



Centre for
Climate Change
Economics and Policy

An ESRC Research Centre

Sustainability Research Institute

AN ESRC RESEARCH CENTRE

Climate change adaptation and cross-sectoral policy coherence in southern Africa

Matthew England, Andrew Dougill, Lindsay Stringer,
Katharine Vincent, Joanna Pardoe, Felix Kalaba,
David Mkwambisi and Emilinah Namaganda

April 2017

Centre for Climate Change Economics and Policy

Working Paper No. 303

Sustainability Research Institute

Paper No. 108



The Centre for Climate Change Economics and Policy (CCCEP) was established by the University of Leeds and the London School of Economics and Political Science in 2008 to advance public and private action on climate change through innovative, rigorous research. The Centre is funded by the UK Economic and Social Research Council. Its second phase started in 2013 and there are five integrated research themes:

1. Understanding green growth and climate-compatible development
2. Advancing climate finance and investment
3. Evaluating the performance of climate policies
4. Managing climate risks and uncertainties and strengthening climate services
5. Enabling rapid transitions in mitigation and adaptation

More information about the Centre for Climate Change Economics and Policy can be found at: <http://www.cccep.ac.uk>.

The Sustainability Research Institute (SRI) is a dedicated team of over 20 researchers working on different aspects of sustainability at the University of Leeds. Adapting to environmental change and governance for sustainability are the Institute's overarching themes. SRI research explores these in interdisciplinary ways, drawing on geography, ecology, sociology, politics, planning, economics and management. Our specialist areas are: sustainable development and environmental change; environmental policy, planning and governance; ecological and environmental economics; business, environment and corporate responsibility; sustainable production and consumption.

More information about the Sustainability Research Institute can be found at: <http://www.see.leeds.ac.uk/sri>.

The **Future Climate for Africa UMFULA** project is a four-year research project that aims to improve climate information for decision-making in central and southern Africa. More information about UMFULA can be found at: www.futureclimateafrica.org/umfula/.

This working paper is intended to stimulate discussion within the research community and among users of research, and its content may have been submitted for publication in academic journals. It has been reviewed by at least one internal referee before publication. The views expressed in this paper represent those of the author(s) and do not necessarily represent those of the host institutions or funders.

TABLE OF CONTENTS

Abstract	4
1. Introduction	5
2. Adaptation as a cross-cutting policy issue	5
3. Research Methodology	6
4. Results	8
4.1. Climate Change Adaptation Planning in Sectoral Policies	8
4.2. Policy coherence across sectors and with NDPs / Climate Change Policies	9
4.3. Expert interview verification and insights	15
5. Discussion	18
References	20

ABSTRACT

To be effective, cross-cutting issues like climate change adaptation need to be mainstreamed across multiple sectors and for this greater policy coherence is essential. Using the cases of Malawi, Tanzania and Zambia, this paper investigates the extent of coherence in national policies across water and agriculture sectors and their links to climate change adaptation and national development plans. A two-pronged qualitative approach is applied using Qualitative Document Analysis of relevant policies and plans, combined with expert interviews from key non-government actors in each country. Findings show that sector policies have differing degrees of cross-thematic coherence, currently being strongest in Zambia and weakest in Tanzania. We show that sectoral policies are more likely to be coherent in addressing immediate-term disaster management issues of floods and droughts rather than in longer-term approaches to climate adaptation. Coherence between sector and climate policies and strategies is strongest when the latter has been more recently developed. However, this has largely been achieved by repackaging of existing sectoral policy statements into climate policies drafted by external consultants to meet international reporting needs and not by the establishment of new connections between sectoral planning processes. For more effective mainstreaming of climate change adaptation, governments need to actively embrace longer-term cross-sectoral planning within their own cross-Ministerial structures to foster greater policy coherence and integrated adaptation planning.

KEYWORDS

Mainstreaming, Water, Agriculture, Malawi, Zambia, Tanzania.

Submission date 07-04-2017 Publication date 07-04-2017

Acknowledgements

This work was funded by Future Climate for Africa (FCFA) programme as part of the UMFULA regional consortium project (NE/M020207/1). The FCFA programme is funded jointly by the Natural Environmental Research Council (NERC) and UK Department for International Development (DFID).

1. Introduction

Development in southern Africa is occurring against a backdrop of climate change (Brown et al., 2011). This makes careful adaptation planning imperative, as climate change is projected to increase temperatures, alter the temporal and spatial distribution of rainfall and increase the severity of droughts and flooding (IPCC, 2014). Climate impacts are taking place alongside rapid social, economic and demographic transitions that combine to influence development outcomes, including food security (Ford et al., 2015). Climate adaptation planning is subject to challenges of the paucity of reliable climate information (Jones et al., 2015) and uncertainties about the timing of impacts and their spatial distribution (Davis, 2011; Abson et al., 2012). As climate change is a cross-cutting issue, adaptation needs to be mainstreamed into sector-based policies (Stringer et al., 2014) and across different levels of governance (Urwin and Jordan, 2008). However, empirical analyses are lacking regarding the extent to which this is happening at the national level across sub-Saharan African states.

The aim of the study is to assess policy coherence in climate change adaptation planning in Malawi, Tanzania and Zambia. To achieve this, we focus on two specific objectives:

1. To identify the extent and nature of climate change adaptation planning approaches included in sector policies.
2. To assess the policy coherence across sectors and with National Development Plans (NDPs) and climate change adaptation policies and strategies.

Document analysis is complemented by, and triangulated with, qualitative expert interview data. We focus on water and agricultural sectors due to their sensitivity to climate impacts and because agriculture contributes around 20% of southern Africa's GDP, as well as being the dominant livelihood for the majority of the population (SADC, 2012).

2. Adaptation as a cross-cutting policy issue

Adaptation is defined as “adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities” (IPCC, 2014: 1757). In recent years the United Nations Framework Convention on Climate Change (UNFCCC) has begun to place more emphasis on adaptation – for example in the Cancun Adaptation Framework from 2010. Article 7 of the Paris Agreement calls for adaptation efforts to be enhanced and for Parties to integrate adaptation into relevant socio-economic and environmental policies and actions. In this paper, we concentrate our analysis on planned adaptation, defined as “adaptation that is the result of a deliberate policy decision, based on an awareness that conditions have changed or are about to change and that action is required to return to, maintain, or achieve a desired state” (IPCC, 2014:1758).

Effective adaptation planning is needed across all sectors in such a way that recognises sectoral interdependencies and policy entry points (Conway and Mustelin, 2014). Indeed, the post-2015 development agenda recognises the complexities

associated with the prevailing sectoral approach to policy-making and emphasises the importance of policy coherence in addressing cross-cutting challenges (Conway et al., 2015; Nilsson et al., 2016) and ensuring improved links between international climate policy and national sectoral policy development (Cochrane et al., 2017). Policy coherence is defined as “the systematic promotion of mutually reinforcing policy actions across government departments and agencies creating synergies towards achieving the agreed objectives” (OECD, 2004:3). Analyses of coherence are important to identify where policies in different sectors are horizontally supporting or conflicting with one another, as well as the ways in which they are aligned vertically between national commitments to international agreements (Chandra and Idrisova, 2011). Coherent policy approaches can lead to greater effectiveness and efficiency, and can reduce competition for limited budgets and resources (Akhtar-Schuster et al., 2011).

Policy studies outside of southern Africa have identified the importance of strengthening partnerships and collaboration to manage the impacts of climate change as well as developing an appropriate institutional context and supporting policy instruments (Massey et al., 2014; Biesbroek et al., 2010). The need to build such policy activities upon cross-sector dialogue and actions has also been recognised in southern Africa by the establishment of inter-ministerial climate change committees and task forces in countries such as Malawi, Zambia and Zimbabwe (Stringer et al., 2014).

3. Research Methodology

Qualitative Document Analysis (QDA) has been utilised to facilitate objective analysis of policy documents, (e.g. Altheide *et al.*, 2008; Wesley, 2011) and provides an approach that considers the meaning and implications of text. It uses subjective scoring followed by validation through a series of independent expert interviews. The approach adopted in this study follows several steps to improve rigour and consistency of analysis, including: a) setting criteria for the selection of documents; b) obtaining documents; c) analysis of documents; d) validation; e) finalisation (Altheide *et al.*, 2008).

In setting the boundaries of the study and the criteria for the selection of documents, our sample initially considered official government documents from countries within the Southern African Development Community (SADC). From this, we then focused on three countries (Malawi, Tanzania and Zambia) which have a full set of policy documents across water and agriculture, as well as NDPs and climate change policies and strategies (Table 1). These documents were systematically analysed to ascertain: i) whether adaptation was being considered or not; and ii) how it was being treated and iii) whether climate change adaptation statements were coherent with the other documents assessed. Documents were analysed using a content analysis approach (Stemler, 2001) based on a scoring criteria to assess coherence (Table 2).

Table 1: Documents forming the sample for Qualitative Document Analysis.

Policy document	Country		
	Malawi	Tanzania	Zambia
Water Policy	National Water Policy. (GoM, 2005)	National Water Policy. (GoT, 2002)	National Water Policy. (GoZ, 1994)
Agricultural Policy	National Agricultural Policy (GoM, 2011a)	National Agricultural Policy (GoT, 2013)	National Agricultural Policy (GoZ, 2004)
National Development Plans (NDP)	Malawi Growth and Development Strategy, 2011-2016 (GoM, 2011b)	Tanzania Development Vision 2025 (GoT, 1999)	Revised Sixth National Development Plan, 2013-2016 (GoZ, 2013)
Climate Change	National Climate Change Policy (GoM, 2016)	National Climate Change Strategy (GoT, 2012)	National Climate Change Response Strategy (GoZ, 2010)
National Adaptation Action Plan (NAPA)	Malawi's National Adaptation Programme of Action (GoM, 2006)	National Adaptation Programme of Action, 2007 (GoT, 2007)	National Adaptation Programme of Action, Final Report (GoZ, 2007)
(Intended) Nationally Determined Contribution (INDC)	Nationally Determined Contribution. (GoM, 2015)	Intended Nationally Determined Contribution (GoT, 2015)	Nationally Determined Contribution (GoZ, 2015)

The content analysis comprised four stages. In the first stage, each of the sector policies (water and agriculture), NDPs and climate change policies and strategies was assessed for dominant approaches to four key themes: i) water, ii) agriculture, iii) water and agriculture inter-sector alignment for climate change adaptation, and iv) climate change adaptation. As approaches to water and agricultural adaptations were identified, we recorded the discursive context in which those words were found. This led to identification of specific keywords such as “irrigation”, “drought”, “flood”, “disaster management”, “water security” and “food security”.

The second stage involved using these keywords to analyse the parts of each document where they were located. This assessed water and agriculture approaches based on the content of the sentence or paragraph in which they were included within the policy, providing country-specific background context and insights into government plans and priorities. The keywords and approaches were grouped together, and in synthesised form were entered into tables for each of the three countries. This enabled cross-comparison of the main emphases in each sector and in NDPs and climate change policies and strategies. The dates of policies were recorded to enable a chronology of policy development and links to climate adaptation planning to be developed for each country.

The third stage involved searches of keywords within the respective themes. These were used to assess the extent to which the other documents referred to the same issues. For example, how did the agriculture policy, NDP, national climate change policy, NAPA and (I)NDC each refer to water? A qualitative score was then applied to the level of coherence, from 3 (full coherence) to 0 (no coherence) (Table 2) for each policy for each of the 4 search terms. With regards to the theme “climate change adaptation”, for example, Malawi's agriculture policy recognises climate

change in policy and advocates a number of management approaches across sectors, stressing the importance of disaster management for floods and droughts. It was thus ascribed a score of 2.

The fourth stage focused on assessing the coherence of policies relative to each other within each country. This was based on calculating the average of the two values from stage one. For instance, the coherence of Zambia’s Agricultural Policy relative to its National Climate Change Policy is 1.5 (as the average coherence across building blocks is 1 for Zambia’s Agricultural Policy and 2 for the National Climate Change Policy).

Table 2: Scoring criteria to assess coherence (adapted from Le Gouais and Wach, 2013).

Type of coherence	Description of coherence	Score
High coherence	The policy aligns strongly across water, agriculture and climate change statements. Policy devotes specific attention to both water and agriculture inter-sector alignment and in relation to climate change adaptation. It includes numerous and detailed complementary activities (including projects) for achieving that.	3
Partial coherence	Although the policy supports both water and agriculture inter sector alignment and in relation to climate change adaptation (particular in the form of general statements), it is less clear and distinct how it could be achieved. Relatively fewer details and activities are included within the policy.	2
Limited coherence	The policy supports water and agriculture inter-sector alignment and/or in relation to climate change adaptation. Lack of relative details in terms of activities and plans.	1
No coherence	There is no evidence in the policy to suggest that sectoral statements are co-ordinated and/or aligned.	0

Validation and finalisation steps in the QDA involved government and non-governmental expert interviews, including from international organisations (e.g. United Nations organisations, multilateral banks and international donor organisations) who are providing guidance on, and funding for, climate adaptation initiatives and from the leading national University researchers, chosen as people working across the study sectors. In total, eight expert interviews were undertaken in Malawi, seven in Tanzania and five in Zambia.

4. Results

4.1. Climate Change Adaptation Planning in Sectoral Policies

Climate change adaptation was not explicitly addressed in any of the water policies in the three countries, but appears in agriculture policies of both Malawi and Tanzania. For example, Malawi’s National Agricultural Policy notes that: “Since Malawi has a low economic capacity to cope with climate change, the policy therefore seeks to urgently implement adaptation and mitigation interventions to minimize future adverse effects of climate change on agriculture” (GoM, 2011a:20). Tanzania’s agricultural policy states that: “The Government, in collaboration with other stakeholders, shall strive to improve adaptation measures to climate change effects and deal with all the risks involved” (GoT, 2013:29). Adaptation does not feature in the agriculture policy of Zambia, which was developed earlier than the

other two countries (GoZ, 2004). Conversely, adaptation is included in several places in both Malawi and Zambia's NDPs, and Zambia's was revised in 2013 with mainstreaming of climate change as one of the explicit aims. This is partly driven by the funding provided by Multilateral Development Banks to support the integration of climate change into National Development Plans as well as recent extreme climate events witnessed by the countries linked to enhanced El Niño events. Indeed, Malawi's NDP emphasises the importance of "mainstreaming climate change adaptation aimed at protecting water and sanitation infrastructure against damages and safeguarding communities against flooding, disease outbreaks and water scarcity during events of heavy precipitation and droughts" (GoM, 2011b:103). Similarly in Tanzania, the latest two 5 year Development Plans (2011-2016; and 2016-2021) both include substantial references to climate change. Inclusion of adaptation in sector policies indicates that climate adaptation is starting to become mainstreamed within Tanzanian planning. Inclusion is an important first step in the quest for policy coherence (Mickwitz and Kivimaa, 2007).

4.2. Policy coherence across sectors and with NDPs / Climate Change Policies

A large and diverse range of water and agriculture adaptation approaches were identified in policy documents for each of the study countries (Table 3). The majority of the approaches that are detailed in water and agriculture sectoral policies are also mentioned in similar (or exact) wording in climate change documents (NAPA, NCCP and (I)NDCs) and the NDPs, but with limited extensions in these new policy statements. While the approaches in NDPs recognise that climate conditions are dynamic and that actions are required to attain a desired state, whether adaptations are specifically to climate change or to broader economic, political, social and environmental changes is unclear.

Water and agriculture management approaches that represent policy adaptations to climate change cover both extreme weather events (notably floods and droughts) and longer term trends, through improved water management and investments in dams, irrigation and rainwater harvesting based on projections of drier future climates (IPCC, 2014). We note that the approaches remain incremental, rather than supporting adaptation as transformation (Pelling *et al.*, 2015). This can partly be explained by the limited awareness of longer-term climate scenarios / projections to inform planning across all government departments (Vincent *et al.*, 2017). Longer term approaches were more diverse but less regularly mentioned than short-term event-based issues that have a more immediate risk and disaster management need in both agriculture and water policies. The most frequently mentioned water management approaches include disaster management for floods and droughts, water conservation, groundwater management and rainwater harvesting. Examples of longer term adaptations relating to water include integrated water resources management, improving coverage and access to urban and domestic water supply, increasing reservoir water storage and enhancing hydropower generation capacity.

Table 3: Coherence of policy documents for key themes and adaptation keywords for Malawi, Tanzania and Zambia (Score 3=high coherence; 2=Partial coherence; 1=Limited coherence; 0=No coherence).

a. Malawi	Water Policy	Agriculture Policy	National Development Plan	National Climate Change Policy	National Adaptation Programme of Action	Nationally Determined Contribution
Water	N/a	(2) Recognises linkage between water and agriculture, and supports the development of small & large irrigation schemes for Green Belt Initiative project.	(2) Supports Green Belt Initiative and an increase in the area under irrigation.	(1) Recognises water scarcity as issue of concern. Very few details or plans for water management	(2) Highlights implications on water security owing to climate change, notably floods & droughts. Details numerous water approaches to adaptation.	(1) Highlights vulnerability of water sector to climate change impacts. Details a few activities, but lacks specific details.
Agriculture	(1) Recognises agricultural dimensions to water management , but lacks details.	N/a	(2) Supports Green Belt Initiative and an increase in the area under irrigation, detailing numerous agricultural management approaches.	(1) Highlights vulnerability of rainfed agriculture to climate change. Details numerous land use and agricultural practises for sustainable intensification of crops and livestock production.	(2) Highlights vulnerability of rainfed agriculture to climate change and calls for increasing resilience of agriculture to droughts. Details numerous agriculture activities, plans and projects.	(1) Highlights vulnerability of agricultural sector to climate change impacts, particularly rainfed agriculture. Details a few activities but lacks specific details or projects.
Water and agriculture inter-sector alignment for Climate change adaptation	(1) Contains a few general statements regarding inter-sector alignment but no specific approaches or projects.	(2) Contains general statements inter-linking water and agriculture and a few approaches.	(2) The policy inter-links water and agriculture together and provides a number of plans through the Green Belt Irrigation project. Fails to link this to climate change.	(1) Only one mention of complementarity between water and agriculture.	(2) Call for a multi-sector approach encompassing water and agriculture. Projects targeted at rural communities to enhance food and water security in areas prone to droughts & floods.	(1) General statement on vulnerability of sector to climate change.

Climate change adaptation	(1) Recognises climate change as issue of concern, advocating disaster preparedness and management	(2) Recognises climate change in policy and advocates a number of management approaches across sectors, stressing the importance of disaster management for floods & droughts.	(1) Recognises climate change as issue, particularly an increase in droughts and floods. However, fails to explicitly link it to climate change orientated statements.	(3) Details potential climate change impacts stressing importance of an increase in incidence of floods and droughts and some adaptation approaches.	(3) Details potential climate change impacts stressing importance of an increase in incidence of floods and droughts and livelihood activities.	(2) Recognises climate impacts across the country but lacks specific details in terms of adaptation.
Mean	1	2	1.75	1.75	2.25	1.25

b. Tanzania	Water Policy	Agriculture Policy	National Development Plan	National Climate Change Strategy	National Adaptation Programme of Action	Intended Nationally Determined Contribution
Water	N/a	(1) Recognises agriculture but does not include specific strategies.	(1) Recognises importance of water for livelihoods and development, includes a few examples of approaches.	(2) Policy recognises climate change vulnerability and details plans for water approaches for climate change adaptation.	(3) Policy acknowledges the importance of water for climate change adaption. Numerous water-based activities and projects detailed, including prioritisation and ranking.	(1) General statement about the importance of water in the context of climate change adaptation. Some activities provided but not in detail.
Agriculture	(2) Recognises agriculture and includes some examples of approaches including water use efficiency and irrigation.	N/a	(1) Recognises importance of agriculture for livelihoods and food production, includes a few examples of approaches.	(2) Policy highlight importance of agriculture and food security. Policy details a handful of agricultural approaches to adapt to climate change.	(3) Recognition of the vulnerability of agriculture, and need to enhance resilience. Numerous agricultural approaches mentioned in the policy, including prioritisation and ranking.	(1) No explicit reference to the importance of agricultural vulnerability or adaptation approaches. Few details provided.
Water and agriculture inter-sector	(1) Policy contains a few general	(1) Policy contains a few references to	(0) No explicit reference to	(1) General statements concerning	(2) General statements of how climate	(1) Only two mentions of complementarit

alignment for Climate change adaptation	statements about inter-sector alignment but lacks details.	inter-sector alignment but lacks details.	inter-sector alignment.	the risk of climate change, but no mention of plans or projects that directly link water and agriculture.	change risks will impact food and water security. Plans to improve water efficiency in irrigated crop production.	y between water and agriculture in general statements of intent.
Climate change adaptation	(0) Does not recognise climate change as an issue nor explicitly advocates any water-based adaptation approaches.	(1) Recognises climate change potential impacts on the agricultural sector but lacks specific details on adaptation approaches.	(0) Does not explicitly mention climate change or offer any potential adaptation approaches.	(3) Details potential climate change impacts stressing importance of increase in incidence of floods and droughts. Includes numerous approaches to adaptation.	(3) Details potential climate change impacts. Details a number of specific approaches as adaptation.	(2) Recognises climate change impacts and numerous adaptation approaches, but lacks specific details.
Mean	1	1	0.5	2	2.75	1.25

c. Zambia	Water Policy	Agriculture Policy	National Development Plan	National Climate Change Policy	National Adaptation Programme of Action	Nationally Determined Contribution
Water	N/a	(2) Policy recognises importance of water for agricultural production and includes a few approaches including irrigation, water conservation within farming systems.	(2) Recognises importance of water for overall development, including numerous activities and approaches.	(2) Recognition of the potential impacts on climate change upon water resources and water scarcity. Detailed account provided of water management plans.	(3) Recognition of the adverse impacts of climate change on water resources. Detailed account provided of specific plans.	(2) Recognition of climate change impacts on water security (GoZ, 2015:1) Mentions a few water management approaches but lacks significant details.
Agriculture	(2) Policy recognises importance of water and includes irrigation	N/a	(2) Recognises importance of agriculture for development and food security,	(2) Recognition of the potential impacts on agriculture	(3) Rainfed agriculture highlighted as vulnerable to climate change, with	(1) Outlines climate change impacts on crop production. Includes a few agricultural

	system improvement to increase food production.		includes numerous activities and approaches.	and implication for national food security. Plans and activities outlined.	direct implications for food security. Numerous plans detailed for agricultural adaptation in different regions.	management plans and approaches, but lacks specific details.
Water and agriculture inter-sector alignment for Climate change adaptation	(1) General statement on importance of inter-sector linkage but no mentioned projects or approaches.	(2) Recognises importance of inter-sector linkages and includes a number of approaches to achieve integration.	(2) Document recognises water and agriculture inter-linkage and provides details of some associated programme and projects.	(1) Policy contains general statement on inter-linkages but lacks specific details on approaches.	(2) Overarching statements including water and food security to promote sustainable development. A few specific plans explicitly linking water and agriculture.	(2) Recognition of climate change impacts through droughts and floods. General statements as well as a number of plans regarding management water and agriculture together.
Climate change adaptation	(0) Does not explicitly mention climate change as an issue or provide any potential adaptation responses.	(0) Does not explicitly mention climate change as an issue or provide any potential adaptation responses.	(2) Recognises climate change as an issue of concern, particularly through floods and droughts. Contains numerous approaches to adaptation.	(3) Details climate change impacts stressing importance of an increase in incidence of floods and droughts. Details a number of specific adaptation approaches.	(3) Details potential climate change impacts stressing importance of an increase in incidence of floods and droughts, including a number of specific adaptation approaches.	(3) Details potential climate change and a number of specific adaptation approaches.
Mean	1.33	1	2	2	2.75	2

The most frequently mentioned approaches for agriculture include food and nutrition security, livestock management, risk management including early warning systems for crops, food and seed storage systems and the appropriate use of fertilizers and pesticides. Common examples of longer term adaptations in the agricultural sector include soil and crop research, use of appropriate technology and irrigation development.

Analysis of recent changes and updates to climate change documents revealed repeated concerns about an increase in the frequency and severity of floods and droughts. This was particularly apparent in the 2015 (I)NDC statements. For

example, Zambia's NDC states that it is “highly vulnerable country to the adverse impacts of climate change especially droughts and floods” (GoZ, 2015:7). Tanzania's INDC notes that “Currently more than 70% of all natural disasters in Tanzania are climate change related and are linked to recurrent droughts and floods” (GoT, 2015:3), while Malawi's NDC states that the: “Major climate related hazards that wreak havoc in the country are floods and droughts” (GoM, 2015:1). Similarly, the NAPAs and NCCPs of all three countries single out the importance of managing floods and droughts. A range of water and agriculture management approaches are advocated, including the development of early warning systems to strengthen national and local water and food security.

When we consider the extent of policy coherence around adaptation, analysis shows that Zambia has the most coherent set of policies, followed by Malawi and then Tanzania (Table 4). Results indicate that NAPAs provide the most coherence with respect to the other documents examined. This reflects the nature of their development and its differences compared to typical national policy development. NAPAs act as an adaptation-focused collation of existing sectoral plans and a specific project funding list aimed at external funding bodies rather than a binding guide for future sectoral policy development. For example, Tanzania's NAPA and National Climate Change Strategy recognise vulnerability of climate change impacts, with the Strategy stating: “Tanzania's NAPA ranked agriculture and food security as the most vulnerable and important sector that is severely impacted by climate change and advocated that studies on the impact of climate change in the sector and on food security be a priority activity” (GoT, 2012:27).

Table 4: Coherence of policy documents within Malawi, Tanzania & Zambia (3=high coherence; 2=Partial coherence; 1=Limited coherence; 0=No coherence; Results presented are rounded to the nearest whole number).

	Water Policy	Agriculture Policy	National Development Plans	National Climate Change Policy	National Adaptation Programmes of Action	Intended Nationally Determined Contribution	Total
Malawi							
Water Policy (2002)		2	1	1	2	1	7
Agriculture Policy (2011)	2		2	2	2	2	10
National Development Plans (2011)	1	2		2	2	1	7
National Climate Change Policy (2012)	1	2	2		2	1	8
National Adaptation Programme of Action (2006)	2	2	2	2		2	10
Intended Nationally Determined Contribution (2015)	1	2	1	1	2		7
Total coherence scores	7	10	7	8	10	7	49
Tanzania							
Water Policy (2012)		1	1	2	2	1	7
Agriculture Policy (2013)	1		1	2	2	1	7
National Development Plan (1999)	1	1		1	2	1	6

National Climate Change Strategy (2012)	2	2	1		2	2	9
National Adaptation Programme of Action (2007)	2	2	2	2		2	10
Intended Nationally Determined Contribution (2015)	1	1	1	2	2		7
Total coherence scores	7	7	6	9	10	7	46
Zambia							
Water Policy (1994)		2	2	2	2	2	10
Agriculture Policy (2004)	2		2	2	2	2	10
National Development Plan (2013)	2	2		2	2	2	10
National Climate Change Strategy (2011)	2	2	2		2	2	10
National Adaptation Programme of Action (2010)	2	2	2	2		2	10
Intended Nationally Determined Contribution (2015)	2	2	2	2	2		10
Total coherence scores	10	10	10	10	10	10	60

Whilst Zambia (60) scores higher than Tanzania (46) and Malawi (49), optimal coherence would give a total possible score of 90. Our findings thus indicate that the level of integration of climate change adaptation into sector policies remains partial. Challenges to, and opportunities for, achieving more integrated policy development for enhanced adaptation were a key focus of the expert interviews that validated and discussed the patterns shown in Table 4.

4.3. Expert interview verification and insights

Interviews with NGO, donor and university experts discussed the findings and scores in Table 3 and also explored the political economy of climate change adaptation planning. Initial national adaptation commitments in all three countries were developed for the National Adaptation Programmes of Action (NAPAs). However, it was stressed that these documents were produced rapidly, with their writing often based on external consultancy input with an emphasis on large projects requiring multi-lateral funding. (I)NDCs were also typically produced rapidly to suit internationally-driven timeframes (international organisation representative, Malawi), with poor in-country awareness of the document's existence, yet alone involvement in its production (policy advocacy representative, Malawi). There remain significant conflicts of some of the NDC commitments with national policies in other sectors, notably energy and forestry. This shows that despite the establishment of a cross-ministerial national climate change technical committee, only limited cross-sectoral planning is supported to date. Each of the three countries has developed national climate change policies and/or national climate change strategies within the last six years, but the experiences are different in each case as detailed below.

a. Malawi

Expert interviews in Malawi highlighted the role of the current institutional and governance arrangements in which climate change adaptation issues are being addressed. These issues have previously been highlighted in relation to climate information use (Vincent *et al.*, 2017), institutional governance around climate-smart agriculture initiatives (Dougill *et al.*, 2016) and coherence between national policies and international environmental agreement communications (Stringer *et al.*, 2010; 2014). Differing timeframes and ages of policies was identified as a significant impediment to policy coherence (government, NGO and international organisation

representatives). At a sector level, there remains significant concerns on the lack of capacity and co-ordination in policy development and implementation processes. For example, one donor interviewee noted that “*irrigation schemes on both small- and large-scale were stalled due to disagreements between the Ministry of Finance and Department of Irrigation over who would manage funds*”.

Particular political problems were stressed in many discussions. Recent corruption scandals and the regular changes seen in personnel at ministerial, permanent secretary and director level in sectoral ministries act as barriers to policy development and revisions. Whilst technical level coordination has improved, an international organisation representative highlighted that significant barriers remain at higher levels. There have recently been cases where high level political commitment can push through policies and decisions rapidly. For example the Department of Disaster Management Affairs, within the Office of the President and Cabinet, has recently gained a high profile through major flooding (January 2015) and drought events (linked to El Niño in 2015/16). Similarly, the National Disaster Management Policy, which had been in draft for many years, was rapidly ratified in 2015 following a public statement by the President that the policy was in existence.

Attempts have been made to create an enabling environment to improve policy coherence and encourage more integrated climate adaptation planning through managing the incentives or barriers to reform of relevant institutional structures. Climate change adaptation is managed across sectors through the National Steering and Technical Committees on Climate Change. The Environmental Affairs Department (EAD) is in charge of implementing the cross-cutting National Climate Change Policy. Although this policy has been approved after many years in draft, challenges were noted by all interviewees with regards to links to sectoral policies will influence its implementation and impacts. These include the inability of the EAD to insist on changes in sectoral planning or policy development due to its status as a government department “*on the same rung of the ladder*” (NGO representative). Interviews also stressed the financial resource constraints with “*expenditure reviews showing that only about 3.5% of government spending goes to climate change, disaster and water issues, despite their priority in the NDP*” (international organisation representative). The inability of this funding to reach District levels where development plans are required to include climate adaptation is a particular problem given the commitment to decentralised governance.

b. Tanzania

Discussions with experts in Tanzania suggest that climate change has increasingly been incorporated into policy over the past ten years as a result of international influence and funding support, together with increasing realisations of climate change impacts. However, climate change adaptation in policy remains highly sector specific. Interviews highlighted that the lack of coherence between sectors is a product of an ingrained tradition of sectoral working, exacerbated by tight sectoral budgets. Several non-governmental experts mentioned Ministry concerns with protecting limited budgets as a key challenge to cross-sectoral collaboration. For example, the irrigation division has moved regularly between being based in the Ministry of

Agriculture and a Ministry of Water over the last twenty years, without building strong cooperative links between the two sectors.

Another key barrier to policy coherence is the lack of an overarching climate change policy to pull the sectors together. A new policy aiming to enhance coherence and mainstreaming of climate change across various government sectors, including water and agriculture, is in development by the Department for Environment under the Vice President's Office, but this Department is widely viewed by respondents as having only limited political influence. The developing Climate Change Policy is intended to overcome some of the barriers to cross-sectoral policy coherence.

Tanzania has also been affected by infrequent and delayed policy revisions. The national sectoral policies have been designed without specific review dates and recent history shows that these policies have rarely been updated. The National Water Policy was first produced in 1991 with a revised policy issued in 2002. In the case of the agriculture sector, the only National Agriculture Policy was produced in 2013. The infrequent revisions of national policies suggest that any new policy developed to improve mainstreaming and cross-sectoral coherence is viewed as unlikely to be effective in the near term (both NGO and international organisation representatives).

Table 3 shows that many of the policy statements relating to climate change are general and lacking in specific plans and strategies to promote adaptation. The expert interviews highlighted that this is partly the result of limited information on specific climate change impacts for Tanzania (NGO representative). One donor interview highlighted climate change as an emerging issue that is not yet fully understood. Another commented that "*climate change is a new phenomenon. That is why studies are very important to close the gap ... information [from studies] are set to improve policies and planning*". Interviews also highlighted concerns that policies and plans do not necessarily result in effective actions at District levels.

c. Zambia

Part of the reason that Zambia scored highest for policy coherence is because national policies for water, agriculture, forestry and other climate related sectors have been undergoing recent reviews to incorporate issues of climate change and improve coherence with other sectoral policies in line with donor demands (Kalaba *et al.*, 2014). However, the inter-ministerial and inter-departmental linkages in relation to climate change adaptation are still subject to challenges. Zambia's Interim Climate Change Secretariat (ICCS) has been tasked to integrate climate change across government, and is staffed by representatives from different departments. Although this has facilitated improved communication, adaptation interventions are still typically project-driven, something which was stated as a constraint by Government and NGO representatives alike. The ICCS currently sits under the Ministry of Finance, but the policy holder is the Ministry of Lands, Natural Resources and Environmental Protection. Until the policy passes through cabinet and remains in draft, long-term institutional arrangements are uncertain.

The Revised Sixth National Development Plan (R-SNDP) explicitly mainstreams climate resilience, but expert interviews highlighted that such national plans, are typically drafted by external consultants and not according to national needs. These consultants have access to other policy documents and are simply tasked to provide documents that are consistent with other national policies. One policy advocacy actor at national level highlighted that: *“There is pressure by donors to show compatibility of policies in addressing climate compatible developmental projects. To ensure funding of project activities, donors currently want to see coherence of policies in climate change disaster management, adaptation and mitigation.”*

The externally driven impetus for policy coherence has implications for implementation. It was highlighted by NGO representatives that sectors are not familiar with the contents of climate change policies due to the top-down, externally-led approach of policy development. The mainstreaming of climate change across agriculture, water and energy sectors as outlined in the latest NDP currently *“lacks implementation due to limited financial resources, lack of expertise at district levels and a lack of ownership of strategies and policies at local scales”* (International organization representative).

5. Discussion

Policy coherence is vital to provide non-conflicting signals and to enable climate adaptation planning to become mainstreamed. Our analysis shows that considerable scope remains to develop a more mutually supportive policy mix across water and agricultural sectors capable of providing benefits across both sectors. The current reliance on external (often international) consultants to develop policy documents reduces opportunities for consultation across Government Ministries, meaning that opportunities for greater coherence are being missed. Our findings highlight that policy coordination remains weak across southern Africa and needs to be strengthened to allow greater support to cross-sectoral planning. This calls for improved vertical (to include links to District Management Plans) and horizontal cross-ministerial coordination in drafting the terms of reference for policy development. Timing is also an issue and key political and climatic events and associated resilience planning need to be harnessed to drive cross-sectoral changes. Currently, policies often remain in draft form for many years before they are adopted, such that they become outdated in relation to dominant paradigms or problems before they have been approved.

Most of the national water and agriculture sector policies analysed here failed to explicitly include consideration of climate change vulnerabilities, impacts and potential adaptations. Sectoral policy documents were developed before the policy development process was sensitised to climate change vulnerability and impacts, with iterations of sectoral policies not including all of the actions and priority areas reported on through climate change reporting via NAPAs and (I)NDCs. Problems of limited policy coherence are exacerbated as the long-term impacts of climate change are poorly understood at a national level (Jones et al., 2015; Vincent et al., 2017) and are not explicitly addressed in policy formulation. Chronological analysis combined with keyword analysis indicates that sectoral policies have been used as a valuable basis for developing climate change strategies, policies and actions (Table 3). Where

coherence between sector and climate policies and strategies is strongest, it appears that recently published climate policies are largely repackaging existing sectoral policy statements, rather than building new linkages. This matches observations for other countries such as China (Hallding et al., 2009). Such policy repackaging is happening in the absence of learning and critical evaluation of the success and appropriateness of sector policy efforts, and does little to channel attention towards mainstreaming climate change adaptation. It is important to note that limiting later climate change policies to dominant approaches found in earlier sectoral policies to improve coherence is not in itself useful and suggests that recent (I)NDCs may not act as a catalyst for national climate actions (Day et al., 2015). The limited scope of (I)NDCs also implies that links to District-level planning processes which are vital to create a step-change in practical climate change adaptation planning (Urwin and Jordan, 2008) are not yet being realised.

Our findings identify that water and agriculture sector and climate change policies and strategies show greatest cross-thematic coherence around disaster management and planning, linked to flooding and droughts. Such a focus permits the uncertainty associated with climate change impacts to be used to justify reactive rather than proactive responses. Some of the policy documents analysed outlined a wide range of approaches that could be considered long-term adaptations, such as integrated water management and efforts to increase crop production efficiency. However, these intentions require further support in the way of new policy instruments, alongside the development of financial and economic mechanisms at both international and national levels that can help to create an enabling environment (Akhtar-Schuster et al., 2011). This requires reconciliation between policy statements that target the long-term and the short-term nature of policy planning linked to electoral cycles and the need for immediate as well as long-term economic gains.

Greater awareness is needed of the economic context of adaptation planning decisions if they are to be adequately supported. We note that all of the documents in our analysis presented climate change adaptation as a challenge rather than an opportunity for development and there was little evidence that social and cultural contexts and the wealth of indigenous knowledge in the region were considered. This supports findings from complementary research across the SADC region (e.g. Stringer et al., 2009; Conway et al., 2015) which identifies the need to better use climate information to guide long-term development planning and sectoral policy development.

Our analysis suggests that policy coherence around climate change adaptation needs better horizontal climate governance co-ordination at the national level involving all relevant sectoral stakeholders. This will be need to be enabled by improved institutional structure before policies can present a coherent approach to adaptation. The Paris Agreement and the Sustainable Development Goals, provide useful entry points for advances in cross-sectoral planning in relational to national climate statements. Countries need to use the opportunities within these international processes to leverage the necessary resourcing and financial support to further update their policies and improve their adaptation mainstreaming and cross-sectoral policy coherence.

References

- Abson, D.J., Dougill, A.J., Stringer, L.C. (2012). Using Principal Component Analysis for information-rich socio-ecological vulnerability mapping in Southern Africa. *Applied Geography*, 35, 1-2, 515-524.
- Akhtar-Schuster, M., Thomas, R.J., Stringer, L.C., Chasek, P, Seely, M.K. (2011). Improving the enabling environment to combat land degradation: institutional, financial, legal and science-policy challenges and solutions. *Land Degradation and Development*, 22, 299-312
- Altheide, D., Coyle, M., DeVriese, K., Schneider, C. (2008). Emergent qualitative document analysis. *Handbook of emergent methods*, 127-151.
- Biesbroek, R., Swart, R.J., Carter, T., Timothy, R. (2010). Europe adapts to climate change: comparing national adaptation strategies. *Global Environmental Change*, 20, 440-450.
- Chandra, A., Idrisova, A. (2011). Convention on Biological Diversity: a review of national challenges and opportunities for implementation. *Biodiversity and Conservation*, 20, 3295-3316.
- CDKN (2015). *Future Climate for Africa*. Climate Development Knowledge Network, London.
- Cochrane, L., Cundill, G., Ludi, E., New, M., Nicholls, R.J., Wester, P., Cantin, B., Murali, K.S., Leone, M., Kituyi, E., Landry, M-E. (2017). A reflection on collaborative adaptation research in Africa and Asia. *Regional Environmental Change*. <https://link.springer.com/article/10.1007/s10113-017-1140-6>
- Conway, D., Archer van Garderen, E., Deryng, D., Dorling, S., Krueger, T., Landman, W., Lankford, B., Lebek, K., Osborn, T., Ringler, C., Thurlow, J., Zhu, T., Dalin, C. (2015). Climate and southern Africa's water-energy-food nexus. *Nature Climate Change*, 5, 837-846.
- Conway, D. Mustelin, J. (2014). Strategies for improving adaptation practice in developing countries. *Nature Climate Change*, 4, 339-342.
- Davis, C. (2011). *Climate Risk and Vulnerability: a handbook for southern Africa*. Pretoria, South Africa: Council for Scientific and Industrial Research.
- Day, T., Röser, F., Tewari, R., Kurdzile, M., Höhne, N. (2015). Preparation of Intended Nationally Determined Contributions (INDCs) as a catalyst for climate action. NewClimate Institute. <https://mitigationpartnership.net/indcs-catalysts-climate-action>
- Dougill, A.J., Whitfield, S., Stringer, L.C., Vincent, K, Wood, B.T., Chinseu, E.L., Steward, P., Mkwambisi, D.D. (2016). Mainstreaming Conservation Agriculture in Malawi: knowledge gaps and institutional barriers. *J. of Environmental Management*. <http://www.sciencedirect.com/science/article/pii/S0301479716307472>
- Ford, J.D., Berrang-Ford, L., Bunce, A., McKay, C., Irwin, M., Pearce, T. (2015). The status of climate change adaptation in Africa and Asia. *Regional Environmental Change*, 15, 801-814.
- GoM, (2017). *Draft Malawi National Resilience Plan*. Government of Malawi
- GoM, (2016). *National Climate Change Policy*. Government of Malawi.
- GoM, (2015). *Nationally Determined Contribution of Malawi*. Government of Malawi.
- GoM, (2011a). *National Agriculture Policy*. Government of Malawi.

- GoM, (2011b). Malawi Growth and Development Strategy, 2011-2016. Government of Malawi.
- GoM, (2006). Malawi's National Adaptation Programme of Action. First Edition. Government of Malawi.
- GoM, (2005). National Water Policy. Government of Malawi.
- GoK, (2015). Ending drought Emergencies Common Framework. Government of Kenya
- GoT, (2015). Intended Nationally Determined Contribution. Government of Tanzania
- GoT, (2013). National Agricultural Policy. Government of Tanzania
- GoT, (2012). National Climate Change Strategy. Government of Tanzania
- GoT, (2007). National Adaptation Programme of Action. Government of Tanzania
- GoT, (2002). National Water Policy. Government of Tanzania
- GoT, (1999). Tanzania Development Vision 2025. Government of Tanzania
- GoZ, (2015). Nationally Determined Contribution to the 2015 Agreement on Climate Change. Government of Zambia.
- GoZ, (2013). Revised Sixth National Development Plan, 2013-2016. Government of Zambia.
- GoZ, (2010). National Climate Change Response Strategy. Government of Zambia.
- GoZ, (2007). National Adaptation Programme of Action, Final Report. Government of Zambia.
- GoZ, (2004). National Agricultural Policy. Government of Zambia.
- GoZ, (1994). National Water Policy. Government of Zambia.
- Hallding, K., Han, G., Olsson, M. (2009). China's Climate- and Energy-security Dilemma: Shaping a New Path of Economic Growth, *Journal of Current Chinese Affairs*, 38, 119-134.
- Hussey, K., Pittock J. (2012). The Energy–Water Nexus: Managing the Links between Energy and Water for a Sustainable Future. *Ecology and Society*, 17, 1, 31. <http://dx.doi.org/10.5751/ES-04641-170131>
- IPCC, (2014). Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom.
- Jones, L., Dougill, A.J., Jones, R., Steynor, A., Watkiss, P., Kane, C., Koelle, B., Moufouma-Okia, W., Padgham, J., Ranger, N., Roux, J-P., Suarez, P., Tanner, T., Vincent, K. (2015). Ensuring climate information guides long-term development. *Nature Climate Change*, 5, 812-814.
- Kalaba, F.K., Quinn, C.H., Dougill, A.J. (2014). Policy coherence and interplay between Zambia's forestry, energy, agricultural and climate change policies and multilateral environmental agreements. *International Environmental Agreements: Politics, Law and Economics*, 14(2), 181-198.
- Le Gouais, A., Wach, E. (2013). A qualitative analysis of rural water sector policy documents. *Water Alternatives*, 6(3), 439-461.
- Massey, E., Biesbroek, R., Huitema, D. (2014). Global Environmental Change-Human and Policy Dimensions, 29, 434-443.
- Mickwitz P., Kivimaa P. (2007). Evaluating Policy Integration – The Case of Policies for Environmentally Friendlier Technological Innovations. *Evaluation* 13, 1, 68–86.

- Nilsson, M., Griggs, D., Visbeck, M. (2016). Map the interactions between Sustainable Development Goals. *Nature*, 534, 320-322.
- OECD, (2004). Institutional Approaches to Policy Coherence for Development. A Comparative Analysis of Institutional Mechanisms to Promote Policy Coherence for Development. OECD Policy Workshop, 18-19 May 2004.
- Pelling, M., O'Brien, K., Matyas, D. (2015). Adaptation and transformation. *Climatic Change*, 133, 113-127.
- SADC (Southern Africa Development Community) 2012. SADC Facts and Figures. Online: <http://www.sadc.int/about-sadc/overview/sadc-facts-figures/> [accessed 23 April 2016]
- Stemler, S. (2001). An overview of content analysis. *Practical Assessment, Research and Evaluation* 7(17), 1-6.
- Stringer, L.C., Dyer, J., Reed, M.S., Dougill, A.J., Twyman, C., Mkwambisi, D.D. (2009). Adaptations to climate change, drought and desertification: insights to enhance policy in southern Africa, *Environmental Science and Policy*, 12, 748-765.
- Stringer, L.C., Mkwambisi, D.D., Dougill, A.J., Dyer, J.C. (2010). Adaptation to climate change and desertification: Perspectives from national policy and autonomous practice in Malawi. *Climate and Development*, 2, 145–160.
- Stringer, L.C., Dougill, A.J., Mkwambisi, D.D., Dyer, J.C., Kalaba, F.K., Mngoli, M. (2012). Challenges and opportunities for carbon management in Malawi and Zambia. *Carbon Management*, 3, 159-173. doi: 10.4155/cmt.12.14
- Stringer, L.C., Dougill, A.J., Dyer, J.C., Vincent, K., Fritzsche, F., Leventon, J., Falcao, M.P., Manyakaidze, P., Syampungani, S., Powell, P., Kalaba, G., (2014). Advancing climate compatible development: lessons from southern Africa, *Regional Environmental Change* 14, 713-725.
- Urwin, K., Jordan, A. (2008). Does public policy support or undermine climate change adaptation? Exploring policy interplay across different scales of governance. *Global Environmental Change*, 18, 180-191.
- Vincent, K., Dougill, A.J., Dixon, J.L., Stringer, L.C., Cull, T. (2017). Enhancing climate services for national planning in sub-Saharan Africa: lessons from Malawi. *Climate Policy*, 17(2), 189-202. <http://www.tandfonline.com/doi/full/10.1080/14693062.2015.1075374>