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# Institutional barriers to climate change and health adaptation in Burkina Faso

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## ABSTRACT

West African countries, such as Burkina Faso are particularly vulnerable to an array of health impacts due to climate change. Consequently, Burkina Faso has drafted and implemented adaptation plans and programmes, with varying levels of success. This exploratory qualitative study examines the institutional barriers faced by policymakers in this process, particularly in the health system of concern. We applied in-depth interviews with policymakers, using framework analysis. We identified the barriers to implementing climate change and health programmes and categorized the barriers according to the *Framework to diagnose barriers to climate change adaptation*. Policymakers identified eight interconnected barriers through the framework: Four barriers in the management phase (insufficient financial resources, frequent turnover, policy-politics disconnect /weak structural support, unsustainable programming), three in the planning phase (heft of bureaucracy/lack of political will, diverging development priorities, insufficient cooperation), one in the larger context of Burkina Faso's environment (national security). The respondents mentioned no barriers in the understanding phase. These barriers are indicative of weak institutional support systems and limited resource allocation to climate and health work in Burkina Faso.

## ARTICLE HISTORY

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## KEYWORDS

West Africa; climate change; adaptation; health; policymaker; barriers; institutional

## 1. Introduction

### 1.1. Background

Governments around the world have developed strategies to adapt to the immediate and forecasted consequences of climate change. Climate change poses a threat to low- and middle-income countries, such as those in West Africa (IPCC, 2018). Experts project that climate change will increase the burden on important sectors and resources such as the agriculture sector, water resources and the health sector, which are already deemed vulnerable in this region (Brown & Crawford, 2008; Beg et al., 2002; Sorgho et al., 2020b). Adaptation ‘The process of adjustment to actual or expected climate change and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities’ (IPCC, 2014), encompasses the strategies, West African countries must engage in to reduce the consequences of climate change, which will have lasting repercussion on their nation's population and development (Beg et al., 2002; Adger et al., 2003)

Burkina Faso like other West African nations, is especially at risk because its population is facing both gradual change in key meteorological variables and an increase in the frequency, duration and intensity of extreme weather events. Climate change will impact health through these extreme weather events and a multitude of other pathways including, increasing heat stress, decreasing water and air quality, increasing vector and ecological diseases, worsening socio-economic factors and decreasing food supply and safety (Haines & Ebi, 2019; Watts

et al., 2018). Extreme weather events such as heatwaves, torrential rainfalls and consecutive mini-droughts are detrimental to food security in Burkina Faso, where more than 70% of the nation's population relies on subsistence farming for their annual food supply (De Longueville et al., 2016; Sorgho et al., 2020a). Heat stress resulting from heat waves is decreasing farmers' physical work capacity, limiting their ability to tend their agricultural fields, while changing rainfall patterns are decreasing the growth potential of crops, leading to poor yields and destabilized food security (Karst et al., 2020; Sorgho et al., 2020a) (Rigolot et al., 2017; Tourre et al., 2017). Direct and indirect impacts of climate change on health have been observed specifically in Burkina Faso, through increasing child undernutrition and mortality resulting from changes in rainfall and agricultural yields (Belesova et al., 2017b; Belesova et al., 2017a; Belesova et al., 2019) to increasing rates of cardiovascular, respiratory, and cerebrovascular morbidity and mortality in elderly populations due to heat waves and heat stress (Bunker, 2018; Bunker et al., 2016). The population's high exposure and vulnerability to climate change are compounded by a low individual and institutional capacity to adapt (Sorgho et al., 2020a; Williams et al., 2018). Therefore, it is crucial that national stakeholders create climate change adaptation strategies and that the policy implementers execute these strategies.

Burkina Faso has made strides in drafting and adopting climate change policies such as the 2007 National Action Program for Adaptation to Climate Change (NAPA), and the 2015 National Adaptation Plan (NAP), but still has a way to

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go in developing and implementing adaptation options, especially in the sector of human health (UNFCCC, 2019; Kalame et al., 2011). Burkina Faso is facing difficulties in regard to adaptation to climate impacts on health, this is particularly evident in the arena of child undernutrition and food security (Kalame et al., 2011; Haines & Ebi, 2019; Sorgho et al., 2021). The institutions responsible for and active in adaptation implementation have to identify, categorize and define these adaptation difficulties as barriers before they can be overcome. This will enable stakeholders in the country to better understand, plan and manage options for climate change adaptation, including those that benefit health.

## 1.2. Framework

In their 2010 publication ‘A framework to diagnose barriers to climate change adaptation’, Susanne C. Moser and Julia A. Ekstrom outlined a systematic process for identifying, categorizing and discussing barriers to climate change adaptation. Barriers are ‘obstacles that can be overcome with concerted effort, creative management, change of thinking, prioritization, and related shifts in resources, land uses, institutions ...’ (Moser & Ekstrom, 2010). The framework uses a descriptive rather than normative approach to defining barriers. Hence, the barriers discussed are impediments that can divert, delay or stop the adaptation process. Adaptation barriers unlike adaptation limits can be overcome with efforts, political will, social support and resources (Adger et al., 2009; Woodward & Smith, 2014).

The process for adaptation used in the framework is structured similarly to the processes of decision making, policy making and risk management (Moser & Ekstrom, 2010; Ekstrom et al., 2011). The framework has three phases: understanding, planning and managing. Each phase in this non-linear model has three subprocesses (Figure 1).

The first phase, understanding, is subdivided into (a) problem detecting and awareness raising, (b) information

gathering and deep problem understanding and (c) problem (re)definition. The second phase, planning is subdivided into (a) developing (b) assessing and (c) selecting one or multiple adaptation options. Lastly, the managing phase is subdivided into (a) implementing the selected option(s), (b) monitoring the environment and outcomes and (c) evaluating the outcomes of the realized options (Figure 1) (Moser & Ekstrom, 2010).

Climate change adaptation barriers arise while policy-makers are moving through the three phases and can be recorded when posing key questions about interconnected structures: the system of concern, the relevant actors and the larger context of governance and environment (Figure 2) (Moser & Ekstrom, 2010). The adaptation situation of a country must be examined within the overall context of the governmental and environmental setting which provide the enabling and constraining conditions that shape adaptation actions (Moser & Ekstrom, 2010). Next, adaptation options must be planned in relation to the specific human-natural system of concern they intend to improve. Lastly, adaptation barriers can be elicited through the actors who conduct the adaptation process as they go through the phases of understanding the problem, planning adaptation options and managing adaptation options (Ekstrom et al., 2011).

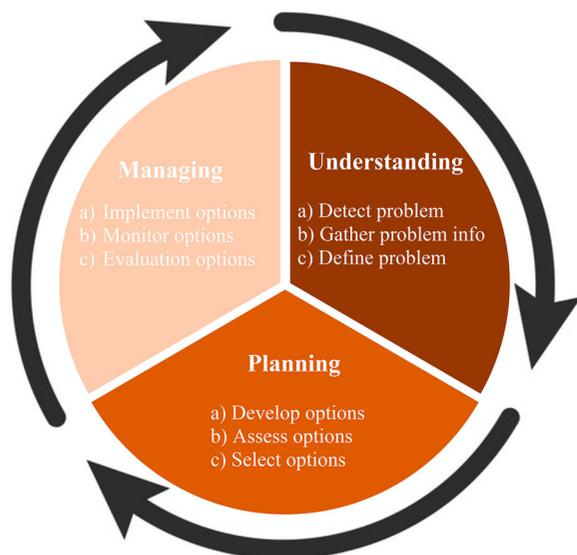
In the scope of Burkina Faso (the larger context of governance and environment), this study aims to diagnose the barriers that national stakeholders and provincial implementers (the actors) face, while understanding, planning and managing adaptation options for climate change and human health (the system of concern) (Figure 2). Through qualitative in-depth interviews and framework analysis, we meet the following specific objectives: (1) to identify the barriers to implementing climate change and health programmes and (2) to categorize and define the barriers according to the framework.

## 2. Methods

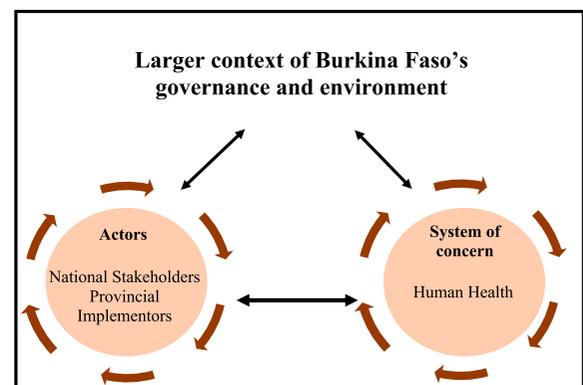
### 2.1. Study setting

#### 2.1.1. Study location

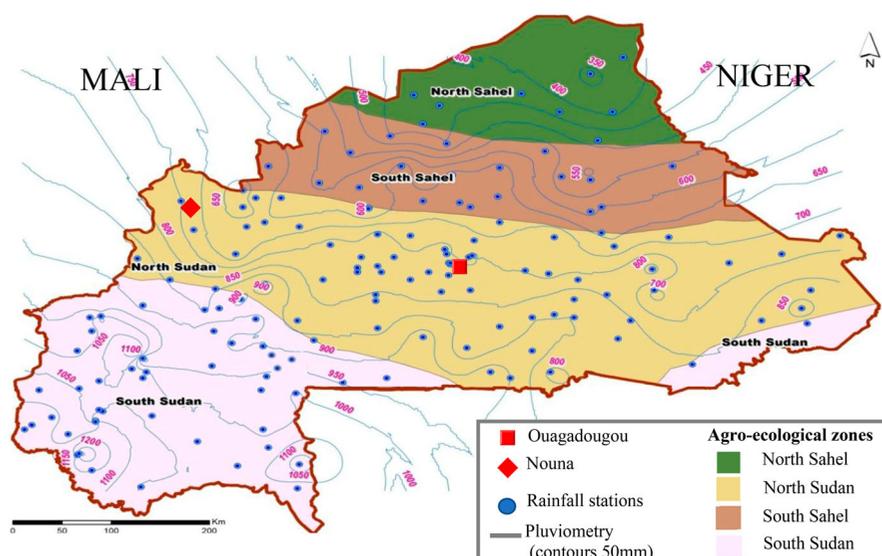
Our study took place in two parts of Burkina Faso, Ouagadougou and Nouna. Ouagadougou is located in the centre of the country and Nouna is in the North-west province of Kossi



**Figure 1.** The climate change adaptation process with its three phases (understanding, planning and management) further subdivided into three subprocesses each, adapted from the 2010 framework to diagnose barriers to climate change adaptation by (Ekstrom et al., 2011).



**Figure 2.** Illustrate the relationship between the larger context, the systems of concern and the actors in the system. The figure is been modified from the 2010 framework to diagnose barriers to climate change adaptation by (Ekstrom et al., 2011).



**Figure 3.** Map of Burkina Faso highlighting the four agro-ecological zones of the country. The map also outlines the nation's rainfall stations and pluviometry contours. Lastly, the map shows Ouagadougou (the capital) and Nouna (in the Kossi province). Figure adapted from (Fonta, 2019).

(Figure 3). Ouagadougou was selected because as the capital, it hosts all the country's national policy and administrative offices. Nouna was selected because it is representative of the country in terms of the layout of provincial offices. Furthermore, Nouna's sudano-sahelian climatic zone, annual rainfall of approximately 800 mm and single rainy season results in a combination of climatic conditions similar to many areas across West Africa (Diboulo et al., 2012; Poda et al., 2017; Fonta, 2019).

## 2.2. Study participants

For this exploratory qualitative study using in-depth interviews, policymakers were recruited and interviewed. Policymakers constitute two groups of participants: national stakeholders and policy implementers. These are briefly described, in turn, in the following sections.

### 2.2.1. Policy stakeholders

The primary policy and decision-making institutions, which employ national experts, decision-makers and policy writers in Burkina Faso, are located in Ouagadougou. The study recruited stakeholders at the national level with the capacity to influence, direct and draft policies, and or the authority to sign and pass legislation. In this study, we define national stakeholders as individuals with expertise and experience in one of four fields, the environment, agriculture, animal husbandry or health, at the national level. The study participants worked in the national government employee (ministry of the environment, agriculture, animal husbandry or health), non-governmental organizations (United Nations organizations, international organizations and non-governmental organizations) or civil society (community-based groups and research institutions). We identified a selected sample of national stakeholders in one of three ways: (1) through published literature on Burkina Faso's climate adaptation projects and policies (2) through a key informant and (3) through snowballing with interviewed study national stakeholders and policy implementers. Each participant was then initially contacted

through an email or telephone call. Next participants were engaged in the recruitment process during which they received a study information form followed by a consent form and consent taking.

### 2.2.3. Policy implementers

The national government has instituted provincial government service offices covering forestry, environment, agriculture, livestock/animal husbandry and health (Minister du Développement Rural, 2015) throughout the country's 13 regions. The provincial government offices connect the adaptation of national policies to the local population through implementation of programmes and initiatives. In this study, we define policy implementers as service members employed in one of the Kossi's provincial offices in the northwest of Burkina Faso, more specifically in Nouna. In Nouna, the intersection of climate change and health is evident in regards to nutrition and food security situation of the population. The population is under pressure to adapt their agricultural practices and their dietary habits to worsening climatic conditions, in order to withstand increasing levels of nutritional and food insecurity (Dixon, 2010; Sorgho et al., 2020a; Mank et al., 2020). The policy implementers' were initially contacted through an in-person visit to their office. After the introductory meeting, participants were provided with the study information form and the consent form. At the recruitment stage, consent taking was conducted. In four of the five province offices, we interviewed a high-ranking professional along with one other employee, either a full-time technician or a part-time field agent. Within the health services, we conducted interviews with the head of the paediatric department at the Nouna Medical Center and the head of the District Nutrition Rehabilitation and Education Center.

## 2.3. Data collection

The in-depth interviews for the national stakeholders and policy implementers were conducted using the same semi-structured guides with open-ended questions followed by probes

and prompts. The first round and the follow-up interviews were in November 2018 and May 2021, respectively. For the policy implementers, the interview guide was tested and adjusted a week prior to data collection, through two pilot interviews in Nouna. The interviews were conducted at the study participant's place of work, in French, starting in November 2018. For the national stakeholders, two pilot interviews were conducted in Ouagadougou one week prior to data collection. The interviews, in French, were conducted at the participant's place of work in Ouagadougou during the month of April 2019. Follow-up interviews were conducted in May 2021. All the interviews were conducted by the principal investigator.

All participants in the study gave informed, oral and written consent to participate and be audio-recorded. The audio recordings lasted between 30 and 80 min. At the end of each interview day, voice memos were created about the interaction with the participants, underlining any new information, general reactions and surprises from the interviews. At the end of each week, the principal investigator wrote memos reflecting on the overall progress of the interview. This was to assess and highlight points of interests and similarities in interviews. It also served to adapt the interview guide as data collection continued. The weekly benchmarks allowed for an overview of the study development and an evaluation of how much further data collection should continue. This was the process utilized to determine saturation (Mcmahon & Winch, 2018).

## 2.4. Data analysis

We anonymized the interviews with study-specific codes, performed a pure verbatim transcription in Microsoft Word and uploaded them on NVivo 12 software (QSR International) for analysis. The framework was used as the coding and analysis basis. Framework analysis, a qualitative method for applied research involving a five-step process was used: familiarization with the data, identification of the thematic framework, indexing (coding) the data, charting the data and finally mapping and interpreting the data (Srivastava & Thomson, 2009; Ritchie & Spencer, 2002).

After the collection of data in November 2018 and April 2019, the principal investigator returned to Burkina Faso in February 2020 for a results validation workshop. The aim of this field visit was to transparently present the preliminary findings to the study participants. Participants had the chance to reflect on the findings, provide feedback and ultimately validate the study results. Based on the feedback from the validation workshop, the principal investigator returned to Burkina Faso in May 2021 for follow-up interviews with a subset of the study participants.

The study results, are presented with the support of direct participant quotes (Anderson, 2010; Sandelowski, 1994). The quotes are identified with the participant's study number (P), age and place of work government (G), international organization (IO) or civil society group (CS) and the age of participants.

## 3. Results

The study comprised a total of 44 policymakers, 37 men and 7 women. The age of the 34 national stakeholders ranged from

32 to 61 years; 28 were men and 6 were women. The 10 policy implementers were 25–57 years old; 9 were men and 1 was a woman (Figure 4).

### 3.1. Identified barriers

The study participants named 8 interconnected barriers, 7 of which arose during the process of climate change and health adaptation, and one related to the larger context of Burkina Faso (Table 1).

The process barriers at the institutional level were: (1) insufficient financial resources, (2) heft of bureaucracy/lack of political will, (3) policy-politics disconnect /weak structural support, (4) frequent turnover, (5) diverging development priorities, (6) insufficient cooperation and (7) unsustainable programmes.

Lastly, the national stakeholders and policy implementers named national insecurity as a barrier arising from the current context of Burkina Faso's larger governance and environment (Table 1).

### 3.2. Defined barriers at phase 1: Understanding

Study participants expressed that, in Burkina Faso, there was a high awareness of the climate change and health relationship. Those in the policy scene understood the problem. They had sufficient information and evidence of the difficulties the country faces in regard to adaptation options to impact climate and health. This was reflected in the research findings of (Sorgho et al., 2021)

National stakeholders and provincial implementers faced the majority of barriers at the institutional level in regard to planning and managing adaptation options through programmes and projects.

### 3.3. Defined barriers at phase 2: Planning

#### 3.3.1. Heft of bureaucracy/lack of political will

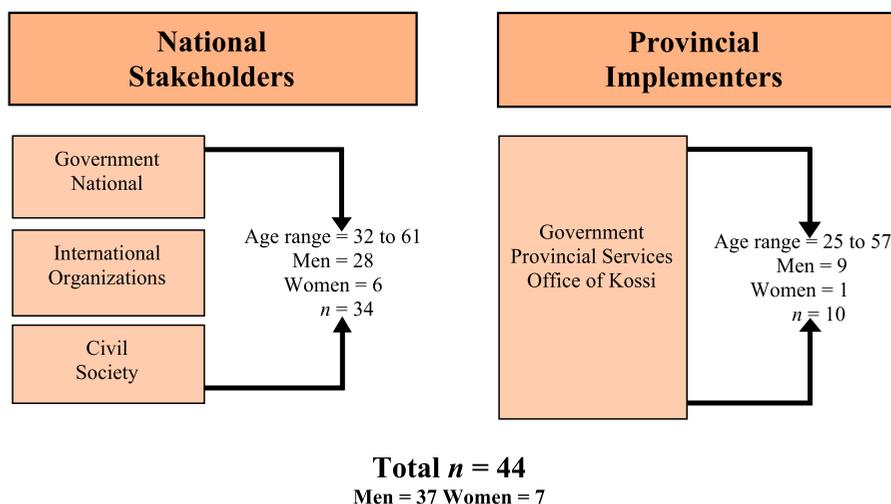
In the interviews, study participants cited the heft of the bureaucratic process as a first stumbling block in the planning phase of adaptation options. This was reflected in the difficulty, demand, time and constraints of applying for adaptation support. Participants stated a high level of effort is necessary to mobilize relevant actors and resources for adaptation programmes.

It's heaviness that [we] encounter there. Even when you have good ideas, you want to develop things, it always takes a long time to convince partners, to mobilize resources, to do this, to do that ... often, you don't have at the level of government actors who are really motivated, convinced of what they are doing ... (P07\_IO\_45)

This heavy bureaucratic process was stated to meet with complex application systems by large funding agencies, lacking availability of partners in real time for proposal drafting, difficult negotiations and a lag in the engagement of national parties, which study participants viewed as a lack of political will.

Participant (P02\_IO\_39) states that the biggest problem his institution faces in the planning of adaptation

## Study Participants: Policymakers



**Figure 4.** Characteristics of the two groups of study participants: national policy stakeholders and the provincial policy implementers.

is political will. In regards to adaptation, really ... I think that there is a political will that must be displayed, so that everyone can have this as a standard, otherwise we will not advance. While we, NGOs, are working with our small adaptation projects ... if the state, which has more strength, more resources, does not integrate this in its agenda, it remains as if we are preaching in a vacuum. (P02\_IO\_39)

Furthermore, participants perceive a particular lack of political will to follow through on strong standing positions and to defend the concept of climate change and health. As a result, political attention was passed to other health issues, for which there is stronger political will.

### 3.3.2. Diverging development priorities

The NPP described the differing priorities of adaptation work, often integrated in development work, as a barrier that results directly from the sectoral vision of development in Burkina Faso. Although they may all relate to development work, each sector (social, agriculture, nutrition, health ...) in Burkina Faso acts independently to identify and resolve problems,

Unfortunately, up to now, we have had a very sectoral development vision, which means that each sector tries to intervene in its own way, we realized that if there is no integrated vision, sectors end up stepping on each other. (P03\_G\_32)

**Table 1.** Categorization of policymaker stated barriers according to the framework to diagnose barriers to climate change adaptation.

Framework phases	Framework subprocesses	Barriers
Phase 1: Understanding	Gather problem info	
Phase 2: Planning	Define Problem	
	Develop Options Assess Options	Heft of bureaucracy/Lack of political will Diverging development Priorities Insufficient
Phase 3: Management	Select Options	Insufficient cooperation
	Implement Options	Insufficient financial resources
	Monitor Options	Frequent Turnover Politico-Policy disconnect/weak structural support
Larger context	Evaluate Options National Security	Unsustainable programming

The sectoral approach leads to different and overlapping priorities and discordance. This can change if there is a collaborative approach towards development and adaptation work. Participants elaborated the notion of competing priorities as a barrier, even within the same ministry.

There are so many priorities, so the country has to make the choice. If the country doesn't make this [climate change] as a priority, especially the health ministry, it will continue to be difficult to bring ministry partners in, to force them to work on it. But our job is to tirelessly make them understand that this [climate change] has an impact even on the quality of the health outcomes they hope to have with all the other work they do. (P14\_IO\_62)

The low priority rank of climate change and health in Burkina Faso, is reflected in the perception of the low level of government financing it receives

We tried to see roughly how much public funds are [Burkina Faso] invested in the thematic of climate change. We have found that it is less than 1% [of the public budget]. That pretty indicative ... (P07\_IO\_45)

According to participants this is likely because some actors in Burkina '... have the impression that we still have time [to deal with climate change], while they say this, the carrots are cooking'.

### 3.3.3. Insufficient cooperation

Participants cited cooperation and collaboration as a barrier across the governmental ministries, civil and international organization even though the government, IGO and academics have tried to create platforms and networks around interconnected issues.

There are networks that have been created at the level of partners, the private sector, civil society, at the academic level and in Government which make it possible to mitigate the difficulties of collaboration and coordination ... but it's still not easy. (P08\_IO\_42)

It is still a challenge since competition, not collaboration, is leading the way '... it's as if we are in a world of competition between us, the same organizations will compete for the same

call for projects ...' (P04\_IO\_42) Organizations have competitive mindset because institutions often submit proposals for the same project. This serves as an obstacle for collaboration and transparency about goals, aims and desired work.

We walk on each other's toes, that's an expression. They does this [kind of work], I also do the same thing, instead of doing work that complement each other, so the projects meets up, we end up doing, duplicating, almost the same project. (P04\_IO\_42)

The cooperation barrier leads to adaptation efforts and programme duplications where complementary programmes would have been more effective increasing resilience more holistically.

### 3.4. Defined barriers at phase 3: Managing

#### 3.4.1. Insufficient financial resources

Financing was the difficulty discussed most frequently amongst policymakers in regard to planning and managing adaptation programmes. According to participants, their institutions have developed tools and programmes centreing on various adaptation options but funding has been a persistent barrier.

The biggest problem is the financial means ... we establish our program, our work methodology, we identify the possible financial source for implementation, if we have them [the financial means] we go forward with the program, if we do not have them, everything remains at the idea stage. (P18\_G\_55)

This funding problem was not restricted to civil society and international organization, it was also experienced by government ministries. This issue was outlined in regards to Burkina Faso's national adaptation policies and resulting programmes

... the fundamental problem is the funding of these programs ... Burkina Faso had to develop its climate change adaptation program, we had temporary funding from Denmark. There were four projects implemented but after that there was no continuation up to today. The [four implemented] projects have been finished for at least seven years and there is no more funding to continue ..." (P05\_G\_59)

#### 3.4.2. Frequent turnover of staff

The frequent turnover of staff is a longstanding difficulty for stakeholders across the political sphere. Participant (P31\_G\_40) explains that staff turnover is listed as one of the biggest difficulties in his organization's 2017 internal report

In 2017 we took stock to see the state of implementation [of our national adaptation plan], we came across all the difficulties you can imagine. The first difficulty is that the administration was, so transient, those who were involved in the development of the plan are no longer working there. Some [new employees] who are there now don't even know the document! (P31\_G\_40)

This turnover, and the constant change in the relevant ministry staff constitutes a barrier to the sustainability of adaptation programmes

... with the changes in ministries, we are not able to carry program to the end. We start an initiative, then they [new staff] come we change it, so we can't get through to the end, there are a lot of changes. (P21\_G\_52)

Participants explain that the difficulty of the frequent staff turnover is exemplified by past efforts of Burkina Faso's government to integrate certain key ministries under one development agenda to streamline and facilitate development work.

We had already started to think of the concept of a single ministry, especially under the powerful minister, the late Salif Diallo, Minister of Agriculture, he had started, there were already joint Ministerial Sector Boards (CASEMs), to get the different ministers working on a joint approach ... (P21\_G\_52)

The study participant explained that the idea of integrated ministries gained much momentum and aimed to reduce the overlaps and advance work on a united front. But this idea, which originated from the Minister of Agriculture, ended with his departure from the position as there was no continuation with his successor. This is a negative effect of the constant staff turnover at the relevant ministries (P21\_G\_52).

#### 3.4.3. Unsustainable programmes/incomprehensive programmes

Participants enumerated difficulties designing comprehensive adaptation programmes because programmes today must be all-inclusive, focusing on the primary aim, but also incorporating many intersectoral components "Today, you cannot do a program without taking into account ... the women representation, without the climatic components, the water, hygiene and sanitation problems, it is a death effect, but it is an evolution" (P15\_IO\_56)

This was stated to create increasing complex requirements for designing programmes.

Once a comprehensive adaptation programme is established, participants pointed to difficulties ensuring sustainability. Socio-economic constraints hindered the full development and establishment of adaptation programmes, rendering them weak, producing poor results and reducing their chances of surviving yearly cycles

It's the socio-economic constraints. If we take, for example, in terms of the adaptation of crops in Burkina Faso, there are a lot of techniques that have been used, that have been developed now, we must move to scaling-up. How do you move to scale? previously there were the national agricultural credit unions [accessible to farmers], but since privatizations they need guarantors to get credit, ... then there are the most vulnerable producers those who do not have access to land ... If you are not the owner [of the land you cultivate], to invest in it is complicated, these are socio-economic problems ... (P30\_IO\_56)

This leave in question the sustainability of programmes from year to year.

Some communities are able to sustain adaptation activities even after the end of a project and others are not

For example, for horticulture gardening, we call them health gardens, because beyond gardening production we combine it with essentially awareness-raising on good [nutrition] practices. Gardens have been established in the region since 2012. Many [of these gardeners] continue to operate because they [participants] understood the importance of this activity. But in general, the challenge remains great when it comes to the sustainability of the activities that we manage to put in place (P01\_IO\_40)

The interviewed participants explain that projects supported by external or international funders end without continuation

when they are not taken over by the national government. This transition is a weak point in the sustainability of many adaptation programmes

It is the post-project phase that is the problem, it is the weak link of all projects in Burkina. Because after the project, the staff who have been recruited, who are on contract, are released, the civil servants are assigned elsewhere, and as the achievements of the project are not taken into account in the new planning of the ministry after 2–3 years, it's as if the project never existed ... (P13\_G\_61)

### 3.4.4. Policy and politics disconnect resulting in weak structural support

National policy stakeholders pointed to a lack of local structural support for populations that want to implement adaptation.

There is currently no support system [for the population], and everyone is doing their own thing, when you want to do something, you want to set up an adaptation technology, you have to inform yourself ... you have to manage by yourself.” (P08\_IO\_42)

From national stakeholders' perspective more could be done for the population when it comes to support. ‘The government can do better, through supervision. I realize that we do not spread information, there is not a lot of information for the population on the link between climate change and health’ (P08\_IO\_42). Social support at the local level would reinforce the capacities of populations taking up adaptation options.

... the supervision of populations at the local level has really diminished in Burkina Faso. The state must strengthen the network of supervision at the local level, build capacities, also see the transfer of technology that can be adapted at the local level for much stronger agricultural productions in our country. (P12\_G\_60)

Furthermore, this would serve to diminish the barriers at the population level.

### 3.5. Identified barriers in the general context

Participants explained that climate change and health, cannot be examined as an independent system of concern. It impacts and is affected by components beyond the control of the actors in the system. Study participants highlighted national security, as a barrier arising from the current context of Burkina Faso which effects climate change and health and adaptation.

The Northern region of the country, arguably the region experiencing the greatest variability in climatic events, is also the region plagued by jihadist insurgency in Burkina Faso. In this region, participants state that

Already there is the problem of a climatic phenomenon which impacts [the population living there]. Now the most vulnerable areas are the areas where there is also insecurity. When you go to the Sahelian strip, [area close to] Mali, Niger ... these are the insecure areas. The people [living there] will no longer be able to produce food because of the insecurity. They are already fighting against [climate] adversity and when security issues are added, they overlap. (P30\_IO\_56)

The northern regions of the country, already vulnerable due to climatic factors, are further plunged into insecurity, creating additional vulnerability and a cascade adaptation difficulties.

These problems are evident in both the planning and implementation of adaptation options.

#### 3.5.1. National insecurity at phase 2: Planning

National security is currently a priority for the government, resulting in the de-prioritization of other sectors and reduced funding

... Burkina is in a very, very difficult budgetary situation today. A very large part of its financial resources go to defense and security, given the current situation, so the rest, which is very, very small, is now being used for the other sectors ... reforms and investment. (P26\_IO\_60)

Participant (P26\_IO\_60) discusses the budgetary restriction he is facing due to the shift governmental funding ‘... as we mentioned earlier, all ministerial sectors have experienced dramatic budget cuts and partners are obliged, for example, to support these activities [previously funded by the government], such as those to improve the nutritional status of women and children’ (P27\_IO\_55).

The situation is a new barrier faced by policymakers who did not factor national security barriers in their adaptation programmes, programmes today have gone as far as requiring military assistance to deliver programme in insecure zones of the country

... The security situation, when we made our plan, there was no such problem. Now the problem is seen at the international level, it causes problem at the regional level ... we now have an G5 and CILLS participating country agreement for the security aspects which are managed by the military ... (P30\_IO\_56)

#### 3.5.2. National insecurity at phase 3: Managing

The security difficulties are also reflected at the management phase

Currently in Burkina, it [security] is one of the concrete difficulties that has arisen. There is a significant part of the border regions with Niger, Mali, where we, as program managers, can no longer do field missions to see how activities are conducted, and also to support partners, adviser, guide them ... and also ensure that what is planned, is actually implemented for the benefit of the intended beneficiaries [population]. (P19\_IO\_50)

Furthermore, when implementing their adaptation work, civil society and international organizations can no longer ensure the establishment and the sustainability of their programmes

We can't do it any more, we cannot ensure control and follow-up like before ... we find ourselves in an exceptional situation with the insecurity. It adds on to make things much more difficult, people are displaced, they [displaced and host community] need assistance, food. Already the situation was precarious, now ... it is a rather complex, this leads us to think that the [adaptation] efforts that have been done for years will crumble. (P26\_IO\_60)

## 4. Discussion

### 4.1. Adaptation

#### 4.1.1. Summary of main findings: according to the framework

In this qualitative study, through 44 in-depth interviews with policymakers (national policy stakeholder and provincial

policy implementers), 8 primary barriers were identified. These barriers were then categorized according to the framework's three phases (Moser & Ekstrom, 2010). Four barriers were categorized in phase 3 'managing' (insufficient financial resources, frequent turnover, unsustainable programming, politic-policy disconnect/weak structural support) and three barriers were categorized in phase 2 'planning' (heft of bureaucracy/lack of political will, diverging development priorities, Insufficient cooperation). The last barrier, national security, emerged from the larger context of Burkina Faso's environment. No barriers emerged or were categorized in phase 1 "understanding".

In our previous work, we reported that policymakers in Burkina Faso were aware and informed about the climate change problem in Burkina Faso, especially those related to human health (Sorgho et al., 2021). The policymaker's understanding of climate change and health aligned with published scientific literature. Recent literature also indicated that the rural population of Burkina Faso, predominately subsistence farmers, was aware of climate change as it relates to their environment and agriculture (Sorgho et al., 2021). Sorgho et al. (2020a) detailed, how farmers were experiencing climate change, and its impacts on their agricultural inputs, nutrition, health and livelihood. This explains, why phase 1 "understanding", which is about detecting, informing and defining the problem, was no longer perceived as a phase from which barriers are arising.

#### 4.1.2. *The system of concern: health*

The adaptation barriers enumerated in the literature differ heavily according to the analytic framework utilized and also on the system/sector of concern on which they centre (Huang et al., 2011; Moser & Ekstrom, 2010). Our study is one of the few, which centre on human health as the system of concern (Huang et al., 2011; Ford et al., 2010; Lesnikowski et al., 2011). Studies conducted around the world on sectors such as energy and water resources, which have been researched more extensively, have highlighted vastly different barriers than studies on the health systems (Biesbroek et al., 2013).

Key barriers to climate change adaptation in the water sector included limited exposure to hydrological modelling and variations in flood protection standards (Hamlet, 2011) (Mcneeley, 2012), whereas in the health sector studies by (Huang et al., 2011) (Ford et al., 2010) highlighted the low ranking of climate change impact in relation to health challenges and conflicts over health care provision, as important barriers. In a global literature review on public health adaptations to climate change the following barriers were identified: financial challenges, technological limits, institutional arrangements, social capital and individuals cognition as barriers, all components which were enumerated by the policymakers in Burkina Faso with the exception of individual cognition (Huang et al., 2011).

Although some barriers are specific, others have been found to be cross cutting regardless of the sector/system of concern. The cross-cutting barriers are (1) Leadership (2) Resources (3) Communication and Information and (4) Values and beliefs (Moser & Ekstrom, 2010). Each of the four cross cutting

barriers was identified in our study, reflected under the sub-categories: disconnect between policy and politics, insufficient financial resources, insufficient cooperation, lack of political will and commitment (Moser & Ekstrom, 2010).

#### 4.1.3. *The larger context: national security*

Since the early 2000s, research and policy communities have begun to examine climate change as a major threat to national and international security (Koubi, 2019; Hendrix & Glaser, 2007). Research is illustrating that climate change is redrawing the maps of population distribution, water availability, food security and disease prevalence (Brown et al., 2014). These shifts, especially in politically fragile parts of sub-Saharan Africa, are exacerbating existing tensions and triggering resource-based socio-political and ethnic conflicts (Brown & Crawford, 2008).

Dupont (2006) outlined five such dimensions that link climate and conflict. Three of these dimensions (1) climate change reshaping resource scarcity (2) climate change tipping fragile states (3) climate change driving resource competition, were enumerated by the policymakers in this study. The climate change and conflict Burkina Faso is facing directly and indirectly impact the health of populations:

These climate and conflict dimensions, which according to our policymakers are relevant to the West African setting were defined by Dupont & Pearman as: (1) climate change reshaping resource scarcity – 'Volatile weather patterns, coupled with changes in rainfall and temperature, have the capacity to reshape the productive landscape of entire regions and exacerbate food, water and energy scarcities' (2) climate change tipping fragile states – 'More frequent and intense natural disasters coupled with a greater burden of diseases such as malaria could stretch the coping capacity of developing countries. This could, in turn, tip poor countries into fragile states and fragile states into failed states' (3) climate change driving resource competition – 'Natural disasters and a changing landscape could contribute to destabilizing and unregulated population movements (so-called climate refugees). This would bring previously separate groups in competition for the same dwindling resources' (Dupont, 2006).

In addition to these dimensions linking climate and conflict, policymakers in our study elaborated another conflict facing Burkina Faso: violence emanating from neighbouring Mali.

Burkina Faso is facing violent threats emanating from the conflict spilling from Mali into the north of the country. The conflict, which gained international attention in 2012 during the Tuareg-dominated rebellion led by the National Movement for the Liberation of Azawad and the takeover of northern Mali by the radical Islamist groups Al Qaeda in the Islamic Maghreb, contributed to the destabilization of the Malian government (Diallo, 2017). Since then, the conflict and resulting violence has spilled into communities all across Mali and into neighbouring countries. In order to address the security challenges posed by the situation in Mali, a new regional organization, the G5 Sahel, was formed by Mali, Chad, Burkina Faso, Mauritania and Niger in February 2014. G5 Sahel is actively working to drive back the various non-state armed groups and curb jihadist cross-border operations. The group

members have each provided financial and military resources to face the problem, resulting in the shifts in ministry budgets in Burkina Faso, described by our study participants (Diallo, 2017; Rupesinghe, 2018).

Literature on the conflict argues that although some of the ideology, affiliations and aims of the various armed group seem new and the recent conflict in Central Mali has reached global levels of concern, at its core, it's still fundamentally driven by local competition over land resources between farmers and herders in an area exposed to environmental stress (Diallo, 2017). Groups such as the Katibat Macina in central Mali have created broad-based appeal with nomadic pastoralist community by exploiting longstanding grievances against the Malian state and existing conflicts over resources between communities (Rupesinghe, 2018). This competition over land, pasture and socioeconomic opportunities is likely to be amplified as climate change further stresses the environmental resources of the region.

#### 4.1.4. Categorizing barriers: according to scales of influence

Moser and Ekstrom (2010) created a theoretical framework, to address interventions and to overcome barriers based on the notion of 'scale of its influence'. Scales of influence describes an actor's ability to overcome a barrier and the availability of resources to overcome that same barrier. Actors at different levels of government and institutions have varying degrees of decision-making authority and are faced with resource availability determined by a variety of factors. The framework defines the *scale of influence* of actors across four categories: proximate contemporary, proximate legacy, remote contemporary and remote legacy (Moser & Ekstrom, 2010).

The 7 of the 8 barriers enumerated in our study are perceived by study participants as fitting two categories (i) remote and contemporary and (ii) remote and legacy.

- (i) Three barriers, *heft of bureaucracy/lack of political will, insufficient cooperation* and *unsustainable programmes* are described by participants as remote and contemporary, meaning that the barriers arise from current structural problems at national levels of government. Furthermore, it means that these are barriers over which local government officials have limited financial authority and little political influence.
- (ii) Four barriers, *frequent turnover, diverging development priorities, insufficient financial resources, and disconnect in policy and politics*, are described as remote and legacy. This means they are barriers arising as a result of the decisions made and systems constructed by past, not current, administrations. It also means that they are barriers that can only be addressed at the national level of governance.

Although the barriers are categorized individually, it's important to note that they are interconnected. For example, *frequent staff turnovers*, is connected to *insufficient financial resources* and *unsustainable programmes*. Frequent turnovers are often caused by insufficient financial resources. The two-to-four-year funding timeline of projects are mirrored in

staff contracts. At the end of the project-funded timeline, the staff is assigned to another project or leaves the institution altogether. This effects the projects remaining staff's ability to apply for extensions or additional funds, and the lack of staff members impacts the projects ability to continue to support the communities with whom they engage, reducing the chances of sustainable continuity. When working to overcome the barrier of frequent turnovers, one must address it's multiple causes, which will inevitably impact other barriers (i.e. insufficient financial resources, unsustainability of financial resources...). The interconnected nature of the barriers renders them complicated to resolve and marks one of the core difficulties in addressing and overcoming them. Another difficulty is the fact that barriers are dynamic in nature, time and perspective (Ekstrom et al., 2011; Moser & Ekstrom, 2010).

#### 4.2. Limitations

The findings of our study need to be interpreted with caution. We have applied a framework to analyze and structure the results. However, the complex system of climate change adaptation is rather dynamic in the context of Burkina Faso. As a consequence, some of the enumerated barriers may fit in more than one scale of influence or dimension of conflict, depending on the approach and timeframe. In addition, fewer women than men were included in our study. While this might be considered a limitation, the study sample reflects the fact that women in Burkina Faso remain underrepresented in the political sphere, in both, legislative and policymaking positions (INSD, 2019; Japan International Cooperation Agency, 2013; UOF, 2016; Tiendrébéogo-Kaboret, 2002).

#### 4.3. Strengths

The majority of adaptation studies were conducted in developed countries with a focus on water-related domains such as water management, coastal zone management, or multiple sectors simultaneously (Biesbroek et al., 2013). Our study stands out, as it focuses on health as the system of concern and Burkina Faso, a low-income country. Therefore, our study is (a) filling a gap in the literature regarding barriers in a low-income country and (b) building scientific evidence on health as the system of concern.

Another strength of the study is the active reduction of biases and the active enhancement of validity during data collection and analysis. The principle investigator of the study, who has over a decade of experience in Burkina Faso, was the sole interviewer and first author of the publication (Dwyer & Buckle, 2009). The interviews and entirety of data analysis were conducted in French and only the final quotes were translated into English, this reduced the threat to validity associated with the translation of the entire data set (Van Nes et al., 2010).

Three processes were implemented to ensure reliability and transferability of the research. First, information-rich reporting of research data and context was key for facilitating transferability of the research to similar contexts and settings (Shenton, 2004). Next, the distance between study participants'

experiences and their interpreted meaning was reduced by conducting an on-site validation workshop in Burkina Faso, where the preliminary results were presented to half the study participants in person or over the telephone. The participants had the chance to comment on whether the study findings properly reflected their perspectives and adequately portray their meanings (Polkinghorne, 2007). Lastly, data source triangulation was conducted between, daily observations, weekly memos and the recorded interviews.

#### 4.4. Perspectives for research and policy

##### 4.4.1. Research

Based on the study findings we make two recommendations for research: (i) investigating the power dynamics of policymakers and the systems they work in and (ii) researching the knowledge gap on overcoming barriers. Regarding power dynamics, our study results indicate that policymakers, even those at the highest level of government, civil society and international organizations, perceived themselves to lack some of the power, control and authority to impact change in the face of the listed institutional barriers. This perceived lack of influence could be investigated through a two-fold approach. The first one is using qualitative research to understand the reasons behind policymakers' perceived sense of disempowerment and to determine how to change their perception. The second approach is using political science research to identify the role of political institutions and their system structures in contributing and fostering the disempowerment of the policymakers working within their structures. Concerning the techniques to overcome the identified barriers, our study highlights that further research is necessary to find effective and sustainable solutions to address these barriers. Research on addressing the complex and dynamic barriers is warranted. Systematic literature reviews on methods for overcoming institutional barriers can provide policymakers with background information, tools and techniques on how to approach and resolve the barriers that formulate blockades.

##### 4.4.2. Policy

Our research found that policymakers understood the connection between climate change and health, had the political will to conduct adaptation work but faced multiple barriers, part of which stemmed from the fact that climate change and health has remained a marginalized issue in Burkina Faso. In order to push the nations' climate change and health agenda forward and gain the necessary influence and resources to overcome their institutional barriers, policymakers are advised to (i) lobby and promote climate change and health across all political institutions and (ii) emphasize the economic co-benefits of climate change adaptation for health (iii) accomplish their current and diverse adaptation funding commitments. Regarding the lobbying groups, these will collaboratively use their political influence and currency to draw public attention to the issue of climate change and health, while simultaneously pushing the issue higher on the national agenda. Lobbying groups would then broaden the network of interest on the issue, guide institutions looking to undertake climate and health-related work, and connect those already engaging in such

adaptation work. This will constitute a solid collaborative foundation, on which to apply pressure on the government and draft applications for large-scale international funding. For the economic co-benefits, reframing of the climate change and health issue may constitute a powerful tool to make the subject more cross-cutting and appealing. Using scientific evidence that highlights the economic benefits that Burkina Faso can gain by integrating adaptation programmes in climate-resilient health systems can serve as a motivator for policymakers outside the health sector. This, in addition to successfully completing and properly reporting their current climate change commitments, can also be used as a leverage to insist on greater financial support from international agencies such as UNFCCC.

## 5. Conclusion

Policymakers in Burkina Faso have the information, knowledge and will to undertake adaptation work. Their experienced institutional barriers include insufficient financial resources, heft of bureaucracy/lack of political will, policy-politics disconnect/weak structural support, frequent turnover of staff, diverging development priorities, insufficient cooperation, unsustainable programmes and the current national security situation. These constitute a blockade in the implementation of sustainable adaptation. Of these eight identified barriers, four were identified in the management phase, three in the planning phase and one in the larger context of Burkina Faso's governance and environment. No barriers emerged in the understanding phase. The scale of influence of actors working at the national level of government was deemed high, but the scale of influence on resources was perceived as low, regardless of the level of government/institution. Despite the fact that high-level national stakeholders were categorized as having the power to influence change, the policymakers in our study, even those of the highest level, perceived themselves just as powerless as local actors in this system of concern.

Overall, the barriers discussed by policymakers underline weak government structures, rigid systems and a lack of financial resources. This is indicative of a need for systemic reform, which can be addressed by first (i) investigating the power dynamics of policymakers and the systems they work in, (ii) conducting systematic research to fill the knowledge gap on overcoming institutional barriers, (iii) building a lobbying group focused on pushing climate change and health on the national agenda and (iv) utilizing tool such as articulating the economic co-benefits of a climate-resilient health system for the entire nation.

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## Ethical considerations

All study participants provided their written and verbal consent to participate in the study. The Ethics Committee of Heidelberg University [Identification Number: S-594/2018] and the ethical committee of the Centre de Recherche en Santé de Nouna [Deliberation Number N2018-013/CIE-CRSN] reviewed the study protocols and materials, and independently approved them before the start of the study.

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