

# Introducing the Multi-Dimensional Injustice Framework: a case study in climate-related health risks

*Morten Fibieger Byskov, Keith Hyams and Oyinlola Oyebode*

*Abstract:* Recent years have seen a shift in focus from research that asks how adaptation to climate change can be achieved, to research that asks how *fair and equitable* adaptation to climate change can be achieved, reflecting a broader turn in the climate literature towards pathways for *just transitions* in the face of the climate crisis. This paper introduces the Multi-Dimensional Injustice Framework (MDIF) as a normative framework for understanding, articulating, and tackling issues of justice and fairness in complex development challenges such as climate adaptation. The MDIF provides a set of indicators to identify distributive and procedural injustices that can be utilised within development and adaptation policy and planning. The paper further demonstrates how the MDIF can be applied in practice using a case study of climate-related health risks in the informal settlements of Lusaka, Zambia.

*Keywords:* Climate adaptation, equity, fairness, just transitions, climate justice, health risks, informal settlements, multi-dimensional injustice.

*Notes on the authors:* see end of article.

Recent years have seen a shift in focus from research that asks how adaptation to climate change can be achieved, to research that asks how *fair and equitable* adaptation to climate change can be achieved. This reflects a broader turn in the climate literature towards pathways for *just transitions* in the face of the climate crisis. Such an agenda requires not only empirical research, but also engagement with philosophical theories of justice (Byskov *et al.* 2019). What, for example, are people owed as a matter of justice, such that adaptation can be said to be fair? And how do structural inequalities affect what people are owed as a matter of justice in adaptation?

In this article, we introduce the Multi-Dimensional Injustice Framework (MDIF). The MDIF provides a normative framework for understanding, articulating, and tackling issues of justice and fairness in complex development challenges, such as, in particular, in regards to climate impacts and climate adaptation. The MDIF holds (i) that the ethical challenges posed by many development issues are multi-dimensional in nature, in the sense that they cannot be reduced to a single primary indicator; (ii) that these dimensions are best conceptualised using the language of (in)justice; and (iii) that resolving development challenges requires recognising and addressing the underlying issues of injustice and inequality. Consequently, the MDIF introduces a set of indicators to identify distributive and procedural injustices that can be utilised within development and adaptation policy and planning. We show how the MDIF can be applied in practice using a case study of climate-related health risks in the informal settlements of Lusaka, Zambia.

The article is structured as follows. In the first section, we briefly discuss the need for a structured framework to capture (in)justice issues in adaptation and evaluate the existing literature in that regard. In the second section, we introduce the MDIF and its three propositions. We further detail how the MDIF can help categorise and identify injustices through a set of distributive and procedural injustice indicators. In the third section, we explore climate-related health risks in the informal settlements of Lusaka, Zambia, through the lens of the MDIF.

## **1 A framework for (in)justice in adaptation?**

Climate change will negatively impact the lives, livelihoods, and wellbeing of individuals and communities around the world. In many cases, especially in low- and middle-income countries, changes to the local environment due to the negative effects of climate change are already being experienced by the most vulnerable and climate-exposed communities. Moreover, research has shown that climate vulnerabilities and adaptive capacities can vary greatly depending on a number of factors (Carmin *et al.* 2015, Downing *et al.* 2005, Harlan *et al.* 2015, IPCC 2014, chapter 13,

R.E. Kasperson & Kasperson 2005, J.X. Kasperson *et al.* 2005), such as gender (Andrijevic *et al.* 2020, Demetriades & Esplen 2008, Denton 2002, Edvardsson Björnberg & Hansson 2013), physical and mental health (Ford 2012, Ford *et al.* 2014, Paavola 2017), race and ethnicity (Ford *et al.* 2016, Johnson *et al.* 2021, Loughran & Elliott 2021, Phadke *et al.* 2015, Whyte 2013a), and socio-economic and legal status (Eriksen & O'Brien 2007, Hallegatte *et al.* 2018, Harrold *et al.* 2002). Given these inequalities in terms of adaptive capacities and adaptive outcomes, it is necessary to examine how fair and equitable adaptation can be ensured, including what obstacles stand in the way. This requires engagement with normative theoretical discussions about what people are owed as a matter of justice in adaptation and how structural inequalities affect their adaptive capacities (Adger 2006, Byskov *et al.* 2021). Consequently, we aim to present a clear and comprehensive framework for understanding how the different forms of injustice interact to exacerbate climate vulnerabilities, compromise adaptive capacities, and undermine adaptation efforts.

Justice issues in climate adaptation have received increased attention in recent years. Researchers have highlighted the need to address inequalities and injustices both in terms of the distribution of resources and capabilities (Edwards *et al.* 2016, Holland 2017, Hughes 2013, Schlosberg 2012, Schlosberg *et al.* 2017) as well as in terms of the inclusion (Schlosberg *et al.* 2017, Yang *et al.* 2021), participation (Shi *et al.* 2016), and recognition (Angelovski *et al.* 2016, Chu & Kavya 2019, Massarella *et al.* 2020) of vulnerable communities in climate adaptation planning. This literature makes a valuable contribution to highlighting specific justice issues within adaptation. It is important, however, also to capture the multi-dimensional nature of justice in adaptation and the interconnectedness that exists between different forms and dimensions of (in)justice.

A nascent literature acknowledges that maladaptation is underpinned by *multiple* forms of injustice. For example, Schlosberg (2012) argues that we need an account of how misrecognition leads to maldistribution and how people are able to convert a given set of resources into capabilities. Byskov *et al.* (2021) also highlight six justice issues that adaptation and resilience planning must take into account, including its distributive (the just distribution of resources and responsibilities), compensatory (for example, remedying unjustified losses by restoring people to their positions *ex ante*), and procedural concerns (equitable representation and effective participation in decision-making). Malloy and Ashcraft (2020) argue that just adaptation planning requires inclusion of vulnerable populations, recognition of systematic injustices, and a focus on incremental evaluations of implementation.

Building on these approaches, the MDIF aims to provide a framework that not only acknowledges the different aspects of justice but also shows how they reinforce each other and how they should be categorised in practice. As such, our focus is not

so much on providing a method for analysing differences in adaptive capacities and outcomes (Coggins *et al.* 2021, Harlan *et al.* 2015, Shi *et al.* 2016, Ziervogel *et al.* 2017), but on building on, and extending, existing literature on this topic in two novel ways.

First of all, it brings the disparate literature together to provide an overarching framework that not only expands on the existing multidimensional justice in adaptation theories, but also shows how these distinct injustices connect to and reinforce each other. For example, the framework considers lack of recognition as a distinct injustice from a lack of opportunity for participation within development planning in order to highlight the fact that it is possible to create pathways for participation in development planning, yet fail to give sufficient recognition to relevant stakeholders, such as climate-vulnerable communities. By making this distinction, the framework can help show how the full inclusion of vulnerable groups requires not only pathways for participation but also recognition of their values, reasons, and knowledge. Although we will not be able to explore each connection across dimensions in detail, similar connections between distinct dimensions of justice exist between, for example, resources and capabilities; representation and recognition; resources/goods and participation; capabilities and participation; and recognition and goods/resources. Using the language of justice can help illuminate how different forms of (in)justice can undermine and/or reinforce each other.

Second, as we further argue in the next section, the reference to justice provides a *normative* basis that goes beyond the merely descriptive analysis of inequality in adaptation. From a normative philosophical perspective, inequality is not necessarily unjust. For example, inequalities in the recognition of people's knowledge are not necessarily unjust: we routinely recognise the knowledge of experts as better informed in a particular area than the knowledge of non-experts. However, mis- and under-recognition of knowledge *can* be unjust, such as in the case of Indigenous knowledge, which is often unfairly dismissed, in favour of 'Western' scientific knowledge, despite it carrying insights into local socio-economic and environmental aspects that are important for the successful implementation of development plans (Byskov 2020, Ludwig & Poliseli 2018, Whyte 2013b). The language of justice—in this case epistemic injustice—specifically refers to inequality that is unfair and why that makes it unjust, something that cannot be achieved by appealing to related concepts, such as inequality.

## 2 The Multi-Dimensional Injustice Framework

The MDIF is a normative framework that offers a structured way of thinking about justice issues in climate impacts and adaptation, as well as development policy and practice more broadly. The MDIF holds three propositions.

First, it notes that most development challenges, including climate adaptation, are multi-dimensional in nature in the sense that they engage several different factors, which interact with each other. For example, health risks in urban slums are the result of an interaction between socio-economic factors, healthcare provision, individual health choices, and climate-related factors including droughts and rainfall. The MDIF offers a way to conceptualise such challenges as interlinkages across analytically distinct dimensions.<sup>1</sup>

The second proposition is that normative aspects of the interlinkages across dimensions can be conceptualised using the language of (in)justice. Such language provides a way to describe the fundamental wrongs and harms that lie at the root of most development challenges. For example, the issue of climate-related health risks in urban slums is underpinned by socio-economic factors that are not directly health- or climate-related, and which cannot be adequately captured without highlighting their normative dimensions. The MDIF provides a language to describe the ways in which such factors constitute interacting injustices by virtue of being arbitrary and unjustified, and by virtue of their unequally and unfairly exposing some populations to greater health risks than others.

Third, the MDIF holds that resolving development challenges requires recognition of, and policy that aims to address, the underlying issues of injustice and inequality highlighted by the framework. Development solutions that do not address the underlying injustices will fail to address the root of the problem and are thus likely to reproduce existing injustices and create new injustices further downstream. Consider, for example, how Indigenous peoples are often socio-economically disadvantaged (a distributive injustice) and politically marginalised (a procedural injustice) within a given society. As Satyal *et al.* (2021) show, this has frequently led to a lack of consultation of Indigenous peoples—in this case, the Batwa people of Uganda—in national climate planning, resulting in adaptation policies that have further disadvantaged and marginalised the Batwa people within society.

<sup>1</sup> Within philosophy, the term ‘analytically distinct’ is used to refer to two (or more) concepts that can be *theoretically* distinguished at least, although not often in practice. For example, social justice and economic justice are theoretically (that is, analytically) distinct from each other as they concern two different aspects of justice, yet in practice achieving social justice will often depend on achieving economic justice and vice versa.

The MDIF divides injustice into two main categories, namely distributive and procedural indicators of injustice, each of which is separated into sub-indicators. In the following, we explain each of these main and sub-categories of injustice indicators in more detail. An overview of the MDIF can be found in Table 1.

**Table 1.** An overview of the multi-dimensional injustice framework. Adapted from Satyal *et al.* (2020).

<i>Indicator</i>	<i>Description</i>	<i>Possible issues</i>
<i>Distributive justice indicators</i>		
Goods and resources	To what extent are goods and resources required to live a minimally decent life, such as adequate housing, landownership, health care, and education, distributed in a fair and equal manner?	Basic needs for human development and functioning (food, clothing, shelter, access to education and health) are lacking.  Distribution is affected by discrimination.
Capabilities	To what extent is the substantive opportunity to achieve certain doings and beings, such as the rights to food and development, distributed in a fair and equal manner?	Personal, socio-economic, and/or environmental factors affect the extent to which someone can convert a good, resource, or right into substantive opportunities.
<i>Procedural justice indicators</i>		
Recognition	To what extent are the knowledge, interests, and needs of communities recognised within policy and planning processes?	Knowledges and interests are treated differently based on prejudices about race, gender, social status, etc.
Representation	To what extent are local communities (substantively) represented within the policy and planning process: for example, through interest organisations?	Elected or chosen representatives do not have the best interest of communities at heart.  Social marginalisation leads to under-representation within public and political discourse.
Participation	To what extent do local communities participate in and have the opportunity to participate in policy and planning processes?	There are limited opportunities for and possible restrictions on participation in decision-making.

## 2.1 Distributive injustice indicators

Distributive injustice concerns whether everyone is given their fair share of the overall distribution, according to what they are owed as a matter of justice (Lamont & Favor 2017). If someone receives less (or more) than what they are owed, this is a distributive injustice. Note, this does not necessarily imply that a distribution gives everyone an *equal* share. Who gets how much depends on the theory of justice that we adopt. Rawls (1999, 2001), for example, allows that inequalities are justifiable when they benefit the worst off. Dworkin (2002) and other luck egalitarians claim that inequalities due to differential choices are sometimes permissible. Prioritarians (Parfit 1997) argue that the focus should not be on equality per se, but on prioritising improvements to the worst off over (comparably large) improvements to the better off. Sufficientarians, such as Frankfurt (2000), hold that what matters is just ensuring that everyone has *enough*.

According to the MDIF, distributive injustices can usefully be divided into those that concern the distribution of goods and resources, and those that concern the distribution of capabilities.<sup>2</sup>

The *goods and resources* injustice indicator is concerned with whether the distribution of goods and resources is fair (Dworkin 1981). Resources here denote more tangible things that can be (re)distributed, such as land, building materials, and money, while goods denote more intangible things, such as services, certain types of legal rights, and the environment. Consider, for example, how many informal settlement communities use communal water taps that often run dry during seasons of drought, limiting the supply of water than can be shared. If everyone is owed water as a matter of justice, it is necessary to consider how the limited supply of water can be distributed such that everyone receive their fair share.

An unjust distribution of goods and resources can have a major impact on people's lives. Those who receive more than that which they are owed gain an unfair advantage over people who have less than what they are owed. For example, an unfair distribution of property rights means that communities lacking such rights have

<sup>2</sup>It might be argued that a third distributive category should be concerned with the distribution of harm. It is important to take into consideration within climate adaptation planning who will suffer the negative effects of climate change and to what extent the risk of harm from climate change is fairly distributed. While this is certainly true and a relevant normative concern, we have decided not to include the distribution of harm as an indicator because the distribution of harm is a direct function of the two other kinds of distribution, namely of goods and resources, and capabilities and functionings. Climate vulnerabilities and adaptive capacities—and thus the extent to which someone is exposed to risks of harm from climate change—are highly determined by the goods, resources, and capabilities that one has, and the unequal distribution of these directly leads to the unequal distribution of harm.

diminished opportunities to invest in resilient housing and infrastructures as a way of adapting to climate risk.

The second dimension of distributive justice looks beyond what goods and resources people have, to what they are able to do with these goods and resources. This is what is denoted by the terms of *capabilities* and *functionings*. Capabilities are the real, or substantive, opportunities that people have: for example, to be educated, to have a job and income, to be well nourished and well sheltered, and to be healthy and secure. Relatedly, functionings are capabilities that have been realised (Robeyns & Byskov 2020). The extent to which people are able to convert goods and resources into such substantive opportunities differs between people.

The distribution of goods and resources can be seen as being concerned with what people have at their disposal as they navigate their daily lives, while capabilities and functionings can be conceived of as the outcome for their lives of using those goods and resources (Robeyns 2017: 83). A discrepancy between the input and the output—for example, where someone is given their fair share of goods and resources yet is unable to convert them into capabilities and functionings—can be an indicator of structural injustices that keep some people from achieving their fair share of capabilities and functionings.

## 2.2 Procedural injustice indicators

One of the ways in which structural injustices are created and perpetuated within policy is due to the lack of consideration of how different policies affect different people, as well as the extent to which their claims are recognised as valid within the decision-making process. As Fraser (1996, 2007, Fraser & Honneth 2003) has argued, (in)justice cannot be reduced to a concern with fair redistribution. What Fraser here highlights is that the procedure by which policies are developed can itself be unjust, independently of any distributive injustice arising from the policy. The procedure may be unjust, for example, because the claims of certain groups are not recognised as equally valid, or their interests are not adequately or fairly represented.<sup>3</sup>

The MDIF divides procedural injustice into three indicators: *recognition*, *representation*, and *participation*. The first, *recognition*, concerns the extent to which the knowledges, interests, and needs of communities are recognised. Recognition serves both a democratic and an epistemic purpose within procedural justice, and misrecognition can, accordingly, lead to both democratic and epistemic forms of injustice. In the first case, the equal recognition of other people's claims is a fundamental

<sup>3</sup>This influence also goes the other way: socio-economic inequality is also a determinant of political influence (Christiano 2010).



principle of democracy (Fraser & Honneth 2003). As Fraser (Fraser & Honneth 2003, chapter 1) argues, unless everyone recognises each other as equals—for example, if I do not think that your claim to receive a share of some resource or good is equally valid to my claim to that good or resource—then a fair procedure (and, in many cases, a fair distribution) is unlikely to be achieved. In the second case, the recognition of knowledges and experiences can provide a better and more in-depth view of how different policies impact different people, including the structural constraints that influence the extent to which someone can achieve the same capabilities and functionings with the same goods and resources. Yet, knowledges and experiences are often treated differently based on prejudices about race, gender, social status, and so on. This leads to instances of epistemic injustice (Fricker 2007), in which the knowledges and experiences of those who are subject to these prejudices are not recognised as valid input to the procedure, and their holders have less epistemic power to influence the decision-making process.

Recognition alone—although a fundamental prerequisite for both representation and participation to be just—is insufficient for just policymaking in the absence of some mechanism by which recognition can be translated into substantive influence. Such influence can be exercised indirectly through representation and/or directly through active participation. *Representation* happens when someone claims to speak for—to represent the interests of—a particular group of individuals (Saward 2010). As such, representation is an indirect way of ensuring that the interests of communities are represented within development policy. The lack of such representation is an injustice because it means that the interests of those communities are not represented within the process, in turn increasing the risk of creating and reproducing socio-economic inequalities and injustices. As Saward notes, the claim of a representative to represent a particular group or community can be stronger or weaker, depending on the extent to which the represented community agrees with the way that their interests are represented. Representation that does not align with the represented community's actual interests is misrepresentation and is an injustice to the affected communities insofar as it leads to their interests being unfairly under-prioritised, resulting in the reproduction and exacerbation of socio-economic inequalities and injustices.

One way for vulnerable communities to influence development policy and planning more directly is through their active *participation* in the procedure. Measuring participatory justice cannot be reduced to whether communities participate in the procedure, because participation also depends on whether there exist substantive opportunities for them to participate in the first place. This is so in two ways. First, opportunities for participation may be unfairly and unequally distributed between communities, such that members of some communities are more able to participate in and, by extension, influence the decision-making process. Consider, for example, how someone might be

interested in participating in a community development programme, yet be prevented from participating due to circumstances such as having to work during the meeting hours, or having no means of transportation to get to the meeting venue. Second, even if substantive opportunities for participation exist, there is no guarantee that participation will translate into actual influence. This connects to the issue of recognition above, in which the knowledge and interests of different communities are, for no justified reason, given different weight within the process, such that their influence is unfairly unequal, resulting in an unjust procedure and subsequent distribution.

It is tempting to think of the three procedural injustice indicators as moving from less to more substantive involvement in social policy, with recognition being the weakest commitment to taking the concerns of communities into account and participation being the active involvement of communities in policymaking. However, this would be a mistake because recognition is fundamental to the other two justice indicators. For example, participation is meaningless unless the concerns and knowledge of participants are actively being recognised, while indirect representation of communities might be more just insofar as representatives recognise these concerns and knowledges.

In sum, the MDIF provides a way to capture the multi-dimensional nature of development challenges, how they are rooted in issues of injustice, and how these different forms of injustice are interconnected and reinforce each other. In the following section, we show how the MDIF can be applied in practice by using it to analyse a particular development issue, namely the case of climate-related health risk in urban slums.

### **3 A case study of multi-dimensional injustice: urban slum health and climate change**

The right to a healthy mind and body is recognised as an important aspect of social justice (Ruger 2004). Not only is a good health valuable in itself—it is also necessary to be healthy in order to pursue other goals in life (Nielsen 2014). In turn, in order for people to be healthy, they must have the necessary means and services to lead healthy lives, including access to decent health care, nutritional food, clean water, adequate education and information, working sanitation, resilient housing, and protection from the environment. If people are owed the right to a healthy life as a matter of justice, they also have a right to the conditions that enable them to lead a healthy life and denying these amounts to an injustice. Yet global and local socio-economic inequalities mean people in different parts of the world—especially in low- and middle-income countries—have widely different health opportunities (Marmot 2005).

One of the most vulnerable populations in terms of health are urban slum communities. The term ‘slums’ is used to denote urban areas with a high concentration of poor people, often with inadequate access to safe water, inadequate access to sanitation and other infrastructure, poor structural quality of housing, overcrowding, and insecure residential status (UN-Habitat 2007). ‘Slums’ and ‘informal settlements’ are often used interchangeably, but they are analytically different despite often overlapping in practice: Slums are urban areas of poverty, yet they do not necessarily consist of informal housing that has been developed outside of the formal and legal planning regulations. Conversely, informal settlements are developed outside of formal housing plans, but they are not necessarily poor and do thus not necessarily constitute slums. Lusaka’s informal settlements are all slums. Hence, in the following, we talk about informal settlements in the context of Lusaka (with the understanding that they are also slums) and about slums in the context of climate-related health risks in general.

It is estimated that one in every three individuals in Sub-Saharan Africa lives in urban slums. As a result of poor access to services, urban slum populations are especially vulnerable to health risks. These include infections, injuries, malnutrition, diarrheal diseases, and respiratory diseases (Ezeh *et al.* 2017). Changes to the local and global climate threaten to exacerbate these health risks. For example, increased risks of flooding as a result of longer and heavier rainy seasons increase exposure to infectious diseases through the contamination of drinking water; physical injuries as a result of collapsing housing structures or landslides; and respiratory diseases due to indoor cooking with charcoal. Meanwhile, droughts threaten food supplies and access to clean and safe water.

In the following, we use the MDIF to analyse the case of climate-related health risks in Lusaka’s informal settlement communities. With an urban population of 2.4 million individuals, an estimated 70 per cent of whom live in one of the 37 informal settlements (UN-Habitat 2021), Lusaka is a prime example of an urban area that is prone to and at risk of increasing health risks in the face of climate change. Lusaka’s informal settlement population faces a number of climate- and health-related risks. In general, they have poor access to adequate water and sanitation (Ministry of Local Government and Housing 2017: vi): For example, water within the informal settlements is accessed through centralised wells that are shared between several households and often dry out during prolonged dry-spells, while most households in the informal settlements only have access to shallow wells and pit latrines that, in addition to being shared between households, often overflow during rainy seasons, spreading fecal matter.

Each year the rainy season threatens to flood and destroy the poorly constructed homes, many of which are built from makeshift materials, in addition to increasing

breeding grounds for communicable diseases: in 2018–17, Lusaka experienced an outbreak of cholera, which led to 547 infected and 15 deaths (WHO 2017), and which originated in and was primarily spread throughout the informal settlements. Additionally, Lusaka faces perennial water shortage, leading to issues of hygiene and security and lack of electricity and food security. Lusaka's residents also experience a lack of electricity with frequent power outages when the water levels in rivers are too low for the hydroelectric generators.<sup>4</sup> These power outages in turn lead to increased health risks, such as respiratory diseases and burn injuries due to charcoal cooking as well as safety issues as homes and streets in the informal settlements are poorly lit.

### 3.1. The multi-dimensional causes of climate-related health risks in urban slums

Many of the health risks faced by the residents of Lusaka's informal settlements have several causes; some are interrelated; and most are exacerbated in one way or another by climate change. Respiratory disease, for example, is in itself a non-climate-related health risks caused by general air pollution, poor housing, and the use of charcoal for cooking. All three causes, however, are exacerbated by climatic factors: air pollution lingers in times of high temperature and little wind; poor housing means that inhabitants are exposed to bad weather, such as cold, heat, and rainfall; while bad weather forces inhabitants to cook inside, further exposing them to dangerous charcoal smoke. As climate change increases the risk of extreme weather events, such as extreme heat, prolonged cold periods, and increased rainfall, cases of respiratory complications are likely to follow. Likewise, waterborne communicable diseases, including malaria, dengue fever, hepatitis A, yellow fever, and diarrheal diseases such as cholera, are climate-related diseases that affect inhabitants of Lusaka's informal settlements. Increased and prolonged rainfall as a result of climate change leads to floods that in turn increase breeding sites for mosquitoes carrying diseases, such as malaria, yellow fever, and dengue fever. Increased rainfall combined with poor sanitation structures, such as shallow wells, lack of piped water, and pit latrines, and poor disposal of waste also means that water reservoirs get frequently flooded with fecal matter and waste during rainy seasons, leading to an increase in diarrheal diseases.

The causes of climate-related health risks in urban slums have both distributive and procedural justice dimensions along the five indicators set out by the MDIF. That is, climate-related health risks are often further aggravated by *socio-economic and*

<sup>4</sup>Zambia relies on hydroelectric power. However, although its rivers should produce enough power for everyone, a botched privatisation of Zambia's copper mines, which promised to provide the mines with cheap electricity, means that 70 per cent of the national electric grid capacity goes to the mines with only 20 per cent to consumers.

*political factors*. In particular, in addition to the more general issue of poverty, the lack of basic services, such as waste disposal, alternative energy sources, access to piped drinking water, and poor sanitation structures; poor education and a lack of knowledge of proper hygiene; a lack of landownership and land tenure; and a lack of political will to address health risks in the informal settlements are all factors that exacerbate climate-related health risks.

In terms of the distribution of goods and resources (for example, the lack of access to basic services) affects the health prospects of Lusaka's urban poor in several ways. Many inhabitants cannot afford to have their waste picked up and instead they dump it on the street during the night, which in turn leads to an increase in breeding grounds for diseases as well as increased risk of contamination of groundwater during rainy seasons. Moreover, poor sanitation facilities, such as shallow wells and pit latrines, also increase the risk that groundwater becomes contaminated during rainy seasons as latrines spill over into the wells.

Likewise, in terms of capabilities, the lack of substantive educational opportunities and access to information compounds a lack of knowledge about (climate-related) health risks in Lusaka's slums: many people are simply unaware of how the spread of disease can be prevented through proper hygienic measures. A lack of education is also often tied to unemployment, in turn reproducing poverty and a lack of resources to purchase basic services and goods, such as healthy and nutritious food, building materials, clean drinking water, and health care access.

One of the main distributive factors creating vulnerability to climate-related health risks is the lack of *landownership rights and land*. That is, because inhabitants of Lusaka's informal settlements lack ownership of their land, they lack the legal freedom to improve their houses and yards as well as the incentive to do so since they risk losing the money and resources they put into the improvements if the government decides to clear the houses. Land tenure can help inhabitants to build more resilient houses, using sturdier building materials, and to plant vegetable patches in their garden, thus improving access to healthy and nutritious food and decreasing reliance on rural agricultural output. Without the right to improve their houses and land, residents not only face the perennial threat of eviction, but also lack the capability to create a more climate-resilient environment for themselves, their families, and neighbours.

On a procedural level, climate-related health risks in urban slums are partly caused by a lack of recognition of local practices and knowledge and poor representation of the interests of local communities, which is compounded by the lack of clear pathways for participation of local stakeholders in policy and planning. The lack of political will and urgency to address socio-economic and health issues in the informal settlements is tied in with the issue of landownership. For example, it is widely believed

among the informal settlement communities that the only reason why the city authorities acted on the cholera outbreak of 2018 was that on this occasion cases had been detected in Lusaka's more affluent neighbourhoods. In other words, the lack of democratic power of the inhabitants of the informal settlements—partly due to a lack of landownership; partly due to a perceived lack of economic contribution—makes them easy to ignore by those who are meant to represent their interests.

The lack of recognition of local knowledge, interests, and needs is moreover compounded by poor representation of slum communities and the lack of opportunities for participation in climate and health planning. In general, the issue of urban slums does not feature very highly among political priorities. Urban slum populations often have little political power and are therefore easy for policymakers to ignore, such as in the case of the cholera outbreak above. While participation in political processes is often impossible for slum communities due to constraints of time and resources, Lusaka's informal settlements are each represented by a local representative. However, the relationship to this representative is often marred by political clientelism in which the represented communities are 'indebted' to their representative—that is, his representation is regarded as a favour to the communities—and creating a power asymmetry between representative and represented. This can be regarded as a procedural injustice because the fair representation of the communities is contingent on the favour of the representative (Lovett 2010, Pettit 2012). As a result, already vulnerable slum communities lack robust representation, even if *on paper* they are represented.

In sum, analysing the causes of climate-related health risks in urban slums through the lens of the MDIF shows how they are rooted in justice-related issues, such as the unfair distribution of resources, structural constraints on opportunities, and the lack of fair representation and recognition. In the following section, we show how the MDIF can help clarify efforts to prevent and address these issues.

### **3.2. The multi-dimensional challenges to tackling climate-related health risks in urban slums**

Climate-related health risk is a multi-dimensional issue that requires input and action from many different stakeholders, including policymakers; city authorities on health and sanitation; service providers of water, sanitation, and health; community- and faith-based organisations; researchers; and international NGOs (non-governmental organisations).

For example, community- and faith-based organisations (CBOs and FBOs) are crucial to addressing climate-related health risks in informal settlements: these organisations can provide the nexus for tasks, such as identification of problems, identification of solutions, community mobilisation, awareness creation, and

information dissemination. Moreover, involving local communities is a way of creating ownership of the implemented plans. CBOs and FBOs also act as interest organisations through which the slum and informal settlement communities can communicate their needs and knowledge to each other and to authorities and policymakers: because CBOs and FBOs work directly with these communities, they are well placed to identify the needs and interests of the communities and to gather knowledge about any challenges to addressing these. Within the local communities, schools and local businesses are also resources. Schools can most obviously be tasked with capacity building and awareness raising through education, while local businesses provide informal service provision, such as access to food. There is a need for the implementation of a corporate social responsibility framework to leverage the capacities of local businesses to help address issues in their local community through assisting in programme implementation.

However, distributive and procedural inequalities and injustices complicate this coordination and in particular the involvement of local communities. Despite the need to integrate the efforts of multiple stakeholders, this prospect is impeded by a lack of resources and services (distributive injustices) as well as corruption, clientelism, and a lack of political will (procedural injustices). As a result, efforts are often siloed off from each other; replicated by different actors; and/or lack a clear division of responsibilities: city authorities, service providers, and policymakers often lack awareness of local circumstances, with the result that policies are top-down and unresponsive to local realities, thus leading to maldevelopment.

In terms of distribution, global socio-economic inequality plays a big factor in the lack of response to climate-related health risks in urban slums (Moellendorf 2009, 2012). Committing resources to tackling health risks in urban slums—whether climate related or not—is complicated by the fact that climate-related health risks in urban slums are mainly an issue in low- and middle-income countries where economic resources are often scarce (Acemoglu & Robinson 2013). At the local level, the lack of resources, caused by poor global redistribution, is compounded by a set of procedural injustices. There is often a lack of political will and motivation to address these issues, with local citizens, authorities, and policymakers all expecting compensation for their participation. Thus, there is a need to address political corruption and clientelism, which sees the interests of the politically marginalised population in the informal slums often being sidelined in favour of more affluent population groups, as in the case of the cholera outbreak, but also in terms of the provision of basic needs and rights, including landownership and access to services, such as running water, electricity, and nutritious food.

The result is a distributive injustice at the local level in which slum communities often lack the resources and services to create more resilient infrastructures, which

limits their capabilities in life. This includes piped water to decrease reliance on centralised water taps that may run dry; access to safe stoves to decrease reliance on wood and charcoal and, hence, decrease risks of burn injuries and respiratory diseases; installation of covered latrines, in place of pit latrines, to reduce the risk of contamination; housing constructed from permanent building materials to reduce exposure to bad weather, such as rain and wind; access to the city's electrical grid to increase safety on the streets as well as to enable children to study; and access to affordable nutritious food, for example, through the promotion of peri-urban farming. In absence of the necessary resources and services, urban slum communities are unequally exposed to health risks—whether climate-related or not—in ways that more affluent communities are not. The unequal distribution of resources is unjust because it threatens to undermine one of the most basic capabilities necessary for human survival and flourishing, namely bodily health (Venkatapuram 2011).

#### **4 Concluding remarks**

Recent literature on climate adaptation has shifted to a focus on how to ensure the fair and equal adaptation to climate change. Efforts to minimise climate vulnerabilities and to build adaptive capacities among climate-affected communities, this literature argues, are often frustrated by existing inequalities and injustices. Yet, the existing literature lacks a clear and comprehensive framework for understanding how the different forms of injustice interact to exacerbate climate vulnerabilities, compromise adaptive capacities, and undermine adaptation efforts. In this paper, we have introduced the Multi-Dimensional Injustice Framework (MDIF) as a normative framework for understanding, articulating, and tackling issues of justice and fairness in climate impacts and climate adaptation. The MDIF introduces a set of indicators to identify distributive and procedural injustices that can be utilised within development and adaptation policy and planning. We further showed how the MDIF can be applied in practice by analysing a case study of climate-related health risks in the informal settlements of Lusaka, Zambia. Just as climate-related health risks in urban slums are caused by multi-dimensional injustices, efforts to address them are undermined by distributive and procedural inequalities and injustices. Consequently, tackling climate-related health risks in urban slums requires not only the redistribution of resources and goods, but also efforts to address deep-rooted structural inequalities that keep urban slum populations in poverty and outside of political power. The MDIF, we hold, can be useful for analytically and structurally approaching other climate- and development-related issues, such as gentrification through urban development; COVID-19 impact and recovery; food insecurity and food sovereignty



(Huambachano 2015, Patel 2009); displacement due to large-scale development projects (Penz *et al.* 2011); social and political exclusion of vulnerable and marginalised communities, including Indigenous peoples, disabled people, and LGBTQ+ people; epistemic discrimination; and gender inequalities in the household, at work, and in society at large.

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#### *Notes on the authors:*

Dr Morten Fibieger Byskov is a postdoctoral research assistant at the Department of Politics and International Studies, University of Warwick. He is especially interested in ethical issues that arise from development and climate planning and policy, especially the epistemic issues surrounding the inclusion and representation of vulnerable communities. Dr Byskov is also active within the capability literature where he is co-author (with Ingrid Robeyns) of the entry on the capability approach in the Stanford Encyclopedia of Philosophy. Most recently, he has been developing the ethics of climate adaptation as a field of study, mapping out the unique ethical challenges presented by the need for climate-affected communities, both now and in the future, to adapt to climate change.

email: [morten.byskov@warwick.ac.uk](mailto:morten.byskov@warwick.ac.uk)

<https://orcid.org/0000-0002-1682-2311>

#### *Recent relevant publications*

- Byskov, M.F., Hyams, K., Satyal, P., Anguelovski, I., Benjamin, L., Blackburn, S., Borie, M. *et al.* (2021), 'An Agenda for Ethics and Justice in Adaptation to Climate Change', *Climate and Development*, 13(1): 1–9. <https://doi.org/10.1080/17565529.2019.1700774>
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Professor Keith Hyams is Deputy Directory of the Interdisciplinary Ethics Research Group at the University of Warwick, where he leads the Ethics in Climate and Development research programme. His current research focuses on ethics and justice issues arising in the context of climate change and international development. He is the winner of the 2020 International Society for Environmental Ethics Andrew Light Award for Public Philosophy, and the Inaugural Sanders Prize in Political Philosophy. He has published widely on ethics, political philosophy, and climate justice.

[k.d.hyams@warwick.ac.uk](mailto:k.d.hyams@warwick.ac.uk)

<https://orcid.org/0000-0003-3755-646X>

#### *Recent relevant publications*

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Dr Oyinlola Oyeboode is director of the Warwick Centre for Global Health and deputy director of the Warwick Interdisciplinary Research Centre for International Development. She has an interest in the determinants of health in deprived urban neighbourhoods, and development of interventions to improve health in these settings. She is a co-author of the 2017 Lancet series on slum health.

<https://orcid.org/0000-0003-0925-9839>.

*Recent relevant publications*

- McGranahan, M., Bruno-McClung, E., Nakyeyune, J. *et al.* (2021), 'Realising Sexual and Reproductive Health and Rights of Adolescent Girls and Young Women Living in Slums in Uganda: A Qualitative Study', *Reproductive Health*, 18: 125. <https://doi.org/10.1186/s12978-021-01174-z>
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