



Relating perceptions of flood risk and coping ability to mitigation behavior in West Africa: Case study of Burkina Faso

Katherine E. Schlef^{a,b,1,*}, Lionnel Kabore^{b,2}, Harouna Karambiri^b, Y.C. Ethan Yang^{a,3}, Casey M. Brown^a

^a Department of Civil and Environmental Engineering, University of Massachusetts Amherst, 130 Natural Resources Rd., Amherst, MA, 01003, United States

^b International Institute for Water and Environmental Engineering (2iE), 01 BP 594, Ouagadougou 01, Burkina Faso

ARTICLE INFO

Keywords:

Flood
Perception
Mitigation
West Africa
Burkina Faso
Perception motivation theory

ABSTRACT

The recent increase of devastating floods in West Africa implies an urgent need for effective flood risk management. A key element of such management is understanding how perceptions affect the implementation of mitigation measures. This paper uses the technique of framework analysis in conjunction with the conceptual framework of protection motivation theory to interpret flood perceptions and mitigation actions of flood victims and public officials in Ouagadougou, Burkina Faso as conveyed through in-depth semi-structured interviews. The results show that, despite the experience of a devastating flood in 2009 and clear understandings of flood causes, mitigation actions in Ouagadougou after the 2009 flood varied widely. This occurred due to adverse perceptions that mitigation actions are costly and that personal ability and responsibility to effect change is limited. These adverse perceptions offset neutral or positive perceptions that mitigation measures, if correctly implemented, are effective, and that the risk of flooding is high. The paper concludes with a comparative meta-analysis of West Africa flood perception and mitigation literature that reveals the need for actionable studies on the implementation of specific measures for flood risk management.

1. Introduction

West Africa has experienced an increase in flood risk since the great drought of 1968 to 1985 due to increasing urbanization in flood prone regions, extreme rainfall events, and soil degradation (Di Baldassarre et al., 2010; Nka et al., 2015; Sighomnou et al., 2013); from the period 2007 to 2017 there were 130 flood occurrences affecting in total nearly 15.6 million people (EM-DAT, 2017). Furthermore, future flood risk is likely to be further exacerbated by climate change, continued urbanization and land use practices, and societal and political obstacles (Arnell and Gosling, 2016; Winsemius et al., 2016), indicating an urgent need for effective flood risk management.

A key element of effective flood risk management is understanding how perceptions of flood risk and capacity for mitigation affect the implementation of mitigation measures (Bubeck et al., 2013; Fuchs et al., 2017; Slovic et al., 1982). The focus here is on mitigation (i.e., measures to reduce risk, such as maintaining clean storm water systems or relocation to higher ground); the concept of adaptation, while often

recommended in conjunction with mitigation for dealing with slowly developing risks such as climate change (Nyong et al., 2007), is less clear in the context of short-duration events such as floods (Birkholz et al., 2014). The first objective of this study is to elucidate the flood perceptions and mitigation actions of flood victims and public officials in Ouagadougou, Burkina Faso. The second objective of this study is to combine the results from Ouagadougou into a comparative meta-analysis of other West Africa studies on flood perception and mitigation to provide concrete recommendations for risk management. The paper is organized as follows: Section 2 reviews West Africa flood perception and mitigation literature, Section 3 describes the study region while Section 4 describes data collection, Section 5 describes the analytical method underlying data synthesis and interpretation, Section 6 provides the results, Section 7 discusses the comparative meta-analysis, and Section 8 concludes with recommendations to reduce flood risk.

* Corresponding author at: Consortium of Universities for the Advancement of Hydrologic Science, Inc., 50 CambridgePark Drive Suite 203 Cambridge, MA 02140.
E-mail address: kschlef@cuahsi.org (K.E. Schlef).

¹ Consortium of Universities for the Advancement of Hydrologic Science, Inc., Cambridge, MA, 02140.

² InGenius, 06 BP 9374, Ouagadougou 06, Burkina Faso.

³ Department of Civil and Environmental Engineering, Lehigh University, Bethlehem, PA, 18015.

Table 1
 Studies on flood risk perception and adaptation or mitigation in West Africa. [YEAR] indicates focus on flood event of that year. Results are that coming from the study methodology and do not include study recommendations, discussion or conclusion.

Reference	Location (characteristics)	Data	Framework	Results
Adelekan (2010)	Lagos, Nigeria (urban, coastal)	Semi-structured questionnaire to 486 randomly sampled households in four poor urban communities, interviews with key informants, group discussions with community members	"integrated vulnerability framework" (Dolan and Walker, 2006)	Statistics of urban development, wetland loss and rainfall; causes of floods; vulnerability of surveyed households; perception of flood causes, frequency and impacts; adaptation/mitigation measures at the individual, household and community level
Adelekan, (2011)	Abeokuta, Nigeria (urban, inland)	Questionnaire to 248 residents in 14 flood-affected areas of the town	Vulnerability (based on a combination of existing literature)	[2007] indicators of vulnerability (socio-economic, susceptibility, exposure, and recovery)
Adelekan and Asiyambi, (2016)	Lagos, Nigeria (urban, coastal)	Semi-structured questionnaire to 1000 respondents in 40 flood affected districts	Risk perception, in particular the psychometric risk paradigm of Kraus and Slovic (1988)	[2011, 2012] socio-economic data; flood experience and awareness; concern about floods relative to other problems; concern about flood impacts; perceptions of flood vulnerability and risk
Ahouangan et al. (2014)*	Zagnanado, Benin (rural, inland)	Observational visits, semi-structured interviews with key informants, questionnaire to 60 randomly chosen heads of households	Goal is to assess perception of vulnerability (no reference to existing literature)	[2010] perception of risk and flood magnitude; flood disaster management, impact, migratory response and post-event adaptation strategies
Ajibade et al. (2013)	Lagos, Nigeria (urban, coastal)	36 in-depth interviews pre-disaster, 453 questionnaires immediate with the disaster, and six focus group discussions post-disaster of women in three sections of the city	Social vulnerability (Cutter et al., 2003) and feminist political ecology (Rocheleau et al., 1996)	[2011] normal gender-roles and well-being; women's perceptions of floods and gender; differential flood impacts on and coping strategies of women
Amoako and Boamah (2015)	Accra, Ghana (urban, coastal)	38 unstructured questionnaires and in-depth interviews with officials, review of policy documents, workshops/interviews with flood victims and communities	Integrated flood risk management developed by authors (no reference to existing literature)	Perceived and reported causes of floods
Ayode and Akintola (1980)	Lagos and Ibadan, Nigeria (urban, coastal and inland)	Questionnaire to 266 and 246 randomly chosen households within zones in Lagos and Ibadan, respectively	Goal is to assess perception of flood hazard (no reference to existing literature)	Perceived flood impacts, causes and solutions; mitigation/adaptation strategies
Bempah and Øyhus, (2017)	Two communities in the Northern region (capital Tamale), Ghana (rural, inland)	60 interviews, participant observation, four focus group discussions	Authors created framework to connect beliefs, perceptions, and experience with disaster risk reduction (unclear how referenced literature is used in framework)	[2009, 2010] perceptions of flood causes and of the national disaster management agency
Douglas et al. (2008)	Lagos, Nigeria and Accra, Ghana (urban, coastal)	Focus group discussions	Participatory vulnerability analysis (Smit and Wandel, 2006)	Perceptions of flooding and its causes and solutions; adaptation strategies
Lassailly-Jacob (2015)*	Kaya, Ouagadougou, and Tougouri, Burkina Faso (urban and rural, inland)	36 semi-directed interviews with officials and flood victims	Goal is to assess perceptions, disaster response, and adaptation (no reference to existing literature)	[2009, 2010] perceptions of causes and characteristics of floods; disaster response; migratory adaptation strategies
Odemthero, (2015)	Warri, Nigeria (urban, coastal)	Questionnaire to 129 residents in nine sections of the city	Flood risk resilience (Gersonius, 2012)	Perceived types and causes of flooding; potential impacts of urban development on flood risk; possible adaptation strategies at government, community and household level
Ologunmorita and Adeyemo (2005)	Baleysa and Rivers states (capitals are Yenagoa and Port Harcourt, respectively), Nigeria (rural, coastal)	Questionnaire to 500 landowners chosen by systematic random sampling in 15 settlements across three ecological zones	Goal is to assess perception of flood hazard and coping strategies (no reference to existing literature)	Socio-economic data; experience of floods; perceived characteristics, causes, damages, and solutions associated with floods; short- and long-term adaptation strategies
Oriola (1994)	Ondo, Nigeria (urban, inland)	Questionnaire to 120 landlords using systematic sampling, field measurements	Goal is to assess behaviors that may cause floods and perceptions of flood risk (no reference to existing literature)	Socio-economic data and property characteristics; flood-inducing socio-cultural activities; flood perception and experience
Oruonye (2013)	Jalingo, Nigeria (urban, inland)	Questionnaire to 252 randomly selected respondents in three affected regions in the city	Risk perception (Slovic, 1987) (referenced literature has minimal influence on study design and results)	Experience of flooding; perceived causes and frequency of flooding; duration of evacuation from home; disaster response

(continued on next page)

Download English Version:

<https://daneshyari.com/en/article/11005270>

Download Persian Version:

<https://daneshyari.com/article/11005270>

[Daneshyari.com](https://daneshyari.com)