

MASTER'S THESIS

Course Code: SO345S

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Impacts of Climate Change on Rural Women's Domestic Workloads in Nepal

Date: 01/09/2021

Total number of pages: 71

Acknowledgements

Julia Olsen, Ph.D., Department of Social Sciences at Nord University in Bodø, Norway, deserves my deepest gratitude for her constant guidance, constructive feedbacks, and encouragement in completing this research. Similarly, I am grateful to Dr. Yan Zhao, an associate professor in the Faculty of Social Sciences at Nord University, for her help and guidance. I would also like to thank Grete K Hovelsrud, professor of Environmental Sociology at Nord University for believing in me and allowing me to perform this study under Julia Olsen's supervision. Margit Konstanse Jensen, an academic advisor at Nord University, is equally to be appreciated for her invaluable assistance and advice during my studies.

In addition, I will always remember my friend Dil Kumar Sijali Magar's warm and brotherly advices as well as his wife Anita Thapa's sisterly supports during my studies. At the same time, I am grateful to all my friends, relatives, and teachers who have helped me in this endeavor both directly and indirectly.

Finally, but most significantly, I am indebted to my family for their unwavering support, understanding, prayers, blessings, love, and patience during my overseas studies.

Buddhi Bahadur Adhikari

25 August 2021

Abstract

Individuals' vulnerability to climate change varies based on their socioeconomic and gender structure in a given place and at a given time. The study conducts a scientific review of the literature on gender and climate change in Nepal to answer the research problem of whether climate change has affected rural women's household workloads in Nepal or not. From the findings, in many ways, women are more vulnerable to climate change than males, partly because they make up the majority of the world's poor and are engaged with their natural environment that are endangered by climate change. Furthermore, many Nepalese women confront social, economic, and political obstacles that limit their ability to adapt to climate change threats. Rural women are also particularly vulnerable because their livelihoods are predominantly reliant on natural resources, which are already threatened by climate change. As natural resources become scarce, domestic duties such as collecting water and firewood, cooking meals, caring for family members, and performing agricultural work become more important. The literature study reveals both rural women's vulnerability and local adaptation measures in Nepal. Most of the articles in the review, on the other hand, examine how climate change has resulted in a scarcity of natural resources, as well as how gender biased societal norms and practices have rendered marginalized groups, notably women, more susceptible. Finally, the findings of the study lead to the conclusion that rural women are burdened with more domestic workloads than men due to climate change.

Keywords: gender, vulnerability, workloads, rural, adaptation,

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A list of Abbreviations

UNDP	United Nations Development program
IPCC	Intergovernmental Panel on Climate Change
UN	United Nations
USAID	United States Agency for International Development
IUCN	International Union for Conservation of Nature
MOE	Ministry of Environment
IFAD	International Fund for Agricultural Development
UNFCC	United Nations Framework Convention on Climate Change
UNIFEM	United Nations Development Fund for Women
UNISDR	United Nations International Strategy for Destruction Reduction

CHAPTER 1: INTRODUCTION

1.1. Background

Climate change is a serious environmental and social challenge to mankind which has posed a threat to sustainable development (Blair, 2006; Borza, 2012; Habtezion, 2013; Pachauri et al., 2014; Rajan & Bhagat, 2017; UNDP et al., 2020). Floods, draughts, cold and heatwaves, landslides, water scarcity, cyclones and hurricanes, wildfire and sea level rise have major impacts on people's lives and livelihoods which are created by climate change (Dankleman, 2010; UN Women Watch, 2009). Furthermore, climate change has an influence on people's livelihoods, which is exacerbated by existing inequalities or non-climatic stressors such as socio-cultural, political, and economic stressors, which raise poverty, degrade food security, and exacerbate gender imbalance (Ahmed & Eklund, 2021; Santos et al., 2020). Poor women, particularly in developing countries, confront numerous gender-specific restrictions that hinder their ability to cope with and adapt to changing climate (Terry, 2009). Climate change exacerbates those existing gender inequities in adaptation, and susceptibility (IPCC, 2014a). So, women and men are affected 'differently by the distinct capabilities they have to adapt to its impacts, and respond to climate stressors' (extreme weather, draughts, landslides and floods) (Boyer et al., 2020, p. 1).

Both women and nature are said to be the primary food providers in natural farming based on sustainable 'flows of fertility from forest and farm animal to croplands' (Shiva, 1988, p. 92). However, the fact is that climate change has affected almost all the natural sectors by exacerbating their degradations where mostly the rural women depend on for production of foods for livelihoods (IPCC, 2014b; UNDP et al., 2020). Supporting this argument, ecofeminists claim that the women's vulnerability to climate change is caused due to the existing inequalities such as the low access to education, poverty, socio-cultural restrictions, male domination, no decisive roles and unequal access to land and attachment with nature for survival (Gaard, 2015; Macgregor, 2010). Therefore, women's adaptive capacity also depends on their attachments with both nature and men (Mainlay & Tan, 2012). Though, climate change and gender have been much-talked issue in the global arena, however, there is minor progress in practice and policies to build their resiliency and adaptive capacities to combat the vulnerabilities induced by climatic change (Patt et al., 2009) in the Global South. Despite the growing number of studies on climate change and gender in Nepal, they still lack to study the impacts of climate change on rural women's domestic workloads

in Nepal. So, the purpose of this study is to see how climate risks influence rural women in Nepal's daily domestic duties, considering the gender disparities that exist in their homes and communities. Furthermore, the study attempts to answer the research question by reviewing existing academic literature on climate change and gender in Nepal, which will have various roles and responsibilities in the future and can be used to identify solutions that rely on women's skills, knowledge, resources, and experiences.

1.2. Women's Vulnerability to Climate Change in the Global South

The rural women in the Global South are one of the most vulnerable groups owing to the prevalent discriminatory socio-cultural practices and unequal power structures deeply rooted in the patriarchal society (Arora-Jonsson, 2011; Mitchell et al., 2007; Solar, 2010; Tschakert & Machado, 2012). In the global south, the climate-induced disasters like floods, resource scarcity, landslides, and draught impact both men and women, however, they are not equally vulnerable as their vulnerability to climate change hazards depend on the socio-economic conditions, power relations, cultural expectations, behaviors, dependency on natural resources, and their gender roles in the particular contexts (Costello et al., 2009; Dankleman, 2010; Goodrich et al., 2019; Nagarajan et al., 2020; Patt et al., 2009; Pearse, 2017; USAID, n.d.). So, women face risks of climate-induced scarcity of food, low agricultural yields, water, and energy scarcity which are badly affected by climate change, which are also the basic things for women's livelihoods and responsibility (International Union for Conservation of Nature (IUCN), 2007). Moreover, rural women in the developing countries are mostly vulnerable due to their high dependency on local natural resources for their livelihoods as 'women are close to nature' (Ortner, 1972, p. 72), and because of their little knowledge, poverty, lower lack of social protection and employment, and low social status (UN Women Watch, 2009).

There are a number of reasons why the women in the south are more vulnerable; one is poverty as 70% of the 1.3 billion people living in developing countries live below the poverty line, are women (Denton, 2002). In the global south, the climate-induced disasters like floods, resource scarcity, landslides, and draught impact both men and women, however, they are not equally vulnerable as their vulnerability to climate change hazards depend on the socio-economic conditions, power relations, cultural expectations, behaviors, dependency on natural resources, and their gender roles (Costello et al., 2009; Dankleman, 2010; Nagarajan et al., 2020; Patt et al., 2009; Pearse, 2017; USAID, n.d.). So women face risks of

climate -induced scarcity of food, agriculture, water, and energy which are badly affected by climate change , which are the basic things for women's livelihoods and responsibility (International Union for Conservation of Nature (IUCN), 2007). Furthermore, rural people in the developing countries face the non-climatic stressors such as less access to information, poverty, underinvestment in agriculture, problems with land and degradation of natural resources, lower lack of social protection and employment, and low social status (IPCC, 2014a; UN Women Watch, 2009). Similarly, studies show that women in rural south Asian countries are more vulnerable due to their illiteracy and high poverty and because of their kindness or virtuous nature of shouldering households and caring responsibilities (Yadav & Lal, 2018).

The environmental use, management, and social relationships are closely linked in the daily lives of men and women in which ‘the eco-sphere and socio-sphere’ interact with each other which is gender-specific (Dankleman, 2010, p. 21). The women in the study are referring to gender roles rather than biological sex. It does not imply that all females are vulnerable to climate change; rather, it is dependent on the women's individual circumstances as well as the geography of their respective communities (Goodrich et al., 2019). So, the women in the south do not only disproportionately experience the climate impacts but also are excluded in decision-making roles due to the ‘prevalent socially constructed patriarchal norms and culture’ (Ahmed & Eklund, 2021, p. 160).

Gender inequalities in connection with climate change impacts do not only affect the existing behaviors and relations but it can induce adverse changes in gender relations (Mainlay & Tan, 2012, p. 4). Such as in many societies women are in disadvantaged position with the major responsibilities of managing agriculture, firewood, and water in household and community level, the resources which have been threatened by climatic change (Dankleman, 2010, p. 12). My motivation and goal in reviewing the literature on climate change and gender is to highlight why gender must be considered in climate change research, development programs, and policies, particularly measures to assist rural women and people in adapting to changing climate.

1.3. Research Question

The purpose of this research is mainly to address the following question through the findings synthesized from the systematic literature review of scholarly articles included for this study.

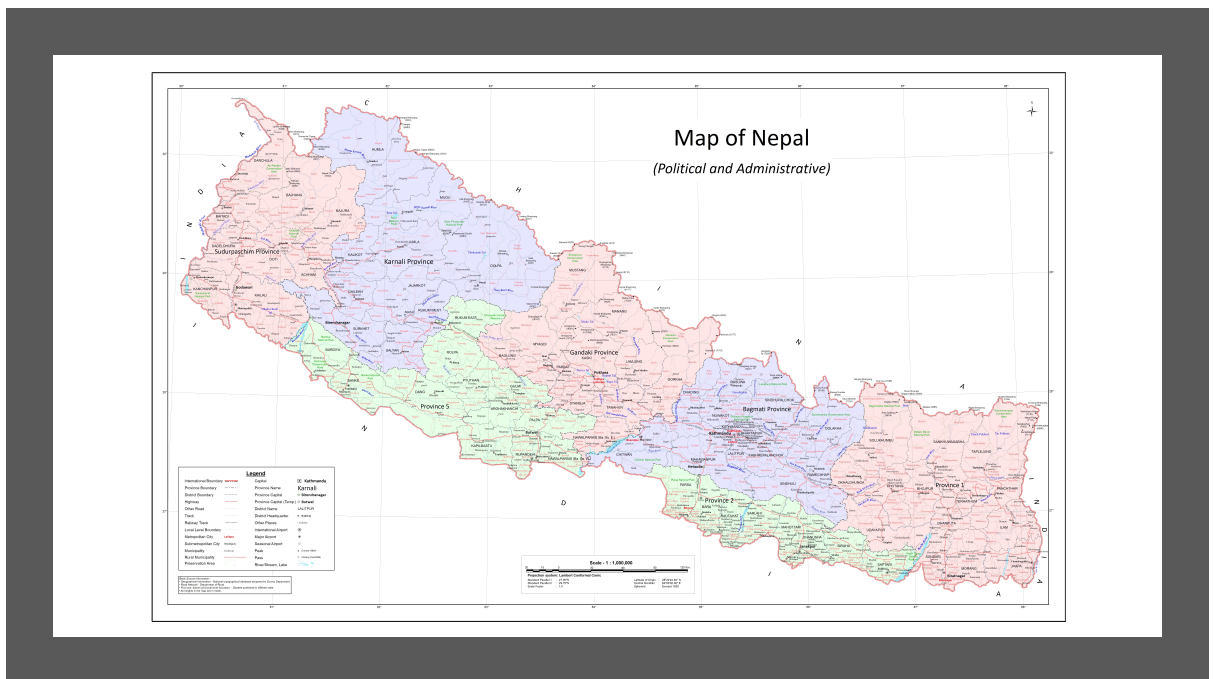
How does climate change impact the domestic workloads of rural women in Nepal?

1.4. Overview of Nepal in the light of Climate Change

Regarding Nepal, which is the study area of my study, has been facing adverse effects of climate change due to its fragile geography, poverty, illiteracy, social disparity, gender inequalities and high dependence on natural resources for livelihoods (Ministry of Forest and Environment Nepal, 2019). For instance, in 2017 in Nepal, torrential rains impacted 35 districts which affected 18 of them severely. It destroyed and damaged over 1,90,000 houses displacing tens of thousands where 134 people died (Singh et al., 2020).

Figure 1

A Map of Nepal



Map Source: Ministry of land Measurement Cooperatives and Poverty Alleviation (2020)

Nepal is a land-locked Himalayan country in South Asia situated between India and China, where the terrain is generally mountainous and about 80% people live in the rural areas across the country (ADB, 2021). According to the report of Government of Nepal (2010) ‘more than 1.9 million people are estimated to be highly vulnerable to climate change and 10 millions are increasingly at risk in Nepal’ (P. 11). Moreover, Ministry of Forest and Environment Nepal (2019) said that Nepal has the high risk of climate change vulnerability

due to its mountainous and fragile landscapes, sensitive ecosystem, and diversity in climate whereas the situation has been worsened due to the presence of socio-economic inequalities and poverty (P. 1). Climatic change stressors for Nepal include landslides, floods, draughts, shortages of water, melting ice and increase in temperature (Ministry of Science Technology & Environment, 2014). So, climate change has posed a serious threat to Nepal (Ministry of Forest and Environment Nepal, 2019, p. 3).

Generally, the research has dealt with the issue of climate change and gender in Nepal. Particularly, it discovered the disparity through the existing literature how the poor rural women in Nepal are more vulnerable to climate change with the burden of hardships in comparison to men as women disproportionately dependent on threatened natural resources (Mitchell et al., 2007).

Nepal has been experiencing the climate change - induced disasters like floods, landslides, windstorm, and wildfire every year causing the loss of life and property Ministry of Forest and Environment Nepal (2019, p. 1) Nepal's remoteness, undulating terrain, fragile landforms, extremely diverse landscape, and unevenly distributed resources will pose different levels of location and context specific climate change impacts. Nepal is ranked and listed as the most climate vulnerable countries in the world (Ministry of Environment (MoE), 2011, p. 1). Though the Government of Nepal has been working to build the climate resilient society by applying bottom-up and inclusive approach to build local capacity of socially marginalized people (Ministry of Forest and Environment Nepal, 2019), still there is need for further research to find out the vulnerability and domestic workload burden of rural women due to climate change. The research till date lacks to focus the rural women's workload burden induced by climate change hazards in the Nepalese contexts. My research systematically reviews the literature and texts available to reveal the vulnerability of rural Nepali women due to the change in climate and points the gap in knowledge yet to be fulfilled. Women experience the climate change impacts differently than men due to the gender inequalities.

1.5. Rural Areas in Nepal in the Contexts of Climate Change

Rural generally refers to the areas of open country with small settlements (IFAD, 2010). Climate change in rural areas occurs in the context of numerous key economic, social, cultural, and land-use developments, and the poverty rate in rural areas is also higher (IPCC, 2014a). In both developing and developed countries the rural is defined as the inverse of the urban where nearly half of the world's population about 3.3 billion people lives and '90% of them are from the developing countries' (Dasgupta et al., 2014, p. 618). Based on this definition, rural areas in Nepal have also the 'scattered settlements and geographical complexities' (National Planning Commission Nepal, 2020, p. 341). About 80% of people depend on subsistence agriculture and almost the same percentage of people live in rural areas across Nepal and poverty rate is higher than the urban population (Central Bureau of Statistics Nepal, 2011). Nepalese rural people are poor due to lack of resources, lower level of education, poor health services, lack of infrastructures, and little access to communication with 'low productivity and geographical difficulties in comparison to urban people' (Acharya, 2008, pp. 183-187). Women represent the bulk of the impoverished and uneducated in rural Nepal, making them the most vulnerable (Sharma, 2016; UNDP Nepal, 2009). Moreover, they are highly dependent on natural resources and agriculture for their livelihoods, which are highly sensitive to climate change, climate stressors and extreme weather (Dasgupta et al., 2014; Mainlay & Tan, 2012) and Goodrich et al. (2017, p. 7) talking about the discriminatory gender division of labor, said that women especially in rurality are responsible for domestic activities such as cooking, cleaning, caring children, sick and old, collecting water and firewood. In Nepal, the status of women is poor based on the fact that Nepal is one of the least developed countries in which most of the people survive on low subsistence agriculture (Acharya et al., 1999; Karki & Gurung, 2012). Though the Government of Nepal has been working to build the climate resilient society by applying bottom-up and inclusive approach in its National climate change policy to build local capacity of socially marginalized people (Ministry of Forest and Environment Nepal, 2019) still across cultural diversities, the majorities communities in Nepal are patriarchal where a woman life is strongly influenced by her father and later by her husband. (Acharya et al., 1999). The reasons behind the women's vulnerability are; most women in the South represent the poorest sections of the society, they have high rate of mortality in natural disasters and they are more conscious and dependent on the natural resources and environment for livelihoods (Arora-Jonsson, 2011). Due to prevalent gender -based socio-cultural equalities in

Nepal tend to impact the resilience and climate vulnerability (Sandal, 2021, pp. 1-2). According to the survey in Nepal, 61% of women are involved in subsistence farming whereas only 47% men are (Central Bureau of Statistics Nepal, 2017)

The climate change can aggravate land and agricultural degradation which leads to decreased agriculture yields, contributing to poverty and reduced opportunities (FAO, 2017). Despite the efforts made, the rural women in Nepal have faced many non-climatic stressors such as lack of equal education, poverty, health services and roles in decision making and therefore remain more vulnerable to climate change (ADB, 2021).

Furthermore, agriculture and livestock are the means for livelihoods for majority of rural people in Nepal (Chaudhary, 2018). Mostly rural women living in hills and mountains (rural areas) in Nepal are economically disadvantaged and therefore suffer from insufficient nutrition, food and poor health, unemployment and illiteracy unlike the urban population (Asian Development Bank, 1999). Even though rural women contribute to large portion of agricultural labor force in Nepal still their work is undervalued. They are often paid less than men for the same work outside home, and many of them involved in care giving and farming (UN Women, 2017).

Different types of discriminations, such as class, caste, and gender roles, are at the foundation of Nepalese culture and society, with males playing a major role in decision-making, demonstrating patriarchal domination (Mainlay & Tan, 2012). Worse, climate change has the greatest impact on women and girls because it exacerbates the effects of established gender inequality (Action Aid UK, 2019). Climate change affects everyone, but its effects are not gender-neutral (Richardson, 2015; UNFCCC's Gender Action Team, 2016) and are dependent on women's socio-economic and cultural limitations. Due to severe gender disparities and their location in a challenging physical terrain with restricted access to services and resources, rural women are doubly afflicted (Boetto & McKinnon, 2013).

1.6. Structure of the Thesis

There are six chapters in the thesis. The following chapter will use ecofeminism as a theoretical framework for analyzing the study's findings. It also looks at how ecofeminism looks at women's gender roles, vulnerability, and adaptations in relation to climate change. The methodological section of Chapter 3 focuses on the procedures employed to complete the current study. The systematic literature review on climate

change and gender is the focus, as well as how the processes are carried out to develop the research methodically and logically to improve validity and credibility in addressing the research question given. The results part of chapter four discusses the conclusions gleaned from the literature review. The fifth chapter applies the theory to evaluate and discuss the findings of the researched literature to answer the research question: consequences of climate change on rural women's domestic duties. Finally, the last chapter includes a conclusion, as well as limitations and recommendations.

CHAPTER 2: THEORETICAL FRAMEWORK

2.1. Ecofeminism

Ecofeminism deals with the environmental issues such as ‘trees, forest, land, water, draught, desertification, food production, etc., and why these issues relate to the women, race, discrimination, social structure, culture and poverty’ (Warren, 2000, p. 1). Peace movements, labor movements, women's health care, and anti-nuclear, environmental, and animal liberation movements have all contributed to the development of ecofeminism as a theory (Gaard, 1993b). Ecofeminists claim that the environmental problems are also the feminist issues which have a connection to understand the domination of women and other marginalized people in the society (Warren, 2000). Ecofeminism is therefore an umbrella term for the connections and intersections of dominations such as the unjustified oppression of women, children, people of color, indigenous people, the poor and marginalized people which are categorized as Others and the domination of nature (Banerjee & Bell, 2007; Gaard, 1993b; Warren, 2000). The non-western ecofeminists want to dismantle all forms of ‘interrelated oppressions of racism, sexism, classism and ecological destruction’ (Gaard, 1993b, p. 10). Since the 1980s the discourses that women are intrinsically closer to nature have been hardest hit by environment degradation (Resurrección, 2013). Ecofeminism is based on various social movements and grounded in the feminism, peace and the ecology movements in the late 1970s and 1980s’ and the term was first used by Françoise D’Eaubonne in France (Nhanenge, 2011; Shiva & Mies, 2014, p. 13) .

Grounded in feminist movement (Nhanenge, 2011), ecofeminism, argues ‘about the connectedness of theory and practices’ not only dealing with environmental degradation but is also aware of the dominance and oppression and inequalities in male-dominated society (Agarwal, 1992, p. 120; Shiva & Mies, 2014, p. 14). Ecofeminism studies the women's efforts to save their livelihoods and making the communities safe to live (Shiva & Mies, 2014). Like this, Sturgeon (2016) showing the women-nature relationship, put forward that the treatment done on women and the environment has a connection (P.30). Ecofeminists believe in the relationship between women and nature by saying ‘we are woman and nature’ (Griffin, 2016 in prologue) however some critics criticized this idea of being closer with nature which has made women inferior and subordinate to men who are said to be closer to culture (Suresh, 2021). They draw the concept of a gender perspective to see the oppression of women with the

oppression of the environment (Grosse, 2018; Macgregor, 2011). The ecofeminist perspectives claim that both women and nature must be respected (Adams, 1993). So, ecofeminism asserts that there is a link between environmental exploitation and degradation and women's subordination and oppression (Cuomo, 2002; Mellor, 2007). As Shiva (1988, p. 41) claims that with the violation of nature is linked with the violation and marginalization of women especially in the developing world.

Women are, without a doubt, the most vulnerable to climate change and natural disasters, but their vulnerability is the product of inequities created by gendered social roles, discrimination, and poverty (Gaard, 2015). Therefore, ecofeminists combat the elimination of patriarchal domination and socio-cultural unfair gender relations and poverty in the society and the differences in household economy like fuel, fodder, and food. It also argues that women are the primary sufferers of environmental degradation and scarcity of natural resources (Warren et al., 1997). In connection with climate change, those people who are socially, economically, culturally, or institutionally marginalized in society are especially vulnerable to climate change and are affected in adaptation (IPCC, 2014a).

Moreover, Warren (2000) wrote that the ecofeminism has the historical connection of 1947 which is known as Chipko movement where women embraced the trees to save them from lumberjacks to cut them down and saved twelve thousand square kilometers of sensitive watersheds. Furthermore, ecofeminism can be better understood from the conceptual framework that is how we view the reality from our perspective and beliefs which can be seen that the history of perpetuate and justification or oppression against women by patriarchal society (Warren, 2000). The conceptual framework is the 'socially constructed lens through which one perceives the reality' (Warren, 2000, p. 46) which has the connection with the social constructionism.

2.2. Domestic Workloads

Women's domestic workload is often characterized by repetitive, tedious, and cumbersome activities that are time consuming and unavoidable and they must carry out them simultaneously (Vickery, 1977). Unlike the productive activities, the domestic work hereby refers to the household chores which does not generate an income and is not reflected in a country's gross domestic values (Cooke, 2016). The workloads here mean the labor-intensive activities and domestic chores or drudgery to be done every day by the women which are unpaid and undervalued. Cattle rearing, firewood collection, cooking, fetching

water, farming, caring old and children, travelling and transporting are some such activities (WOCAN, 2017, p. 17). Rural women in poor countries are the main sources of labor in the agricultural sector, they are also responsible for the vital tasks of caring for children, the sick and elderly as part of their household responsibilities which are undervalued and not recognized (Hauran, 2014, pp. 356-357). Women and girls perform most of the unpaid household labor in all economies and cultures (UN Women, 2017). Water and fuel collection, food processing, farming, preparation, and cooking are all part of the household burden, as are travel and transportation, as well as unpaid caring (Jacobs et al., 2013). Women already shoulder the majority of domestic responsibilities in heterosexual relationships, which has been exacerbated by the coronavirus (Graves, 2020).

In many developing nations, the women's workloads are difficult and time-consuming. These activities are laborious and time consuming in many rural areas of developing countries. Women spend much of their time in such unpaid domestic chores workloads which are undervalued tasks than men. This can restrict the 'women's economic activities and participation, health, nutrition, and well-being' (International Fund for Agricultural Development (IFAD), 2016, p. 1).

2.3. Exposure and Vulnerability to Climate Change

Economic, social, geographic, cultural, institutional, governance, and environmental elements all influence vulnerability and exposure, which change through time and space (Cardona et al., 2012). Individuals and groups are exposed and vulnerable in many ways based on factors such as wealth, education, race, ethnicity, religion, gender, age, class, and caste, as well as health status (Cardona et al., 2012). Vulnerability is linked to sensitivity, which refers to the direct consequences of climate change on systems such as crop yields (McCarthy et al., 2001).

2.4 Adaptive Capacity and Adaptation to Climate Change

The phrase adaptive capacity refers to a system's ability to adapt to climate change by reducing harmful impacts (McCarthy et al., 2001). It is the ability of an individual, family, community, or other social group to adapt to changes in the environment in order to live and prosper (Lavell, 1999). Adaptive capacity also refers to people's, organizations', and systems' ability to face and manage unfavorable events or disasters with the skills and resources they have (UNISDR, 2009).

Climate change adaptation initiatives are aimed at mitigating the effects of potential changes in the frequency, intensity, and length of weather and climate events on the risks of extreme consequences on human society (Cardona et al., 2012). The exposure and vulnerability to certain risks, as well as the climate and weather events, determine the risk. As a result, adaption techniques should be based on a thorough understanding of exposure and vulnerability aspects (Cardona et al., 2012).

Adaptation to climate change has the potential to substantially reduce many of the adverse impacts of climate change and enhance beneficial effects -though neither cost nor without leaving residual damage (McCarthy et al., 2001). Adaptation greatly depends on the adaptive capacity of an affected system or region or community to cope with the risks of climate change. The adaptive capacity of communities is determined by their socio-economic characteristics. So, enhancing the adaptive capacity reduces vulnerabilities and promotes sustainable development. Adaptive capacity is the function of wealth, access to technology, effective institutions, system for information, equitable distribution of power, and well-functioning social systems (McCarthy et al., 2001). Adaptation is the process of adjustment to actual or expected climate and its effects by reducing vulnerability to climatic hazards (Mujere, 2016) or the adjustment in socio-economic systems to lessen the susceptibility of climatic extremes is part of climate change adaptation (Smit & Pilifosova, 2003). Adaptation in the human system is to mitigate or avoid harm while also taking advantage of advantageous possibilities and human involvement in some natural systems may make it easier to respond to predicted climate and its consequences. (IPCC, 2014a).

2.5 Climate Change and Gender Vulnerability

Climate change is defined as a change in the condition of the climate that may be detected using statistical tests by changes in the mean and/or variability of its attributes over time, generally decades or more (IPCC, 2014a). IPCC (2014a, p. 14) further projects that 'climate change will disproportionately impact the rural livelihoods mainly on water supply, food security, agriculture and production areas of food [..]' and especially the rural women will be victimized. The notion of vulnerability, which is "connected to other concepts such as risk, exposure, sensitivity, resilience, and adaptive capacity," is essential to the debate and study of climate change (Chanda et al., 2019, p. 4; Goodrich et al., 2017). Existing disparities and access to resources, as well as individual choices and opportunities affected by a history

of social dominance and marginalization, all contribute to vulnerability (Eakin & Luers, 2006).

IPCC (2014, P. 5) defines vulnerability as a variety of concepts and elements including ‘sensitivity or susceptibility to harm and lack of capacity to cope and adapt’. So, vulnerability to the impacts of climate change depends on several factors including gender, age, socio-economic status, caste, and disability according to their respective vulnerabilities and adaptive capacities (Mujere, 2016) as vulnerability depends on the intersections of different non-climatic factors such as socio-cultural, economic and political (IPCC, 2014a). Moreover, vulnerability is a term used to characterize a group of people's circumstances as a result of historical and current cultural, social, environmental, political, and economic circumstances (Cardona et al., 2012). Similarly, in the climate change discourses, vulnerability is determined by exposure and sensibility to stressful stimuli in relation to women’s capacity to deal with such stress or shocks (Morchain et al., 2015). For instance, the increased droughts and water shortage affect the women and girls in the developing countries who are the primary collector of water and firewood and decrease in these resources have jeopardize their livelihoods (Mujere, 2016). The particular setting shapes the gendered vulnerabilities with the persistent disparities coming from patriarchal systems and gender discriminatory attitudes and practices that give women and men uneven control over resources and decision-making power (Chanda et al., 2019).

So, Women are generally subject to cultural norms and practices that differentiate them from men such as poverty and marginality which make them more vulnerable to natural disasters (Patt et al., 2009, p. 82). Women vulnerability to climate change has connection with the non-climatic factors such as the unfair socio-cultural and economic structures of the society which push them in poverty and marginality (Osman-Elasha, 2012; Patt et al., 2009). Women represent major section of poor people . Seventy percent of 1.3 billion , who produce around 50-60% of the total production has less than 10 % of land ownership (Osman-Elasha, 2012). In Nepal women constitute the majority of poor and therefore are most vulnerable (Mainlay & Tan, 2012, p. 4). Climate change impacts vary based on the intersections of categories like gender, age, socio-economic situations, and cultural and ethnical backgrounds (UNDP, 2009) and climate change has added an insult to injury that has aggravated women's vulnerability (Osman-Elasha, 2012, p. 54).

2.5.2. Non-Climatic Factors and Vulnerability

Climate change deepens the gender inequalities and norms which adds extra burdens and increases gender gaps between men and women. Gender inequalities intersects with

climate change hazards (UNDP, 2009), which (Dankleman, 2010) further highlighted that climate change intensifies the existing inequalities in the communities and gender inequality is one of them (P. 14). Being in a disadvantaged position, women face severe challenges while dealing with the disasters. Like, illiteracy, and little access to the resources pushed the women into poverty which makes them double vulnerable to climate change disasters (Dankelman, 2010; Dankleman, 2010). The study shows that the weakest and the poorest sections of population are mostly hit by climate change regardless of men or women, however, the women especially in the poor countries represent the weakest sections with extreme poverty and poor social status (Masika, 2002).

Due to climate change, resources get scarcer, production goes down, prices go up, conflicts and burdens increase due to the shortage of resources. As a result, women in developing countries who depend on natural resources for their agriculture and livestock, bear burdens to live their livelihoods (Dankleman, 2010, p. 14), as the ‘male migrate to seek off farm work’ (International Fund for Agricultural Development (IFAD), 2016, pp. 3-4). Thus, the rural women are double victimized because of the unfair division of labor which puts more burdens on women (Masika, 2002).

In comparison to men, women are more victimized due to the social factors like little access to education, wealth, information, and due to the socio-cultural aspects to see the women in some developing countries like Nepal. The feminists also claim that the consequences of climate threats hit the ones who are marginalized, poor, and having no access to the property, education, and information, social hierarchy, roles, and social location (Buckingham- Hatfield, 2000). So, the rural women in developing countries are the most vulnerable one due to the socio-economic and cultural constraints and geographical hardship.

Furthermore, highlighting the extra burdens of climate change on rural women in developing countries, Yadav and Lal (2018) said that women in South Asia have low education and high poverty especially from the unprivileged and rural communities of the country. Those women are responsible for the household work like cleaning, cooking, collecting firewood, fetching water, fodder collection, looking after animals, cultivation of crops, seeding, weeding, and harvesting (P. 5). Due to the extreme and unusual changes in climate with draught, wildfire floods, landslides and heat wave, they are mostly hit which results in the increase of their workloads (Dankleman, 2010). For instance, Yadav and Lal (2018) further also told that in some regions of India and south Asian countries, there is chronic water shortage due to climate change which has decreased the sources of clean water for drinking and other household purposes (P.7). They added that the rural women in these

areas depend on small sources of water like ponds and streams to meet their daily needs which disappeared with the change in climate (P.6). In a study from Guinea and Malawi, it is found that women spend twice to eight times more than men in fetching wood and water (UNIFEM, 2009).

CHAPTER 3: METHODOLOGY

The research paper's methodology section contains information that is used to assess the study's validity (Kallet, 2004). As a result, it necessitates a clear and detailed account of the processes, including what was done to answer the research question, how it was done, and how the results were evaluated, as well as a description of the research material (Kallet, 2004). The section here presents the approach, materials, and procedures used in the study to answer the research question on how the climate change has impacted the rural women's workloads in Nepal.

3.1 Why Qualitative Approach

Based on the nature of the study and open nature of the research question, the research is based on the qualitative method in the analysis of data. It is based on the inductive approach in the relationship of theory and data, or it goes from findings to testing theory unlike the deductive approach (Bryman, 2016). Epistemologically, it is based on interpretivism of findings and follows the constructionism, ontologically. Most importantly, as a qualitative research the study deals with words rather than measurement and quantification of data (Bryman, 2016). The analysis of literature was conducted with qualitative approach which is regarded as the free-standing technique, used to explore and understand the human problems to systematically interpret data or findings (Creswell, 2014). Qualitative research proceeds with a problem, data collection and data analysis, conducted inductively from specific to general theme and finally interpretation of the data (Creswell, 2014).

3.2 *Feminism and Qualitative Research*

Moreover, some feminists argue that qualitative research is associated with a feminist sensitivity and issues and provides opportunity to come to the fore whereas the quantitative is viewed as incompatible with feminism (Bryman, 2016). Quantitative research suppress the voices of women and the issues by ignoring their sensitivity with facts and statistics which ignores the freedom of subjectivity and reflections (Mies, 1993). Since ecofeminist is a part of the feminism, I prefer choosing qualitative method rather than quantitative one which provides me the opportunity to interpret the findings in an open manner.

3.3. *Philosophical Assumptions*

Every research endeavor is founded on a set of philosophical assumptions about 'the nature of the universe and how knowledge about it is acquired' (Myers, 2019, p. 27). In the study has its own philosophical dimensions of epistemology and ontology. In

philosophy of social science, ontology is ‘the theory of being as being’ which means the theory of the nature of reality (Delanty & Strydom, 2003). In another words, ontology relates to the nature of social entities whether they are objectives; meanings that the social phenomena and their meanings are independent from the social actors (objectivism) and next is such meanings and phenomena are socially constructed or built up from the perceptions or actions of social actors (constructionism) (Bryan, 2012). Epistemology is ‘the theory of knowledge’(Delanty & Strydom, 2003, p. 4) which refers to the question of what is or should be regarded as the acceptable knowledge in a discipline which mainly has two positions namely interpretivism and positivism (Bryman, 2016). Interpretivism is concerned with the interpretations of social reality and phenomena where social scientists understand the subjective meanings of social actions, whereas positivism is concerned with the methodology of natural sciences in the study of social reality and phenomena (Bryan, 2012) where the knowledge is based on induction a ‘bottom-up process where patterns are derived from observations or findings’(Ritchie et al., 2013, p. 6). Epistemologically, interpretivism was used here to interpret the results of previous literature on climate change impacts and rural women in Nepal which provides new knowledge in social science research literature. Ontologically, my research was based on constructionism which believes in the formation of ‘reality through interaction and revision, and they are socially constructed’ (Bryman, 2016, pp. 29-32). The situation of rural women and their burden and vulnerability was because of the social construction of gender discrimination and practices.

Interpretivism is a term used in epistemology to describe an alternative to positivism, which has dominated social sciences for decades and encourages subjective interpretations of social actions (Bryman, 2016). Unlike natural science, interpretivism holds that the subject matter of social sciences is fundamentally different from natural science, requiring a different logic of research processes that reflects the uniqueness of humans as opposed to the natural order (Bryman, 2016). The research is based on constructionism, an ontological perspective that states that social phenomena such as gender relations and their meanings are produced or created by ‘social actors’ ‘whose meanings are antithetical to objectivism and knowledge is considered as indeterminate’(Bryman, 2016, p. 29).

3 4. Literature Review as Methodology

To address the research problem of how climate change affects the household chores of the Nepalese rural women, the study is based on scientific literature review of scholarly articles

published in the scientific and academic databases. Literature review serves as a foundation for all types of research in building knowledge, establishing policy and practice guidelines, and generating new ideas and direction (Snyder, 2019). This study was based on systematic review of scholarly literature published in academic and scientific databases. Moreover, my objective is to synthesize all known knowledge on climate change and women/gender on Nepal in a thorough and unbiased manner to address the question of climate change impacts on rural women's domestic workloads in Nepal, prompted the necessity for systematic literature review. Furthermore, the justification for doing a systematic literature review is that the vast majority of research initiatives begin with some form of literature review; yet 'unless a literature review is thorough, complete, and balanced, it is of little scientific use' (Kitchenham, 2004, p. 2).

3.5. *Systematic Literature Review*

The systematic review has 'recently become a major methodology in research' (Gough et al., 2017, p. 9) and a 'rigorous alternative to narrative review' (Torgerson, 2003, p. 6). The objective of a systematic review is to provide a comprehensive and contemporary assessment of research on a phenomenon of interest or to address the research question with transparent methods to reduce bias (Kitchenham, 2004; Needleman, 2002). Furthermore, the application of procedures and techniques that strives 'to comprehensively identifying, critically appraising and synthesizing of all relevant studies on a certain issue' is known as systematic review (Petticrew & Roberts, 2008, p. 19; Torgerson, 2003, p. 9). Therefore, like the primary research, the goal of systematic review is to have methods that are explicit, rigorous, accountable, reproducible, and open to scrutiny for giving accurate representation of current state of knowledge on an issue to answer a specific research question rather than addressing the topic (Gough et al., 2017, p. 5; Higgins et al., 2019; Petticrew & Roberts, 2008; Torgerson, 2003). Clarifying the question being asked, discovering and characterizing the relevant literature, critically appraising research results in a systematic manner, and bringing the findings together into a cohesive system known as synthesis are all part of the systematic literature review (Gough et al., 2017). The systematic protocol of preferred Items for Systematic Review Recommendations (PRISMA) outlined in Moher et al. and Pickering et al. were used to conduct a systematic literature review. The approach aimed at comprehensively synthesize, evaluate, and track the scientific literature on a certain topic of interest and minimizes the potential biases which might occur in a narrative review (Berrang-Ford et al., 2015; Raad & Burke, 2018). A systematic review has higher accuracy, consistency,

and transparency if inclusion and exclusion criteria are strictly defined and followed (Berrang-Ford et al., 2015; McDowell et al., 2014).

The phases of performing a systematic review of literature, according to Petticrew and Roberts (2008) are as follows:

- i. Clearly define the research question (s) that the review will address.
- ii. Determine the sorts of studies that will be included to address the research topic.
- iii. Conduct a thorough literature search to locate those sources.
- iv. Screen the results of the search with inclusion and exclusion criteria
- v. Critically appraise the included literature
- vi. Synthesize the studies
- vii. Disseminate the findings

3.6. *Development of Review Protocol*

A pre-defined protocol minimizes the possibility of bias from the researcher's expectations by including the procedures that will be used to perform a specific systematic review (Kitchenham, 2004). The following figure shows the components of protocol for systematic review with review steps and information.

Table 1

A Systematic Review Protocol with Steps and processes

Review steps	Information
Web of Science	Topic: (climate change”) AND Topic (women OR woman OR gender) AND Topic: (Nepal)
ProQuest	(“climate change”) AND (women OR woman OR gender) AND (Nepal) Additional limits: year, scholarly journal, and articles in English Location: Nepal
Science Direct	(“climate change”) AND (women OR woman OR gender) AND (Nepal) Limited to: Articles, Sub: social Science and open access
Scopus	(TITLE-ABS-KEY ("climate change") AND TITLE-ABS-KEY (women OR woman OR gender) AND TITLE-ABS-KEY

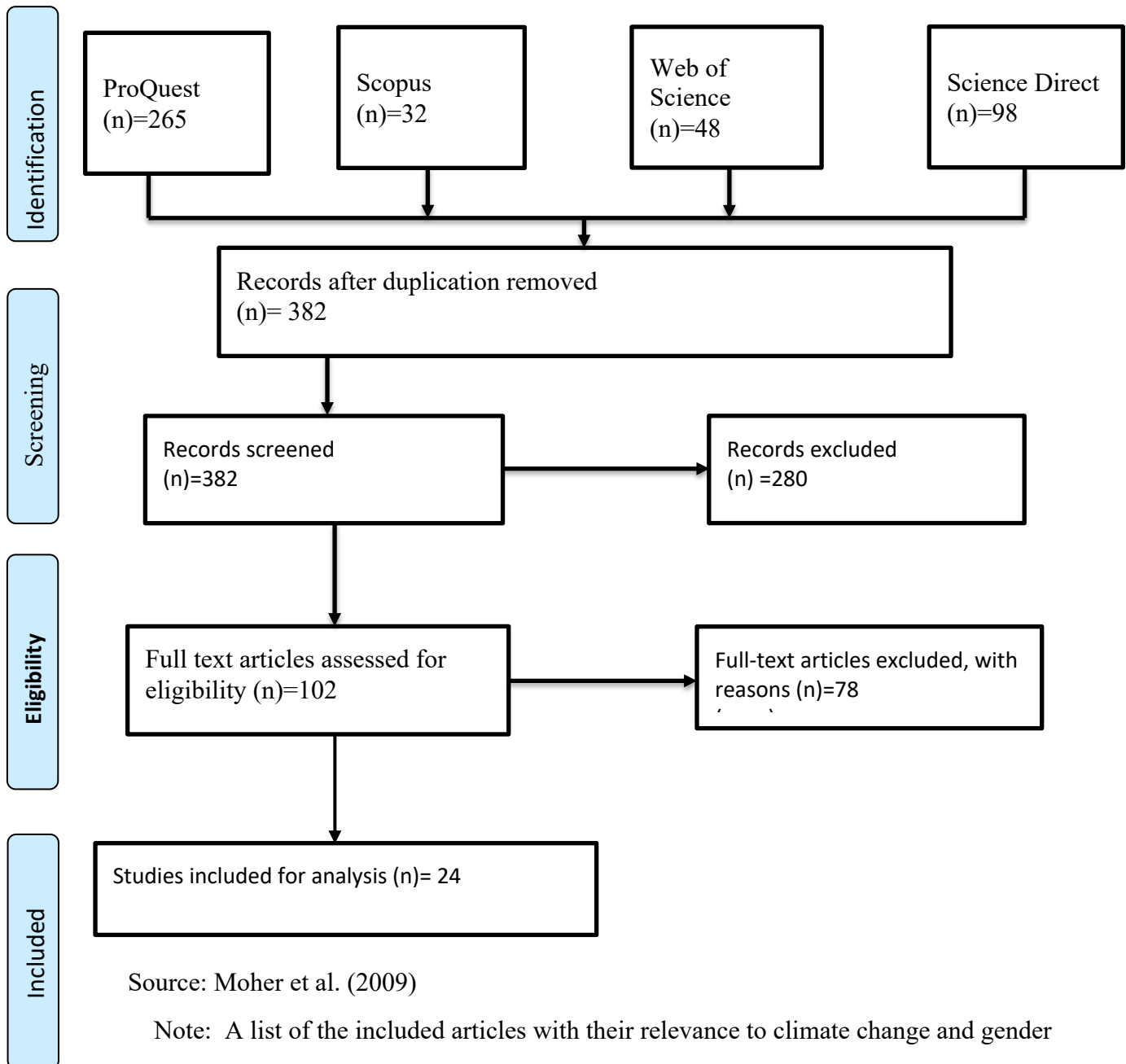
(Nepal) AND (LIMIT-TO (DOCTYPE , "ar") AND (LIMIT-TO (SRCTYPE , "j")

Initial keywords, abstracts, titles, and methodology
select
ion

Inclusion published scholarly articles between 2010-2021, only in English, peer-reviewed, relevant with the research area found in topics or abstracts and content or thematic patterns aligned with my research problem and related only with my study location, Nepal

Exclusion languages other than in English, not peer-reviewed, published outside the selected range of dates, reports, book reviews, working paper, thesis, and articles with the themes outside my study areas

In the spring of 2021, I conducted a comprehensive search of related literature. To find relevant sources, I used the digital access to Nord University's library in Bodo, Norway to search literature in multiple databases. Before I started looking for literature, I scheduled an online meeting with a librarian at Nord's library so that I could organize my database search. However, Google Scholar was first used to get an idea of what kinds of materials were available using key terms like ("climate change") AND ("gender") AND (Nepal). It aided me in identifying relevant sources, allowing me to fine-tune the essential terms for searches in well-known academic databases. Then, I conducted a systematic literature search in Scopus, ProQuest, Web of Science, and Science Direct, which are widely used academic databases that contain high-quality peer-reviewed articles in related fields. I chose multiple databases because I was able to identify variations of sources in different databases and even lessen the publication biasness of a single database. Following that, preliminary searches of sources in various databases revealed that most articles were published after 2010, so I limited the years to 2010-2021 to obtain the most recent development of research in my topic area; however, the included literature was discovered to be published between 2011 and 2020.

Figure 2*A Flow Diagram of Literature Searching and Inclusion Process*

3.7. Data Analysis

Moreover, NVivo 12, a qualitative data analysis software was used in classification of articles, code book development and interpretation of the study. The thematic patterns of included literature have been created in NVivo as a codebook as below:

Table 2

A Codebook Generated in the NVivo based on the Thematic Pattern (Nodes) of the Reviewed Literature

Themes	Descriptions	Files	References
Climate change stressors and impacts on workloads	The literature showed the impacts of the climate change stressors on rural farmers	7	14
Climate smart agriculture and workload reduction	To overcome the gender gap in agricultural labor division, climate smart agriculture has the potential to make a significant difference in reducing women's workloads.	1	1
Gender and cultural aspects of vulnerability	Gender and caste in climate change adaptation process and how social relations shape the adaptations	1	1
Gender development and environmental degradation	Even though gender issues are prevalent in natural resource management and rural livelihood strategies, little study has been done on how new development methods, such as Reduced Emissions from Deforestation and Forest Degradation (REDD+), account for gender.	1	4
Gender relations and adaptations	How gender-based inequalities affect the adaptation	1	3
Impacts of climate change on gender	Vulnerability is rooted in social structures and intersectionality of age, caste, class, gender, etc.	1	6
Migration and its impacts on division of workloads	Due to male out migration, the women's roles in agriculture and household workloads have been affected	2	5
People's livelihoods and adaptation practices	Vulnerability and community-based adaptation practices	1	3

power relations in climate change adaptation	Highlights the underlines causes of vulnerability and power relations	2	6
Rural Communities Vulnerability and variations	Climate change vulnerability is a social phenomenon that is shared by social, cultural, economic, and political processes that occur at different times and vary depending on the group of people, their well-being status, and their socio-political position.	3	5
women and Agriculture	Gender inequalities in agricultural management and how they are worsened by climatic change	5	16
variations on climate change vulnerability	Climate change vulnerability vary according to group of people, well-being status, socio- political situations	1	2
Water and women	Gender roles in household water management and women's workloads burden	1	2
women and Agriculture	Gender inequalities in agricultural management and how they are worsened by climatic change	5	16

CHAPTER 4: FINDINGS

In this section, the findings of the systematic review of the literature are presented. The findings of a review of the literature on climate change and gender focused on rural communities' susceptibility, particularly that of marginalized groups (women, lower caste people, impoverished farmers), as well as adaptation choices and challenges. In addition, the Appendix, presents a table of included papers for review, highlighting relevant themes on gender and climate change in Nepal's rural context in each of the articles.

4.1. Climate Change Hazards and Resource Scarcity

Climate change have differential impacts on rural households in the mid-hilly regions in Nepal based on their poor economic status and higher sensitivity due to their reliance on resources water and forest (Gentle et al., 2014; Poudel et al., 2020). It was found climate change caused the scarcity of natural resources which impacted the rural farmers (Adhikari, 2018). The literature revealed that climate change contributed to increasing disasters such as floods, extreme weather like heat wave and extreme cold, landslides, wildfire, and water scarcity and those impacts are especially on the poor families (Adhikari, 2018; Gentle et al., 2014; Gurung, Sanot, et al., 2019; Hussain et al., 2018; Khapung, 2016; Shrestha et al., 2019; Sugden et al., 2014). The changing climatic conditions had brought limited livelihood options for rural people with the decreased resources (Gentle et al., 2014). Moreover, the increased floods and landslides have made the rural people especially the poor and Dalits (untouchables) the most vulnerable as they have less resources to cope with the challenges (Gentle et al., 2014). Thus, these impacts severely affected the rural populations depending mostly on the natural resources for livelihoods. Additionally, the agricultural production was declined and less flow in streams and springs, lowering of underground water, soil erosion and landslides and increase in pests and diseases were experienced by the villagers (Macchi et al., 2015).

4.1.1 Vulnerability Caused by Water Scarcity and Draught

The availability of water resources in Nepal is affected by the rainy and dry seasons (Komatsu et al., 2020). Climate change-induced draught and water scarcity affected the rural livelihoods and farming systems in the mid-hills of Nepal (Adhikari, 2018, p. 1; Gentle & Maraseni, 2012; Maharjan et al., 2020; Onta, 2011; Shrestha et al., 2019). About 20-25% of water resources went dry during the last 20 years in Nepal which adversely affected the rural

livelihoods especially in mid-hilly regions which showed that nearly 87% of poor rural people faced stress due to water scarcity (Gentle et al., 2014; Gurung, Sanot, et al., 2019). The water scarcity mainly affected the women as they have had the dynamic connection with it in their lives and households management (Shrestha et al., 2019). Due to the continuous draught, there is also decreasing number of livestock with the degradations of grazing land (Gentle & Maraseni, 2012). Moreover, the scarcity of water resources had created stress and livelihoods vulnerability (Gurung, Adhikari, et al., 2019) such as insufficient drinking water, conflicts in water use, low agricultural yields, problems for irrigation and animal rearing (Gentle et al., 2014; Gurung, Adhikari, et al., 2019; Gurung, Sanot, et al., 2019; Komatsu et al., 2020). It is, therefore, the remote rural households depended on rain-fed agriculture for the livelihoods (Gentle & Maraseni, 2012; Karki et al., 2020; Poudel et al., 2020) which increased the household burdens for water collection by sending time and energy (Komatsu et al., 2020). Water scarcity and depletion in natural resources made many males migrate as an adaptive measure for the alternative income (Gentle et al., 2014; Gurung, Sanot, et al., 2019; Karki et al., 2020) which made the women shoulder more households responsibilities and drudgery in the agricultural activities (Paudyal et al., 2019). Due to the out-migration of men, there was an increase both in rural agricultural workforce and in abandonment of agricultural land (Maharjan et al., 2020; Spangler & Christie, 2020). Furthermore, the draught and scarcity of water posed a problem to the most vulnerable people (Poudel et al., 2020), which impacted not only on managing drinking water but also on agricultural productions and yields (Adhikari, 2018; Gurung, Sanot, et al., 2019).

4.1.2 Gender- Division of Labor

According to the articles reviewed, there is vast differences in workloads distributions of men and women in rural areas. For instance Shrestha et al. (2019) said that in Melamchi watershed areas 85% of women are involved in water collection activities and terrible was that women had to trek farther to fetch water than men as men fetched water only from the nearby taps and women were supposed to go to the springs far away travelling up to 4.5 km. Moreover, the study showed that 46% of women spent about 3 hours to fetch water whereas men spent only 15 minutes (Shrestha et al., 2019). In the same study, the findings showed that women had shouldered the responsibilities of farming and livestock rearing after the men abandoned the land for outmigration (Shrestha et al., 2019).

4.2 Climate Change Adaptation Practices

The rural and mountain areas are the mainly vulnerable to climate change hazards such as resource shortages like firewood and water (Adhikari et al., 2018). However, the

people in the rurality have adopted a new adaptation plan, suitable for changing environment such as the forest-based adaptation strategies in a household and the community level to fight climate change and to develop their adaptive capacities (Adhikari et al., 2018). Similarly, in agriculture, they adopted the practices of crop diversification and draught resistant crops, cultivating cash crops, and cultivation patterns (Adhikari et al., 2018; Gentle & Maraseni, 2012; Karki et al., 2020) and men mostly adopt out-migration and non-farm activities in comparison to women (Shanta Paudel et al., 2018). Moreover, conservation of agriculture, practiced for sustained agricultural yields, soil and water conservation had been adopted for farming in slope lands prone to landslides and soil erosion in the rural areas (Halbrendt et al., 2014). Moreover, about 40% of the rural farming communities were found adapting themselves by rainwater harvesting, pond construction for water management (Karki et al., 2020).

4.3 Gender Inequalities and Climate Change Exposure

Rural communities were found struggling to adopt to the changing environment with their limited knowledge, poor assets and insufficient external support (Gentle & Maraseni, 2012). Agriculture and forest which are highly affected by the climate change, are directly related with the livelihoods of rural people as the livestock depends on forest for grass, water, fodder and firewood (Bhattarai et al., 2015). Due to the changing environment, there is depletion in forest (Gentle & Maraseni, 2012). The structural gender inequalities were seen in the agricultural activities which had badly impacted the local level adaptations to climate change (Bhattarai et al., 2015). Women were also discriminated in management of environmental resources like forest management and access to benefits (Bhattarai, 2020; Khadka et al., 2014) which based on socio-cultural aspects of power relations between men and women (Khadka et al., 2014). In addition to this, due to the conservation of community forest the poor women in rural places were doubly victimized as they depended on forest for timber or firewood (Bhattarai, 2020). The reviewed literature showed that the male dominated society, the women in community forest management programmes which revealed the gender gaps in adaptation programs to climate change in the locality (Bhattarai, 2020). The majority of Nepalese rural people relied on subsistence agriculture which have been negatively impacted by climate change, and the agriculture had also been feminized (Bhattarai, 2020; Bhattarai et al., 2015; Farnworth et al., 2019; Paudyal et al., 2019; Spangler & Christie, 2020). It was also found the the power relation in agriculture was not fair as women were discriminated in management and decision making (Bhattarai et al., 2015).

4.4 Gender Power Relations in Adaptation and Decision -Making

The climate change has brought significant risks and hazards to the farming communities in Nepal who depended on rain-fed agriculture for livelihoods (Gentle & Maraseni, 2012; Karki et al., 2020, p. 18). It was found that most rural farmers had faced problems in adapting to the climate change due to the inadequate government supports (Karki et al., 2020), limited access to land, resources, information, market and transportation (Karki et al., 2020).

The role of women in the agricultural production and food security is significant in the developing country like Nepal (Khatri-Chhetri et al., 2020; Spangler & Christie, 2020) however, the gender gap was seen in their access to information, knowledge, power and technology compared to men (Paudyal et al., 2019) despite the fact that the agriculture had been feminized in Nepal (Shanta Paudel et al., 2018). From the reviewed literature, it was found that how the power interplay at local level between different actors impact the policies in adaptation to climate change (Nagoda & Nightingale, 2017; Vij et al., 2019) and the gender gaps between female-headed and male-headed households as the females had less access to land ownership, information and little access to financial resources which determined their (women's) vulnerability (Poudel et al., 2020). The out-migration of men also changed the power dynamics of female in the decision making and households responsibilities (Gentle et al., 2014; Spangler & Christie, 2020) as women gradually taking over the male-dominated tasks such as ploughing fields (Spangler & Christie, 2020).

4.5. Gender Discriminatory Cultural Norms and Practices

Though women had important roles in such adaptation programs as they carry most of the household chores, and are highly dependent on water, land and forest, still they were ignored in the local level meetings and decision makings on climate change adaptation for development and reduction to the impacts of climatic hazards (Vij et al., 2019). The literature reviewed revealed that how the most marginalized groups especially women and low caste people had been sidelined in policy making and programs in climate change adaptation in the local levels (Nagoda & Nightingale, 2017; Sapkota et al., 2016). The social and cultural exclusion and isolation of the most marginalized sections of people in the local communities such as the Dalits (the untouchables) the poor and the women which had heightened their vulnerabilities to climate change hazards (Nagoda & Nightingale, 2017; Sapkota et al., 2016) and had intersections with their social, economic and cultural status and practices (Sapkota et al., 2016). The power relations between women and the men and the male-controlled local politics and social structures affected the local level vulnerability patterns leaving the most disadvantageous groups more vulnerable (Nagoda & Nightingale,

2017). However, it was found in the study that many households share the equal engagement of men and women in agricultural decision making, still 51.3% of women reported that they had less control over their male counterparts (Halbrendt et al., 2014). Similarly, the most vulnerable people such as Dalits and women in the remote areas were found their traditional knowledge in adaptation to changing climate and by maintaining their social relations with various social groups strengthen their mutual adaptive capacity and to fight for food insecurity in the local levels (Onta & Resurreccion, 2011).

The diversity was seen in access, use and management of forest resources in Nepal (Khadka et al., 2014). Gender and social issues of forestry required to be improved to make it inclusive for men and women (Khadka et al., 2014).

4.6. Climate Smart Agriculture and Food Security

Agriculture was one of the most vulnerable sectors of climate change impacts (Khatri-Chhetri et al., 2020, p. 30). Gender, climate change and agriculture are interrelated, however, the integrations of the women in policy making of agricultural programs lacked effectiveness in implementations understanding the gender differentiated impacts of climate change on women (Paudyal et al., 2019). It was found that climate smart agriculture supported in empowering women by reducing their stress and drudgery related to climate change hazards on agriculture (Khapung, 2016; Khatri-Chhetri et al., 2020) for instance, technology of transplanting plants and sowing crops was used which contributed to lessen the drudgery of women to some extent (Khatri-Chhetri et al., 2020). Landslides, floods, heat waves, and draughts have affected the agricultural production in the rural areas (Khapung, 2016). The traditional agricultural system in Nepal, the little access to technology, growing population and limited land affected the farmers' livelihoods with low productivity which contributed to food insecurity in many distant rural areas (Khapung, 2016; Maharjan et al., 2020; Onta, 2011). Due to cultural norms and taboos, women in rural regions of the nation were denied access to education, knowledge, and land, as well as inequality in control over resources and decision-making (Shanta Paudel et al., 2018), reducing their adaptive capacity (Khapung, 2016; Paudyal et al., 2019). The women's socio-economic status were found low despite their important roles in community development and agricultural activities (Khapung, 2016). Moreover, in the study of the far western region of Nepal, it was exemplified that the cultural discriminations in the patriarchal society hampered the women to participate in development activities and even the division of labor were fixed on cultural aspects (Khapung, 2016; Shrestha et al., 2019). Despite all these complexities, the involvement of the poor and disadvantaged women in the smart agriculture such as technical training, knowing how to use

fertilizers, crops diversifications and vegetable farming, helped them to uplift their lifestyles which also reduced food insecurity (Khapung, 2016)

CHAPTER 5: DISCUSSION

The findings from the included literature are interpreted in this chapter using ecofeminism as the theoretical framework to examine the findings and answer the study question of climate change's effects on rural women's domestic workloads in Nepal. The results from the reviewed articles indicate that climate change has affected disproportionately affected the rural women. Similarly, due to the scarcity of natural resources and natural calamities such as landslides, floods and draughts, women are burdened with extra workloads in the households. The chapter also includes the overview of the findings gleaned from the literature review.

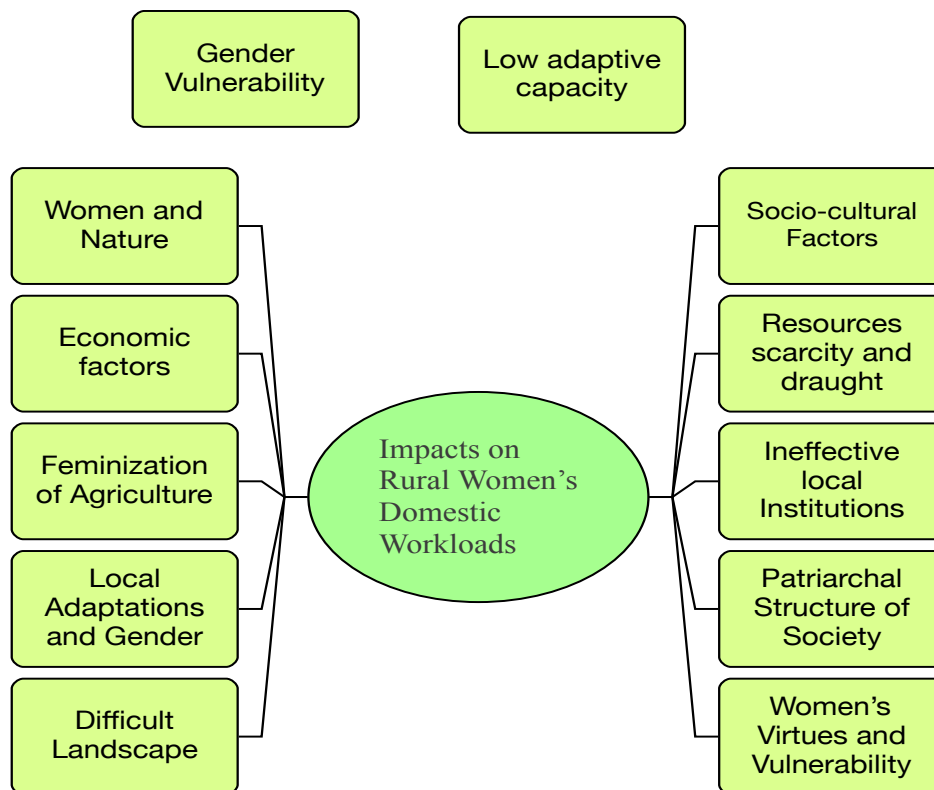
5.1. Synopsis of Findings from the Reviewed Literature

The scientific evaluation of the included articles reveals the increasing vulnerability of marginalized groups in rural Nepal to climate change hazards and a need for adaptation due to gender inequities in local contexts. Most of the studies focused on gender disparities in social status and practices and their negative implications for climate change adaptation. Only a handful looked at the threatened livelihoods of impoverished farmers who rely on subsistence agriculture and local natural resources. The findings discuss how climate change stressors such as draughts, landslides, floods, and a scarcity of natural resources (water, forest) have affected the life of Nepalese impoverished people, particularly women. The findings also reveals the social consequences of climate change, such as male outmigration, which resulted in additional agricultural obligations for women such as ploughing the fields (Spangler & Christie, 2020) which contribute to the feminization of agriculture. Furthermore, several of the articles focused on local adaption tactics and agricultural technology to lessen women's drudgery, but these strategies are ineffective to cover most of the rural women.

The fig. 4 illustrates elements that have contributed to increase the household workloads of rural women in Nepal, according to the findings of the examined literature. Women have lower adaptive capacity in the local level due to socio-cultural and economic inequalities, as well as environmental or physical factors, and are thus more sensitive to climate change. The components are listed in the following diagram, and they serve as the foundation for this section's interpretation.

Figure 4

Factors Affecting Women's Increased Workloads in the Rural Nepal



5.2. Socio-cultural Factors Affecting Women's Vulnerability and Workloads

According to the findings of the literature research, patriarchal social practices encourage women to perform domestic duties, hence many rural women in Nepal are primarily responsible for collecting water for home consumption. This means that rural women in Nepal have been subjected to a variety of non-climatic stressors, including a lack of access to education and technology, a lack of rights to land and property, a lack of participation in decision-making, and the burden of family obligations. According to the findings, almost 87 percent of rural residents face a daily water deficit (Gurung, Adhikari, et al., 2019) Patriarchal attitudes and customs have dominated and subjugated Nepalese rural

women in this way. The rural women are poor not because of their own faults, but because of the patriarchal society's socio-cultural norms. The findings even mention rural women's vital contributions to community development and agricultural output; nonetheless, their social standing in Nepal is not sufficient. Rural women's low adaptive capacity, exacerbated by socio-cultural and economic constraints, increases their vulnerabilities and workloads (Khapung, 2016; Paudyal et al., 2019). These inequalities have a connection with the issue raised by the ecofeminists as they want to defend and dismantle all forms of dominations against women by the male-dominated society (Shiva & Mies, 2014).

One of the main factors that rural women are unable to deal with the threats of climate change due to superstitions and discriminatory cultural practices. Dalit (Untouchable) women, for example, live in deplorable conditions. They are socially marginalized and outcasts, and they are unable to cope with the effects of climate change due to their poverty. Environmental degradation, especially water supply, has significant consequences from an ecofeminist perspective (Gaard, 1993a). Similarly, patriarchal societal norms in Nepal envision women taking care of all home activities, such as fetching water and cooking, which males are rarely involved in. Climate change has caused male family members to seek alternative sources of income, putting additional strain on rural women's domestic responsibilities. Women are left to continue out men's past labor as well as the difficult obligations of collecting and processing forest products when men relocate to cities in search of work.

As a result, patriarchal traditions want women to be limited to household activities like cooking, sweeping, caring for the elderly and cattle, and working in agriculture. As a result of the male-dominated social system, women are more vulnerable and sensitive to climate change. The patriarchal framework is linked to all kinds of injustices, inequities, and violence against women (Shiva & Mies, 2014). These discriminatory cultural practices have been worsened as a result of the loss of natural resources caused by climate change. As a result, women's home responsibilities have expanded. Females are supposed to care for their families and are not permitted to work outside the home. Even if they wanted to, they couldn't since society's deeply rooted socio-cultural standards prevented them from doing so. This is referred to by feminists as patriarchal oppression of women, which limits them to the house. The grim reality is that agriculture is becoming more feminized, but women still lack access to land and property.

5.3. Nature and Women Connection and Climatic Hazards

The findings of the literature study revealed a strong link between nature and women, as well as how women are affected in Nepal's rural areas because of changing environmental conditions. In both imagination and practice, women are intimately connected to nature (Shiva, 1988). Nature is portrayed as the embodiment of the feminine principle on one level, and she is nurtured by the feminine on another level in order to produce life and provide subsistence (Shiva, 1988). The shortage of water and firewood or the loss of trees can be connected to the ecofeminist perspective which says that the destroyers of the nature is caused by the oppressive nature of men. They want to dominate and oppress both nature and the women. Under patriarchal structures, women, like nature, are objectified, owned, invaded, colonized, consumed, and pushed to yield and produce by males (Suresh, 2021). Moreover, the sufferers of the scarcity of natural resources are the women and the poor people. Men are responsible for environmental degradation and overconsumptions of resources and will not be solved by masculinist techno-science (Gaard, 2015). However, the women are the real victims of the environmental loss.

Climate change has harmed the nature, including water resources and forests, on which the rural women rely on. Women have to trek far for fuel and fodder when trees become sparse (Warren, 2000). Women are disproportionately affected by forest destruction. Women in rural areas, particularly indigenous women, can be observed protecting trees and forests from loggers and destroyers, suggesting a significant link between gender and the environment (Resurrección, 2013).

The study's findings also show a link between gender vulnerability and the degradation of Nepal's forest and water resources in rural areas. It is said that rural women in the south are the unsung heroes of the natural world, and they are the first to be affected by climate change (Resurrección, 2013). Women play an essential part in community forest conservation in Nepal. As nature is the experiment, and women are the traditional natural scientists as agriculturists, and water resource managers and their knowledge is ecological and multiple, reflecting the diversity of natural ecosystems as well as the cultural diversity that comes with living in nature (Shiva, 1988)

However, they are also the victims of forest degradation and climatic dangers. The findings demonstrate the vulnerability of rural women due to a lack of firewood in the forest as climate change has degraded the number of resources. In Nepal's rural areas, firewood is an important source of fuel for cooking and to keep people warm at home. There is a loss of trees because of climate change, which has caused challenges for rural women and indigenous women in collecting firewood.

Another factor that leads to women's vulnerability is a lack of water for drinking and household use. In Nepalese settings, women are obliged to collect water for domestic usage, which is based on a patriarchal structure. They must journey a great distance to collect water because the nearby water supplies have dried up because of climate change, adding to the problems encountered by women. Water scarcity is a major issue for women and girls in developing countries (Warren, 2000). The bulk of rural women rely on these two natural factors or goods for survival: firewood and water. Droughts, deforestation, and climate change have all had a deleterious impact on these two components. These concerns have a lot of ramifications from an ecofeminist standpoint. Ecofeminists show that nature (water and forest) and women are inextricably linked, and that when nature is degraded, women suffer.

5.4. Feminization of Agriculture, Food Insecurity and Women's Workloads

According to the findings of the literature review, men have migrated in pursuit of income-generating occupations as a result of climate change stressors which degraded the cultivable land in the rural areas of Nepal. For female-headed households in rural areas, this has resulted in a slew of family issues. First, women must assume their men's responsibilities, such as agricultural and livestock rearing, and then manage all family daily operations. Women have had to take on additional responsibilities because of these changes. Wealth created by both nature and women are invisible (Shiva, 1988) in the society where male dominates. In Nepalese context too, women produce food, and sadly, their farming is subsistence, which is insufficient to feed their hands and mouths and face the problem of food insecurity despite the fact that they spend all time in agriculture. From an ecofeminist standpoint, this feminization of agriculture is significant. Women are unable to leave their homes as easily as men.

Feminization of agriculture has ecofeminist implications. Women produce the majority of the world's food; it is believed that females grow between 59 and 80 percent of the world's food (Warren et al., 1997) but the tragedy is that they lack land and property. The men gather and engage in cash crops (Warren et al., 1997) and they control the family's economics. Rural Nepalese women work all day in agriculture, food processing, and preparation, but they have little to eat. This is due to the patriarchal system of dominance and control, which has forced women to work as slaves in the fields which is also a case in Nepal.

5.5 Patriarchal Social Structure, Poverty and Vulnerability of Rural women

Economic factors such as income, employment and property/wealth are vital for strengthening rural women's or marginalized groups' adaptative capacity so that they are less vulnerable to climate change. Many other social elements, such as education, employment,

gender equality, and equal division of labor, are linked to economic considerations. Rural women in Nepal, on the other hand, are denied access to these services. For instance, villagers in far-western regions in Nepal are still living in below poverty line who are deprived of basic right to life (Khapung, 2016). They are two victims: first, they are victims of the harsh rural nature, and second, their social roles. Besides the cultural inequalities between men and women, the dispossession and deprivation of resources, according to ecofeminists, are the primary causes of women's poverty which puts rural women more vulnerable to climate change (Shiva, 1988). The findings of a few scholarly articles included look at the case of rural women in far-flung regions demonstrate that they lack access to contemporary technology and information, putting them at an additional risk from climate change.

As a result, a culture dominated by men's supremacy denies women economic rights. Women are frequently left with insufficient money to feed and care for their children (Shiva, 1988). Even natural resources are under the jurisdiction of men, with women being banned from forest, land, and water administration (Shiva, 1988). These gender subordinations and patriarchy are forms of oppressions that have long been present in our culture. Such oppression has a negative impact on rural women's and indigenous people's lives. So, gender inclusive policies should be made in the local level to guarantee equality in forest or resource management.

5.6. Building Adaptive Capacity

Despite their tough geography (villagers have to walk hours through difficult trail alongside hilly mountains to fetch water for drinking (Komatsu et al., 2020), lack of assets and assistance, and lack of services, rural people are struggling to adapt to the changing environment (Gentle & Maraseni, 2012). They do, however, participate in agricultural diversification with recent plant transplanting technology (Khatri-Chhetri et al., 2020) and communal forest management (Gentle & Maraseni, 2012) have contributed to strengthen women's capacity to adapt to climatic hazards. Various projects utilizing current technology in agriculture are being implemented in local contexts to mitigate the negative effects of climate change, such as draughts, landslides, and flooding, among other things. Community engagement, for example, is an important strategy for collaborating to increase local people's adaptive capacity. The findings highlight the uneven consequences on the impoverished and downtrodden in the community, particularly Dalits (untouchables) and women. They are victimized on two levels: first, because of the inequitable social caste hierarchy based on gender or higher and lower caste, and second, due of their poverty, they are the most

vulnerable to climate change. Additionally, community-based forest conservation initiatives aid in the adaptation to climate change. It assists to the protection of water resources while also assisting in the maintenance of trees and rural communities. Diversification of agricultural systems is the best option for cultivating crops in the changing climate of rural areas. The socio-cultural foundations of rural women's susceptibility, on the other hand, are found in their conception of themselves as domestic workers. As a result, they have more challenges and obligations when natural disasters hit, and natural resources are exhausted.

Furthermore, as an adaptation strategy, community forest conservation is a solid start in which women may play a key part in increasing their adaptive capacity to cope with changing environmental conditions. The community forestry committee, on the other hand, is dominated by women. In the local levels, male power has affected the formation of committees and decision-making roles. Ecofeminists think that women are more knowledgeable about nature, forests, and trees than males, and they have demonstrated this in the conservation of a local forest in Nepal, despite finding it difficult to manage fuel and fodder. The male supremacy of power, on the other hand, has overlooked the women in positions of decision-making in the forest conservation committee.

5.7. Gender Relations, Adaptation and Local Governance

Rural women's livelihoods are reliant on agriculture, which is their primary source of income and is also one of the most vulnerable industries to climate change (Khatri-Chhetri et al., 2020). However, different solutions have been developed by local institutions at the local level to mitigate vulnerability in climate wise agriculture in Nepal to lower the workloads of rural women. Traditional methods of subsistence agriculture have remained mostly unchanged; nevertheless, new technology has not yet reached rural regions to totally replace traditional techniques. Climate smart agriculture has transformed rural women's roles from unproductive to income-generating agriculture. As a result, it has assisted people in becoming more empowered and capable of combating the drudgery created by a scarcity of natural resources and the destruction of agricultural land.

Climate smart agriculture and community forest conservation committees are two good examples of community involvement identified in the literature that represent community engagement to reduce climatic hazards in the area. However, the findings demonstrate that rural women are underrepresented in local committee decision-making, and that male-dominated local politics and ineffective governance have harmed women's and

marginalized people's adaptive capacity, including those from lower castes (Nagoda & Nightingale, 2017).

Furthermore, local institutions fail to safeguard gender equality and ensure that women have equal access to education, property, and decision-making power. Women's sensitivity to climate change has been increased by patriarchal society's isolation and marginalization of impoverished people, particularly women (Nagoda & Nightingale, 2017).

Climate smart agriculture has aided rural women and poor people in finding alternatives to fit in with the changing environment and minimize women's burdens to some level.

Furthermore, climate smart agriculture has adopted new growing practices in Nepal's rural areas, allowing women to earn money from the cash crops they cultivate.

Ecofeminists, on the other hand, desire to end all types of oppression against women and even environment (Warren, 2000). They claim that patriarchal social structures in society are the primary cause of women's vulnerability, and that these structures must be overthrown for women to be empowered.

CHAPTER 6: CONCLUSION

The study sought to answer the topic of how climate change has affected Nepalese rural women's domestic workloads and thus their vulnerability to climate change. Climate change has increased the family responsibilities of rural women by worsening the imbalances they confront in today's society, according to the findings of a scientific literature study of peer-reviewed and scholarly articles. The findings show that rural women are more vulnerable than men due to patriarchal society's socio-cultural and economic limitations and limits and degradation of environment, according to ecofeminists. The data also suggest that depletion of natural resources has a direct influence on rural women's life and the costs are heavier for women than men (Shiva, 1988) because rural women are inextricably linked to the natural world. Because of their commitment to the environment and reliance on subsistence farming, both of which have been impacted by climate change, rural women are particularly vulnerable. The next source of vulnerability for women is cultural and societal practices that devalue women's empowerment, such as lack of access to education and knowledge, lack of rights to land and property, and being responsible for home administration and care, among other things. As a result, their ability to adapt to changing settings and the hazards of climate change is limited. Furthermore, climate change stressors such as draughts, floods, and landslides have harmed marginalized people in rural Nepal, with women bearing the brunt of domestic responsibilities such as collecting water, firewood for cooking and drinking, and participating in agricultural and livestock rearing. All of these responsibilities have increased the strain of rural women, and male outmigration has exacerbated their problems.

Furthermore, according to the literature, rural women, as well as other impoverished farmers, are more vulnerable than any other category of individuals in Nepal. Poverty, as well as patriarchal beliefs and dominance, are the key causes of greater vulnerability. Women in Nepal's rural areas are expected to perform the majority of domestic activities on their own, but climate change has made this more difficult and time-consuming. Due to climate change, surrounding water sources have dried up, requiring women to trek considerable distances to obtain water, as well as collecting firewood for cooking, both of which are underpaid and useless activities. Female family members must shoulder the additional duties of handling

male tasks in agricultural work as a result of male outmigration. As a result of climate change, women's workloads have increased. To sum up, to analyze the findings of the reviewed literature, the following points have been generated:

- i. Climate change impacts are gendered
- ii. Inequalities increase vulnerability
- iii. Adaptation measures require more involvement and engagement of rural women such as in smart agriculture and diversification of crops, access to information, community forest management, water resource management and most importantly the transformation of gender roles where women can decide themselves.

6.1. Limitations

Though I took great effort to include several databases in this scientific evaluation of literature to avoid publication bias, the results could be different if grey literature such as scientific reports or working papers released by various groups working on climate change and gender were included. Furthermore, because the study's methodology is confined to a literature review, the conclusions might have been different if the study had been empirical or based on interviews and field trips.

6.2. Recommendations

More empirical research is needed to better understand and address the challenges that rural women face, particularly the drudgery of their domestic chores because of climate change, according to the conclusions of the literature review. Women's sociocultural and economic status must improve in order for them to be better equipped to deal with future climate change risks. Furthermore, the findings could be used in policymaking to establish equitable and gender-responsive adaptation programs at the local and national levels, enhancing rural women's adaptive capacity to cope with climate change threats.

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Appendix

Descriptions of the literature Reviewed Based on the Themes on Gender and Climate Change

Authors	Year	Title	Relevance on Gender and Climate Change
Komatsu, S., Yamamoto, Y., Ito, Y., Kaneko, S. & Dhital, R. P.	2020	Water for life: ceaseless routine efforts for collecting drinking water in remote mountainous villages of Nepal	The article deals with the scarcity of water sources (climatic stressor) due to climate change and burden of water collection for households in the rural mountains of Nepal. It highlights the time (average 148.6 min each day) and hard work spent on water collection especially by girls and women. The article also deals with the connection of water and women.
Adhikari, Shankar	2018	Drought Impact and Adaptation Strategies in the Mid-Hill Farming System of Western Nepal	The article reveals the climate change -induced draughts stress as a climatic stressor on smallholder farmers and women. It further concerns the issues of socio-political and gender discriminatory

practices and culture in the society which have made the poor and the women more vulnerable to climate change.

Spangler, K. & Christie, M. E.	2020	Renegotiating gender roles and cultivation practices in the Nepali mid-hills: unpacking the feminization of agriculture	It points out the themes of social issues of out migration of male and its socio-economic impacts on women in Nepal. It further clarifies that how the women got affected with the increase in the agricultural burdens and household responsibilities due to the male migration caused by climatic hazards.
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Bhattarai, B., Beilin, R. & Ford, R.	2015	Gender, Agrobiodiversity, and Climate Change: A Study of Adaptation Practices in the Nepal Himalayas	The article has dealt with the gender relations and inequalities in development activities and agrobiodiversity management and how these inequalities are exacerbated under a changing climate in adaptations. It also further illustrates how
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the gender roles and power determines the adaptation policies in the local contexts.

Adhikari, Shankar, Baral, Himlal & Nitschke, Craig	2018	Adaptation to Climate Change in Panchase Mountain Ecological Regions of Nepal	The article presents the adaptive strategies of crops diversifications and farming practices as adaptation strategies in the local level by different groups of people including women to fight the impacts of climate change on their livelihoods.
Poudel, S., Funakawa, S., Shinjo, H. & Mishra, B.	2020	Understanding households' livelihood vulnerability to climate change in the Lamjung district of Nepal	The rural households depending on natural resources for earning their livelihoods through their subsistence farming are most vulnerable. The article even shows that the female-headed households and the poor farmers were found more vulnerable due to the shortage of natural resources.
Paudyal, B. R., Chanana, N.,	2019	Gender Integration in Climate Change	The article analyses the policy on the women

<p>Khatri-Chhetri, A., Sherpa, L., Kadariya, I. & Aggarwal, P.</p>		<p>and Agricultural Policies: The Case of Nepal</p> <p>participations in agriculture and gender gaps in access to information, education, technology, and markets in Nepal which impact the adaptations to climate change.</p>
<p>Gurung, Anup, Adhikari, Sanot, Chauhan, Raju, Thakuri, Sudeep & Nakarmi, Selina</p>	<p>2019 Water crises in a water-rich country: case studies from rural watersheds of Nepal's mid-hills</p>	<p>The study examines the water crisis in the rural places in Nepal and its disproportionate effects on women. The article further points out the male-dominated family or social structure and how the women and girls are dominated in the household responsibilities in managing drinking water.</p>
<p>Shrestha, Shobha, Chapagain, Prem Sagar & Ghimire, Motilal</p>	<p>2019 Gender perspective on water use and management in the context of climate change: a case study of Melamchi watershed area,</p>	<p>The study explores the gender perspective on water management in the rurality of Nepal in connection with climate change and studies how women are vulnerable due to</p>

		Nepal	the shortage of water.
Vij, S., Biesbroek, R., Groot, A., Termeer, K. & Parajuli, B. P.	2019	Power interplay between actors: using material and ideational resources to shape local adaptation plans of action (LAPAs) in Nepal	
Macchi, M., Gurung, A. M. & Hoermann, B.	2015	Community perceptions and responses to climate variability and change in the Himalayas	The article studies how the gender power relations in the local level affect the poor and the women in their adaptations to climate change. The article also examines the power interplay and settings in formations of policies and programs to influence the local level adaptations.
Khapung, S.	2016	Transnational feminism and women's activism: Building resilience to climate change impact through	The article explores the vulnerability of the marginalized people especially the women in the far-western Nepal in connection with climate change

women's empowerment in climate smart agriculture hazards. The articles focus on the effects of climate change on agricultural yields and how to practice farming resilient to climatic effects by creating awareness and using technologies which empowers the rural women to fight the climate change.

Nagoda, S. & Nightingale, A. J.	1017	Participation and Power in Climate Change Adaptation Policies: Vulnerability in Food Security Programs in Nepal	The participation in climate change adaptations programs reinforces the local vulnerable groups representing different cases, ages, gender, and class. The article focuses on the food insecurity in the households as vulnerability to climate change hazards.
Gentle, P., Thwaites, R., Race, D. & Alexander, K.	2014	Differential impacts of climate change on communities in the middle-hills region of Nepal	The article studies the level of vulnerability of different group of people in terms of their economic status due to the decreased options of livelihoods

and shortages of natural resources. The research indicates that the differential impacts of vulnerability in terms of socio-political contexts and its application in the communities.

Bhattarai, B.	2020	How do gender relations shape a community's ability to adapt to climate change? Insights from Nepal's community forestry	This study analyzes the gender inequalities persisted in the environmental management focusing on the community forestry management and how it shapes the gender relations in adaptations to climate change. It focuses on how the patriarchal social structure is manifested in the forestry management in the local environmental management.
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Halbrendt, Jacqueline, Kimura, Aya Hirata, Gray, Steven A., Radovich,	2014	Implications of Conservation Agriculture for Men's and Women's	Women bears disproportionate burdens (53-55%) on the farm-labor in comparison to men.
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Theodore, Reed, Brinton & Tamang, Bir Bahadur	Workloads Among Marginalized Farmers in the Central Middle Hills of Nepal	The gender-sensitive solutions are required to practice the right adaptation to conservation of agriculture with the application of new technologies in the rural and mountainous regions of Nepal.
Khadka, M., Karki, S., Karky, B. S., Kotru, R. & Darjee, K. B.	2014 Gender Equality Challenges to the REDD plus Initiative in Nepal	The article shows how the new development strategies such as Reduced Emissions from Deforestations and Forest Degradation has incorporated gender issues (REDD +). As most of the rural population especially women depend on the forest for their livelihoods, with the new changes in rules on forest, how the women and marginalized communities are affected. It further examines that how the new development strategies support the

			gender equality in the forest management.
Onta, N. Resurreccion, B. P.	2011	The Role of Gender and Caste in Climate Adaptation Strategies in Nepal Emerging Change and Persistent Inequalities in the Far-Western Region	The study focuses on the climate change impacts on the Dalit and Lama households in the distant rural areas in Nepal. The cultural norms of high caste and low caste systems have caused the problems in the adaptation strategies in the local level. The article studies on the dependency of inter-caste people in the rural parts and how the Dalit (untouchables) suffer from the hazards of climate change and how the social relations and supports help the vulnerable groups to adapt to the change in climate.
Khatri-Chhetri, A., Regmi, P. P., Chanana, N. & Aggarwal, P. K.	2020	Potential of climate-smart agriculture in reducing women farmers' drudgery in high	The article is about the reduction of rural women's drudgery and burdens on agriculture induced by the climate change by using the

		climatic risk areas	climate smart agriculture strategy or technology. The study says that the introduction of climate smart agriculture will help to close the gender gaps in households work in the rural parts of Nepal.
Sapkota, P., Keenan, R. J., Paschen, J. A. & Ojha, H. R.	2016	Social production of vulnerability to climate change in the rural middle hills of Nepal	The article explores the root causes of vulnerability of rural communities in Nepal focusing on social isolation, financial situation and knowledge-based supremacy which have contributed to make the marginalized groups (women) more vulnerable. The social hierarchy seen will limit the adaptation process in long term.
Maharjan, A., Kochhar, I., Chitale, V. S., Hussain, A. & Gioli, G.	2020	Understanding rural outmigration and agricultural land use change in the Gandaki Basin, Nepal	This study investigates the rural out migration and agricultural land in Nepal in connection with the climate change. The study shows that the out

			<p>migration of males as social impacts of climate change has given more responsibilities, rights, and workloads to women. It has contributed to feminization of agriculture.</p>
Gentle, Popular & Maraseni, Tek Narayan	2012	Climate change, poverty, and livelihoods: adaptation practices by rural mountain communities in Nepal	<p>This article studies the vulnerability of rural mountains communities including the women who have limited livelihood options. They have low adaptive capacity to adapt to the climate change due to their limited information, poor access to service and low agriculture yields. The resource degradation, poverty, food scarcity, lack of basic services and the growing social inequalities have made the marginalized groups more vulnerable.</p>

Karki, Sikha, Burton, Paul & Mackey, Brendan	2020	Climate change adaptation by subsistence and smallholder farmers: Insights from three agro- ecological regions of Nepal	The article analyzes the different regions of Nepal to study on how the climate change has impacted the rural smallholder farmers including women on their subsistence rain- fed agriculture. It further examines the adaptation strategies adapted by the rural farmers.
Shanta Paudel, Khatiwada, Deng, Wei, Paudel, Bikash, Khatiwada, Janak Raj, Zhang, Jifei & Wan, Jiangjun		A Gender Analysis of Changing Livelihood Activities in the Rural Areas of Central Nepal	The article presents the gender analysis on the changing livelihoods in the rural parts of Nepal. With the impacts of changing climate, the men and women have changed their livelihoods where men search for out migration and women adapting cash crops which help them to adapt to the climate change hazards. The article further shows that the social and financial capital will lead to the equitable

livelihood
improvement for both
men and women in
rural Nepal.
