



## 'Power-sensitive design principles' for climate change adaptation policy-making in South Asia

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### ABSTRACT

Despite the proliferation of power approaches to study climate change, there is little focus on how to deal with the negative effects of power in climate change adaptation (CCA) policy-making. CCA literature provides little insight into understandings of manifestations of power that can create negative effects, especially in the context of South Asia. This review answers the question: *How can CCA policy actors deal with the negative effects of power during the policy-making process?* We used a two-layered systematic literature review to identify various manifestations of power that are responsible for negative effects in CCA policy-making in South Asia and to determine power-sensitive design principles (PDPs) to address these manifestations of power. We conclude that although the four PDPs are no panacea for dealing with the negative manifestations of power, they are useful considerations when engaged in long-term CCA policy processes.

### 1. Introduction

Climate change impacts in South Asia are becoming more frequent and extreme to human and natural systems (Wijngaard et al., 2019; Ahmed et al., 2019). Climate change adaptation (CCA) is, therefore, increasingly necessary and is characterised as the process of adjustments in human and natural systems to avoid observed and projected impacts of climate change and can be realized at different scales (IPCC, 2014). Recent discussions emphasise the importance of planning long-term systemic transformations in the most vulnerable regions in the world, including South Asia (Field et al., 2014; Pelling, 2010). National governments in the region are continuously deliberating about preparing and implementing dedicated CCA policies to prepare for long-term impacts (Vij et al., 2017). Generally, long-term transformative plans and policies are designed for a period of more than 10 years, to change the climate paradigm and relationship between human and natural systems (Field et al., 2014; Pot et al., 2018). Various power-related challenges impede the design and implementation of such CCA policies (Stock et al., 2020; Morrison et al., 2017; Jones and Boyd 2011; Manuel-Navarrete 2010). Moreover, it is surprising that long-term perspectives are an

important element of CCA policies and critical to transforming societal systems, yet there is limited knowledge on the role of power in shaping the temporal dimensions (long-term and short-term) of CCA policies.

For this article, we define 'power' as a manifestation between policy actors to influence the climate change adaptation policy-making processes, often transpiring through interactions, discussions, negotiation and dialogue (influenced by Dahl, 1957; Hayward and Lukes, 2008; Krott et al., 2014; Vij et al., 2018). We theorise power as an interactional phenomenon that is a fundamental part of human relations. Interaction can be broadly considered as communication (written or verbal) produced between two or more actors in a given policy context (Hardy, Lawrence and Grant, 2005). In this relational perspective, power is produced, interpreted and reproduced through interactions between individual policy actors to make decisions during the policy-making process. Policy actors may represent groups, offices, governments or nation-states tied in a certain relationship at a given juncture.

Power-related issues can create negative effects on the policy-making process at different scales (Morrison et al., 2017; Fazey et al., 2016; Pelling et al., 2015; Yamin et al., 2005). For example, at the national scale, certain policy actors (e.g. politicians, representatives from donor

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agencies and non-governmental organizations) prioritize tangible development activities for short-term political gains by using their discursive capacities such as authority, knowledge and financial support, rather than investing in long term transformative adaptation (Morrison et al., 2017; Nawab and Nyborg 2017). Vij et al. (2018), Ojha et al. (2016) and Nightingale (2017) highlight the exclusion of community actors (such as lower caste, class and women) and the over-powering of their knowledge and ideas by powerful politicians and external consultants during CCA policy-making processes. The CCA literature has reported other negative effects of power in South Asia, including a strong influence of technocrats during national level policy making, top-down government-driven approaches to implement CCA strategies at the local scale, a lack of community participation in prioritizing CCA measures, elite control over resources, and domination of certain higher-class and caste groups at the local scale during policy-making processes (Sovacool 2018; Rao et al., 2017; Sultana and Thompson 2017; Burch et al., 2014; Sultana 2014).

Although such examples are found throughout the CCA scholarship in South Asia, a systematic understanding of the causes and effects of power are limited, and even fewer studies have proposed possible ways of dealing with them (Manuel-Navarrete 2010). This is perhaps because the process of designing and implementing CCA policies is relatively new, offering limited empirical cases to study power in practice. Further, the focus of adaptation studies have mostly been on identifying suitable adaptation measures to reduce the vulnerability and increase the resilience of the communities. However, such adaptation measures and strategies may further increase vulnerability due to the reconfiguration of power at different levels of governance as competing interests for financial and physical resources between a variety of actors increases (Nightingale, 2017; Eriksen et al., 2015). Adaptation efforts, in most cases, continue to situate vulnerability within analyses of climate change and natural hazards, rather than in a socio-political context, which in many contexts is the primary reason for vulnerability (Ribot, 2011). On-the-ground adaptation efforts may purposefully avoid the political and power related nuances of risk and vulnerability to meet the political and social interests of powerful actors.

Moreover, there are various political and social barriers to implement the adaptation measures which are increasingly recognized and studied. It is essential to study the causes and effects of power in CCA as it will allow us to prepare relevant climate action strategies at different levels of governance and will aid in reducing the uncertainty, ambiguity and prioritize socio-political contexts. Such research will also enrich and add value to the environmental governance and policy-making literature.

This article therefore aims to answer the following research question: *How can policy actors deal with the manifestations of power that create negative effects during climate change adaptation policy-making processes?* To answer this question, we make use of a systematic review methodology. Systematic reviews allow us to capture the current state of the literature on adaptation policy-making and power, and identify key lessons learned in how to deal with the negative manifestations of power.

In doing so, we aim to distil 'Power-sensitive Design Principles' (PDPs) from the literature that can possibly address the manifestations of power in CCA policy-making and reduce the negative effects. PDPs can be seen as a collection of key lessons learned and best practices from multiple case studies and practices to deal with power-related issues. PDPs inform the design of policy-making processes in an attempt to reduce negative effects (Hajer et al., 2003; Edelenbos 1999; Windhoff-Héritier and Héritier 1999). For instance, based on key lessons from different works of literature, a PDP may suggest the design of who participates and what roles and responsibilities actors may have during CCA policy-making processes in South Asia. Disciplines such as political science, human geography and sociology have engaged with questions of power, politics and decision making for many decades. Considering climate change adaptation to be a newer discipline, we broadened the

systematic review to include key lessons learned from other social sciences disciplines such as international relations, development studies, development and practice, human geography, political science and public administration to construct the PDPs for climate change adaptation policy-making.

The remainder of this article is divided into three sections. The next section introduces the methodology used, explaining the systematic review methodology, data collection methods and analysis. Section 3 presents the results, discussing the identified manifestations of power and the PDPs created. In the discussion section, we reflect on the state of CCA literature in dealing with power, discuss the limitations and benefits of PDPs, and reflect on the method used.

## 2. Methodology

Systematic literature review approaches are used across disciplines in social sciences, predominantly helping to conduct a formal, transparent, standardized synthesis of the literature to answer specific research questions or address a knowledge gap (Gough et al., 2012; van der Heijden, 2021). We developed a two-step systematic review methodology: Systematic Review 1 (SR 1) to identify negative manifestations of power in CCA policy-making in South Asia and, Systematic Review 2 (SR 2) to distil PDPs based on a broader search of key lessons learned across the social sciences to deal with the manifestations of power. SR2 is based on the outcomes of SR1.

To maintain a greater level of transparency in data collection and analysis, the systematic review followed the ROSES Protocol (Haddaway et al., 2018). Authors consulted numerous systematic reviews while designing this research study (cited in References) and followed the 'best practices' of this methodological approach. Web based search engine SCOPUS was used for identifying the scientific articles as it is one of the most comprehensive databases of social and environmental sciences articles (Landauer et al., 2015). Our systematic reviews followed five steps (see supplementary material 1) to reduce possible biases and limitations, documenting all the activities during the review process. Table 1 provides an overview of the main steps taken. More details on the methodological approach and steps of the systematic review used can be found in S1 (supplementary material).

### 2.1. Systematic review 1: climate change adaptation and negative manifestations of power

The first step was to run initial search queries to identify synonyms (or manifestations) of power, climate change, and South Asia to explore literature relevant to our research question. Based on this, we created a codebook to ensure a transparent and rigorous selection of review articles. The database was searched using the title, abstract and/or keywords of published articles for different Boolean configurations of *power* (and related terms such as authority, control, domination, and supremacy), *climate change adaptation* (and related terms such as climate and/or climatic change, long-term planning, future planning, policy processes), and *South Asia* (with country/region specific terms such as Bangladesh or Afghanistan). For the purpose of SR 1, 'power' relates to both progressive (processual based) and conservative (outcome based) viewpoints of relational power. We coded the articles based on the elements of power that explain both processual and outcomes of power interplay, including elements such as authority, legitimacy, knowledge, ideas and narratives. The results yielded 388 articles, of which 58 were selected after using the exclusion and inclusion criteria on the title, abstract and keywords (see Table S1, electronic supplementary material). Full text of the articles were screened. Exclusion and inclusion criteria included peer-reviewed English language articles between the period of 2000–2018, as well as an exclusive focus of articles on the concepts of power and climate change adaptation. As a result 42 of the 58 articles were selected for analysis. Using forward and backwards reference checking, we identified and included 5 more articles. In the

**Table 1**  
Steps involved in two-layered systematic literature review – SR 1 and SR 2.

Step (s)	Systematic Review 1 (SR 1)	Systematic Review 2 (SR 2)	
		SR 2(a)	SR 2(b)
Step 1	<b>Search based on keywords</b> (SCOPUS) – CCA 'Power', 'Climatic change adaptation', 'country/region' <sup>a</sup> . <b>Result – 388 articles</b>	<b>Search based on keywords</b> (SCOPUS) – Others - CCA 'Knowledge', 'domination', 'country/region' <sup>a</sup> . <b>Result – 716 articles</b>	<b>Search based on keywords</b> (SCOPUS) – Others - CCA 'Authority', 'funding', 'aid' and 'assistance', 'country/region' <sup>a</sup> . <b>Result – 4179 articles</b>
Step 2	<b>Screening (inclusion/exclusion)</b> Based on abstract, keywords and title of the articles <b>Articles – 58 articles</b>	<b>Screening (inclusion/exclusion)</b> Based on abstract, keywords and title of the articles <b>Articles – 95 articles</b>	<b>Screening (inclusion/exclusion)</b> Based on abstract, keywords and title of the articles <b>Articles – 611 articles</b>
Step 3	<b>Screening (inclusion/exclusion)</b> Based on the full text <b>Articles – 42 articles</b>	<b>Screening (inclusion/exclusion)</b> Based on the full text <b>Articles – 65 articles</b>	<b>Screening (inclusion/exclusion)</b> Based on the full text <b>Articles – 63 articles</b>
Step 4	<b>Screening – critical appraisal</b> Based on the robust use of methodology and sufficient explanation of the concepts – power and CCA ( <b>excluded 9</b> ) <b>Total Articles – 38 articles</b>	<b>Screening – critical appraisal</b> Based on the robust use of methodology and sufficient explanation of the concepts – knowledge ( <b>excluded 36</b> ) <b>Total Articles – 29 articles</b>	<b>Screening – critical appraisal</b> Based on the robust use of methodology and sufficient explanation of the concepts – authority ( <b>excluded 26</b> ) <b>Total Articles – 37 articles</b>
Step 5	<b>Analysis</b> Inductive analysis to identify manifestations of power in each article.	<b>Analysis</b> Inductive analysis to identify practices to deal with the issue of domination by knowledge	<b>Analysis</b> Inductive analysis to identify practices to deal with the issue of authority of certain actors

<sup>a</sup> **Country/region search keyword include** – Bangladesh, India, Nepal, Pakistan, Bhutan, Sri Lanka, Afghanistan and South Asia (region).

critical appraisal step, we excluded articles with unclear or lacking methodological sections and a conceptual explanation of power and climate change adaptation. The final number of articles for review was 38. We inductively coded the articles using the codebook, abstracting each argument the authors made to explain the scale of research, sectoral focus, conceptual and empirical interpretation of power, the negative/positive influence of power and the underlying reason for these negative/positive influences. We extracted all relevant excerpts from the article. Using inductive clustering, we thematically grouped the different manifestations of power in three themes (see Table 2, results section).

## 2.2. Systematic review 2: PDPs for knowledge and authority

Thematic clustering in step 1 resulted in 24 articles (60% of reviewed articles) that discussed the use of material and ideational resources during the CCA policy-making process, with domination by knowledge and authority as most frequently used topics. Material resources refer to financial capacity and human resources and are used by actors to influence policy-making processes through the availability of staff and finances, and by creating authority of certain actors over others (Orsini, 2013). Importantly, the material resources can provide actors with agenda-setting power, decision-making power during an interaction and power to exclude or include actors or ideas (Fuchs and Glaab, 2011). Whilst ideational resources refer to the ability to master, adapt and utilize ideas, knowledge and information, which enables actors to influence the policy design process (Orsini, 2013). Such resources influence the cognitive and normative dimensions of human interactions (Carstensen and Schmidt, 2016).

From SR1, we found that most articles discuss the manifestation of power relating to questions of knowledge and authority, and have been considered critical in climate change adaptation processes. Hence, we focused systematic review 2 to determine 'power-sensitive design principles' (PDPs) for knowledge and authority in South Asia.

For this, we conducted two separate systematic reviews. The first systematic review was focused on domination by knowledge. Search queries were used with various synonyms of *knowledge* (such as data, information, expertise, and discourses) with the country/region specific terms. By removing 'adaptation' from the search query, a broader set of literature was considered in the review. A set of similar exclusion and inclusion criteria as for step 1 were used to screen the articles based on the title, abstract and/or keywords of published articles. After full-text

screening, 65 articles were selected. The critical appraisal step reduced the final set of articles to 29. Articles with no clear explanation on strategies to reduce the negative effects of power were screened (see supplementary material). Further, the articles were inductively coded for arguments made in relation to possible ways to reduce the effects of domination by knowledge in policy-making. For instance, a few articles suggested ways to reduce the domination of engineers who used technical or scientific knowledge to overpower local knowledge of farmers to manage the irrigation system. Like SR1, relevant meta-information and relevant excerpts were collected and analysed inductively to create PDPs. We only included articles that empirically discussed the domination of a particular knowledge system (e.g. technocratic influence over management of community based water and forest resources) and ways to counter these knowledge systems.

We used similar steps for **authority**; we used search queries based on synonymous terms such as *domination*, *control*, *position*, *funding*, *aid* and *assistance* with country/region specific terms. For the first round of review, we screened 1789 articles based on the article's title, abstract and keywords, using similar exclusion and inclusion criteria for the other review. For the second round of review, we selected 611 articles. After going through the articles, we selected 63 articles for the systematic review. A critical appraisal of selected articles was conducted resulting in 37 articles. For these articles too the meta-information was collected, excerpts stored and analysed to inductively create PDP's. For both reviews SR2a and SR2b, the PDPs are the result of discussions among the authors of this article.

## 2.3. Limitations

There are three main limitations to the methodology used in this study. First, we used systematic review methodology to explore broad themes such as power, authority and knowledge. Whilst we carefully designed the search query and synonyms and added cross-referencing as an intermediate step to ensure comprehensiveness in our search, there is a possibility that we might have missed certain literature that has used different terminology than we have used in this study. Second, for our data collection, we focused on SCOPUS. Whilst this is the most comprehensive database for social and environmental sciences, there might be more domain specific databases that could yield additional results. However, reference checking ensures that we captured the main articles. We also did not consider databases that included non-English articles, although recognizing that some literature could have been

**Table 2**  
Manifestations of power responsible for negative effects in CCA policy-making.

No.	Themes	Manifestations of power	Key literature – SR 1
1	Use of material and ideational resources (60% of SR 1 articles)	<ul style="list-style-type: none"> <li>• Knowledge is used to exert power</li> <li>• Domination of ideologies/framing and elite control</li> <li>• Access and control over natural, physical and financial resources</li> <li>• Authority to influence other actors</li> <li>• Influence of technocracy</li> </ul>	Nagoda and Nightingale (2017); Nagoda and Eriksen (2015); Azhoni et al. (2017) Vij et al. (2018); Rahman and Giessen (2017); Sultana and Thompson (2017) Rahman and Giessen (2017) Nightingale (2017); Vij et al. (2018) Ojha et al. (2016); Vij et al. (2019); Paprocki and Huq (2018)
2	Contextual, social and historical conditions (15% of SR 1 articles)	<ul style="list-style-type: none"> <li>• CCA policies and projects disempower women by lack of participation</li> <li>• Gender, class, caste, race and ethnicity are used to shape power relations and then actors use these manifestations to influence the CCA policies</li> </ul>	Rao et al. (2017); Molden et al. (2014) Sultana (2014); Stock et al. (2019); Singh (2018)
3	CCA policy processes reinforce power imbalances (25% of the SR 1 articles)	<ul style="list-style-type: none"> <li>• Policy institutions shape power relations</li> <li>• Policy networks empower certain actors</li> <li>• Institutions disempower certain communities</li> </ul>	Sovacool (2018); Taylor (2013) Sultana and Thompson (2017) Tschakert et al. (2016); Rahman and Giessen (2017); Sovacool et al. (2017)

published in local languages. Third and finally, we have not included unpublished and grey literature such as theses, governmental reports, and project evaluations. Whilst this could be considered a limitation to our search strategy, particularly for the PDPs identified in the second step, we are confident that the current review provides a sufficiently comprehensive overview to distil key PDPs. Future research could expand the search to other databases and languages using the methodology developed in this article.

### 3. Results

#### 3.1. Manifestations of power influencing CCA policies of South Asia (SR1)

The 38 articles included in SR 1 showed a wide range of focus, with the majority of studies in India ( $n = 13$ ), Bangladesh ( $n = 9$ ) and Nepal ( $n = 8$ ), covering both the national level ( $n = 13$ ) and local level ( $n = 16$ ) cases. All studies focussed on current climatic impacts experienced; we found no articles that had an explicit focus on the link between power and long-term climate impacts and planned adaptation. This is surprising given the strong call for transformative adaptation in the region, which depends on long-term policies and planning. Although all articles identified in this review explicitly refer to power in climate change adaptation, we found no articles that explicitly addressed strategies to deal with power-related issues in South Asia. This too is a critical gap in the literature.

The articles demonstrate a variety of manifestations of power. We categorized various manifestation into these into three overarching themes: 1) use of the material and ideational resources by policy actors; 2) contextual, social and historical differences (e.g. class, caste, gender); and 3) design of the CCA policy processes itself reinforces power imbalances among policy actors. These are discussed below, see also Table 2.

##### 3.1.1. Use of material and ideational resources by policy actors

In total 24 articles discuss the use of material and ideational resources used by variety of actors during CCA policy processes as key manifestations of power. First, material resources are used by actors to influence CCA policies through the availability of staff, technology and finances, and by asserting the authority of certain actors over others (Giessen et al., 2016). For instance, several studies show how in Nepal and Bangladesh material resources are used by actors for setting the political agenda and to include or exclude other actors in the planning process (Vij et al., 2018; Rahman and Giessen 2017). Second, ideational resources were frequently reported, referring to the use of ideas, knowledge and policy narratives that enable certain actors to influence others (Rahman and Giessen 2017; Rahman et al. 2018; Fuchs and Glaab 2011). For example, actors use ideational resources such as legitimacy

and knowledge to shape current and future choices and values in agri-food governance in India (Fuchs and Glaab 2011). These actors use narratives to steer short-termism, push for tangible results in the short-term, and connect future investments to uncertainty.

The material and ideational resources often work in tandem; during the process of formulating CCA policies, certain actors' ideas and interests are considered, and others are ignored. Nagoda and Nightingale (2017) identify that in Nepal actors use material resources such as authority and socio-political positions to defend their interests, shaping current adaptation outcomes. Policy actors in Bangladesh, India and Nepal use ideational resources such as adaptation science and knowledge, narrative of technocratic adaptation measures and India's foreign policy principle of bilateralism to push for short-term development measures through adaptation plans and policies (Vij et al. 2018, 2019). Further, Nightingale (2017) and Nagoda and Eriksen (2015) emphasise that powerful actors struggle over authority and recognition, resulting in the exclusion of long-term perspective of marginalized actors such as women in a patriarchal rural context.

##### 3.1.2. Contextual, social and historical conditions in South Asia

The second theme of manifestations of power is related to social differences, especially along the axes of gender, caste and class which influence CCA policy processes. Several studies note that community adaptation strategies are deeply rooted in class and ethnic hierarchies that trap the poor, powerless and consequently increase human insecurity (Sovacool 2018; Stock et al., 2019). In these cases, higher-class and caste groups use their existing authority and position to further strengthen their control in society by implementing tangible development measures that prevail short-term benefits over long term transformational changes. Similar patterns emerge across gender groups; Sultana (2011) and Molden et al. (2014) argue that climate change is not affecting the poor uniformly in South Asia, but it is further complicated by gendered power relations that are intersecting with other social differences such as class, caste and ethnicity. Further, it is argued that although gender relations play an important role in CCA, women tend to be systematically disadvantaged in terms of access to resources, participation in policy planning exercises and decision-making (Rao et al., 2017). Such contextual, social, and historical conditions in South Asia have an immense influence on CCA policy processes and is likely to shape the CCA decision-making as well.

##### 3.1.3. CCA policy processes reinforce power imbalances

The final theme revolves around the observation that many existing CCA policy processes reinforce power imbalances or create new power struggles. For instance, Nightingale (2017) argues that certain civil society actors want to implement long-term CCA measures in Nepal, but the myopic vision of local adaptation planning processes and project timelines restricts their actions. Such design of CCA policy processes

pushes for producing quick and measurable results in short time-periods, instead of aiming for long-term policy measures for transformational change, entrenching extant power relations. Moreover, the literature highlights political economy attributes to adaptation policies, stressing that CCA policies and institutions are inherently limiting access and marginalizing certain actors in the decision-making process (Sovacool et al., 2017; Sovacool 2018). The power of policy actors is derived from a variety of formal and informal institutions, enabling them to ‘pull down’ resources from other (vertical) scales of governance.

### 3.2. PDPs for long-term climate change adaptation in South Asia (SR2)

The various manifestations of power identified in SR1 (see Table 3), can be dealt with in a variety of ways. SR1 showed that there were few if any strategies to deal with the manifestations reported in the adaptation literature. We, therefore, focused on the two main manifestations reported in the climate change adaptation literature – domination by knowledge and authority – to design PDPs, four in total.

#### 3.2.1. Domination by knowledge

Domination by knowledge is generally referred to as the capacity of a policy actor to influence others by means of certain expertise (technical or social) or knowledge resonating with values or norms in society (Vij et al., 2018; Rahman et al. 2018). We systematically reviewed the social science literature (see section 2.2) for key lessons learned to deal with this manifestation of power and identified two main PDPs: 1) shift in policy actors’ thinking from ‘transfer of scientific knowledge’ to ‘co-creation of knowledge’ and 2) creation of safe spaces for continuous dialogue, interaction and raising concerns for future planning.

#### Shift from ‘transfer of knowledge’ to ‘co-creation of knowledge’ (PDP 1).

We found 23 articles which suggest that there is a tension between users of local and scientific knowledge systems in South Asia. Here we define local knowledge as a combination of practices, beliefs and values that are determined locally, with the reduced dominance of external agencies in a particular geography (Agrawal, 1995). Whilst scientific knowledge is developed and transferred by an external agent, it is explicitly based on theoretical explanations such as laws, concepts and hypothesis. Literature recognizes that having access to expert scientific knowledge is no guarantee of reducing current vulnerability and building long-term community resilience (Birkenholtz 2008; Evers et al. 2009). Lack of trust and conflicting views on the value of scientific knowledge are frequently reported challenges to consider long term climate impact knowledge. Rather than pushing for scientific knowledge and ignoring local knowledge systems, these articles emphasise the value of creating a balanced mix of the two knowledge systems to create context-specific CCA policies. For addressing the domination of a particular knowledge system, the literature suggests a shift in the acting of policy actors from

‘transfer of (scientific) knowledge’ to ‘co-creation of knowledge’. Such a shift can be organized by intensifying the collaboration and making actors realize the mutual dependency between them. Aggressive, top-down enforcement of scientific knowledge does not mobilize relevant actors to start to adapt to climate change impacts (Veld, 2010; Rist et al., 2007). (Re)designing processes to increase the feedback on the knowledge shared by actors will also increase trust and tolerance. Such knowledge co-creation will provide an opportunity for actors supporting different knowledge systems to generate empathy for each other, enhancing trust and confidence among actors (Wang et al. 2016). Trust and confidence can create long-term relations between actors, which can support the process of designing policies that rise above vested interests.

Birkenholtz (2008) discusses an example where civil society, community members and state actors are collectively governing an irrigation canal in Rajasthan, India. The author highlights the contestation and power relations between the state actors (engineers and development practitioners) and farmers based on their different knowledge systems. To resolve such a contestation, knowledge exchange between different actors based on co-creation had improved the process of generating attractive options of governing the irrigation system, inclusion and ownership of community actors, motivation to maintain the system for long-term, and reducing the transaction costs in the future. Sufficient responsibilities to govern the canal should be bestowed upon the communities to drive the process of co-creation, giving freedom to raise a voice in deciding whose knowledge is considered for making decisions.

Creation of safe spaces for continuous dialogue, interaction and raising concerns for future planning (PDP 2). To improve sharing of different types of knowledge between a variety of actors, literature suggests there is a need for the creation of safe spaces that provide equal opportunities for actors to present their ideas, opinions, and beliefs (Pereira et al., 2015). These emphasise the procedural and intellectual space, instead of physical opportunities. Safe space can create long-term reflexive dialogues, opportunities to co-create knowledge, nurture innovation, build trust, gain respect and address power asymmetries (Pereira et al., 2015). For instance, safe spaces can enable inclusion of marginalized actors usually excluded from policy processes in South Asia (e.g. illiterate, resource-dependent women and lower caste groups), whose local knowledge and expertise may prove to be more effective ways of managing resources such as irrigation systems, community-managed forests, and groundwater. In countries such as India, Nepal and Bangladesh issues of caste, gender and class discrimination are prominent and also visible in adaptation policy designing and implementation (Nightingale 2017; Stock et al., 2019). Safe spaces can provide an opportunity for co-creation of knowledge (see PDP 1), with weak actors freely expressing their ideas and powerful actors with open-minds listening to and valuing different knowledge and ideas. Examples in the literature refer to street theatres performed by local communities in front of

**Table 3**  
Power-sensitive design principles for the two manifestations of power.

Manifestations of power	Discipline(s)	PDPs	Example(s)
<b>Domination by Knowledge</b>	Development practice; development studies; human geography	Shift in policy actors’ thinking from ‘transfer of knowledge’ to ‘co-creation of knowledge’ to minimise the power of certain actors	Combining local and technical expertise for irrigation management
	International relations; human geography; sociology	Creation of safe spaces for continuous sharing of knowledge to allow the inclusion of powerless actors and their voices	Continuous multi-stakeholder & multi-scale dialogues for transboundary cooperation
<b>Authority</b>	Political science; public administration	Democratic devolution in a multi-actor environment to support	Communities reviewing the actions and policies prepared by authorities and community leaders
	Development practice; behavioural science; organizational behaviour	Create mechanisms to build communication competence and confidence to encourage empowerment among weak actors	Capacity building of communities on CCA; long-term thinking in CCA; developing negotiation and communication skills

government buildings can give an opportunity to the community to present their choice of narratives and share their present and future concerns. Safe spaces allow voices that are overlooked to be included, and missing stories get told (Mattingly, 2001). Collectively, such a safe space can balance the influence of powerful and powerless actors.

Another example of safe space is discussed by Barua et al. (2018), in the form of a continuous informal multi-actor and multi-scale dialogue for transboundary river cooperation. Here informal dialogues help in building trust between actors and promote an exchange of challenges and opportunities of governing transboundary water resources through social learning or by addressing the power interplay between actors (Rasul 2014; Dore et al. 2012). Such dialogue processes are often discarded for policy processes due to actors' desire to preserve their influence and power over processes, lack of time by actors or inadequate resources. However, studies suggest that the creation of safe spaces can improve the continuous sharing of knowledge and increases the quality of interactions between actors, allowing for more reflexivity and adaptiveness necessary to design more equitable long-term CCA policies (Termeer et al., 2015).

### 3.2.2. Authority

The second manifestation of power is authority, which refers to a relational exercise of power by policy actors through the legitimacy of institutions and positions to influence other actors to exert certain interests and set the agenda (Sikor and Lund 2009). To address authority, we identified two more PDPs from the articles reviewed: 3) democratic devolution in a multi-actor environment to support long-term policy-making and implementation; and 4) create mechanisms to build capacity, communication and negotiation skills for empowerment.

*Democratic devolution in a multi-actor environment to support long-term policy-making and implementation (PDP 3).* Devolution processes can bring communities and civil society organizations closer to the state and policy-making process (Brugere 2006). To reduce the authority and control of state and private actors on the flow of information and monopoly in policy-making, it is important that communities have the opportunity to participate in policy processes, and periodically review and change the policies prepared by governments. In general, devolution is achieved by public administration reforms, civil service reforms, and strengthening of local institutions by reducing the focus on the state and legitimizing community strategies (Sikor and Lund 2009). For adaptation, devolution could entail empowering actors and institutions at the local scale with tasks and responsibilities, and in doing so it can improve the inclusivity of local state and non-state actors and set clear and legally recognized geographical and administrative responsibilities (Lachapelle et al., 2004).

We identified seven articles which showed that devolution of power in the multi-cultural, denominational and multi-ethnic environment of South Asia requires a careful interaction with the local socio-political structure. For example, local public servants can be given administrative and financial powers to design forest management strategies for their own regions (Nygren 2005) or devolved to municipalities that consult with local communities for policy actions (Nygren 2005). In doing so, it is important to identify realistic strategies that recognize the needs and goals of multiple actors, especially for the ones who are less powerful (Nygren 2000). Literature suggests that the challenge of devolution is to ensure that the state is not abandoning their responsibilities, but focuses on embedding these responsibilities in legislative reforms, improving conflict management mechanisms, assuring participatory policy formulation and building long-term trust with communities. It is also important that the central government is working towards improved coordination between different local governments (Singh and Khare 1993).

*Create mechanisms to build capacity, communication and negotiation skills for empowerment (PDP 4).* SR1 showed that actors may dominate other actors not only by material and ideational resources they hold but particularly because of their communication skills and confidence. Communication skills and confidence enable self-empowerment and improve socio-political status for community members both as individuals and as a collective. We found 8 articles explicitly referring to the need for increasing such skills and abilities among participating actors as these will support creating a level playing field (Brewer et al. 1991).

Such mechanisms should be focused on improving communication skills, building capacity on policy topics, and increasing their skills to negotiate with powerful actors. For instance, capacity building of communities on the challenges and benefits of climate change adaptation and future climate change scenarios can help in balancing the influence of state and private actor's knowledge influence on how plans and policies of CCA should be designed. Such capacity building efforts can help communities to challenge other policy actors and appropriately prioritize CCA measures. Moreover, increasing their communication skills and capacity will enable communities to not fall for immediate, short-term coping mechanisms or development measures proposed by the state or private actors. Literature suggests that vulnerable groups and powerless actors could learn to negotiate, get trained in raising voices effectively and make constructive arguments about their local knowledge, practices and institutions (Gautam and Shivakoti 2004).

## 4. Discussion and conclusion

In this article, we critically assessed the climate change adaptation literature for manifestations of power and aimed to create PDPs for navigating the negative effects of power on climate change adaptation policy-making in South Asia. These PDPs are key lessons learned from multiple practical cases in how to address the negative effects of power to support long-term thinking in the CCA policy-making process in South Asia. Based on our findings, we share five key insights.

First, we propose to extend the work on PDPs, which was inspired from the seminal work of Elinor Ostrom. Although only two manifestations of power were focused on in this study, we recognize that there are other important ones, such as social identities and historically specific power imbalances created by policy processes that need to be investigated. We call for developing PDPs for these two important manifestations to offer relevant solutions for power-loaded CCA policy-making and implementation. The two suggested manifestations of power influence policy-making processes at the local scale in South Asia, where communities with different cultural and societal backgrounds interact with one another. Community-based adaptation strategies are deeply rooted in class and ethnic hierarchies that trap the poor and the powerless and consequently increase human insecurity (Stock et al., 2019). Determining more PDPs offers a larger portfolio of options for policy actors to deal with the negative manifestations of power.

Second, our systematic review showed that whilst power is a critical dimension discussed in the literature, as is noted by others (Vink et al., 2013; Manuel-Navarrete 2010), and an often mentioned barrier to adaptation (Shackleton et al., 2015; Biesbroek et al., 2013; Ishtiaque et al., 2021), there is very limited, if any, literature that explicitly analyses the relationships between long-term thinking and power in CCA policy-making in South Asia for the years surveyed in our systematic review (2000–2018). This is surprising given that long-term thinking is an important element of CCA policies (Suckall et al., 2018; Hallegatte 2009; Reilly and Schimmelpfennig, 1999) and critical in the context of transforming societal systems to be better adapted to future climate impacts. A deeper understanding of how power influences long term planning is critically important for the future development of South Asia and adaptation plans to improve the adaptive capacity of the vulnerable communities (Blythe et al., 2018; Stock et al., 2020).

Third, whilst power is noted as a key issue, we found very few

examples of concrete ways to deal with the various manifestations of power. This is surprising given that most of the adaptation literature is practice-oriented and are expected to explicitly reference intervention strategies. However, it also showed the relative newness of power-related research on adaptation, and the limited lesson drawing from other fields in the social sciences to inform adaptation scholarship (Preston et al. 2015). Although both issues might be resolved when research on adaptation further matures, we argue that a more proactive approach such as taken in this study, could be a useful step to bring in knowledge and expertise from other social science disciplines where power-related research has been well established, including from sociology, development studies, and international relations. Combining multiple systematic reviews can be useful in bridging the observed gap in this article between power manifestations observed empirically and ways to deal with them. Although our SR 2 focuses on two main manifestations of power only due to time and resource constraints, it does demonstrate that systematic reviews allow for bringing in knowledge and expertise from other domains in a transparent manner and by doing so, can assist in advancing research on adaptation and provide policy-relevant recommendations.

Fourth, the PDPs proposed are particularly useful for two manifestations of power: 'power over' and 'power in'. 'Power over' refers to a situation where certain actors directly influence the policy-making process (Torfing et al., 2012). For instance, certain actors have the power to close down or start the policy-making process due to the social legitimacy of their roles to decide and take action (Purdy 2012). In such cases, the policy actors have the power to include or exclude other actors and their ideas or can set the agenda (Vij et al., 2018). PDPs such as the creation of safe space and democratic devolution can reduce the overpowering ability of some actors (or 'power over') during the policy-making process. 'Power in', on the other hand, refers to a situation where certain policy actors use material and ideational resources to influence the interactions during the policy-making process (Carstensen and Schmidt 2015; Purdy 2012). PDPs such as knowledge co-creation and mechanisms to build capacity and negotiation skills can help reduce the influence of the discursive power of policy actors (or 'power in') during the policy-making process. Clearly, the proposed PDPs are conditional and dependent on the policy actors involved in the policy-making processes. If a policy actor is using authority or knowledge to overpower other actors to meet their vested interests and priorities, then the same actor will likely not be interested in using PDPs to (re)design policy processes. In cases where policy actors do implement PDPs, powerful actors might still find ways to counter the positive effects of these PDPs. In other words, the PDPs are bounded by actors' willingness and behaviour, along with the institutional strengths and weaknesses in which they are implemented. PDPs therefore only work if they are not used in an overly rational or hyper-structuralist way (Van Hecken, Bastiaensen and Windey 2015). To elaborate, the PDPs can be effective only if actors show intent of change to transform systems already in place. Moreover, hoping certain actors use them considering the gravity of the situation.

Lastly, the proposed PDPs are inter-dependent and work in tandem. This is particularly important because of the way we have defined the concept of PDPs. For instance, PDP 1 on knowledge co-creation is a process to prevent overpowering by (scientific) knowledge, but it also creates trust, empathy and confidence among policy actors to build a long-term relationship. This helps them not to think about their individual priorities and interests only and hopefully keep long-term benefits at the centre of the adaptation policy-making process. But knowledge co-creation works in tandem with PDP 2 and PDP 4, the creation of safe spaces and building communication and negotiation skills. Ideally, knowledge co-creation needs a safe environment where

different policy actors feel comfortable and are not overpowering each other during the process, along with the right communication and negotiation skills weak actors can raise their voices. Hence, the PDPs work in tandem and are inter-dependent on each other.

To conclude, we aimed to gain a better understanding of the power-related challenges adaptation policy processes face and determine power-sensitive design principles (PDPs). We synthesized three themes from the current adaptation scholarship representing various manifestations of power that influence CCA policy-making in South Asia. Based on two other systematic reviews, we identified four PDPs for two specific manifestations of power – domination by knowledge and authority. We argue that the proposed PDPs are a first step towards addressing the manifestations of power during CCA policy-making that are observed in the literature. PDPs can be implemented by (policy) actors to increase the inclusivity of actors and ideas, gain reflexivity from other knowledge disciplines, empowerment of marginalized or less powerful actors through skill development and the creation of safe spaces at different scales. PDPs provide guidance for actors to design or improve the CCA policy-making process. Together the four PDPs presented here capture the design elements of CCA policy-making. Further testing and refinement of these PDPs are necessary to gain a more substantive overview of relevant power-sensitive design principles that can inform policy practices. As climate change is accelerating in South Asia, particularly affecting marginalized and vulnerable populations, PDPs can inform policy processes that facilitate equitable adaptation.

#### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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#### Appendix A. Supplementary data

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