determined Contribution Priority Areas: Agriculture, Energy and Waste



**National Commission for Women and Children
Royal Government of Bhutan**



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Royal Government of Bhutan**

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དཔལ་ལྷན་འབྲུག་གཞུང་།
ROYAL GOVERNMENT OF BHUTAN
རྒྱལ་ཡོངས་ཨམ་སྐྱ་དང་ཨ་ལོ་འི་ལྷན་ཚོགས།
NATIONAL COMMISSION FOR WOMEN AND CHILDREN
Making a difference



Chairperson

Foreword

The National Commission for Women and Children (NCWC), as the nodal agency for gender equality has made efforts to mainstream gender into sectoral plans, policies and programs. Gender mainstreaming into programs are initiated through sector specific projects to enable effective delivery of outcomes. The Royal Government of Bhutan has now embarked on mainstreaming gender into climate sectors to enable gender responsive climate actions through the project "Gender Responsive Nationally Determined Contributions (NDCs) implementation in Bhutan".

The brunt of climate change cannot be escaped, and its impacts are different and non-discriminatory due to the differing roles of men and women. Despite the recognition of differential vulnerabilities and capacities in coping with climate change, the impacts of climate change continue to overly burden the poorest and most vulnerable sections of the population. In general, women bear the brunt of climate change compared to men due to existing gender inequalities and other developmental gaps as well as the nature of the job that they are engaged in.

Similarly, the increasing temperature as a consequence of climate change has adverse but varying consequences on the lives of both men and women due to their differential adaptation and mitigation capacities.

Therefore, a Study on Gender Analysis in three NDC sectors - Agriculture, Waste and Energy - was conducted to develop concrete short-term and long-term recommendations to inform future projects and programs in mainstreaming gender in climate actions. The study deep dives into areas of governance and provides concrete, action-oriented recommendations. Furthermore, the study findings will set a basis for understanding gender climate linkages in these three NDC sectors through data collection, tabulation and analysis. We are hopeful that such studies will enable us to incorporate gender approach analyses into climate change and its sectors to promote understanding of how the identities of women and men determine different vulnerabilities and capacities to deal with climate change.

The NCWC would like to acknowledge the support and contribution of all stakeholders involved during the study. Due to its cross-cutting interlinkages, climate and gender require collaboration and coordination among all stakeholders to deliver effective outcomes. As such, I would like to urge all our stakeholders for your support and cooperation in implementing the study recommendations.

Tashi Delek!

(Dr. Tandi Dorji)
Chairperson
National Commission for Women and Children

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ACRONYMS AND ABBREVIATIONS

ADB	Asian Development Bank
AKRA	Agency Key Result Area
AP	Asia Pacific
APA	Adaptation Plan of Action
APA	Annual Performance Agreement
ARDC	Agricultural Research and Development
AREP	Alternative Renewable Energy Policy
BAOWE	Bhutan Association of Women Entrepreneurs
BCCI	Bhutan Chamber of Commerce and Industry
BEA	Bhutan Electricity Authority
BPC	Bhutan Power Corporation
BTFEC	Bhutan Trust Fund for Environmental Conservation
EE	Energy Efficiency
CB	Clean Bhutan
CBS	Centre for Bhutan Studies
CC	Climate Change
CCA	Climate Change Adaptation
CCM	Climate Change Mitigation
CCP	Climate Change Policy
CEDAW	Convention on the Elimination of all forms of Discrimination Against Women
CIAT	Centre for Tropical Agriculture
CIS	Climate Information Systems
CNR	College for Natural Resources
COP	Conference of Parties
CRA	Climate Resilient Agriculture
CRU	Climate Research Unit
CSA	Climate Smart Agriculture
CSI	Cottage and Small Industries
CSO	Civil Society Organization
DCSI	Department of Cottage and Small Industries
DDM	Department of Disaster Management
DHHS	Department of Hydro-met Services
DHPS	Department of Hydropower and Power Systems
DLG	Department of Local Governance
DoI	Department of Industry
DRC	Department of Revenue and Customs
DoT	Department of Trade
DRE	Division of Renewable Energy
DRM	Disaster Risk Management
ECB	Election Commission of Bhutan
ECCD	Early Childhood Care and Development
ECP	Environment, Climate Change and Poverty
EDP	Economic Development Plan
EE	Energy Efficiency
EE&C	Energy Efficiency and Conservation
FHH	Female-headed household
F	Female
FYP	Five Year Plan
GAP	Gender Action Plan
GBV	Gender Based Violence
GCF	Green Climate Fund

GCFP	Gender and Child Focal Point
GDI	Gender Development Index
GDP	Gross Domestic Product
GECDP	Gender, Environment, Climate Change, Disaster Risk Reduction and Poverty
GEG	Gender Expert Group
GEMS	Gender Equality Monitoring System
GES	Gender Equality Strategy
GE	Gender Equality
GEF	Global Environment Facility
GER	Gross Enrollment Rate
GFP	Gender Focal Point
GGG	Global Gender Gap
GHG	Greenhouse Gas
GIA	Gender Impact Assessment
GII	Gender Inequality Index
GLOF	Glacial Lakes Outburst Flood
GM	Gender Mainstreaming
GNH	Gross National Happiness
GNHC	Gross National Happiness Commission
GRPB	Gender Responsive Planning and Budgeting
HDI	Human Development Index
HEROES	Himalayan Environmental Rythm Observation and Evaluation System
HH	Household
HIMAP	Himalayan Monitoring and Assessment Programme
ICIMOD	International Centre for Integrated Mountain Development
ICOS	Information Communication and Outreach
IETC	International Environmental Technology Centre
INDC	Intended Nationally Determined Contribution
ISWM	Integrated Solid Waste Management
IWRM	Integrated Water Resources Management
JICA	Japan International Cooperation Agency
LDPM	Local Development Planning Manual
LED	Low Emission Development Strategy
LPG	Liquid Petroleum Gas
LKRA	Local Key Result Area
M	Male
M&E	Monitoring and Evaluation
MoAF	Ministry of Agriculture and Forests
MoE	Ministry of Education
MoEA	Ministry of Economic Affairs
MoF	Ministry of Finance
MoFA	Ministry of Foreign Affairs
MoH	Ministry of Health
MoHCA	Ministry of Home and Cultural Affairs
MoIC	Ministry of Information and Communication
MoLHR	Ministry of Labour and Human Resources
MoWHS	Ministry of Works and Human Settlements
MSW	Municipal Solid Waste
MT	Megaton
MW	Megawatt
NAMA	National Appropriate Mitigation Action
NAP	National Adaptation Plan
NAPA	National Adaption Programme of Action
NBC	National Biodiversity Centre
NCCC	National Climate Change Committee

NCHM	National Centre for Hydrology and Meteorology
NCWC	National Commission for Women and Children
NDC	Nationally Determined Contribution
NEC	National Environment Commission
NEPA	National Environmental Protection Act
NER	Net Enrollment Rate
NGEP	National Gender Equality Policy
NGO	Non-governmental organization
NKRA	National Key Result Area
NLC	National Land Commission
NLCS	National Land Commission Secretariat
NPAG(E)	National Plan of Action for Gender (Equality)
NPAPGEE0	National Plan of Action to Promote Gender Equality in Elected Offices
NPPC	National Plant Protection Centre
NSB	National Statistical Bureau
NSC	National Seed Centre
NSSC	National Soil Services Centre
NWFPs	Non-Wood Forest Products
NWMS	National Waste Management Strategy
OA	Organic Agriculture
OHS	Occupational Health and Safety
PE	Poverty and Environment
PES	Payment for Environmental Services
PHCB	Population and Housing Census of Bhutan
PIA	Pasakha Industrial Area
PM	Parts per million
PPD	Policy and Planning Division
R&D	Research and Development
RAA	Royal Audit Authority
RDC	Research and Development Centre
RE	Renewable Energy
REC	Royal Educational Council
RET	Renewable Energy Technology
RGoB	Royal Government of Bhutan
RIM	Royal Institute of Management
RLDC	Regional Livestock Development Centre
RNR	Renewable Natural Resources
RSPN	Royal Society for Protection of Nature
RTC	Royal Thimphu College
RUB	Royal University Bhutan
SAP	School Agriculture Programme
SAPA	Sectoral Adaptation Plan of Action
SAARC	South Asian Association for Regional Cooperation
SDGs	Sustainable Development Goals
SJI	Samdrup Jongkhar Initiative
SRHS	Sexual and Reproductive Health Services
STEM	Science, Technology, Engineering and Mathematics
TF	Tarayana Foundation
TVET	Technical and Vocational Education and Training
UFB	Ultra Fine Particles
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNFPA	United Nations Population Fund
UWICER	Ugyen Wangchuk Institute for Conservation and Environmental Research

VAW	Violence Against Women
VAWG	Violence Against Women and Girls
VEEET	Village Electrical Engineering Technician
WHO	World Health Organization
WMD	Waste Management Division
WWF	World Wildlife Fund
ZFF	Zamin Friends Forever



EXECUTIVE SUMMARY

This report is intended to assist the Royal Government of Bhutan and other stakeholders, with ongoing efforts to achieve the country's pursuit of carbon-neutral, resilient and sustainable development in a gender-responsive way.

The study that was conducted looks into the gender–climate change nexus in Bhutan, particularly in the areas of agriculture, energy and waste sector identified in the Nationally Determined Contribution (NDC), focusing on climate change impacts and actions. It included a desk review of existing literature, interviews with 30 organizations, a national survey with a sample of 600 households in 10 dzongkhags covering three agro-ecological regions of the country, and several stakeholder consultations.

Bhutan is a net sink of Greenhouse Gases (GHGs) because of its large forest cover, relatively low levels of industrial activity, and almost 100 percent electricity generated by hydropower. However, GHG emissions are increasing, particularly in key sectors such as industry, transport and waste. Impacts of climate change (CC) range from rise in average temperatures, extreme weather events, melting of glaciers, increased flooding including Glacial Lake Outburst Floods (GLOFs), landslides and wildfires, erratic rainfall pattern, shortage of water supply and decreased agricultural productivity, increase in pests and diseases, more frequent and intensifying disasters, and destruction of infrastructure. In the survey, over eight in 10 people reported that climate change affects the natural resources they depend on for their livelihood. A little over half the surveyed households reported being well-prepared in the event of a disaster, but more than one third indicated lack of preparedness for CC-induced disasters.

Bhutan is signatory to many international gender conventions and agreements, and equal rights are enshrined in its Constitution and other legal frameworks. Still, the gender equality status in the country presents a mixed picture. While important progress has been made over the years in the areas of education, maternal mortality, and participation in society and work, gender inequalities persist in other critical areas. These include unequal land ownership, low representation in public and political institutions, higher unemployment levels, gender payment gaps and gender-based violence. The survey indicates male dominance in decision-making at the household level, and confirms that men spend more time outside the home than women do, with the latter spending more time on household tasks.

Gender differences are visible with respect to CC vulnerability, participation in CC decision-making and action, and in diverse levels of benefit-sharing. The responsibilities held by women become more difficult, productivity decreases, and women and girls are disproportionately affected with increasing male out-migration, violence and sexual exploitation, health problems, and deteriorating working conditions. Differences also exist with respect to the felt effects of climate change on personal life. In the survey, a relatively higher proportion of women reported a decrease in household income, as well as changes in household food habits and in the natural resources they depend on. About half of the population agreed that climate change increases women's workload more than that of men's, and that climate change impacts women more than men.

To cope with climate change, men are more inclined to look for alternative employment and/ or to migrate to a city. On the other hand, a higher proportion of women reported that they changed their consumption patterns including buying water. Women's active participation in climate policy development and decision-making is significantly lower than that of men. Although the role of women in CC mitigation and adaptation is not very clear, interviewees shared examples where this crucial role becomes visible.

The agricultural sector is a significant GHG emitter in Bhutan. At the same time, climate change exacerbates challenges faced by the sector—which includes crop production, livestock rearing and forest-management and -use—with loss of agro-biodiversity and agricultural land, and increases in human-wildlife conflicts, pests and diseases. Other problems that the rural population faces are labour shortages and persistent poverty.

Most study interviewees mentioned that while half of farmers are women, feminisation of agriculture is taking place due to men out-migration. Women have access to land, but less control than men over this resource. Their work burdens are also higher because of informal care tasks, and the male to female ratio for unpaid work is 2:3. Women participate actively in the Cottage and Small Industries (CSIs), including in agri-businesses and the market place. Given their roles and responsibilities, rural women are more vulnerable than men to the effects of climate change, including when climate-induced disasters hit. The survey also learned that most rural men (84percent) and relatively less women (69percent) are aware of climate- smart agricultural initiatives.

Having pledged to remain carbon neutral for all times, Bhutan has been promoting renewable energy as well as energy - efficiency and conservation. The study finds that the energy demands of women and men differ. Women are mainly responsible for housework including cooking and heating, and rely largely on fuelwood and other biomass. However, by large men are responsible for the supply of all forms of energy, women are also responsible for fuelwood collection. Modern sustainable energy services and fuel - and labour-saving technologies such as improved cookstoves help reduce drudgery, as well as indoor air pollution - thereby reducing harmful effects on women's health.

With a slightly higher proportion of women than men, more than 70 percent of the survey respondents reported awareness of initiatives that promote energy-saving. However, only one percent reported the use of energy-efficient cooking appliances. A higher proportion of men than women reported having access to information about sustainable renewable energy. Most employees in the energy sector are men, and women and men are often impacted differently by energy projects. Women are still a minority in science, technology, engineering and mathematics (STEM) education but their participation is increasing. In the CSI-sector, sustainable energy production and consumption offer important opportunities for enhancing efficiency, sustainability, and women's empowerment.

Transport as the most prominent GHG emitter in the energy sector is not gender-neutral. Overall, women have inferior access to transportation compared to men. Women use urban public transportation more than men, and prefer taxis over buses and other modes of transport. Personal safety while using public transportation is of high concern, both for passengers and (female) taxi drivers. Employment in the transport sector is male-dominated and only few women are engaged in local decision-making about roads. Meanwhile, women carry disproportionate shares in the maintenance of farm roads, and road construction work is often hard and unsafe especially under deteriorating weather conditions.

With increasing amounts of solid waste, emissions from waste disposal and wastewater treatment and discharge forms a small but an increasing contributor to GHG emission. The gender gap in the waste sector is quite large in terms of division of labour, power structures, payment, access to information and equipment.

Women are the main managers of household waste, and are active as small entrepreneurs - especially in prevention, minimization, reuse and recycling - often in informal settings. Waste segregation at source is applied, and some engage in home composting. Gender divisions are evident in the waste sector with men employed as machine operators and drivers of waste collection vehicles. On the other hand, women are engaged in waste collection and segregation. In these positions, women often have less job security, and are unaware of adverse health effects of waste. Most informal scrap dealers, repair shops and waste management entities are owned by men, and many women work at the scrapyards.

Some non-governmental organizations empower women and their CSIs in recycling businesses, prevention of waste, and composting. Awareness on sustainable waste management methods and the type of information received by respondents is diverse. There is a major discrepancy between the support required and the support actually received for waste management by beneficiaries.

Overall, there are adequate legal frameworks on climate change, agriculture, energy, transport and waste management - but most are gender neutral or blind. Nevertheless, increasing efforts are made to integrate gender into recent policies, plans, strategies and roadmaps - such as the Climate Change Policy of the Kingdom of Bhutan 2020 (CCP).

While institutions like the National Commission for Women and Children and the network of Gender Focal Points offer important starting points for mainstreaming gender into the sectoral plan, policies and programmes, there is limited institutional capacity and resources at the implementation level. While there is increasing interest in the gender-CC nexus, there is limited gender-disaggregated data on climate change, agriculture, energy and waste management, and related research and expertise.

The key recommendations of the study includes; promoting a gender-transformative approach in climate-related policies and actions, awareness-raising and capacity-building, evidence-building, participation, empowerment and changing mindset through education.

Given the study's focus on selected NDC areas of agriculture, energy and waste sector, the study also provides specific recommendations pertaining to the promotion of gender-responsive climate-smart and -resilient agriculture; sustainable energy consumption and production; sustainable transport systems; and sustainable waste management.





1. INTRODUCTION

1.1 Country Context

The Himalayan Kingdom of Bhutan is landlocked between China to its north, and India to its west, south and east. It is a small, mountainous country running about 300 kilometres (km) wide and 150 km long with an elevation of 160 metres (m) above sea level in the southern foothills to 7,500 m along the northern ridges. Great climatic variations can be found across several agro-ecological zones - namely alpine, temperate and sub-tropical.

The southern belt experiences subtropical climate with hot summers, monsoon between mid-July to September, and significant annual rainfall (ca. 5,000 mm) that can lead to flooding, landslides and other calamities. Cold winters are a feature of valleys like the capital Thimphu, among others, often accompanied by snow. The far North has a harsh mountain climate, with most areas above 4,500 m covered in snow and ice.

Bhutan's isolation and physiographical variation also results in its status as a biodiversity hotspot, hosting more than 11,000 species or five percent of the world's biodiversity. This includes, among others, 105 endemic species, 678 species of birds, and close to 200 mammals. Some of these, including the Bengal tiger, snow leopard, Asian elephant, red panda, golden langur, and the national animal-the takin-are seriously endangered (UNDP, 2019a).

Article 5 of the Constitution of the Kingdom of Bhutan 2008 mandates the Royal Government of Bhutan (RGoB) "to protect, conserve and improve the pristine environment and safeguard the biodiversity of the country" and "to ensure a safe and healthy environment for present and future generations"; and therewith to strive for intergenerational equity.

Bhutan has committed 51.44 percent of its total land area as protected areas and connecting biological corridors (MOAF 2018). While the Constitution mandates at least 60 percent of the country to be maintained under forest cover at all times, the current forest coverage is 71 percent (MOAF 2016). This extensive coverage contributes to the fact that Bhutan is carbon neutral, with negative net greenhouse gas emission. It is the country's goal to stay carbon neutral for all times to come, as is also reflected in its Nationally Determined Contribution (NDC) of 2015.

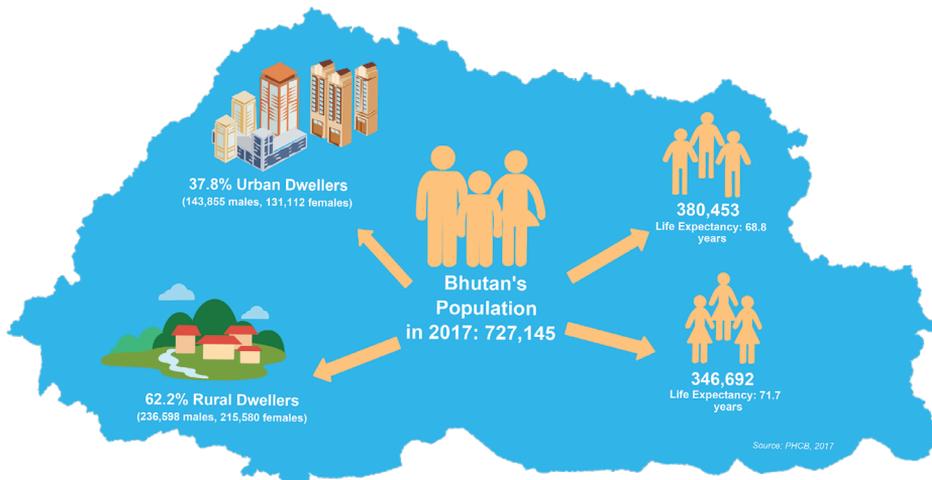


Figure 1: Demographic characteristics of Bhutan as of 2017.

The population is concentrated along the east-west highway in the central valleys and the southern belt. Given a predominant pattern of male migration to urban areas, labour shortages have developed in agriculture with significant impacts on rural women (ADB, 2014).

Bhutan's Human Development Index (HDI) of 0.617 ranked 134 of the 189 researched countries in 2018, placing it in the medium HDI country category (UNDP, 2019b). See Table 1 for GDP in 2010 and 2019.

Table 1: Bhutan's GDP in 2010 and in 2019 (NSB, 2018a)

	2010	2018
GDP (in million USD)	1,585.32	2,446.30
GDP growth rate (%)	11.94	5.46
GDP per capita (USD)	2,277.76	3,411.94

In 2019 the percentage Gross Domestic Product (GDP) share of the primary sector (agriculture, livestock, forestry) is 15.82 percent (2015: 14.44%); of secondary sector (industry, manufacturing) 36.13 percent (2015: 42.49%); and of the tertiary sector (services) 48.05 percent (2015: 43.08%). (NSB, 2019). The economic outlook for the fiscal year 2019-2020 indicates that the economy is projected to grow at 7.2 percent (MoF, 2019).

The primary sector - mainly constituting those engaged in subsistence agriculture - employs 51.4 percent of the total labour force, while the services sector employs 34.9 percent and the industry sector employs 14 percent as of 2019. The overall unemployment rate in 2019 was 3.3 percent, with male unemployment at 2.7 percent, female unemployment at 4.2 percent, and youth (ages 15-24) unemployment at 12.3 percent (NSB, 2019). Some of the key development challenges for Bhutan are rural poverty, rapid urbanization, small private sector, youth unemployment, and gender gaps.

1.2 Governance Structure

With the adoption of the Constitution in 2008, Bhutan transitioned from a monarchy to a Constitutional Democratic Monarchy in the same year. Its Parliament consists of an upper house or the National Council, comprised of 20 members representing the country's 20 dzongkhags (districts) and five eminent members appointed by His Majesty the King; and a lower house or the National Assembly, comprised of elected members from 47 constituencies. As reflected in the Local Governance Act 2009, decentralization is promoted and the 20 dzongkhags are further classified into 205 gewogs (sub-districts), and four thromdes (municipalities).

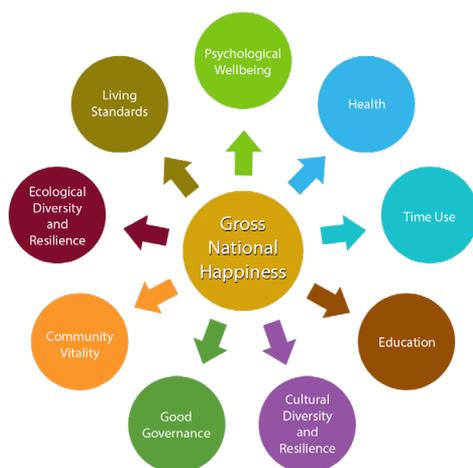


Figure 2: Nine domains of Gross National Happiness in Bhutan. Source: Provisional Findings of 2015 GNH Survey, p.11⁶.

Bhutan's overarching goal is to "promote those conditions that will enable the pursuit of Gross National Happiness" (Constitution, Article 9.2). Enunciated in the early 1970s by His Majesty the Fourth King of Bhutan, the concept of Gross National Happiness (GNH) provides important guidance for policies and programmes, and a holistic development framework based on the four pillars of sustainable and equitable socio-economic development; environmental conservation; preservation and promotion of culture; and good governance. Within these pillars, poverty eradication forms an overarching objective (CBS and GNHC, 2019).

In order to assess GNH conditions, the GNH development index identifies nine domains—as shown in Figure 2—and 33 indicators.

The Gross National Happiness Commission (GNHC) was formed as the nodal agency to coordinate all policy formulation, monitoring and implementation of development plans and policies in line with the principles of GNH. A GNH Policy Screening tool has been put in place since 2008 to screen all policies to ensure that they are in line with the GNH principles. The GNH development framework is in consonance with the United Nations 2030 Development Agenda and the Sustainable Development Goals (SDGs): both advocate a holistic approach to development, put people and planet at the centre of development, and have poverty eradication and sustainable development as central overriding objectives (RGoB, 2018b).

In its NDC 2015, Bhutan reiterated its commitment to remain carbon neutral. Its Economic Development Policy (EDP) 2016 emphasizes the ‘five jewels’ i.e. hydropower, tourism, mining, agriculture, and Cottage and Small Industries (CSIs), and includes measures to promote ‘green growth’. All development programmes under the Five-Year Plans (FYPs) are formulated based on the four pillars of GNH. The 12th FYP (2018-2023) identifies 16 NKRA, of which NKRA 6 on climate-sensitive development and NKRA 10 on gender equality are directly related to the subject of this report¹.

The National Budget for the Fiscal Year 2019-2020 also reflects some of the aspects that are relevant for this study, including a section on gender budgeting and a series of five Flagship Programmes. These are “high priority multi-sector interventions to address national issues in a concerted and holistic manner”, and include programmes on Health, Education, Digital Druknyul, Water, Organic Bhutan, Startup and CSI, Tourism, Waste management and Footprints of National Day (PMO, 2019). However, climate finance and the visibility of issues related to climate mitigation and adaptation in the budget is very limited, with, for example, small investments in mixed energy supply including renewable solar pumps for irrigation.

1.3 Objective of the Study

This study was undertaken to assist the RGoB and other stakeholders in ongoing efforts to achieve the country’s vision of carbon-neutral, resilient and sustainable development in a gender-responsive way. This is in accordance with the RGoB’s 12th Five Year Plan (FYP) 2018-2023, in particular National Key Result Area (NKRA) 6, ‘Carbon Neutral, Climate and Disaster Resilient Development Enhanced’; and NKRA 10, ‘Gender Equality Promoted, and Women and Girls Empowered’

Through this study, the intention is to promote a process in which these objectives will be brought together, so that the country’s NDC and its updates, as well as related climate policies, institutions, and mitigation and adaptation strategies and actions, will become gender-responsive or even gender-transformative².

It seeks to provide a clearer picture of the national context in key climate-related sectors, with a focus on gender equality and the empowerment of women and girls. The study describes the gender–climate change linkages (causes and effects), and the gender-climate action (adaptation and mitigation) nexus. Within the broader scope of NDC priority areas, the agriculture, energy and waste sectors were identified for the study, given the increase in present and projected emissions from these sectors.

This study therefore analyses the following areas in general and also more specifically for the NDC sectors of agriculture, energy and waste:

- Climate change and its impacts on gender dynamics and women’s empowerment; and
- Climate actions i.e. mitigation and adaptation in the context of gender dynamics and women’s empowerment (including access and, or, control over resources, participation and decision-making, benefit-sharing, and livelihood security).

The level of analysis is at the national, dzongkhag and local scales, and looks specifically at related governance issues - these include institutional and legal frameworks and coordination mechanisms, NDC - related planning, and processes and policy instruments for mitigation and adaptation actions. This analytical framework of the study is reflected in Figure 3.

1.4 Methodology

The study consists of secondary and primary research: an extensive literature/desk review, mainly executed between June-July 2019; two rounds of interviews with 92 people in 30 organizations, executed from 1-9 July, and 19-30 August 2019; and national field research, executed in September-October 2019³. A national stakeholder consultation workshop was conducted on 14-15 November 2019, followed by a review meeting from 6-10 January 2020, and a validation workshop on 3 February 2020.

The qualitative interviews followed a list of guiding questions that were adapted for the various interviewees, and an analysis of the gained information is reflected in this report.

The field study was conducted to get an understanding of gender issues within the context of climatic

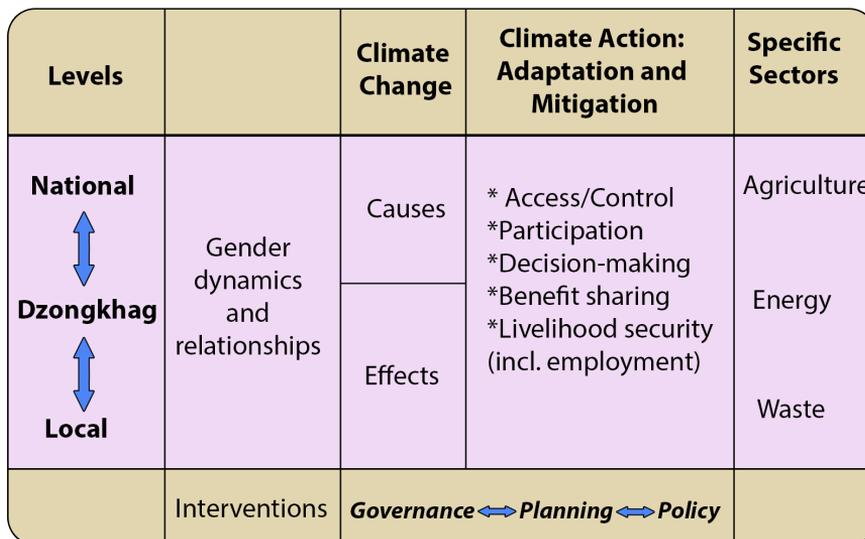


Figure 3: Analytical framework of the study

change in Bhutan and policy responses in communities related to agriculture, energy and waste. A descriptive cross-sectional study design was adopted for the survey. Data was collected using a structured questionnaire, administered by trained interviewers through face-to-face interviews.

In particular, the survey was designed to answer the following questions:

- i. How do men and women perceive climate change and, particularly, the livelihood risks associated with climate change?
- ii. What are the gender disparities in access to and control over assets, and how and to what degree does the disparity in assets affect how men and women experience climate shocks and change?
- iii. How, and to what degree, do climate change mitigation and adaptation responses—particularly in the areas of agriculture, energy and waste—enhance gender equality and women’s empowerment (SDG 5 & NKRA 10)?
- iv. Which mitigation and adaptation strategies and options are preferred by women and men, respectively, and why?

A multi-stage stratified cluster sampling procedure was adopted for the study. A sample of 600 households in 10 dzongkhags was selected for enumeration from diverse agro-ecological zones and three regions (east, centre and west) (see Figure 4). The dzongkhags within each region were clustered based on three ecological zones of alpine, temperate, sub-tropical regions. Additionally, an effort was made to have

roughly 55 percent male and 45 percent female respondents. Two-thirds of the sample was allocated to rural areas and the remaining one-third to urban areas.

The map of the 10 sampled dzongkhags is shown in Figure 4. The distribution by region, dzongkhag, agro-ecological zone, and rural-urban areas is presented in Table 2.

Table 2: Distribution of sample by region, dzongkhag, agro-ecological zone, and rural-urban areas

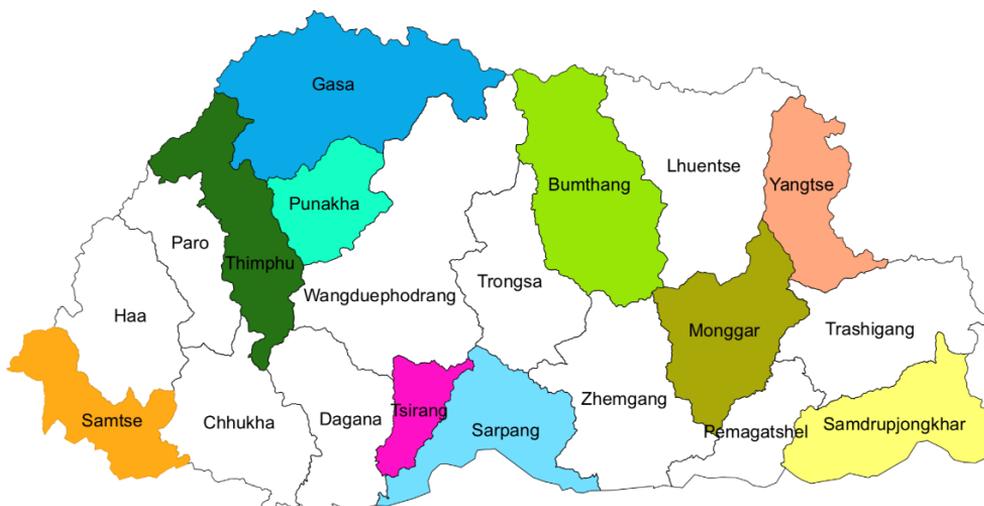


Figure 4: Map showing sampled dzongkhags

Region	Agro-ecological zone (AEZ)	Dzongkhag	Sample size		
			Both areas	Rural	Urban
East	Alpine	Trashi Yangtse	60	40	20
	Temperate	Monggar	60	40	20
	Sub-tropical	Samdrup Jongkhar	60	40	20
Centre	Alpine	Bumthang	60	40	20
	Temperate	Tsirang	60	40	20
	Sub-tropical	Sarpang	60	40	20
West	Alpine	Gasa	60	40	20
	Alpine	Thimphu	60	40	20
	Temperate	Punakha	60	40	20
	Sub-tropical	Samtse	60	40	20
		TOTAL	600	400	200

Out of 600 sampled households, the survey successfully enumerated 578 with a response rate of 96.3 percent. The response rate is slightly higher in rural areas (96.5 percent) compared to urban areas (96 percent).

The survey questionnaire was adapted from global studies on gender and climate change surveys. The questionnaire was divided into eight parts covering climate change information, coping strategies adopted by households, agriculture, energy, waste management, general information of the respondents and demographic information. The questionnaire was pre-tested before the actual survey. The survey was conducted by trained survey enumerators who were monitored by field supervisors and the national consultant. The total number of households is estimated at 165,264 households of which 73 percent are in rural areas and the remaining 27 percent in urban areas. Of the households estimated to have been represented by the sample, 43 percent had male respondents and the remaining 57 percent had female respondents. Using population weight, the survey estimated a total population of 696,921 members.

1.4.1 Research limitations

The fact that the research was executed during a short period of time i.e. June – December 2019, is the main limitation. The study also faced challenges of limited human resources and scattered information sources. The fact that the study involved three different methodologies (desk review, qualitative and quantitative) also presented a challenge. Although such an approach supports triangulation, it also made the study more complex and the interpretation demanding.

1.5 Household Characteristics

The average household size in the survey was 4.22 members; households in rural areas have slightly higher household size (4.33 members) compared to households in urban areas (3.91)⁴. Of the 165,264 households, 4,408 households (2.67 percent) are single-member households, while 19.89 percent of households (32,882 households) have more than five household members. About 60 percent of households have children under the age of 15 years currently living in the households, and about 21 percent of households have elderly members aged above 65 years currently living in the household⁵. Of the respondents, 66.35 percent are farmers, and only 41.97 percent had formal education (47.24 percent men and 37.92 percent women). More information about respondents is provided in Table 3.

Table 3: Household characteristics by sex of the respondents

Household characteristics	HH represented by Male respondents	HH represented by Female respondents	HH represented by Male and Female respondents
Households represented by sex of the respondents (%)	43.43	56.57	100
Mean age of respondents (age in year)	43.22	37.20	39.81
Percentage of respondents who are farmers	68.79	64.47	66.35
Percentage of respondents with formal education	47.24	37.92	41.97
Average HH size (no. of persons)	4.00	4.38	4.22
Percentage of single member HH	4.51	1.26	2.67
Presence of children below 15 years of age in the HH (% of HHs)	52.91	65.91	60.27
Presence of elderly member above 65 years of age in the HH (% of HHs)	16.73	23.53	20.58

1.5.1 Land ownership

Over 97 percent of the surveyed households reported owning land with 97.8 percent men and 96.4 percent women respondents. By area of residence, almost all households in rural areas (99.6percent) reported owning land anywhere in Bhutan while only about 90 percent of households in urban areas reported the same.

1.5.2 Main problems faced by households

Figure 5 shows the degree of problems faced by households using a predetermined list of common problems usually faced by households.

By area of residence, a relatively higher proportion of rural respondents reported shortage of water (rural: 10.86%; urban: 6.10%), land (rural: 11.22%; urban: 9.24%), fuelwood (rural: 7%; urban: 2.4%), technologies (rural:22.79%; urban: 4.68%), agricultural inputs (rural: 9.10%; urban: 3.3%), and health facilities (rural: 10.92%; urban: 2.58%) as serious problems faced by their households. On the other hand, a relatively higher proportion of urban respondents reported lack of transport (rural: 10.35%; urban: 12.78%), employment opportunities (rural: 13.3%; urban: 21.43%) and lighting facilities (rural: 4.54%; urban: 11.79%) as some of the serious problems faced by their households.

1.5.3 Membership in groups and associations

Membership in groups or associations acts as a buffer against both economic and social hardships, and is known to accrue several other benefits for individual members and their families. Therefore, belonging to a group or association that supports cooperation among members is important for people in the communities. According to the survey, the number of groups and associations that respondents are a member of range between one (35.36%), two (20.71%), three (7.70%), and four or more (18 %); while about 17.95% did not belong to any. Figure 6 below shows the proportion of respondents participating in various groups and associations.

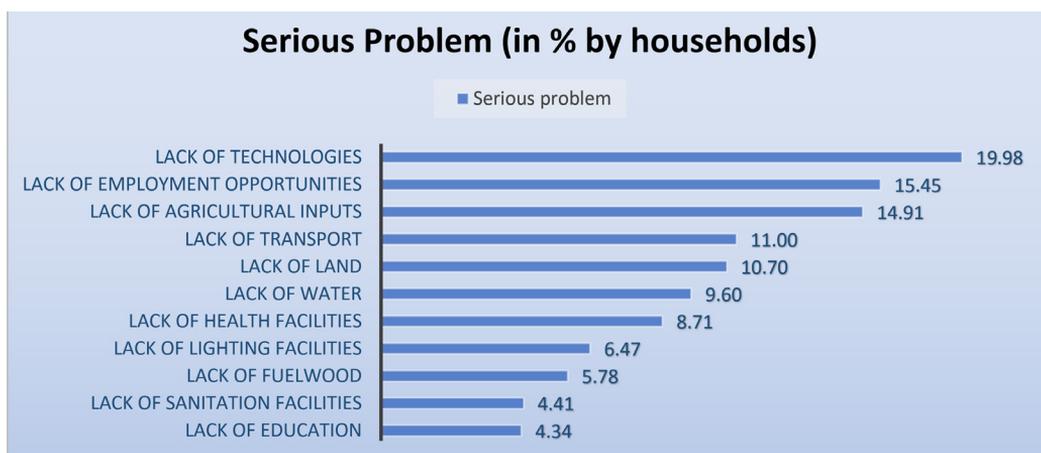


Figure 5. Percentage of households reporting issues as serious problem faced by the households

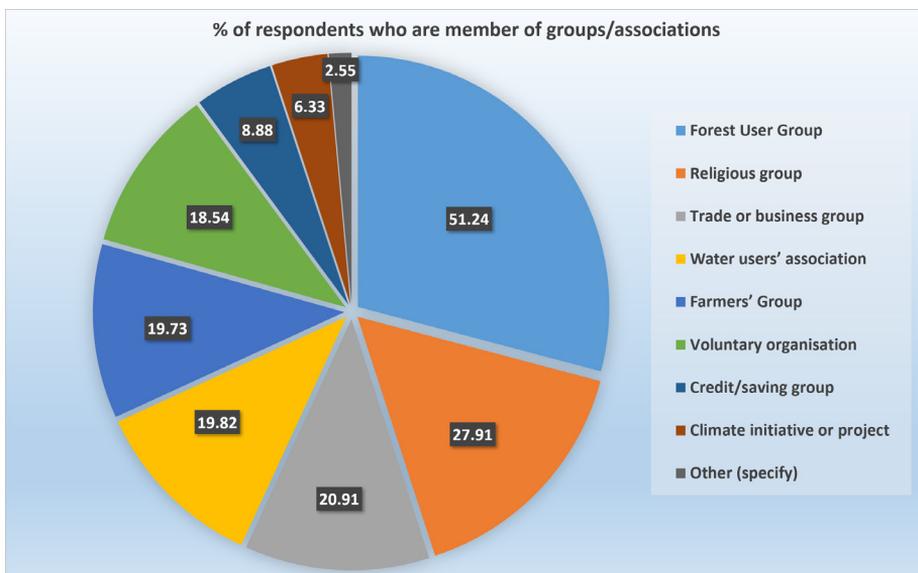


Figure 6: Proportion of respondents reporting membership in different groups or associations



2. BHUTAN AND CLIMATE CHANGE

2.1 Climate Change Scenarios

At the 2009 Conference of Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) in Copenhagen, commonly referred to as COP15, the RGoB stated Bhutan's commitment to remain carbon neutral for all times. This unilateral commitment to ensure that GHG emissions remain below its forest sinks, was reaffirmed in 2015 during COP21 in Paris.

Bhutan is a net sink of Greenhouse Gases (GHGs) because of its large forest cover with 71 percent of the land area, relatively low levels of industrial activity, and almost 100 percent of electricity generated by hydropower (MoAF,2018). Total GHG emissions were 1,727.74 Gg CO₂e in 1994 and rose to 3,814.09 Gg CO₂e in 2015 (NECa, 2020).

Bhutan's net GHG emission has been fluctuating annually and is influenced by emission and removals in forestry sector. In terms of percentage change in Bhutan's GHG emissions from 1994 to 2015 and 2000 – 2015 level, all the sectors except AFOLU show an increase in emissions as presented in Table 4. The energy sector witnessed the highest increase of emission of 656.32 percent.

Although the sink capacity has been increasing gradually over the period, the net national emission or Bhutan's carbon stock has decreased by 23.12 percent from 1994- 2015 period and saw an increase of 3.56 percent in comparison from 2000-2015 (NEC, 2020a).

Table 4: National GHG emissions from sources and removals by sink (1994-2015) – Gg CO₂e (NEC , 2020a)

Year/ Emission	Energy	Industrial Processes and Product Use	Waste	Agriculture	LULUCF	Net Emissions
1994	93.60	166.93	55.78	600.84	-8165.34	-7248.19
2000	259.13	220.45	67.94	575.31	-6503.82	-5381.01
2010	468.63	497.13	87.75	570.01	-8078.90	-6455.37
2015	707.92	796.42	126.51	552.88	-7756.22	-5572.50
% Change, 1994-2000	176.84	32.06	21.79	-4.25	-20.35	-25.76
% Change, 2000 - 2015	173.20	261.28	86.21	-3.90	19.26	3.56
% Change, 1994-2015	656.32	377.10	126.79	-7.98	-5.01	-23.12

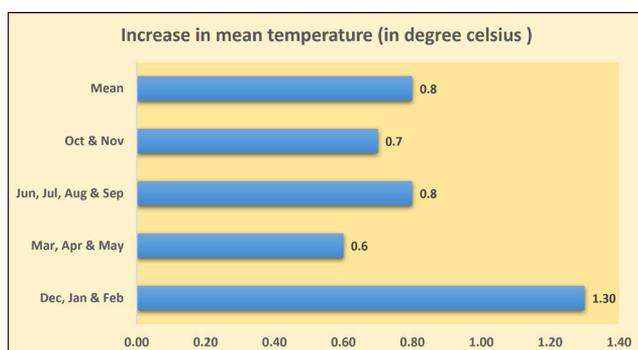


Figure 7. Incremental change in seasonal and annual mean temperature during the period 1976-2005 over Bhutan for CRU dataset (NCHM, 2019a).

2.2 Climate Change and its Impacts

Bhutan is highly vulnerable to the adverse impacts of climate change. In addition to being a land locked and least developed country with a fragile mountainous environment, high dependence of the population on agriculture and the significant role of hydropower for economic

development increase the vulnerability. Bhutan also faces increasing threats from climate hazards and extreme events such as flash floods, glacial lake outburst floods, windstorms, forest fires and landslides (NEC, 2020b).

Recent analysis for the HKH show significant temperature rises in recent decades, as well as substantial long-term changes in frequencies of extreme temperature events. During the past six decades, changes took place with extreme cold events decreasing and extreme warm events significantly increasing in the whole region (Krishnan et al, 2019). Seasonal and annual mean temperature have changed as depicted in Figure 7.

The climate projection (under the RCP 4.5 scenario) for surface temperature indicates an increase of about of 0.80°C–1.6°C during 2021–2050 (representing the 2030s mid-term climate change scenario) and about 1.6°C–2.8°C towards the end of the century (2070–2099). Overall, the climate projection of surface temperature indicates an increase in about of 0.8°C–2.8°C during 2021–2100 (NCHM, 2019a).

The mean annual rainfall over Bhutan is likely to increase in the future. Under the RCP 4.5 scenario, the mean annual rainfall over Bhutan indicates an increase of about 10–30 percent on the mean annual scale, with summer (July–September) rainfalls between five to 15 percent. Under the RCP 8.5 scenario, the mean annual rainfall indicates an increase of about 10–20 percent during 2021–2050 with more than 30 percent increase all over Bhutan towards the end of the century (2070–2100). Under both scenarios, a marginal increase in rainfall trend is indicated (NCHM, 2019a).

Weather patterns are also changing, resulting in extreme weather events and natural disasters such as floods, flash floods, and landslides; droughts and forest fires; as well as storms and hail storms (NCHM, 2019a; Smith, 2018). Of particular concern is the melting of glaciers and related formation of glacial lake, which can result in flooding with significant consequences for water supply in the region (NCHM, 2019a). A recent ICIMOD/HIMAP report (2019) indicates that across most of the HKH, glaciers have thinned, retreated, and lost mass since the 1970s. These trends are projected to continue, with possibly large consequences for the timing and magnitude of glacier melt runoff and glacier lake expansion. A recent assessment of GLOFs showed that 17 glacial lakes are potentially dangerous (NCHM, 2019b).

As part of the National Adaptation Programme of Action (NAPA) process in Bhutan, key climate change vulnerabilities by sector have been identified as summarized in Box 1.

Box 1. Key climate change vulnerabilities in different sectors (NEC&WWF, 2018)

Forestry and biodiversity:

- Drought combined with more frequent lightning may cause greater risk of forest fires;
- Possible loss of endemic plant and animal species;
- Change in migratory pattern of transboundary wildlife, which may result in loss/ degradation of forest ecosystems and reduction of alpine range lands; and
- Possible increase in vector-borne disease in wildlife due to warming.

Agriculture:

- Possible crop yield instability, loss of production and quality (due to variable rainfall, temperature, etc.), decreased water availability for crop production, and increased risk of extinction of already threatened crop species (traditional crop varieties);
- Loss of soil fertility due to erosion of top soil and runoff, loss of fields due to flash floods, and loss of soil and nutrients;

- Crop yield loss (flowers & fruit drop) due to hailstorms; deteriorated produce quality (fruit & vegetables) due to unanticipated heavy rains and hailstorms;
- Delayed sowing (late rainfall), as well as damage to paddy and potato crops due to sudden early and late spring frost respectively; and
- Outbreak of pests and diseases in fields and during storage where they were previously unknown.

Natural disaster and infrastructure:

- Debris-covered glaciers forming huge moraine dam lakes that ultimately lead to GLOFs (i.e. flash floods and landslides, heavy siltation of the rivers, and other geotechnical hazards); and
- GLOF will affect “essential” infrastructure, namely (1) Hydropower systems (generation plants, transmission and distribution infrastructure), Bhutan’s main export product (2) Industrial estates/infrastructure (3) Human settlements i.e. urban, suburban and rural settlements (4) Historical and cultural monuments such as *dzongs*, monasteries, *chortens*, etc., and (5) Public utilities such as roads, bridges and communication systems.

Water and energy:

- Temporal & spatial variation in flow, notably affecting electricity production/exports due to disruption of average flows for optimum hydropower generation;
- Increased sedimentation of rivers, water reservoirs and distribution network, notably affecting irrigation schemes’ productivity/ agricultural crop yields;
- Reduced ability of catchment areas to retain water/increased runoffs with enhanced soil erosion (deterioration of environment); and
- Deterioration of drinking water quality.

Human health:

- Loss of life from frequent flash floods, GLOF and landslides;
- Spread of vector-borne tropical disease (malaria, dengue) into more areas (higher elevations) with warming climate; and
- Loss of safe (drinking) water resources increasing water borne diseases.

For 15 long years, Dur Pati Rai from Sergithangmaed village in Sergithang Gewog, Tsirang could not cultivate paddy. Acute shortage of water for irrigation forced her and others in the village to leave their rice fields fallow.

“Rice used to be one of our main crops, but water sources began drying up over the years and paddy cultivation became almost a thing of the past. We could only grow maize and lentil,” she says.

Not only did the water sources start drying up, rainfall became erratic. “We got a lot of rain sometimes and scanty rainfall other times. And increasingly rain came at the wrong time, hampering paddy transplantation.”

Human-wildlife conflict aggravated the problem. Farmers had to guard their fields against wild boars.

As water scarcity and erratic rainfall pattern—which people in Sergithangmaed believe is climate-induced—coupled with human wildlife conflict rendered farming almost next to impossible, farmers found themselves exploring other livelihood opportunities. That sometimes meant leaving their village, temporarily in many cases and permanently in some.

“Men in the village started migrating to other districts to work in hydropower and other construction projects, leaving the women behind to take care of family and livestock. It wasn’t easy,” recalls 39-year-old Dur Pati Rai.

Her brother, Lal Bir Rai, was one of the men from the village who went to work in a hydropower construction project. “There was no other option. Without water, we couldn’t do much on our farms,” he says.

The water shortage was acute, so much so that they couldn’t even grow vegetables easily. That essentially meant families had to buy all their food, which led to an increase in their household expenses.

The water stress has been eased thanks to a Government project that helped bring irrigation water from a faraway source with technical support from UNDP and financed by Global Environment Facility (GEF). The 7.2-km climate-resilient pressurized piped irrigation system opened in May 2019, bringing much-needed respite to the water-scarce communities in the gewog.

However, the impacts of climate change are not limited to water resources. The farmers in Sergithangmaed village have also noticed a change in cropping pattern. The Sergithang Gewog Agriculture Extension Officer, Dhan Bdr Ghalley, confirmed this. He said the farmers in the village usually sow quinoa seeds from August to October. But now they sow in November.

“The seeds failed to germinate when we sowed them during the usual months of August, September and October. From last year onward, we sowed the seeds in November, and they grew fine,” says Dhan Bdr Rai. He has also witnessed outbreaks of pests and diseases

over the years and attributes this to climate change. "Pests never seen or heard of before started appearing."

Orange is another crop that's been bearing the brunt of climate change. The Gewog Agriculture Extension Officer said oranges now grow in higher places and not in the low-lying places where it usually grew not so long ago. Orange was once a popular cash crop until citrus greening disease devastated the crop.

2.2.1 Perceived impacts

Figure 8 shows, more than four-fifths (91.6 percent) of the respondents in the survey agreed to the statement that 'climate change is becoming more and more serious over time' followed by 'climate change is affecting my life' (85.8 percent), and that 'climate change is leading to increased disasters in this area' (80.3 percent).

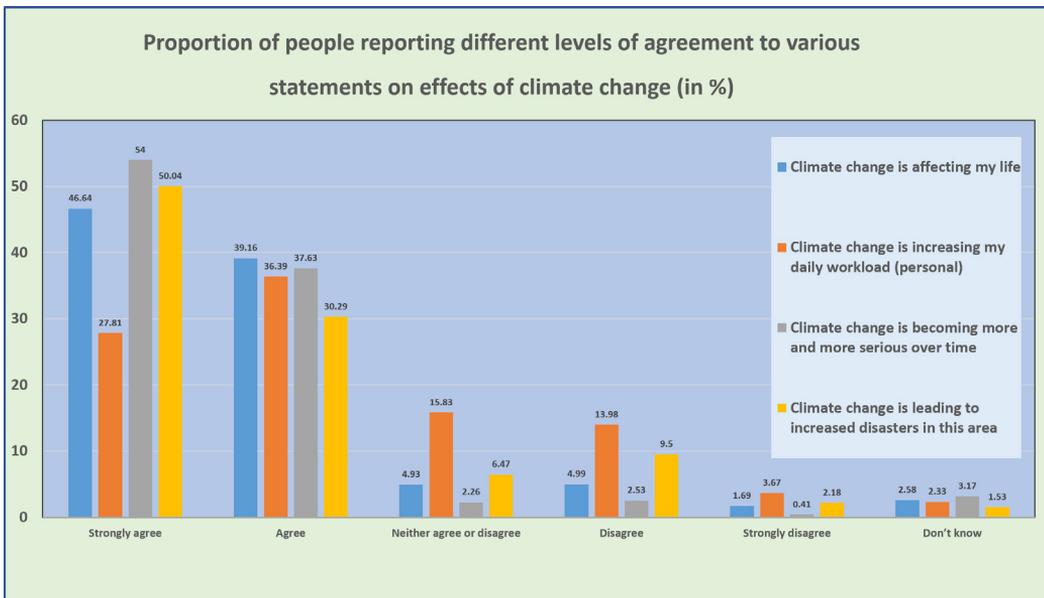


Figure 8: Proportion of people reporting different levels of agreement to various statements on effects of climate change

Over nine in 10 people (96 percent) reported experiencing 'warmer weather' and 'unpredictable weather' (93 percent). This is an indication that people are being affected by climate change and global warming, as the prevalence of these severe weather conditions is linked to climate change. Likewise, more than three-fourths of the survey population reported experiencing 'increased landslides' (79.36 percent) and 'hail storms' (76.2 percent), which also indicates more extreme weather conditions, as indicated in Figure 9.

Besides people's experiences of severe weather conditions, the survey also collected information on various impacts on their personal life as a result of climate change. The most common impacts of climate change affecting people's lives reported in the survey are damage to roads, shortage of water supply, increased human-wildlife conflicts, increased use of electric fan, changing roles and responsibilities in the household, increased household waste, impact on health of oneself or other family members, difficulties in food production, lack of energy sources, and changes in food habits of households⁷. These effects reported by about 50 percent of the respondents are in line with other findings on climate change impacts in Bhutan.

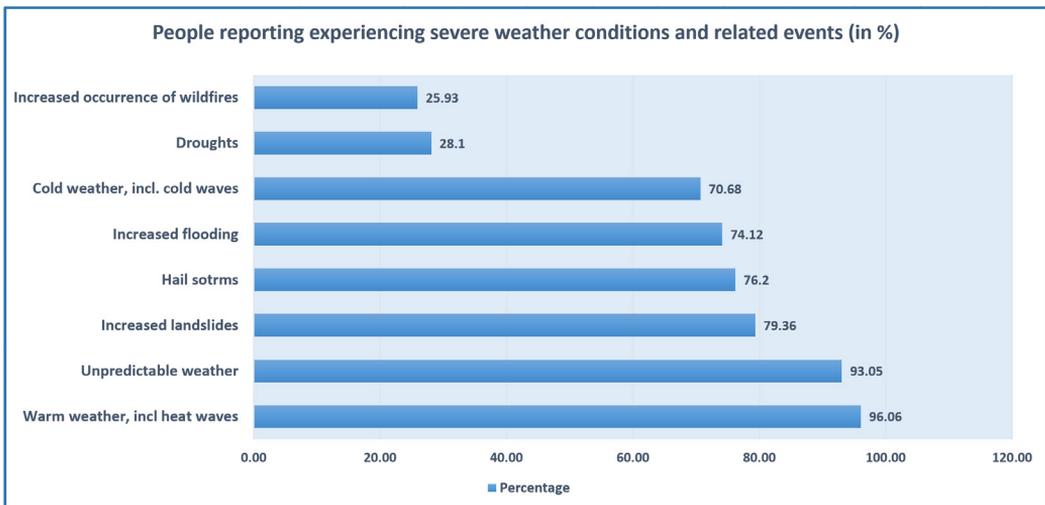


Figure 9: Proportion of people reporting experiencing severe weather conditions and related events

A relatively higher proportion of rural than urban respondents reported ‘difficulties in food production’, ‘increased human-wildlife conflicts’, ‘increase in time to collect fuelwood’, and ‘decrease of household income’ as effects of climate change on their personal lives. ‘Damage to road’ and ‘lack of water supply’ were cited equally by both rural and urban respondents.

The survey also found that over eight in ten people (83.24%) reported that change in climate change affected the natural resources that they depend for their livelihood. As shown in figure 10.

2.3 Perceived Strategies to Cope with Climate Change

Preparedness to face challenges posed by climate change is critical for developing resilience. A little over half (54.3 percent) the respondents either “agreed” or “strongly agreed” to the statement, ‘my household is well prepared in the event of a disaster’, indicating a certain level of preparedness to face disasters in local communities. However, about 34 percent of the respondents also ‘disagreed’ or ‘strongly disagreed’, indicating lack of preparedness to face disasters brought about by climate change among a significant proportion of the population.

Most (60.4 percent) reported that they would ‘receive aid’, followed by ‘change consumption patterns’ (56.2percent), and ‘change farming practices’ (59.4percent) as a coping strategy to adapt to climate-

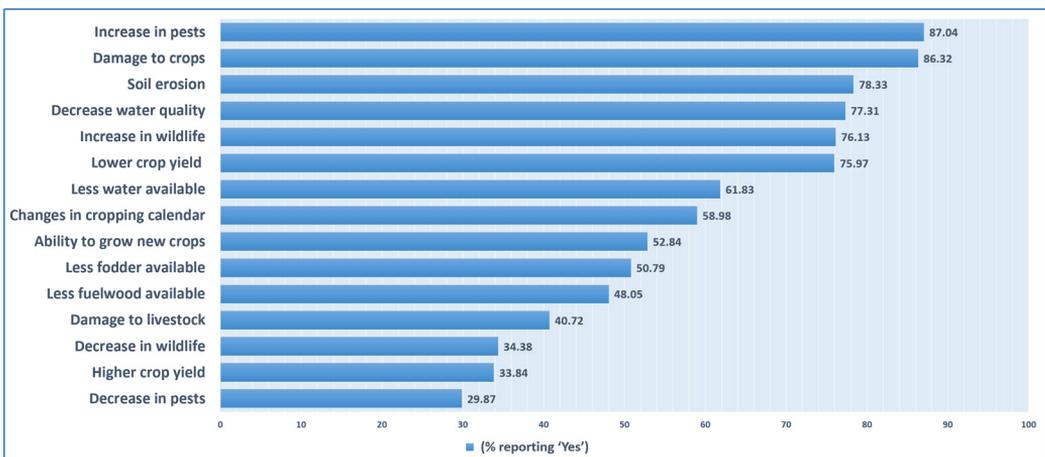


Figure 10: Climate change effects on various natural resources (% reporting 'Yes')

induced disasters⁸. Coping strategies such as ‘taking children out of school’ is reported by about five percent of the respondents. Similarly, 22 percent of the respondents reported ‘migration to a city’ as a adaptation strategy. Considering the already very high rate of rural-to-urban migration and ever-increasing absentee households in rural areas, this is a point of concern from a social as well as an economic perspective⁹.

2.4 Climate Change Policy Framework

The Constitution of the Kingdom of Bhutan (2008) underscores the obligation of the Royal Government “to protect, conserve and improve the pristine environment and safeguard the biodiversity of the country” (Article 5.1), and “to ensure a safe and healthy environment for present and future generations” (Article 5.2).

The National Environment Protection Act (NEPA, 2007) is an umbrella act which provides establishment of an effective system to conserve and protect environment while regulating and promoting sustainable development in an equitable manner.

In 2015, the Royal Government of Bhutan submitted the Intended Nationally Determined Contribution and re-communicated Bhutan’s commitment made in 2009 to remain carbon neutral by ensuring that our emission of GHGs does not exceed the sink capacity of our forest. The commitment was made with the view that there is no greater need, or more important, than keeping the planet safe for life to continue. While making this sincere commitment, Bhutan’s NDC outlines nine priority actions for mitigation and 10 priority adaptation needs (see Box 3). Bhutan also called on the international community to assist in implementing the actions contained in the NDC.

The 12th FYP (2018-2023) identifies ‘Carbon Neutral, Disaster and Climate Resilient Development Enhanced’ as NKRA 6. In order to achieve this NKRA, 10 different programmes are identified, including enhancement of solid waste prevention and management, and the promotion of the use of alternative renewable energy (sun and wind). The Local Government Key Result Area (LGKRA) 9 strives for the enhancement of carbon neutral, climate and disaster resilient development.

The Climate Change Policy of the Kingdom of Bhutan 2020 envisages to provide strategic guidance to ensure that Bhutan remains carbon neutral and protects the wellbeing of the people of Bhutan by adapting to climate change in an efficient and effective manner. Additionally, the policy also aims to address challenges and opportunities such as international support in the form of finance, technology, capacity building, research and awareness arising from recent developments in national and international arena of climate change, which will be critical in implementing climate actions.

Box 3: RGoB NDC (2015) strategies and priorities in the areas of climate mitigation and adaptation

Mitigation strategies:

- i. Sustainable forest management and conservation of biodiversity to sustain environmental services;
- ii. Promotion of a low carbon transport system;
- iii. Minimizing GHG emissions through application of zero waste concept and sustainable waste management practices;
- iv. Promotion of a green and self-reliant economy towards carbon neutral and sustainable development;
- v. Promotion of clean renewable energy generation;

- vi. Promotion of climate-smart agriculture to contribute towards achieving food and nutrition security;
- vii. Energy demand-side management by promoting energy efficiency in appliances, buildings and industrial processes and technologies; and
- viii. Integration of low emission strategies in urban and rural settlements through green buildings, sustainable construction methods and climate-smart cities.

Adaptation priority needs:

- i. Increase resilience to the impacts of climate change on water security through Integrated Water Resource Management (IWRM) approaches;
- ii. Promotion of climate-resilient agriculture to contribute towards achieving food and nutrition security;
- iii. Sustainable forest management and conservation biodiversity to ensure sustained environmental services;
- iv. Strengthening resilience to climate change-induced hazards;
- v. Minimizing climate-related health risks;
- vi. Climate proof transport infrastructure against landslides and flash floods;
- vii. Promotion of climate-resilient livestock farming practices, contributing towards poverty alleviation and self-sufficiency;
- viii. Enhancement of climate information services for vulnerability and adaptation assessment and planning;
- ix. Promotion of clean renewable and climate resilient energy generation; and
- x. Promotion of climate-resilient and low-emission strategies in urban and rural settlements.

The policy also underlines that climate change is a cross-cutting issue that needs to be addressed comprehensively and coordinated effectively across all relevant sectors and levels, including gender equality considerations and disaster-risk management.

The policy also outlines the requirement of gender friendly technology support through the promotion, identification and transfer of appropriate technologies to support gender responsive mitigation and adaptation actions.

Gender issues are well-defined in the CCP and the process of implementation states that “Gender issues shall be integrated across all climate change actions. Such integration shall be informed by situational analysis of gender gaps and issues and the interlinkages with climate change in Bhutan and will aim to advance the identified gender aspects that need to be addressed through gender- responsive climate actions.” (Responsibility: All agencies with support of NCWC).

The National Commission for Women and Children (NCWC) is identified as the agency that will provide support in mainstreaming gender-responsive climate actions.

In line with the CCP, specific actions and responsibilities will be defined in a National Climate Change Action Plan, and in sector-specific policies. As an example, Box 4 describes a selection of existing adaptation programmes and projects in Bhutan.

Bhutan's National Adaptation Programme of Action (NAPA) was presented in 2006 and updated in 2012. Under this, specific projects have been developed and executed in order to enhance adaptation capacity in the country. After the NAPA I Project (2008-2013), the NAPA II Project (2014-2018) was executed—a comprehensive plan that resulted in climate-resilient water harvesting, storage and distribution systems. Other elements of the NAPA II project were riverbank and flood protection, landslide hazard mapping, water resources inventories, forest fire management plans, disaster management and contingency plans, automated real-time hydrometeorological stations, and enhanced capacity of the National Weather and Flood Warning Centre (RGoB et al., 2019).

The NAPA III Project on 'Enhancing Sustainability and Climate Resilience of Forest and Agricultural Landscape and Community Livelihoods in Bhutan' (Oct. 2017- 2023)—supported by UNDP/GEF/LDCF— aims to operationalise an integrated landscape approach through the strengthening of biological corridors, and sustainable forest- and agricultural-systems. It seeks to build climate resilience in community livelihoods, improve institutional capacity at all levels for the sustainable management of forest and agricultural landscapes, enhance the governance system and conservation management for biological corridors, and promote climate-resilient livelihood options for local communities.

The National Adaptation Plan (NAP) Project (June 2019-2023), aims to develop the first NAP for Bhutan and focuses specifically on the water sector. It looks into enhancing climate information, addressing climate risk management, strengthening adaptation investments, and building related M&E systems. The outcomes that it seeks to achieve are: (1) Enhanced coordination, learning and knowledge management from iterative NAP process; (2) Technical capacity enhanced for generation of climate scenarios and impact assessment; (3) Vulnerability assessments undertaken and adaptation options appraised and prioritised; and (4) NAP formulated and capacity for implementation and monitoring established.

2.5 Institutional Framework

The National Environment Commission (NEC) is a high-level autonomous agency of the RGoB. It is mandated to look after all environment-related issues in the country. The NEC functions as the National Climate Change Committee (NCCC), and considers all policy and regulatory matters on climate change and provides overall guidance related to climate actions. The Climate Change Coordination Committee (C4) is a multi-sector technical body to serve as a forum for discussion and coordination of matters related to climate change in Bhutan and makes recommendations for consideration by the NCCC/NEC.

The CCP identified the NCWC as the agency that will provide support in mainstreaming gender-responsive climate actions.

The GNHC as an apex planning agency is responsible for supporting the integration of climate change into policies, programs and plans and mobilize external resources for the implementation of climate change programs and projects.

The MOF has mandate to mobilize resources and budget allocation and also to provide fiscal incentives and other instruments to support private sector lending to support implementation of climate related projects.

The National Centre for Hydrology and Meteorology (NCHM) coordinates the collection of climate data and information, and the Royal University of Bhutan (RUB) is involved in climate-related research to support informed decision-making and the planning and implementation of climate change action. All other line agencies will integrate climate change action within their respective mandates, policies and programs towards implementation climate change actions.

Although climate change is an issue of growing concern to many citizens and stakeholders are not aware of country's commitments such as the NDC, Box 5 presents some of the ideas for necessary climate action, expressed by interviewees during interviews for this study.

Box 5: Climate actions needed

Interview participants for this study underlined that agriculture, energy-use, transport, industry and waste contribute significantly to GHG emission, and that cross-cutting climate action is therefore necessary among these sectors. Some of the possibilities include adoption of climate-smart agriculture, promotion of renewable energy and electric modes of transport, reducing industry emissions, reduction and reuse of waste, and introducing the concept and implementation of circular economy, among others. While the industrial sector in the country is growing, cleaner technologies are often neglected due to high costs.

Interviewees expressed that schools—and more broadly the education system—has an important role in raising environmental awareness, not only through the curricula but also via campaigns such as the Social Forestry Day, or the School Agriculture Programme (SAP) supported by the MoAF and the MoE, and School Nature Clubs. The project HEROES, or the Himalayan Environmental Rhythm Observation and Evaluation System—supported by NEC and the Ugyen Wangchuck Institute for Conservation and Environment (UWICE)—moves from observation to mitigation and disaster-risk management. One of the interviewees suggested the need to promote solar energy in schools to mitigate climate change.



III. GENDER EQUALITY SITUATION IN BHUTAN

3.1 Background

International indices give a useful picture about Bhutan’s progress and challenges on gender equality. UNDP’s Gender Development Index (GDI) measures gender inequalities in health, education and command over economic resources. The 2018 HDI value for Bhutan is 0.581 for women and 0.650 for men, resulting in a GDI value of 0.893 for female-male HDI ratio (See Figure 11). The GDI is 0.939 for the Maldives and 0.897 for Nepal (UNDP, 2019a).

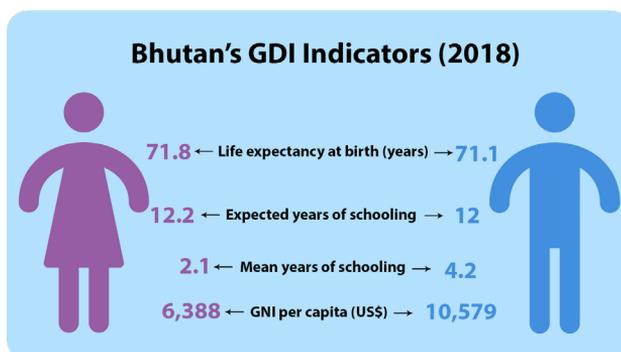


Figure 11: Bhutan GDI indicators, 2018 (UNDP, 2019a)

The Gender Inequality Index (GII) reflects gender-based inequalities in three dimensions: reproductive health, empowerment, and economic activity. With a GII of 0.436 in 2018, Bhutan ranks 99th out of 162 countries; the Maldives ranks 81st and Nepal ranks 115th (UNDP, 2019a). This is reflected in the indicators presented in Figure 12.

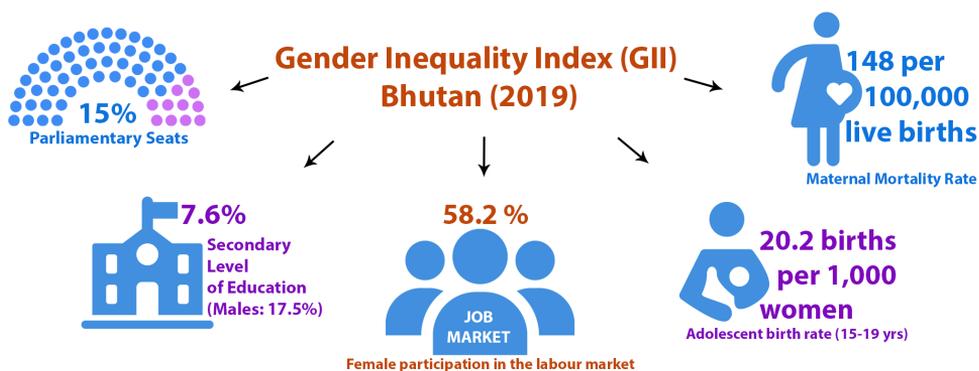


Figure 12: Gender Inequality Index (GII) Bhutan: Selected Indicators, (UNDP, 2019. Human Development Report 2019)

The Global Gender Gap Index (GGI), developed by the World Economic Forum, focuses on the gender gap in economic and political life. For GGI 2020, Bhutan ranks 131 out of 153 countries with a score of .635, reflecting gender equality status in economic participation and opportunity, educational attainment, health and survival, and political empowerment (WEF, 2019).

Table 5: Selected GGI Indicators for Bhutan (WEF, 2019)

Indicators	Female	Male	F/M
Labour force participation (%)	60.7	76.8	0.79
Estimated earned income, int'l \$ 1,000	6.4	11.3	0.57
Literacy rate (%)	57.1	75.0	0.76
Enrollment secondary education	76.6	64.1	1.19

Indicators	Female	Male	F/M
Sex ratio at birth (F/M) (%)	--	--	0.96
Healthy life expectancy	60.5	60.8	1.00
Member in parliament (%)	14.9	85.1	0.17
Ministerial position (%)	10.0	90.0	0.11

As suggested by the views of study interviewees—described in Box 7—perceptions about gender equality in Bhutan is varied.

Box 7: Perceptions on gender equality in Bhutan

Some of the interviewees in this study were of the view that there is gender equality in Bhutan, stating that “There is no gender discrimination in Bhutan”; that “... women and men go hand in hand, and there are no difficulties for women to get equal opportunities”; and that “Infrastructure is gender neutral”. Others depict women mainly as the weaker sex, stating that, “Women are more vulnerable, and psychologically and mentally weaker”; and that “During disasters women seem to be at higher risk, for example during flooding their security is often at stake (because of psychosocial issues) as they are working in the fields”. One organization stressed that “there is still a taboo to depict women as being better qualified or stronger”.

Some interviewees said that women and men have the same roles, although women have more household responsibilities. While in the past gender disparity certainly existed in education (with the girl child staying at home), nowadays there is not much gender disparity – at least up to the secondary level. One organization described that girls are especially affected by bad situations at home, including violence against women and girls, and that female children need extra protection, for example in term of ensuring safe boarding schools. As well, public transport such as buses require specific attention in order to prevent (sexual) harassment. Several interviewees underlined prevention of violence against women and girls as a priority.

Others emphasized that there is still an issue with gender inequality, and that this is closely linked with other circumstances such as poverty, climate change, disasters, and environmental change. This is also due to women’s multiple roles in the household, including collection and use of water, fuelwood and non-wood forest products; farming, including kitchen-gardening; and informal sector activities. Male out-migration (rural to urban) and feminisation of agriculture is also seen as one of the extra burdens for women.

3.2 Gender Equality in Practice

An analysis of Gross National Happiness Surveys showed that in 2010 the GNH index was 0.743—disaggregated at 0.704 for women and 0.783 for men, which translates into a difference of about 11.2 percent between the two sexes. The GNH index showed a slight improvement with 0.756 in 2015—at 0.730 for women and 0.793 for men. This translates into a difference of about 8.6 percent between men and women, indicating that the gender gap closed only by about 2.6 percent (Verma & Ura, 2018). The GNH Survey, 2015 showed that men (49%) are reported to be happier than women (33%). The largest gap is found in literacy, schooling, working hours, and political participation.

Significant gender gaps persist in some key areas, with girls and women lagging behind in terms of representation in Parliament, higher education, labour force participation, and other socioeconomic conditions.

3.2.1 Main problems faced by men and women in households

As presented in Figure 7, a relatively higher proportion of households represented by male respondents reported 'lack of water', 'lack of technologies', and 'lack of health facilities' as serious problems faced by their household. On the other hand, a relatively higher proportion of households represented by female respondents reported 'lack of fuelwood', 'lack of education', and 'lack of transport' as serious problems faced by their households. (Figure 13).

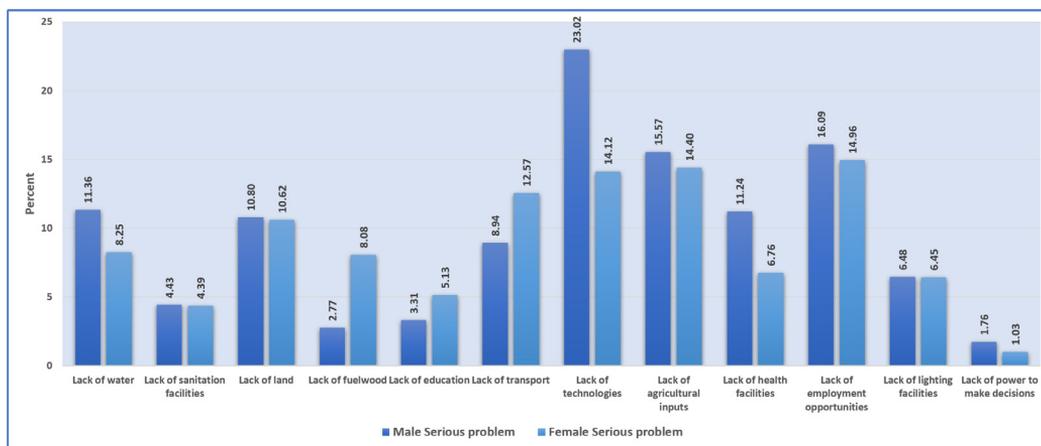


Figure 13: Proportion of households (represented by male and female respondents) reporting issues as a 'serious problem' faced by their household.

The survey showed, as presented in Figure 14, that land ownership in Bhutan is still uneven from a gender perspective. 32.01 percent of respondents reported that women owned land and 63.24 percent reported men having ownership over land.

3.2.2 Education

Female literacy rate increased from 48.7 percent in 2005 to 63.9 percent in 2017 (PHCB, 2017). The Adjusted Net Primary Enrollment Rate is 101.53 percent for girls and 97.3 for boys. At secondary level (class VIII-XII), girls have overtaken boys with a Net Enrollment Rate (NER) of 80.22 percent for girls and 71.16 percent for boys. The Gross Enrollment Rate (GER), which includes continuing education, is 95.66 percent for girls and 83.98 for boys (MoE, 2020). As such, girls outnumber boys at both primary and secondary level.

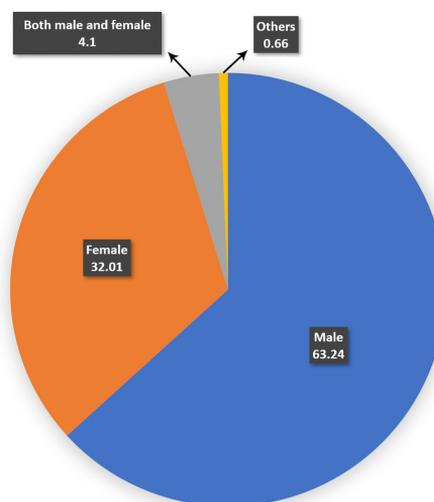


Figure 14: Land ownership by gender (Survey results)

While there is improvement in the Gender Parity Index (GPI) at tertiary level from 0.80 in 2015 to 0.94 in 2020, gaps continue to exist. The GER for tertiary education (age 19-23) is 23.52 percent for girls and 23.62 percent for boys (MoE, 2020).

Overall, girls are mainly concentrated in humanities courses, and their enrollment in the Science, Technology, Engineering and Mathematics (STEM) majors is low. As of 2020, the GPI for technical and vocational education is 0.41 (MoE, 2020). Table 6 below shows that the number of male students is twice that of females in the country's STEM-specialized colleges.

Table 6: Number female and male students in selected STEM-specialized colleges in Bhutan (AES, 2020)

Sl. No	Institute	Female	Male	Total
1.	College of Science & Technology	277	717	994
2.	Jigme Namgyel Engineering College	206	488	694
3.	Gyelpozhing College of Information Technology	122	143	265
	Total	605	1348	1953

3.2.3 Marital status and health

The official age for getting married is 18 years – both for men and women (Marriage Act of Bhutan 1980, Section Kha 1.14). The proportion of women (age 20-24) who married before the age of 18 decreased from 8.7 percent in 2012 to 5.5 percent in 2017 (NCWC, 2019). However, early pregnancies still prevail, with the average number of live births among women aged 15-19 being 1.1 (NSB, 2017). The Bhutan Multiple Indicator Survey (BMIS) 2020 thematic analysis on child protection reveals a number of serious health, social and economic risk for young mothers. The report also highlights gender differentiated health risk such as feminisation of HIV, and limited access to Sexual and Reproductive Health Services or SRHS (NCWC, 2012)¹⁰

3.2.4 Work and employment

The composition of women in civil service has increased from 34.68 percent in 2015 to 38.16 in 2018 (RCSC, 2015/2019). Although the number of female civil servants is growing, they are under-represented at the leadership and management levels. About 86.12 percent of men are in executive and specialist levels compared to women who represent only 13.88 percent.

Gender gap also exist in the labour force participation. In 2019, men's participation was 75.7 percent in urban areas, and 70 percent in rural areas; while women's participation was 49.5 percent in urban areas, and 67 percent in rural areas (NSB, 2019).

Amongst employed persons, women's participation in regular paid employment is much lower at 19.3 percent, compared to 36.5 for men. Women's participation in the agricultural sector is substantial at 61.7 percent, compared to 41.8 for men; while it is lower in the industrial sector at 11.3 percent compared to 16.4 for men. The participation rate for women in the service sector is 27.0 percent compared to 41.8 percent for men (ibid). According to several interviewees in this study, technical professions in particular are still male-dominated, although more young professional women are starting to work in this sector.

Female unemployment rate stands at 3.3 percent as compared to 2.2 percent for male. Youth (age 15-19) unemployment is a serious concern with the total unemployment rate at 11.9 percent. The female youth unemployment rate in 2019 is 13.8 percent as compared to 9.7 of their male counterpart.

The study on "Accounting for unpaid care work in Bhutan" conducted by the NCWC in 2019 found that women performs 71 percent of unpaid household and care work which is 2.5 times more than what men do. On the other hand, men spend 2.5 times more time than women on paid work as indicated in figure 15. In terms of contribution of unpaid care work to the share Gross Domestic Product (GDP), women contribute around 11 percent as compared to 5 by men (NCWC, 2019). However, women's overall women's unpaid and domestic work is largely unrecognized.

3.2.5 Division of labour and time spent on daily activities

The findings of quantitative survey reveals a marked gender difference in the time spent on different activities in a day as shown in figure 16. For instance, men spend more time working outside the home and on farming while women spend more time cooking and cleaning the house. Women also reported sleeping and meditating/praying for slightly longer durations, while men spend slightly more time selling

household produce and managing kitchen garden.

As shown in Table 7, women's participation in cooking, cleaning, and taking care of children is significantly higher than that of men. However, men's participation in projects is much higher than that of women.

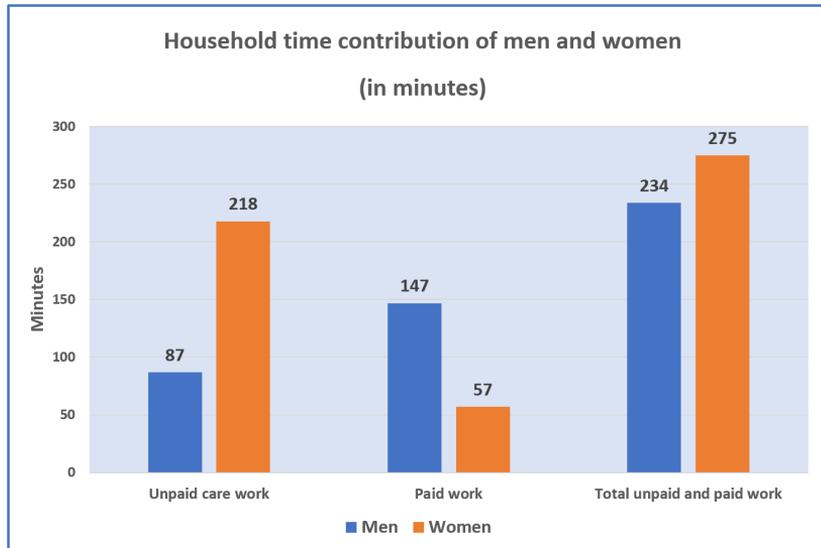


Figure 15: Household time contribution of men and women (NCWC, 2019)

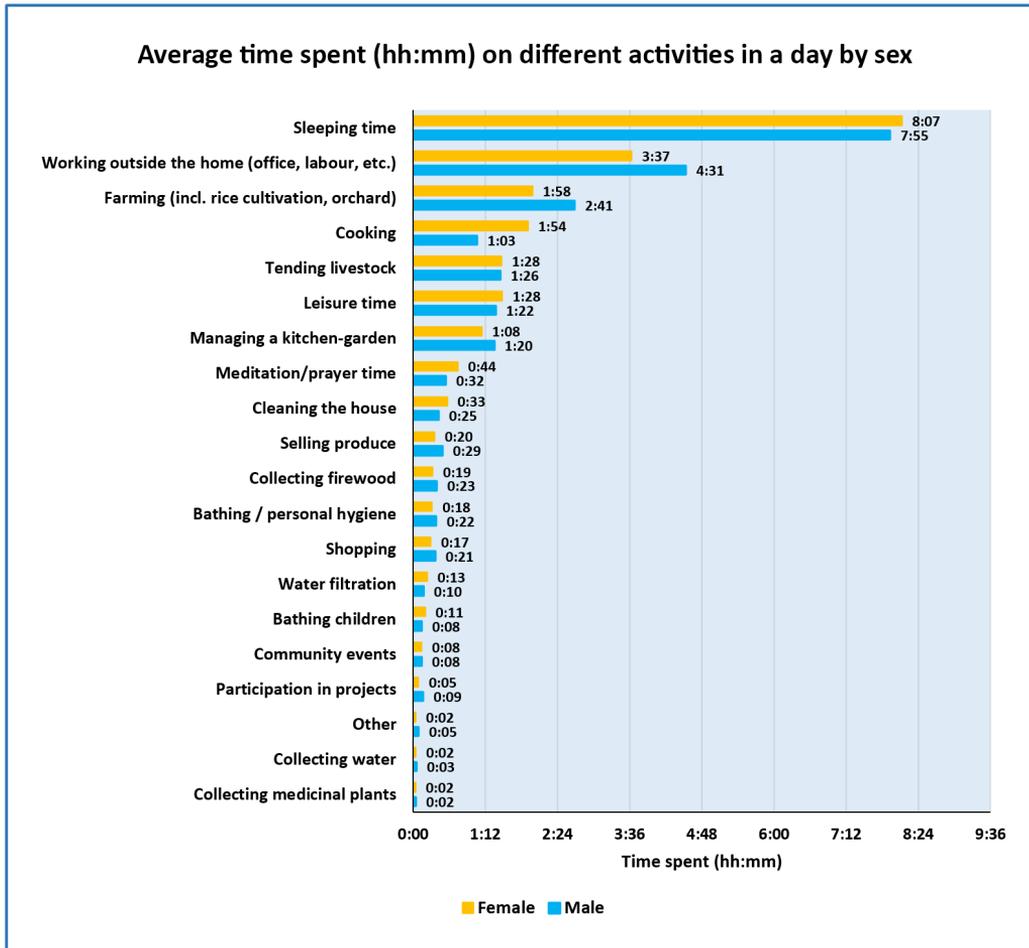


Figure 16: Average time spent (hh:mm) on different activities in a day by sex

Table 7: Participation in different activities (%) by sex

Activity	Participation rate in different activities (%)		
	Male	Female	Both sexes ¹¹
Cooking	67.51	94.41	83.32
Cleaning the house	42.87	62.42	54.36
Collecting water	12.25	12.63	12.47
Water filtration	24.55	31.77	28.79
Bathing / personal hygiene	78.59	73.90	75.84
Bathing children	17.61	41.63	31.72
Working outside the home (office, labour, etc.)	73.50	74.43	74.05
Shopping	91.99	85.34	88.09
Selling produce	48.68	44.45	46.19
Farming (incl. rice cultivation, orchard)	58.34	52.15	54.71
Managing a kitchen-garden	66.41	71.13	69.18
Tending livestock	56.67	62.37	60.02
Collecting firewood	53.08	54.65	54.00
Collecting medicinal plants	4.58	3.92	4.19
Sleeping time	100	100	100
Meditation/prayer time	38.61	43.20	41.31
Leisure time	85.31	85.00	85.13
Community events	68.16	58.57	62.53
Participation in projects	47.38	28.34	36.19
Other	2.79	1.51	2.04

3.2.6 Decision-making

While both sexes are involved in making household decisions, there are marked gender differences for some of the decisions. For instance, women are more involved in decision-making related to ‘household

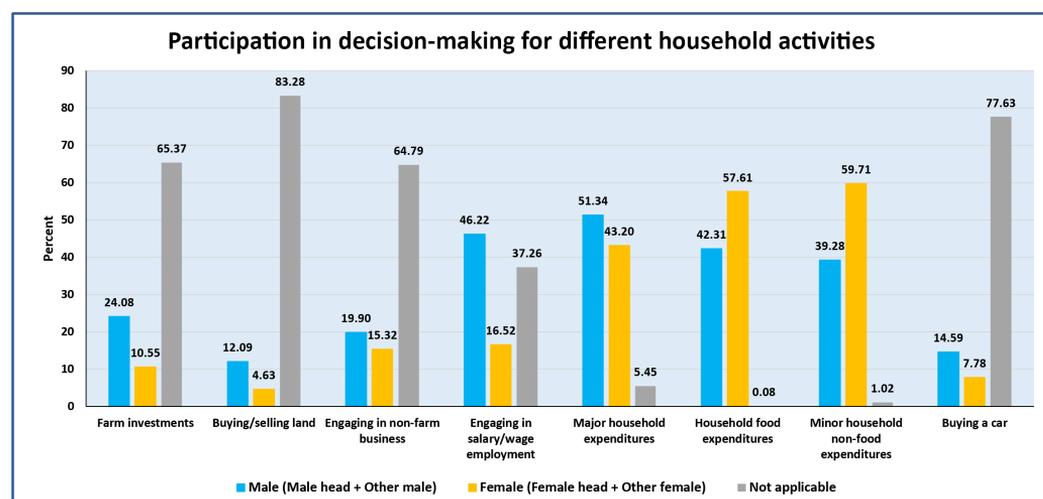


Figure 17: Participation in decision-making for different household activities

food expenditure' and 'minor household non-food expenditures' while men are more involved in decisions related to 'major farm investments', 'buying and selling of land', 'whether or not members of the household engage in non-farm activity', 'whether or not members of the household engage in salary or wage employment', 'buying car', and 'major household expenditure' on durable goods. The results, as presented in Figure 17, indicate male dominance in major household decisions.

3.2.7 Public and political representation

Representation of women in public and political life is low. In 2008 women's representation in the National Assembly was 13.8 percent while the represented rate decreased to 8.3 in 2013. In 2013, of the 11 women candidates, only 3 (6.4 percent) gained seats out of the 47 seats in the National Assembly; and aside from the two women eminent members appointed by His Majesty the King, no other women representing the Dzongkhags held seats in the National Council.

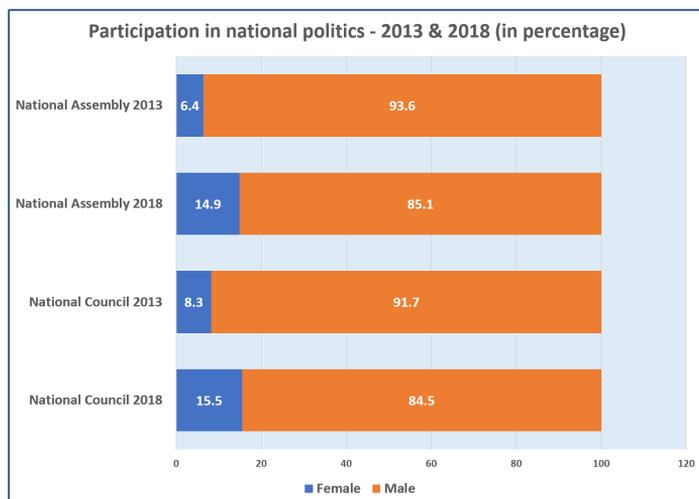


Figure 18: Female participation in National Politics in 2013 and 2018

As shown in Table 8, there was some improvement in 2018, with seven of 10 women candidates elected and holding 13 percent of the seats in the National Assembly. In the National Council as well, women held 11.6 percent or four of the 25 seats. The overall representation rate of women in the Parliament stands at 15.3. However, both the National Assembly Speaker and the National Council Chairperson were men, and only one of the 10 Cabinet Ministers was a woman (ECB, 2018).

As shown in Table 8, 92.1 percent of the 1443 elected representatives during the 2011

Local Government elections were men, as compared to 7.9 percent women. Women representation saw a slight increase in 2016 with 11.9 percent of the 1,494 elected representatives being women and 88.1 men (ECB, 2016).

Table 8. Summary of elected candidates in Local Government Elections 2016; and for comparison of 2011 (ECB 2016)

Elective Post	2016			2011		
	Male	Female	Total	Male	Female	Total
Thrompon	4	0	4	4	0	4
Gup	203	2	205	204	1	205
Mangmi	181	24	205	193	12	205
Gewog Tshogde Tshogpas	901	140	1041	895	98	993
Dzongkhag Thromde Thueme Ngotshab	11	3	13	11	0	11
Thromde Tshogpas	16	9	25	21	4	25
Total	1,316	178	1494	1,328	115	1,443

Although Bhutan's Constitution and electoral laws provide equal civil and political rights to all women and men, to take part in all aspects of all political and electoral processes, the number of women coming forward to contest in these elections and the number of elected women candidates are still quite limited.

3.2.8 Membership in groups and associations

Equal participation in groups or associations is important for promoting gender equality in access to resources and opportunities, as well as to benefit from the unique strengths of men and women in realizing groups/association objectives.

The survey result shows a relatively higher proportion of men (55.7%) than women (48.1%) reported being a member of a 'forest user group'. Likewise, a higher proportion of men (10.3%) than women (3.5%) reported being a member of a climate initiative or project group. On the other hand, a relatively higher proportion of women (24.48%) reported being members of 'trade or business group' and 'farmers' group'

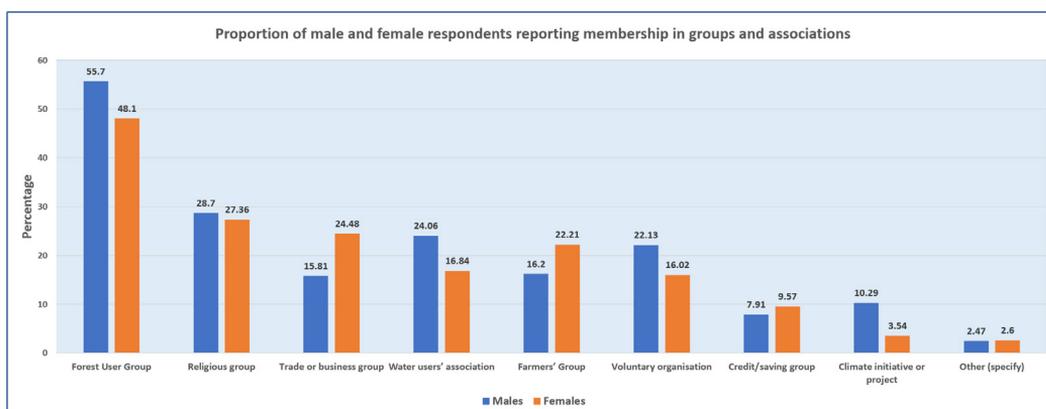


Figure 19: Proportion of male and female respondents reporting membership in groups and associations

than men (15.81%). Figure 19 provides details on participation of men and women by types of groups and associations.

Regarding the composition of various groups and associations, over half the respondents reported that the groups or associations they belong to have 'equally-mixed' men and women members. However here is a slight difference between the perception of men and women regarding the promotion of women's equal participation by the associations and groups. A relatively lower proportion of women than men reported that different groups or associations promote women's equal participation.

The findings also show that promotion of women's equal participation varies by the type of groups and associations. Most respondents (87.73%) reported that 'religious groups' promote women's equal participation, while the 'water users' association' had the lowest proportion of respondents reporting the same (70.96%).

Table 9: Promotion of women's equal participation in groups/associations by sex of respondents

Groups	Male			Female		
	Yes	No	Total	Yes	No	Total
Farmers' Group	90.16	9.84	100	70.03	29.97	100
Water users' association	78.91	21.09	100	61.56	38.44	100
Forest User Group	89.29	10.71	100	84.59	15.41	100
Trade or business group	94.99	5.01	100	75.89	24.11	100
Credit/saving group	86.74	13.26	100	69.63	30.37	100

Groups	Male			Female		
	Yes	No	Total	Yes	No	Total
Religious group	96.98	3.02	100	80.77	19.23	100
Voluntary organization	96.84	3.16	100	78.67	21.33	100
Climate initiative or project	98.07	1.93	100	66.10	33.90	100

Survey respondents belonging to groups or associations were asked to rank their level of comfort in speaking during group meetings, on a 5-point Likert scale ranging from 'not at all' to 'Yes, very comfortable'. a relatively higher proportion of men than women across all groups or associations reported being 'fairly comfortable' or 'very comfortable' with speaking in groups to give their opinion or offer suggestions as indicated in figure 20.

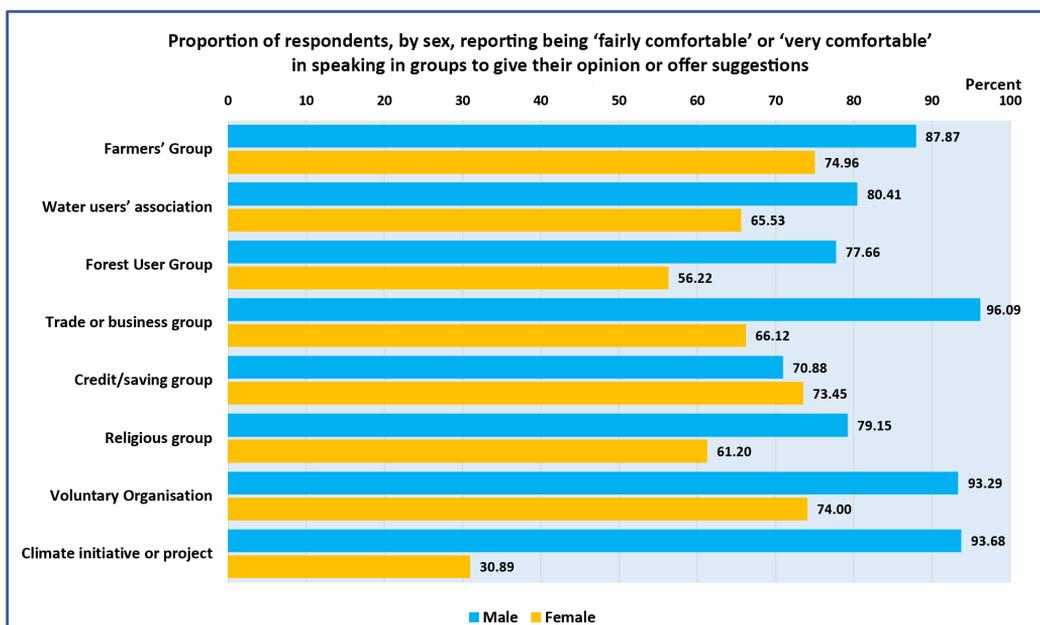


Figure 20: Proportion of respondents, by sex, reporting being 'fairly comfortable' or 'very comfortable' in speaking in groups to give their opinion or offer suggestions

3.2.9 Gender Based Violence Against Women and Girls

Generally, acceptance level of Gender based Violence (GBV) particularly Intimate Partner Violence is high with half the female population (53.4%) justifying violence against them by their partners under certain circumstances (NCWC, 2017). The national survey on violence against women and girls showed that 44.6 percent of women and girls aged 15-64 experienced one or more forms of partner violence once in their life time and 6.1 of them experienced sexual and/or physical violence in the last 12 months. The survey also revealed that 12.5 percent of them experienced non-partner physical violence and 5.8 percent sexual violence. Likewise, sexual abuse during childhood – especially by male strangers – was experienced by 6.9 percent of the respondents (ibid).

Perceptions on domestic violence perpetrated toward different groups within the household was collected through the quantitative survey of the study to assess the prevalence of such problems in communities. A relatively higher proportion of people 'strongly agreed' or 'agreed' that domestic violence perpetrated towards women (49.4%) is a serious issue in their community, closely followed by against youth (48.5%), and people with accessibility needs (34.3%). 28.8 and 32.45 percent of respondents felt that men and elderly people experienced domestic violence respectively indicating the prevalence of such issues among men too .

Table 10. Domestic violence perpetrated against different groups within the household as a serious issue

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree	Don't know	Total
Women	22.97	26.39	4.54	24.49	5.10	16.52	100
Men	9.58	19.19	11.84	34.21	7.06	18.12	100
Elderly	11.32	21.13	11.09	29.13	7.91	19.43	100
Youth	22.90	25.64	5.11	24.21	4.66	17.48	100
People with accessibility needs.	17.08	17.25	8.08	26.70	5.62	25.28	100

Overall higher proportion of female respondents than males agreed that domestic violence is a serious issue in their community as shown in Figure 21¹².

3.3 Gender Equality Policy Framework

The RGoB has adopted several international and national legal frameworks of relevance from a gender perspective. The Universal Declaration on Human Rights as well as the United Nations Charter was signed in 1971¹³. The Convention on the Elimination of all forms of Discrimination Against Women (CEDAW) was signed in 1980 and ratified in 1981. The South Asian Association for Regional Cooperation's (SAARC) Convention on the Prevention and Combating of Trafficking of Women and Children for Prostitution was signed in 2002. The Beijing Platform for Action (1995) and Agenda 2030 with its SDGs are also important international frameworks that Bhutan adheres to.

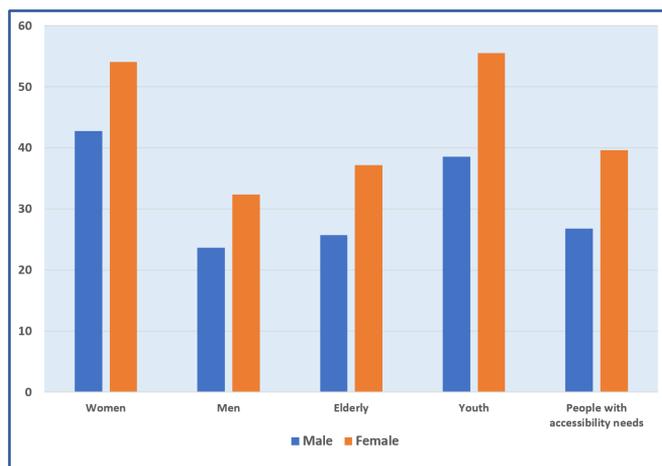


Figure 21: Domestic violence perpetrated against different groups within the household perceived as a serious issue (% agreeing or strongly agreeing), by sex

The Constitution of the Kingdom of Bhutan in Article 7 on Fundamental Rights states that “All persons have the right to life, liberty and security of person and shall not be deprived of such rights except in accordance with the due process of law.” Some these rights, as identified in sub-sections of the Article, include the right to security, to speak, to vote, to movement, and to own property. For instance, Article 7.15 states that “All person are equal before law and are entitled to equal and effective protection of the law and shall not be discriminated against on the grounds of race, sex, language, religion, politics or other status”.

Article 9 on Principles of State Policy states that “The State shall endeavour to take appropriate measures to eliminate all forms of discrimination and exploitation against women including trafficking, prostitution, abuse, violence, harassment and intimidation at work in both public and private spheres”.

The Inheritance Act (1980) accords equal inheritance rights for men and women; the Loan Act (1981) states that women are eligible to possess land and collateral for getting a loan; and the amended Land Act (2007) establishes 18 years as the minimum age for both women and men registering land. The Domestic

Violence Prevention Act (2013), covers the prevention of physical, sexual, psychological, economic, and emotional violence.

The Disaster Management Act (2013) underlines the importance of women's participation in making decisions related to disaster management and risk reduction. The Labour and Employment Act (2007) prohibits sexual harassment, and the Regulation on Working Conditions (2012) looks into creating an appropriate and safe conditions at the workplace.

The National Gender Equality Policy (NGEP) 2020 explores gender equality through the lens of three domains i.e. political, social and economic. The policy aims to: (1) Provide a coherent strategic framework for the Government's priorities on gender equality; (2) Strengthen accountability and operational strategies to address priority gender issues; and (3) Facilitate deeper collaboration across sectors and stakeholders towards a common vision of gender equality.

Statement 5.9 of the NGEP establishes the link to climate change:

Mainstream gender in all disaster and climate change related initiatives through acknowledgment of differentiated impacts of disasters and climate change on women and men, and the positive roles that women can play in adaptation and mitigation efforts.

The NGEP Implementation Plan (2020) further identifies actions for statement 5.9, as follows:

- i. Assess gender differentiated capacity needs and develop a gender responsive capacity-building strategy for climate change actions;
- ii. Develop capacity of Gender Focal Points (GFPs, GEGs, MRGs, C4 and LGs) on mainstreaming gender and NDC targets into sectoral policies, plans, programmes and projects;
- iii. Conduct a gender assessment of selected NDC sectors;
- iv. Develop gender mainstreaming toolkit for selected NDC sectors; and
- v. Prepare local adaptation plans including support needs, based on complete gender analysis that take into account the needs of rural women.

The National Plan of Action for Gender Equality or the NPAGE (2019-2023) outlines strategies to promote gender equality in the political, public, social and economic domains. It seeks to address gender issues across 10 critical areas and for each of these areas, the progress, gaps and challenges, as well as result-based actions are identified. Critical Area 10 of the NPAGE is 'Environment and Climate Change'. The action plan recognizes the gender dimensions of environment and climate change; acknowledges that the extensive environmental legal framework and strategies in place are not adequately gendered; and that the lack of awareness, resources and appropriate institutional framework are still an issue.

Enhanced participation of women in climate change decisions and actions, and their reduced vulnerability to climate change impacts is identified as Outcome 10 in the related NPAGE-Results Matrix (2019). Expected outputs are:

- i. Enhanced participation of women and girls in climate change actions;
- ii. Measures implemented to reduce the vulnerability of women and girls to climate change impacts;
- iii. Enhanced capacity of decision-makers, policy-makers, Local Government leaders and relevant stakeholders to mainstream a gender perspective in climate change actions; and
- iv. Sex-disaggregated data and knowledge on gender and climate change nexus. The NPAGE-Results Matrix identifies 26 specific actions to produce these outputs.

The National Plan of Action to Promote Gender Equality in Elected Offices or the NPAPGEEO (2019) promotes actions to enhance women's participation in politics through interventions across four domain-institutional; societal, individual and legal.

Gender as a cross-cutting concern is underlined in the FYP formulation guideline. 12th FYP adopts a two-pronged approach to promoting gender equality- through a dedicated NKRA 10, "gender equality" and mainstreaming gender as crosscutting theme into all other NKRA's. Women's representation in Parliament (percentage); gender parity index in tertiary education (ratio); and Prevalence of Violence Against Women are identified as key performance indicators.

Gender Responsive Planning and Budgeting (GRPB) is identified as an important strategy to achieve the gender equality goals. Within this context, the Strategic Framework and Action Plan for Gender Mainstreaming and Gender Responsive Planning and Budgeting was approved in 2014. It provides guidance to implement GRPB and identifies institutional arrangements, advocacy, awareness-raising and capacity-building, collection of sex-disaggregated data, gender analysis of sectors, and development of gender-sensitive indicators as main strategies.

Since, 2013 the Budget Call Circulars for the Fiscal Year (FY) underlined the need to mainstream gender in sectoral activities. The Guidelines for Preparing the Budget for the FY 2019-2020 emphasize alignment with the 12th FYP and APA targets, and explicitly states that "As the 12th FYP calls for mainstreaming crosscutting themes, the budgetary agencies must ensure that budget proposals are inclusive of gender, environment, climate change and disaster."

The Protocol for Policy Formulation requires the Gender Focal Point of the proponent sector, environment representatives and other key external stakeholders to be involved in the screening exercise of draft policies. The format for submission of Policy Concept Note requires the proponent agencies to identify opportunities and challenges in the areas of gender and other crosscutting issues.

3.4 Institutional Framework

The NCWC is the main coordinating institutional body for the review, formulation, reform, initiatives, advocacy and support of policies, plans, projects and activities from a gender equality- and child-sensitive perspective.

Gender Focal Points (GFPs) and Gender and Child Focal Points (GCFPs) have been instituted as coordinating entities and drivers for gender mainstreaming in ministries, dzongkhags, Civil Society Organizations (CSOs), and the private sector. The GFP plays diverse roles, such as awareness-raising and sensitization on gender issues and initiatives, to creating a gender-friendly and enabling workplace. The GFPs are supported and trained by the NCWC. Currently, 24 GCFPs (7 females, 17 males) are active in the Dzongkhags and Thromdes, and 32 GFPs (16 females, 16 males) at central level¹⁴.

A Gender Expert Group (GEG) - comprised of six members with well-established gender expertise from government, CSOs and private agency - has been established to provide technical support to the NCWC

Box 8: Some gender mainstreaming tools and their limitations

Tools:

- Gross National Happiness (GNH) Screening Tool: promotes gender mainstreaming in all policies; gender equality (GE) is one of the 26 parameters used to screen policies.
- Framework to mainstream Gender, Environment, Climate-Change, Disaster Risk Reduction and Poverty (GECDP), 2013: aims to take gender, environment, climate change, disaster risk reduction and poverty into account in all aspects of the development process at all levels.
- Local Development Planning Manual (LDPM), 2014: includes several references to gender elements in order to mainstream gender at local levels.

- National Gender Mainstreaming Guidelines, 2014: provides approaches and procedures for gender mainstreaming in each sector, with checklists for planning and implementation, and law and policy development.

Limitations

- While many guidelines, tools and strategies are available to mainstream gender into overall and sectoral policies and practices, effective implementation is often hampered due to lack of awareness, capacities and practice.
- Limited focus on intersectionality and people facing multiple discrimination and vulnerabilities such as single mothers, persons with disability, those in informal sectors.

including reviewing policies and conducting capacity-building programmes.

At the local level, Dzongkhag/Thromde Woman and Child Committee was established to increase provision of services to women and children in need of care and protection and implement the CCPA and DVPA.





IV. GENDER AND CLIMATE CHANGE IN SELECTED NDC SECTORS

The nexus between climate change and gender equality issues has been studied internationally since the beginning of this century (Masika, 2002). A recent report of the UNFCCC Secretariat outlines the following gender-differentiated areas of climate change:

- i. Gender-specific vulnerability;
- ii. Differentiated participation of women in climate decision-making, policy-formulation and implementation; and
- iii. Differentiated benefit-sharing from climate policy and action. Issues related to climate change adaptation (CCA) and climate change mitigation (CCM) are described, as well as means of implementation, including capacity-building and action for climate empowerment, the role of access to and control over technology, and climate finance (UNFCCC Secretariat, 2019). These areas are also central in this section of the report.

4.1 Introduction

Climate change has sudden and slow-onset impacts on different social groups. These impacts are shaped by gender differences in roles, responsibilities and activities, and social and cultural norms and practices that influence access to and control over assets (including natural resources, technologies, financial resources), mobility, education and training, and relevant information (Dankelman, 2010a; UN Women AP, 2016). Similarly, people's vulnerability is shaped by absence of empowerment and decision-making power.

It is important to underline that those who are more susceptible to risks, or less able to cope, are termed 'vulnerable'. Although in many local situations - because of the reasons mentioned above - women seem to be more vulnerable to climate change than men, at the same time women are vital partners in environmental management.

The natural resource-related tasks (described in chapter III) are particularly impacted by changing rainfall patterns, rising temperatures and extreme weather events. Resulting droughts, flooding, GLOFs and changing agro-ecosystems (see chapter II) not only directly impact personal health and security, but also increase time and labour burdens for women as they carry out livelihood security tasks, including those for food, water and energy (Dankelman, 2010b). This again, limits not only women's leisure time, but also their ability to attend meetings, trainings, and access to (paid) quality work (RGoB & UNDP, 2014). This is particularly the case in rural areas.

Climate change and deteriorating agro-ecological conditions push male members of households into out-migration in search of off-farm employment, increasing the number of female-headed households (Verma et al, 2018). Other indirect climate change impacts include an increase in intimate partner violence because of intra- household tensions and pressures (including increased alcohol consumption), and an increase in sexual exploitation, trafficking, and early marriages (ADB, 2014; Verma et al, 2018). Likewise, incidences of pests and diseases in agriculture and livestock, and increasing human-wildlife conflicts, are having major effects on rural households, and particularly impact local women (ADB, 2014).

4.1.1 Gendered experiences of climate change

The survey shows that local households experience many and diverse changes in weather conditions. In particular, warmer or unpredictable weather is experienced by more than 90 percent of the respondents, as shown in Table 11. As well, increased flooding and landslides, hail storms and colder weather are experienced by a majority of respondents.

The percentage of males and females experiencing extreme weather conditions is diverse. A slightly higher proportion of males than females report warmer weather (including heat waves), increased flooding, and hail storms; and a larger percentage of females report more unpredictable weather, increased occurrence of wildfires, and increased landslides.

Table 11: Percentage of respondents reporting experiencing extreme weather conditions, by sex (% reporting 'Yes')

Weather conditions	Males	Females
Warmer weather, incl. heat waves	97.85	94.81
Colder weather, incl. cold waves	71.00	70.45
Unpredictable weather	90.51	94.83
Increased flooding	78.42	71.10
Droughts	28.97	27.49
Hail storms	77.09	75.58
Increased occurrence of wildfires	22.81	28.11
Increased landslides	77.70	80.53

The survey reveals difference in experience of men and women with regard to effects of climate change on personal life. A relatively higher proportion of men reported 'increased use of electric fan', 'difficulties in food production', 'increased household waste', and 'increased conflicts in the household' while a relatively higher proportion of women reported 'decrease in household income' and 'changes in food habits of household'.

Box 9: Experiences with gender and climate change in Bhutan

When introducing the concept of gender and climate change, interviewees mentioned that they were not able to link gender with climate change due to limited knowledge. An interviewee questioned, "Isn't climate change gender neutral; it is difficult to see the connections"; another said, "An equal number of women and men is impacted by climate change issues these days".

However, there were also interviewees who stated the opposite i.e. that the 10th FYP the GNHC had started the Poverty and Environment (PE) Project, and important lessons can be drawn from that experience. Particularly rural women, children and elderly are vulnerable and affected by climate change; and limited coping capabilities add to their burdens. An interviewee stated that women and men are affected equally, but that women are more vulnerable to the impacts of climate change as they are already burdened by household chores, including child care, food security, and the provision of water and fuelwood. As women are working in the fields they are particularly vulnerable; and if they are affected they do not get compensation.

Several organizations emphasize that women's workloads, drudgery and stress increase, for example when water sources are drying up and women have to work longer distances or excessive rainfall leads to flooding; or when the firewood that they collect is getting scarce. Female workers, for instance those working on road maintenance, are exposed to heat stress. This all is exacerbated by increased climate-induced migration that affects women and men differently, as more often male members of households are migrating—thereby increasing women's work burdens. Increased stress in the family can lead to more domestic violence, and climate related disasters increase physical and other burdens particularly on women. In such situations, one of the important coping strategies for women is looking for diversification and alternative employment, especially in the cottage and small industries. Another interviewee, however, emphasizes that women not only play a critical role in CCM and CCA, but that they are also causing climate change because of their household roles.

A slightly higher percentage of women (84.20%) than men (81.86%) reported the effect of climate change on the natural resources that they depend on for their livelihood.

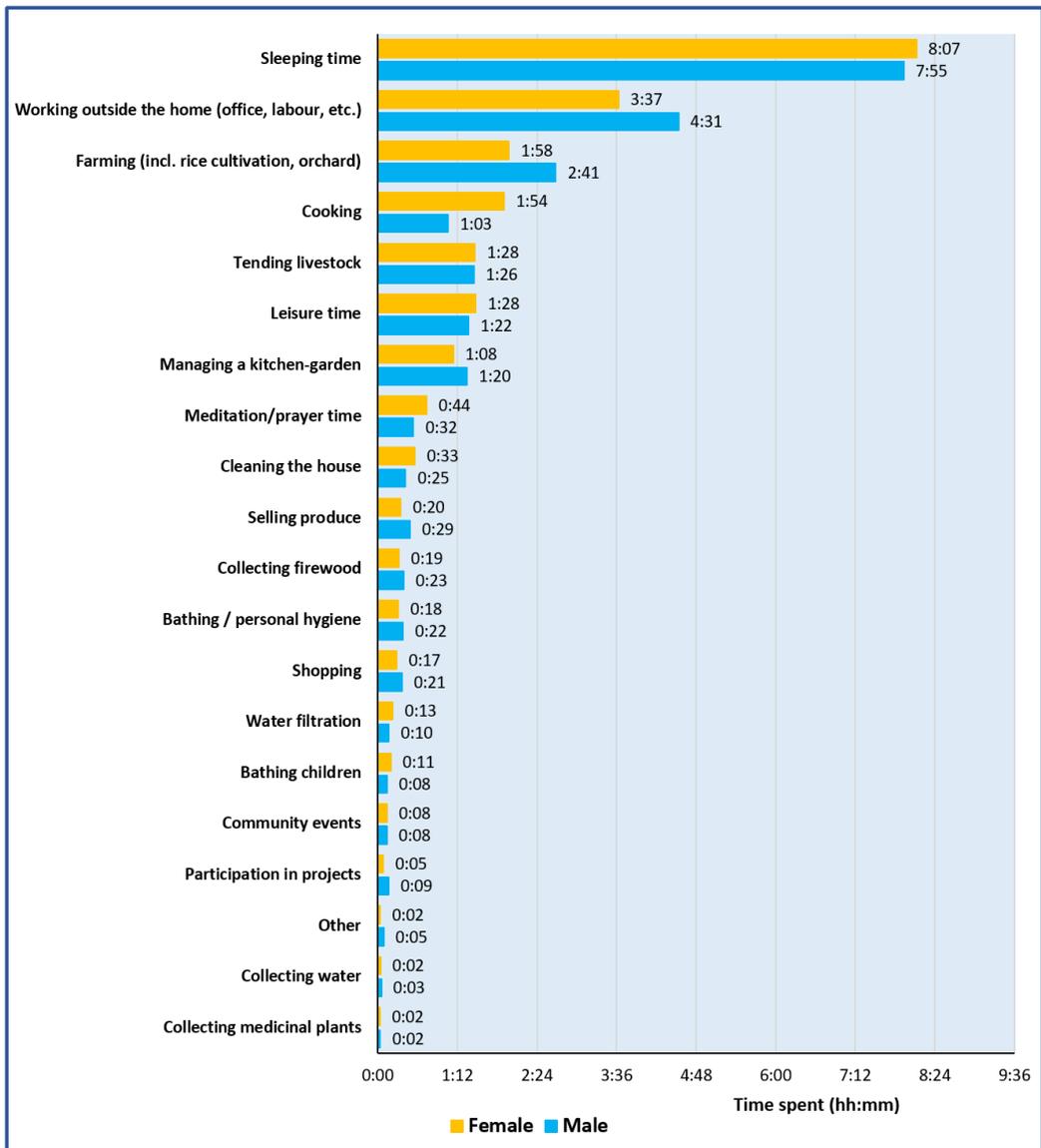


Figure 22: Proportion of respondents reporting effects of climate change on their personal life, by sex

4.1.2 Gendered impacts of climate change

As shown in Table 12, about half of the survey population ‘agreed’ or ‘strongly agreed’ that ‘climate change increases women’s workload more than men’s’ (49.3%), and that ‘climate change impacts women more than men’ (55.6%)—indicating that although both men and women are affected by climate change, people perceive the impact is more severe on women than on men.

Table 12: Proportion of respondents reporting degrees of agreement to statements on the effects of climate change

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree	Don't know	Total
Climate change increases women's workload more than men's	17.27	32.02	20.95	18.20	3.25	8.31	100
Climate change impacts women more than men	20.73	34.90	11.11	18.73	5.50	9.03	100

4.1.3 Choice of coping strategies

By sex, males are more inclined than females to 'look for alternative employment' to mitigate the impacts of climate change, with 40 percent of male respondents reporting 'yes' as compared to 28.4 percent of female respondents. Males are also more likely to 'migrate to a city' (24.6%) than females (19.4%) as a means to deal with impacts of climate change. On the other hand, a higher proportion of females reported that they will 'change consumption patterns' and 'buy water' to cope with the impacts of climate change, as shown in Figure 23.

4.1.4 Gendered participation in climate change decision-making

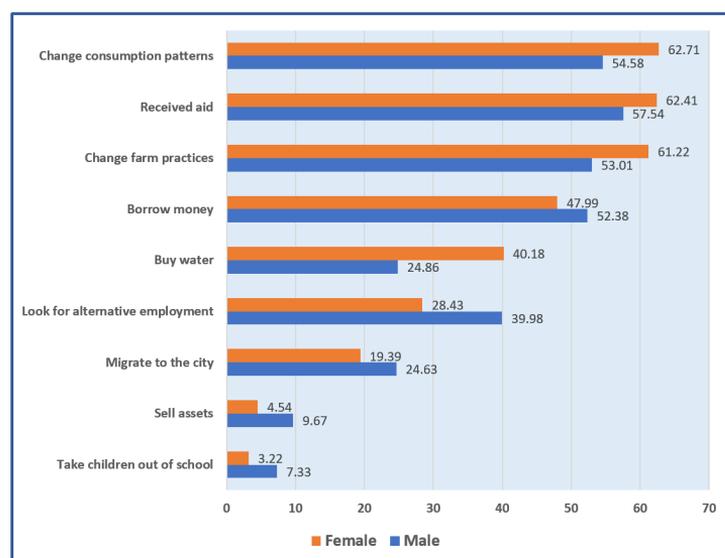


Figure 23: Coping strategies to counter impacts of climate change by sex (% reporting 'Yes')

Women are mostly affected by the impacts of climate change and climate change adaptation and mitigation interventions requires equal participation of women to be effective. However, their active participation in climate policy development and decision-making is significantly lower than that of men. Similarly, their participation in making decisions related to agriculture and waste is limited despite higher composition of women in these sectors (Verma et al, 2018).

With regard to women's participation in decision making in forestry sector, there is limited information about how they participate and benefit from these efforts although many women are engaged in community forest activities. There is also limited engagement of women in the water and waste management decision making. As such, the Payment for Ecosystem Services is not gender responsive.

Nevertheless, as household managers, consumers and (informal) entrepreneurs, women play an important role in waste management - especially in segregating waste at source, home composting at household - and community-level, and waste upcycling.

According to some interviewees the role of women in climate change mitigation (CCM) and adaptation (CCA) is not yet clear, but others share examples where this role becomes visible. With regard to mitigation and adaptation, one example is the promotion of biogas plants (as promoted in the 11th and 12th FYPs) for which women have to collect the dung. However, many households do not have cattle. Interviewees also suggested the promotion of improved cooking stoves, electric cooking stoves or solar technologies and biogas from food waste as climate change mitigation measures. During the interview, energy efficiency and awareness-raising starting with women and increasing women's access to clean and renewable energy are highlighted as means to promote gender equality in climate actions by the participants.

Other forms of CCM and CCA in which Bhutanese women are engaged is tree-planting, REDD+ initiatives, kitchen gardening, sustainable land (including soil) management, and organic agriculture. It is important to stimulate women's entrepreneurship in the areas of agriculture (including agribusiness i.e. upgrading production and products), eco-tourism, and energy (clean fuel-efficient cooking stoves, solar and small hydropower). One of the interviewees stated, "My wife - as a woman - is more concerned about environmental issues than I am". However, there is general consensus from the interview that not only women (and men) at the household level but also schools that have a role to play in awareness- raising around environmental and climate change issues.

The Royal University of Bhutan (RUB) reports that in the context of promoting a 'green economy', there is growing interest amongst students to study environmental subjects and strengthen skills in these areas. The College of Natural Resources (CNR) teaches many subjects that are relevant from an environmental and climate change perspective, including subjects like climate change, water resources management, organic agriculture, natural resources management, sustainable development, environmental engineering and earth sciences. Similarly, the Jigme Namgyal Engineering College (JNEC) and the College of Science and Technology (CST) have included environmental issues in their curricula. Sherubtse College offers a range of multidisciplinary undergraduate programmes, and has a Centre for Population and Development Studies and a Centre on Climate Change and Spatial Information—in which disaster issues, demographic transitions including migration, and sustainable development, are studied. However, as yet, none of these RUB colleges deal with education or research specifically on the gender-climate nexus.

The Royal Thimphu College (RTC) offers a Bachelor of Science (BSc.) in Environment Management, in which issues related to natural and social sciences, business, economics and humanities are integrated; presently the programme is under review, which may offer possibilities to integrate gender issues in a new climate change module. RTC's BSc. in Anthropology offers a module on Ecology and one on Gender Approaches; in the 3rd year a course on Contemporary Issues is offered, paying specific attention to vulnerable people, and in which climate change is eminent.

Although the Royal Institute for Management (RIM) does not have any curricula in which gender or climate change issues are integrated, it is currently working on the integration of a gender curriculum in post-graduate courses. As well, under the NAP Project, RIM will start offering an introductory course on climate change.

There are also plans to make campuses more sustainable and greener—for example by saving energy, through waste management, rainwater harvesting, and the promotion of biodiversity on campus.

As far as this study could investigate, there are no Technical and Vocational Educational Training (TVET) institutes where the nexus of gender and climate change is integrated in the curricula.

Review and reform processes of school curricula, guided by the Royal Educational Council (REC) also offer possibilities for integration of gender and climate change issues, through for instance, in the curriculum of Geography. There is also an opportunity to integrate issues like 'inclusiveness', the prevention of VAWG, and disaster preparedness in the curriculum, for which capacity development of teachers would be required.



4.2 Agriculture, Gender and Climate Change

Agriculture is a priority area in Bhutan's NDC. This section will describe the situation regarding agriculture as contributor to GHG emissions, gender issues in agriculture, and related policy and institutional frameworks.

4.2.1 Agriculture and climate change

Agriculture provides the main source of livelihood for majority of the Bhutanese with 51.1 percent of the population engaged in agriculture. The ratio of women working in agriculture sector is 61.7 percent comparing to male of 41.8 percent. (NSB, 2019;). There are 66,587 landholdings, with an average size of 3.7 acres. Agriculture is largely subsistence-based (for own consumption or limited sale), and includes crop farming, livestock rearing and forestry. Of the agriculture land holdings 54 percent is headed by men and 46 percent by women (MoAF, 2019).

The agriculture sector includes crop cultivation and animal husbandry, often in an integrated system with the direct environment, including grazing land and forests. The agriculture sector is the main driver of the primary sector's economic growth. In 2020 crop production contributed 8.93 percent of GDP, livestock management 4.55 percent, and forestry 2.33 percent (NSB, 2020). In the agricultural system, forests are used for the collection of NWFPs, timber and grazing - with grazing and leaf litter collection being one of the key benefits for farming communities.

Bhutan's agriculture contribution to GDP has reduced from 45.1 percent in 1981 to 15.82 percent in 2020 (NSB, 2020). The output value of crops grew at 71 percent between 2012-2016, but the contribution of livestock and forestry declined significantly.

Most rural households depend on crop and livestock production as well as forest products for their livelihoods. Agriculture is practiced on difficult terrain, with more than 30 percent of cultivated land located on slopes of more than 50 degrees (Wangmo, 2020). Land use include Chhuzhing (wetland agriculture), Kamzhing (dryland cultivation), orchard, and *khimsa*¹⁵. Livestock management - of cattle, mithun, yak, buffalo, pigs, chicken, goat, sheep and horses - is largely free-range or through stall-feeding, except in the high mountains of northern Bhutan where nomadic herding still prevails (Ura, 1993). The farming system is predominantly organic with almost 94.84 percent of landholdings using farmyard manure or compost. However, 25.32 percent still uses chemical fertilizers (MoAF, 2019).

Bhutan is rich in agrobiodiversity having more than 100 species of agriculture crops. Agrobiodiversity - through genetic variability of crops and livestock species - plays a crucial role in adapting to altered climatic conditions (MoAF, 2019). Erosion of agrobiodiversity - with a loss of 28.7 percent of traditional varieties of crops and animals - becomes a major challenge largely due to land conversion, introduction of modern crop varieties and breeds, overgrazing, unsustainable farming practices, pollution, invasive species, and human-wildlife conflicts (Dendup, 2018).

Forest resources form an integral part of rural livelihoods, and about 85 percent of landholdings collect at least one or several kinds of wood and NWFPs, such as mushrooms, cordyceps, and medicinal and aromatic plants (MOAF, 2019).

The main challenges faced by the agriculture sector are irrigation problems (with almost half of the farmers irrigating their land, mainly with surface water), crop damage from wildlife, and labour shortages (MoAF, 2019). Low productivity and technology levels, and inaccessible markets are additional challenges for farming households (Dukpa, 2006).

These challenges are further aggravated by climate change. The increase in temperatures, erratic precipitation and extreme weather events cause major direct and indirect threats to agrobiodiversity, crops and stocks, and to agricultural practices (NEC, 2016). Bhutan's NAPA has identified the Renewable Natural Resources (RNR) sector and farming communities as the most vulnerable to climate change (SNV & MoAF, 2015). The livestock sector, for example, is impacted by changes in biodiversity and feeds, heat stress, water insecurity, increase in diseases and in disease vectors (Thornton et al, 2009).

Agriculture is one of the most climate sensitive sectors which is also confirmed through the field interviews. Farmers have experienced climate change impacts such as water shortage due to erratic rainfall, rising temperatures and droughts, increased incidences of pests and diseases, and changes in crop calendar.

The emission from agriculture sector has been gradually decreasing over time. This trend indicates that emission associated with development has increased while emissions from agriculture remain relatively stable (NEC, 2020)

At the same time, agriculture is also an important GHG emitter contributing to climate change. In 2000 this was 42 percent, and while total emissions from agriculture, livestock and other land use increased in 2015 the sector contributed 32.4 percent of the national total emissions (RGoB/NEC, 2000; 2011; 2020). For a breakdown of GHG emissions within the sector, see Figure 24.

Some of the major emission drivers are rapid urbanization, farm mechanization, and changes in community institutions—for instance, moving from informal to more formal institutions like cooperatives (Dendup, 2018). High-value, commercial crops such as apples, oranges, areca nut, hazelnut, cardamom, ginger and chillies, red rice and vegetables are being promoted, while wheat, for example, is being replaced by potatoes (Dukpa, 2006). In animal husbandry, Jersey and Brown Swiss cattle are being promoted. At the same time, a shift towards organic agriculture (OA) forms a more recent transformation in agriculture (Neuhoff et al, 2014; Tashi and Wangchuk, 2016).

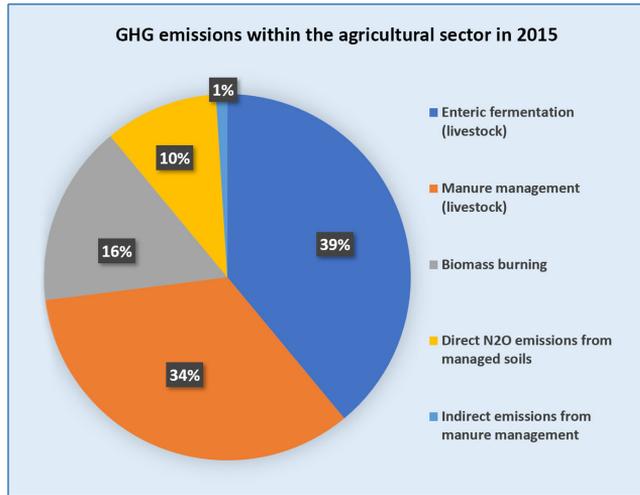


Figure 24: GHG emissions within the agricultural sector in 2015 (RGoB/NEC, 2020)

4.2.2 Gender in agriculture

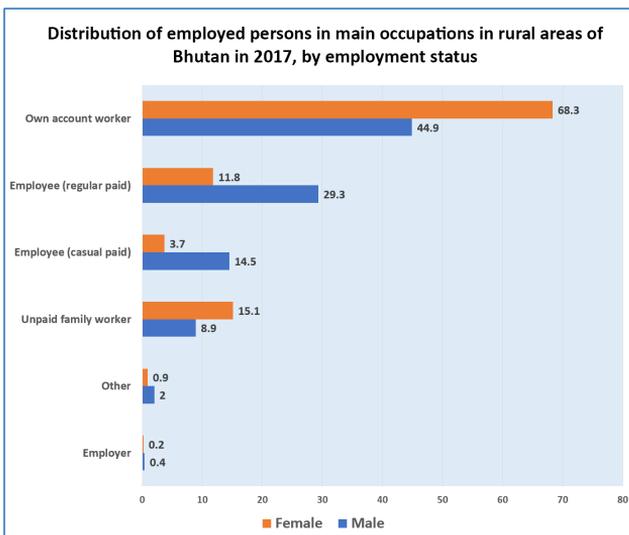


Figure 25: Distribution of employed persons in main occupations in rural areas of Bhutan in 2017, by employment status (NSB, 2018)

The labor force survey 2019 reports that 61.7 percent of women are working in agriculture, compared to 41.8 percent men (NSB, 2019). In addition, women play a central role in the marketing of agriculture products. For instance, at Centennial Farmers' Market, Thimphu has 391 women and —83 men registered sellers of agriculture produce.

Of the total respondents, 96.44 percent reported that they engage in agriculture activities. By sex, a slightly higher proportion of rural women (97.19%) than rural men (95.93%) reported engaging in agricultural activities. Large gender differences exist in terms of education background, with about

68 percent of female farmers without formal education as compared to 33 percent of male farmers. Among educated farmers, males have a higher educational attainment (MoAF, 2019). Key tasks, including agriculture tasks, in rural households are gender-specific, as Table 13 shows.

Table 13: Access control and division of tasks in rural households (Source: Adapted from UNDP GEF, 2016; UNW 2016)

	Women	Men
Agricultural	Weeding crops	Ploughing
	Transplanting paddy seedlings	Cardamom cultivation
	Vegetable cultivation	
	Production (milk, cheese, butter)	
	Marketing (cereals, vegetables, fruits, livestock)	Marketing
Livelihood tasks	Collecting drinking water	irrigation water management
	Collecting fuelwood and fodder ¹⁶	Collecting fuelwood and fodder
HH tasks	Cooking, washing, cleaning, child care, hygiene maintenance, family health care	
Non-Farm work	---	Off-farm employment
Community tasks	Religious and village ceremonies	
GO-sponsored meetings	Less women attended	Mainly men attended
Decision-making	Decision-making in agriculture (by consensus), incl. political decisions	
Access to land (also governed by matri/patrilinearity)	Equal access but less control; Benefits shared equally.	Equal access but more control; benefits shared equally.
Access and control over	More over livestock	More over forest products and agriculture machinery
Access and control over	Agriculture, credits, labour, health and education services; Equal sharing of benefits from agriculture and forestry activities.	
Benefits		From off-farm contracts, businesses, farm labour;
Decision-making		Gewog and Dzongkhags level meetings and trainings : men's participation dominant.

Although available data provide little insight into the gender-specific functioning of households, women farmers face particular challenges. Work burdens of rural women are higher than those of men, particularly because they have to bear the dual responsibility of family and community, next to their economic or productive activities. According to NCWC (2019), women in Bhutan perform 71 percent of unpaid household and care work. On average, men spent 1 hour 25 minutes (or 85 minutes) more on paid work compared to women; by contrast, women spent around 2 hours 11 minutes (or 131 minutes) more on unpaid work, which includes both care and household work.

Although women and men have equal legal right over land or any other property, the alienation within the family depends on the region, culture and tradition. In practice, the economic benefits in terms of access and control over the land still remains with husbands (World Bank, 2013).

Interviewees indicated that the agriculture system is characterised by feminisation due to men out-migration. More women are engaged in agriculture, while men get more involved in off-farm activities, migrating from rural to urban areas. Women also participate actively in CSIs, including agribusinesses. As they take on more roles in rural households and with local economies undergoing more difficult circumstances, women become more vulnerable to climate change impacts and are more seriously affected when climate-induced disasters hit.

Gender in climate-smart agriculture

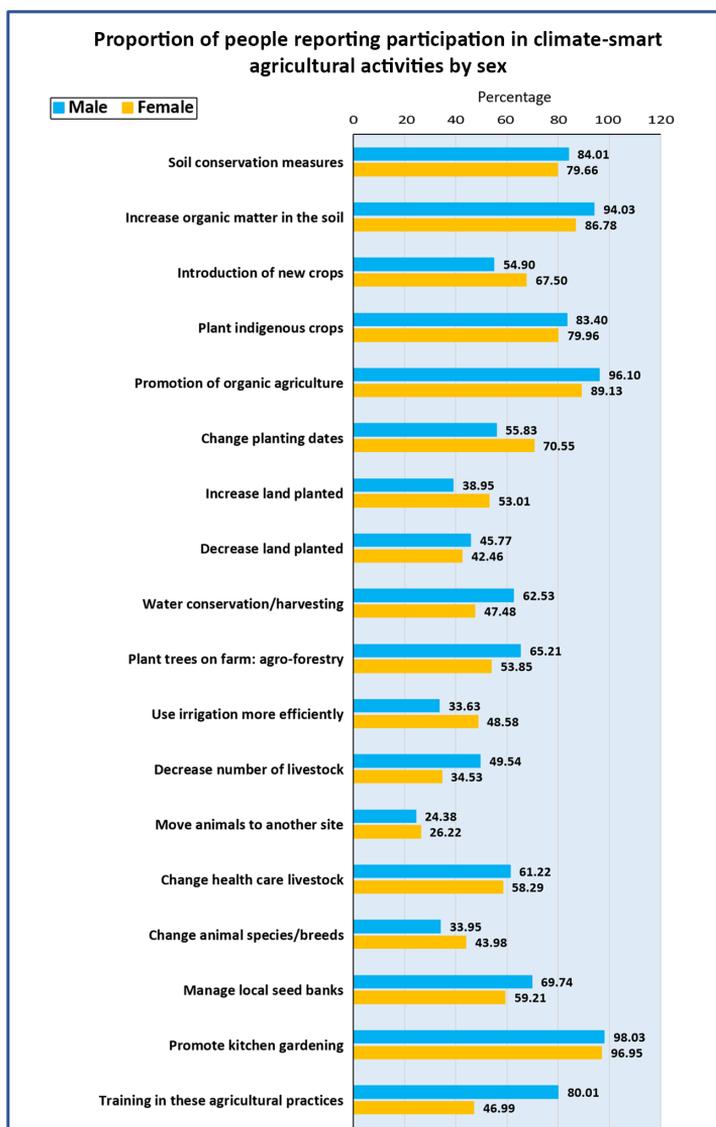


Figure 26: Proportion of people reporting participation in climate-smart agricultural activities by sex (% reporting 'Yes')

Adaptation and mitigation measures are strategies to enhance resilience of farming communities. Climate-Smart Agriculture (CSA) is an approach to improve the integration of agriculture production, development, and climate responsiveness i.e. mitigation and adaptation—and includes practices like use of water-and energy efficient technologies, sustainable and integrated soil management, organic agriculture, integrated pest management, and the use of resistant and tolerant varieties and breeds (CIAT, 2017).

The awareness on the existence of different initiatives and projects that make agriculture better adapt to climate change was assessed by asking respondents whether they are aware about any climate adaptation and mitigation initiatives in agriculture. Of those in the rural population surveyed who engage in agriculture, 74.55 percent reported being aware of such initiatives or projects. By sex, more men (83.8%) than women (68.1%) reported being aware about the existence of climate-smart agriculture initiatives or projects.

Survey findings presented in Figure 26 indicate that in order to adapt to climate change impacts, a majority of rural households are involved in activities such as 'kitchen gardening', 'organic agriculture', 'increasing organic matter in the soil', 'soil conservation measures', and 'planting indigenous crops'. As such, over 50 percent of the respondents reported being aware on most of the activities promoted by different climate-smart agriculture initiatives or projects.

A relatively higher proportion of women reported their participation in interventions such as 'introduction of new crops', 'change in planting dates', 'increase land (area) for plantation', 'efficient use of irrigation, and 'change in animal species/breeds'. On the other hand, a relatively higher proportion of men reported participation in interventions related to 'water conservation/harvesting', 'agroforestry', 'livestock management', 'local seed bank management', and 'training in climate-smart agriculture technology'. According to the interviews, women often play an active role in organic agriculture, while leading kitchen gardening initiatives.

Access to climate-smart agriculture support

The adoption of CSA will depend largely on access to information and support availability for climate-smart agriculture. About 77 percent of survey respondents engaged in agriculture activities reported having access to information on climate-smart agriculture of which 84.46 percent are men and 69.44 percent are women. A higher proportion of men (55.01%) than women (27.73%) reported having access to training in CSA.

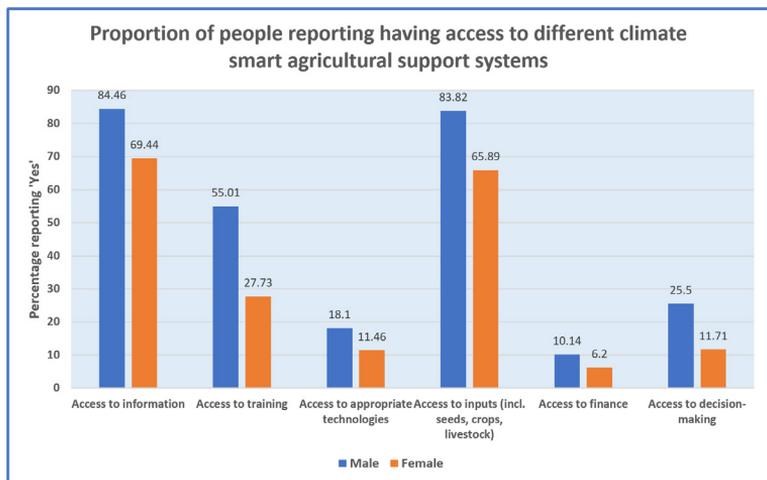


Figure 27: Proportion of people reporting access to different climate smart agricultural support systems by sex (% reporting 'Yes')

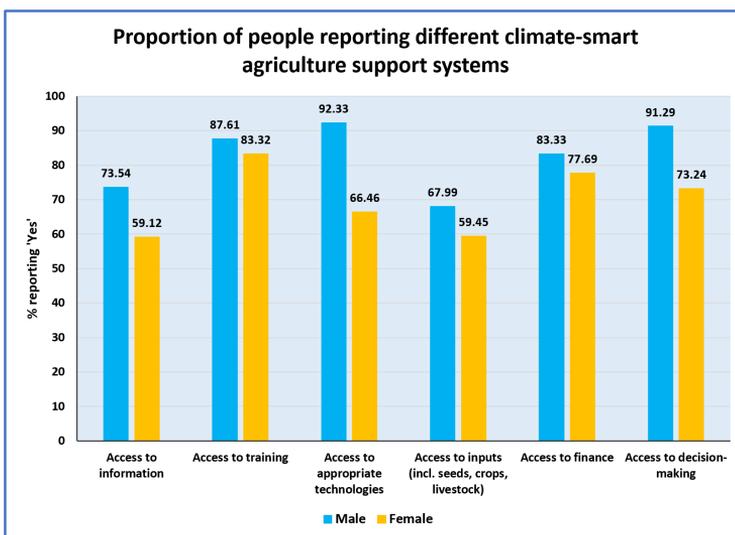


Figure 28: Proportion of people reporting that climate-smart agriculture support systems pay attention to gender issues, by sex (% reporting 'Yes')

As such, while the survey findings indicate that a higher proportion of women participate in agriculture related activities, in practice, the access to training information on CSA is limited among women.

In addition, the "access to input" was also reported by 65.89 percent for women and 83.82 percent for men. From the six different support systems, 'access to appropriate technologies' and 'access to finance' appears to be the two least accessible CSA support system. A higher proportion

of men reported getting all support for CSA.

The survey findings specified under Figure 28 indicate that most of the CSA initiatives are not gender-responsive - with the exception of initiatives on 'access to information' and 'access to inputs', where over 80 percent of respondents reported that these support systems pay attention to gender issues.

Views on whether different climate-smart support initiatives pay attention to gender issues differ between men and women. As shown in Figure 28, the male-female difference in opinion - on whether the various CSA support initiatives pay attention to gender issues - is biggest on 'access to appropriate technologies', where about 92 percent of men agreed that they pay attention to gender issues while only about 66 percent of women reported the same.

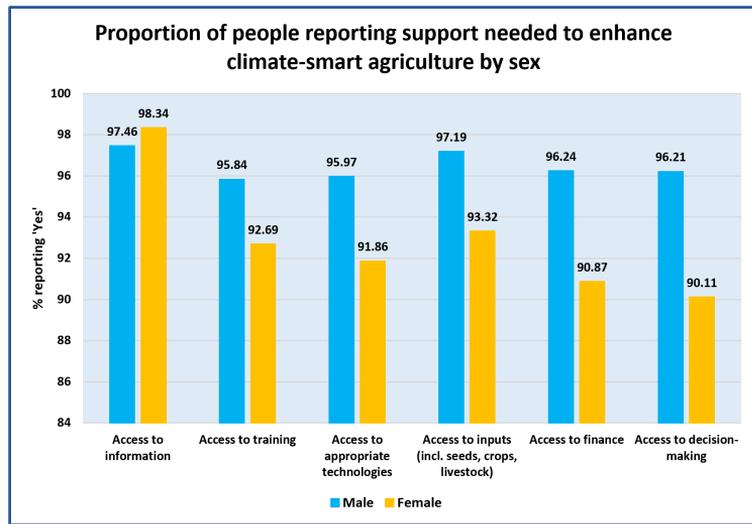


Figure 29: Proportion of people reporting support needed to enhance climate-smart agriculture by sex (% reporting 'Yes')

Box 13: Suggested climate adaptation and mitigation strategies

The interviewees in this study suggested the need to promote Climate-Smart Agriculture (CSA) as part of strategies to enhance the resilience of farming communities to climate change. For example, MoAF is promoting climate-smart technologies and an Agro-met Decision Support System (ADSS). However, there is a need to ensure that these technologies are gender-responsive. Crop diversification and the promotion of alternative livelihood opportunities, such as eco-tourism, were identified as important approaches to undertake.

The promotion of water user groups (mostly mixed groups), cleaning and guarding water sources, conserving indigenous crops or animal breeds and the use of water reservoir were likewise identified. A need to promote agro-ecological approaches, including organic agriculture and community seed banks, was also identified. Interviewees suggested that sustainable land management programmes and interventions should also be gender-sensitive. They underscored the need to institutionalise training on gender, natural resource use, and climate change in existing training institutions including those within the Technical and Vocational Education and Training (TVET) system, the Royal University of Bhutan (RUB), the Royal Institute of Management (RIM), and the College of Natural Resources (CNR). Meanwhile, the Bhutan Trust Fund for Environmental Conservation (BTFC) has supported a CSA curriculum development at RTC (see also Chapter 4.1)

As presented in Figure 29, over 90 percent of survey respondents reported the need for these CSA support systems, indicating their relevance for people engaged in agriculture. There is not much difference in opinion on the matter.

4.2.3 Policy framework

Bhutan's NDC identifies the following priority needs relevant to addressing climate change in agriculture:

Mitigation:

- Promotion of climate-smart livestock farming practices to contribute to poverty alleviation and self-sufficiency¹⁷; and
- Promotion of climate-smart agriculture to contribute towards achieving food and nutrition security.

Adaptation:

- Promotion of climate-resilient agriculture to contribute towards achieving food and nutrition security;
- Promotion climate-resilient livestock farming practices, contributing towards poverty alleviation and self-sufficiency; and
- Enhancement of climate information services for vulnerability- and adaptation- assessment and planning.

With NKRA 8 on “Food and Nutrition Security Ensured”, the 12th FYP mandates MoAF to increase production for enhancing food self-sufficiency and nutrition security for women and children in order to reduce prevalence of malnutrition. Further, the key strategies are to provide critical support for agriculture production; to implement the Irrigation Master Plan 2016; to establish a network of post-production and marketing facilities; to strengthen price support for the agricultural sector; to initiate crop insurance schemes; and to strengthen research and extension services. Identified programmes focus on food and nutrition security; value chain and enterprise development; and research and extension service i.e. adaptive and applied research regarding soil fertility, plant protection, post-harvest and market linkages.

The Inheritance Act of Bhutan(1980) and the Land Act of Bhutan (2007) provides equal right to both men and women to own land and properties.

The National Forest Policy 2011, aims to promote sustainable and equitable management of Bhutan's forest resources, so as to produce a range of social, economic and environmental goods and services for the optimal benefit of all citizens while still maintaining 60 percent of land under forest cover. The policy describes measures for the management of private and community forests, as well as parks and protected areas. However, the policy has no gender specific statements.

The Food and Nutrition Security Policy of the Kingdom of Bhutan 2014 requires all programs implemented in achieving food and nutrition security to be gender sensitive and socially inclusive RNR Marketing Policy of the Kingdom of Bhutan 2017 aims to enhance RNR marketing through product value additions, the marketing infrastructure, finance, commodity marketing, marketing information and risk management, where gender mainstreaming is considered as one of the important goals and guiding principles for promoting RNR commodity marketing and add value to the RNR products¹⁸.

RNR Sectoral Adaptation Plan of Action (SAPA) 2016 forms an updated version of RNR SAPA 2013—proposing a series of Adaptation Plan of Action (APA) to mainstream climate change risks, vulnerabilities and adaptation measures into the RNR sector plans and programmes, and to promote resource mobilization. There is no focused gender specific action plan but recognizes the hardship of rural women.

An interesting gender approach for the RNR sector can be found in the Roadmap to Country Approach to REDD+ Safeguards for Bhutan (2016). Gender aspects are integrated in the different safeguards concerning transparency and effective forest governance, defining indigenous peoples and local communities, and procedural rights including effective participation.

Agriculture, health and education are the pilot sectors for Gender Responsive Planning and Budgeting (GRPB) in Bhutan. An analysis of 2012-2013 budget for agriculture sector indicated that the impact of the budget results for women and men were not visible prominently, and the sector is overall assumed to be gender neutral, impacting women and men equally.

The use of sex-disaggregated data in agriculture planning and budgeting was limited to information on the gender divided in various positions within the MoAF, number of men and women farmers or in farmer groups (UN Women, 2016).

In conclusion, the Food and Nutrition security policy and marketing policy in the agriculture sector has gender mainstreaming goals and guiding principles. The MoAF has carried out many gender-related initiatives through project-tied activities. However, gender integration through the five-year plans have always been a challenge, given inadequate knowledge and skills on gender tools while drafting national- and local- level plans. As such, the ministry has taken important steps to build capacities of Plan Focals and Annual Performance Focals from each department and research centre—including through sensitization of Dzongkhag RNR Sector officials. The intention is to ensure focal persons' ability to analyze and approach plans from a gender perspective. Further, the maintenance of gender-disaggregated data for all activities carried out by departments and agencies has been initiated, and is coordinated by the Gender Focal Point of the Ministry.

Although gender mainstreaming is not fully integrated into plans and programmes, it does exist in varied forms such as through development and implementation of gender mainstreaming strategy for specific projects, and having an internal framework to address gender issues at the work place—which is one of the mechanisms adopted to start mainstreaming in the RNR sector.

4.2.4 Institutional framework

The Ministry of Agriculture and Forests, also known as the RNR Sector, is the lead agency at the national level for enhancing food and nutrition security and for sustainable conservation and management of natural resources and biodiversity. The technical departments under the MoAF include the Department of Agriculture, Department of Livestock, and the Department of Forests and Park Services. Interventions pertaining to the sector's adaptation and mitigation to climate change (including CSA) are coordinated and implemented through these three technical departments at

the central level. In addition, the Department of Agriculture Marketing and Cooperatives (DAMC) facilitates value addition and marketing of RNR produces. Other relevant institutions under the MoAF include the National Biodiversity Centre, the Ugyen Wangchuck Institute for Conservation and Environment (UWICE), and Bhutan Agriculture and Food Regulatory Authority (BAFRA).

At the regional level the Agriculture Research and Development centres (ARDCs), the Regional Livestock Development Centres (RLDCs), seven central programs (National Soil Services Centre, National Plant Protection Centre, National Mushroom Centre, Agriculture Machinery Centre, National Seed Centre, National Post Harvest Centre, and Central Machinery Unit) and the livestock central farms located at strategic locations across the country coordinate, promote and implement CSA initiatives. The outreach of the MoAF is further enhanced at the local level through the agriculture sector representatives at the dzongkhag level and the RNR Extension services at the gewog level.

Besides the MoAF, other ministries and agencies also contribute to agriculture-related activities in the country through various support. These include the National Centre for Hydrology and Meteorology (NCHM), the National Environment Commission (NEC), the Gross National Happiness Commission (GNHC), and the Bhutan Chamber of Commerce and Industry (BCCI).



Box 14. CSO support for sustainable rural livelihoods

Tarayana Foundation - a local Civil Society Organization (CSO) - supports rural communities to enhance their food and nutrition security. It provides agriculture support and opportunities for skills-development by supplying maize grinders, oil expellers, power tillers, distribution of greenhouse structures and other machineries. Through Tarayana initiatives, rural communities benefit by reducing drudgery and increasing efficiency and production. Trainings in vermi-composting and ecological farming is promoted in target communities to promote natural eco-system networking. The self help groups are formed to enhance food and nutrition security resulting in economic opportunities for the groups.

Climate-resilient water harvesting is also supported by the foundation to address water scarcity issues in 36 villages in an integrated approach on water resource management. Community members have been trained in land management, basic landslide and erosion control measures, watershed management, protection of water source. Water user committees with saving schemes have been formed to ensure community ownership and sustainability of these activities. To provide access to piped water, 44 reservoir tanks have been constructed, and 109 rainwater harvesting units have been installed to meet household water needs.

4.3 Energy, Gender and Climate Change

Energy security and management have been few of the priority areas in Bhutan's NDC. This section will describe the situation regarding energy sources and use as a contributor to GHG emissions, gender issues in energy use and management, and related policy and institutional frameworks.

4.3.1 Energy and climate Change

As shown in Figure 30, Bhutan's energy production comes from a mix of energy sources (Bhutan Energy Data Directory, 2015). Its energy use is divided over several sectors (DRE, 2015), as shown in Figure 31.

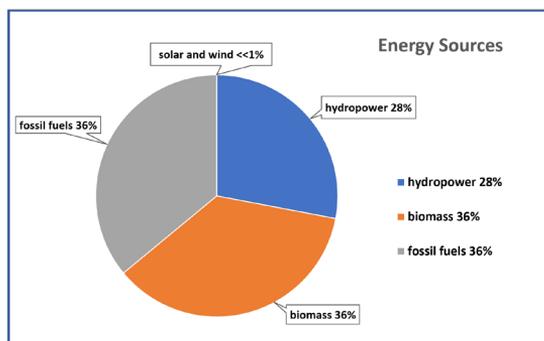


Figure 30: Energy sources

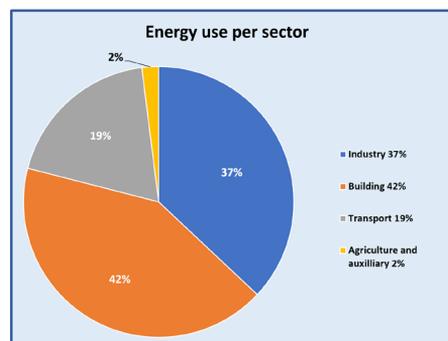


Figure 31: Energy use per sector

Since 2012, Bhutan promotes low carbon development through the promotion of renewable energy and energy efficiency. Towards fulfilling its pledge to remain carbon neutral at all times, the RGoB encourages the development of hydropower and alternative renewable energy. In its Economic Development Policy (EDP) 2016, hydropower is described as one of its "five jewels" and strives to achieve a minimum power generation of 5000 MW by 2022. Through its exports of hydroelectricity, the Bhutan offsets 4.4 million tons of CO₂e per year, and it has the potential to offset 22.4 million tons of CO₂e by 2025 (NEC, 2015). Hydro-meteorology data acquisition and dissemination is strengthened to facilitate reliable weather, GLOF and flow forecasting for hydropower generation and safety of hydro installations (MoEA, 2016). Apart from hydropower, alternative renewable energy such as solar and wind energy is promoted to diversify the country's energy supply and to enhance the energy security.

Considerable progress has been made towards the goal of 'electricity for all'. Electricity access has increased from 30 percent in 2000, to 61 percent in 2006, and almost 100 percent at present. Bhutan's electricity is mostly generated through run-off on-grid hydropower. However, the reach of electrification in remote rural areas is promoted through off-grid renewable energy. The Government has provided around 1,500 rural households with solar-home systems till date.

Due to economic growth, energy emissions have increased from 259.125 Gg CO₂ in 2000 to 707.917 Gg CO₂ in 2015 - an increase of 173.2 percent (NEC, 2020)

Table 14: GHG emissions (percentages) through the use of energy sources per sector 1994 (NEC 2020)

	1994	2000	2020
Energy industries	8.77%	0.03%	0%
Manufacturing industries and construction	17.07%	40.31%	34%
Transport	44.99%	44.06%	60%
Other sectors	29.18%	15.53%	5%
Fugitive emissions from fuels	0.00%	0.08%	1%

Transport consumed 19 percent of energy as of 2014 and has been the highest consumer of the petroleum products till date, and within the energy sector it is the most prominent GHG emitter (60percent; see Table 19 above). Emissions from the transport sector could triple by 2030. This will cause air pollution from particulate matter (PM) and Nitrogen dioxide (NO₂), which is much higher than permissible levels. Therefore transport, including the promotion of public transport, forms an important area for CCM and CCA.

Under NKRA 9 in the 12th FYP, the need for a good and climate- resilient road network, particularly in rural areas, has been stressed¹⁹. Though there has been a steady expansion of the (rural) road network, increased road access not only comes with benefits but also with costs as it increases car use, which in turn leads to traffic congestion, pollution and increased stress on land. On the other hand, climate change has growing impacts on the country's infrastructure.

4.3.2 Gender and energy

Women are responsible for many aspects of household chores such as collection of fuelwood for cooking and heating. Therefore, women's demands for energy differ from those of men. Many (rural) households and CSIs still rely on fuelwood and other biomass despite almost 100% electrification rate. As per EDD 2015, the biomass dependence is 36%. Wangchuk and Lhendup (2019) asserted that extremely high concentrations of particles when fuelwood was burned in stoves for cooking and heating. The mean Ultra Fine Particles or UFP (<0.1µm) and fine particles PM_{2,5} (<2.5 µm) concentrations observed were 3 and 4 times higher than the mean concentrations measured before heating, respectively. Similarly during cooking, concentrations of UFP and PM were 64 and 69 times the mean concentrations measured before the cooking, respectively. This contributes to environmental pollution and has serious effects on the health situation of women and children, who are mostly indoors during cooking and heating.

Box 15: Energy situation according to interviewees/agency

Energy consumption in Bhutan is increasing, which reinforces the need for climate adaptation and mitigation. The country already relies heavily on Renewable Energy (RE) technology from run-off hydropower, which is dependent on river systems and thereby also climate sensitive. Promotion of alternative RE presently includes the installation of solar technology for lighting and water heating, wind technology, and improved cookstoves. Along with this, Energy Efficiency and Conservation (EE&C) is also promoted. As one of the largest emitters of GHGs, the industry sector can also contribute significantly to CCM/CCA by promoting the use of RE and EE&C.

Ensuring women's access to affordable, reliable and sustainable energy services (SDG 7) - including on- grid electricity, biogas and solar energy - and to fuel- and labour-saving technologies such as improved cookstoves, is crucial for the enhancement of their livelihoods (UNEP, 2016). Biogas technology, for example, has social benefits in terms of reducing drudgery as well as time and effort spent on fuelwood collection, and also prevents negative health impacts through reduction of hazardous indoor smoke. The government's effort to diversify energy mix and provide cleaner cooking technology by providing almost 6,000 biogas plants (DRE, 2020) across the country has benefited a lot of households with the reduction of LPG cylinder use and efficient use of animal waste. Similarly, improved stoves contribute to reduced indoor air pollution. The distribution of the improved cook stoves stands at 11,447 numbers till date (DRE,2020) which was distributed by the Department of Renewable Energy. Such efforts can be further enhanced to provide low smoke cooking technology.

Equitable access to technical, maintenance, and construction opportunities in renewable energy technologies is also an important aspect of women's livelihood enhancement. Most employees in the energy sector are still male. In STEM education women are still in the minority, although more and more women account for a growing proportion of graduates in fields relevant for the energy sector (ADB, 2014). In the CSI- sector, where many women find formal and informal employment, entrepreneurship as energy technology suppliers including the operation and maintenance (e.g. solar PV) and consumption offer important opportunities for enhancing efficiency, sustainability and women's empowerment.

Hydropower, which provides electricity in the country, has diverse impacts on the lives of women and men. In general, the hydropower sector forms a very male-dominated sector. A case study on the Tala Hydropower Plant in Chhukha Dzongkhag showed that rural households appreciated the establishment of the dam as it brought access to electricity (IRADe, 2017). It has improved the quality of life, basic health services and roads. Wellbeing among women and girls was enhanced, in particular by reducing the burden of domestic chores. Use of electric cookers and water boilers proved to be beneficial for women, as they reduced cooking time, and their exposure to hazardous smoke from fuelwood.

Electrification also had direct impact on education outcomes as better lighting allows study in the evenings. It enabled girls to attend school as they were no longer needed to gather fuelwood and make dung cakes. Intensification of economic activities had taken place as well, particularly for men, who got involved in project construction and maintenance work. This resulted in an increase in women's participation in agriculture, adding to their work burdens. Land acquired for the dam was 855 acres, and it is unknown if settlements were affected during construction (IRADe, 2017)²⁰.

Other studies show that loss of land and livelihoods, and destruction of forests, agricultural- and grasslands owing to the construction of hydropower plants can compel women to walk longer distances to collect natural resources. Hydropower projects can also pollute the water source during construction, again adding to women's work burden in having to fetch clean water from further distances. New roads, businesses and communication systems, as well as the in-migration of a large number of men for jobs in the sector, can also disrupt women's security and enhance social conflicts (ENERGIA/ETC, 2014)

Sources of energy used by households

According to the survey findings for this study, the most common sources of energy used by households is electricity (99.94%) followed by fuelwood (75.23%), and liquid petroleum gas (LPG) which was reported by 74.05 percent of the households. A substantial proportion of households also reported using kerosene (27.50%).

Environmentally clean and renewable energy sources such as biogas, solar, and wind energy as a source of household energy was reported by less than 10 percent of the households, as presented in Figure 32²¹.

Responsibility for energy supply and management

The survey collected information about the household member responsible for supply and

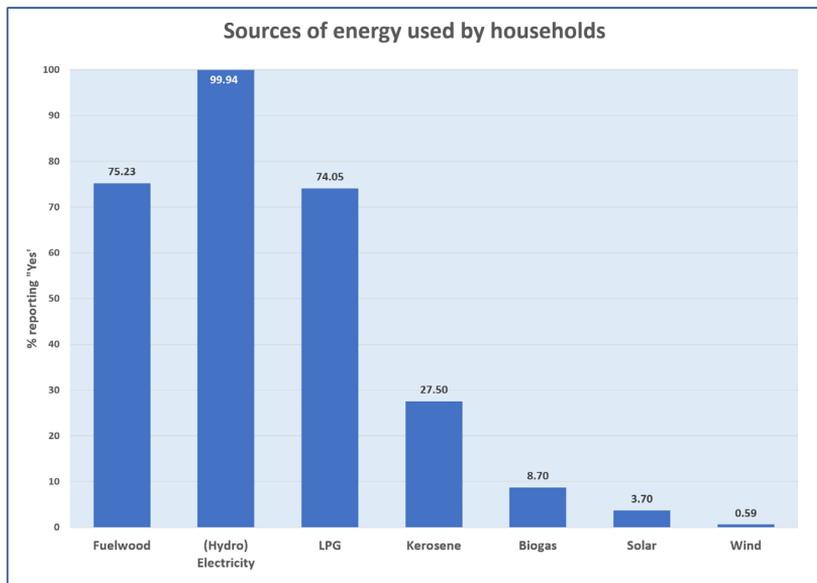


Figure 32: Sources of energy used by households (% reporting 'Yes')

management of different energy sources. As indicated in Table 20, men are responsible for supply of different energy sources, although women and in a few cases children were also reported as the household member responsible for this activity.

Table 15: Household member responsible for supply of households' energy needs (percentages)

	Men	Women	Children	Don't know	Not applicable	Total
Fuelwood	45.23	29.89	0.99	0	23.89	100
LPG	54.07	21.1	1.29	0.05	23.47	100
Kerosene	19.69	9.32	0.37	0.54	70.08	100
Biogas	5.81	4.82	0.34	0.29	88.73	100
Solar	3.79	2.8	0.34	0	93.07	100

Awareness of and support on energy-saving and energy initiatives

The survey also collected information on the types of energy-saving practices in households, the results

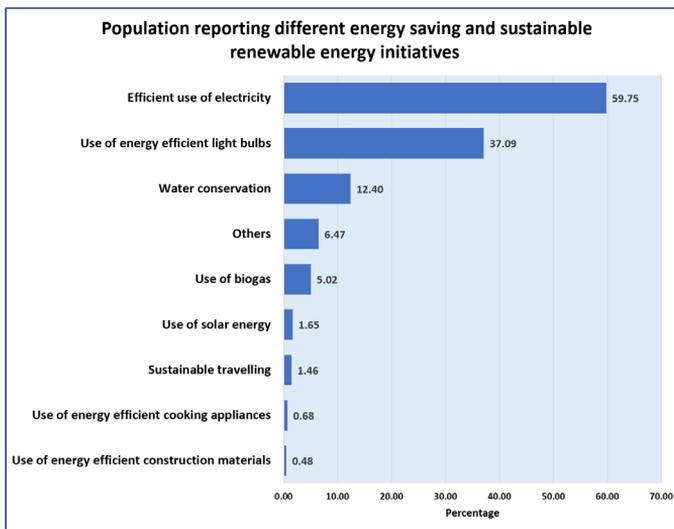


Figure 33: Percentage of population reporting different energy-saving and sustainable renewable energy initiatives (multi response allowed, therefore, total exceeds 100%)

of which are shown in Figure 33. Most respondents reported 'efficient use of electricity' (59.75%)—for example by putting off lights when not required, by limiting the number of appliances used, or by using more efficient appliances—followed by 'use of energy efficient light bulbs' (37.09%).

Other energy saving initiatives that respondents reported being aware of include 'water conservation', 'sustainable traveling', 'use of biogas', and 'use of solar energy'.

Over six percent of the respondents also reported 'Others' which includes

responses such as 'efficient use of LPG', 'avoiding overcooking of foods', and 'efficient use of firewood' (for example through the use of efficient wood stoves).

Access to information can help minimize inefficient use of energy and thereby help with energy conservation. About three-fourths (76.89%) of the respondents reported having access to information about saving energy, of which 74.05 percent were men and 78.89 percent were women.

As shown in Figure 34, the survey also captured information on people's

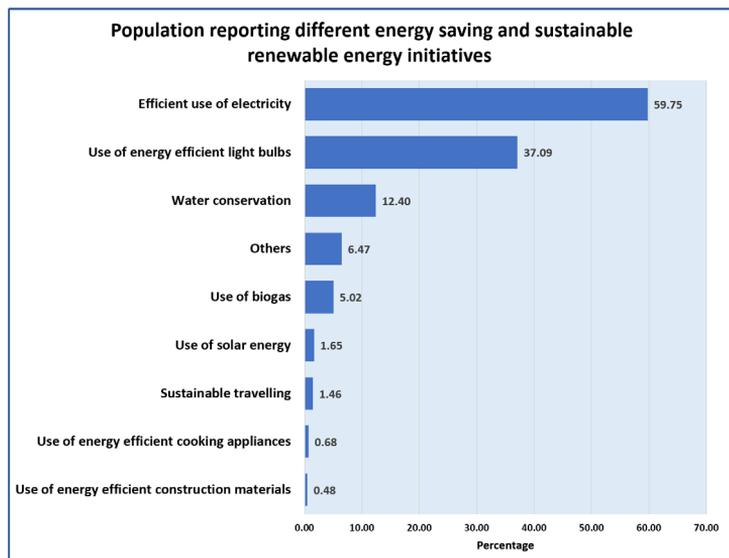


Figure 34: Proportion of respondents who are aware of RE initiatives

awareness of the initiatives that promote alternate renewable energy such as solar, biogas, and wind energy.

People’s preferences for renewable energy can be enhanced if they have access to proper information. About 56.10 percent of the survey respondents, with a higher proportion of men (61.77%) than women (52.13%), reported having access to information about renewable energy. Information on the kind of support people currently receive to save energy or promote the use of renewable energy was collected.

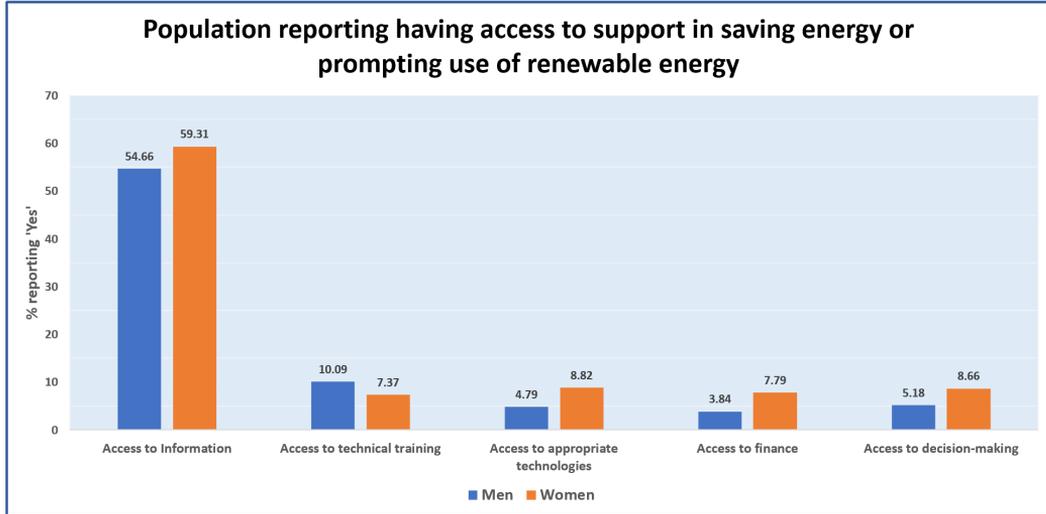


Figure 35: Proportion of population reporting access to support in saving energy or prompting use of renewable energy by sex

About six in 10 respondents reported receiving support in the form of ‘access to information’ (57.39%). A very small proportion of the population reported getting support in terms of ‘access to technical training’ (8.50%), ‘access to appropriate technologies’ (7.16%), ‘access to finance’ (6.16%), and ‘access to decision-making’ (7.22%).

As shown in Figure 35, a relatively higher proportion of women (except with regard to ‘access to technical training’) than men reported availing support for energy-saving and renewable energy use. The study finding shows that an overwhelming majority of the respondents reported that they needed the various types of support to promote energy saving and renewable energy use - as shown in Table 16.

Table 16: Proportion of population reporting the need for various types of support to promote energy saving or use of sustainable renewable energy

	Yes	No	Don't know	Total
Access to information	94.97	4.48	0.54	100
Access to technical training	93.04	5.36	1.61	100
Access to appropriate technologies	93.94	5.46	0.60	100
Access to finance	94.64	4.22	1.14	100
Access to decision-making	94.32	3.72	1.96	100

Gender and transport

Apart from energy use in households, another sector where personal choices are involved in the use of energy sources is in transport. While the transport sector uses about one fifth of energy sources in the country, it is the largest GHG emitter²². Besides negatively impacting the environment, it is also known

to cause huge trade deficits through the import of fuel for vehicles. The import of fuel has consistently featured as one of the top ten imports of Bhutan, in terms of import value, over several years now.

Improved transport services and pedestrian facilities are critical to women's mobility, especially in times of disasters. Economic, social and livelihood status greatly influences mobility, and women and men experience this differently. Literature suggests that mobility for women is more complex than for men.

Overall, women have lesser access to transportation compared to men, and travel with heavier travel burdens because of their multiple tasks and responsibilities. Women use urban public transportation more than men, often to go to hospital, with a preference for taxis (34.5%) over buses (18.3%) and other modes of transport (Choden, 2017).

Box 16: Transport and Gender

The increasing number of cars in Bhutan is contributing to an increase in emissions. Therefore, public transport and more environmentally-sound technologies are being promoted. In public transport, women are more exposed to insecure situations, including (sexual) harassment, an issue that gets attention from authorities. To strengthen security, CCTVs have been put in parking places and taxi stands. Priority seating has been introduced in city buses for pregnant women, the elderly and the disabled. In the Government's promotion of electric taxis through subsidies, there is a preference to make these available to female taxi drivers, and presently eight female taxi drivers are driving electric cars.

Although employment in the transport sector is male-dominated and only few women are engaged in local decision-making about roads, women seem to carry disproportionate shares in the maintenance of farm roads (ADB, 2014). Their work in road construction is often very hard, especially under deteriorating weather conditions, including climate change-induced heat stress and road flooding.

Personal safety while using urban transportation is of high concern, both for passengers and taxi drivers, particularly female taxi drivers. Of the 2,200 registered taxis in Thimphu, only 35 are driven by female taxi drivers (Choden, 2017). Similarly, pedestrians are exposed to dangerous situations, and especially female pedestrians might be exposed to (sexual) harassment, for example if footpaths are not lightened.

Car ownership and fuel type

Ownership of a family car saw an increase of 32.12% from June 2016 till June 2020 (NSB, 2020)

The survey revealed that about 27 percent of households own a car or any other transportation equipment, with almost equal proportion of men and women reporting the same. About 60 percent of those who own a car reported using petrol while about 41 percent reported using diesel²³. The survey did not capture any households owning electric cars.

4.3.3 Policy framework

The importance of energy efficiency and conservation measures is underlined in Bhutan's NDC. It identifies mitigation and adaptation actions within the energy sector, in the context of GNH and the SDGs, as listed below.

Mitigation priorities:

- Promotion of a green and self-reliant economy towards carbon neutral and sustainable development;
- Promotion of clean renewable energy generation;
- Promotion of a low carbon transport system; and
- Energy demand-side management by promoting energy efficiency in appliances, buildings and industrial processes and technologies.

Adaptation priorities:

- Climate-proof transport infrastructure against landslides and flash floods; and
- Promotion of clean renewable and climate resilient energy generation.

The EDP 2016, which is the apex policy for the country's economic development, provides guidance for all ministries and agencies to stimulate economic growth, and more importantly to ensure that growth takes place in consonance with the principles of GNH. The EDP 2016 states that women shall be encouraged to participate as technicians, professionals and managers and identify critical training needs with particular focus to encourage women entrepreneurship.

The Sustainable Hydropower Development Policy 2008 focuses mainly on large hydropower projects (>25MW). While it mentions social considerations, it makes no reference to gender issues. The policy outlines environmental requirements and an environment management plan, but there is no mention of any pro-poor or gender/socially inclusive requirement. There is, however, a provision for providing employment to one member of a displaced family during the project construction period (ENERGIA/ETC, 2014).

The National Strategy and Action Plan for Low Carbon Development 2012 was prepared to fulfill the country's commitment of remaining carbon neutral, ensuring that national GHGs emissions remain less than the national sequestration capacity. It makes no reference to the position of women or other gender considerations.

The Alternative Renewable Energy Policy (AREP) 2013 provides direction for the promotion and development of renewable energy, fossil fuel substitution with green energy sources, enhancement of a more diversified system and energy mix, and energy security. It sets a preliminary target of 20 MW renewable energy by 2025; and seeks to promote RE technology for solar (Photo Voltaic, thermal), wind, bio-energy, geo-thermal, waste to energy, and pico/micro/mini/small hydro plants of up to 25 MW²⁴. Gender and pro-poor considerations are not identified as key issues in the policy, and no references are made to gender issues, the position of women, or renewable energy as a source for lightening women's drudgery. Inclusion of organizations with gender expertise in RE planning is also not mentioned.

In the Cottage, Small and Medium Industry Policy 2019 commitments are included to support women's entrepreneurship, including in the energy sector.

The National Energy Efficiency and Conservation (EE&C) Policy of Bhutan 2019 intends to contribute to the Government's carbon neutral commitment, and provides guidance for promoting, governing and monitoring various developments and behaviour regarding EE&C. Listing buildings and appliances, industry, and transport as major energy-consumers, the policy states: "Energy savings in any form will also enhance disposable income for households. This will in turn positively affect gender equity, as most households are operated by women" (clause 2.7 of the EE&C Policy 2019). Besides this mention, however, gender issues do not feature in the strategies and actions formulated for the policy.

The Energy Efficiency (EE) Roadmap 2019 has been developed to guide the formulation and implementation of EE measures in energy-intensive sectors like building, appliance and industry; to institute Measuring, Reporting and Verification (MRV) systems; and to contribute to meeting the country's global commitments as set out in its NDC and the SDG targets. The gender perspective has been included under expected outcomes where at the household level, the EE measures are expected to bring energy savings and enhance household income, employment opportunity, and added advantage to women who handle household chores.

4.3.4 Institutional Arrangements

Energy-related issues²⁵ are addressed by a wide range of stakeholders²⁵.

The Ministry of Economic Affairs has several entities that are responsible for energy affairs, but expertise

on gender is very limited.

- The Department of Renewable Energy (DRE) is the central coordination agency for renewable energy with three divisions (ENERGIA/ETC, 2014). In the present planning mechanism, there is no process for a dialogue or consultation between DRE and the NCWC and this partly explains the lack of gender considerations in DRE-related policies and documents. Although the DRE sometimes collects sex-disaggregated data during the implementation of activities, there is no systematic procedure in place to ensure that gender disaggregated data is collected and used in planning, monitoring and reporting.
- The Department of Hydropower and Power Systems (DHPS) is the lead agency for promoting sustainable hydropower for socioeconomic development in the country.

The Bhutan Electricity Authority (BEA) is the main agency responsible for restructuring and regulating electricity in the country.

The Bhutan Power Corporation Limited (BPC) is a utility company responsible for distribution of electricity in the country.

The Druk Green Power Corporation promotes, develops, and manages RE projects— particularly regarding hydropower—in an efficient, responsible and sustainable manner, and to maximize revenue for the nation.

Box 17. Gender aspects in policies relevant to the transport sector

- General Rules and Regulations on Occupational Health and Safety (OHS) in Construction, Manufacturing, Mining and Service Industries, 2006—No gender-specific references.
- Labour and Employment Act, 2007—No gender-specific references.
- Guidelines on Road Classification System and Delineation of Construction and Maintenance Responsibilities, 2009 (MoWHS, 2009)—No gender-specific references.
- Regulations on Working Conditions, 2012—Requires gender parity amongst labour inspectors; and refers to the Sexual Harassment Regulation, 2009 (article 38, pg.14-22).
- Regulations on Occupational Health, Safety and Welfare, 2012—Includes the need for safe latrines (one per 20 females, and one per 25 males), along with signage indicating ‘for men’ or ‘for women’ at the respective blocks outside; requires creches to be provided in every workplace with women employees; and sets a maximum weight load of 50 kg for adult males and 25 kg for adult females.
- Bhutan Transport Vision 2040: Integrated Strategic Vision, 2013 (MoIC)—No reference to gender issues.
- Road Safety and Transport Act, 2014—No reference to gender issues.
- National Transport Policy, second draft, 2017—One of its objectives is to “Address gender disparity and promote social equity.” Under its guiding principle of ‘inclusiveness’, it talks about “Promoting inclusive society by providing transport access to all, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.” Policy objective 4.1.2. looks into providing safe, affordable, accessible and sustainable transport services to connect all gewogs with the nearest urban centres, with special attention to the needs of “those in vulnerable situations, women, children, persons with disabilities and older persons”; Policy objective 4.2.3. is about the development of a safe, affordable, accessible and sustainable electric/hybrid public bus transport system, with special attention to the needs of “those in vulnerable situations, women, children, persons with disabilities and older persons”.

The Ministry of Agriculture and Forests (MoAF) oversees watershed management, bio-energy, and the provision of sustainable sources of biomass (see also section on 'Agriculture'); it has capacity on gender-related concerns and collects gender-disaggregated data.

The National Environment Commission (NEC) is responsible for climate change policies and actions, and water resources coordination. The NEC has a gender focal person, and is working with the NCWC on this study.

The Ministry of Information and Communication (MoIC) is the lead agency for (public) transport. It intends to substitute fossil fuels with green energy sources in the transport sector. Under the MoIC, the

Box 18: Renewable energy, transport and gender-related initiatives

- In a 2009 ADB project called 'Solar Warriors', a group of 44 women went to the Barefoot College in India for six months to participate in their Rural Electricians Training Program. Following this, the women placed solar panels for 504 households in 46 villages in Bhutan. The women have now been transformed into Village Electrical Entrepreneur and Electrical Technician (VEEET)²⁷; and
- Some organizations, like the Tarayana Foundation, are promoting the use of alternative renewable energy sources—including the use of appropriate green technologies in rural villages—to promote environmental sustainability, mitigate effects of climate change, enhance efficiency and advance economic opportunities, specifically with regard to rural women. Some of the green technologies implemented in rural areas are:
 - Micro-hydro rural electrification, whereby a 17 kw pilot project on micro-hydropower unit in Dali, Zhemgang benefits 24 households and a community temple with the provision of electricity for home lighting, and operation of electrical appliances and small-scale food processing units;
 - Solar dryers, whereby community members in Dagana and Paro have been trained to fabricate and operate solar dryers, to enable the preservation of excess produce for consumption and sale during lean season. This has helped to improve sanitation in the vegetables- and meat produce-preservation process, and enabled farmers to supplement their income through the sale of these products;
 - Solar fencing has been installed across an area of 50 km in Trongsa, Monggar and Lhuentse to protect crops from wild animal damage; and
 - Fuel efficient stoves for households and institutions have been introduced in Tarayana Foundation's target areas, for cooking and space-heating purposes in efforts to reduce fuelwood consumption and smoke emission.

Road Safety and Transport Authority (RSTA) is responsible for ensuring access to safe, sustainable and inclusive transport systems for accelerated socio-economic development.

The Ministry of Works and Human Settlement (MoWHS) is responsible for developing policies, plans, acts, regulations and standards related to infrastructure and human settlements in the country. MoWHS is the lead agency for any energy efficiency matters in the building sector.

The Bhutan Standards Bureau (BSB) is responsible for setting standards and for product certification, including for electric appliances, which has an impact on energy efficiency and conservation.

Thromdes are responsible for promoting the substitution of fossil fuels with green energy sources in urban transport, street lighting, district heating system; conversion of waste to energy; and green buildings.

4.4 Waste, Climate Change and Gender

Waste management is another priority area in Bhutan's NDC. This section will describe the situation regarding the treatment, disposal and discharge of waste as a contributor to GHG emissions, gender issues in waste management, and related policy and institutional frameworks.

4.4.1 Waste and climate change

With the steadily growing population, a more open market system, improvements in economic welfare and changing lifestyles, as well as urbanization and rural to urban migration, the generation of solid wastes is increasing. The amount of hazardous waste is also becoming more prominent (UNEP-IETC and GRID-Arendal, 2019).

Key contributors to the challenges of solid waste management include: (i) change in the consumption pattern of urban residents; (ii) inadequate public awareness and advocacy; (iii) poor civic responsibility among the general public; (iv) lack of coordination among institutions responsible for waste management; (v) poor enforcement of the existing legal framework and implementation mechanisms; and (vi) rural-urban migration contributing to a rise in urban populations (RSPN, n.y.). The type of waste, as well as management and challenges, are identified in Table 17.

Table 17: Management of various types of waste and challenges faced (NEC/NSB 2019)

Type of Waste	Management and Challenges
Municipal Solid Waste	The most common practice of waste management in the country is open burning and dumping in open landfill. Segregation and waste recycling are minimal in the <i>dzongkhags</i> due to lack of facilities and infrastructure.
Sewage	The dominant practice for managing sewage is the use of individual septic tanks with soak pits that are regularly overloaded with sludge. Greywater from kitchens and bathrooms are also released directly into storm water drains without any treatment. Eco-friendly wastewater treatment plants have been introduced in many of the <i>dzongkhags</i> and eco-line biofilm technology has been installed in some <i>dzongkhags</i> .
Medical waste	The health care centers in Bhutan generate 996.20 kg of medical waste a day. According to National Waste Inventory Survey 2019, almost 95 percent of the health centres segregate waste into different types. Around 35 percent of the health centres resorted to open burning. More than one-fifth, or 23.36 percent of the health centres are dumping waste in pits. Almost 15 percent are using municipal services to dump their general waste. Among health centres generating pathological and infectious waste, more than half the health centres or 51 percent are either burning or bury the pathological and infectious waste generated. Around 25 percent autoclave or do chemical treatment for pathological and infectious waste. Rest of the health centres dump in separate pits or treat with bleaching powder prior to dumping.
E-waste	The current practice of managing e-waste from Government offices is surrendering non-functional electronics and appliances to the Department of National Properties (DNP). E-waste generated by the private sector is repaired and reused or sold to scrap dealers. Of the total waste generation in the country, 1.3 percent is e-waste.

Type of Waste	Management and Challenges
Industrial waste	Industries across the country generate 5719.34kg of solid waste a day. The Pasakha Industrial Area (PIA) has 37 registered industries, which mostly manufacture TMT bars, ingots, billets, ferro alloys, calcium carbide, marble slabs, liquid oxygen, nitrogen, bitumen, beer, soap, and carbonated drinks. The common practice of the industries is to stockpile waste in their premises. The Pasakha industrial landfill has been under operation since July 2015. No designated industrial landfill site exists in other industrial estates. Waste from automobiles, including oils and spare parts, also contribute to industrial waste.

The country generates a total of 172.16 metric tons of solid waste a day as per the National Waste Inventory Survey 2019 and the per capita solid waste generation was estimated at 0.23 kg a day. Of the total, more than 85 percent of the waste was from households and commercial units. Approximately, 46 percent comprises of wet (food) waste which includes all waste generated from kitchen, such as vegetables, fruits, food remains, etc. followed by plastics (17.1 percent) and paper and card boards (15.8 percent) (NEC/NSB, 2019).

GHG emissions from the waste sector was 126.50 Gg CO₂e in 2015 and represented 3.317 percent of the total GHG emissions in the country. However, from 1994 to 2015, the GHG emission has increased by 126.795 percent (NEC,2020). The GHG emissions from the waste sector are through solid waste disposal, and waste-water treatment and discharge as shown in Figure 38.

Waste prevention and management

The 'Zero Waste Society' vision of the RGoB emphasizes on waste prevention and sustainable management as the best options to reduce environmental and societal problems associated with waste. Against the backdrop of legal and institutional frameworks as described in sections 4.4.3 and 4.4.4 respectively, waste

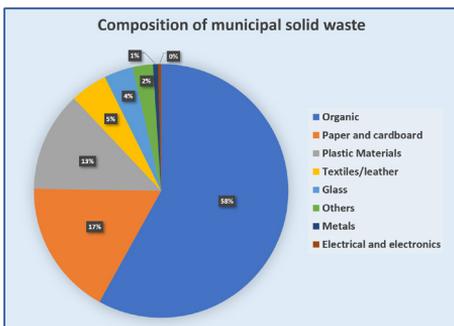


Figure 36: Composition of MSW in 2018 (NEC&WWF, 2018)

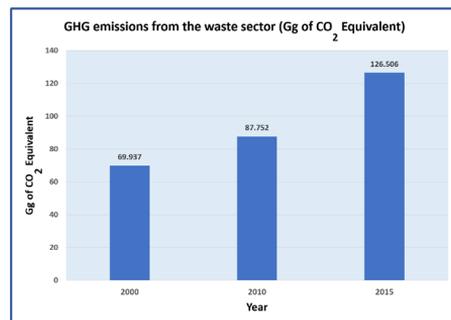


Figure 37: GHG emissions from the waste sector (Gg of CO₂ Equivalent) (RGoB/NEC, 2020)

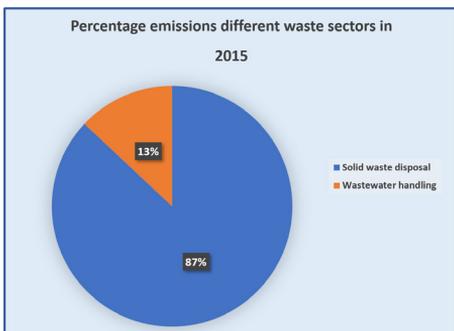


Figure 38: Percentage emissions different waste sectors in 2015 (RGoB/NEC, 2020)

prevention and management are implemented in various ways at the local level.

The comprehensive implementation of plans for waste prevention and management continues to be a challenge. By and large, illegal dumping of waste is still a problem, due to which CCTV surveillance has been installed in Thimphu and several other places as a preventative measure. The lack of landfills (with existing ones overflowing), and a lack of adequate waste compost plants are additional key issues (Ghalley, 2017).

Wastes from urban households are often collected by private companies to whom municipalities outsource the task. The collected waste is taken to a transfer station where recyclables are recovered and the rest is dumped in a landfill. The capacity of Thimphu Thromde's landfill at Memelakha has long been exceeded (UNEP-IECT and GRID-Arendal, 2019). Overall, the number of waste-collection trucks is far from adequate (a total of 78 vehicles and related machines nationally), and given their poor running condition they are prone to frequent breakdown. During periods of intensive rainfall and heat, waste collection and dumping becomes more difficult (NEC and WWF, 2018).

Box 19. Case study: Waste and gender—How women play a critical role in waste management

Sonam Choden, 40, has embarked on a journey to prevent Thimphu's landfill from reaching a breaking point. She is leading the composting effort at the Royal Bhutan Police (RBP) campus, which is home to about 600 families and produces tons of kitchen waste every day.

Sonam has teamed up with three other friends. They have received training in Takakura, a popular Japanese method of composting food or kitchen waste. Thimphu Thromde provided the training with support from the Japan International Agency Cooperation (JICA) Bhutan.

"It's been three months since we set out to do this," says Sonam. "We sell the compost for Nu 50 per 1-kilogram bag. Segregation takes up much of our time. Not all kitchen waste that we receive are segregated properly."

Sonam and her team are now trying to get more women to jump onboard. The opening of a new compost shed built with support from UNDP Bhutan has given new impetus to their composting effort. She hopes the initiative will be smooth sailing once they garner the support of all families in their community.



From left to right: Karma Yangzom, Pema Wangmo, Dechen Dema, Sonam Choden

Waste management largely remains a female domain in Bhutan as evidenced by Sonam's story. From waste segregation to composting, disposal and recycling, women play a key role in managing household waste. This is not surprising given traditional gender roles remain entrenched in Bhutanese society as elsewhere.

For instance, UNDP helped build three other compost sheds in Thimphu, and all three are run by women. Also, over the years, numerous women groups have taken up waste recycling. They are actively engaged in turning plastic waste into crafts, thus making cash out of trash, while at the same time advocating the three Rs—Reduce, Reuse and Recycle—in their communities.

And young Bhutanese women entrepreneurs are making waves with their modest, yet trailblazing business ideas inspired by the mounting waste problem that Bhutan is witnessing as rapid urbanization continues to sweep the country. Sharan Kumari Gurung is one such woman. The mother of three has ventured into a reusable cloth baby diaper-making business.

The idea struck Sharan after she gave birth to her twin sons in 2017. "About a dozen soiled diapers would end up in the bin at home every single day," she says. "Imagine the amount of diaper waste going to the landfill if every family with babies generate that many soiled diapers daily. This was when I realised I must find an alternative."

Sharan's business idea bagged her the first Loden-UNDP Entrepreneurship Loan. Through the support, Sharan was able to access interest- and collateral-free loan of an amount of Nu 1.5 million to start her diaper business.

The seemingly modest efforts of women like Sonam and Sharan will go a long way in helping Bhutan manage its waste. A new report, which is yet to be released officially, shows that kitchen waste makes up almost 60 percent of the total waste generated by Thimphu's urban residents. Composting of organic waste, if practiced widely, could help keep tons of kitchen waste away from landfills, which in turn, will help cut down emissions from the waste sector.

In the case of Thimphu Thromde, construction wastes is disposed in a pre-identified landfill sites. but it is also dumped. While medical waste is required to be treated and safely disposed, it mostly ends up in the landfill (NEC, 2019). Most electronic devices such as televisions sets, refrigerators and computers are still being repaired, so, there is minimal generation of e-waste from households. However, old electronic devices from Government offices and institutes are generally stored and auctioned (UNEP-IETC and GRID-Arendal, 2019).



Figure 39: Waste hierarchy (Source: UNEP, 2015)

Due to the limited infrastructures, recycling of plastic is done for road surfacing and production of fencing poles. Specific glass bottles and PET bottles are widely reused. Scrap dealers or private companies sell valuable recyclable waste across the border. Through the National Waste Management Strategy 2019, the value of waste is being recognized in the context of promoting a circular economy.

Wet and dry waste are generally segregated at the household level and is collected separately in urban areas. According to the National Waste Inventory Survey 2019, Thimphu Thromde, about 46 percent of waste is wet (food) waste and the rest is dry. Some of the wet waste is taken to compost pits, however, due to the lack of source segregation and inefficient collection system, certain portion of wet waste are dumped in the landfills from urban areas. Nationwide and local composting is promoted by NEC and Thimphu Thromde.

4.4.2 Gender and waste

Women particularly at the grassroots level play a critical role in waste-related issues, including as household managers, consumers and small entrepreneurs. Strong cultural norms and practices determine that women are primarily responsible for household and caregiving tasks.

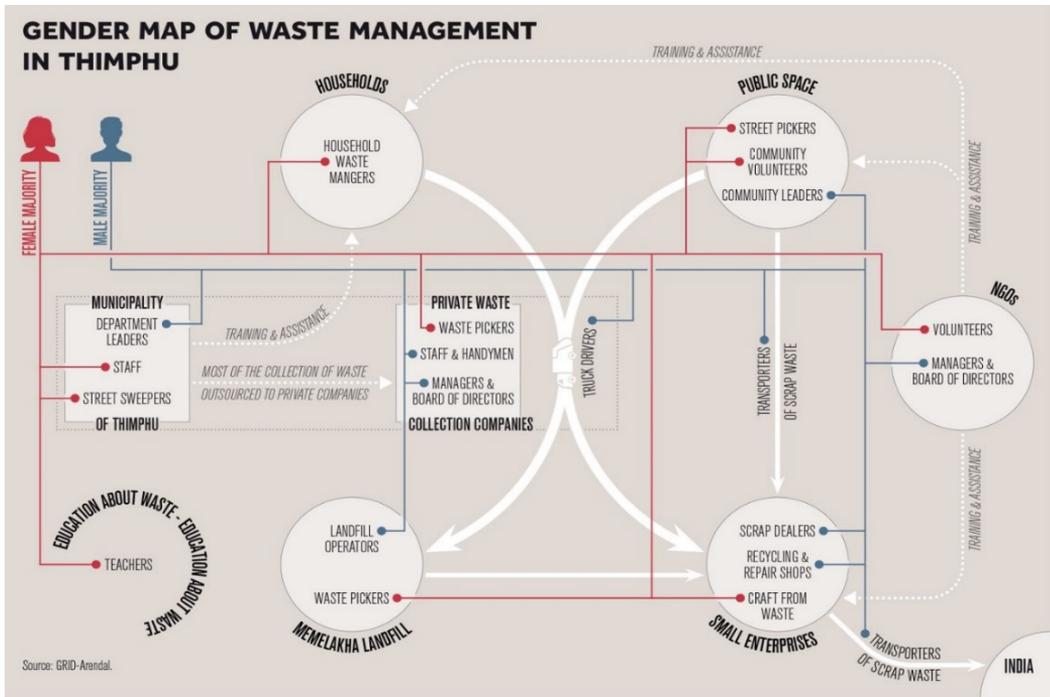


Figure 40: Gender map of waste management in Thimphu. (UNEP-IETC and GRID-Arendal, 2019. *Gender and Waste Nexus: from Bhutan, Mongolia and Nepal*. UN Environment, Nairobi; p.66.)

Women are active in waste segregation at source and in some cases in home composting. The National Waste Inventory Survey 2019 revealed that 88.71% of the waste management in household is carried out by women.

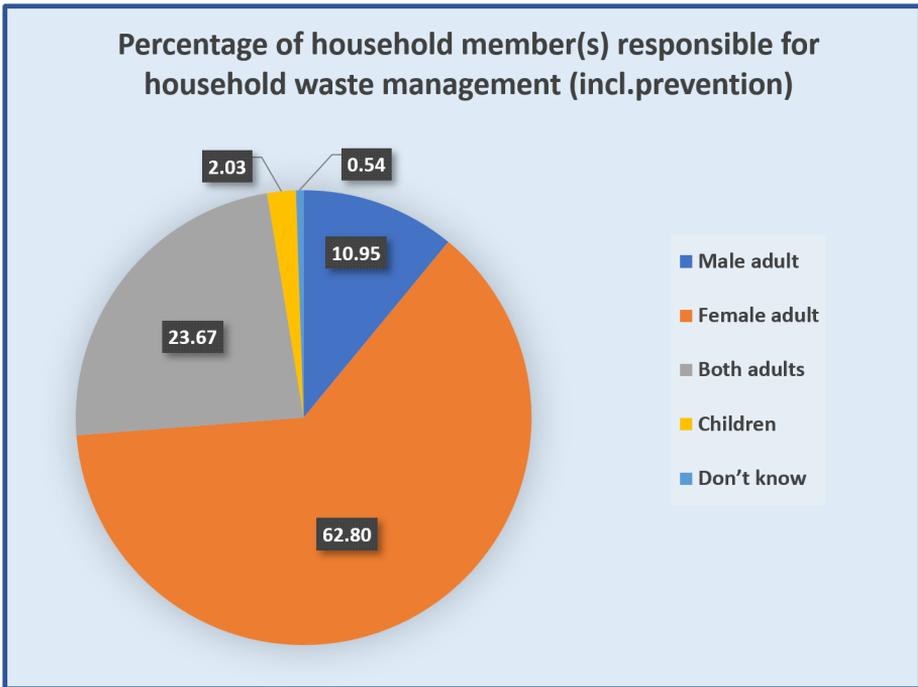


Figure 41: Household member(s) responsible for household waste management (including prevention)

Next to their household responsibilities, women are particularly active in small waste management enterprises, for example with composting for income generation, as illustrated by the case study presented in Box 19.

Women are often associated with the upper four levels of the waste hierarchy as depicted in Figure 39 i.e. starting from prevention through to recycling. However, this is mainly within the informal household or community sphere, which is not protected. Men dominate the upper-administration in the public and private sectors as managers, planners, or machine operators at landfills (UNEP-IETC and GRID-Arendal, 2019).

At the community level, initiatives are taken to improve local waste management. However, most of the

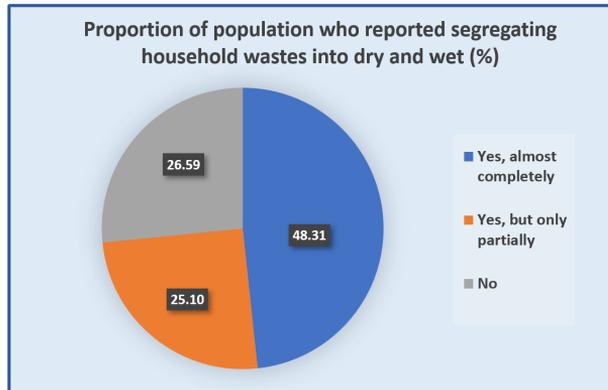


Figure 42: Proportion of population who reported segregating household wastes into dry and wet (%)

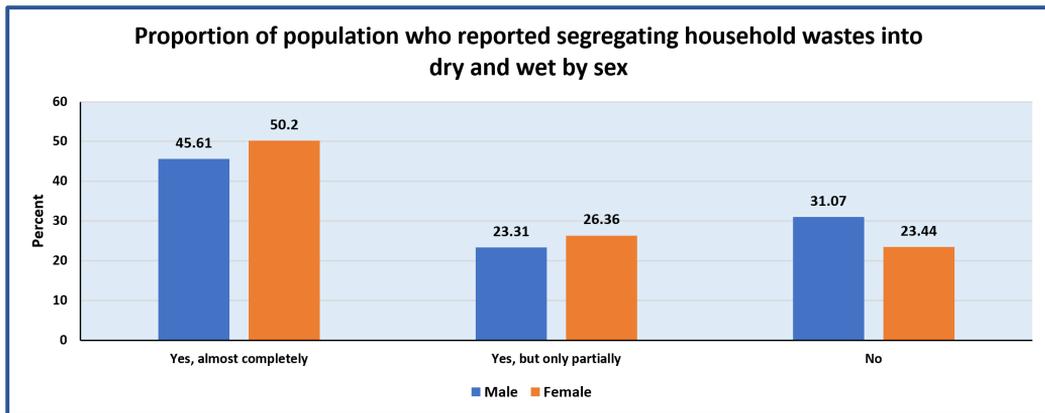


Figure 43: Proportion of population who reported segregating household wastes into dry and wet by sex

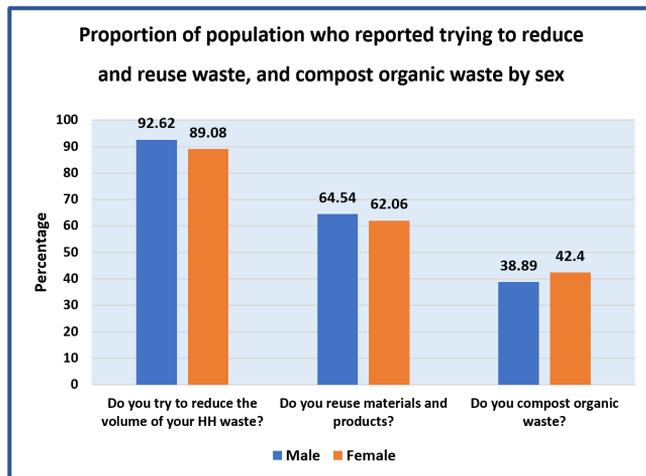


Figure 44: Proportion of population who reported trying to reduce and reuse waste, and compost organic waste, by sex

community leaders, who represent and engage in dialogues with the municipality, are men. These leaders can mobilize community members and organize composting or waste segregation trainings. As community members, women play an important role in actually cleaning streets and their direct environments (ibid).

In the public and private sector, women are almost invisible at the senior, decision-making levels including in politics and areas related to waste management. Although, women's participation in STEM and in technical (engineering) sectors is increasing in recent years, their

participation as professionals at the higher levels is limited.

Overall, there is less gender parity among office staff in private companies than in the public sector. Most Board members of Civil Society Organizations (CSOs) and private sector organizations are men while majority of women are engaged in cleaning streets, waste-picker and volunteers. The Thimphu Thromde employs 75 street sweepers, of which 71 are women, for USD 5.5 day per week. At the waste dump of Thimphu Thromde's landfill in Memelakha landfill in Thimphu, women work three days per week as waste-pickers, and another three days per week at the transfer station of Greener Way, a private waste management company—



Figure 45: Proportion of people reporting access to information on different aspects of sustainable waste management

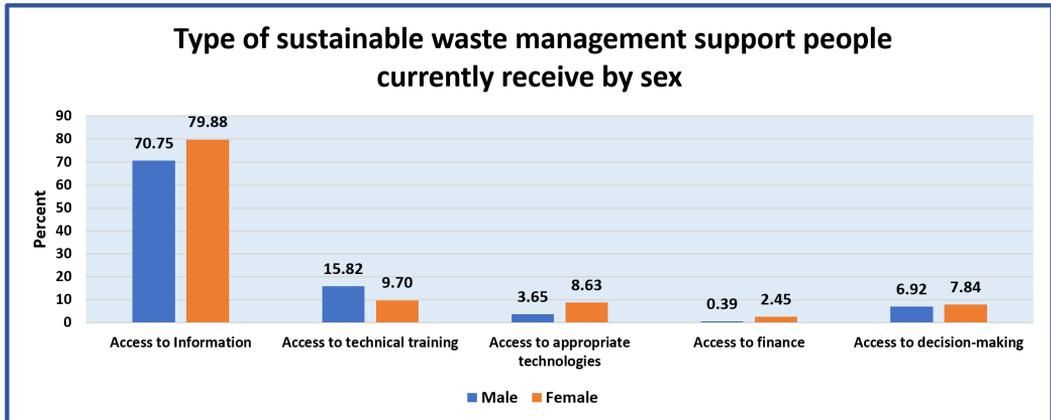


Figure 46: Type of sustainable waste management support people currently receive by sex

earning about USD 100 per month. Employees are often unaware of the adverse health effects from working with waste. Measures to protect the health of waste-pickers and scavengers, including that of women, men and children, as well as the provision of related information and equipment are scarce (ibid).



Figure 47: Type of sustainable waste management support people currently receive and the need for such support

Recycling of waste materials, using plastic wrappers or tetra pak and weaving these into bags or baskets, is mostly seen as a women’s activity. Formalization and technological improvements of informal activities tend to push informal workers, often women or people living in poverty, out of the sector; this process is also exacerbated because women and girls are still under-represented in STEM education (ibid).

Gender and waste prevention and management

About two in three respondents (62.8%) of this survey reported that the female adult member of the household is responsible for prevention and management of household waste, whereas about 11 percent said it is a male adult’s responsibility. About 24 percent reported that both male and female adult

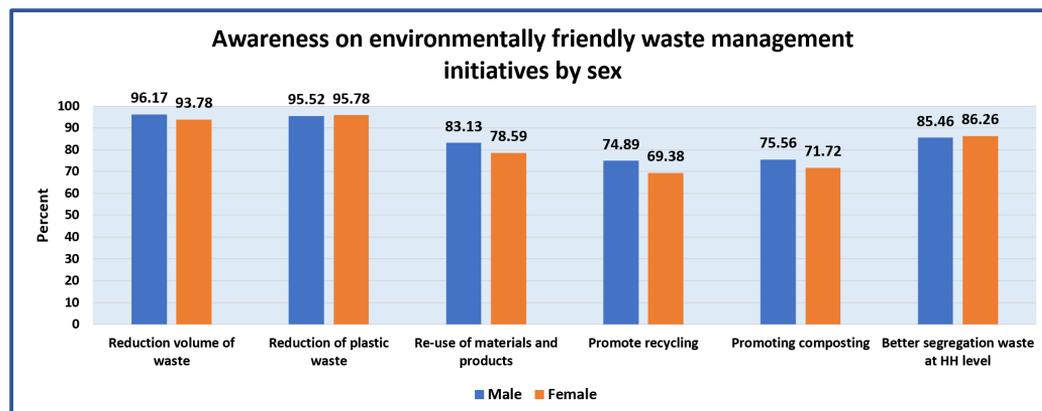


Figure 48: Awareness on environmentally friendly waste management initiatives by sex

members of the household are responsible for household waste management.

48.31 percent reported that they completely segregate dry and wet wastes, while 25.10 percent reported that they segregate but only partially. The remaining 26.59 percent of the respondents reported that they do not segregate wastes at all as shown in Figure 42.

A higher proportion of women than men reported that they either ‘almost completely’ or ‘partially’ segregate household wastes into dry and wet wastes. On the other hand, a relatively higher proportion of men reported not segregating household waste at all (figure 43).

About 91 percent of the respondents reported that they try to reduce the volume of their household waste. Furthermore, about 63 percent of the population reported reusing materials and products which could otherwise end up as waste. A slightly higher proportion of men reported trying to reduce household waste and reusing materials and products as shown in Figure 44. About 41 percent of the respondents also reported composting organic wastes, and by sex, almost 39 percent of men and 42 percent of women reported the same.

Access to information and support for waste management

Access to information on sustainable waste management can help people to effectively manage their household wastes. 71 percent of the survey respondents reported having access to sustainable waste management information of which 72 percent are women and 68 percent of men. As presented in Figure 45, most respondents reported receiving information on ‘reusing wastes’ (41.55%) followed by ‘recycling wastes’ (29.30%). About 20 percent of the respondents reported receiving information on other aspects of sustainable waste management.

Among the five types of support for sustainable waste management currently received by people, about 76 percent reported having ‘access to information’, followed by ‘access to technical support’ (12.22%). Other types of support such as ‘access to appropriate technologies’, ‘access to finance’, and ‘access

to decision- making’ were reported by a very small proportion of the respondents. Women reported receiving (slightly) more support than men as shown in Figure 46.

Majority of the respondents reported the need for sustainable waste management support as indicated in Figure 47.

Among six common environmentally- friendly waste management initiatives, most respondents reported being aware of ‘reduction of plastic waste’ (95.67%), followed by ‘reduction of volume of waste’ (94.77%), and ‘better segregation of waste at household level’ (85.93%). A relatively lower proportion of respondents reported having awareness of initiatives on ‘promoting recycling’ (71.65%), followed by ‘promoting composting’ (73.30%) and ‘reuse of materials and products’ (80.46%). A slightly higher proportion of men reported being aware of initiatives related to recycling and re-use of materials and products, as shown in Figure 48.

4.4.3 Policy framework

With regard to waste prevention and management, the RGoB’s vision is for Bhutan to be a “Zero Waste Society by 2030”.

The Environmental Assessment Act 2000 establishes procedures to assess potential impacts of strategic plans, policies, programmes and projects on the environment; and to determine policies and measures for reducing potential adverse effects and for promoting environmental benefits.

The National Strategy and Action Plan: Integrated Solid Waste Management 2007 provides guidance on how waste—which may have a negative impact on public health and the environment— can be removed regularly and affordably.

The National Environment Protection Act 2007 aims to protect the physical and ecological environment. Principle 5 on fundamental right and duty states that “A person has the fundamental right to a safe and healthy environment with equal and corresponding duty to protect and promote the environmental wellbeing of the country.” Principle 6 on inter-generational equity states that “The present generation

Box 20. Initiatives on waste prevention and management

The National Waste Management Flagship Program was launched by the Prime Minister’s Office. The NEC launched the National Waste Management Strategy, and a programme called ‘Zero Waste Hour: My Waste, My Responsibility’, while the Thimphu Thromde launched the Household Compost Product²⁸.

The ‘Zero Waste Hour’ initiative is a move towards a ‘Zero Waste Society’. The intention is to build civic responsibility of all citizens in practicing proper waste management, by encouraging all to voluntarily dedicate at least one hour on cleaning their own areas on the 2nd day of each month. Since June 2019, the NEC Secretariat has been coordinating the programme in collaboration with other stakeholders. Within Thimphu Thromde, a total 39.4 tonnes of waste (consisting mainly of plastics, followed by rubber, glass, clothes, wood, metal and papers) was collected through the collective effort of more than 1000 volunteers. Other institutions, Dzongkhag and Gewog Administrations have also coordinated the programme in their respective areas²⁹.

CSOs conduct regular cleaning campaigns and awareness programmes during public events by engaging volunteers. Some CSO initiatives are geared towards economic empowerment of women through waste entrepreneurship i.e. by supporting with income generation while helping to reduce waste (especially plastic and tetra pak wastes) in landfills. As well, women are also trained in household composting.

must ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.” Principle 16 on access to justice states that “Any individual whose right to a safe and healthy environment has been affected or is likely to be affected shall have the right to seek legal redress.” The Act also includes the Precautionary Principle, Polluter Pays Principle, Principle of Payment of Environmental Services (PES), and the Principle of the 3 Rs (reduce, reuse, recycle).

The Waste Prevention and Management Act of Bhutan 2009 seeks to protect and sustain human health through protection of the environment by (a) reducing the generation of waste at source; (b) promoting segregation, reuse and recycling of wastes; (c) disposal of waste in an environmentally sound manner; and (d) effective functioning and coordination among implementing agencies.

The Water Act of Bhutan 2011 aims at ensuring that water resources are protected, conserved, and/or managed in an economically efficient, socially equitable, and environmentally sustainable manner.

The Waste Prevention and Management Regulation 2012 and the Waste Prevention and Management Regulation (Amendment) 2016 provides comprehensive regulation for waste minimization and management.

Bhutan’s NDC 2015, under its Mitigation action seeks to “minimize GHG emission through application of the zero waste concept and sustainable waste management practices”, i.e. through “enhancement of the 3R principles including the conversion of waste to resources” and by “improving the current system and infrastructure for waste management.”

The Draft National Sanitation and Hygiene Policy 2017 is the only policy that looks into sanitation and hygiene issues in both urban and rural Bhutan, and focuses on the management of liquid waste in the country.

The National Waste Management Strategy (NWMS) 2019 seeks to prevent and minimize waste generation at source and divert materials to be refused, re-used, recovered, and recycled. Following the circular economy concept, the goal is to continuously move towards a “Zero Waste Bhutan” in partnership with the general public, industries, CSOs, Government authorities at local and sectoral levels, municipalities, and potential development partners. It places emphasis on appropriate management to respond to waste as an emerging national environmental issue. Building the linkage between waste and climate change, it identifies strategic interventions and tools for sound waste management. Gender is highlighted as a crosscutting concern with gender issues to be integrated across all waste management actions in the strategy. It highlights the need to mainstream gender in the planning processes. Furthermore, all the waste related studies need to take account of gender disaggregated analysis on waste recycling, reuse and value addition.

4.4.4 Institutional Framework

Regulatory, Implementing and Collaborating Agencies

- The NEC is an independent authority and the highest decision-making body on all matters relating to the environment and its management in the country. Its Waste Management Division (WMD) has the mandate of developing policies and plans, and to monitor their implementation. It delivers Information, Communication and Outreach (ICOS) on national waste issues.
- The National Coordination Committee representing key implementing agencies was set up by the NEC Secretariat for effective functioning and coordination among institutions on waste management. The multi-sectoral committee acts as a bridge between implementing agencies and the NEC, in order to enhance efficient coordination and to ensure the implementation of roles and responsibilities.

The lead responsibility for implementation is vested with the following agencies and any others as may be determined by the National Environment Commission (RGoB/NEC, 2009):

- The MoWHS for ensuring waste prevention and management in the Thromdes.
- Dzongkhag Tshogdu and Gewog Tshogde for ensuring waste prevention and management under Dzongkhag, Dungkhag, Gewog and Chiwog levels.

Various other Government and non-government entities coordinate with the key implementing agencies as relevant to their respective mandates and areas of operation. The following agencies are responsible for ensuring prevention and management of wastes resulting from various sectors, as briefly described below:

- Department of Trade, MoEA: Wastes resulting from transboundary trade, including import and export of waste as well as waste-producing materials.
- Department of Industry, MoEA: Industrial wastes.
- Tourism Council of Bhutan (TCB): Wastes from hotels, restaurants, camp sites and trekking routes.

Box 21: NGOs involved in waste prevention and management

Clean Bhutan seeks to reduce waste at source, and focuses on upcycling plastic and tetra pac wastes into bags. In doing so, it works to empower women and youth (particularly those who are disadvantaged) through the conduct of trainings and by enhancing income generation. Currently, 225 women and 5 men are trained on upcycling woven bags, as well as on composting wet organic waste. Established in 2014, its current workforce of 11 people are comprised of 9 women (including project coordinators, finance managers and trainers) and 2 men. In promoting the 'Zero Waste Bhutan by 2030' vision, its mission is to change mindsets towards sustainable life styles. It works with the Central and Local Governments, monastic institutions, CSOs, private sectors, and education institutions. Presently, it conducts a capacity-building programme for urban housewives in Sarpang, Samdrup Jongkhar and Samtse municipalities on composting kitchen wastes, and has plans to replicate the initiative in other parts of the country.

The Tarayana Foundation focuses on women's empowerment, particularly in rural areas, and has executed a project on enhancing income generation of low-income women from waste recycling. It offers direct training to women on a one-to-one basis in their homes. The Foundation supports technical skills-building of women—which is one way of enhancing their self-esteem—so that they might be able to start CSIs on waste (recycling) entities on their own (UNEP-IETC and GRID-Arendal, 2019; p.68).

The Bhutan Association of Women Entrepreneurs (BAOWE) supports women in setting up CSIs, mainly to sell farm products, although some of the CSIs focus on solar energy and waste recycling.

The Samdrup Jongkhar Initiative (SJI) of the Lhomon Society seeks to foster ecologically-friendly development in Samdrup Jongkhar Dzongkhag by reducing waste, building awareness and empowering communities. It actively promotes zero-waste strategies that include, among others, the establishment of model zero-waste communities; formation of a zero-waste craft group, mainly of women, and marketing the products; building and installing Material Recovery Facilities and waste segregation stations; developing various training materials as well as training local people on zero waste; reducing waste at tsechus (local festivals), religious ceremonies and other community events³⁰.

The Red Dot Campaign (in schools) deals with safe disposal of menstrual waste, including awareness-raising on menstruation. Sanitary pads are distributed, waste bins are placed in schools, and the waste is disposed off in sanitary pad burning incinerators. The campaign aims to remove stigma on menstruation and empower young women. The various waste entities are involved in this campaign.

Zamin Friends Forever (ZFF) is a start-up enterprise that promotes and produces eco-friendly sanitary pads made of cotton, with a thin layer of plastic which can be reused.





V. CONCLUSIONS AND RECOMMENDATIONS

Based on qualitative and quantitative analysis of the situation regarding climate change (CC) and gender in Bhutan, particularly with regard to the NDC sectors of agriculture, energy, and waste management - this section presents the conclusions and recommendations of the study.

5.1 Conclusions

As mentioned, this study with its analysis of the gender-climate interactions in Bhutan - particularly in the NDC sectors of agriculture, energy and waste -is intended to assist with Bhutan's ongoing efforts to achieve carbon-neutral, resilient, and sustainable development in a gender-responsive way.

Given its large forest coverage of more than 70 percent of total land area, its relatively low levels of industrial activity, and the generation of almost 100 percent of its electricity from hydropower, Bhutan is a net sink of GHGs. At the same time, rapid rise in GHG emissions is being recorded especially in key sectors such as industry, transport and waste.

Much of the effects of climate change in Bhutan is determined by its position in the Hindu-Kush Himalayas. CC events such as rising average temperatures, extreme weather, glacial melting, and erratic rainfalls lead to increased flooding including GLOFs, droughts, landslides, and wildfires. These, in turn, affect water supply and agriculture; bring about more pests and diseases; and increase the frequency and intensity of disasters, human-wildlife conflict, and infrastructure destruction.

All these effects are already taking place, as reported by stakeholders consulted for this study; and as such effects are becoming more prominent over time, their workloads and daily lives are also being affected. While about half of the survey respondents said that they are well-prepared in the event of a disaster, more than one third indicated lack of preparedness for CC-induced disasters.

Although Bhutan is signatory to many international gender conventions and agreements, and women's equal rights are enshrined in the Constitution and other legal frameworks, the gender equality status shows a mixed picture. Over the years, important progress has been made with regard to women and girls in education, limiting maternal mortality, and increasing participation in society and work. But there are areas where gender inequalities persist: land ownership is unequal, violence against women and girls are pervasive, and representation of women in public and political institutions is low. As well, women still experience higher unemployment levels and gender payment gaps. While men spend more time than women outside the home, and females spend more time on household tasks, household-level decision-making is male dominated.

Gender differences are also visible in terms of vulnerability to climate change, participation in decision-making and action on CC, and the diverse levels of benefit-sharing. With changing climatic conditions, production is decreasing, and the roles of women are becoming more difficult as male out-migration as well as VAWG and sexual exploitation increase. As well, health problems become more prominent and working conditions deteriorate. About half of the survey population 'strongly' agrees that climate change increases women's workload more than that of men's, and that climate change impacts women more than men. Male participation in climate initiatives is relatively higher than female participation, which the survey shows is 10 percent and 3.5 percent respectively. Overall, active participation by women in the development of climate policy and decision-making is significantly less than that of men.

Awareness and knowledge on the Gender-CC nexus is still limited in Bhutan. Few recent studies exist on the subject, and such analysis is not yet part of study programmes in universities, colleges and schools. However, with CC-issues becoming more relevant in some curricula and an increasing interest in the area, curricula review processes offer interesting opportunities for future integration.

The agricultural sector is the most prominent GHG emitter in Bhutan. At the same time agriculture itself is vulnerable to the effects of climate change. Challenges such as loss of agrobiodiversity and of agricultural land, and increased human-wildlife conflicts, are exacerbated by climate change. Rural communities are also confronted by poverty and farm labour shortages. A majority of rural population is engaged

in low productive crop and livestock production, and forest uses. A transformation is taking place from traditional subsistence to more market-based agriculture, and organic agriculture is also being promoted.

Around half of Bhutan's farmers are female, but due to male out-migration feminisation of agriculture is taking place. Women have access to land and other renewable resources but less control than males. Because of all their various roles and responsibilities, rural women are more vulnerable to the effects of climate change, and they are more affected than men when climate-induced disasters hit. On the other hand, the survey for this study shows that while most rural males are aware of climate-smart agriculture initiatives, very less women are aware of the same.

Bhutan's energy production depends on a mix of energy sources i.e. hydropower, biomass and fossil fuels. Electricity access has increased from 30 percent in 2000, to about 100 percent at present. During the period 2000 to 2015, GHG emissions from the energy sector increased by 12.35 percent due to economic development. Inefficient use of biomass causes GHG emissions and environmental health problems, due to indoor-pollution by particles and emissions particularly for women and children. Transport uses 19 percent of energy in Bhutan, and within the energy sector it is an important GHG emitter contributing 55 percent of sector emissions. Transport, which is not gender-neutral, also causes air pollution from particulate matter and nitrogen dioxide.

Modern sustainable energy services—including on-grid electricity, biogas and solar power—and fuel- and labour-saving technologies such as improved cookstoves, contribute to reductions in pollution, positively impacting women's health and reducing drudgery. However, these technologies are not widespread and not easily accessible particularly for (individual) rural women.

With a slightly higher proportion of females than males, more than 70 percent of the survey population is aware of initiatives that promote energy-saving. By sex, a higher proportion of males compared to females reported having access to information about sustainable renewable energy. However, only a very small proportion of the population reported getting support in terms of access to technical training, appropriate technologies, finance, and decision-making. Except for the support in terms of access to technical training, a slightly higher proportion of females compared to males reported such support.

Most employees in the energy sector are male, and women and men are often impacted differently by (sustainable) energy projects. In STEM education women are still a minority, but their participation is increasing. In the CSI-sector, sustainable energy production and consumption offer important opportunities for enhancing energy efficiency, sustainability and women's empowerment.

In Bhutan the amount of solid waste (including hazardous waste) is growing along with economic welfare, a more open market system, changing lifestyles, urbanization, and a general lack of public awareness and advocacy. Waste forms a small but increasing contributor to GHG emissions (esp. CH₄), particularly via waste disposal on land and—to a lesser extent—from wastewater handling.

Waste prevention and segregation at source is key to successful waste management. However, men and women have different views and experiences with segregation, disposing methods, recycling, and reduction of waste. The gender gap in the waste sector is quite large, including the division of labour, power structures, payment, access to information and equipment, and unequal roles and opportunities. Women are the main handlers of household waste management, segregating wastes at source, home composting, and teaching children. They are active in prevention, reuse and recycling, often in informal settings, and some become small waste recycling entrepreneurs.

In the public and private waste sector, women are often absent at senior levels or as professionals, and they work mainly as office staff. At operational levels, truck drivers are male; waste segregation in transfer centres is mainly done by women; and waste-pickers and sweepers are predominantly women. They are often unaware of the adverse health effects of improper waste-handling; protection is scarce; and job security is lacking. There is a major discrepancy in the support for managing waste, which people presently receive and the need for which is almost 100 percent, as reported by survey respondents.

Overall there is an extensive institutional framework regarding agriculture, energy, and waste management, but only a few recent policies, plans, strategies and roadmaps specifically mention gender issues²⁶. As such, gender mainstreaming in CC-related agricultural, energy and policy areas in Bhutan is limited. However, gender issues are being integrated with the implementation of more recent policies, such as the Climate Change Policy. Likewise, climate change is recognized as key policy area in the recent National Gender Equality Policy and National Plan of Action for Gender Equality.

Gender expertise in sectoral institutions is also just building up. There is a need for empowering and building the leadership of female farmers, energy users, and waste managers. Their communication skills need to be enhanced so as to strengthen their voice and decision-making power in (local) governance and climate-smart farming, renewable energy use, and sustainable waste management.

Although the presence of the NCWC and the network of gender focal points or GFPs offers important starting points for gender-sensitive governance, the limited institutional capacity connecting NDC priority areas and gender issues makes gender-responsive policy development and implementation a challenge. Gender-disaggregated data on climate change, agriculture, energy and waste management, and related research and expertise are still limited. However, an increased interest in the gender-CC nexus in Bhutan's context is evident.

5.2 Recommendations

There are several ways in which a gender transformative approach in climate-related policies and actions—generally as well as specific to sectors—should be promoted.

5.2.1 General recommendations

These recommendations relate to all climate change-related sectors, including the selected NDC priority areas for this study. They are organized around areas where action is needed in order to make climate action gender-responsive i.e. in the policy sphere and the institutional sphere, and in terms of awareness-raising and capacity-building, evidence-building, participation and empowerment, education, and implementation. Together, they are intended to contribute to a gender transformative trajectory.

A. POLICY SPHERE

Recommendation A1: Integrate gender and climate aspects in the formulation and review processes of existing policies, programmes and projects on climate change and related sectors (including the NDC and APA), by conducting a gender analysis of climate-related policies and policy action plans, through the involvement of internal and/or external gender experts/expertise, and with close monitoring of the implementation using gender-specific indicators.

Recommendation A2: The important but unvalued contributions that women make to climate mitigation and adaptation in households, communities and larger society need to be acknowledged and recognized, including in the national accounting system.

B. INSTITUTIONAL SPHERE

Recommendation B1: Ensure organizational mandates and commitments are in line with national and international gender-CC commitments, and include gender and climate change as mandatory indicators for relevant sectors in Annual Performance Agreements.

Recommendation B2: Enhance institutional capacity-building, including short-term and long-term training on gender-responsive climate action in institutions, ministries, agencies, CSOs, and private companies, including for male local leaders. Disseminate findings of this study on Gender-Climate Change in NDC sectors to management and staff.

Recommendation B3: Strengthen the role and position of Gender Focal Points (GFPs) within institutions and agencies, and institute a mechanism to include GFPs in all climate change

actions within the various sectors.

Recommendation B3: Enhance capacity by including the National Commission for Women and Children (NCWC) in the C4 committee (on climate change policies and actions), reviving the central Mainstreaming Reference Group to provide backstopping for mainstreaming cross-cutting issues across all policies, including in the NDC sectoral priority areas.

C. AWARENESS-RAISING AND CAPACITY-BUILDING

Recommendation C1: Inform and raise awareness of government officials at all levels, professionals, private sector, academia, students, CSOs, and the broader public about the gender dimensions of climate change, climate policies, and related mitigation and adaptation strategies and practices in Bhutan—with a focus on the agricultural, energy and waste sectors. Engage the media—including mass media and social media—in this endeavour. To facilitate this, provide training to journalists on the gender dimensions of climate change and climate action.

Recommendation C2: Make the gender-CC nexus part of the agendas of leadership forums, such as the Executive Forum, Annual Gup Conferences, and District Head Annual Conferences.

Recommendation C3: Ensure that in activities addressing CC causes, impacts and actions, the perceptions and attitudes are gender-sensitive and critically monitored, preventing stereotypes about gender roles.

D. EVIDENCE BUILDING

Recommendation D1: Guarantee the systematic collection of sex-disaggregated data, development of gender-sensitive statistics and other information in design, planning, implementation, monitoring and evaluation of climate mitigation and adaptation efforts in all sectors and at all levels. Apply existing sex-disaggregated data, indicators and information with regard to climate change action, including in NDC priority sectors. As well, make sex-disaggregated climate information, data and statistics available in a coordinated way, for example through a national repository on gender and climate change.

Recommendation D2: Develop research and document case studies in the area of gender and climate change in Bhutan—in particular on women's and men's engagement in climate action in the NDC priority areas, on gender-based violence & climate change (e.g. on human-wildlife conflicts and increasing violence against women and girls guarding the fields), and on gender, health and safety in the context of climate change and climate action.

E. PARTICIPATION AND EMPOWERMENT

Recommendation E1: Strive for gender equality and parity at all levels within agencies, institutions and organizations dealing with climate action, by promoting inclusive, active and meaningful participation and decision-making of women.

Recommendation E2: Empower and train women to take on leadership roles and act as change agents in CC action from community to management levels, locally and nationally, building on the existing leadership trainings of CSOs and other agencies.

F. EDUCATION

Recommendation F1: Integrate gender and climate change issues in education at all levels, from primary education to academic levels, vocational training and informal education, through the review of existing curricula and development of new courses and curricula. As well, encourage

girls at all levels to engage in STEM-education.

Recommendation F2: Promote innovations on addressing issues related to agriculture, energy and waste in the context of climate change through universities, academia and schools, involving a broad community of male and female students and teachers.

Recommendation F3: Organize learning and awareness programmes for children on social issues, gender, and climate change in Bhutan, incorporating these in existing forums/initiatives, such as school camps, scouts camping, and other vacation activities, seminars and workshops.

G. IMPLEMENTATION

Recommendation G1: Climate change adaptation and mitigation programmes need to address differentiated needs, priorities and knowledge systems of women and men. In order to do so, apply a participatory gender analysis or gender impact assessment (GIA) as well as gender-sensitive monitoring and evaluation for all climate-related initiatives, including in NDC priority areas. Ensure gender expertise is included in the development and implementation of such climate mitigation and adaptation programmes and projects.

Recommendation G2: Enhance women's livelihoods and promote women-led green enterprises by ensuring their access to finance, including climate finance, insurance, technical training, and sustainable technologies, specifically in climate-related sectors such as agriculture, energy, transport, and waste. Apply health, safety and labour standards in these initiatives. As well, enable women's participation in CSA/CRA, renewable energy, and sustainable transport and waste management sectors, by supporting Early Childhood Care and Development (ECCD) and creches for children of employees.

5.2.2 Recommendations on gender and CC for NDC priority area: Agriculture

H. GENDER-RESPONSIVE CLIMATE SMART AND RESILIENT AGRICULTURE

Recommendation H1: Target CC mitigation and adaptation programmes, through CSA, towards needs and priorities of rural women and men. Enhance rural women's access to and control over productive resources, such as land, forest resources, water sources, agrobiodiversity and livestock and enhance their access to labour and extension services.

Recommendation H2: Ensure rural women's access to sustainable technologies, inputs, credit and financial services for CSA, including organic agriculture. Promote access to agro-meteorological information, Climate Information Systems (CIS) and market information through mobile phones/applications or radio, in national and local languages.

Capacity development of women to digitize agriculture to address the challenges faced by farming communities through innovative IT solutions.

Recommendation H3: Promote awareness of female and male farmers (including groups and cooperatives) on climate smart and resilient agriculture, and gender-differentiated contributions, through training, extension services, mass media and social media.

Recommendation H4: Facilitate women and men's equal participation in and access to benefits from CSA/CRA activities. Support empowerment and leadership-building of rural women, and their full and meaningful involvement in the development and implementation of agricultural mitigation and adaptation activities—including CSA/CRA and organic agriculture. Enable rural women to participate actively in relevant groups, such as farmers groups, cooperatives, forests groups, and water-user groups.

5.2.3 Recommendations on gender and CC for NDC priority area: Energy (including transport)

I. SUSTAINABLE ENERGY CONSUMPTION AND PRODUCTION

Recommendation I1: Ensure equal participation of women and men in sustainable energy use, through awareness-raising and promotion, including by recognizing and empowering women as agents of change for energy efficiency inside and outside the household. Promote women's increased participating in decision-making, supply and use of renewable energy technologies (RETs)—like solar for lighting and heating, biogas plants, and improved cookstoves and heating stoves.

Recommendation I2: Decrease women's workloads and explore options for investments in and subsidies for programmes promoting use of improved cookstoves and other labour-saving energy-efficient devices. Enhance women's access to finance, technical training, and appropriate sustainable technologies for promoting the use of sustainable renewable energy, contributing to the enhancement of women's welfare, environmental health and gender equality.

Recommendation I3: Support women's participation in sustainable energy-related livelihoods and entrepreneurship, advancing their economic opportunities. Target women's organizations and enterprises as possible producers and suppliers of renewable energy products.

Recommendation I4: Increase women's participation as employees, professionals and managers in the energy sector, and involve women's organizations and gender expertise in energy planning, monitoring and evaluation.

J. PROMOTING SUSTAINABLE TRANSPORT SYSTEMS

Recommendation J1: Change the mindset that everybody needs a car, building on awareness campaigns that address the general public. Promote clean transport technology; sustainable public transport and energy efficiency in public infrastructure and monitoring; and explore and introduce alternative modes of transport such as cable cars, water transport, electric mass transport, and railways.

Recommendation J2: Emphasize the role of public transport investments in improving mobility and quality of life, as well as its affordability, in order to address gender issues and CCM/CCA with clear gender and climate assessments. Induce gender-friendly public transport services through an inclusive transport policy.

Recommendation J3: Ensure safety for women and girls on roads, in transport services, and public spaces. Enhance facilities for taxi stands, to create safe, affordable and accessible parking places. Strengthen and streamline women's safety on the road.

Recommendation J4: Explore and promote employment opportunities for, and entrepreneurship of women in sustainable transport services. Improve working conditions and guarantee better payment including in road construction. Build women's capacity to drive electric vehicles (EVs), and give priority to female taxi drivers for subsidies on EV taxis.

5.2.4 Recommendations on gender and CC for NDC priority area: Waste

K. SUSTAINABLE WASTE MANAGEMENT

Recommendation K1: Ensure women's participation in all levels of waste management, including women in decision-making related to waste management. Promote women leadership and women's entrepreneurship in the waste sector, with Government, CSO and private sector

support. Gender perspective should be incorporated right from the planning phase through implementing waste management ventures.

Recommendation K2: Strengthen institutional collaboration for effective implementation of gender responsive waste management system.

Recommendation K3: Enhance education, awareness and advocacy at all levels on waste management—including but not limited to principles of 3Rs, segregation, recycling, composting and occupational health and safety. Build appreciation for women’s and men’s work in this sector, and advocate for waste management (including in the waste value-chain) as a valued occupation. Raise awareness to change existing cultural norms and gender division of labor—including household waste management.

Recommendation K4: Improve support systems for sustainable waste management particularly in terms of access to finance, technical training and appropriate technologies and ensure their availability to local women and men. Set up and support community (women’s) groups to establish composting units business firms/units on waste management.



ENDNOTES

- 1 NKRA 1: Macroeconomic stability ensured; NKRA 2: Economic diversity and productive capacity enhanced; NKRA 3: Poverty eradicated and inequality reduced; NKRA 4: Culture and traditions preserved and promoted.
- 2 Gender-responsive means that rather than only identify gender issues or work under the “do not do harm” principle, a process will substantially help to overcome historical gender biases in order for women to truly engage and benefit from these actions. A Gender-transformative approach means that promoting gender equality—the shared control of resources and decision-making—and women’s empowerment are central to an intervention.
- 3 See Annex 2: List of Organizations and Officials Interviewed (July-August 2019).
- 4 In the Population and Housing Census in Bhutan 2017, the average HH size as measured by the number of members per regular household was 3.9 persons in 2017 (and 4.6 persons in 2005).
- 5 In the Population and Housing Census in Bhutan 2017, the total child population (below 15 years old) is estimated at 26.1%, and the elderly population (above 65 years old) is estimated at 5.9% of the total population. Note that in this study we looked at the percentages per household.
- 6 <http://www.forastateofhappiness.com/how-is-gross-national-happiness-measured-in-bhutan/>
- 7 Climate change damage of roads is due to landslides, flooding etc; lack of water supply is due to changes in precipitation; increased human-wildlife conflicts because the animals lack food, fodder and water; increased use of electric fan because of increased temperatures; changing roles and responsibilities in the household because of scarcity of resources, deteriorating livelihoods and/or migration; increased waste because of landslides and flooding, as well as failed crops; impact on health because of heat stress, pollution and vector-diseases; difficulty in food production and biomass energy sources because of lack of water, flooding and weather extremes; changes in food habits because of the changes in quantity and composition of food items.
- 8 This is also in line with the NAPA-2 study of Tarayana Centre for Social Research and Development: Verma et al., 2018.
- 9 The 2017 PHCB reported that 21.7 percent of people migrated to urban areas from rural areas in the course of their lives.
- 10 Kuenzang Lhamu (NCWC Director), Gender Equality in Bhutan: A Situational Analysis: <https://www.ncwc.gov.bt/perspectives/324>
- 11 ‘Both Sexes’ stands for: average of all respondents.
- 12 This is the result of the question: Do you agree with the statement: Domestic violence (violence within the household) is a serious issue in this community, as perpetrated towards the following groups? These different groups are women, men, elderly, youth, people with accessibility difficulty. The results presented are disaggregated by sex of the respondent.
- 13 https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=I-2&chapter=1&clang=en
- 14 Communication NCWC (7 February 2020)
- 15 *Khimsa*: Plot of land around the house on which a mixed variety of crops are grown, mostly for self-consumption.
- 16 In the original UNDP et al, 2016 study, fuelwood collection was not identified as being a female function. However, other studies, such as the Survey that includes the field research for this study, clearly indicate that women in Bhutan are also quite active in fuelwood and fodder collection.
- 17 Through organic livestock farming and eco-friendly farm designs; improvement of livestock breeds, including conservation of native genetic gene pool/diversity; expansion of biogas production with stall feeding; and agro-forestry or agro-silvo pastoral systems for fodder production.
- 18 Other acts that include aspects of relevance to agriculture in Bhutan are: the Seeds Act (2000), the Pesticides Act (2000), the Livestock Act (2001), the Biodiversity Act (2003), the Food Act (2005), draft National Biodiversity Strategy and Action Plan (NBSAP) (2014), and draft Access Benefit Sharing (ABS) Policy (2014), which deals with fair equitable sharing of benefits arising from the use of genetic resources and traditional knowledge.
- 19 RGoB, 12th FYP NKRA 9: Infrastructure, communication and public service delivery improved, Strategy 2: Improve and maintain climate resilience of road network.
- 20 ‘Bhutan Dzongkhag Statistics, 2017’ in Integrated Research and Action for Development (IRADe), 2017, Impact of CBET on Livelihoods and Gender in Nepal and Bhutan. SARI-EI Secretariat
- 21 Although the use of wind energy is formally only in Wangduephodrang Dzongkhag, which is not covered under the survey, some forms of local wind energy are used by respondents.
- 22 In terms of energy use, industry and buildings are bigger users; and in terms of GHG emissions, transport accounts for 55

percent, and manufacturing industries and construction for 40 percent. However, gender aspects of energy use in industry and construction sectors are out of the scope of this study, as these are often beyond personal choices people make (apart from work and decision-making in the sector, and—even more indirectly—through consumption). These aspects could be studied in a follow-up study.

- 23 About one percent of households who reported owning car must be owning more than one car, hence the total reporting diesel and petrol exceeds 100 percent.
- 24 Aims to contribute to SD, CC mitigation, energy and economic security, and conservation of the environment in Bhutan, as well as reduction in GHG emissions, green growth, enhancing productive manufacturing capacity in RE, develop framework for Carbon Trading/Market Mechanisms, promote R&D; public and private sector—development of RE Master Plan; allotment diverse projects via NA; also includes Water User Charges, Recycling and management of waste (as per the prevailing Waste Management Acts), land acquisition and compensation (see Land Act); Renewable Energy Development Fund (REDF)—to promote financial assistance for RE; Promotional measures renders RET (Services) accessible and affordable to the rural poor and marginalised section of the society.
- 25 The work of other agencies and departments is also relevant from an energy perspective, including that of the GNHC, and some other departments in the MoEA i.e. the Department of Trade (DoT), Department of Industry (DoI), Department of Revenue and Customs (DRC), and the Department of Cottage and Small Industries (DCSI).
- 26 The Roadmap to Country Approach to REDD+ Safeguards for Bhutan (2016), the Energy Efficiency (EE) and Conservation Policy of Bhutan (2019), the EE Roadmap (2019), and the National Waste Management Strategy (2019). As well, the agricultural sector a priority area for Gender Responsive Planning and Budgeting in Bhutan.
- 27 See also Solar Warriors: <https://energy-access.gnesd.org/projects/11-solar-warriors-bhutan.html>
- 28 <https://thebhutanese.bt/her-majesty-thegyaltsuen-graces-launch-of-waste-management-flagship-program-and-then-leads-a-team-to-clean-sangaygang-to-commemorate-2nd-june/>
- 29 Chimi Dema, Kuensel. In: <https://dailybhutan.com/article/244-metric-tonnes-of-waste-collected-since-the-start-of-zero-waste-hour-initiative-in-thimphu>
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National Commission for Women and Children

Royal Government of Bhutan
Telephone #: +975 - 2 - 334549 / 334553
Woman & Child Toll Free Helpline: 1098
Fax #: +975 - 2 - 334709
Website: www.ncwc.gov.bt

United Nations Development Programme (UNDP, Bhutan)

UN House, P.O. Box 162, Peling Lam, Kawangjangsa,
Thimphu, Bhutan.
For more information:
www.bt.undp.org



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