

# Impact of climate hazards on at-risk livelihoods in Burkina Faso

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A woman in the Burkina Faso village of Niaptana, Yagma province tends her crops that benefitted from a Spanish Red Cross food security programme. A Climate Centre study as part of the UK-supported WISER programme identifies particularly vulnerable groups, including agricultural workers, people affected by conflict, and low-income households in Burkina Faso, with vulnerability further intensified for women and girls. Expanded social protection is part of the solution. (Photo: Olliwer Girard/IFRC)

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## Key report highlights

The Weather and Climate Information Services (WISER) Clima-Social Project (2023-2025) focused on enhancing resilience through strengthened social protection pathways and improved access to weather and climate information services (WCIS) in two countries – Burkina Faso and Mauritania. This report presents findings from research conducted to better understand how certain livelihoods are impacted by climate hazards in Burkina Faso. The secondary evidence collected has also been validated by key government stakeholders and community members in Kaya, Koudougou et Bobo-Dioulasso and Korsimoro, Sabou et Bam regions of Burkina Faso, through methods such as focus group discussions and key informant interviews. The objective of the study has been to identify adaptation options for livelihoods most at risk from climate hazards, as well as social protection pathways for those likely to be affected. In this context, some of the main findings are highlighted below:

- An interplay of various factors impacts livelihood security and resilience in arid, landlocked Burkina Faso, including geography, climate, wealth and gender. For instance, the country's long international border with Ghana enhances market demand and employment opportunities. Wealth is a major determinant for the type of livelihoods undertaken by the population. For instance, the wealthier groups are employers in the gold mines, large-scale agriculture and livestock trading, while the poor work as labourers in gold mines, farms or urban businesses.
- Floods and droughts destroy thousands of hectares (ha) of farmland in the country, resulting in major threats to food security. Subsistence farmers are the most affected as they must deal with the loss of tools, animals and seeds for long-term sustenance. Even high tolerance crops, like millet and sorghum, struggle to survive and their production reduces when temperatures surge beyond 35°C.
- Women and children are among the most vulnerable to climate-related livelihood risks in Burkina Faso, marginalization and unsafe working conditions in the agriculture sector. Many children are forced into labour on farms and factories due to factors like migration-limited access to schools and weak labour inspection. Children are often forced into work for survival with increasing financial instability and lack of access to education.
- Women's involvement in agriculture, alongside family and caregiving duties, significantly increases their workload. Studies in Burkina Faso reveal gender disparities in productivity, where female farmers have less access to inputs, meagre or no compensation and endure poorer health conditions than men.
- Research indicates a direct correlation between livestock diseases and climate hazards, like droughts and floods, in Burkina Faso, resulting in reduced production and livestock fatalities. This issue is further aggravated by the inadequate availability of veterinary clinics in rural areas of the country.

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## 1. Introduction

More than 40 per cent of the population in Burkina Faso lives below the national poverty line (World Bank, 2024) and the country was ranked 184th out of 191 countries in the 2021–2022 Human Development Index Report of the United Nations Development Programme (UNDP, 2022). The dwindling food security situation in this landlocked arid country is aggravated by harsh climate conditions like erratic rainfall, persistent land degradation, deforestation and desertification. These conditions also impact crop and livestock farming practices, which are the primary sources of livelihoods in the country, accounting for approximately three-quarters of the country's GDP and employing over half of the population (USAID, 2015). Evidence suggests that approximately 34 per cent of the country's land area has already been degraded due to desertification (World Bank, 2018) and the absence of any major river for irrigation, like many of its Sahel neighbours, further worsens the scenario. This situation makes it increasingly important to understand the intricate relationship between people and the landscapes they depend on, as climate change-related risks and hazards increasingly threaten their livelihoods (Sinare, n.d.).

### 1.1. Methods

This report aims to explore the at-risk livelihoods in Burkina Faso and how the growing impacts of climate change affects the households practicing them, across all wealth groups and gender. Drawing from a previous analysis conducted internally by the Red Cross Red Crescent Climate Centre that studied the climate hazards prevalent in the region, this report delves deeper into the direct and indirect impacts of these hazards on people's livelihoods. It examines the impact of identified hazards of concern, namely, riverine and flash floods, droughts and heatwaves, on the livelihoods of the population practicing them. The report also identifies some key strategies that can be adopted by social protection systems and national hydrometeorological agencies in association with the local communities to safeguard assets and reduce hazard impacts.

To identify key sectors highly vulnerable to climate hazards, we employed a multi-faceted research approach. This combined secondary analysis of existing literature with qualitative insights after consultations with key social protection and climate officials during a regional workshop in November 2024 as well as mutual training held in February 2025. Our methodology was designed to ensure a comprehensive understanding of how climate change affects different livelihoods across various demographic groups, irrespective of wealth status or geographic location (rural or urban) in Burkina Faso.

First, we conducted an extensive review of existing reports, policy documents and academic studies related to climate change, social protection, livelihoods practiced and the economic vulnerability of people in Burkina Faso. This included analysing national and international research on climate-related risks in Burkina Faso. By synthesizing this information, we identified trends and patterns that highlight the livelihoods most exposed to climate hazards. To support our literature review, we engaged with social protection and climate officials through a regional workshop and a mutual training programme to receive first-hand information and recommendations on livelihoods at risk in Burkina Faso and how mutual collaboration between social protection and climate actors can safeguard existing livelihoods in the country. Based on the findings of this report, a case study was conducted in Kaya, Koudougou et Bobo-Dioulasso and Korsimoro, Sabou et Bam regions of Burkina Faso. Through a mutual agreement with climate and social protection stakeholders, heatwaves were identified as the primary hazard of

concern for the case study. To present an in-depth understanding of the impacts in the case study, we conducted a survey and focus group discussions (FGDs), involving 446 rural and urban community members in total. These discussions helped validate the secondary literature used and provided valuable perspectives on how climate hazards – specifically heatwaves – disrupt livelihoods, exacerbate vulnerabilities and challenge both existing adaptation strategies and early warning systems in the regions. The case study report can be shared upon request.<sup>1</sup>

Through secondary analysis of existing literature and insights from social protection and climate officials, we identified crop farming and livestock farming as primary livelihoods in Burkina Faso. Additionally, we found that gold mining is widely practiced across various regions. However, due to the high risks, precarity and lack of infrastructure and agency to support groups practicing artisanal mining, as well as the limited relevance in the location selected for our case study, this livelihood was not included in the subsequent case study survey. However, information on gold mining, its regional presence and the conditions of those engaged in the sector, as found in the literature, have been provided in the annex section of this report. The surveys identified additional livelihood activities such as handicrafts, local trade and fisheries, which were primarily derived from community insights. However, these livelihoods were not widely documented in existing literature, indicating a gap in formal recognition despite their significance at the community level.

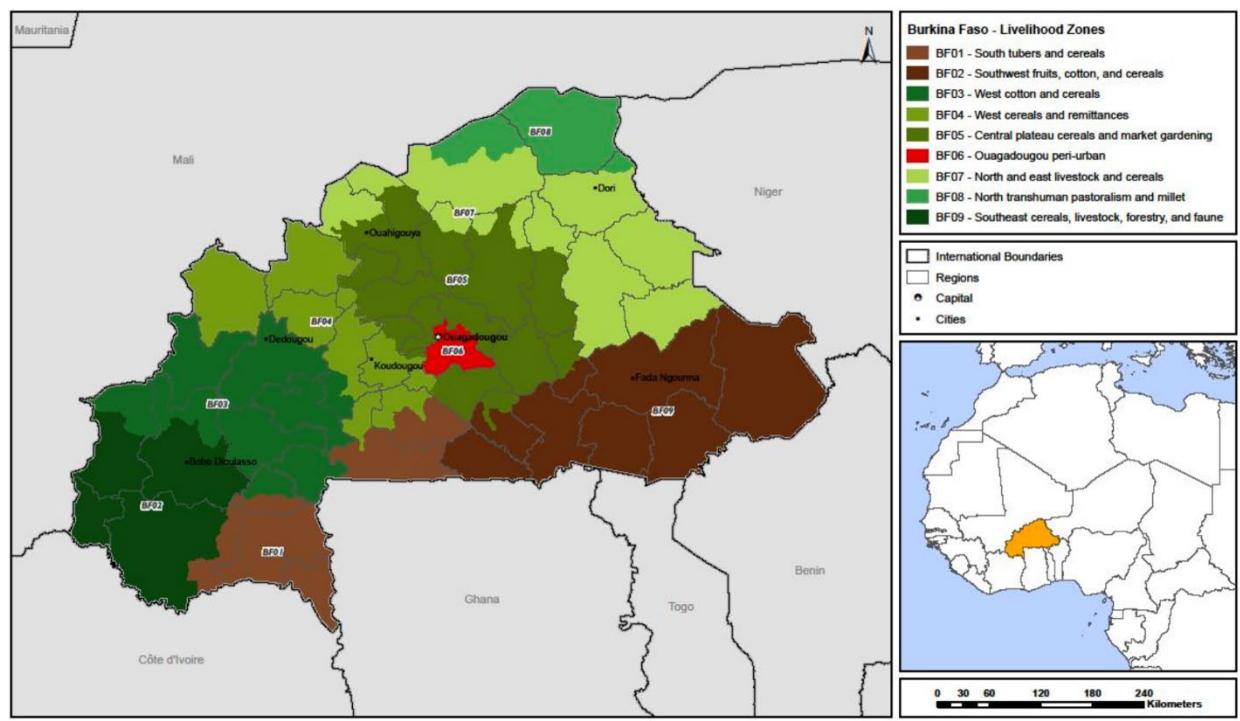
The novelty of this secondary analysis also lies in the application of a livelihood zone map of Burkina Faso that was prepared by the Famine Early Warning Systems Network (FEWS NET, 2010) in the country in association with USAID. This map (Figure 1) is an updated version of the country's agro-economy zone map prepared in 2003; revised following several rounds of regional interviews and zoning workshops held in Ouagadougou in June 2009. Crop farming and livestock farming are key sectors that engage a significant portion of the population irrespective of their wealth status or location in rural or urban areas and are highly vulnerable to climate hazards. We drew extensively from the 2010 FEWS NET and USAID study to map these at-risk livelihoods across the zones where they are predominantly practiced and to identify the key geographical features that have influenced these practices. Additionally, we referred to the study's wealth group classifications that divide the population into 'very poor', 'poor', 'middle' and 'better-off' categories based on their livelihood strategies, vulnerabilities and assistance needs. We further enhanced this zone mapping by analysing how climate hazards impact these livelihoods, highlighting the differences in effects on various wealth groups and vulnerable groups such as women and children.

The nine zones can be identified as:

Zone number	Zone name	Areas covered
<b>BF01</b>	South tubers and cereals	West and Centre West regions as well as the Ouo department of the Cascades region
<b>BF02</b>	South West fruits, cotton and cereals	Includes both the Cascades and Hauts-Bassins regions in addition to Burkina Faso's second town, Bobo Dioulasso
<b>BF03</b>	West cotton and cereals	Large part of Boucle du Mouhoun and Hauts-Bassins as well as small parts of the Centre West and South West regions
<b>BF04</b>	West cereal and remittances	Northern parts of Boucle du Mouhoun and Centre West regions
<b>BF05</b>	Central plateau cereals and market gardening	Mossi Plateau, covering parts of six regions: North, Centre, Centre-North, Plateau Central, Centre-South and Centre-West
<b>BF06</b>	Ouagadougou peri-urban	Ouagadougou
<b>BF07</b>	North and East livestock and cereals	Parts of Yatenga in the West, parts of Soum and Séno in the North and Yagha, Gnagna and Komondjari in the East. It sprawls across four regions: Sahel, East, Centre-North and the North
<b>BF08</b>	North transhuman pastoralism and millet	Covers all of the province of Oudalan and parts of Séno and Soum
<b>BF09</b>	South East cereals, livestock, forestry and wildlife	Parts of the East, Centre-East and Centre-South regions

In addition to the livelihoods discussed here, we also identified activities such as wood/charcoal/fodder sales, handicrafts/bricks sales, temporary local labour and market gardening practiced by 'poor' and 'very poor' wealth groups. Trade, however, is another common livelihood practice for the wealthier groups in the region. Additionally, remittances sent by labourers who have migrated out are also a source of income.

To identify viable alternative livelihood options for those engaged in at-risk livelihoods in Burkina Faso, a short survey was conducted with climate and social protection stakeholders. The survey aimed to assess whether decision-makers, particularly government stakeholders, believe adopting alternative livelihoods is crucial for safeguarding economic stability. Notably, 100 per cent of respondents agreed that supporting alternative livelihoods is both essential and feasible for the government in Burkina Faso. Several participants highlighted the growing opportunities in the renewable energy sector, particularly in enhancing solar and wind energy systems. Additionally, stakeholders identified eco-tourism and recycling-based product development as promising alternative livelihood options. These emerging sectors offer potential pathways for economic diversification and resilience in the face of climate challenges.



**Figure 1:** Map depicting the nine agro-economic zones of Burkina Faso, developed as part of the USAID-FEWS NET study (2010)

Several factors influence people's livelihood practices and their potential within these zones, also playing an important role in differentiating one zone from another. While the report primarily focuses on livelihoods and the associated climate impacts, it also explores the interplay of wealth, culture and human interactions that shape people's access to these livelihood opportunities. For example, areas of arable land, dense forest and abundant rainfall reduce the need for people to migrate in search of work, as they sustain their livelihoods through the sale of firewood and agricultural products. Similarly, Burkina Faso's long international border with Ghana, in livelihood zone 9, accentuates employment opportunities and market demand. The varying levels of wealth also play an important factor as they starkly differentiate households' living conditions, even if they share the same livelihood context of ecology and geography. Such differences are essential in determining a household's food security as well as its ability to respond to livelihood shocks and adapt to alternative livelihoods. The sources of food and cash for households involved in identified livelihoods have also been considered to understand how a particular wealth group can be affected by a hazard.

## 1.2 Report structure

This report has been structured in two sections, each focusing on a specific at-risk livelihood activity in Burkina Faso – crop farming and livestock farming. The profile of each zone within the country where these livelihood activities are predominantly practiced has been discussed in the sections, with an overview of the socioeconomic, demographic and geographic features that starkly differentiate one zone from the other. Next, climate-related hazards like riverine and flash floods, droughts/dry spells and heatwaves that impact activities and livelihoods have been outlined. Applying the livelihood zone profiling, each source of livelihood has been systematically assessed for various wealth groups as well as women in the zones. Finally, some strategies and social protection pathways to cope with and recover from such risks have been discussed.

This report is also informed by an internal Gender, Equity and Social Inclusion (GESI) scoping [study](#) that was conducted by the Climate Centre for the Clima-Social Project. The study identified vulnerable groups and communities in Burkina Faso that may face marginalization due to their intersecting identities. Building on the identification of vulnerable groups like women, children, internally displaced persons (IDPs) and migratory communities, this report examines the extent of risk to their livelihoods. It also builds on the need to implement GESI-responsive and transformative approaches, shaping recommendations that recognize the needs and roles of these groups in enhancing community resilience to climate-related risks affecting their livelihoods. The discussions on vulnerable groups outlined in this report for each identified livelihood also contributed to shaping the questions for the case study conducted in Burkina Faso, focusing on climate hazards and impacts on livelihoods.

## 2. Crop farming

### 2.1 Overview

The economy of Burkina Faso is largely dependent on agriculture and the sector employs about 80 per cent of the country's workforce (World Bank, 2024). In addition to the production of crops like fruits, maize, millet, rice and vegetables, the country is a major producer of cash crops cotton and groundnuts. However, harsh climate conditions have always posed severe threats to agriculture in the region. According to Resilient Food Systems (2021), the major droughts in the 1970s and 1980s not only degraded the land, but it also led to widespread desertification. Unsustainable farming practices have further aggravated these conditions; over-farming and over-grazing have turned vast acres of fertile land into desert-like landscapes. Practices like monoculture have also depleted the soil of its essential nutrients, causing erosion. Such unsustainable farming practices have left behind only around 18 per cent of land suitable for farming (Kabore, 2021). The effects of climate change – like variable rainfall causing dry spells, heatwaves in some areas and rainfall-led flooding in others – have further added to farmers' woes. The following livelihood zones are based on the 2010 FEWS NET study, supplemented by the case study survey conducted between November and December 2024 as part of the WISER Clima-Social Project.

### 2.2 Zone-wise livelihood profile

**BF01:** This zone experiences the longest agricultural cycle spanning from May to January.

This rainfed region grows tubers followed by cashew nuts, coco-grass and *niébé* (cowpea) in abundance, leading to steady cash crop earnings. Other crops like yam, groundnuts and rice are also produced in this zone. Most households in this zone belong to the 'middle' wealth groups with 5.5–7.5 ha of cultivated land, owning ploughs and orchards.

**BF02:** The second zone is also rainfed, with maize, fruits, millet and sorghum produced throughout the year. Cotton is an essential cash crop of this zone, mediated by a company Sofitex. The income of cotton farmers here is set by the government and the company. Farmers producing fruits also sell their produce to a processing factory – Dafani in Orodara. Most farmers in the region belong to the 'poor' category. With a landholding of approximately 3–5 ha, their income sources depend primarily on paid agricultural work.

**BF03:** This zone is characterized by rainfed agriculture, particularly cultivated cash crops like cotton, groundnuts and sesame. Maize and sorghum are also grown and sold in this region. The existence of the Mouhoun River in this zone aids irrigated agriculture to some extent. Cereals are exported from the region, while cotton is sold by farmers to Sofitex. Many households fall into the 'middle' wealth group, cultivating 8–12 ha of land as well as owning ploughs.

**BF04:** Agriculture as a source of livelihoods is affected by poor soil quality in this zone. The most important crops grown for consumption are *niébé*, millet and sorghum in the region. Sorghum and *niébé* are also the most sold crops, along with peanuts, here. As this region is dominated by 'poor' and 'very poor' households, crops are often sold immediately after harvest and not until the prices rise.

**BF05:** Zone five is population dense. This naturally leads to degraded land, poor crop yields and small landholdings. While the region is centrally located with increased access to market, the effects of climate change over the years have put income sources at risk for farmers in the region. Producing crops from market gardening, like millet, rice and *voandzou*, brings in some revenue for farmers.

**BF06:** The peri-urban region of Ougadougou falls in this zone and is influenced by market demand and employment, but poor quality soil and small landholdings due to population density have been a major hit to farmers. Due to its strategic location and stature as the capital city, agri-business is a proliferating sector here. Crops like *niébé*, millet, sorghum and peanuts are the primary crops sold in this region. The 'middle' wealth group in the region is a majority here, cultivating 3–4 ha of land and engaging in market gardening.

**BF07:** This zone has local variation in rainfall with plentiful and reliable downpours experienced more in the South East than in the West. Therefore, millet is the main cereal in the West and sorghum in the East. Many farmers belonging to 'poor' and 'very poor' households, who migrate in search of work during other parts of the year, usually return to the zone to secure the best possible yield from their land from June to November. For households dependent on agriculture in the region, not only does cultivated land increase with wealth but soil quality and the ability to use organic fertilizer do too.

**BF08:** This zone is highly food insecure due to the sudden dependence of pastoralists on agriculture and other livelihood sources. With the lowest rainfall and poor-quality soil, agriculture is highly inefficient in the region. The emerging competition among pastoralists, pitching farmers and agricultural labourers against the households originally practicing farming, is another hindrance. Crops like millet, sesame and sorghum are produced sparsely with many crops imported from other more productive zones here.

**BF09:** Agricultural produce is bountiful in this zone with an additional benefit of cross-border trade of produce within neighbouring countries like Benin, Ghana, Niger and Togo. The plentiful rainfall with high quality soil aids the production and sale of cereals and cash crops like cotton, maize and *niébé* primarily. Cotton farmers in this zone sell their produce to companies like FASO COTON and SOCOMA. While cotton prices have declined over the years, crops like maize, sesame, rice and peanuts have benefitted highly. The wealthier groups have larger areas of cultivated land in comparison to most other zones.

The sources of livelihoods examined across sectors like agriculture and pastoralism/agro-pastoralism in the discussion primarily include activities such as local agricultural labour work, cash crop sales, cereal sales, poultry and livestock sales as well as the export of products.

## 2.3 Livelihood risks

Extreme weather conditions like riverine and flash flooding, droughts and heatwaves depress agricultural productivity in Burkina Faso, resulting in a vicious cycle of income and asset loss, exacerbated food insecurity, fragility and conflict every year (Selassie & Kramarenko, 2023). According to Alliance Sahel (2024), climate shocks with accelerated demographic growth, lack of crop diversification, low economic productivity, inter-community tension and violent extremism triggering migration and displacement also affect agriculture in the region. Several researchers highlight that extreme weather events affecting agriculture, among other livelihood sources, could multiply and even worsen over the years. For instance, flood events have increased from the early 2000s to five incidents per year with more than 50 per cent of floods reported in 2006–2016 (Tazen *et al.*, 2018). Some of the climate hazards prevalent in Burkina Faso that have substantial impacts on farmers are outlined below:

- **Riverine and flash flooding:** Both riverine and flash floods are prevalent across much of the country with significant impacts on lives and livelihoods. Studies have found that intense storms in the West African Sahel have become more frequent over the past 35 years (Taylor *et.al.*, 2017). These storms, known as mesoscale convective systems (MCSs), are among the most powerful on Earth and contribute to extreme rainfall in the region. One such study shows that this increase in storm intensity is not just due to natural changes in rainfall patterns but is closely linked to rising global land temperatures (*ibid*). One key factor driving this trend is the warming of the Sahara Desert, which has created a stronger temperature contrast between the desert and the Sahel. This, in turn, affects wind patterns and atmospheric conditions, making storms in the Sahel more intense (*ibid*). While factors like rainfall and the overflow of water bodies onto the surrounding banks cause flooding in the region, factors like rapid urbanization, poor land use and management along with inadequate waste management and people's settlement in flood-prone areas due to lack of affordable housing have also resulted in flooding over the last 30 years (World Bank, 2021). Flash floods, mostly occurring in July/August, are common in zones 3 and 5, which receive around 700–900 millimetres of precipitation per year. Flash floods in zone 4 usually occur 1–3 times every ten years (FEWS NET, 2010).

Floods sweep away food stocks by submerging cropland, thereby threatening lives and livelihoods across the region. Waterlogging – a consequence of flooding in agricultural fields – has also been a limiting factor in the country's crop production. Damage caused by waterlogging is contingent on the duration and frequency of the crops' inundation along with their stage of development. Studies in Burkina Faso have highlighted strong detrimental effects of waterlogging on crops due to both of these reasons (Müller *et al.*, 2023). While floods affect agricultural lands in the region and destroy livelihoods, this destruction is differentiated depending on households' total landholdings as well as their other sources of income. Floods also increase the chances of health deterioration due to water contamination, food insecurity and injuries, which also exert a lot of financial pressure on households, further impacting the already affected livelihood system.

- **Droughts and heatwaves<sup>2</sup>:** Droughts, dry spells and heatwaves have had a degrading effect on Burkina Faso's economic performance by massively restricting agricultural production. Recurrent droughts in 1969–2020 have affected more than 15 million people in the country. While droughts have significantly affected food production in the region, the effects of droughts are also disproportional to men and women (Humanitarian Practice Network, 2025). They not only decrease crop yields but also reduce agricultural value addition and labour force participation in farm activities, increasing unemployment for households dependent on agricultural labour (Sawadogo, 2022).

### Internal displacement crises

Burkina Faso is facing a dire humanitarian crisis, with over 2 million IDPs due to ongoing conflict. The country also hosts 38,000 refugees, mostly of Malian origin, further straining its resources. The number of people in need of humanitarian assistance increased by 35 per cent in 2022–2023, rising from 3.5 million to nearly 4.7 million people. In addition to internal displacement, many displaced individuals lose their land due to conflict, often being left with only unproductive land where they struggle to meet their basic needs. This situation has worsened food insecurity and increased vulnerability among the population (UNHCR, n.d.).

Furthermore, farmers from central Burkina Faso are migrating towards the West and South of the country in search of more fertile lands, leading to heightened competition for agricultural resources and land disputes (*ibid*). This migration, coupled with the already fragile conditions, has created tensions between displaced populations and host communities.

While abundant crops like millet and sorghum grown in the region are heat- and drought-tolerant, even their yields decrease if the temperature goes beyond 35°C (USAID, 2017). In the heatwave case study conducted for this project, heatwaves were considered a major preoccupation by over 92 per cent of the respondents, one-quarter of whom had agro-pastoralist livelihoods and 29 per cent of whom worked in the informal sector, including day labour on farms. Major concerns about heatwaves include the health impacts caused by lack of sleep, dehydration and respiratory issues. Respondents also mentioned the loss in agricultural production, with longer term economic concerns including increased costs and decreases in productivity. The loss in production has been shown to have detrimental effects on both the urban and rural populations which effects the availability, price and security of food (El-Bilahi, 2021), as corroborated by both urban and rural respondents in our heatwave case survey.

Research highlights that rainfall after droughts and dry periods has adverse impacts on the soil quality of agricultural lands by affecting microbial composition (Sharma & Gobi, 2016). Rains after droughts or dry spells also have the tendency to wash away dry soil leading to erosion, as the soil loses its absorption capacity with increased dryness (Crawford *et al.*, 2016). As per estimates by the Food and Agriculture Organization (FAO), approximately 9 million ha of productive land in the region has been degraded due to desertification with a projected increase in degraded land of 3.6 million ha per year (FAO, 2021).

## Women and children in agriculture

In addition to the differential possession of land, equipment and ability to sell agricultural products in Burkina Faso, based on the geographical divisions and wealth segregation presented earlier, there is also a gendered division of labour and access in this sector. Agriculture employs more than 90 per cent of rural women in Burkina Faso (MECV, 2007) – one of the most vulnerable groups living in the region. Rural women farmers remain the most vulnerable to the effects of poverty, traditional socially assigned domestic roles and unequal rights and representation. Women's involvement in agricultural production, combined with their family responsibilities and caregiving duties, significantly increases their overall workload. Studies in Burkina Faso also highlight the gendered difference in agricultural productivity in several parts of the country. By examining men and women living in the same household who cultivate the same crop during the same year in North East and South West Burkina Faso, specifically in the villages located between Dori and Bobo-Dioulasso, inefficiencies were found in the allocation of inputs across plots managed by female and male farmers, with women farmers having less access to these inputs (Udry, 1996 ; Habi, 2023).

Additionally, farming in rural areas of Burkina Faso is primarily a collective activity at the household level, with all family members contributing to production. Individuals are allowed to own smaller pieces of land for personal production, typically aimed at generating cash. However, this extra activity is often carried out very early in the morning or in the evening. As a result, women face significant time constraints as they are responsible for domestic chores, which are also performed during these early morning and evening hours. Considering their limited access to land and time, women often engage in other small-scale activities, such as beer brewing or shea butter production, to supplement their income. In Burkina Faso, women's involvement in agriculture is influenced by complex land tenure systems and societal norms. Research (Prosterman, 2013) highlights that customs and institutions limit women's land rights, leading to smaller and less fertile plots compared to men's. Additionally, traditional practices often place land management under male control, leaving women with less access and security over the land they cultivate.

An econometric analysis of women conducted by Diendéré and Ouédraogo (2023) in the Centre-North region of Burkina Faso – a hub of agricultural and livestock produce – claims that the adaptation choices and strategies of women farmers have the potential to reduce the negative impacts of climate change and increase families' incomes. Among the surveyed respondents of this study, 72 per cent of women farmers had adopted at least one climate change adaptation measure. Water and soil conservation techniques, such as building *zai* pits, stone barriers and half-moons are common (Diendéré and Ouédraogo, 2023). *Zai* pits are small holes (20–40 centimetre (cm) in diameter and 10–20 cm deep) filled with manure or compost that are used to increase soil fertility and plant vegetable seeds, in addition to helping harvest rainwater. Stone barriers are walls built along the contours of the land to slow down water runoff and improve water collection capacity. Half-moon micro-catchments are small semi-circular earthen embankments that capture water that flows down a slope (Diendéré and Ouédraogo, 2023).

Additionally, the effects of climate change and associated hazards are different for women and men. Underlying gender inequalities mean that women are disproportionately impacted by the adverse effects of climate change, given the social, economic and political barriers increasing women's susceptibility to the hazards (UN WOMEN, n.d.) Studies in different parts of Africa have concluded that extreme weather events and shifting weather patterns, such as destructive winds, droughts, floods and temperature changes, have both direct and indirect negative effects on women workers. These factors, compounded by the large time burden women experience in relation to their unpaid domestic responsibilities (UK aid, n.d.) leave them with limited time for personal hygiene, health and growth.

According to a study by FAO (2023a), more than 55 per cent of children aged 5–17 in cotton-growing regions of western Burkina Faso are involved in work, with 62.5 per cent of boys and 48.1 per cent of girls affected. Nearly half of these children are engaged in tasks that are either prohibited or inappropriate for their age (FAO, 2023a). Burkina Faso has ratified several international conventions such as Convention No. 138 on Minimum Age for Admission to Employment and Convention No. 182 on the Worst Forms of Child Labour. The country has also increased the

minimum age for employment and compulsory schooling to 16 years with an exemption for light work for children aged 13 or older. In addition, it has listed hazardous work prohibited for children since 2009 with a revision of the list in 2016. Yet, eliminating child labour remains a challenge, particularly in the agriculture sector. Several factors like the seasonality of agricultural production, migration, lack of technology, low awareness of workplace hazards, limited access to schools, weak labour inspection and law enforcement in rural areas along with an entrenched social attitude about the role of children, complicate efforts to combat child labour in the cotton-growing fields. Children's work is invisible when they are assisting parents in the field; many children also work on a 'piecework' or quota basis on large farms (ILO, 2023). The high number of children working in Burkina Faso's cotton sector is primarily due to the labour-intensive nature of production, small family farms, poverty and few alternative income opportunities. Many children work long hours, often exceeding legal limits, with little or no pay. They may handle dangerous pesticides, endure extreme temperatures, lack proper food or rest, and face conditions that harm their physical and mental development. This work frequently comes at a cost to their education (ILO, 2023).

## 3. Pastoralism/agro-pastoralism

### 3.1 Overview

Pastoralism refers to a livelihood where income is derived from livestock production and, at times, also relies on spatial and temporal mobility to access land and resources (Behnke *et al.*, 2011; Reid *et al.*, 2014). According to the FAO (2023b), more than 56 per cent of households in Burkina Faso rely on livestock. Pastoralists are majorly concentrated in the northern communes of Baraboulé, Djibo, Liptako, Séno, Soum, Oudalan and Yagha of the country (IWGIA, 2011). As an adaptive practice, this livelihood system often leads to nomadic movement of livestock seasonally. In Burkina Faso, the Fulani have been the biggest community of cattle owners, herding around 70 per cent of the total cattle population but own only about half of it (Gonin *et al.*, 2015). Many of them have settled in one place and integrated agriculture with livestock production – a system termed ‘agro-pastoralism’. In addition to agricultural produce, livestock produce also plays an important role in ensuring food security in the region and therefore acts as a major source of livelihood. In fact, USAID’s livelihood profiling has determined zone 3 of the country as livestock rich with a widespread household engagement in livestock rearing and production across wealth groups and gender (FEWS NET, 2010).

The following livelihood zones are based on the 2010 FEWS NET study, supplemented by the case study survey conducted between November and December 2024 as part of the WISER Clima-Social Project.

### 3.2 Zone-wise livelihood profile

**BF01:** This is a rainfed and food secure zone with a high dependence on livestock rearing. The main livestock in the areas covering the zone are goats, pigs, poultry and sheep. Livestock and its products are exported and sold internally within the country. With a lower livestock holding across wealth groups in the zone, the ‘middle’ and ‘better off’ – which together constitute more than 50 per cent of the population – own most livestock and are largely dependent on livestock sales.

**BF02:** All wealth groups in this zone rely on livestock and have substantial holdings of cattle, goats, poultry and sheep. Households have been putting a lot of pressure on fattening livestock for sale and have taken to producing eggs and dairy products too. The ‘poor’ and ‘very poor’ wealth groups are reportedly forced to sell their livestock at a young age, while the wealthier groups can wait until the livestock mature and prices rise.

**BF03:** Livestock, like oxen, are used by wealthier groups for ploughing the land in this zone. Cattle, goats, pigs, poultry and sheep are reared by households, but their contribution to the zone’s economy is not significant in comparison to other zones.

**BF04:** Spanning the northern parts of Burkina Faso, sedentary livestock rearing is an essential livelihood source in this zone. The main livestock are goats, pigs, poultry and sheep, with large cattle holdings owned by the wealthier groups. There is a significant difference in large cattle holdings between the ‘middle’ and ‘better off’ wealth groups, with the former owning more. The zone is significant agriculturally and livestock sales are a major source of earnings here.

**BF05:** Livestock is a less important livelihood source in this zone with low holdings across wealth groups; however, the sale of smaller ruminants and poultry still generates steady income. Interestingly, women in households lead the livestock rearing and sale here, pointing to their involvement in the labour market. Lack of water and pasture pose a threat to larger livestock (like cattle and sheep) in the zone.

**BF06:** The zone covers the central region of the country, where access to the market for livestock products is very sound. Defined by the influence of capital due to its strategic location, livestock rearing is practiced abundantly here. Cattle, goats, pigs, poultry and sheep are the main livestock reared in this zone. It also forms a major source of investment and long-term savings for households. Over the years, this region has seen a significant proliferation of large livestock farms devoted to the production of chicken, eggs, pigs and such for sale.

**BF07:** Livestock is a primary source of livelihood across the wealth groups in this zone; however, the high price of livestock feed and late start of the agricultural cycle in some recent years – due primarily to uneven rainfall – often has a drastic negative impact on livestock here. Cattle, goats and sheep are an important source of cash income for the population. Unlike other zones, livestock holding for every wealth group is on par with each other in this zone.

**BF08:** Almost all wealth groups possess livestock in the region, but cattle herds are owned by 40 per cent of ‘middle’ and ‘better off’, whilst the ‘poor’ and ‘very poor’ have limited numbers and smaller stock. Livestock is reared on both a transhumant and non-transhumant basis in this zone with cattle, goats and sheep the primary animals. Hens are usually owned by the poorer households and camels by the ‘better off’ and ‘middle’ groups. Apart from local sales, livestock is also exported for income in this region.

**BF09:** Many people practice livestock rearing in this zone with large holdings in comparison to other zones. Livestock sales and exports also act as primary income source for people here. This zone is also characterized by the large-scale seasonal movement of people with their livestock to other geographies in search of grazing resources due to scant rainfall. Livestock holdings include cattle, goats, pigs, poultry and sheep.

### 3.3 Livelihood risks

While the pastoralist communities in Burkina Faso require training, diversification and intensification of livestock systems to modify production practices and enhance output per anima, per unit of land and per unit of labour (Nicholson *et al.*, 1995), they also need sustainable ways to improve their economic realities. Climate change and its associated risks pose significant threats to livelihood production and livestock health. Studies have highlighted a direct correlation between livestock diseases and climate deterioration in Burkina Faso and other parts of West Africa (Cham *et al.*, 2018a, 2018b; Rojas *et al.*, 2017). The situation is aggravated by the lack of veterinary clinics and other sources of community medical support. Fluctuation in market prices and inflation because of climate hazards also have a notable impact on animal feed prices. Climate-induced stress on agricultural and livestock production systems also intensifies conflicts among farmers and mobile pastoralists over land and water resources (USAID, 2017). Some climate hazards prevalent in Burkina Faso that have substantial impacts on livestock and farmers are outlined next:

- **Riverine and flash flooding:** Floods account for almost half of the disasters in the region, and their frequency is directly linked to the effects of climate change and rapid socioeconomic development (Hirabayashi, 2013). A common effect of floods in the region is the destruction and displacement of livestock which significantly impacts food security and sources of income, with more than half of the population dependent on livestock rearing. The recent record rainfall and subsequent floods of 2022 in several regions of the country resulted in the deaths of thousands of livestock along with the displacement of many others (Reed *et al.*, 2022). Also, livestock health is severely jeopardized as an after-effect of waterlogging caused by floods. Bacterial and parasitic infections, toxicities due to poisonous plants, animal foot rot, snake bites and gastrointestinal diseases also proliferate due to waterlogging in the aftermath of floods. Livestock also has a higher chance of consuming contaminated water after floods.

There is also a significant loss of pasture during and after floods, leading to the unavailability of food for livestock. Floods also result in the destruction of infrastructure which often include village- or town-level shops selling and storing animal feed. With a significant number of pastoralists using mobile practices for livestock rearing, floods make it impossible for them to commute, thereby causing a hindrance to their livelihoods.

- **Droughts and heatwaves:** Livestock owners across the region have identified droughts as a primary constraint to livestock production. The northern parts of the country have been major victims of droughts and dry spells with a majority of the population dependent on livestock rearing (USAID, 2017). Droughts effect livestock by degrading pasture, limiting water availability and making livestock susceptible to various diseases. Research in the Sahel region highlights that 12 per cent of surveyed individuals lose their livestock income in drought years (USAID, 2017).

While research on heat stress in Burkina Faso is limited, evidence from sub-Saharan Africa – demonstrating similar hot temperatures and frequent dry spells – has shown significant impacts on livestock production. Reduced feed intake, reproduction and growth rate, longevity, milk production, egg laying and disease resistance are some of the direct impacts as highlighted by the study. For instance, chickens are vulnerable to heat in most regions, causing widespread mortality (USAID, 2017) – the heatwave case study survey shows that 86 per cent of poultry farmers lost more than ten animals in a past heatwave, with over one-quarter having lost 40 animals. One survey respondent added that heatwaves are particularly difficult for poultry farmers who also slaughter and cook their chickens themselves. The health risks of working over an open fire during the hot day and a lack of refrigerators to keep the meat sanitary severely limits their daily livelihoods.

Outbreaks of livestock diseases such as anthrax due to grazing in infected pasture can have long-lasting effects on herd sizes and strength. Newcastle disease among poultry, tropical theileriosis and foot and mouth disease among cattle as well as highly pathogenic avian influenza are common in livestock subjected to droughts and extreme heatwaves prevalent in many regions of the country (USAID, 2014). For instance, 44 per cent of heatwave case study survey respondents who keep large ruminants such as cattle reported losses of over 75 per cent of their normal milk production (WISER Case Study Survey, 2024).

## Women practicing livestock farming

Considering the influence of women in livestock farming is essential as they play a major role in this form of livelihood across the country. Women farmers make up nearly 39 per cent of the country's livestock sector, primarily involved in rearing cows, pigs, poultry and sheep, though men dominate in leadership roles (AFDB, 2023). The constraints faced by women working as livestock farmers are completely different to men's. Women's roles in livestock production include taking care of the animals and birds, feeding them, grazing them, collecting fodder, processing milk, and sales. Studies conducted in parts of Kenya, Ethiopia and Tanzania revealed that pastoralist women have a key role in taking care of young calves as well sick and weak livestock, which becomes challenging in times of scarcity. Natural hazards like floods further endanger women's lives as well as those they take care of, due to restricted mobility (Amsalu & Wana, 2013; Omolo & Mafongoya, 2019). Additionally, women's access to and control over essential resources and livestock production information is highly limited. Women contribute labour to numerous livestock production tasks but have little decision-making power over the sale of animals or their products – a situation worsened by their lack of land ownership (Furusa & Furusa, 2014). Despite their significant contribution, the challenges faced by women in livestock production remain masked in most studies due to the limited availability of gender disaggregated data. As a result, their issues are often underrepresented in this livelihood sector (Amole *et al.*, 2020).

While policies like the National Sustainable Livestock Development Policy (PNDEL) 2010-2025 stress the need for implementing a gendered approach to livestock development, traditional norms keep pushing them away (AFDB, 2023). For instance, even though women have the right to own land, they continue to be excluded from this right due to cultural obligations. Women are also sidelined in livestock markets headed by men as women have little control over financial decision-making, profitability and returns from the farming activities (*ibid*). Women livestock farmers' involvement in the informal sector with limited access to human capital development opportunities, access to market and financial resources are other major drawbacks (*ibid*).

Interestingly, the more physically demanding activities associated with livestock farming – for example, the longer distance grazing of livestock – are more often practiced by men (including teenagers) who may be exposed to extreme heat during the dry season and can be more prone to getting into conflicts with crop farmers.

## 4. Recommendations

Climate-related disasters have been impacting lives and livelihoods of the people in Burkina Faso for decades. Given the inherent uncertainty in future climate change scenarios, long-term investments by the government and private sector to safeguard agriculture, livestock and other forms of livelihoods is crucial. In this section, we present key recommendations on reducing impacts, improving coping capacities and strengthening adaptation through stronger social protection programmes provided by climate and social protection stakeholders in Burkina Faso, gathered during a mutual training session held in the country in February 2025. Additionally, we highlight various adaptation strategies that address the diverse livelihood sources discussed in this report:

**a) *Short-term coping strategies:***

- Adopting efficient land management practices, such as retaining crop residue to enhance soil organic matter and maintaining year-round plant cover instead of relying solely on seasonal crops; and climate-smart practices, which focus on the selection of seeds based on scientific information (e.g. seasonal forecast to account for the high year-to-year variability).
- Strengthening waterway management to prevent rising water levels in fields during floods and accelerate drainage. Infrastructure solutions, including levees, embankments, floodwalls, and mobile rubber tube dams, can effectively channel excess water to alternative sources.
- Providing anticipatory cash support through social protection programmes or humanitarian interventions to enable timely actions, such as relocating livestock to higher pasturelands or moving communities to elevated dry areas, to mitigate flood impacts.
- Ensuring the safety of animal and bird feed, as it may become contaminated following floods. Livestock farmers should also be encouraged to assemble disaster preparedness kits containing essential medicines and first aid supplies for their animals.
- Promoting the provision of flexible working hours in enterprises during heatwaves and introducing livelihood protection measures, including short-term unemployment assistance and income support, especially for informal workers whose activities must be paused due to extreme heat.

**b) *Medium-term adaptation strategies***

- Early warning systems providing reliable climate information, allowing farmers to secure their produce, relocate livestock to safer areas, and adjust their livelihood strategies in response to different hazards. Ensuring effective communication of this information is crucial. Engaging communities in designing and developing climate information systems tailored to their needs, simplifying the information for easy understanding, and building farmers' capacity to access and interpret it can significantly enhance its effectiveness (WFP, n.d.).
- Social protection agencies can benefit greatly from integrating climate predictions into their planning to proactively anticipate and mitigate the impacts of shocks, such as droughts and floods and other extreme weather events.

- Incorporating climate forecasting into social protection programmes enhances preparedness, improves resource allocation and enables timely interventions to protect vulnerable populations.
- A key challenge for social protection agencies is the absence of a high-level strategy to address the anticipated impacts of climate change. This is particularly critical as climate-related shocks, especially those affecting livelihoods, will require substantial investments to support vulnerable communities. Without a clear strategic framework, these agencies may struggle to respond effectively to escalating climate risks.
- Establishing a climate-risk registry to map vulnerable communities and their exposure to climate-related risks can help to ensure more targeted and effective adaptation and response strategies.
- Growing fodder tree species can help mitigate feed scarcity, particularly during the dry season and heatwaves. Additionally, as emphasized by the International Livestock Research Institute (2020), efforts should focus on both crop improvement and livestock feed production in a complementary manner to reduce farmer–herder conflicts (Amole *et al.*, 2020).
- Vaccinating animals is crucial to protecting them from diseases and enhancing their resilience to various climate shocks. Given the large number of pastoral animals, mandatory vaccinations are necessary to prevent flood-related ailments such as anthrax and parasitic infections. Identifying livestock escape routes in case of hazards is also a vital step in emergency preparedness.
- Exploring partnerships for technical assistance to utilize drone and satellite-based surveillance for flood risk assessment, avoiding seed sowing in low-lying areas, and training community members as agricultural and livestock extension workers can further strengthen adaptation efforts.
- Raising awareness among farmers about climate-smart agriculture activities like sustainable land management practices, crop diversification, irrigation techniques and other scientific methods is essential for safeguarding farm livelihoods against natural hazards.

**c) Long-term resilience building strategies**

- Reinforcing the responsibilities of the already-existing national agency for disaster risk reduction (DRR) can enhance coordination between technical agencies, such as hydrometeorological (hydromet) and social protection agencies. However, key factors such as leadership, coordination mechanisms and resource allocation should be assessed carefully.
- Implementing adaptive social protection programmes – such as cash transfers combined with skills training, market linkages, coaching and access to financial services – can effectively build long-term household and individual resilience to natural hazards within targeted landscapes (Bowen *et al.*, 2020).
- Identifying the most relevant and feasible hazards that social protection measures can address is essential. Once these key hazards are determined, integrating appropriate language into social protection policies can ensure legal recognition. Additionally, redesigning social protection programme components can help effectively mitigate the impacts of these hazards.

- Strengthening advocacy efforts for increased social protection funding, resource mobilization and robust policy action is crucial. Emphasizing how climate change exacerbates vulnerabilities can help highlight the urgent need for social protection interventions to both safeguard existing livelihoods and promote alternative livelihood opportunities.
- Expanding insurance schemes for vulnerable populations through pilot projects can help assess their effectiveness and sustainability, providing a basis for wider implementation.
- Integrating social protection agencies into the National Framework for Climate Services (NFCS) through a structured approach can enhance coordination and ensure climate-informed decision-making for expanding and strengthening social protection systems.



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## 6. Annex

### 6.1 Gold mining

#### *Overview*

Gold mine production has risen to nearly 60 per cent in Africa since 2010 and has soared rapidly in many countries including Burkina Faso (World Gold Council, 2024). As the world's fifth largest producer of gold in 2023, the country's economy is highly dependent on this source of livelihood across all wealth groups. Endowed with gold mine sites, mostly in the northern half of the country, Burkina Faso has witnessed the rapid migration of labour from different parts of the country for seasonal work. With the increase in artisanal gold mining in the country in the last few years, there has also been a rise in violent attacks and cascading violence with subsequent deaths since 2015 (Lanzano, 2021). Artisanal or small-scale gold mining, which began in Burkina Faso in the 1980s, is a result of severe climate hazards like droughts and was a survival mechanism for the rural population (World Gold Council, 2022). It also provides jobs and produces cash income for local households, unlike industrial or commercial gold mining (Pokorny *et al.*, 2019). However, the livelihood activities in this sector have clear distinctions based on the wealth groups in which the workers belong. For instance, the 'poor' and 'very poor' work as labourers and the wealthier groups work as employers who often hire these labourers to work in their mining sites. A survey across six districts and 600 households of the country highlighted that while gold mining is a key factor for local subsistence in the regions, adverse socioecological conditions accentuate the problem of mining investments (*ibid*). The following section outlines the zone-wise distinction of regions practicing gold mining as a source of livelihood.

#### *Zone-wise livelihood profile*

**BF05:** Gold mining is a notable income source for households across all wealth groups living in this zone. Interestingly, the role of these wealth groups involved in gold mining differs significantly based on income. While 'poor' and 'very poor' households are engaged as labour using traditional methods, the 'middle' and 'better off' households fall in the entrepreneur category. More often, they are seen as employers of the poorer groups and provide them with equipment and food.

**BF07:** For the poorer groups living in this region, the migration of labour to work in gold mines is an important source of income. Many households taking up labour in gold mines in this zone also work in their own communities during the agricultural season. Migration usually takes place in the dry months with the amount of time spent away from agriculture directly correlated to the amount of rainfall.

**BF08:** Formerly working as pastoralists, many households in this zone have slowly changed their livelihood source to gold mining. The increase in importance of this source of livelihood dates to the early 2000s. It also serves as an alternative to migration (to Ougadougou). In fact, a lot of mining sites in this zone are exploited industrially, while some are mined by villagers using traditional methods.

In addition to the three zones, gold mining sites are also found in zones 2, 4 and 6; however, gold mining is not practiced extensively in these regions.

### ***Livelihood risks***

Small-scale gold mines are generally located in remote areas with limited and fragile infrastructure and at potential risk from climate hazards. As gold mining involves multiple stakeholders like the government, local authorities and, most importantly, the local or migrating communities, greater resilience from physical climate risks can reduce economic and social risk (World Gold Council, 2022). While there are studies on the carbon footprint generated by gold mining in Africa, not much literature exists on understanding the impacts of physical climate risks in gold mining as a source of livelihood in Burkina Faso. Over the last few years, the deaths of some gold miners have been reported, due to the impact of hazards like rainfall and subsequent mudslides. Details of the impacts on gold miners of other hazards, like floods and droughts, have also been sourced from countries such as Nigeria and South Africa that also have thriving gold mining sectors.

- **Riverine and flash flooding:** In the event of floods, gold mine pits partially or completely fill with water (Christopher *et al.*, 2023), often trapping workers for days and even resulting in deaths. With many people engaged in gold mining as labourers, floods can turn fatal at times. Incessant rainfall due to cloudbursts often leads to flooding of tailings and dams, increasing the risk of landslides. Episodes of mine worker deaths have been common in the region, with the most prominent one killing 34 workers due to mudslides in 2008 (Reliefweb, 2008). Risks from climate hazards like flooding and landslides increase exponentially in the absence of safety measures and protocols at the mining sites, especially those that are run illegally. Deaths due to flooding have also occurred in the zinc mines of Ouagadougou with the recent most reported in 2022 (Reuters, 2022).
- **Droughts and heatwaves:** The efficiency of mining is also impacted by rising temperatures and droughts. Increasing temperatures run the risk of causing a breakdown of equipment. Additionally, underground mines require more energy to cool during heatwaves (Equip, 2025). Mining also requires large amounts of water to extract and refine the gold. This need for water leads to frequent conflicts with local communities over this often-scarce resource (Underwood, 2017). Episodes of drought further aggravate the struggles with water availability for the gold miners in Burkina Faso. The Blue Deal Partnership (2018–2030) with the Dutch Water Authorities in the country is working to draw up sustainable water management plans, re-use water and improve water quality and monitoring (Dutch Water Authorities, 2019).

### Women in gold mining

Approximately 20–30 per cent of gold miners in Burkina Faso are women. In addition to their socio-culturally binding household chores, women carry out tasks such as crushing ore, collecting water and concentrating ore using sluices in the mining sites. With little or no rights over assets and resources and very limited say in decision-making, they are often given low-paid, labour-intensive work.

Women's involvement in manually crushing primary ores in the mining sites often results in respiratory illnesses like chronic bronchitis, silicosis or tuberculosis. Entrusted with the task of sluice washing, women often extract gold concentrate using a highly poisonous mercury amalgamation, despite national laws prohibiting the use of mercury in the sector. Studies conducted at the Djarkdougou, Gnikpiere, Fandjora and Tonka-La artisanal mining sites also concluded that, instead of money, women involved in sluice washing are often compensated with leftover sluice which they sell or reprocess to extract any remaining gold (Kabore *et al.*, 2020).

## Adaptation strategy

- Establishing partnerships with local water authorities can help mitigate the negative impact of gold mining on water systems. Initiatives such as setting up water monitoring programmes and collaborating with the Burkina Faso Ministry of Mining and local water authorities can be beneficial. Additionally, promoting water reuse in mining operations can regulate water consumption and reduce environmental degradation.
- Establishing and implementing clear evacuation protocols for gold mining sites, ensuring the accessibility of emergency exits, reliable communication channels and regular drills to enhance worker preparedness.

