



Contents lists available at SciVerse ScienceDirect

## Global Environmental Change

journal homepage: [www.elsevier.com/locate/gloenvcha](http://www.elsevier.com/locate/gloenvcha)

## Everyday realities of climate change adaptation in Mozambique

Luis Artur<sup>a</sup>, Dorothea Hilhorst<sup>b,\*</sup><sup>a</sup> Lecturer Mondlane University, Maputo, Mozambique<sup>b</sup> Professor of humanitarian aid and reconstruction, Wageningen University, the Netherlands

## ARTICLE INFO

## Article history:

Received 8 February 2010

Received in revised form 23 November 2011

Accepted 25 November 2011

Available online xxx

## Keywords:

Climate change adaptation

Multi-sited ethnography

Mozambique

Floods

Evacuation

Resettlement

## ABSTRACT

This paper analyzes discourses and practices of flood response and adaptation to climate change in Mozambique. It builds on recent publications on climate change adaptation that suggest that the successes and failures of adaptation highly depend on the cultural and political realms of societal perceptions and the sensitivity of institutions. To capture this, the paper adopted a multi-sited ethnographic approach. Acknowledging that there is no central locus of representation that can unveil the working of disaster response in Mozambique, the paper brings together five vignettes of research in different 'sites' of concern to the rise in floods in Mozambique. These are the politics of climate change adaptation at the national institutional level, societal responses to increased flooding, local people's responses to floods, the evacuation and resettlement programme following the 2007 flood. The paper finds how adaptation to climate change becomes part of everyday politics, how actors aim to incorporate responses into the continuation of their normal behavior and how elites are better positioned to take advantage of adaptation programmes than the vulnerable people that were targeted. It argues that climate change adaptation must be made consonant with historically grown and ongoing social and institutional processes. It concludes with lessons that the analysis and methodology of the research can provide for the practice of climate change adaptation.

© 2011 Published by Elsevier Ltd.

## 1. Introduction

This paper aims to explore the importance of the socio-political and cultural dimensions of adaptation to climate change, using the case of responses to floods in Mozambique. It conceptualizes climate change adaptation as an arena where social actors at different scales, from national to local, have different understandings of adaptation, interests and power which, combined, significantly affect the outcomes of government-driven adaptation plans. We explore the connections and disjunctions between different scales of adaptation policy and practice by adopting a multi-sited ethnographic approach. We use vignettes examining how climate change and flood responses are framed in different locales and scales. These are the politics of climate change adaptation at the national institutional level, societal responses to increased weather-related disasters, and the interaction between government and local people's responses to flooding. In each of these vignettes we study how actors appropriate ideas and practices to align them with their own views, ambitions and projects. Together, the vignettes provide a composite picture of

the arena of climate change allowing us to find cross-cutting themes.

The paper builds on recent publications that suggest that the successes and failures of climate change adaptation depend more on societal perceptions and the sensitivity of institutions than on the availability of appropriate policies, technologies or funding, notwithstanding the importance of these last three aspects. We find that adaptation gets incorporated into the everyday politics of politicians, bureaucrats, priests, businessmen, local chiefs and people living in flood plains. Flood responses and adaptation programmes are emerging properties from these socio-political and cultural processes and affect social ordering and differentiation. Importantly, we find that powerful people are better positioned to take advantages of the politicization of climate change adaptation, even though many programmes explicitly target vulnerable people.

In Section 2 we propose our analytical framework of the arena of climate change adaptation. Section 3 contains the methodology and in Sections 4–8 we present our results in five vignettes. Section 9 concludes the paper and ends with some policy implications of our findings, calling on the need for flexible programming that leans on qualitative monitoring, more inclusive governance of adaptation and the popularization of scientific climate change debates.

\* Corresponding author at: Disasterstudies, Hollandseweg 1, 6706 KN Wageningen, the Netherlands. Tel.: +31 317482472/651915934.

E-mail addresses: [lartur@uem.mz](mailto:lartur@uem.mz) (L. Artur), [thea.hilhorst@wur.nl](mailto:thea.hilhorst@wur.nl) (D. Hilhorst).

## 2. Arena of climate change adaptation

This paper aims to contribute to the growing body of literature that studies how the idea of climate change derives meaning and is translated in everyday practices that affect people's vulnerability and adaptive capacity (Pettenger, 2007). As pointed out by Hulme (2009, xxvi) climate change has become an idea that travels beyond its origin in natural science, meeting world politics, economics, popular culture, religion and in doing so, takes new meanings and serves new purposes. Research in this tradition focuses on a wide range of historical and contemporary social and economic processes and practices that bring about vulnerability, and seeks to understand how adaptation can be grounded in existing policies and regulations, rather than deriving policy from dictates of climate change modeling (Burton et al., 2002, 157; Paavola and Adger, 2006, 596). A focus on everyday practices of climate change adaptation must draw on historical analysis of how people and societies have interacted with nature (Dovers, 2009). It takes into account the context of socio-economic and demographic changes, competition over natural resources, changing technologies, changes in global governance, social conventions and the globalizing flows of capital and labour (Leichenko and O'Brien, 2008; Christoplos, 2010). This makes it difficult to detach climate change induced adaptations from other policies and events (Kate, 2000, p. 13; Kelly and Adger, 2000, p. 329; Adger et al., 2005, p. 78).

In line with this emerging tradition, we adopt a constructivist perspective on adaptation policy, where policy is not a 'thing' but the outcome of social negotiation. Climate change is the concern of many different actors and institutions that can be seen to constitute an arena where this social negotiation (by all different means) takes place. The positioning of actors toward the issue is not a translation of a shared concern with the urgency of climate change adaptation. It is also not a direct function of their political-economic interests. Interests are usually neither clear nor consistent, and even rights are often contradictory and subject to interpretation (Paavola and Adger, 2006). The way people act in their everyday politics is largely conditioned by institutional, social and cultural patterns (Kelley and Scoones, 2003). Adaptation policy can thus be seen as the result of a pattern of interaction between the different participants, which try to shape the process in ways that fit their own perspectives of the problem and goals (Long and Long, 1992; Colebatch, 1998; Hilhorst, 2003; Mosse, 2005; Barnett and O'Neal, 2010).

This means that we step away from the notion of the policy cycle model that underlies most adaptation programmes, in which policy is the systematic pursuit of goals, and follow instead empirically how policy is produced and implemented. Acknowledging the complex dynamics of adaptation programmes shows that government capacity, or the lack of it, is only one aspect of climate change adaptation (Kate, 2000, p. 7; IPCC, 2001, p. 879). It has been widely acknowledged that adaptation ultimately depends on individual households and local managers of natural resources in the context of local and regional economies and societies (Handmer et al., 1999, pp. 268–269; Tol, 2005, p. 573). The arena model that underlies this paper allows us to analyze how adaptation may depend on multiple actors and institutions, including, for example, churches and traditional leaders aiming to strengthen their hold on their constituency.

This arena is loosely configured, yet different parts are connected in co-producing notions, responses, policy and practice around disasters and climate change adaptation. In order to unravel the processes that lead to vulnerability or adaptive capacity to climate change, we distinguish different domains of response to risk and disaster (Hilhorst, 2004). We consider here the domain of science and disaster management, the domain of disaster governance and the domain of local responses. They are

the respective domains of scientists and development experts, bureaucrats and politicians, and local producers and vulnerable people. Although these domains are diverse in themselves, they have a certain proximity, physical or discursive, in the ways in which people refer to disaster and risk. In different locales we study the interfaces between these domains, to understand how different actors respond to weather-related disaster, in particular floods, and how they appropriate the ideas and means of climate change adaptation in practice. In this, we pay particular attention to discourses as more or less coherent sets of references that frame the way we understand and act upon the world around us. In reality, there are always multiple discourses at work and one of our foci is how actors align with and struggle over competing discourses.

## 3. Study location and methodology

The present paper is based on research into the interpretations and responses of different actors in Mozambique to disasters and climate change adaptation.<sup>2</sup> Data were collected during 18 months in Mozambique, from January 2007 to July 2008 by Artur, forthcoming, and some additional interviews in 2009 with key informants in Maputo to update previous data.

Mozambique is one of the poorest countries in the world and ranks third on global weather-related damage, following Bangladesh and Ethiopia (Buys et al., 2007). Natural hazards such as droughts, floods, cyclones and related disasters have all been part of Mozambican history, and have had an impact in shaping the country's poverty and vulnerability situation. In 2000, Southern Mozambique was hit by a historical flood, affecting 4.5 million people and claiming about 700 lives. The 2001 flood affected 500,000 people. The database of EM-DAT, which underlies most publications on disasters in Mozambique (GoM, 1988, p. 27; Christie and Hanlon, 2001, pp. 13–14; Negrão, 2001, pp. 3–4; INGC, UEM and Fewsnet, 2003, pp. 10–12; World Bank, 2005, p. 29) shows that disasters have increased in frequency and intensity over the past few decades. Since 1970, Mozambique was hit by 77 disasters, 41(53%) of which occurred just in the past decade (2000–2009). In 2005, an estimated 94% of the population was affected by natural hazards (Mafambissa, 2007, p. 5). Droughts have historically been the major hazard but flooding is predominant in the present decade. Although the exact relation between increased floods and climate change is still subject to debate, the Mozambican Government considers disaster risk reduction as an important component of climate change adaptation (INGC, 2006). Its policy is based on the premise that by 2100, temperatures have increased between 5 and 6 °C, resulting in severe droughts, cyclones and floods (INGC, 2009).

Because people's response to disasters are embedded into the interpersonal, historical, cultural, organisational and global environments they inhabit we need to capture the everyday practices of disaster response and climate change adaptation. For this, we adopted a multi-sited ethnographic approach (Marcus, 1995). Multi-sited ethnography is designed to study contemporary local changes in culture and society. It acknowledges that such changes are being multiply produced in different sites. There is no central locus of representation that can unveil the working of disaster response in Mozambique. What is written in policy and what happens in meeting rooms in Maputo, in churches along the Zambezi rivers, in villages and resettlement centres is physically disconnected yet each of these sites are nonetheless connected through different relationships of association, constitution, interaction or reaction. Multi-sited ethnography usually follows a group

<sup>2</sup> This project was coordinated by Dorothea Hilhorst and funded by the Netherlands Organisation for Scientific Research (NWO). We are most grateful for this contribution.

of people, a set of commodities, or the travelling of an idea (Marcus, 1995). In this paper, we follow a concern: the increasing floods in Mozambique that are framed as manifestation of climate change. We bring together phenomena that appear to be apart and by juxtaposing the different vignettes we follow how discourse around climate-related disasters gets produced and what the dominant trends as well as contradictions are that emerge.

A major strength of this methodology is that it allows for a symmetrical analysis of stakeholders where we avoid two different (and opposite) biases. The first bias would be to locate culture, stagnation and refusal in local people without questioning the cultured properties of policy and governance. The second bias would unravel the power politics of governance, while ignoring everyday politics of people that are often represented as disembodied communities of local knowledge and solidarity. Our methodology allows us to cross-cut between dichotomies such as national versus local, community versus government, or policy versus implementation.

The vignettes of the paper draw on different methods. They combine participant observation with historical research. The first two vignettes rely mainly on secondary data, key informant interviews and observations of meetings and ceremonies. The last three vignettes are derived from a year of intensive fieldwork by Artur, forthcoming in the village of Cocorico in Mopeia district, Zambezia province with extended visits to the adjacent districts of Chinde, Mutarara, Caia and Marromeu. Ethnographic fieldwork uses multiple methods, including participant observation, surveys, informal interviews, group discussions, secondary data analysis, extended case studies, discourse and content analysis (Hammersley and Atkinson, 1983, pp. 23–24). Apart from participant observation, Artur, forthcoming held a total of 16 group discussions; 78 semi-structured interviews (50 with key informants, i.e. local leaders, teachers, doctors, policy, soldiers, red cross volunteers); attended 16 church services, 2 funerals and 3 weddings. A survey was carried out in Mopeia district to establish the differences in practices and perceptions between people living in the floodplains and those living on high grounds, covering 198 households. The position of the researcher varied in these different sites, ranging from participant to friend, greatly facilitated by his fluency in *Sena*, and in some sites as an academic speaking on equal terms to those being studied.

#### 4. The national-level arena: government and donors

Our first vignette concerns policy producing at the national level. After the UNCED summit in 1992, Mozambique has gradually developed a legal framework to cope with climate change. Under the coordination of the Ministry for Coordination of Environmental Action (MICOA), different working groups and regulatory tools have been established to implement the national Clean Development Mechanism (CDM) and the National Action Plan for Adaptation (NAPA). Despite these legal tools, the overall achievement of environmental sustainability (Millennium Development Goal 7) is unlikely to be achieved by 2015 (GoM and UN, 2005). In practice, the government is focusing more on MDG 1 (halve the proportion of people living in extreme poverty).

Economic growth competes with environmental concerns. A major economic policy has been to encourage private foreign investments with different incentives such as limited taxation. Some of these are (controversially) presented as climate-friendly, such as the provision of land for producing biofuels<sup>3</sup> and investments in hydro-power, others will certainly increase greenhouse emissions in the years to come. Forests, in the meantime, are being depleted by exportation of wood to China, which some ironically refer to as the 'Chinese takeaway' (Mackenzie, 2006). The effect of the

government's preoccupation with development, although understandable, is that climate-change adaptation becomes a competing claim in the allocation of budgets. Decision-making often entails negotiation between the two interests.

In the meantime, international adaptation programmes in Mozambique are increasing. Major programmes in 2009 were: Joint Program in Environmental Mainstreaming and Adaptation to Climate Change in Mozambique funded by MDG-F Spain and UNDP; Mozambique Poverty and Environment Initiative funded by the government of Ireland; Joint Program on Strengthening Disaster Risk Reduction and Emergency Preparedness funded by UNDP; Coping with Drought and Adaptation to Climate Change funded by GEF; and a World Bank study that was expected to result in a Fund for Climate Change Adaptation.

These programmes have led to competition among government bodies. Development agencies, especially the Ministry for Planning and Development (MPD), have questioned MICOA's authority by claiming that climate change is a developmental more than an environmental problem. This has created (backstage) conflicts between MICOA and MPD over coordination.<sup>4</sup> Another claimant to the position of coordinator is the Ministry for Science and Technology (MCT), which handles interventions regarding science and technology (MCT, 2006).

The National Institute for Disaster Management (INGC) also has increased its influence on climate change adaptation programmes. It has broadened its mandate by incorporating prevention, vulnerability reduction, reconstruction and development of drought-prone areas. Due to its strong reputation since the 2000/2001 floods, many international agencies have a preference to work with INGC. INGC is handling projects with UNDP, DFID, GTZ, World Bank, FAO, and the Nordic countries among others.<sup>5</sup> INGC has also produced the first national study on climate change. At the launch of the study in Maputo in May 2009, which Artur, forthcoming attended, the coordination of climate change adaptation became a contentious issue, and many guests from competing institutions perceived the initiative as an attempt by INGC to claim the leadership. The climate adaptation arena is further complicated by the entry of municipalities, which develop interventions in their areas of jurisdiction. On the non-governmental and private side, adaptation programmes are organised by agencies like the Mozambican Red Cross, Care international, GTZ, and World Vision, and the private sector has seen different companies ask for certificates to access funds under the CDM.<sup>6</sup>

The emerging property of this unfolding arena is a lack of coherent strategy and leadership for adapting to climate change. This leads to a dispersion of projects, efforts and funds. Rather than displaying a unified concern to prepare the country for increasing disasters, national level actors thus politicize adaptation and make it subject to bureaucratic competition. This produces a fragmented field of adaptation programmes where actors in other domains find room for manoeuvre to bend climate change interventions to their own understanding, needs and rules.

#### 5. Societal discourses on increased weather-related disasters and social order

Our second vignette concerns the societal understanding of increased disasters. The scientific explanations of climate change are not widely known in Mozambique, and people find different

<sup>4</sup> Interview with officer from MICOA, September 18, 2008 in Maputo, and officer from MPD, October 8, 2008 in Morrumbala.

<sup>5</sup> Interview conducted on 28 May 2009 with Coordinator Office Manager, INGC.

<sup>6</sup> These include the Matola Gas Company (MGC), the Cimentos de Moçambique (CM) and the Electricity company (EDM). Interview with officer from MICOA, Maputo May 27, 2009.

<sup>3</sup> <http://knowledge.cta.int/> (accessed 13.12.09).



**Fig. 1.** A national newspaper reporting lynching related to the lack of rainfall. The heading and subheading say: Justice begins to judge lynching: 23 people in Zambezia will answer for encouraging the killing of 'witches' that 'held-up' the rain.

alternative explanations for the increase in extreme weather events. We discuss three alternative discourses of attribution that explain disasters as the will of God, the ancestors and the wrongdoing of witchcraft. These so-called cosmological interpretations are widespread in Mozambique (MICOA, 2006, p. 19).

The first discourse turns to a religious explanation of disasters and attributes climate change to the will of God (see also Schipper, 2010). It comes in a benign and a threatening variation. One of the respondents objected during a workshop on an adaptation project: "Nobody can claim droughts and floods. Only God can decide when to send rain or not!" This turned out to be a popular explanation that was actively propagated by church leaders. In 16 services attended in local churches along the Lower Zambezi and the Zambezi river basin, Artur, forthcoming found priests talking about floods in their sermons. Typically, a priest would pray for those who lost their lives and belongings. He would refer to God as all-powerful – able to command floods and droughts, and responsible for choosing who lives or dies. Mourners should find comfort in the afterlife awaiting the deceased. These sermons had three important social roles. They provided comfort to the survivors, helped them make peace with their situation, and enhanced solidarity with victims.

In some churches, the priest used different Bible verses, where increased flooding, drought and other natural hazards were understood in connection to the end of the world and the urgent need for people to follow the church's guidance. While the latter is obviously geared toward enhancing the influence of the church, the comforting variation can also be seen as reproducing social order, because flooding and droughts are seen as produced by forces beyond humankind. Both variations diffuse social tension and strengthen the church's grasp of people. They do not recognize potentials for mitigation and adaptation to climate change.

A second explanation for disasters in Mozambique was found in the role of ancestors. Ancestors play a large role in the lifeworlds of Mozambicans. They have to be placated by rituals that precede major events, the launch of new public works or development interventions. This is the domain of traditional leaders who are the medium to ancestors and reproduce these beliefs. When there is a lack of rainfall, the traditional leaders in some regions of the country perform rituals to ask forgiveness from the ancestors and make peace with them. Evidence was found in group interviews about such rituals in Canhungue, Mutarara District in 2003, in Xinsomba, Chinde District in 2005, and in Cocorico-Mopeia district in 2006. Searching for protection from ancestors reinforces and strengthens traditional leadership. Like the priests, 'traditional' leaders understanding of extreme events beyond living creatures has the effect of strengthening their hold over the people.

A third alternative discourse that was found concerns witchcraft. Some people associate misfortunes such as droughts, rainfall and flooding with the influence of people believed to be witches. In June 2009, newspapers in Mozambique reported about alleged witches who were thought to have put off rainfall (Fig. 1). Some of them were lynched by local people in districts of the Zambezia province in order to seek 'justice'. In a television interview in the first week of June 2009, interviewees tended to blame the lack of rain to those who were better off: "They only make it rain on their own fields, so only they have production and become rich".

More than the other two discourses, this discourse displays a (misdirected) sense of social injustice. And it is obviously disruptive. While the other two discourses usually remain uncontested by the government, the lynching incidents provoked not only the arrest of the perpetrators, but also an immediate campaign to send teams from the National Institute of Meteorology to local areas to explain what generates droughts and flooding and why rainfall patterns are changing.

The three discourses all attribute climate events to supernatural forces. They are all permeated by local values that influence how households are affected by and respond to climate impacts (see also Agrawal et al., 2008). Yet, they simultaneously hide the role of social institutions, economic processes and political choices that contribute to people's vulnerability to natural hazards. This is reinforced by traditional leaders and priests who interpret climate change toward reinforcing the existing order. Even the government only seeks to intervene when the social order is challenged, as in the case of the witchcraft accusations. The latter expressed people's discontent like no other, and compelled the government to reach down to people with educational campaigns on climate change.

Local explanations of disasters, as this vignette demonstrates, thus have a strong sub-text in reinforcing social order and power. The next vignettes will continue on this theme and show how local people seek to minimize the disruption of disaster and find continuity in their lifestyle.

## 6. People's responses to climate-related disaster on the delta Zambezi

Flooding on the Zambezi delta in Mozambique is a historical phenomenon with records dating back as far as 1586 (Chidi-massamba and Liesegang, 1997). In the 19th century, 21 big floods have been recorded (Monteiro, 1955; Beilfuss, 2005). The delta constitutes a flood plain that houses almost one million people, mainly from the *Sena* ethnic group (INE, 2007). They build their

**Table 1**

Investment priorities in the Cocorico floodplain and Mopeia village. Percentage of households owning the item or average number of item per household.

Item	Research area Cocorico (N=84) Mopeia village (N=114)	Percentage
Radio	Cocorico	67.85%
	Mopeia village	57.01%
Canoe	Cocorico	64.42%
	Mopeia village	10.52%
Plates (average units per household)	Cocorico	5.63
	Mopeia village	8.92
Cups (average units per household)	Cocorico	4.24
	Mopeia village	5.69
Bike	Cocorico	59.52%
	Mopeia village	50.87%
Fishing nets	Cocorico	51.19%
	Mopeia village	32.45%
Spoons (average units per household)	Cocorico	3.58
	Mopeia village	5.78
Chicken/ducks (average units per household)	Cocorico	5.20
	Mopeia village	3.62
Goats	Cocorico	13.09%
	Mopeia village	18.45%
Pigs	Cocorico	21.42%
	Mopeia village	19.42%
Cows	Cocorico	0
	Mopeia village	0

livelihoods from agricultural production, fishing and ‘petty’ trading. Their lifestyles are highly influenced by flooding regimes. They take advantage of the Zambezi River and its ecosystem, and have developed numerous adaptation practices against flooding. These are often incorporated in everyday livelihood strategies and many of them are tacit. In the research area of Cocorico, a highly flood-prone village of 1500 inhabitants in 2007, people have developed adaptation practices that permeate their entire lifestyle.

Houses are located on heights or constructed with grass and wood. The use of local material may be related to poverty but is also considered ‘rational’ because investments in brick houses may be washed away by floods. Survey data further show a different pattern of investments of households in flood-prone areas (see Table 1). Households in flood-prone Cocorico mainly invest in canoes, fishing nets, radios and poultry. Households in Mopeia village own more plates, cups, spoons and goats. Canoes and radios have additional functions beyond their everyday use, in serving as warning mechanism and means of transport during extreme floods. The survey indicates that there is a tendency to avoid accumulating big animals such as goats and cattle or large furniture such as mattresses, beds and tables that would get lost in floods.<sup>7</sup>

People also adapt through social arrangements that develop over time. They create interdependencies, for example through polygamous marriages (often with one household near the river, and the other in a higher area to ensure that the entire polygamous household has a secure place during floods), and through festivities and drinking that are important aspects of social life in the flood plains.<sup>8</sup> Our survey found that 76% of the households in Cocorico

<sup>7</sup> In group discussions people on the floodplains suggested that small poultry such as chicken has multiple advantages. It is easier to carry during evacuations; it is easier to sell if needed; it reproduces fast and, due to its lower monetary value, losing it during flooding is less painful if compared with animal of higher monetary value. For bigger animals, they tend to prefer pigs rather than goats. The major explanation, apart from its faster reproductive capacity, was that pigs are better at resisting flooding compared to goats.

<sup>8</sup> Group discussions Canhungue (Mutarara District) May 23, 2007; Inhangoma (Mutarara District) September 10, 2008; Xitsomba (Chinde district) June 15, 2007; Luabo (Chinde District) October 23, 2007; Cocorico (Mopeia District) September 24, 2007 and Chupanga (Marroneu District) March 11, 2007. Interview besides group discussions with local governmental authority traditional leaders in Canhungue; traditional leader *regulo* in Cocorico; traditional leader *regulo* of Chamanga in Mopeia May 7, 2008.

**Table 2**

Polygamy.

		Frequency by study area		
		Cocorico	Mopeia village	Total
Polygamy in the study area				
Are you under polygamy	Yes	64(76%)	27(24%)	91
	No	20(24%)	87(76%)	107
Total		84(100%)	114(100%)	198

were polygamous with an average of 2.5 wives per male, against 24% of Mopeia with 2 wives per male (see Table 2).

People’s adaptive strategies thus encompass much more than the diversification of livelihoods that received attention in literature (Osbaht et al., 2008). They range from flood-proofing houses to investment strategies to all kinds of social arrangements, including polygamy that constitute people’s everyday life and can simultaneously be understood as protection against floods. However, the balance between these different factors that constitute people’s adaptive lifestyles has come increasingly under pressure.<sup>9</sup> The threats are environmental, economic, political, social and cultural. They range from the influence of dams and deforestation to the deterioration of the traditional leadership that guarded the interdependencies of the villagers. As a result of these threats, the intensification of floods has coincided with a complex process toward increased vulnerability to flooding (see also Patt and Schöter, 2008). Increasingly, this makes people susceptible to the societal discourses surrounding floods as described above. And increasingly, people have to depend on aid to cope with floods.

## 7. The evacuation programme following the 2007 flooding of the Zambezi River

In 2007, central Mozambique experienced heavy rainfall. As it also rained in neighbouring countries, the upstream Kariba and Cahora Bassa dams had to be partly opened. On February 8, the water flow peaked at 10,404 m<sup>3</sup>/s (more than during the 2001 flood), affecting nearly all the lower lying areas along the Zambezi river. There were no casualties, and the government of Mozambique (GoM) counted 163,045 affected people, from which 107,534 were displaced (INGC, 2007). This vignette deals with the evacuation process that was initiated by the government when the water started to rise.

After the 2001 floods, the government invested heavily in its flood response capacity. The 2007 floods provided the opportunity to put these to the test. When the medium term weather forecasts anticipated the rains in October 2006, planning began and the GoM disbursed US\$ 5 million toward the response. As waters continued to rise, the government declared a red alert and ordered the evacuation of people in the Zambezi floodplains on 4 February. Three days later, the army was assigned to forcibly evacuate people who continued to defy the evacuation instruction. Coercive search and rescue missions brought people to resettlement centres created by the government. On March 10, the government lifted the red alert.

The search and rescue operation was severely hampered by people who refused to evacuate or returned to their houses immediately after evacuation. The government and newspaper reports labelled this in terms of stupidity, irrationality, reluctance and backwardness.<sup>10</sup> One local leader was imprisoned because he allegedly instigated his people to return home. Numerous

<sup>9</sup> Eriksen et al. (2009) reach a similar conclusion for villages in South Mozambique.

<sup>10</sup> See for example, Noticias newspaper February 7; BBC February 8; Washington Post February 14; Reuters February 15.

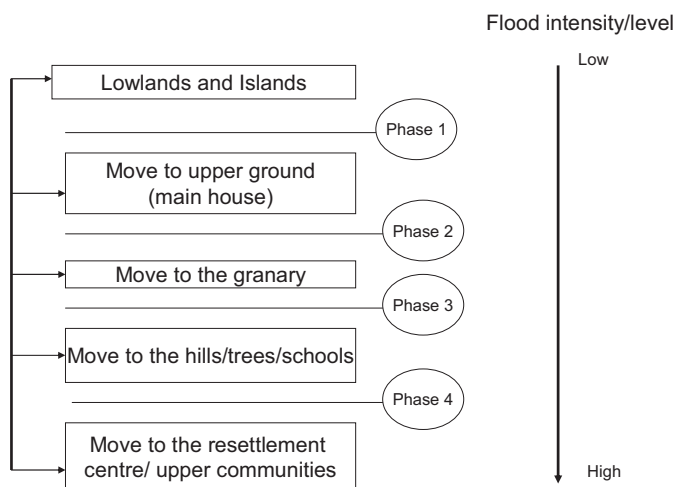


Fig. 2. The hierarchical response.

interviews with flood victims showed, however that people have their own rationalities for dealing with the flood. While the search and rescue was geared toward saving lives, people took a broader perspective and aimed to safeguard their livelihoods as well.

For local people, evacuation is a strategy of last resort. It is a risky process as animals cannot be taken along and properties may be looted during their absence. People display a hierarchy of responses according to the severity of the floods (see Fig. 2). They will first move their belongings to the main house located on higher grounds. When the water level rises, they will prepare to live in their granaries that are built on poles mainly to protect grains from animals. When water levels threaten the granary, they move away from their homestead to find accommodation nearby in the local hills. Only when this does not suffice, people are willing to move away entirely. When the rescue teams arrived after the red alert has been issued, the situation was not deemed very alarming by local standards. In most of Cocorico, waters had just inundated the floors of the main houses and people were not willing, nor prepared to evacuate.

People will only accept helicopter rescue when their lives are in immediate danger. The evacuation operation availed of four helicopters and five large boats. People used an estimated 1000 private canoes (Foley, 2007, p. 15). Even if the government would have had more means, people would prefer their own canoes.<sup>11</sup> Helicopter rescue tends to separate families, whereas households typically want to stay together in times of crisis (Raphael, 1986, p. 47). This was especially complicated because many families in the floodplains of the Zambezi River continue, as we have seen for the case of Cocorico in Section 6, to be polygamous, resulting in complex and large households. Another reason why people preferred to evacuate in their own canoes, was the strict 'people only approach' of the rescue teams. This meant that livelihood assets such as livestock, fishing nets and tools had to be left behind which would result in devastating losses for poor households (Lautze, 1997). A woman in the Amilcar Cabral resettlement centre complained on February 14: "we are not allowed to carry our belongings but we are taken like belongings. I do not know where my husband is and my son". People also preferred to move in their canoes to maintain their dignity. As somebody put it 'Ine sine Nkuku para kwatiwa- I am not a chicken to be carried'.

We found rescue also to be highly gendered. People strategize about the question who will be evacuated, often opting for the

women and children to leave (and ensure access to aid) while men stay behind to protect property and take care of animals. Men with multiple wives did not want to register in a centre because it would force them to choose between the wives. This would have serious repercussions for their relationships and could even lead to divorce and the loss of their position of fatherhood.<sup>12</sup> Being rescued creates social obligations and people feel it is more respectful to rescue than be rescued, which is related to norms of masculinity. This was why many local chiefs chose to be the last to be evacuated, defying the governmental decree that they should go first to set the example.

All in all, it can be stated that the general evacuation decreed by the government did not harmonize with people's responses to floods and was to some extent premature. Most interviewed people argued behind the scenes that they would have been able to handle the situation themselves. With the rescue operation just completed, the government then launched an ambitious plan for the permanent resettlement of 54,000 affected families. If the evacuation was problematic, the resettlement program was even much more complicated.

## 8. Resettlement as a permanent solution

This final vignette is about the differentiated responses to the permanent resettlement of flood-affected families. Mozambique has had a long history of resettlement processes that have displaced millions of people in the context of economic development, villagization programmes, and resettlement of the displaced of the civil war (Coelho, 1993; Taju, 1992; Vines, 1996; UNHCR, 1996; Newitt, 1988; Filipe, 2003). In view of this tradition, the resettlement programme after the floods was much more than a 'spatial' reallocation to protect people against recurring flooding. It represented an ambition to 'modernize' the people from lower Zambezi. The government emphasized the modern design of the new settlements with *casas de cimento*, modern infrastructure and services. It also aimed to integrate people better in the markets by modernizing agriculture with high-yielding variety seeds. This means that people would have to reinvent themselves in a 'modern lifestyle' of taxation, lined cement houses, associational life and market integration (cf. Downing, 1996, 2002; Feldman et al., 2003; Oliver-Smith, 2005).

The implementation of the resettlement policy has been beset with many complications. Patt and Schöter (2008) found that people refused to cooperate with evacuations and resettlement after the 2000 flood, because of their different perception of climate change. This articulates with our findings in the previous sections about local response to evacuation. However, in the case of the resettlement programme we found that people did not refuse the programme as such, but they used forms of social negotiation of the conditions of resettlement. People were seeking room for manoeuvre to make the best of it. This is apparent in the registration practices and the construction of houses.

People's way of dealing with resettlement displays a strategy to selectively incorporate what they consider the opportunities, while maximizing the continuation with their normal way of life. Many people are disinclined to move permanently to the new sites,<sup>13</sup> but they nonetheless like to register for housing to be grounded in multiple locations and diversify their livelihood strategies. Especially in the first period after the flood, there was a lot of spurious registration. We found that people would inflate the size of families; register at different centres; split the household members between different centres; or apply for settlement

<sup>11</sup> Group discussion in Inhangoma (Mutarara district) September 10, 2008; Cocorico (Mopeia district) September 24, 2007; Luabo (Chinde district) October 23, 2007 and Chupanga (Marromeu district) March 11, 2007.

<sup>12</sup> Interview with local chief in Cocorico, July 8, 2007.

<sup>13</sup> Many regarded their relationship with ancestors as one reason. For instance 'we cannot leave our ancestors burial because it may bring along misfortune'.

without having been affected by the flood.<sup>14</sup> The process can be characterized as a set of strategies and counter-strategies to control the registration process. The government and aid agencies would devise different strategies, ranging from nocturnal checks, the use of gentian violet ink, and police intimidation. People, on the other hand, redistributed aid according to their own criteria and invested time on 'intelligence work from below' to make sure to be present at census-taking exercises in the centres.<sup>15</sup>

Resettlement is still ongoing. The construction of houses in the first phase, that was included in our research, was characterized by processes of elite capture. The stakes in the location and quality of the houses were high and people tried to get the best locations and highest level of services. Leaders are much better positioned than poor households in this competition. While the government planned homogeneous communities where each family would be allotted plots of 30–40 m<sup>2</sup> (according to the international humanitarian Sphere standards), differentiation became visible from the start, with families claiming larger plots or being left with smaller ones. This was only partly explainable by reference to needs (household size) and was much more a reflection of power differentials. The government provided house designs with two or three rooms. The three room houses became known as the *chief's houses*; and the two room houses as the *public's design*. In the research areas of Mopeia District, only chiefs occupied three-room houses. Differentiation was further created because families had to produce their own bricks, which poor or female-headed households could not easily manage. To occupy a plot one needed to have finished the brick-production and as a result the plots near the road became occupied by the better-off. The disaster policies of the government thus led to the reinforcement of social differentiation and elite formation in the area.

## 9. Concluding analysis

This paper analyzed the arena of climate change adaptation in Mozambique through five vignettes: the national policy domain, societal discourses on weather-related disaster, local adaptation practices, the evacuation and resettlement programme after the 2007. For each of these we brought out how dynamics are shaped by interactions between international interventions, the government and other power holders, and local people.

A major finding throughout the vignettes is that the emergency discourse prevailing internationally around climate change does not resonate with any of the actors in Mozambique. While actors take the adaptation agenda to some extent seriously, in everyday practice it gets incorporated in bureaucratic politicking, social manipulation and everyday politics of competing claims over resources.

Secondly, we can observe that the stakes of climate change are high in two ways. Climate change is said to result in increased flooding which has a visible effect on Mozambique. The stakes are also high in the sense that international attention to climate change has opened up an arena of contestation over ideas and resources. At the national level, the availability of international programmes has unleashed a competitive bid for coordination among national institutions at the detriment of a co-ordinated approach. Locally, people try to expand their room for manoeuvre by appropriating opportunities provided by evacuation and resettlement programmes in their own projects and livelihood strategies.

Thirdly, we found a remarkable cross-cutting tendency that institutions and people alike tend to seek continuity by

incorporating the climate change agenda in their lifestyles and institutional interests. Authorities and churches tend to explain climate change in a way that reinforces social order and affirms their control. They avoid creating consciousness that climate change is human-induced and hence may be effectively countered by mitigation measures. Local people, on the other hand, respond to disasters by holding on as much as possible to their normal lifestyles. They develop a hierarchy of measures that allow them to make disaster as little disruptive as possible.

Fourthly, we found in every vignette evidence of clashes or contradictions within and between the domains of governance, international interventions and people. To highlight a few: government policy is torn between addressing climate change and development concerns. Everyday discourses of climate change have little relation to scientific understandings of the phenomena. Rather than being ignorant or superstitious, they are being propagated by power holders that explain climate change in ways that reinforce the social order. It was only when a discourse on witchcraft emerged that disrupted social order that the government embarked on a campaign to render people's understanding of climate change more scientific. The resettlement programme brings out contradictions between internationally endorsed notions of *living with the floods* with the government's desire for permanent resettlement into a long tradition of resettlement schemes that enhance public control over people. Our narratives of the evacuation and resettlement bring out numerous ways in which government policy disarticulates with people's strategies.

Finally, we find that technocratic responses to the challenge of climate change adaptation take place in a social context of significant inequality and differential power. They are being politicized in practice as actors endeavour to appropriate them according to their own interpretations and interests. People that are powerful – economically, socially or politically – tend to be more successful in this, and the risk that poor and vulnerable people get further marginalized in processes of climate change adaptation is substantial. This is alarming considering the explicit objective of many disaster response programmes (including the resettlement programme in Mozambique) to target the poor as the primary beneficiaries.

Taken together, the vignettes make clear that responses to climate-related hazards are complex and need to be understood by taking into account the historical and contemporary processes beyond climate and disaster. Adaptation interventions do not take place in a vacuum, but get shaped in an arena of different and often conflicting interests.

This leaves us with the question what our findings and approach can mean in practice? We have presented a multi-sited ethnography that shows how policies and responses to climate-related disasters come about and get altered in numerous sites. Actors negotiate adaptation in their everyday practice. The more explicit these negotiations are, the better they can become subject to policy interventions. This means investing in multi-stakeholder governance arrangements around climate change adaptation. The analysis also gives a sobering view on the steering power of policies and programme objectives which appear limited in practice. More attention is, therefore, needed for the process of policy-making and implementation. Among others, this points to the importance of building into programmes a strong monitoring function, including qualitative monitoring for unintended outcomes, and retain flexibility to adjust programmes accordingly.

Finally, our methodology of multi-sited ethnography can also have activating power. Certain patterns, interactions and contradictions can only become visible when approaching the arena from different sides. Policy makers and staff of programmes could likewise learn from exposure to different sites of the adaptation arena. Researchers that have a privileged view of different sites

<sup>14</sup> Group discussion with Red Cross volunteers in Mopeia, September 20, 2008.

<sup>15</sup> Interview with local chiefs at the resettlement centre 24 de Julho, September 23, 2008 and resettlement centre Zonas Verdes, September 24, 2008.

may become more active in popularizing their findings to encourage informed debate. The unique position of Artur, forthcoming in navigating the different sites, has resulted in a culture-critical novel on disaster response that will be published in Mozambique in parallel to this academic publication (Artur, forthcoming).

## Acknowledgments

We are grateful to the Netherlands Organisation for Scientific Research (NWO) to grant this project under the Vulnerability, Adaptation, Mitigation programme. We thank Ian Christoplos and Jeroen Warner for their valuable comments.

## References

- Adger, W., Arnell, N., Tompkins, E., 2005. Successful adaptation to climate change across scales. *Global Environmental Change* 15, 77–86.
- Agrawal, A., McSweeney, C., Perrin, N., 2008. Local Institutions and Climate Change Adaptation. World Bank, The Social Dimensions of Climate Change No. 113, Washington, DC.
- Artur, L., A Patria de Joao Lucas. Ndjira Editors, Maputo, forthcoming.
- Barnett, J., O'Neal, S., 2010. Maladaptation. *Global Environmental Change* 20, 211–213.
- Beilfuss, R., 2005. Understanding Extreme Floods in the Lower Zambezi River. In: Paper Presented at the Seminar on the Water Management on the Lower of Zambezi Held in Maputo September 5–6, 2005.
- Burton, I., Huq, S., Lim, B., Pilifosova, O., Schipper, E., 2002. From impact assessment to adaptation priorities: the shaping of adaptation policy. *Climate Policy* 2, 145–159.
- Buys, P., Deichmann, U., Meisner, C., That, T., Wheeler, D., 2007. Country Stakes in Climate Change Negotiations: Two Dimensions of Vulnerability. The World Bank, Washington DC.
- Chidiambamba, C., Liesegang, G., 1997. Dados historicos sobre ocorrencia e tipos de cheias no vale do Zambeze. In: Paper Presented at the Workshop on Sustainable use of Cahora Bassa dam and Zambezi Valley, Songo 29-09 to 2-10-1997.
- Christie, F., Hanlon, J., 2001. Mozambique and the Great Flood of 2000. Long House Publications, London.
- Christoplos, I., 2010. The Multiplicity of Climate and Rural Risk. DIIS Working Paper 8.
- Coelho, J., 1993. Protected villages and communal villages in the Mozambican Province of Tete (1968–1982): a history of the state resettlement policies, development and war. PhD Thesis, University of Bradford, UK.
- Colebatch, H., 1998. Policy. University of Minnesota Press, Minneapolis.
- Dovers, S., 2009. Normalizing Adaptation. *Global Environmental Change* 19, 4–6.
- Downing, T., 2002. Avoiding New Poverty: Mining-Induced Displacement and Resettlement, No. 58. IIED and WBCSD Publications.
- Downing, T., 1996. Mitigating social impoverishment when people are involuntarily displaced. In: Mc Dowell, C. (Ed.), *Understanding Impoverishment. The Consequences of Development-induced Displacement*. Berghahn Books, Providence and Oxford, pp. 33–48.
- Eriksen, S., Silva, J., 2009. The vulnerability context of a Savanna Area in Mozambique: household drought coping strategies and responses to economic change. *Environmental Science and Policy* 12, 33–52.
- Feldman, S., Geisler, C., Silberling, L., 2003. Moving targets: displacement, impoverishment and development. *International Social Science Journal* 175 UNESCO.
- Filipe, E., 2003. The Dam Brought us Hunger: A History of the Building of Cahora Bassa Dam. Work, Aldeamentos and the Social, Economic and Environmental Transformation in Mutarara and Sena, 1969–2000, MSc Thesis, University of Minnesota.
- Foley, C., 2007. Mozambique: a case study in the role of the affected state in humanitarian action. In: Humanitarian Policy Group Working Paper, September 2007.
- GoM and UN, 2005. Report on the Millennium Development Goals. Maputo, Mozambique.
- GoM, 1988. Raising to the Challenge. Dealing with Emergency in Mozambique. An Inside View. Maputo, Mozambique.
- Handmer, J., Dovers, S., Downing, T., 1999. Societal vulnerability to climate change and variability. *Mitigation and Adaptation Strategies for Global Change* 4, 267–281.
- Hammersley, M., Atkinson, P., 1983. *Ethnography Principles in Practice*. Tavistock Publications, London and New York.
- Hilhorst, D., 2004. Complexity and diversity: unlocking domains of disaster response. In: Bankoff, G., Frerks, G., Hilhorst, D. (Eds.), *Mapping Vulnerability: Disaster, Development and People*. Earthscan, London, pp. 52–67.
- Hilhorst, D., 2003. *The Real World of NGOs. Discourse, Diversity and Development*. Zed Books, London and New York.
- Hulme, M., 2009. *Why We Disagree About Climate Change. Understanding Controversy Inaction and Opportunity*. Cambridge University Press.
- INE, 2007. III Censo Geral da População e Habitação. Resultados preliminares. Maputo, Mozambique. Available at [www.ine.gov.mz](http://www.ine.gov.mz) (accessed 11.11.09).
- INGC, 2009. In: van Logchem, B., Brito, R. (Eds.), *Synthesis report. INGC Climate Change Report: Study on the Impacts of Climate Change on Disaster Risk in Mozambique*. INGC, Maputo, Mozambique.
- INGC, 2007. Diagnóstico Preliminar e Acções de Reconstrução pós-Calamidade. Maputo, Moçambique.
- INGC, 2006. Plano Director para Prevenção e Mitigação das Calamidades Naturais. Maputo, Moçambique.
- INGC, UEM and Fewsnets, 2003. Atlas for Disaster Preparedness and Response in the Limpopo Basin. Maputo, Mozambique.
- IPCC, 2001. *Climate Change 2001: Impacts, Adaptations and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge.
- Kate, R., 2000. Cautionary tales: adaptation and the global poor. *Climatic Change* 45, 5–17.
- Kelley, Scoones, 2003. *Understanding Environmental Policy Processes*. London, Earthscan.
- Kelly, P., Adger, W., 2000. Theory and practice in assessing vulnerability to climate change and facilitating adaptation. *Climatic Change* 47, 325–352.
- Lautze, S., 1997. *Saving Lives and Livelihoods. The Fundamentals of a Livelihood Strategy*. Feinstein International Famine Center.
- Leichenko, R., O'Brien, K., 2008. *Environmental Change and Globalization*. Oxford University Press.
- Long, N., Long, A. (Eds.), 1992. *Battlefields of Knowledge. The Interlocking of Theory and Practice in Social Research and Development*. Routledge, London/New York.
- Mackenzie, C., 2006. *Forestry Governance in Zambézia, Mozambique: Chinese Takeaway! Report prepared for FONGZA, Quelimane, Mozambique*.
- Mafambissa, F., 2007. *Efeitos dos Desastres Naturais na Produção Agrícola de Culturas Alimentares e na Segurança Alimentar*. IESE, Conference Paper #21.
- MCT, 2006. *Estratégia de Ciência, Tecnologia e Inovação de Moçambique (ECTIM)*. Maputo, Moçambique
- Marcus, G., 1995. *Ethnography in/of the world system: the emergence of multi-sites ethnography*. *Annual Review of Anthropology* 24, 95–117.
- MICOA, 2006. *Avaliação Participativa da Vulnerabilidade do País à Mudanças Climáticas*. Maputo, Moçambique.
- Monteiro, G., 1955. *SSE. Sessenta anos de açúcar na Zambézia 1893–1953*. Lisboa.
- Mosse, David, 2005. *Cultivating Development: An Ethnography of Aid Policy and Practice*. Pluto Press, London/Ann Arbor/MI.
- Negrão, J., 2001. *O Impacto Socioeconómico das Cheias. Oração de Sapiência por Ocasião da Abertura do Ano Lectivo 2001–2002*. Maputo, Moçambique. .
- Newitt, M., 1988. Drought in Mozambique 1823–1831. *Journal of Southern African Studies* 15 (1), 15–35.
- Oliver-Smith, A., 2005. Communities after catastrophe reconstructing the material, reconstructing the social. In: Hyland, S. (Ed.), *Community Building in the Twenty-first Century*. School of American Research Press, USA, pp. 45–70.
- Osbahr, H., Twyman, C., Adger, W., Thomas, D., 2008. Effective livelihoods adaptation to climate change disturbance: scale dimensions of practice in Mozambique. *Geoforum* 39, 1951–1964.
- Patt, A., Schröter, D., 2008. Perceptions of climate risk in Mozambique: implications for the success of adaptation strategies. *Global Environmental Change* 18, 458–467.
- Paavola, J., Adger, N., 2006. Fair adaptation to climate change. *Ecological Economics* 56 (4), 594–609.
- Pettenger, M., 2007. *The Social Construction of Climate Change*. Surrey, Ashgate.
- Raphael, B., 1986. *When Disaster Strikes: A Handbook for the Caring Professionals*. Unwin Hyman, London.
- Schipper, E., 2010. Religion as an integral part of determining and reducing climate change and disaster risk: an agenda for research. In: Voss, M. (Ed.), *Climate Change: The Social Science Perspective*. Verlag, Wiesbaden, Germany, pp. 377–393.
- Taju, G., 1992. *Integração de Desmobilizados na Sociedade Civil*. Maputo, Moçambique. .
- Tol, R., 2005. Adaptation and mitigation: trade-off in substance and methods. *Environmental Science and Policy* 8, 572–578.
- World Bank, 2005. *Learning Lessons from Disaster Recovery: The Case of Mozambique*. Working Paper # 12, Washington, DC.
- UNHCR, 1996. *Evaluation of UNHCR's Repatriation Operation to Mozambique*. UNHCR, Geneva.
- Vines, A., 1996. *Renamo: From Terrorism to Democracy in Mozambique?* James Currey, London.