Working Paper

# An Exploratory Analysis into Urban Index-based Microinsurance for Flood Risk in Nairobi: A community-based approach

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**Abstract**

Climate change continues to amplify vulnerability in low-income communities across Nairobi, with many urban livelihoods at great risk to the impacts of flooding. This study explores the scope for index insurance in Nairobi for flood risk at the micro-level. Drawing from relevant academic literature, this paper considers the role of social capital and trust as an analytical framework for studying the interactions between the community and institutions for managing flood risk. Thus, the role of social capital and trust in improving accessibility, availability and inclusiveness of insurance will form the analytical framework around which the thesis of this dissertation will be based. 17 individuals from flood-prone areas in Nairobi, alongside 12 key informants from relevant organisations were interviewed. Through a contextual comparative analysis, this dissertation found that trust and capacity building play a dominant role in providing an enabling environment and creating a demand for IBMI.

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## List of Acronyms

**ACRE Africa** – Agricultural and Climate Risk Enterprise Africa

**ARC** – African Risk Capacity

**CBII** – Community-based Index Insurance

**CCA** – Climate Change Adaptation

**CIC** – Cooperative Insurance Company

**CSR** – Corporate Social Responsibility

**DFID** – Department for International Development (UK)

**DRR** – Disaster Risk Reduction

**DRM** – Disaster Risk Management

**G7** – Group of 7

**GDP** – Gross Domestic Product

**IBLI** – Index-based Livestock Insurance

**IBMI** – Index-based Microinsurance

**ICMIF** – International Cooperative and Mutual Insurance Federation

**INGO** – International Non-governmental Organisation

**IPCC** – Intergovernmental Panel on Climate Change

**IRA** – Insurance Regulatory Authority

**KDI** – Kounkuey Design Initiative

**NGO** – Non-governmental Organisation

**SDGs** – Sustainable Development Goals

**SDI** – Slum Dwellers International

**SWM** – Solid Waste Management

**TIA** – Takaful Insurance Africa

**UN** – United Nations

**UNFCCC** – UN Framework Convention on Climate Change

**UNISDR** – UN International Strategy for Disaster Reduction

**Urban ARK** – African Risk Knowledge

## Key Definitions

### Capacity

The combination of all the strengths, attributes and resources available within an organization, community or society to manage and reduce disaster risks and strengthen resilience (UNISDR, 2009).

### Disaster Risk Management

Disaster risk management is the application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses (UNISDR, 2009).

### Disaster Risk Reduction

Disaster risk reduction is aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development (UNISDR, 2009).

### Index Insurance

Index insurance is a relatively new but innovative approach to insurance provision that pays out benefits on the basis of a predetermined index (e.g. rainfall level) for loss of assets and investments, primarily working capital, resulting from weather and catastrophic events, without requiring the traditional services of insurance claims assessors. It also allows for the claims settlement processes to be quicker and more objective (IFC, *n.d*).

### Microinsurance

Microinsurance is a form of insurance that is aimed at providing easier accessibility and affordability for low income households with insurance against natural disasters (UNFCCC, *n.d*).

### Mutual

A mutual is an autonomous association/organisation of legal entities or persons operating in (and sometimes across) different sectors, including healthcare, banking, insurance and many others. The primary purpose of the mutual is to satisfy its members' common needs, rather than to make profits or provide a return on capital. Mutual organisations are run for the benefit of its member-owners, as opposed to being owned and controlled by outside investors (Swiss Re, 2016).

**Resilience**

The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management (UNISDR, 2009).

**Risk transfer**

The process of formally or informally shifting the financial consequences of particular risks from one party to another, whereby a household, community, enterprise or State authority will obtain resources from the other party after a disaster occurs, in exchange for ongoing or compensatory social or financial benefits provided to that other party (UNISDR, 2009).

**Vulnerability**

The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards (UNISDR, 2009).

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## 1. Introduction

There has been an increase in extreme weather events over the past twenty years, with over 4.4 billion people affected and 1.3 million killed (UNISDR, 2013; Ana-Gonzalez & von Dahlen, 2015). Whilst DRR efforts have helped reduce loss of life over the past decade, loss of livelihoods and assets have amplified (Em-dat, *n.d.*). Sub-Saharan Africa remains one of the most vulnerable regions to climate change, with an increase in the intensity of droughts and heavy rainfall providing significant challenges to vulnerable livelihoods in the region (Niang *et al,* 2014). Consequently, rural livelihood options are becoming limited and many people are migrating to urban areas in favour of more diverse and sustainable livelihood opportunities (World Population Review, 2016; Janzen & Carter, 2013). However, adaptive capacity to extreme weather events in urban sub-Saharan Africa is poor (Egondi *et al,* 2012; KDI, 2015; Revi *et al*, 2014) and there is a growing need to better protect poor urban livelihoods from the perils of climate change through more effective DRM.

Insurance can provide a safety net to those who are most vulnerable to the impacts of climate change. Specific to climate-related hazards, index insurance is a perfect tool to enhance the progress of DRR, CCA and the SDGs, as it transcends the goals of all three. Acting as a form of social security, index insurance can provide financial relief from the shock and stress of extreme or frequent weather events. There is an urgency for greater insurance penetration in developing countries to enhance risk management strategies before the impact of catastrophic disasters such as flooding and drought. There are currently numerous established projects for rural IBMI in Sub-Saharan Africa (Meze-Hausken *et al,* 2009; Macmillan, 2014; Greatrex *et al*, 2015; Whalley, 2016), particularly for agriculture such as cover for livestock and crop-yields. ARC for instance, are very prominent here. However, little has been done to provide index insurance for low-income populations in urban areas. This lack of social protection is of growing concern, with the potential catastrophic impacts of climate change coupled with exponential growth of the urban population in sub-Saharan Africa.

This study does not aim to take attention away from rural index insurance projects in Kenya and coverage should be expanded across sub-Saharan Africa to better protect smallholder farmers from extreme drought and floods. However, the application for index insurance in an urban context has not been readily explored and this study seeks to conceptualize its use for urban livelihoods. Index insurance can be more easily applied to agricultural losses in rural livelihoods,

rather than urban livelihoods. Moreover, the necessary technology in urban areas has not been readily accessible until more recently, which has perhaps discouraged studies of index insurance application for urban livelihoods. This dissertation will seek to explore whether there is an enabling environment for urban index insurance at the community level for protecting SME owners and workers from loss of income. It will not delve too deeply into the technical functions and requirements needed to make it work such as funding, premium collection and claims payments. Further studies should be done to explore these technical variabilities and expertise in relevant fields should be applied to reach conclusions in this space. Instead, this paper seeks to identify the challenges of creating demand for insurance and scaling up coverage, with an analytical framework built around trust and capacity building respectively (Woolcock & Narayan, 2006; Mladovksy and Mossialos, 2008; Greatrex *et al*, 2015; Morsink & Guerts, 2011). Existing informal social savings and risk sharing platforms in Kenya form the basis of community-based, mutual entities. Thus, the role of mutual microinsurance for addressing these challenges will be considered hereafter.

This paper will identify relevant case studies of both pilot and established index insurance schemes in Kenya, Bangladesh and India to develop a framework for analysis. Alongside the Urban ARK project, I will use qualitative research to consider both the feasibility of and demand for IBMI in Nairobi, Kenya. Case studies of mutual and cooperative microinsurance from India and Kenya will be used to develop a conceptual framework for analysis, where ideas and concepts will be drawn from comparative studies of rural and urban schemes. Moreover, an established urban project in Bangladesh, set up by Oxfam to provide cover for flooding through a Meso-level index-based insurance, will be drawn upon to provide parallels of efficacy in Nairobi. Here I will use a comparative contextual analysis of contrasting index-based insurance methods to build a conceptual framework around which their impact will be individually and collectively measured across a comparative structure. In addition, this paper seeks to identify whether there can be a sustainable long-term business model for IBMI in developing countries as an alternative to the disaster response financial mechanisms implemented by NGOs, international organisations and governments.

**Research Objectives**

**RO1:** Explore the potential and demand for index-based microinsurance for flood risk in Nairobi to protect urban livelihoods.

**RO2:** Identify the role of mutual microinsurance for the provision of Urban Index-based microinsurance.

**RO3:** Investigate the role of trust within the framework of social capital for limiting the effectiveness of community-based and mutual microinsurance.

## 2. Rationale for Research

### *2.1 Introduction*

This section of the dissertation provides an opportunity to review the literature and highlight the gaps in current understanding of the research topic. Five themes will be addressed throughout this section: Climate risk in Nairobi; a background of index insurance; challenges and limitations of index insurance; a community-based, needs-driven alternative; and the role of social capital and trust in community-based, mutual microinsurance. Climate risk in Nairobi will be explored in greater depth, with exposure to flood risk identified as one of the biggest threats to urban livelihoods. Rapid urbanization and more intense rainfall puts thousands of livelihoods at risk. Coping with the stress of natural hazards falls under the remit of DRM and CCA, but this paper also argues for the role of sustainable development as an integrated approach. Index insurance is an important risk transfer mechanism to protect, promote and transform sustainable urban livelihoods (Whalley, 2016). Over the past decade, there has been an increase in rural index insurance projects across the developing world (Johnson, 2013; Meze-Hausken *et al*, 2009), but an exploration into index insurance for protecting poor urban livelihoods is still relatively unfamiliar and identifying the feasibility of potential projects will be studied in further detail. However, there are organizational challenges and limitations to index insurance such as basis risk, transparency and accountability. This paper will review literature on community-based alternatives to negate these organizational challenges. Case studies will be used from mutual microinsurance and community-based initiatives including Uplift Mutual community-based health insurance in India and Meso-Level index-based flood insurance in Bangladesh. These case studies will provide insight into the multi-faceted nature of index insurance and the characteristics needed to make comparable projects work. Woolcock's (1998, 2001, & Narayan, 2006) framework for social capital implemented by Mladovksy and Mossialos (2008) for

measuring community-based health insurance will be drawn upon. The role of social capital and trust in improving accessibility, availability and inclusiveness of insurance will form the analytical framework around which the thesis of this dissertation will be based.

### *2.2 Climate Risk in Nairobi*

The impacts of Climate Change are being seen across the world, but developing countries are recurrently bearing the brunt of these consequences. Extreme weather events continue to increase in intensity and frequency because of climate change (IPCC, 2012; EM-DAT, *n.d*.; Stocker, 2013). Africa is one of the most vulnerable continents to climate change, as many countries have high exposure and low adaptive capacity to natural hazards. In addition, rapid urbanization across Sub-Saharan Africa is amplifying vulnerability at community level, through poor land management and informal settlements (Cutter *et al,* 2012; Pelling *et al*, 2008; Baker, 2012). Heavy rainfall and droughts have been more frequent in the past thirty to sixty years over Eastern Africa, which poses great challenges for DRR and CCA efforts (Niang *et al,* 2014). By the end of the 21st century, many regions will experience '1-in-20-year annual maximum daily precipitation amounts' every five to fifteen years (IPCC, 2012: pp.11), with 'more intense wet seasons' across East Africa (Niang *et al*, 2014: pp.1210).

Coping with the shock and stress of these increasingly frequent weather events is putting a strain on the already waning financial and social capital in poorer communities. Low and middle income countries witness greater economic losses in proportion to GDP than high income countries and there is a growing need to better protect the livelihoods and assets of vulnerable people against the perils of extreme weather events (IPCC, 2012: pp.7; UNFCCC, *n.d*; Collier *et al*, 2012). Livelihoods in sub-Saharan Africa are constantly at threat to climate change and with more than half the world's population living in urban areas (Doig & Ware, 2016), efforts to break the cycle of risk accumulation are vital in decreasing vulnerability (Morton, 2007; Dodman *et al*, 2016; Revi *et al*, 2014). Urbanisation continues to increase at an exponential rate, particularly in Nairobi which is home to 3.5 million urban residents. Over 2.5 million of those residents currently living in urban slums (World Population Review, 2016), where adaptive capacity to extreme weather events is poor (Egondi *et al,* 2012; KDI, 2015; Revi *et al*, 2014). Heavy rainfall across Nairobi in April 2016 displaced thousands of people and provided a stark reminder of the catastrophic nature of flooding and the significance of building urban resilience (Davies, 2016;

Taylor, 2016). Blocked drainages mean intense flooding and destruction to infrastructure can cause water scarcity and spread of disease, which spreads rapidly across urban slums. The risks associated with heavy rainfall drastically limits the adaptive capacity of people living in urban slums and their ability to recover (Baker, 2012: pp.39).

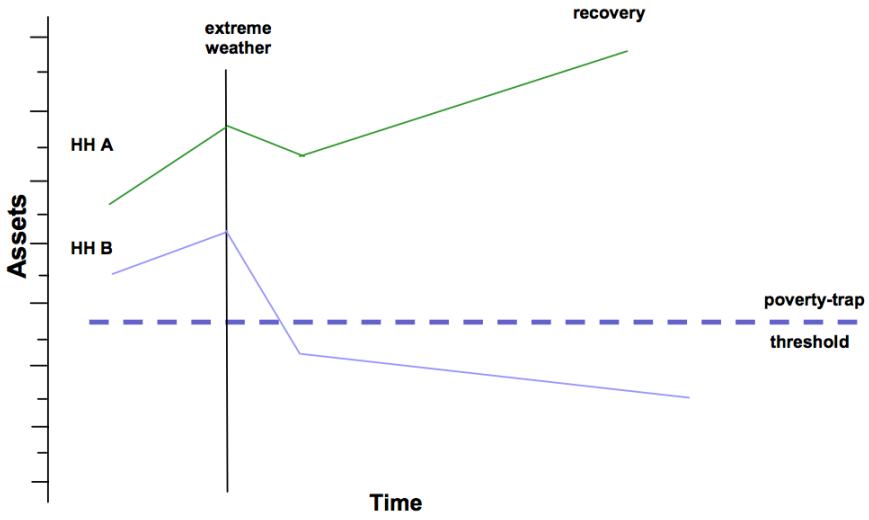


**Figure 1.** Adapted from Carter *et al* (2005) by Skees *et al* (2006) to illustrate the role of index insurance for protecting assets after an extreme weather event.

Inform (2017) indicates high physical exposure to flood risk in Kenya and between 1990 and 2004 over 2 million people have been affected by flooding across the country (KDI, 2015; Jha *et al*, 2012). Climate change coupled with rapid urbanisation has put thousands of households at risk to flooding, particularly alongside rivers in Nairobi, where rent is cheaper (KDI, 2015). Many vulnerable communities do not have access to the necessary social protection from natural hazards for managing disaster risk (Wisner *et al*, 2004; Collier *et al*, 2012), which places pressure on households to fall back on existing financial and social assets to lift themselves out of crisis. In the aftermath of a disaster, households fall back on a multitude of financial and social coping strategies such as: mobilising household labour; reducing expenditure; selling assets; consuming stocks and savings; and borrowing food from friends and family (Adger *et al,* 2009; Smit & Wandel, 2006; World Bank, 2010). One tool for managing the risks of disasters and relieving the burden of debt in developing countries is microinsurance (Janzen & Carter, 2013; Skees *et al,* 2006; Carter *et al,* 2005; see Figure 1).

The Sendai Framework (UNISDR, 2015) and COP21 (UNFCCC, 2015) both cite the importance of insurance for enhancing DRR and CCA efforts in developing countries. Emerging out of COP21, the G7 Insuresilience project aims to provide climate risk insurance for up to 400 million people[1] living in regions vulnerable to climate change (UNFCCC, 2015). InsuResilience will use alternative risk transfer schemes such as *Weather Index insurance*, *parametric insurance* and catastrophe bonds to measure the estimated loss and often calculate payouts before an extreme climatic event (UNFCCC, 2015; UNFCCC, *n.d.*). Thus, the insurance industry has been thrust onto the global political agenda as a means of mitigating the impacts of extreme and frequent weather events (Surminski, 2013; Artemis, 2015; see also Asthana & Wintour, 2017). Despite this, Swiss Re (2017) figures show that insurance density and penetration in developing countries, particularly Kenya (see Figure 2), is still relatively low.

[1] This target is split into two approaches: 300 million people through sovereign-level disaster insurance (ARC and CCRIF) and 100 million through the private sector.

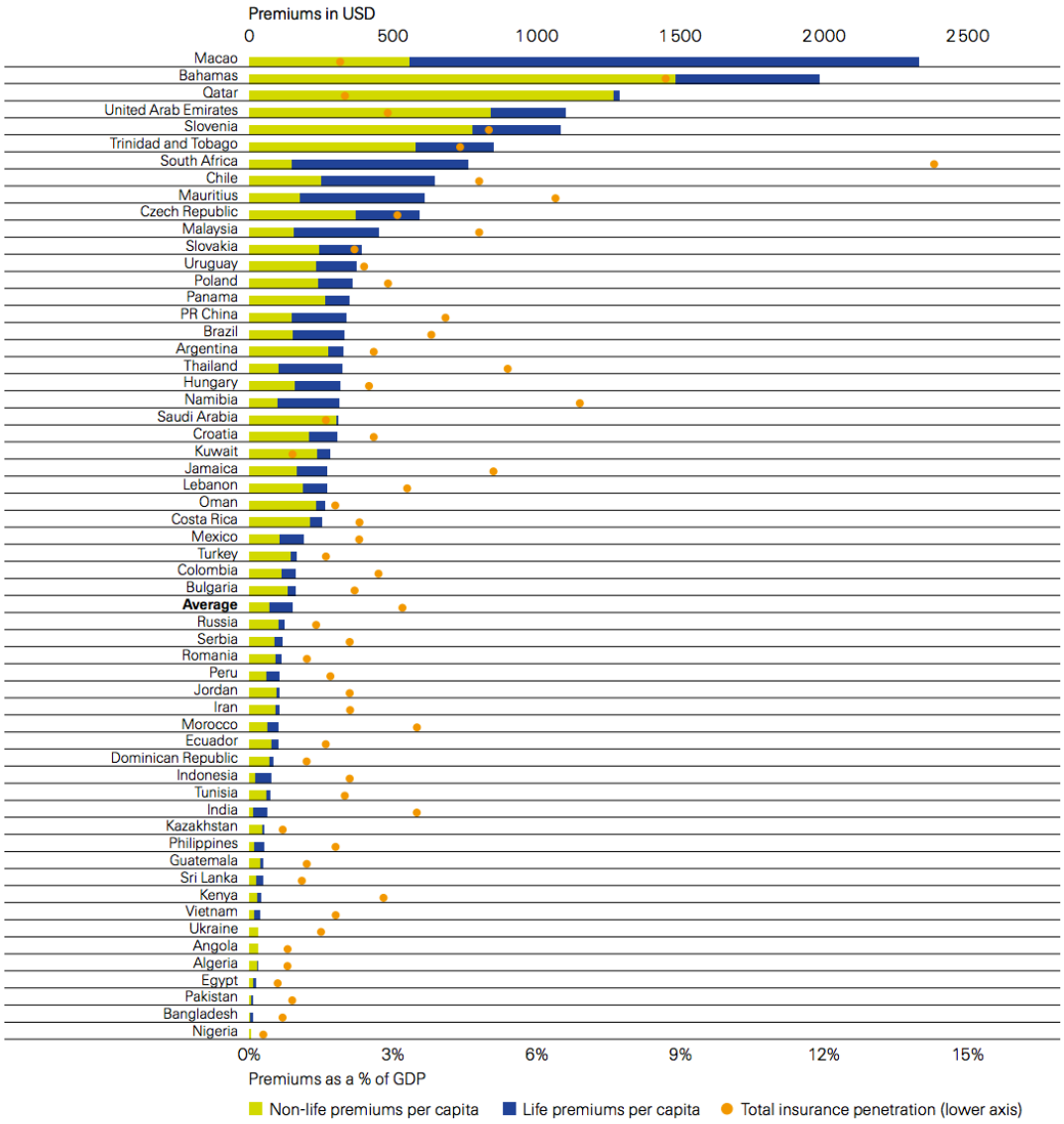


**Figure 2.** Swiss Re Sigma (2017) graph showing insurance density and penetration in developing countries

### *2.3 Index Insurance*

Before the introduction of index insurance, indemnity insurance managed the risk of natural catastrophes. However, indemnity insurance is designed to protect households against the loss of a specific asset, rather than a specific event and policyholders are paid out weeks after a loss (GlobalAgRisk, 2012). Index insurance separates indemnification from production, which might result in lower costs and more apparent risk management than traditional indemnity insurance (Cole *et al,* 2012; GlobalAgRisk, 2012; IRI-USAID, 2013; Crichton, 2008). Timely payouts, lower moral hazard, lower administration costs and more transparency are among the benefits of index insurance (Skees *et al,* 2006; Collier *et al*, 2009; UNU-EHS, 2017). Payouts are dependent on a physical trigger such as rainfall or wind-speed, rather than individual losses. This removes

the element of subjectivity, as once an index is triggered the payout is administered *ex ante*, irrespective of asset loss or damage. Thus, index insurance provides a safety net, making it easier for households to cope with the impacts of natural hazards without the financial burden of debt (Hellmeuth *et al,* 2009; Whalley, 2016).

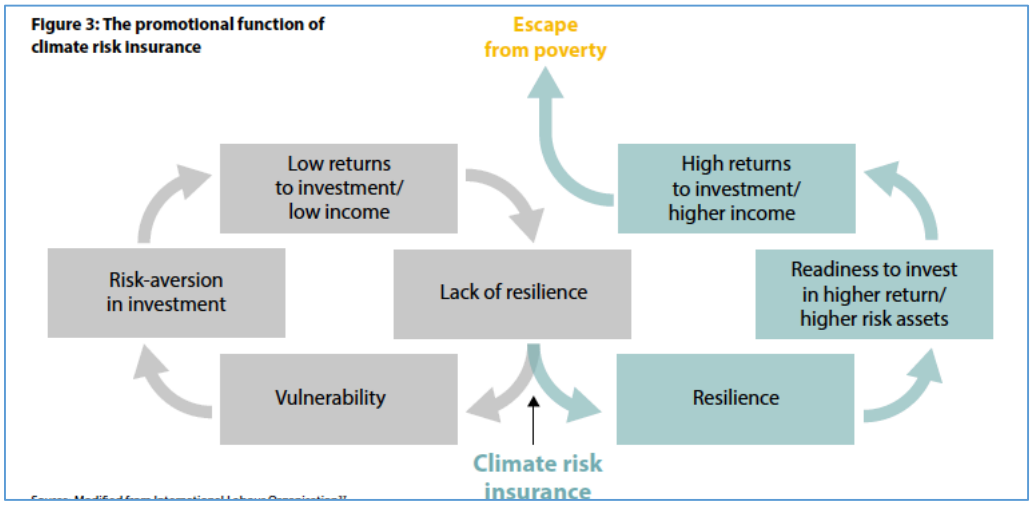


**Figure 3.** Whalley (2016: pp.12) illustrating the transformative and promotive function of Climate Risk Insurance

Advances in scientific technology and the availability of satellite imagery for measuring rainfall variability and crop-yields for instance, have reduced the previously high transaction costs of index insurance and thus expanded its reach to many people who were previously considered uninsurable (Greatrex *et al*, 2015; Development Initiatives, 2017). TIA in Kenya, for example, use satellite imagery to track levels of foliage for livestock in semi-arid and arid drought-prone regions of Wajir County. Once the conditions surpass the index trigger, pastoralists and farmers are immediately compensated, which helps build confidence and trust between the insurer and policyholder (Macmillan, 2014). Consequently, there has been evidence of smallholder farmers across developing countries taking more climate-smart risks with their agricultural methods such as crop diversification and production, which is a great example of the promotive nature attached to index insurance (see Figure 3; Whalley, 2016; Barrett *et al*, 2007; Warner *et al,* 2009; Lashley & Warner, 2015; UNFCCC, *n.d*.; Carter & Janzen, 2012).

There has been an increase in index insurance projects across the developing world for protecting rural livelihoods (Johnson, 2013; Peterson, 2012; Meze-Hausken, *et al,* 2009; see also.

GIIF, *n.d*.), with macro-level projects such as ACRE Africa (Kilimo Salama) in Kenya, Tanzania and Rwanda and ARC providing coverage across sub-Saharan Africa (Greatrex *et al,* 2009; Whalley, 2016). However, there is limited literature or case studies to apply its use for protecting urban livelihoods. With the growing success of index insurance projects for smallholder farmers, parallels should be drawn for low-middle income urban livelihoods in Nairobi (UNISDR, 2015; Whalley, 2016). Oxfam recently launched a Meso-Level Flood Index Insurance project in Bangladesh to protect river-basin people in the flood-prone region of Sirajganj. Payouts are triggered based on water depth and duration of flooding and implemented through a local NGO, who distributes the funds to the households falling within the affected areas (Desai, 2013; Oxfam, 2013). Two years after its inception in 2012, 700 of the 1661 insured households were paid out, allowing them to rebuild their lives without the burden of debt (Swiss Re, 2014). Nairobi has four main rivers (Ngong, Nairobi, Mathare and Mgathi) posing health and safety hazards for nearby households (Weru, 2012), which makes Oxfam's framework for success in Bangladesh an important rhetoric to take forward for potential projects in Nairobi. Whilst agricultural assets are easier to measure through a predetermined index, loss of livelihood through urban fluvial and pluvial flood risk provides a more difficult challenge.

### *2.4 Challenges and Limitations*

Index insurance is not appropriate for slow onset events such as SLR, nor is it an all-encompassing solution for ending poverty (Whalley, 2016; Skees, 2008; Skees *et al,* 2006). However, it is a vital tool in providing *ex ante* protection from natural hazards, which helps reduce vulnerability to disasters. Basis Risk limits the effectiveness of index insurance, as there is often a disconnect between the data available and the losses experienced, which damages trust networks between the insurer and policyholder (Bauchet, 2013). In addition, Johnson (2013: pp.2667) claims the individual must accept 'some degree of basis risk' for index insurance to be structurally dependent, which shifts the burden from institutions to individuals (Skees, 2008). While climate change is a product of developed countries' consumption patterns (Hulme, 2009), individuals in developing countries are continually expected to bear the ownership of climate risk and this is deepening inequalities and furthering climate injustice (Reeves, 2016). Moreover, almost all the current established projects fall under the remit of Macro-Level index insurance, where governments and institutions are in control of administering payouts and implementing the design and technical output of the insurance product (Reeves, 2016; Collier *et*

*al*, 2009). Transparency and accountability at the Macro-Level continues to pose problems for established projects across the developing world (Reeves, 2016; Cai *et al,* 2009).

Whalley (2016) suggests that for index insurance to work for the most vulnerable communities, the insurance industry needs to be committed to a transition from a profit-driven agenda to a needs-based agenda (see also. Jansen *et al*, 2011). Furthermore, insurance needs to work alongside additional services such as educating communities to enhance disaster preparedness; building flood defences; improving waste management; community policing; and water sanitation (Baker, 2012; Muindi *et al,* 2016). Index insurance needs to use a combination of capacity building and raising awareness to build insurance-friendly populations and minimize risk for subsequent natural hazards (Surminski, 2013; Reeves, 2016). Climate change is a wicked issue; the stakes are high and decisions are urgent, which means insurers and international development agencies have added pressure to make index insurance work for the poorest and most vulnerable in society. Linnerooth-Bayer and Mechler (2008) put forward the idea of four models for the provision of microinsurance: Full Service Model; Provider Model; *Community-based model;* and Partner-agent model. Community-based, member-owned initiatives are well served to implement IBMI and this paper seeks to fill a gap in the literature for the provision of mutual microinsurance for low-middle income urban populations. However, there is no 'one-size-fits-all solution'. Instead, localized risk assessments are needed to determine the local needs and conditions that enable effective index insurance schemes (UNU-EHS, 2017).

### *2.5 Mutual Microinsurance*

The community-based model falls under the umbrella of mutual microinsurance. The insurance industry, overall, comes under criticism for not being inclusive and prioritising profits over a needs-based agenda, which can be detrimental for insurance coverage in developing countries (Whalley, 2016). Mutual microinsurance, however, is a bottom-up approach indicative of a values and needs-driven agenda, which can deliver a valuable platform for alleviating poverty and enabling, educating and empowering local communities (ICMIF, 2015; Swiss Re, 2016). Policy development in Kenya, on the other hand, is a top-down approach, where disaster management tends to be reactive and ad-hoc rather than embedded within development efforts (Pelling *et al*, 2008). In mutual microinsurance the agent and the policyholder are stakeholders, meaning that development can be controlled by the community, rather than implemented by

institutions of governance (Reinhard, 2006). This helps address climate injustice and can initiate the process of adaptation to transformation (Pelling, 2010) needed to build resilience in the most vulnerable communities. Reeves (2016) suggests that local member-owned groups, backstopped by equitably financed global social protection, can provide the necessary platform to deliver mutual microinsurance. However, considering community-based initiatives as a 'panacea' to DRM and CCA problems is not suitable (Allen, 2006: pp.82), as they need to cooperate with systems of governance to operate effectively (Wisner *et al,* 2004; Cannon, 2015).

Recently highlighted on the B20 agenda (ICMIF, 2016), mutual microinsurance is expanding access to financial opportunities for marginalised communities and contributing towards the SDGs (Swiss Re, 2016). ILO (2009) states that "63% of Kenyans derive their livelihoods directly/indirectly from cooperative based activities", which suggests they are well placed to enhance social cohesion and thus better protect collective assets (Kuria, 2011). Women are amongst the most marginalised across the developing world (Demetriades & Esplen, 2008; Wisner *et al*, 2004; Doig & Ware, 2016) and improving their access to financial opportunities is embedded within the ideology of mutual microinsurance (ICMIF, 2016). For instance, Uplift Mutuals in India was originally formed by women self-help groups and now covers over 200,000 lives through a community-based model, where people come together to share, own and manage risks (Uplift, *n.d.*; see also CARD MBA, *n.d*; Development Initiatives, 2017). Key Performance Indicators (KPIs) for ICMIF's 5-5-5[2] strategy place an emphasis on the proportion of women insured (ICMIF, *n.d.*). Additionally, greater insurance literacy needs to cooperate with development efforts in education across developing countries and this is being addressed in both the 5-5-5 strategy and the G7 Insuresilience project (Surminski, 2013; MCII, 2015). Despite the apparent success of established health and life mutual microinsurance schemes for urban populations in India, Kenya and the Philippines (Matul *et al*, 2011), there is limited evidence for the use of index triggers in the event of natural hazards. Thereafter, I aim to fill a gap in the literature for the provision of mutual index insurance in developing countries.

### *2.6 Social Capital and Trust*

[2] ICMIF's 5-5-5 Strategy aims to develop mutual microinsurance in five countries, reaching out to 5 million uninsured low-income households, (equating to 25 million individuals in total) through a three-phased approach: diagnostic research phase, an evidence-based strategy phase and a country intervention programme, which sees the strategy put into place.

Risk is accumulated and perceived differently across different social and cultural groups (Bull-Kamanga *et al*, 2003; Cannon, 2015; Moser & Satterthwaite 2010; Moser & Felton 2007), which is challenging for highlighting the relevance of insurance for DRM. Understanding the capacities and vulnerabilities embedded within communities is central to building flood resilience (ZFRP, 2017). Social capital and trust are fundamental to the success of the community-based model (Blackburn, 2014; Cannon, 2008; Mladovsky & Mossialos, 2008). Both contribute to the accessibility, availability and inclusiveness of insurance at the local-level. Drawing from relevant academic literature, this research considers the role of social capital and trust as an analytical framework for studying the interactions between the community and institutions for managing flood risk. To answer theoretical questions using empirical qualitative data, theory must be drawn upon to inform data collection and analysis. Social capital refers to the networks, norms, values and trust underpinning human and physical capital in communities. Social capital has been used to increase collective productivity by improving trustworthiness and social relations across the community (Putnam, 1993).

Building on Woolcock's (1998; 2001; and Narayan, 2006) social capital framework used in Mladovsky and Mossialos (2008) conceptual framework for community-based health insurance in low-income communities, this paper will explore the values, community goals and local power relations determining the success of CBII. Woolcock's framework looks at two types of social capital at the micro-level: (i) relations within communities such as information channels, trustworthiness and social support; and (ii) relations across communities such as social inequalities in class, ethnicity and gender (Mladovsky & Mossialos, 2008; Woolcock, 1998, 2001; Woolcock & Narayan, 2006). Focussing on these two factors will provide an insight into the importance of social capital for local-level DRM and consequently provide a platform for analyzing the feasibility of IBMI. Woolcock and Narayan (2006: pp.9, see Figure 4.) claim that social capital is high in both these factors where microfinance programs have been successful. This diagram reinforces the strength of community ties in improving microinsurance and thus provides a relevant theoretical framework for the study of community-based microinsurance for extreme weather events in Nairobi.

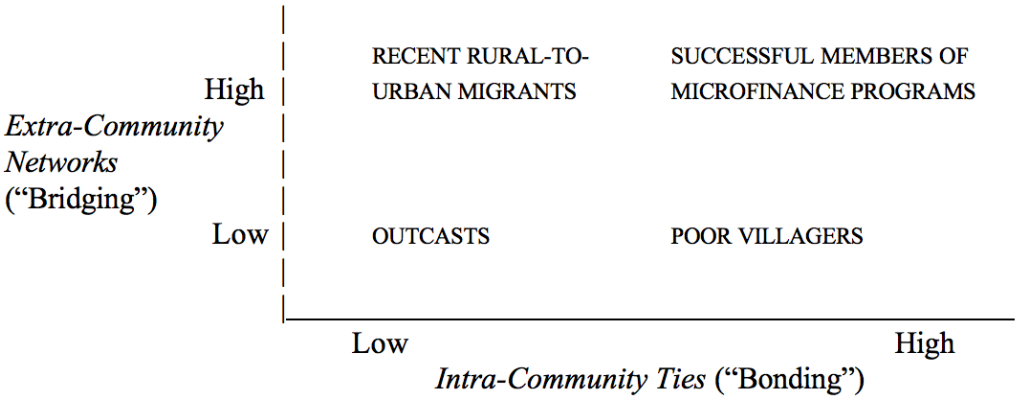


**Figure 4.** shows Woolcock & Narayan's (2006) 'Dimensions of Social Capital at the Community Level' and identifies the link between high social capital and successful microfinance

Additionally, Wisner *et al* (2004) 'Access Model' will provide a platform for analyzing the social factors restricting access to social protection from hazards and limiting urban resilience. Satterthwaite (2011) advocates the use of community-based organisations to directly challenge the power structures that predominantly determine access to key resources. Baker (2012: pp.53) claims that communities are more resilient where social networks are stronger, which means accessibility to social networks determines adaptive capacity to disaster risk for the urban poor. Access to social capital, thereafter, facilitates cooperation and participation to community-based initiatives (Putnam, 1993, 1995) and trust within the community is a byproduct of social limitations (Bouma *et al*, 2008). While some (Basaza, 2008; Troy *et al*, 2008) label organizational and institutional failures as key to the low enrolment of community-based DRM, trust remains an underlying problem (Whalley, 2016; Carrin *et al*, 2005; Cai *et al*, 2009; Bouma *et al*, 2008; Zhang *et al*, 2006). Poor trust-building with institutions leads to a reliance on informal trust-building within communities for risk sharing (Morsink & Guerts, 2011). Trust lies at the heart of the insurance process (Greatrex *et al,* 2015) and organisations need to realise this to effectively reach their aims of expanding coverage to the most vulnerable communities.

While basis risk and transparency hinder the process of index insurance and damage trust (Whalley, 2016; Skees, 2008; Reeves, 2016; Johnson, 2013; Bauchet, 2013; Cole *et al*, 2012), they are also institutional problems and can be addressed by holding insurance companies to account. Trust between individuals and social groups in the community is embedded within

social inequalities and directly hinders the impact of CBII (Cai *et al*, 2009, Kassahun, 2015). Increased cooperation and inclusiveness go hand in hand, but where there is a lack of trust within the community there is also a lack of cooperation (Bouma *et al*, 2008). If the intersectionality of DRR and development is to be embellished, social dimensions of cooperation and mutuality need to be explored in greater detail (Cannon & Müller-Mahn, 2010; Schipper & Pelling, 2011). Discovering the key characteristics currently diminishing social capital across urban slums in Nairobi will be necessary for analyzing the feasibility of an IBMI project.

Muindi *et al* (2016) considers the role of crime and conflict in contributing to poor DRM in Nairobi. Many households do not feel safe leaving their homes in fear of having their possessions stolen and this heightens their exposure and vulnerability to natural hazards. Insurance companies including CIC offer additional services such as community policing, which is set up and run for the benefit of the community to prevent petty crime and help minimize risk (CIC, *n.d.*). This denotes that while insurance can provide an important financial safety net for people to fall back on, it is simply a tool in the broader arsenal of DRM and integrating these multi-faceted components collaboratively is essential. Additionally, everyday life issues embedded within urban livelihoods might prove more threatening than natural hazard risk (Pelling & Wisner, 2012), which makes ownership of insurance more difficult to encourage.

Power relations within communities often determine who makes decisions and this can have severe repercussions for those with limited access to social capital (Blackburn, 2014; Cannon, 2008). With gender at the heart of inequalities in power, equitable representation must be realized to create an enabling environment for community-based initiatives (Wilkinson & Pickett, 2009). Cultural and social factors here are intrinsically linked and must be considered collectively to better include all members of the community in the decision-making process (Van Aalst *et al*, 2008; Cannon, 2008; Doig & Ware, 2016). To effectively undermine ineffectual courses of governance and decentralize power back to the community, local participation must understand the potential for capacity building for integrating all members of society (Blackburn, 2014; Mansuri & Rao, 2012). Capacity building is fundamental for engaging people and creating the demand for insurance, which is one of the key challenges for scaling up insurance coverage (Greatrex *et al*, 2015; Miranda & Farrin, 2012). Delegating power and governance back to the community will be central to the success of index insurance initiatives (Miranda & Farrin, 2012).

# 3. Methodology

### *3.1 Overview*

Nairobi was identified for this study because rapid urbanization and the impacts of climate change are collectively amplifying vulnerability for communities across urban slums (KDI, 2015). The Urban ARK project is a research and capacity building programme led by Professor Mark Pelling at King's College London. The project's main objective is "to reduce disaster risk in urban sub-Saharan Africa by breaking cycles of risk accumulation" (Urban ARK, *n.d.*). My research will look to add to the research and policy publications for risk management in the Urban ARK project. Secondary data and 29 semi-structured interviews, with a combination of key informants and participants, will make up my research methods. With the diversity of participants for my primary research, I feel that an exploratory framework for analysis can be derived and broken down to establish the role of IBMI in Nairobi.

### *3.2 Semi-Structured Interviews*

For my primary research, I conducted 29 semi-structured interviews aimed at gauging perceptions on the provision of IBMI and the challenges it may face in implementation. Qualitative interviews offer a flexible alternative to the structured and rigid nature of quantitative interviews. Although a semi-structured format may not offer more reliability and validity than a structured interview, the interviews are looking to gain a greater understanding of the respondent's point of view (Bryman, 2001). With a more relaxed interview process the participant tends to become more comfortable, which allows for more elaborate responses and helps the researcher better interpret the thoughts and feelings of the respondent. Perceptions of the interviewee are shaped by their values, beliefs, behavior, relationships, places and emotions, amongst other variables. This is symbolic of social research methods overall and the interpretive nature of these semi-structured interviews will play a large role in my findings and conclusions (Longhurst, 2003). All interviews were recorded and transcribed, where they have been used appropriately to reinforce the aims of my research. I spent just under a month in Nairobi and conducted 29 (17 participants and 12 key informants) interviews in total. This isn't a huge amount within the field of social research (Baker & Edward, 2012), but under the time and funding constraints for a master's dissertation it was both realistic and sufficient.

### *3.3 Positionality*

It is critical to remain objective throughout the process of qualitative research. The participant's perceptions can often be influenced by the epistemological standpoint of the researcher (Cloke *et al*, 2004). Therefore, striking a balance between respondent detail and interviewer questioning is critical in reducing positional bias and increasing the credibility of the interview process. My professional background in mutual and cooperative insurance has shaped my position on the topic and should be acknowledged hereafter. Baxter & Eyles (1997), however, claim that the positionality of the researcher is a strength of qualitative research, as it allows for reflexivity.

### *3.4 Sampling Method*

For my sampling method, I used a three-part process:

*(i) Geographical*

Alongside CIC Group, I identified areas that have previously been affected by floods. Three of these areas, contributing to thirteen participants, were in the Southern and Eastern parts of the city: South C, Iradiama and Kitengelo. I also interviewed four members of the Nakomatt Ukay Shopping Centre community in the Northern part of the city. This area was significantly affected by flooding in April 2016 (see Figure 5), because it is built in close proximity to a large river.

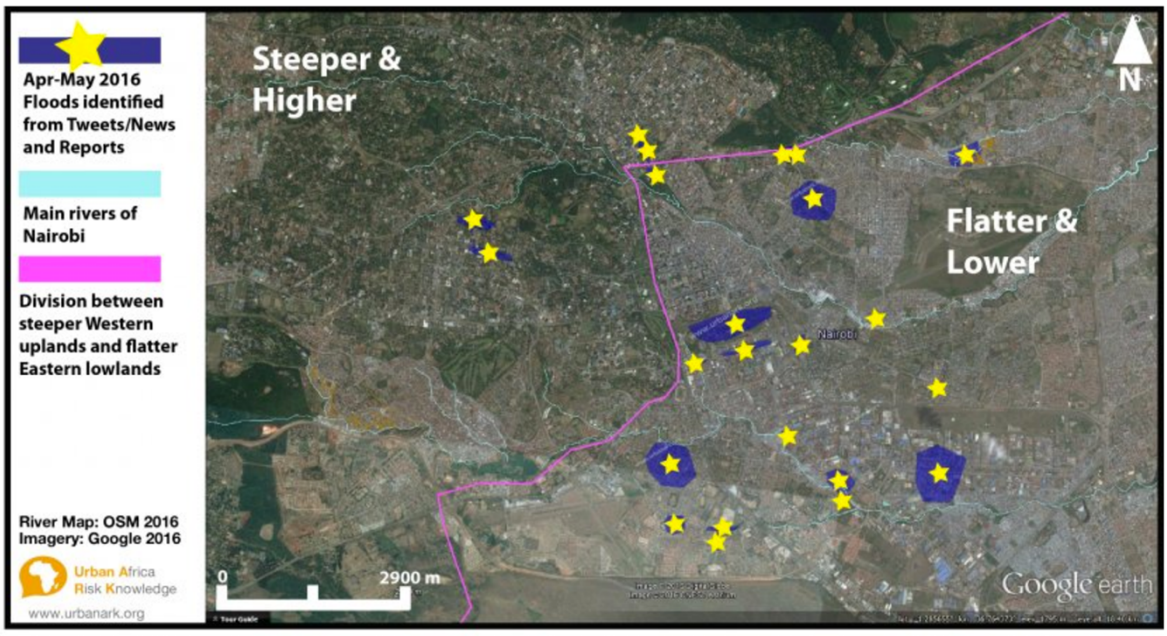


**Figure 5.** showing vulnerability of Eastern lowlands in Nairobi for flooding (Taylor, 2016)

*(ii) Demographic*

For the necessity of narrowing down the prospective participants, I identified low-middle income populations in urban settlements as the most appropriate sample. This gave me a more accurate sampling method for selecting interview participants and created a more clear and coherent research objective. By looking at low-middle income, this minimizes risk and decreases the number of population needing aid after a disaster. Low-middle income people tend to live on the precipice of extreme poverty and their livelihoods are greatly exposed by climate risk. Therefore, small business owners and employees were interviewed to gain an insight into their perceptions of flood risk and their traditional coping strategies in the event of natural hazards.

*(iii) Accessibility*

Whilst a plethora of community-based organisations could be considered to help conduct my interviews, CIC Group were immediately interested by the potential use of urban index insurance. In addition to their work with rural index insurance for smallholder farmers, they also provide community-based health and life insurance across Nairobi. Further to this, they are involved in community engagement projects to educate, empower and enable communities to improve DRM and development. By mobilizing existing community networks from CIC Group engagement strategies, I could speak to small business owners and workers to better understand their needs and concerns around flood risk.

The interviewees were split into two sampling groups: Participants and key informants:

*(a) Participants*

Participants make up the bulk of the interviews and predominantly consist of small business owners and workers from four flood-prone communities in Nairobi. The questions used aimed to interpret prioritizations of risk and barriers to accessing financial risk transfer mechanisms such as affordability, accessibility and social mobility. Moreover, interpretations of how residents of each community interact with environmental risks such as flooding and drought. The questions also explored how social capital in slum areas influences the fostering of trust between groups of people and institutions. Participation is high where social capital and trust is high (Mladovsky & Mossialos, 2008; Woolcock, 1998, 2001; Woolcock & Narayan, 2006; Baker, 2012; Kassahun, 2015), which increases the effectiveness and longevity of community-based

insurance. The analytical framework around which social capital and trust will be explored is derived from the outcome of these interviews.

*(b) Key informants*

Key informants were made up of the potential stakeholders of an IBMI scheme such as insurers (CIC Group), microinsurance consultancies (AB Consultants) and NGOs (SDI, KDI and World Vision). I applied a 'snowball' sampling method using interpersonal relations and connections from Urban ARK, ICMIF, and CIC Group to build a broader and diverse sample of informants (Browne, 2005). The questions used for key informants centered around the potential for an IBMI product in Urban Nairobi. By using the informant's expertise in individual areas, I could gain an insight into the challenges and limitations for index insurance.

### *3.5 Secondary Data*

To answer theoretical questions using empirical qualitative data, I must use theory to inform data collection and analysis (Miles *et al,* 2014). Therefore, secondary data is a necessary tool to build a conceptual framework for analysis. The concept of index-based or parametric insurance is a relatively new alternative risk transfer mechanism. Therefore, much of the data used will be intrinsically grey data rather than peer-reviewed. One key aim for this dissertation is to build a comparative conceptual framework around which the provision of mutual index-based insurance schemes in developing countries will be explored in relation to alternative risk transfer strategies. To construct this framework, a multitude of grey data will be analysed from readily available journals, web pages and publications from organisations such as Swiss Re, Munich Re, ICMIF, Microinsurance Network, World Bank, Oxfam and other non-peer-reviewed journals. I will reinterpret and combine secondary data and breakdown concepts to critically analyse each process involved in the provision of index insurance. Therefore, a conceptual framework will be evident throughout my hypothesis. There is no directly relevant framework to present the results of this thesis, so I will combine the qualitative data collected through my semi-structured interviews with the multitude of secondary data obtained during the research phase of this paper. Here, I can form an analytical framework around which I will be able to form my thesis.

Radermacher & Roth's (2014) theory was applied as a template to measure absolute and total impact of microinsurance schemes. Measuring the impact of one microinsurance scheme in a

developing country does not necessarily represent the absolute impact of microinsurance in developing countries. However, it can give a broader indication of how it can be used as risk protection for the poor (Radermacher & Roth, 2014). Therefore, I will be able to assess the relevant impact through comparative information such as established case studies. Here, I will use the success of established case studies such as Oxfam's Meso-Level Flood Insurance in Bangladesh and Uplift Mutual's community-based health insurance in India to build an analysis for comparison. Skees *et al* (2006) feasibility study was also applied to measure the multi-layered nature of index insurance schemes and determine what characteristics are needed before a pilot project is launched. Most feasibility studies employ the static von-Neumann-Morgenstern expected utility framework (Gollier, 2003), but exploring the demand for index insurance for urban livelihoods is very different to the needs of rural livelihoods (Miranda & Farrin, 2012) and "a thorough feasibility study should determine if index insurance would be appropriate, beneficial and economical" (Skees *et al,* 2006: pp.39). Thereafter, I will fill the gap in the literature between the necessity for social protection from flood risk and the benefits of IBMI for urban livelihoods.

### *3.6 Challenges*

As with most studies, there were challenges that emerged whilst conducting field research. However, it is important to note that these obstacles did not compromise the overall aims of the project. First, when approaching people informally for interviews, women were much less inclined to participate than men, which symbolizes the cultural issues embedded within Kenyan society (World Bank, 2010; Development Initiatives, 2017). In addition, small business owners and employees were not willing to give too much time to talk, which meant that the interviews were slightly shorter than the desired 30 minutes I was aiming for. Second, more than half of the interviews were conducted in Swahili and therefore a translator was needed. The translator was not always able to translate everything word-for-word, as we both allowed the respondent time to elaborate and express their views. This meant that when transcribing the interviews, I was only able to provide a summary of answers rather than direct word-for-word translations. Therefore, the language barrier and the participants' willingness to elaborate in depth made it more challenging to gauge perceptions and understanding around their experiences of flooding. Finally, communicating micro-level insurance was very difficult due to preconceptions surrounding insurance. Currently there are very few low-premium microinsurance products in

Kenya, as there is little application from insurers in this area. Subsequently, perceptions of risk and trust played a larger role when analysing the primary data than perceptions of microinsurance.

## 4. Results and Discussion

### *4.1 Introduction*

The purpose of this study was to explore the demand for and feasibility of IBMI in Nairobi for flood risk, whilst also considering the potential limitations from a community perspective. The first three chapters of this dissertation considered the statement of the problem with a review of the literature and an overview of the methodological design. This chapter will present the findings from the qualitative data collected and provide an analysis and discussion using the analytical framework constructed for this study. After interviewing a total of 17 small business owners and workers across four different flood-prone regions in Nairobi, it became extremely clear that many urban livelihoods are affected by floods. Furthermore, there appears to be an increasing urgency to better protect individuals and communities from the perils of flooding. Similarly, the 12 key informants interviewed recognised the role of IBMI for addressing these challenges. Barriers to accessing insurance however, included trust, awareness, affordability and accessibility. Thereafter, the findings for my research have been split into three themes: Trust, Capacity Building and Technical Input.

First, Kenyan culture is inherently communal, which means individuals share all aspects of risk collectively through informal community savings. Informal social networks of trust appear to undermine formal institutional trust-building and this poses a great challenge for insurance penetration in Kenya. However, mutual microinsurance in its purest form can trace its origins back to these very informal social groups, suggesting that an enabling environment for mutuality can be evident in Nairobi.

Second, embedded within the framework of trust, most respondents showed a lack of knowledge or awareness of any insurance or DRM mechanisms to protect themselves *before* an extreme weather event. The impact of flooding has a severe knock-on effect for many urban

livelihoods and most communities' capacity to cope with this is limited. Thus, disaster preparedness is poor, particularly across informal settlements, where everyday life issues such as health, cost of living and access to education are more pressing than natural hazards meaning that actions are only taken *post-hoc* rather than *ex ante*. The challenge for scaling up insurance coverage is centred around capacity building, with most respondents interested in the benefits of insurance but lacking the appropriate assistance, guidance and information needed to act on interest. This research found that stakeholders will need to work together to develop capacity, build trust and educate communities to minimise risk and improve DRM and development.

Third, poor drainage and unsafe housing were highlighted as the main components of flood risk in Nairobi, suggesting that more needs to be done from a city-level perspective to improve infrastructure and increase flood resilience. These factors must be addressed first before index insurance for flood risk can be explored further. Additionally, through insight from key informants, this research gained an understanding of the technical input required for potential stakeholders to consider participating in pilot schemes such as financial assistance, technology, expertise and evidence-based research. Furthermore, highlighting the potential for innovative technology to transform the distribution and design of microinsurance will be central to mitigating issues of trust and enabling economic empowerment.

## 4.2 Trust

### *4.2.1 Communal Culture and Practices*

Kenyan's are fundamentally communal in nature. This can predominantly be attributed to their emphasis around culture and religion, which underpins their beliefs and attitudes towards a cooperative and communal society. In both their working lives and at home, people tend to share risks collectively rather than individually and have been applying these communal practices for many years (Kuria, 2011; KAIG, 2016; World Bank, 2010). Additionally, there is an emphasis on family support in Kenya, which means families are very close-knit. It is common for elder siblings to pay for education and health bills for the youngest siblings in the family, whilst also caring for his/her individual family. Thus, sharing wealth to improve the life of loved ones does not become a burden, it is more of a privilege and this stewardship extends to people's social networks hereafter.

Whilst most urban populations, particularly across the developed world, tend to come under scrutiny for favouring individualistic lifestyles and attitudes (Hamamura, 2012), this study found that low-income populations in Nairobi were innately social and shared the burdens of risk between themselves. 76% of the respondents took part in some form of informal risk sharing across their social network. Social capital, henceforth, plays an important role within vulnerable communities in Nairobi, which supports the initial empirical evidence stated in previous chapters of this paper. Research suggests that communities are more resilient where social networks are stronger (Baker, 2012) and this study reinforces that notion. Individuals with strong social ties who shared risk collectively tended to display better adaptive capacity to disasters than those who managed risks individually.

Membership of social groups, commonly known as *'Chama's'* (Kiswahili for 'group') in Kenya, for savings leads to a communal ownership of risk, where members pool risk to better prepare for and tackle the challenges that life throws at them. These *Chama's* are informal cooperatives set up between large families and groups of friends or by people with similar interests or livelihoods. Corresponding with Woolcock and Narayan's (2006) social capital framework, community ties are high where people are members of micro-savings programs. *Chama's* are a great platform for informal trust-building, particularly amongst women, and currently have over 12 million members in Kenya (33% of the population). This exemplifies the trustworthiness people have across their social networks (StartUpAcademy, 2014). The introduction of MPESA (mobile money transfer and banking) in Kenya has further increased the availability and inclusivity of *Chama's*, which is symptomatic of the transformative technology that will be explored in more detail later in this chapter (see section 4.4.3). Although *Chama's* are predominantly used for covering accidents, poor health and loss of life within the group, there is scope to enhance flood risk management through existing informal risk sharing with greater capacity building needed to help achieve this (see section 4.3).

Most *Chama's* collectively save through MFIs and are used for investment purposes, but some also adopt a strategy called 'risk', which is simply where a proportion of the money paid in is set aside to help cope with all facets of risk the members face throughout the year. This is a perfect example of informal insurance where individuals can perceive risks differently, often leading to

participation in riskier ventures with their businesses knowing that they have protection from financial risk. This change of mind-set in its purest form is transformative and facilitates economic empowerment across vulnerable communities in Kenya. Symbiotic with the SDGs, these community risk sharing and investment platforms are helping to bridge the gap from poverty to prosperity needed to improve urban livelihoods in Nairobi.

### *4.2.2 Informal and Formal Trust-Building*

Insurance penetration and microinsurance coverage in Kenya is very low, at 2.9% and 5.98% respectively (Swiss Re, 2017). A practice perceived by many as something exclusively confined to the wealthiest elite, it is unsurprising that insurance coverage is not widespread throughout Kenya. Insurance companies, therefore, only represent a small proportion of the population and people at the bottom of the socio-economic pyramid (BOP) are overlooked. Perceptions of insurance companies and insurance in general has caused an increase in the uptake of informal risk transfer. This study found that demand for microinsurance in Kenya is intrinsically linked to poor formal trust-building with institutions. Consequently, many low-income communities turn to the informal market, where social capital and trust is stronger. 65% of the respondents presented a lack of trust towards insurance companies and formal institutions alike. Issues including dishonesty, lack of transparency, affordability and accessibility were stressed as key factors affecting the process of formal trust-building. Claims settling was amongst the major reasons why mistrust was present in the process of insurance, highlighting the potential transformative role of index insurance for reversing these negative perceptions. Trust, therefore, is highlighted as the biggest challenge facing the scale-up of insurance coverage in the developing world and addressing this issue is crucial to the objectives of the G7 Insuresilience initiative and similar international projects aiming to reduce the protection gap.

> *"Unlike a loan, insurance is a promise for a payment later for a premium paid now and as such, trust is inherently at the core of the process"* (Greatrex et al 2015: p.24)

Trust is the predominant factor causing the exponential rise of informal risk sharing, as most respondents had difficulties trusting institutions such as banks and insurance companies. These trust issues are largely caused by past experiences or preconceptions, but also shaped by their peers with identity and status playing a dominant role in changing behaviours and attitudes in

the community. Trust within the community (informal trust) is consequently notably stronger than institutional trust (formal trust) and this can serve as an explanation as to why insurance take-up is so low in Kenya. Morsink and Geurts (2011) also highlight comparable themes in their work on microinsurance and trust-building, where demand for microinsurance is primarily embedded within the framework of formal trust-building. Thus, mobilising the success of informal trust-building should be an area of focus for microinsurance providers (Bauchet, 2013). On the other hand, it could be said that the informal economic market in Kenya is outpacing the formal and proponents of informality might seek to keep the two separated. However, the scope for scaling up informal risk transfer is limited due to lack of resources, financial assets and regulatory requirements. Many informal cooperatives transition over time into large formal cooperatives, with some key informants pointing to successes in central Kenya for these wide-scale transitions.

Recognising this, the formal insurance market needs to pursue lines of cooperation with existing social groups to better understand their needs and provide products focussed entirely around these groups. The culture of communal living means social networks are a perfect example of how people share risks financially and mobilising these groups to participate in formal lines of risk protection is a key area to explore. CIC Group, for instance, are currently distributing microinsurance through aggregators such as affinity groups and self-help groups. Creating demand for microinsurance remains a challenge though and partnering with organisations such as NGOs who have already built trust in the community should be a focal point throughout the consultation process of designing IBMI (see section 4.4.2).

### *4.2.3 Enabling Environment for Mutual Microinsurance*

Mutual insurance can trace its roots back to friendly societies and cooperatives in the late 17$^{th}$ Century, where risk pooling formed between workers and likeminded individuals in the absence of mainstream insurance solutions (Swiss Re, 2016: p.2). Similarly, the current 21$^{st}$ Century informal savings practices in Kenya borne out of impractical, inaccessible and unaffordable insurance solutions, provide an indication of mutuality at its roots. Failures in the mainstream market contribute to a rise in the uptake of mutuality, with the recent economic recession revealing the reflexivity of mutual insurance (Swiss Re, 2016). Gonzalez-Pelaez & von Dahlen (2015) refer to three sectors in their review on insurance regulation for sustainable

development: Public, Private and *Mutual*. Separating mutual insurance from the private sector is indicative of the detachment mutuality instils at its core through its member-owned rather than shareholder driven agenda. Reflecting this bottom-up approach to insurance, recent attention has been drawn to the mutual sector for advancing the SDGs through more inclusive insurance solutions (ICMIF, 2016). With trust rooted at the core of insurance, this study found that mutual microinsurance is well placed to meet the needs of the most vulnerable communities across Nairobi.

As seen in India with the case study of Uplift Mutuals (Section 2.5), informal savings groups and self-help groups provide an enabling environment for mutual microinsurance to operate.
The origins of mutuality are firmly embedded in informal communal practices and mobilising these existing community networks of trust are needed to facilitate the provision of mutual microinsurance. Drawing on empirical evidence from existing developing world case studies and insights from respondents in Nairobi, this study unearthed clear comparisons between the success of mutual microinsurance and high levels of social capital within community networks. In addition, communities' willingness to save and put aside household income to help each other is indicative of their cooperative nature and forms the basis for mutual entities. However, access to social networks may determine the inclusivity and accessibility of microinsurance, which could have a detrimental effect to its overall effectiveness and total impact.

Mutual microinsurance can enable the transformation from a profit-driven to needs-based agenda, which is necessary to bridge the gap between informal and formal trust-building. Thus, increasing protection from the accelerating rate of natural hazards in the developing world. Tailoring community-based products to address the impacts of flooding will provide both protection from climate-related risks and facilitate economic empowerment through community cohesion. Subsequently, this will noticeably contribute to achieving the goals of sustainable development, DRR and CCA, whilst also providing another indicator of the fundamental interconnectivity between the three fields. Improving financial inclusion and closing the protection gap are targets transcending all three major international agreements from 2015. IBMI, through the lens of a mutual model, can become a central tool in attempting to achieve these collective goals.

## 4.3 Capacity Building

### *4.3.1 Community Perception and Awareness*

Risks for urban livelihoods are omnipresent in Nairobi. Challenges directly related to flooding such as water contamination, disease and loss of income are a reminder of the multi-faceted nature of flood risk and the broad spectrum of issues that need to be addressed to better enhance flood risk management. Coping with the impact of natural hazards is particularly challenging for small business owners and workers across Nairobi. This study found that drastic livelihood cuts were apparent in the face of these challenges, with knock on effects such as food rationing, withdrawal from education and poor access to healthcare placing families under severe financial and psychological stress. Cultural and social dynamics in communities such as religion, gender and peer pressure shape the way individuals perceive and transfer risk across the community. Concurrently, behaviours and attitudes determine the adaptive capacity and preparedness of communities to cope with the catastrophic impacts of flooding. Although insurance is not a panacea for DRM or reducing poverty, it is a transformative tool if used effectively and its benefits should be communicated to improve DRM for flood risk (Abu-Bakar *et al*, 2017).

One common theme across all key informants and respondents was the lack of awareness or knowledge of insurance for protecting individuals against natural hazards. When queried over their understanding of insurance, 88% of the respondents displayed basic knowledge on health and motor products but not natural hazards. This portrays the glaring educational challenges facing the potential uptake of IBMI in Nairobi, but does not demonstrate a lack of demand. Proponents of index insurance (Whalley, 2016; Hellmeuth *et al,* 2009; Barrett *et al*, 2007; Warner *et al,* 2009; Lashley & Warner, 2015; UNFCCC, *n.d*.) indicate its transformative nature for rural livelihoods and this study discovered its equivalent potential for urban livelihoods. Similar indications of demand for IBMI were clearly apparent from understanding peoples' concerns around flood risk. Index insurance can ostensibly be tailored to meet the risk management needs of urban livelihoods. Therefore, more exploration into its application should be considered by insurance companies and DRM agencies alike.

Whilst there are few readily available products tailored to urban livelihoods for protection from climate-risk, there is also a lack of education across communities on risk perception and preparedness to help minimize climate-risks. The insurance industry as well as NGOs, regulators and government institutions have a duty to place specific focus on education building for vulnerable communities. Increasing understanding on insurance and future IBMI products before the distribution process will help decrease basis risk and remove elements of mistrust from the claims process. Capacity for scaling up microinsurance coverage in the developing world is inherently limited by awareness. Creating demand and building trust requires greater focus on education building. This can be done through inspiring young, passionate leaders to address these challenges of awareness from within the community and eventually take ownership of IBMI in the long-term. Where many developing world index insurance projects have failed is longevity (Greatrex *et al*, 2015; Abu-Bakar *et al*, 2017). To enable self-sustaining IBMI and reduce reliance on donors, capacity development must be entrenched within the initial strategy and design process of pilot projects. This requires cooperation between public, private and mutual stakeholders to ensure an integrated and effective approach for designing, delivering and maintaining IBMI.

### *4.3.2 Affordability and Accessibility*

Affordability of microinsurance is directly linked to awareness. Many insurance companies in Kenya don't explore the practice of microinsurance because the costs associated with distribution and marketing are too high and not cost-effective. Representatives from CIC Group stated these initial costs as the biggest challenge for spreading microinsurance coverage across the country. Micro-products are informally referred to as CSR within large insurance organisations, with their benefits not congruent with their profit-making aims. Premiums from microinsurance generate small income and it often takes several years to strike a balance between profit and loss. Whilst an approach disparate from the current profit-driven agenda is considered throughout this study, it is difficult to see how companies in developing countries can prioritise this. Sacrificing the current approach requires technical and financial assistance from equitable international organisations who are passionate and driven by the desire to actively transform peoples' lives through evidence-based solutions (Reeves, 2016; Greatrex *et al*, 2015). The challenge of microinsurance is not simply confined to its high initial costs of production, but instead the lack of vision from insurance companies and development agencies

to place a primary focus on innovating micro-products to make them more accessible and more affordable. Only through cross-organisational cooperation and in-depth qualitative and quantitative field research can strategies begin to develop for providing the most effective products.

Macro-level projects tend to overlook this capacity building phase in favour of maximising coverage over the short-term (Reeves, 2016; Collier *et al,* 2009). Consequently, the benefits and caveats of possessing insurance are not communicated, meaning that communities' behaviours and attitudes towards risk continue to heighten their vulnerability to disasters. While this might be the right approach in some developing countries, it does increase reliance on aid and might divert attention away from more relevant DRM strategies. Therefore, macro-level projects have their role to play, but they fail somewhat in their attempts to work alongside sustainable development in favour of providing quick fixes to problems that are deeply entrenched within the socio-economic and cultural dynamics of communities. Micro-level insight is required to better understand these complexities and learning from existing community networks is a pertinent approach herein.

Ultimately, this study found that capacity and education building before the distribution of microinsurance is inherently associated with success of scaling up coverage and providing long-term solutions to disaster risk. Most respondents felt out of touch with current micro-products on the market, with many favouring informal solutions to risk rather than formal. Affordability remains a key challenge for insurance companies, with AB consultants and CIC Group informants labelling regulatory requirements as a major stumbling block to pricing affordable micro-products. AB Consultants suggest that there appears to be a glaring disparity between what microinsurance should be priced at and what the actuaries are pricing it at. Consequently, many respondents felt insurance was neither accessible nor practical for a large majority of the population. Organisational perception of risk differs somewhat from cultural risk perception across communities and there needs to be drastic changes in mind-set from the insurance industry to facilitate this widening perception gap. Microinsurance is still an emerging market and needs to be viewed pragmatically henceforth. The commercialisation of risk from a microinsurance perspective needs to radically transform to meet the needs of the most vulnerable communities. Therefore, regulators must play a major role in providing an enabling

environment for new innovative technologies (Section 4.4.3) and approaches to enhance the distribution of microinsurance and reduce marketing costs.

### *4.3.3 Building an Insurable Population*

To reach the G7 InsuResilience target of 400 million people insured from climate-related risks by 2020, it is becoming relatively clear that there needs to be greater awareness of index insurance from a community-level perspective. The key challenge for scaling up insurance coverage is exactly this. Providing coverage for the masses in the fastest way possible is relatively easy with advances in technological distribution systems (Section 4.4.3) and increasing donor interest. However, providing sustainable coverage with the capability of empowering communities economically and socially should be the long-term aim. This cannot be done in a matter of weeks or months. This must be a process which first and foremost considers the needs of the community to enable the most appropriate product design, before propelling imprudent insurance schemes onto individuals with little or no knowledge of the deeper social and cultural complexities embedded within societies. It is vital that we learn from existing community resilience efforts and build on what they are already doing to better design and distribute index insurance in developing countries and ensure that the needs of the people affected are met.

Key research for facilitating IBMI needs to be studied further such as why insurance is failing vulnerable communities, what characteristics need to be in place to make insurance work (infrastructure, education, health) and should there be additional products to work alongside climate risk such as health and life insurance. Long-term projects to develop insurance friendly populations will significantly help reduce risk accumulation. Additionally, communities should be central to the governance and decision-making process to bridge the gap of institutional trust that is limiting microinsurance. However, the community-based model often requires financial assistance and this study calls for a vertically integrated approach from bottom-up understanding to top-down finance, with a primary focus on community economic empowerment. Technical understanding (Section 4.4.2) is vital and this can only be done through cooperative platforms of knowledge, which form the basis of cooperation from lay knowledge to technical expertise (Rudiak-Gould, 2013; Munene, 2015).

Projects like ICMIF's three-part impact-based 5-5-5 strategy (see Section 2.5) should be explored across the microinsurance space to help empower communities and reduce the financial dependency that so often limits sustainable development (ICMIF, 2015). By building capacity through programmes to develop and improve management skills, insurance literacy and DRM, communities become the sales agent for insurance. This reduces the issues of cost-benefit analysis for insurance companies and benefits communities through the development of transformative economic skills and providing them with the mechanism by which people can set up, run and own their own business for the benefit of the community. Thus, an insurable population can be built with a view to minimizing disaster risk and enhancing disaster preparedness.

## 4.4 Technical Input

### *4.4.1 Infrastructure*

There is empirical and qualitative evidence from this study to suggest that urban livelihoods would benefit from IBMI in flood-prone regions across Nairobi. Despite this apparent demand, there are a few caveats to consider before pursuing its application in a practical sense. Flood risk can be minimized from a city-level perspective through improved SWM, effective drainage systems, adherence to building regulations and safe housing. Most respondents pointed to poor drainage as the underlying factor increasing the risk of heavy rainfall flooding. Drainage systems become blocked due to solid waste, which means surface water accumulates and spreads across roads. Local city council and government officials need to interact with the community to improve SWM through better education and infrastructure. Failing this, community-based NGOs such as KDI could play a pivotal role in mobilising communities to reduce solid waste and improve flood resilience. Therefore, an integrated approach to facilitate the processes of index insurance is needed, with the city council and government providing the enabling environment for communities to access resources and mitigate the impact of floods (Satterthwaite, 2011; Munene, 2015). However, even with effective drainage and safe housing, many key informants felt there would still be significant flood risk in the coming years, owing to the climate projections for higher intensity rainfall patterns (IPCC, 2012). Henceforth, a requirement for tailoring financial risk transfer products to protect urban livelihoods will be vital in reducing vulnerability and increasing resilience to flooding.

### *4.4.2 Stakeholders*

Corresponding with the Oxfam scheme in Bangladesh (Section 2.3), the relevant stakeholders needed to design, manage and sustain an IBMI project in Nairobi must work cooperatively across various fields of expertise. A project lead (INGO), an insurance company (national/ regional insurer), a local NGO (policyholder), a reinsurance company (international organization), a funding agency (international development agency/ government), a technical partner (data provider) and a design partner (consultancy) are amongst the plethora of multi-stakeholders used throughout the process of the Oxfam project (Desai, 2013; Oxfam, 2013). Considering the success of the Oxfam scheme for index insurance and the mutualisation of risk in Nairobi, there is evidence to suggest that a relatively similar template could be used at the Micro-level across the Kenyan capital city. Despite the clear distinctions between flood risk in Bangladesh and Nairobi, successful case studies can present a broader indication of how IBMI can be used as climate-related risk protection for vulnerable communities (Radermacher & Roth, 2014).

Local NGOs with readily accessible social networks act as a moral compass for insurance companies by distributing fair payments to families and businesses affected by floods. Additionally, they provide much-needed education to help develop efforts on increasing community flood resilience. Consequently, this will also help to build the necessary networks of formal and informal trust for scaling up insurance coverage across Nairobi in the years to come. An important aspect to consider is that both microinsurance and index insurance are still relatively new products. Data modelling organisations with access to innovative ways of calculating the frequency and severity of risks can provide a much-needed platform for insurance companies to price risks accordingly and affordably. Alongside technical expertise, financial assistance will also be pivotal for an IBMI scheme, with representatives from CIC Group suggesting that 90% of the initial costs will need to be supported through donors. In recent light of the UK government's announcement on funding disaster insurance in Africa to reduce reliance on disaster aid (Asthana and Wintour, 2017), there appears to be a plethora of relevant donor interest across international development agencies to pursue IBMI projects in sub-Saharan Africa.

### *4.4.3 Transformative Technology*

As previously mentioned throughout this chapter, advancements in technology will be central to maintaining the success of IBMI in developing countries. Case studies from TIA in Kenya (Section 2.3) have proven the dexterity of satellite imaging for improving the speed and effectiveness of claims settling for smallholder farmers. The index trigger itself is transformative for the insurance industry and represents a technological solution for building trust between communities and institutions. Moreover, index insurance embodies the paradigm shift that will be required from the insurance industry to keep pace with the risks associated to our constantly changing climate and ultimately increase protection from climate-related disasters for millions of people in the developing world. The quality of data available is a challenge that is being addressed presently. Limited meteorological data in sub-Saharan Africa symbolises the 'data poverty' that is currently holding back the progress of index insurance in developing countries (Greatrex *et al,* 2015; Development Initiatives, 2017). Constant change and adaptation to better increase the impact of index insurance will be a prerequisite from relevant stakeholders responsible.

Balancing technological innovation with social research must be considered to make sure policyholders have a clear understanding of their cover and the risks associated with disasters. In addition, combined rainfall prediction estimates and consultation with indigenous networks of knowledge to understand and write risk will be key to offsetting the challenge of basis risk (Bauchet, 2013). Issues of dishonesty, lack of transparency, affordability and accessibility are all characteristics that transformative technologies can help reverse. Lack of transparency, for instance, is being tackled through Blockchain: a transparent technological payment system that has the potential to completely transform the microinsurance market (Microinsurance Network, 2016). M-PESA, a mobile banking and transfer system, represents a perfect example of how technology has been used to transform the banking and insurance industries in Kenya, with insurers like CIC Group and projects like ACRE Africa currently pursuing the distribution of microinsurance and small claims settling through M-PESA (Greatrex *et al*, 2015). Insurers must recognise the necessity to be pragmatic in insurance by taking financial risks to transform their business practices through disruptive technologies (Swiss Re, 2016).

## 5. Conclusion

Climate change will significantly increase both the frequency and intensity of flooding in East Africa over the coming years (Niang *et al*, 2014; IPCC, 2012). Recognising this, more needs to be done to enhance social and financial protection from flood risk. This study found that adaptive capacity and resilience to flood risk is increased through informal risk sharing platforms. Communal culture in Nairobi denotes the importance of collectivism for addressing climate risks. Additionally, social capital plays a significant role towards creating more inclusive informal risk financing. High informal trust across poor urban settlements can be, in most parts, attributed to poor trust in formal institutions. Morsink and Guerts (2011) consider formal trust-building as the key challenge to scaling up insurance coverage and this study found similar results. The ability to scale up insurance coverage to reduce the protection gap is innately embedded within formal trust-building. Developing world index insurance projects need to consider this when pursuing macro-level approaches.

While the informal market continues to flourish through the facilitation of *Chama's,* microinsurance penetration in Kenya remains low. Insurers must explore more opportunities to pursue lines of cooperation with the informal market to bridge the gap between informal and formal trust. Informal risk sharing in Nairobi creates a mantra by which mutual microinsurance can thrive, with similar transitions from informal insurance to formal occurring across the developing world (ICMIF, 2015; Uplift, *n.d*; Ana-Gonzalez & von-Dahlen, 2015). Embedded within mutuality is the concept of community ownership and empowerment. Capacity building and education lie at the heart of this and stakeholders need to consider the importance of reducing future risks as well as simply reducing current risks. Insurance is not a panacea for DRM or ending poverty and needs to be integrated into a broader objective, where it works alongside sustainable development such as education, economic empowerment, gender equality and sustainable communities. Here, IBMI has the ability to transcend DRR, CCA and the SDGs by improving resilience to climate risk, increasing financial inclusion and enhancing disaster preparedness.

There is existing empirical and qualitative evidence from this study to suggest that index insurance can be used to enhance DRM for flood risk in Nairobi. Barriers to accessing insurance however, included awareness, affordability and accessibility. Microinsurance and index

insurance are relatively new products. Insurers and regulatory authorities alike have a duty to be pragmatic and launch micro-products that disrupt the market through new technologies. To achieve this for index insurance, the issue of data poverty must be addressed in developing countries. Moreover, striking a balance between social research and technological innovation will be central to the success of IBMI. It is vital that we learn from existing community resilience efforts and build on what they are currently doing to better design and distribute IBMI in developing countries and ensure the needs of the most vulnerable people are met. Engaging the community to drive change from the bottom-up through young, passionate leaders is needed to economically empower communities and enable the transition from adaptation to long-term transformation. Here, stakeholders will need to work cooperatively across organisations and communities to design and distribute the most effective products. A paradigm shift will need to be apparent from the insurance industry to facilitate the success of IBMI in Nairobi and across the developing world. Therefore, IBMI should pursue a needs-based approach, where projects are built for and run by the community. Individuals from within the community who have the vision and passion to play a pivotal role in IBMI projects need to work cooperatively alongside formal institutions to create an inclusive and affordable product. Thus, integrating platforms of knowledge from bottom-up community action to top-down technical expertise will be needed to enable the most applicable IBMI project for the community.

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