Environmental Science and Policy 78 (2017) 58–65

Contents lists available at ScienceDirect

Environmental Science and Policy

journal homepage: www.elsevier.com/locate/envsci

Climate adaptation approaches and key policy characteristics: Cases from South Asia

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ARTICLE INFO

Keywords:
Climate change
Adaptation
Policy approaches
Long-term
South Asia

ABSTRACT

This paper analyses and assesses how existing policies and approaches in South Asia consider long-term climate change adaptation. Presently, it is unclear what approaches are used in the existing policies to cope with the future climatic changes. Our research framework consists of two components. First, we identify and define key characteristics of adaptation policy approaches based on a review of scientific journal articles. The key characteristics identified are institutional flexibility, adaptive nature, scalability and reflexivity. Second, we analyse the presence of these characteristics in the climate change adaptation policies of Bangladesh, India, Nepal, and Pakistan. Our findings show that the four South Asian countries contribute to only 8% of the total journal articles on adaptation policy, with least papers representing Pakistan and Nepal. Reviewing the adaptation policies, we find that except for the Climate Change Policy of Nepal, none of the policies discusses transboundary scale adaptation approaches. The identified adaptation policies lack focus on shared transboundary resources between the countries, and instead focus at national or sub-national scale. This is reflected by relatively low scores for the scalability characteristic. All the countries show high scores for institutional flexibility, suggesting that changing roles and responsibilities between government agencies for adaptation planning and implementation is accepted in the four countries. We conclude that to prevent a loss of flexibility and to promote scalability of shared transboundary resources, policy approaches such as anticipatory governance, robust decision-making, and adaptation pathways can be useful for long-term climate change adaptation.

1. Introduction

The growing likelihood of a more than 2 °C warmer world will require adaptation policy approaches that include long-term considerations (Burton et al., 2002; Rasul, 2014; Di Gregorio et al., 2017). Adaptation policy approaches are defined as the ways in which climate policies are designed and implemented to reduce the impacts of climate change (Dessai and Hulme, 2004). Long-term adaptation policy approaches consider a period between 30 and 100 years (Government of Japan, 2010). As decision-makers face the challenges of addressing

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http://dx.doi.org/10.1016/j.envsci.2017.09.007
Received 30 July 2017; Received in revised form 17 September 2017; Accepted 18 September 2017
Available online 17 October 2017

unpredictable socio-economic and climatic changes, there is an increasing call for long-term adaptation policy approaches. These approaches must perform robustly under a variety of future scenarios and increase flexibility to adapt to future conditions (see e.g. Pahl-Wostl, 2009; Haasnoot et al., 2013; Ranger et al., 2010; Werners et al., 2013). Termeer et al. (2015) argues that such policy approaches need to consider governance capabilities such as (a) reflexivity; (b) resilience; (c) responsiveness; and (d) revitalization. Moreover, these approaches ideally should have the characteristics to allow for upscaling and downscaling, responding to challenges at local and shared transboundary scales (Forsyth, 2013).

There is limited understanding in scientific literature on how climate policy approaches are designed and implemented in South Asia (Butler et al., 2016; Saito, 2013). Most of the existing adaptation policy approaches stem from the developed part of the world (see e.g. Cairney and Heikkila, 2014). Especially in countries that have their policy emphasis on development (e.g. Butler et al., 2016) or disaster risk reduction (Solecki et al., 2011; Mercer, 2010; Patra and Terton, 2017) the use of long term and flexible adaptation approaches is not yet at the required level. It is also observed that there are barriers in uptake of long term and flexible adaptation approaches (Le Dang et al., 2014; Biesbroek et al., 2013). This is either caused by the characteristics of the existing approaches themselves, or because the uptake is hampered by the specific contextual setting in individual developing countries (Tompkins and Adger, 2005).

For example, climate policies in South Asia oftentimes emphasize technical solutions for controlling floods and other disasters, which in the long-term may lead to mal-adaptation (Brockhaus et al., 2013; Colloff et al., 2017). Alternative policy approaches that explicitly consider the long-term may steer away from such mal-practices by emphasizing the importance of flexibility and scale. Shifting to such alternative policy approaches entails a series of adaptive learning decision cycles over time (Willows et al., 2003; Smith et al., 2011; Haasnoot et al., 2013). Therefore, it is interesting to know which of the approaches are presently used and even more so in the context of developing countries, where climate vulnerability and uncertainty is much higher.

Against this background, this paper aims to respond to two questions. First, what long-term oriented adaptation policy approaches (and characteristics) are considered in scientific literature? Second, using the outcomes of question one, what characteristics are present in the existing adaptation policies in South Asia. The focus of our research is on four South Asian countries – Bangladesh, India, Nepal and Pakistan.

The four countries are highly vulnerable and have low readiness to climate change (Kreft et al., 2017; ND-GAIN, 2015). The vulnerability in and between the four countries varies, with Bangladesh and Nepal among the most vulnerable least developed countries (Thornton et al., 2014). Bangladesh is vulnerable due to sea and river flooding (IDL C-ARIAA working paper, 2016), in India floods and droughts affect agriculture productivity (GOI, 2012), glacier outburst floods leads to temporary displacement and disruption of livelihood in Nepal (Kilroy, 2015; Bartlett et al., 2010) and for Pakistan extreme weather events are causing water related disasters (Shaw, 2015). Besides from country specific climate vulnerability, the four countries experience shared climate change impacts with their transboundary natural resources such as rivers and mountains (Hijioka et al., 2014).

The paper proceeds as follows. The methodology section elaborates the methods for data collection and analysis. The results section is divided in two parts. In the first part, the literature-review describes the policy approaches and characteristics identified at the global level and for the four countries. The second part focuses on the assessment of characteristics in climate policies, for which a scoring matrix is developed and used. Lastly, the discussion section reflects on the key insights from this study and the value of this research.

2. Methodology

Our methodology is designed to respond to the above two questions. (Q1) is answered by reviewing the literature at the global and South Asian scale, describing the main long-term adaptation policy approaches and their main characteristics. (Q2) is addressed by assessing the existing climate adaptation policies with the identified key characteristics in Bangladesh, India, Nepal, and Pakistan (Fig. 1). The focus on these four South Asian countries is because they share the same natural resources as well as representing climate vulnerability, along with the diversity of socio-economic challenges. Apart from biophysical conditions, authors only had access to adaptation experts in the above-mentioned countries, excluding Bhutan and Afghanistan.

Fig. 1 shows the overall framework of the paper. It highlights the key questions, different methods of data collection, analysis and key results. The following two paragraphs will elaborate on the data collection and analysis aspects of the paper.

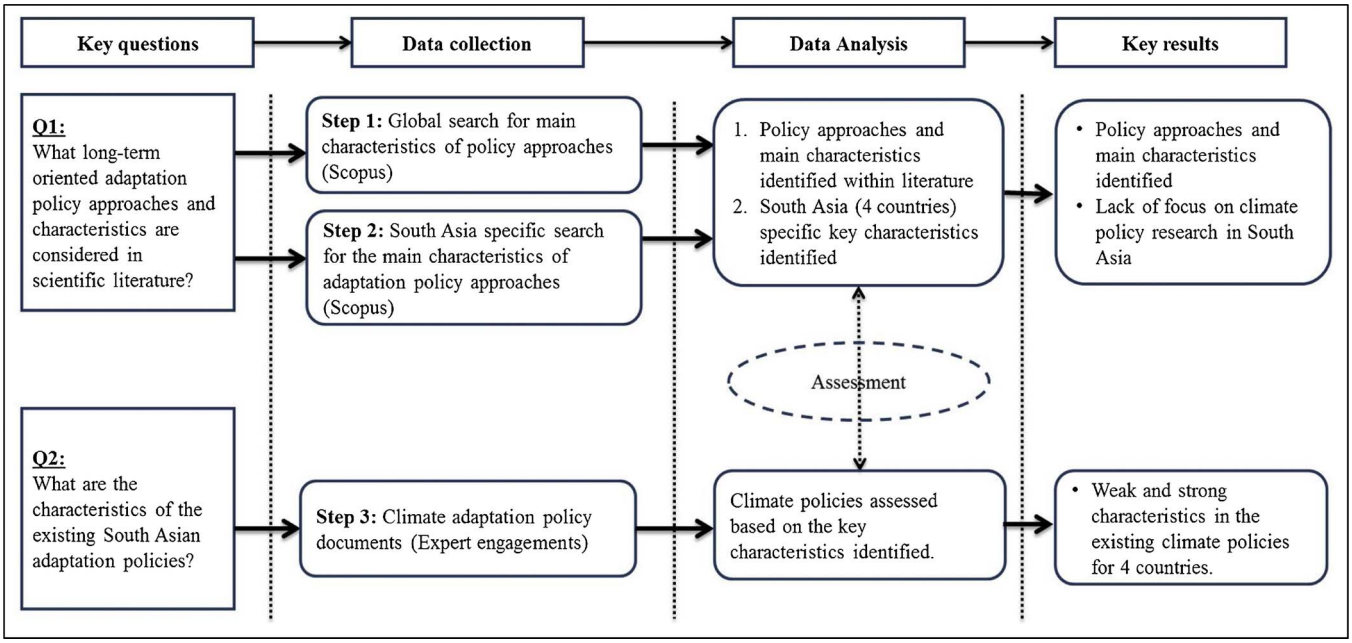

Fig. 1. Methodology of the study.

2.1. Data collection

We use a three-step method to collect the data (Fig. 1). The first step is to identify different types of policy approaches and their main characteristics. A systematic review method based on Liberati et al. (2009) and Biesbroek et al. (2013) was devised to identify journal articles and characterize the existing different adaptation policy approaches. Liberati et al. (2009) provides a general method for conducting systematic literature review, while Biesbroek et al. (2013) implements the systematic literature review method for analysing adaptation policies. Only English language, peer-reviewed, full-text original articles available in Scopus were included for the data collection. Considering the quality aspects and the time constraint, we only included the scientific peer-reviewed articles, excluding the grey literature from our research. Scopus queries al) were created and searched for original research articles published between the period of 1999 and 2017, using search terms: for example *(TITLE-ABS-KEY ("*adapt*") AND TITLE-ABS-KEY ("Climat* change") AND TITLE-ABS-KEY (policy) AND TITLE-ABS-KEY ("*Asi*")) AND DOCTYPE (ar) AND SUBJAREA (soci) AND PUBYEAR > 1999 AND PUBYEAR < 2017*. After running the first queries, a general repository of 915 papers was created. Based on the abstracts and keywords we screened the papers relevant to adaptation; climate change and policy approaches. This resulted in 114 journal articles. We used the papers to distil the most frequently mentioned main characteristics of policy approaches.

To identify scientific literature for the four South Asian countries, we used in the second step the four most cited key characteristics globally (Table 2). Country-wise queries were used, for example: *(TITLE-ABS-KEY ("*Scale*") AND TITLE-ABS-KEY ("Climat* change") AND TITLE-ABS-KEY (policy) AND TITLE-ABS-KEY ("Nepal")) AND DOCTYPE (ar) AND SUBJAREA (mult OR arts OR busi OR deci OR econ OR psyc OR soci) AND PUBYEAR > 1999 AND PUBYEAR < 2017*. This search yielded 72 papers for the four countries for different characteristics such as scale, flexibility, etc., representing 8% of the total journal articles from our database. The papers reflect aspects around adaptation and climate policies in the four countries.

In order to assess the use-in-practice of the key characteristics and adaptation policy approaches identified in step 1 and 2, the third step was to collect the climate policy documents from each country. The policy documents were considered for review based on the discussions of the expert engagements in each country. The experts were involved during the regional and national level science-policy workshops conducted by the partner organizations (BCAS-Bangladesh, ICIMOD-Nepal, PARC-Pakistan, and TERI- India). The qualitative data was collected using structured group interviews and role-plays. Only national scale climate adaptation policies were included in the analysis, emphasizing on designing and implementation to reduce the impacts of climate change. This excluded the national vision documents such as vision 2025 (Pakistan) and Post 2015 development agenda of Bangladesh. These vision documents do not directly discuss how to implement local adaptation activities, but larger strategies to achieve country-level development goals.

2.2. Data analysis

To identify the description and definition of various adaptation policy approaches and their main characteristics (Q1), we used the literature repository created from the data collection step 1. For example, Butler et al. (2016) explained adaptation pathways and adaptive co-management (policy approaches) in rural Indonesia, with underlying characteristics such as reflexivity and institutional flexibility. These results are summarized in Table 1, categorizing existing policy approaches and theoretical concepts such as strategic planning, scenario thinking, pathways, and long term planning. From this categorization, we identified the main characteristics of the policy approaches. The description of policy approaches and the main characteristics contributed in defining the key characteristics used in this paper.

Using the abstracts of the most cited articles and the conceptual framework section; we defined the four key characteristics best representing long-term adaptation policy approaches. For (Q2), we interpreted the main policy documents of each country, based on the four key characteristics. The interpretation is represented in terms of scores of the key characteristics for each policy document (Table 4). To score, we used a scale ranging from − to ++, involving the experts from each case country. The experts includes influential civil society actors, bureaucrats, think tank researchers, and activists. The range of the scores is based on the analysis of the key characteristics in the Section 3. These scores indicates the presence of the key characteristics in the climate policies for each country, with a positive score highlighting the stronger presence of the key characteristics. We arrived at the scores, based on an iterative process, where each expert from each country gave their scores and finally they were corroborated with justifications. The final scores were settled based on the justification provided by each expert, agreeing to the scores.

3. Climate adaptation policy approaches and their main characteristics

To analyse if long-term concerns are included in climate adaptation policies and theoretical concepts, we first discuss the existing adaptation policy approaches and the presence of the characteristics such as flexibility, scalability, reflexivity, uncertainty, resilience, and responsiveness. Scientifically, these characteristics are considered necessary to adapt to future conditions (see e.g. Pahl-Wostl, 2009; Haasnoot et al., 2013; Ranger et al., 2010; Werners et al., 2013). Table 1 shows the most cited adaptation policy approaches and their main characteristics, as were found in the derived dataset from the step 1 of data collection. In the table, we describe the general features of each approach with key References

We used the main characteristics of (Table 1)to define search queries for country-specific literature (Annex 2). The results of these search queries are reflected in Table 2. We used the number of articles referencing to the characteristics to select the four key characteristics. In decreasing order of number of referenced articles *institutional flexibility, adaptive nature, scalability, and reflexivity* were selected. There is a change in the usage of terms from Table 1 to Table 2, for instance flexible became institutional flexibility. These changes are based on the analysis of the literature, allowing us to give a more precise meaning to these characteristics. We use the literature from the repository to derive our understanding and define the key characteristics. These definitions will be used in the remainder of the paper, to analyse the climate policies of the four countries.

3.1. Institutional flexibility

Kwadijk et al. (2010) stress the importance of 'institutional flexibility'. The paper argues that if the magnitude of change is very drastic, then current management strategies will fail and therefore we need institutions that can respond immediately to these changes. Similarly, a study by Amundsen et al. (2010) in Norway marks the importance of institutional change. They highlighted that the local institutions are responsible for issues such as local planning and extreme weather-related emergencies. However, at the national scale the climate change adaptation strategy of 2007 did not initiate any local institutional changes. This sets the ground for very inflexible institutions in the adaptation process. A review paper by Dovers and Hezri (2010) also indicates the importance of institutional change and flexibility to enable adaptation, along with identification of possible reforms. Kuklicke and Demeritt (2016) compare adaptive management approaches and risk-based approaches, to endorse flexibility and experimentation to enable policymakers to change course in response to new information (Pahl-Wostl, 2007; Allen et al., 2011) and avoid decisions that lock-in long-term policy commitments. In this paper, we define 'institutional

Table 1
Most cited adaptation policy approaches and their main characteristics.

Approaches	Description	Main characteristics	Key references
Strategic (spatial) planning*	Key focus on physical solutions; grounded in land-use-planning; inflexible with pre-set time-periods. Number of cases from both developed and developing countries	Inflexible; local and national scale.	Albrechts, 2004; Sartorio, 2005; Faludi, 2016
Scenarios	Key focus on a single scenario of a system; lack of focus on actors or agency; systematic and set process; substantial empirical evidences available.	Inflexible; case focused. Local, national and global scale.	Peterson et al., 2003; Moss et al., 2010; Vervoort et al., 2014.
Adaptation pathways	Key focus on policy reflexivity and adaptive nature of it. Emphasises policy and transformational change; consideration for power and politics; conceptually and theoretically in experimental phase, but some empirical evidences at local scale available. More focus of cases in developed country context.	Flexible; reflexive; time-oriented; experimental; focuses on gradual/ incremental change; Local and national scale.	Butler et al., 2016; Wise et al., 2014; Haasnoot et al., 2013;
Adaptive Governance: Adaptive management; Anticipatory governance; Assumption based planning	Flexible decision framework that uses a wide range of possible futures to prepare for change and to guide current decisions toward maximizing future alternatives or minimizing future threats. Rather than trying to tame or ignore uncertainty, this approach explores uncertainty and its implications for current and future decision-making. Limited focus in developing countries context.	Flexible; incremental change; uncertainty; Local and national scale.	Allen et al., 2011; Walker et al., 2013; Karpouzoglou et al., 2016
Robust Decision Making (RDM)	Quantitative decision- analytic approach for supporting decisions under conditions of deep uncertainty.	Flexible; uncertainty.	Lempert and Groves, 2010; Weaver et al., 2013

Table 2
Key characteristics, number of referenced articles, and their derived definitions.

Key characteristics	No. of referenced articles	Derived definitions
Institutional flexibility	70	Institutional flexibility means the ability to undergo change, i.e. are institutions flexible to change roles for planning and implementation in accordance to future conditions.
Adaptive nature	61	Adaptive nature refers to the policy itself, i.e. how flexible is the policy document in adjusting to new realities. To some extent, it combines the criteria of reflectivity, responsiveness, and revitalization.
Scalability	48	Scalability refers to a characteristic within the policy document that allows the policy to be used at multiple scales combining both functional and spatial units.
Reflexivity	23	Reflexivity stands for how much other sectoral policies (past and present) feed into the new adaptation policy and vice-versa. Reflexivity specifically relates to mainstreaming or integration of multiple agencies/sectors.

flexibility' as institutions that are flexible to change roles for planning and implementation in accordance to future conditions.

3.2. Adaptive nature

Pahl-Wostl (2009) reflects on adaptive nature through the concept of adaptive governance approaches focusing on uncertainty of the future and complex non-linear interactive systems. Similarly, Wise et al. (2014) reflects on how the adaptation pathways approach focuses on the adaptive nature of the decision making process in the face of high uncertainty and inter-temporal complexity. Cilliers et al. (2013) discusses adaptive governance, highlighting the importance of the institutional flexibility and adaptive nature of policies. In this paper, we define 'adaptive nature' as to how flexible is the policy document in adjusting to new realities. To some extent, it combines three of the five capabilities of governance discussed in Termeer et al. (2015) and Termeer et al. (2016) – reflectivity, responsiveness and revitalization.

3.3. Scalability

Cash and Moser (2000) explain scale as any specific geographically or temporally bounded scale. They also recognize that there is reasonable disagreement on the definition of any scale (local, national, regional or global) and rarely there is precise resemblance on whether to consider scale as a functional or spatial unit. Similarly, Osbahr et al. (2008) recognizes the debate around scale in the field of human geography. The paper argues and follows the approach that suggests analysis should address the 'scalar dimensions of practices, rather than practices occurring at different scales'. The paper explains that global phenomenon such as climate change, adaptation responses, and environmental flows experience cross-scale interactions between local and global actors, local and global institutions and different geographies. In the South Asian context Moors et al. (2011) emphasize the need to consider higher administrative scales especially if sharing of common resources is at stake, which is often the case with natural resources such as water. In our paper, we define 'scalability' as a characteristic that allows the policy to be used at multiple scales combining both functional and spatial units scale.

3.4. Reflexivity

Butler et al. (2014) focuses on more local policy making approaches for climate change adaptation, laying emphases on the integration of adaptation and poverty reduction, claiming that the adaptation pathways approach can be useful in the developing country-specific context. Similarly, Goklany (2007) discusses how to include the knowledge of adaptation, mitigation and sustainable development to improve adaptation policies. His paper emphasizes on approaches related to basic development needs such as hunger and mortality rates with the future climatic changes. Termeer et al. (2015, 2016) also uses reflexivity as one of the five governance capabilities. In our paper, we define 'reflexivity' as how much other sectoral policies (past and present) feed into the new adaptation policy and vice-versa.

Table 3
Scoring criteria for key characteristics.

Characteristics Scores	Institutional flexibility	Adaptive Nature	Scalability	Reflexivity
+ +	Changing roles for planning and implementation	Living policy document without fixed term	If there is a focus on local, national and transboundary scale	Mainstreaming or integration of multiple agencies/sectors
+	Decentralized role for planning and implementation	Living policy document with a fixed term	If there is a focus on local and national scale	Only two agencies/sectors integrating for climate change adaptation
0	Decentralized role of planning	Revision provision mentioned in the policy	If there is focus on local and mention of national scale	Mainstreaming/integration not realised
–	Centralized role for planning	Uncompromising policy document with a fixed term	Focus at only one scale (national or local)	Uncoordinated roles between different agencies/sectors
–	Centralized role for planning and implementation	Uncompromising policy document	If there is no focus at any scale	Pre-defined roles for one agency/sector

4. Climate policies in-use

This section assesses the climate policies in-use of Bangladesh, India, Nepal, and Pakistan. To assess the key characteristics in the climate policies, we used a relative scoring scale ranging from − to + +. For each key characteristics, Table 3 explains the range of scores and their interpretation. These scores indicate the presence of the key characteristics in the climate policies for each country, with a positive score highlighting a stronger presence (Table 3).

Table 4 explains the performance of the four characteristics in the main adaptation policies in the four South Asian countries. We include climate polices, climate strategy documents, National action plan for adaptation (NAPA), and (intended) National Determined Contributions (NDCs). Although, NDCs provide insights on the future climate initiatives of a country, they focus on mitigation and emissions targets with a very short description on adaptation. Therefore, we do not use them for our detailed analysis in the following section. In the following paragraphs, we analyse the climate policies based on our four key characteristics (Table 4).

4.1. Bangladesh

Adaptation policy initiatives are currently being implemented under NAPA (2005) and (2009) and Bangladesh climate change strategy and action plan (BCCSAP), 2009. Adaptation policies are steered towards mainstreaming as a key paradigm. Apart from the Ministry of Environment and Forests, Ministry of Planning, and the Ministry of Finance, other sectoral ministries such as Ministry of Water Resources and Ministry of Agriculture are involved in planning and implementation of adaptation initiatives, reflecting high institutional flexibility. The climate cells are operationalized by giving responsibility to an officer to bring coherence between the sectoral ministries and Ministry of Environment and Forests. Moreover, special climate cells have been created in the ministries to coordinate planning and implementation in sectoral ministries. BCCSAP in 2009 was prepared as a living document and the government is currently preparing a revised version. The revised BCCSAP will be adjusted to the new realities and based on the implementation challenges of the existing policy – emphasizing high adaptive nature. Concerning scalability, BCCSAP and NAPAs have a national focus and do not consider transboundary coordination. Moreover, the policies have a very country specific inclination towards floods, with relatively little focus on micro-level planning at villages or Upazila (sub-districts) (Raihan et al., 2010). Lastly, BCCSAP and NAPAs show reflexivity in terms of integration with other sectoral policies. The BCCSAP and NAPAs focus on sectors such as agriculture; water (urban and industry); infrastructure; housing; health; food security; disasters; and energy, emphasizing the aspect of reflexivity with other sectoral policies. For this, they have included adaptation in the annual development plans (6th and 7th five year plans) for creating robust and target-based interlinkages between sectors. Further, Bangladesh has come up with the climate change gender action plan, detailing out the interlinkages between gender aspects, and climate affected sectors.

Table 4
Main policies in Nepal, Bangladesh, Pakistan, and India and respective scores.

Countries	Institutional flexibility	Adaptive nature	Scalability	Reflexivity	Reference
Bangladesh					
BCCSAP (2009)	+	+	–	+	https://www.iucn.org/downloads/bangladesh_climate_change_strategy_and_action_plan_2009.pdf
NAPA (2005 & 2009)	0	+	–	–	https://unfccc.int/resource/docs/napa/ban01.pdf http://www.climatechangecell.org.bd/Documents/NAPA%20october%202009.pdf
NDC (2016)	0	+ +	–	+	http://www4.unfccc.int/ndcregistry/PublishedDocuments/Bangladesh%20First/INDC_2015_of_Bangladesh.pdf
India					
NAPCC (2008)	+ +	+ +	+	+	www.moef.nic.in/downloads/home/Pg01-52.pdf
NDC (2016)	0	+ +	0	+	http://www4.unfccc.int/submissions/INDC/Published%20Documents/India/1/INDIA%20INDC%20TO%20UNFCCC.pdf
Nepal					
NAPA (2010)	+	–	–	+ +	http://unfccc.int/resource/docs/napa/npl01.pdf
CCP(2011)	+	–	+ +	+	https://ldcclimate.files.wordpress.com/2012/05/climate-change-policy-eng-nep.pdf
NDC (2016)	0	+ +	–	0	http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Nepal/1/Nepal_INDC_08Feb_2016.pdf
Pakistan					
NCCP (2012)	+	+	–	+	http://nidm.edu.pk/Documents/Policies/National_Climate_Change_Policy_2012.pdf
NDC (2016)	+	+ +	–	+	http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Pakistan/1/Pak-INDC.pdf

Bangladesh climate change strategy and action plan (BCCSAP); National Action Plan for Adaptation (NAPA); National Action Plan on Climate Change (NAPCC); Climate change policy (CCP); National climate change policy (NCCP); Nationally determined contributions (NDCs).

Considering these mentioned policy initiatives reflexivity is expected to further increase in the near future.

4.2. India

To boost adaptation, India has established the National Adaptation Fund on Climate Change (NAFCC) with a budget provision of INR 3500 million. This is apart from the allocated funds under the various NAPCC Missions. States could use the finance to trigger of some activities listed in their SAPCC. Of the twelve Missions outlined in the National Action Plan on Climate Change, six of the Missions have a focus on sectors wherein adaptation constitutes a core component – Mission on Sustainable Agriculture, National Water Mission, and Mission on Himalayan Ecosystems, the Green India Mission, and the Mission on Strategic Knowledge on Climate Change. Two new missions were recently added in 2015 with a focus on adaptation – Mission on Health and Mission on coastal areas. The cross-sectoral coordination represents 'institutional flexibility'. In addition, the inclusion of new Missions highlight the adaptive nature of NAPCC, but it does not mention future revision of the plan. These Missions were outlined by the Prime Ministers Council on Climate Change, the detailing and execution were given to nodal Ministries for instance the National Water Mission is housed within the Ministry of Water Resources. In some cases, for the execution of these missions multi-agencies committees have been formed. Coming to scalability, NAPCC allows for integration of the work at various scales, given that the SAPCCs for most of the states have also been formulated. However, the Missions in NAPCC have no focus on transboundary adaptation. Reflexivity is high as the execution of most of the activities are outlined in the Missions through a committee that includes members from other Ministries and agencies. It engages the State and multiple actors to be able to achieve desired goals.

4.3. Nepal

Nepal prepared the NAPA document (2010) including the idea of local adaptation plans, followed by Climate Change Policy (CCP, 2011) and Local Adaptation Plan for Action (LAPA) framework document. The institutional flexibility in CCP is not elaborated, except to create inter-ministerial[2] and multi-actor committees,[3] to coordinate the adaptation planning and implementation across different sectors. The adaptive nature of the existing policies is considered weak in NAPA and CCP, and as of yet there is no official communication on the revision of the policies in the near future. Although Nepal is currently preparing a National Adaptation Plan, at present there are a few sectoral policies that include the climate change adaptation perspective (for example, Environment-friendly Local Governance Framework, 2013 and Agriculture Development Strategy, 2015–2035). The scalability is a strong focus of climate policies. Nepal aims to implement village level adaptation projects. This is illustrated in CCP, *"To implement adaptation programmes according to the national development agenda and to ensure at least 80 percent of the total funds available for climate change activities flow to the grassroots level"* (pg. 4, CCP, 2011). However, NAPA has a national and local focus, but CCP also mentions to extend efforts at the transboundary scale. Regarding the reflexivity aspect, both CCP and NAPA discusses about the inclusion of other sectors for adaptation initiatives. The NAPA document details out that adaptation strategies are to be integrated in agriculture, forestry, water, disasters, health and urban settlements sectors.

[2] MCCICC is multi-stakeholder committee, comprised of ministers from various ministries, civil society and academia.

[3] Climate change council is chaired by the PM, to oversee the efforts and investment for the climate change adaptation.

4.4. Pakistan

The goal of National Climate Change Policy (NCCP), 2012 is to coordinate among different sectors and agencies for effective resilience building. NCCP aims to enhance institutional flexibility by coordinating different adaptation activities at national, sub-national and local level. A number of suggested adaptation measures in NCCP are to ensure national food, energy and water security at different administrative levels. It has been found that sector relevant policies rather than National Climate Change Policy are driving public expenditures on climate change. The NCCP is designed as a living document without any fixed term, therefore it is considered to have a high adaptive nature. It emphasizes to evolve based on the changing knowledge and emerging climate change issues. NCCP has a strong focus to implement adaptation at the national scale, coordinating between provinces. However, it has a weak inclination for local and transboundary adaptation. Reflexivity of the policy is high as it shows a great collaboration and provisions with other state polices and strategies for the energy, water, and food sectors.

5. Discussion

From this paper, we gain three key insights. First, from the literature review we found that the South Asia region is under-researched in terms of adaptation approaches, if compared globally. The four South Asian countries contribute only 8% of the total journal articles from our database. In the four countries, the primary focus is on development aspects such as health and education measures in the short-term. This acts as a barrier for climate policy research in two ways. First, the implementation focus neglects the in-depth policy research and second, short-term development measures circumvent long-term planning, which is compulsory for climatic changes. Among the four South Asian countries, Pakistan and Nepal are the least researched countries. This can be attributed to both technical and political reasons. Ojha et al. (2016) indicates that climate policies are technocratic, top-down and aid-driven, eventually supressing in-country policy research, in for example Nepal. In the case of Pakistan, the lack of focus on policy research (long term adaptation planning) is may be due to a centralized policy-making process (Khilji, 2002; Karim, 2016).

The second insight follows from our analysis of key characteristics of adaptation policies. Scalability, flexibility, adaptive nature and reflexivity are the four key characteristics identified from the scientific journal articles. Reflexivity and scalability have a low number of references compared to the other two key characteristics. If our search would have considered the grey literature, it could be expected that reflexivity would have had a higher number of references. Apart from the government, non-governmental think tanks and civil society organizations produce various documents discussing reflexivity in the domain of climate change (Sharma et al., 2009; IDL CARIAA working paper, 2016). Contrastingly, scalability has a low number of references and receives low scores in the assessment of the climate policies (Table 4). The low number of references for scalability is often because of the focus on in-country scalability, excluding the transboundary scale in South Asia.

Third, the climate policies of the four countries mostly focus on the local and national scale. However, the four countries share the Hindu Kush Himalayas, which is the source of the Transboundary Rivers. Such common resources are often the reason of conflicts between the upstream and downstream riparians due to the difference in interests from these commons. Climate inclusive transboundary policies can reduce the conflicts and improve co-management of transboundary resources, such as changing snow and ice volumes (for e.g. Immerzeel et al., 2010; Lutz et al., 2014). Therefore, it is important to define an adaptation policy connecting local and national adaptation efforts at the transboundary level. For example, the upcoming Bangladesh Delta Plan 2100 makes a provision for strengthening international cooperation

and transboundary river management with neighbouring countries. However, this is very complex due to different socio-economic and political conditions in the four countries. We observed that each country has a different sectoral vulnerability. For example, Nepal's adaptation policy focuses on forestry and soil conservation, while Bangladesh's focuses on water and flood management (Pandey et al., 2016; Gain et al., 2017). Moreover, India has a strong internal market for agriculture, leading adaptation in India to focus on agriculture and allied activities. This difference in focus makes it difficult to come up with a common transboundary adaptation strategy, resulting in low scalability of the climate policies.

The adaptation policies are rapidly changing with the latest scientific inputs and policy instruments. For instance, Bangladesh is experiencing rapid changes in adaptation policy formulation and revision due to both internal and external mechanisms such as the Paris agreement, adaptation finance initiatives, and SDGs. These revisions create an opportunity to include transboundary scale adaptation strategies in South Asia.

6. Conclusions

In this paper, we respond to two questions. First, (Q1) what long-term oriented adaptation policy approaches (and characteristics) are considered in scientific literature? Second, (Q2) what are the characteristics of the existing adaptation policies in South Asia? Table 1 shows that strategic planning and scenario thinking are inflexible as compared to the adaptation pathways, adaptive management and robust decision-making approaches. Further, the table highlights that anticipatory governance and robust decision-making discuss about the issues of uncertainty and incremental change. The review of the scientific literature on adaptation policy approaches identified four key characteristics – institutional flexibility, adaptive nature, scalability, and reflexivity (Table 2).

The four countries score high in terms of institutional flexibility, meaning that they have a decentralized planning and implementation for adaptation efforts. All the four countries show relatively high reflexive nature in its adaptation policies. Most of the adaptation policies emphasize on inclusion of other ministries and sectors for coherent adaptation planning and implementation. Bangladesh and Nepal score the highest in terms of adaptive nature in their policies. Bangladesh also scores highest in terms of institutional flexibility. However, except for a cursory mention in Nepal climate policy, none of the country policies mentions the issues of adaptation approaches at a transboundary scale. Rather, they focus at the national or local scale. The relatively low scores for the scalability characteristic reflect this. To prevent rigidity and to improve scalability approaches such as adaptive management and robust decision-making, and adaptation pathways may be useful for long-term adaptation strategies (Weaver et al., 2013; Karpouzoglou et al., 2016; Butler et al., 2016; Wise et al., 2014).

Disclaimer

The views expressed in this work are those of the creators and do not necessarily represent those of the UK Government's Department for International Development, the International Development Research Centre, Canada or its Board of Governors.

Acknowledgements

This work was carried out by the Himalayan Adaptation, Water and Resilience (HI-AWARE) consortium under the Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA) with financial support from the UK Government's Department for International Development and the International Development Research Centre, Ottawa, Canada.

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