

# A Gendered Approach to Understanding Climate Change Impacts in Rural Kyrgyzstan



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**Abstract** This chapter explores climate change impacts and the related experiences and realities of local women in rural Kyrgyzstan by combining research on the physical impacts of climate change in the Central Asian region with an analysis of ethnographic accounts of local people's farming and energy-use practices. Our analysis reveals how interlinked material, social and cultural realities of local communities manifest in social differentiation that enables or limits women's capacities to cope with climate change and engage in adaptation practices. The post-Soviet period has diminished rural women's access to social protection and economic opportunities while reinforcing patriarchal gender norms, depriving women of land ownership rights and decision-making power over strategic life decisions.

**Keywords** Gender · Climate change · Agriculture · Energy · Contextual vulnerability · Kyrgyzstan

## 1 Introduction

The gender and climate change nexus has gained increasing attention from global development institutions and the research community, with the recognition that understanding individuals' positions in society and the political economy impact their capacity to adapt to a changing climate. The academic and practitioner literature has confirmed women's limited opportunities to engage in climate adaptation practices due to their insecure rights to land, limited access to assets and resources, lack of participation in decision-making and missed educational opportunities (Perkins and

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Osman 2021; Eastin 2018; Nyasimi and Huyer 2017). However, the general literature on climate change impacts, mitigation and adaptation tends to have a technical and economic focus, where gender is assumed to be irrelevant (Perkins and Osman 2021). Some emerging literature focuses specifically on the interlinkages between gender and climate change (e.g. Holmelin 2019; Eastin 2018; Goh 2012). This literature provides an in-depth understanding into the ways in which climate change and pre-existing economic, social and cultural pressures are producing and reproducing social and economic inequality. A major challenge of this literature is that, while the manifestations of gendered vulnerability to climate change are well described, the complex and interlinked factors that give rise to them cannot easily be generalised, and cause and effect are not clearly delineated.

This chapter provides a comprehensive and empirically based overview of climate change impacts in rural Kyrgyzstan and explores women's experiences as they adapt to new realities. Valuing local voices (DeVault and Gross 2012) and women's own experiences, needs and perceptions, allows us to critically engage with the implicit structures of oppression and domination in relation to climate change impact and adaptation. We draw our findings from an interdisciplinary approach that combines the analysis of existing regional research on the physical impacts of climate change and ethnographic accounts of rural women's everyday farming and energy-related practices. Both farming and energy use have been identified as being vulnerable to climate change and climate measures globally (Masson-Delmotte et al. 2018). At the local level, they are indispensable dimensions of rural women's everyday life, identity and wellbeing (Kim and Standal 2019; Kim and Ukueva 2017).

Our analysis focuses on contextual vulnerability, whereby climate change impacts are understood in connection with pre-existing pressures, such as migration, declining social protection, and discriminatory cultural gender norms (Goodrich et al. 2019). Further, we draw on the gender and political economy approach, which explores systematic social oppression based on gender, class, ethnicity, religion and age from a materialist perspective (Enloe 2013). This approach highlights the (lacking) social value of women's work and pays particular attention to reproductive work (social reproduction) in society (Perkins and Osman 2021; Enloe 2013). Global trends, such as the feminisation of labour, where women often work within low paid and informal arrangements (Kabeer 2016) and the 'care crisis' in capitalist economies (Fraser 2017), indicate the continued exploitation of women through the reproduction of the conditions of patriarchal structures, where women are associated with the private and unproductive sphere and men the public and productive sphere. This is also reflected in the way that livelihood and care work perspectives and related services continue to be neglected and poorly understood in climate and energy policymaking (Perkins and Osman 2021; Standal et al. 2018), despite overwhelming evidence that reproductive work to create, educate, feed and provide care for the labour force is vital for economic activity, as well as significantly impactful on greenhouse gas (GHG) emissions (Perkins and Osman 2021; Fraser 2017). Moreover, climate governance effectiveness depends on heterogeneous participation, especially the inclusion of vulnerable groups (Perkins and Osman 2021).

This approach is especially relevant to the context of Kyrgyzstan, where the post-Soviet transition resulted in women's diminished access to state social protection. Following Kyrgyzstan's independence in 1991, the country introduced a market economy through a 'shock therapy' method that severely depleted social services and reduced economic opportunities and employment. This transition resulted in decreased political participation by women and the reinforcement of patriarchal gender norms inherent in the new post-colonial national ideology (Kim and Karioris 2021). For many rural women, this meant being deprived of their land ownership rights; limited access to financing, markets, training and networking; and being deprived of decision-making power, even about strategic life decisions, such as who and when to marry (Kim and Standal 2019).

## 2 Gender and Climate Change Impacts on the Agricultural and Energy Sectors in Kyrgyzstan

Kyrgyzstan is an exceedingly mountainous country, which, like the rest of Central Asia (see Daloz, this volume), is highly exposed to climate change (Vakulchuk et al. 2022). Between 1960 and 2010, the annual average temperatures increased by approximately 1.2 °C (WBG and ADB 2021), causing multiple effects, including the melting of glaciers (Barandun et al. 2018; Gan et al. 2014). By the 2050s, the Coupled Model Intercomparison Project Phase 6 (CMIP6) models project 5.3 °C of warming for Kyrgyzstan under the highest emission pathway (SSP5-8.58.5), a rise faster than the global average. Under all emissions pathways, extreme temperatures are projected to increase, enhancing heat stress, especially in lowland areas. The projections for precipitation are more uncertain, as climate models have difficulty in representing this region owing to its complex topography. However, some climate models predict an increase in extreme precipitation—a cause of concern as parts of Kyrgyzstan are already increasingly exposed to floods, landslides and glacial lake outbursts (Chandonnet et al. 2016; Havenith et al. 2015). A lack of precipitation may also become an issue for Kyrgyzstan in the future, as Central Asia is predicted to become one of the regions most affected by meteorological droughts (Naumann et al. 2018; Vakulchuk et al. 2022).

About 65% of the population in Kyrgyzstan lives in rural areas, most of which are mountainous (Murzakulova 2020). However, the agricultural sector's contribution to GDP has drastically decreased, dropping from 44% in the 1990s to 12% in 2017 (Mogilevskii et al. 2017). Rural unemployment, poverty, dysfunctional social protection systems, and massive out-migration all characterise the wider background against which our study takes place (Murzakulova 2020; Tilekeyev et al. 2019; Mogilevskii et al. 2017). Climate projections present imminent threats to rural livelihoods in Kyrgyzstan, especially for households that rely on farming. Farming at high altitudes is challenged by early frosts, long winters, spring floods, droughts, soil salinisation and risk of natural hazards (Mogilevskii et al. 2017; Bobojonov and

Aw-Hassan 2014). Livestock farming is the mainstay of the agricultural economy and enjoys the most investment (Murzakulova 2020; Schoch et al. 2010). Kyrgyz families rely on livestock for subsistence, emergency funds, and cultural identity as herders. This sub-sector depends on the quality of pastures and the animals' health, both of which are vulnerable to environmental change. Drought spells and a general decline in precipitation in the region have also led to crop loss and food vulnerability for poor households, as well as an increase in the price of agricultural produce (Bobojonov and Aw-Hassan 2014; Lioubimtseva and Henebry 2009). Moreover, irrigation, drainage networks and other Soviet-era agricultural infrastructure are weakening, owing to a lack of investment and policy prioritisation (Mogilevskii et al. 2017; Sagynbekova 2017). In this context, climate change impacts, such as an increase in heat stress, could enhance income unpredictability (Bobojonov and Aw-Hassan 2014). Seed sterilisation (due to heat) and extreme weather may have adverse impacts on yields, endangering livelihoods and low-income households, with small-holder and subsistence farmers being most at risk.

The energy sector in Kyrgyzstan has been a source of domestic and cross-border contestation. About 90% of electricity generation in Kyrgyzstan is from hydropower, and the country has been struggling to meet domestic demand owing to water shortages, resulting in public protests against the government. The year 2021 was marked as an energy crisis year as water basins were depleted. Some rural areas have 'cold spots' in the electricity network, which are particularly vulnerable to breakdowns because they need an upgrade or because they are vulnerable to extreme weather events (Kim and Standal 2019). Climate change will result in more extreme events and changes in runoff, precipitation and the melting of glaciers (Gan et al. 2014), leading to further water shortages. At the 2021 United Nations Climate Change Conference (COP26) in Glasgow, the Kyrgyz government restated its plans for increasing the share of hydropower in the overall energy mix, but this requires considerable investment and support that may be difficult to secure. The Kyrgyz government has also pledged to reduce greenhouse gas emissions from fossil fuel use. For rural families, energy fuels such as coal, wood and dung are essential for subsistence (as illustrated in our second case study below). A balance between water demand for energy versus agriculture will also need to be found. In 2021, disputes over irrigation water triggered armed clashes along the border between Kyrgyzstan and Tajikistan, resulting in the death of more than 40 people (Helf 2021).

In Kyrgyzstan, work migration (within the country and overseas) is considered to be an important adaptation strategy to minimise the risks and uncertainty associated with environmental change affecting agricultural income (aggravated by a lack of irrigation schemes), though this trend is formed by complex and intertwined factors (Blondin 2019; Sagynbekova 2017; Chandonnet et al. 2016). Remittances have become an economic mainstay of rural families, but these economic resources are not invested in supporting innovation in climate-smart farming practices (Mogilevskii et al. 2017; Sagynbekova 2017). Rather, migration weakens community-based natural resource management institutions such as pasture committees and water user associations (Murzakulova 2020) and puts pressure on the remaining population

(mostly women) to continue farming activities and uphold family ties to ancestral land (Kim and Standal 2019). Women are more likely to engage in small-holding or subsistence agriculture, and they have less agency to implement new technologies and influence consumer and market preferences (Kim et al. 2018; Kim and Ukueva 2017). Access to resources, such as land, water, energy, credit, income and supportive institutional networks, is socially differentiated by gender, class and ethnicity (Sealise and Undeland 2016). At a global level, research shows that male out-migration can increase women's decision-making in the family as they take charge of the household and farming activities, but it simultaneously increases their work burden and insecurity (Alston 2021; Holmelin 2019). Domestic violence is also widespread in Kyrgyzstan (Kim and Kariotis 2021), severely affecting women's contextual vulnerability. Studies from the global South find that domestic violence increases after extreme weather events that reduce agricultural output (Eastin 2021; Caridade et al. 2022). All of this adds to women's contextual vulnerability resulting from climate change and associated risks.

Below, we present two ethnographic case studies from rural Kyrgyzstan. The first draws upon Kim and Ukueva's (2017) case study illustrating how climate change transforms women's access to value chains, while the second, based on Kim and Standal's (2019) case study, illustrates women's struggles around energy access and climate change. Both studies are based on already published data, with additional previously unpublished quotes from respondents.

### **3 Adapting to Uncertainty: Women's Marginalisation in Rural Issyk-Kul Farming**

Issyk-Kul Lake in eastern Kyrgyzstan is a major tourist attraction but suffers from a lack of regional formal employment opportunities and social provisions. Local families rely on diverse income sources, including community-based tourism, crop agriculture and animal husbandry. Women cultivate crops to generate food and income, and they accumulate unique knowledge of local crop species (Kim and Ukueva 2017). Animal husbandry, though practised by both women and men, is considered to be a male domain. However, many men migrate abroad or to urban areas of the country in search of cash earnings (Sagynbekova 2016).

The fertile soil of the area around Issyk-Kul has made it conducive for fruit and vegetable cultivation and many rural women grow apricots as a main source of income. One respondent stated that her family had 'lived by apricots' for the last 15 years and the income was enough for them to 'survive in the wintertime'. These women take several measures to increase and safeguard their apricot production, such as using a mix of organic and mineral fertilisers (animal manure and saltpetre) and insecticides, whitewashing every tree, and prayers: 'We pray and ask for good weather, no hail, no storms'. Their situation is undermined by the lack of social value that is attributed to their labour and overall gender relations in their community.

The women use so-called ‘heavy trucks’ to sell their produce. This refers to the intermediary purchasers who arrive in the village with large trucks to buy the produce in large quantities. These middlemen, all Kyrgyz men from nearby towns, arrive a few times per month during the harvest season. They establish the purchasing price; the women have little say in negotiating prices for fear that if they wait for too long, the produce will become rotten. These purchasers also determine the scheduling of their arrivals, controlling thereby much of the organisation of the apricot sales. Communicative transactions among the middlemen and women are typically one-directional, with the unreciprocated flow of information going towards the villagers. In this arrangement, women are marginal to the market and the supply chain and, as a result, obtain only a small fraction of the real market value of their produce. The women go along with the ‘heavy truck’ process as their only marketing channel for practical reasons, including the fact that it is predictable, even if it is unfair.

Despite their significant effort, the women’s marginal position is exacerbated further by the effects of climate change. The ‘predictability’ of their interactions with the middlemen has become disrupted due to unexpected increases in temperature. In 2015, following a heatwave and the much earlier onset of the warm season, the apricots ripened before the scheduled arrival of the heavy trucks. By the time the middlemen arrived, most of the produce had gone bad. As a result, the women suffered a considerable loss, both in income and socially. Some of the women tried to use their kitchen gardens to grow staple crops such as potatoes and cabbage to increase their food security and income. A number of women gathered wild sea buckthorn berries for sale. Several also made use of the apricots for their own and families’ consumption by making apricot juice that could replace drinks such as Coca-Cola and Fanta. However, these activities did not allow them to compete with large-scale suppliers, and the financial loss forced the families to sell livestock, which depleted their source of protein and emergency funds.

The 2015 events undermined women’s financial self-sufficiency and further diminished their limited negotiating power. In most households, the oldest men are in charge of financial and budgetary decision-making, even if both women and men contribute to the family budget. The income produced from the apricot sales is seen as the women’s ‘personal money’, which they are free to spend. They had enjoyed independence procuring items such as ‘warm clothes for children, coal and firewood for the house’. Not having their ‘personal money’ fund replenished destabilised women’s sense of autonomy and household wellbeing. For the older generation of women, it was an especially important dimension of their life quality. They derived social and psychological empowerment from the symbolic meaning found in being ‘good Kyrgyz grandmothers’ who take care of their gardens, enjoy, provide their children living in the cities with ‘ecologically clean’ fruits and vegetables, and look after their grandchildren outside of the ‘smoky cities’. The income loss they experienced following the missed apricot sales in 2015 limited their ability to be good grandmothers who ‘pamper’ their grandchildren and the associated social and cultural capital.

This case study demonstrates the imminent risk that rural farmers will face as new weather events repeatedly inflict detrimental effects on their produce

(Climate Risk Profile 2021; Masson-Delmotte et al. 2018) or, as in the situation described here, on the sales of the produce. The study also shows women's resilience and creativity in adapting to new situations. Structural gender inequality is likely to increase with climate change. Certainly, both women and men will be affected by climate change, but the gender-differentiated contextual vulnerability means that women will be impacted differently than men owing to the gender division of labour, male control of supply chains and finances, and the associated marginalisation and disempowerment of women.

#### **4 Energy Struggles: Energy and Women's Care Work in Rural Naryn**

Naryn, in Central Kyrgyzstan, is one of the country's poorest regions, with little industry and few non-farm work opportunities, especially for women. The region is located 2000–2500 m asl with long and cold winters, increased precipitation (snow) and limited farming opportunities beyond livestock husbandry. Most households rely on the work migration of both women and men, who often leave the elderly and children behind to take care of farming activities and care work and uphold the link to ancestral land. Against this backdrop, the electricity supply of Naryn is outdated and prone to breaking down during winter storms, a situation further aggravated by the energy deficit (related to water shortages affecting the hydropower network). As a result, people are compelled to use traditional energy sources, such as animal dung, firewood and coal, for heating and cooking. Access to these resources is socially differentiated, as it involves hard physical labour, financial costs and transport arrangements. In general, the supply of energy is formally a male domain, as men prepare animal dung and gather firewood and organise transport trucks for this purpose; as well as purchasing coal in bulk. Women and poor households are generally marginalised in this process. Women do not handle transport or forest department permits (for logging), and poorer households lack livestock for dung and can only afford to buy coal and wood piecemeal at higher unit costs. In line with other studies (Blondin 2019; Sagynbekova 2017; Chandonnet et al. 2016), several of the women and men interviewed stated that people, especially the younger generation, migrate to 'escape harsh winters and find a better and more comfortable life'. Some women were also reported to migrate as a consequence of forced marriage (bride kidnappings), often accompanied by domestic violence. Moreover, land rights are customarily only given to male relatives and livestock husbandry is a male domain, limiting women's livelihood opportunities and financial security.

The lack of resources to secure livelihoods, and the constant struggle to find sources of energy to keep warm and prepare food, affect the life quality of all households that are not affluent. For women, this also has health effects, as most households use the traditional large brick Pechka stoves to cook, which is time-consuming and labour-intensive, and the stoves emit particles that cause indoor air pollution.

Only the most affluent households have invested in electric hotplates for boiling water or gas ovens for cooking. These households practice so-called ‘fuel stacking’, whereby modern and traditional cooking technology is used side by side. Cooking traditionally (using a Kazan cooking pot on a Pechka stove) is a way for women to seek increased social and cultural status in the family and community. Cooking family meals is perhaps the energy labour most consistently assigned to women and is closely interlinked with identities based on gender roles of femininity, loving, caring, and hospitality (Standal and Winther 2016). A few women had started small businesses to increase their income and independence, such as a bakery, a mobile phone repair business, and vegetable growing, but the unstable electricity supply severely interrupted their activities (Kim and Standal 2019).

As this case study demonstrates, the Kyrgyz government’s failure to prioritise women’s needs, together with the deterioration of energy provision, compounds women’s vulnerable positions in the present-day household economy. Furthermore, the withdrawal of state-sponsored care for the elderly has placed this responsibility onto women because of the taken-for-granted gender division of labour. In addition, the government’s failure to stimulate job creation for the rural population has resulted in massive out-migration, with several children being left in the care of elderly grandparents whose health resources are limited.

Ironically, as a former part of the Soviet Union, Kyrgyzstan was fully electrified during the 1950s (Reid 2005). Rural electrification was prioritised as a way to transform ‘backward’ and ‘unhygienic’ communities, and to transform ‘subordinated’ women (under traditional patriarchies) into active citizens engaged in the productive economy (Reid 2005). Electricity has been linked to opportunities for women’s empowerment by simplifying domestic work and supporting economic opportunities (Winther et al. 2017). The gender dimension of this in Kyrgyzstan is revealed in the way that women are marginalised in their agency and in the opportunities available to them to make choices relating to their livelihoods and social care provision. This is associated with how the reproductive economy is assigned a lower value in the masculine-dominated political economy where women’s issues are essentially rendered invisible and irrelevant. The social implications of the government’s lack of understanding and prioritisation of energy services for rural populations are likely to increase further as climate change puts both the energy sector and rural communities under pressure.

## **5 Seeing Beyond Energy and Livelihoods: Women’s Vulnerabilities in a Changing Climate**

This chapter has advanced the idea that the interplay of contextual conditions creates multiple layers of vulnerabilities in accessing the social and material capital necessary to mitigate climate change impacts. Drawing on women’s voices, this chapter reveals



that gendered structural discrimination in regard to their rights to land, access to income, and access to extension services and basic resources make it difficult for women to negotiate fair conditions in their access to markets, employment and care work. Their wellbeing and struggles are furthermore not understood or prioritised at the policy level even though they bear the bulk of the social reproduction burden. This crisis of care and social protection reproduces and increases inequalities. Some families have the economic and social capital to provide social care (e.g. being able to acquire sufficient energy sources and not migrating away from their children), while others do not. Despite variation in terms of their socio-economic status, age and position within their family and kin group, the devaluation and exploitation of women's work (tending to their family's meals or trying to scramble income by growing apricots) is a consistent factor. As women's adaptive capacity in the face of climate change is entangled with their marginal position in the political economy, their contextual vulnerability will increase as climate change accelerates unless drastic policy measures are implemented.

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