



Research article

Uncovering human social networks in coping with Lake Chilwa recessions in Malawi

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ABSTRACT

This paper provides an in-depth understanding of social dynamics in the form of kinship ties in matrilineal societies. It unpacks gender roles and relationships at the community level to understand how social structures, created by the pattern of relations, enhance or hinder coping initiatives during lake recessions in the Lake Chilwa socio-ecological system. Using qualitative and quantitative methods including in-depth interviews, Focus Group Discussions (FGD) and household questionnaires, this paper provides insights into how people in the Lake Chilwa social-ecological system prepare for and cope with Lake Chilwa water recessions by capitalising on their social networks. The findings have shown that during lake recessions poor households in the Lake Chilwa socio-ecological system are cushioned by fellow households through lineage networks. There is strong tradition secured through kinship ties where the generic term 'mwambo wathu' (our tradition) embraces a group of formative norms enforced via a series of rules and rituals. Based in a matrilineal system, women have strong rights over land allocation and use in which the female sorority group 'mbumba' is very stable. There is a great deal of reciprocity and food redistribution among the households. This self-organization provides deeper meaning about how people assimilate the dynamics affecting their social and natural environments. Specifically the findings provide evidence on how households, communities and their livelihoods in Africa are reconstructed as natural resources fluctuate.

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1. Introduction

The Lake Chilwa basin in Malawi is one of the many socio-ecological systems in Africa that generates important ecosystem services while accounting for the human dimension that shapes and is shaped by its nature (Folke, 2006). The Chilwa ecosystem combines the natural productivity of freshwater and a coastal ecosystem with intensive farming (Government of Malawi, 2000, Kabwazi and Wilson, 1998) and is used by over 1.5 million people (NSO, 2008). The lake itself produces fish valued at over 17 million USD annually. Fishing, as compared to farming, provides greater economic returns per square kilometre (Schuijt, 1999). However, the productivity and economic gains fluctuate seasonally and periodically due to lake recessions. The lake water levels have receded to complete drying twelve times between 1900 and 2012. The recession periods may last two to three years before production

of natural resources from the ecosystem returns to normal. The periodic lake recessions have therefore altered the temporal and spatial distribution of natural resources.

Despite the historical natural resource fluctuations in the Lake Chilwa socio-ecological system, it is not well understood how people survive the periods of resource scarcity, especially during complete dry-ups of the lake. The recent findings on the limitations of Lake Chilwa fishers to migrate to other lakes (Njaya, 2009) and the limited access to Lake Chilwa wetlands for farming (Kambewa, 2006) reveal knowledge gaps in understanding how livelihoods in the socio-ecological system are structured. Analysing networks at the community level therefore helps to understand how social structures, created by the pattern of relations, enhance or hinder coping strategies to natural resource fluctuations.

The Lake Chilwa basin is a socio-ecological system where people are both formally and informally connected through social networks. A social network is defined as a form of social coordination in which actions are coordinated voluntarily by individuals and organizations with self-organising and self-enforcing capabilities (Lee, 2003). Previous studies have identified social networks as an

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important denominator in unifying different stakeholders to effectively deal with natural resource problems and dilemmas (e.g. Gunderson, 1999; Hahn et al., 2006; Folke et al., 2005; Olsson et al., 2008). Social networks bond people together by bridging their diverse norms and promote reciprocity (Dekker and Uslaner, 2001; Uslaner, 2001). Cook (2005) also emphasises the importance of social networks in solving local problems such as illnesses, paying school fees and finding work. He argues that this type of support becomes crucial when coping with disasters. Similarly, Gunderson (1999) underscored the role of informal networks as incubators for new approaches to governing social-ecological systems. Thus, social networks can be seen as having the potential to improve natural resource governance processes by facilitating the mobilisation and allocation of key resources and conflict resolution, especially in managing common pool resources (Ostrom, 1990; Carlsson and Sandstrom, 2008; Hahn et al., 2006). For example, Chilivumbo (1971) reported that the recurrent Lake Chilwa water recessions and their effects on resource availability in the pre-independence era of Malawi opened up traditional management trajectories of the resources from the socio-ecological system through networks.

It has also been shown that social networks can be more important than the existence of formal institutions for effective enforcement and compliance with environmental regulations (Scholz and Wang, 2006). The existence of social networks and institutions that can either enable or constrain coping actions are some of the factors that play a role in decision-making processes (Ostrom, 1990). Davies (1996) states that coping may be either positive or negative in the decision-making process: positive if it is by choice, reversible, and increases security; and negative if it is by necessity, irreversible, and fails to increase security. In this context, coping is not a change in a single behaviour, but a suite of beliefs and practices that take shape under locally specific conditions of uncertainty. In a setting where individuals experience on-going challenges to their well-being, such as the Lake Chilwa water recessions, these beliefs and practices become integral parts of everyday decision-making about life and livelihood, making coping and livelihood inseparable as people manage livelihood vulnerabilities.

The interactions in a network provide information, opportunities and perspectives that can be beneficial to each of the players in the network (Crona and Hubacek, 2010; Papachristos, 2009). With reference to Hewitt (1997), this paper therefore looks at the conditions that influence people's coping strategies and that enable them recover from crises, rather than the severity of the crisis itself. The paper uses the social network perspective to analyse the structural dynamics when communities are faced with natural resource fluctuations (Bowler and Brass, 2011; Crona and Hubacek, 2010). Social structure in this context means the social arrangement and social-economic stratification of a society (Giddens, 1981; Sewell, 1992), while social systems include levels of social units such as neighbourhood, community or society (Giddens, 1984).

2. Methodology

2.1. Study area

The study was conducted at Chisi Island of Lake Chilwa situated in the Zomba District in southern Malawi. Chisi Island is the largest body of land on Lake Chilwa (Fig. 1) located between 30° 35' and 30° 38' east of Greenwich Meridian and 15° 18' and 15° 21' south of the Equator. The island has an area of approximately 21 square kilometres (km²) and is surrounded by marshes to the west and open waters to the east. The Lake has three main distinct zones in terms of depth where the northern zone is very shallow and the southern zone is the deepest (Fig. 1). The deepest part is about five metres.

The choice of Chisi Island for this study was based on the premise that people's livelihoods on the island primarily dependent on the lake and are therefore highly impacted by lake water recessions. The Island's population depends on fisheries with 90% of the economically active group (men and women above 18 years) employed as fishers, fish processors, fish traders or as sellers of firewood and food. The other 10% of the population are primarily involved in agriculture and other non-fish related livelihoods.

2.2. Methods

Multiple methods were used that included focus group discussions (FGD), in-depth semi-structured interviews with key informants, direct observation and household questionnaire interviews. Eight villages were purposively sampled for the FGDs based on differences in the presence of and distance to schools, markets and health clinics. Women and men formed separate discussion groups with each group having 18 people on average. FGDs involved resource mapping drawn in a participatory way, institutional analysis, cause-effect analysis, seasonal calendars, and well-being or ill-being analysis. FGDs focused on knowledge of past recessions of Lake Chilwa, food security status during recessions and during normal lake levels, common challenges that people face in each village, and consensus discussions of household assets as a proxy of well-being, perceptions on vulnerability including people's hopes and fears for the future.

In-depth interviews using semi-structured questions and discussions were conducted with a snowball sample of 25 key informants. Interviews were conducted with the village heads on their village histories and wealth status, fishermen, women processors and traders on the lake and fishing histories. For the purpose of this research all key informants were elderly people with ages estimated to range from 60 to 90 years. The eldest informant was a sister of the former Traditional Authority Mkumbira herein called *Gogo Nasibeko* (not her real name). The choice to interview her was deliberate in order to understand the matrilineal society in detail as well as kinship ties in the area. These interviews provided deeper understanding of some of the complexities of the social structure, the fishing business and its governance. The interviews and observations of social networks, governance issues and customs were conducted while residing on Chisi Island between August 2012 and March 2013. These were done in order to interpret deeper meanings of some of the people's social actions (Walsham, 1995).

Household survey used questionnaire that was administered with the support of two additional research assistants following a training that included the pre-testing the questions on a different community in Zomba. The questionnaire was completed in a structured interview, where we read and interpreted the questions to the respondent and recorded the answers as described by Iarossi (2006). Questions included demographic measures as well as food security and coping strategies during recessions. The survey targeted 150 household heads or the spouses which represented 30% of the total households in four villages.

3. Results and discussions

The Lake Chilwa socio-ecological system provides multiple opportunities for generating food and income thus it is an important source of livelihoods for local communities. The lake and its surrounding wetland hosts many natural resources including fish, invertebrates, zooplankton, algal species, birds, insects and reptiles. The wetland provides space for agriculture production and natural resource gathering. However, the Lake Chilwa socio-ecological system has one of the highest population densities in Malawi and

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