Reg Environ Change (2016) 16:289–299
DOI 10.1007/s10113-014-0632-x

ORIGINAL ARTICLE

Shocks and coping strategies of coastal communities in war–conflict-affected areas of the north and east of Sri Lanka

Mohamed Munas · Gayathri Lokuge

Received: 12 August 2013 / Accepted: 10 May 2014 / Published online: 27 May 2014
© Springer-Verlag Berlin Heidelberg 2014

Abstract A quantitative survey of 1,377 households in three war-affected coastal districts of Jaffna, Mannar and Trincomalee in the north and east of Sri Lanka shows that inflation or price hikes, specially fuel, and natural disasters such as floods and droughts are highlighted as the shocks with the biggest impacts on fisher and non-fisher households. We hypothesise that the pattern/severity of households' coping strategies to face these shocks depends on a set of household characteristics: livelihood diversity, asset ownership, level of education and the ability to borrow. Livelihood diversity, asset ownership and borrowings correlate significantly with the severity of coping strategies adopted by households for both fisher and non-fisher households. Education and livelihood diversification does not show a significant correlation for fisher households although it significantly affects livelihood diversification of both types of households.

Keywords Coping strategies · Fisher livelihoods · Shocks · Sri Lanka · Conflict

Background

There are several gaps evident in empirical literature at the intersection of natural and man-made (e.g. war) disaster-related vulnerabilities and coping, specifically with reference to fisher households. The literature on vulnerability, risks and coping is a large body of work that defines vulnerability from an economic and physical/environmental stand point, without looking at man-made disasters; the literature on war-related vulnerability and coping focuses on agriculture and pastoralists and does not discuss fisher households; and what has been written about vulnerability and coping in fisher households makes no reference to man-made disasters.

We propose that the severity of coping strategies adopted by fisher and non-fisher households, faced with natural, economic and man-made shocks are influenced by their level of education, the extent of their livelihood diversification, their asset ownership and their ability to borrow. With about 60 % of Sri Lanka's coastal area falling directly in the war-affected north and east provinces of the country where fishing is the main livelihood, we consider it appropriate to present an analysis of fishing and non-fishing household coping strategies in the current post-war context in Sri Lanka.

Risks and vulnerability

Discussions around hazards and vulnerability and risk take either a social or physical/environmental approach that considers "the risk of adverse outcomes to receptors or exposure units (human groups, ecosystems and communities) in the face of relevant changes in climate, other environmental variables and social conditions" (Clark and Parson 2000) or an economic approach that looks at poverty and socio-economic deprivations and the "probability or risk today of being in poverty or to fall into deeper poverty in the future". (World Bank 2011).

The economic approach defines vulnerability in relation to consumption and the inability of a household to smoothen (insure against) consumption when faced with income shocks such as disruption to livelihoods or price

M. Munas (✉) · G. Lokuge
Centre for Poverty Analysis, Colombo, Sri Lanka
e-mail: munas@cepa.lk

G. Lokuge
e-mail: gayathri@cepa.lk

hikes, while maintaining a minimum level of assets. (Holzmann and Jørgensen 2011). Added to this is the importance of exposure to risk and access to resources and assets. A household with a lower ability to smoothen consumption will not become vulnerable unless it is exposed to a risk or shock (Chaudhuri 2003), and people with limited access to resources (Adger 1998) and limited access to assets (Vogel 2001) are more vulnerable to the threat of future poverty.

The UNDP (2004) broadens the discussion on causes of vulnerability by bringing in the element of human induced hazards and defines risk as "(T)he probability of harmful consequences, or expected loss of lives, people injured, property, livelihoods, economic activity disrupted (or environment damaged) resulting from interactions between natural or human induced hazards and vulnerable conditions". War is a human induced hazard that is the result of violent conflict on a mass scale. It disrupts livelihoods, increases risk and limits peoples' access to both resources and assets.

Coping

Coping strategies are the actions or responses that households or communities use in order to face shocks (Corbett 1988). They can be defined as "(t)he characteristics of a person or group in terms of their capacity to anticipate, cope with, resist and recover from the impact of a natural or man-made hazard". (Blaikie et al. 1994). Corbett (1988) identifies *precautionary strategies* that deal with frequent non-acute shocks, and *crisis strategies* that address acute threats to food security. Coping strategies are influenced by the intensity and type of the shock, and the status of contributing factors to stable livelihood systems such as labour, markets and credit availability. People actively construct strategies to ensure short-term food security and/or longer term livelihood security (Frankenberger and Goldstein 1990). They are frequently planned at the household level and adopted strategically depending on the intensity of the shock.

Arriving at the coping strategy severity index

Households employ varying coping strategies depending on the context, but there are typical patterns or sequences reported in the literature (Watts 1983; Corbett 1988; Maxwell 1996) which we analysed in order to arrive at the coping strategy severity index for this paper. Coping strategies during war have been studied (see Korf 2002; Brück 2003), but the overlap of war and natural disasters is a relatively recent focus of study (Frerks 2010). This is despite the fact that natural disasters occur in half of the countries in the world, and 75 % of all natural disasters happen in countries with major conflicts (Van Oijen forthcoming, cited by Frerks 2010). Most of the analysis in the literature focuses on coping strategies at the community or household level ignoring gendered and age-based intra-household dynamics.

Corbett (1988) reviewed the evidence of coping strategies in Africa and identifies a hierarchy of low-intensity to high-intensity strategies; collecting famine food and rationing food intake, migrating to other areas in search of work, borrowing food or money to buy food, selling household assets, productive assets including livestock and land and finally mass migration. Cutler (1986) focused on adaptive strategies, sale of livestock, labour migration, sale of key productive assets and finally mass migration as steps in employing coping strategies. Chambers (1989) mentioned eating less and worse, postponing medical expenses, exploiting common property resources, share-rearing and mutual support.

The literature on coping strategies in war emphasises how households manage risk: risk minimising; risk avoidance; risk spreading; and engaging with the market. (Jaspars and O'Callaghan 2010; Korf 2003). For example, people travel to markets in groups to minimise the risk (see Stites and Akabwi 2009). Also, during war, households tend to intensify rather than diversify livelihoods, given their need to minimise risk. Post-war Mozambiquan farm households, for instance, focused on fewer livelihood activities, reduced their asset base to survive till the next season and attempted to enhance village market participation and diversification. Their success was influenced by the household's lifecycle position, the endowment and transaction costs at a local level, among other factors (Brück 2003). Focusing on war-affected areas of Sri Lanka during the last ceasefire period of the protracted war, Korf (2002) identified the following coping strategies of war-affected households in eastern Sri Lanka;

- Reorganisation of assets and investment in mobile assets such as jewellery
- Changed mobility patterns (restrictions on travel to markets)
- Internal reorganisation of household roles (women taking up more active roles in the public sphere, e.g. going to markets)
- Deliberately undertaking risky strategies (accessing banned areas for fishing)
- Households confining their livelihood activities to one source rather than diversification
- Remittances

Livelihood strategies that adapt to short-term shocks and do not contribute to a long-term reduction of vulnerability can be negative (Davies and Hossain 1997). Strengthening

coping capacities usually builds resilience to withstand the effects of natural and other hazards. (Europe Spatial Planning Observation Network 2003, cited in Thywissen 2006: 1). However, people may employ coping strategies that harm the environment or are not economically viable or that erode a household's subsistence base. These coping strategies may in fact produce negative impacts in the long term (Davies 1993).

In summary, households adopt a pattern of coping strategies depending on the nature of the shock and their household characteristics. Households adapt coping strategies that may compromise their well-being and households' subsistence base. Based on the literature on natural disaster-related coping strategy patterns and war-related coping strategy patterns in Sri Lanka, we decided what strategies would compromise the longer term well-being of a household and we arrived at a pattern or severity index comprising the strategies used in our household survey.

Fishing, war, vulnerability and coping

Fishing communities have been particularly vulnerable because of economic and social disruptions to their lives as fish populations decline (FAO 2004), fuel prices increase, climate change takes hold and coastal development mushrooms (Apostle et al. 1998; McGoodwin 1990; Johnson and Orbach 1990; Heinz Foundation 2000; Acheson 2000). Resilience and sensitivity are two concepts linked to the coping of fisher households (Salmi 2005; Allison and Ellis 2001). A livelihood that shows high resilience and low sensitivity is ideal in terms of household well-being, but given that fisher communities are highly dependent on natural resources, they are not resilient to external shocks and do not find it easy to recover from shocks and crises (Islam 2011). They experience loss of lives, fishing craft and equipment while out at sea due to cyclones or rough seas, and loss of houses and agricultural crops due to natural disasters such floods, tidal waves and cyclones. Safety at sea and the vulnerability of coastal communities due to climate change are the more recent recurring themes in terms of shocks faced by coastal or fisher communities.

In Sri Lanka, the fishing communities in the north and east of the country are facing shocks and risks deriving from the three decades of war, in addition to the risks associated with their livelihoods. During the war, "security restrictions on time, distance, access and type of craft used in the directly war-affected northern and eastern regions severely affected the fishery sub-sector. The lack of skill, capital and capacity available in the region, loss of livelihood-based assets due to multiple displacements of the fishing communities, damaged infrastructure from landing centres, storage facilities to market infrastructure, financial establishments such as banks and road networks added to

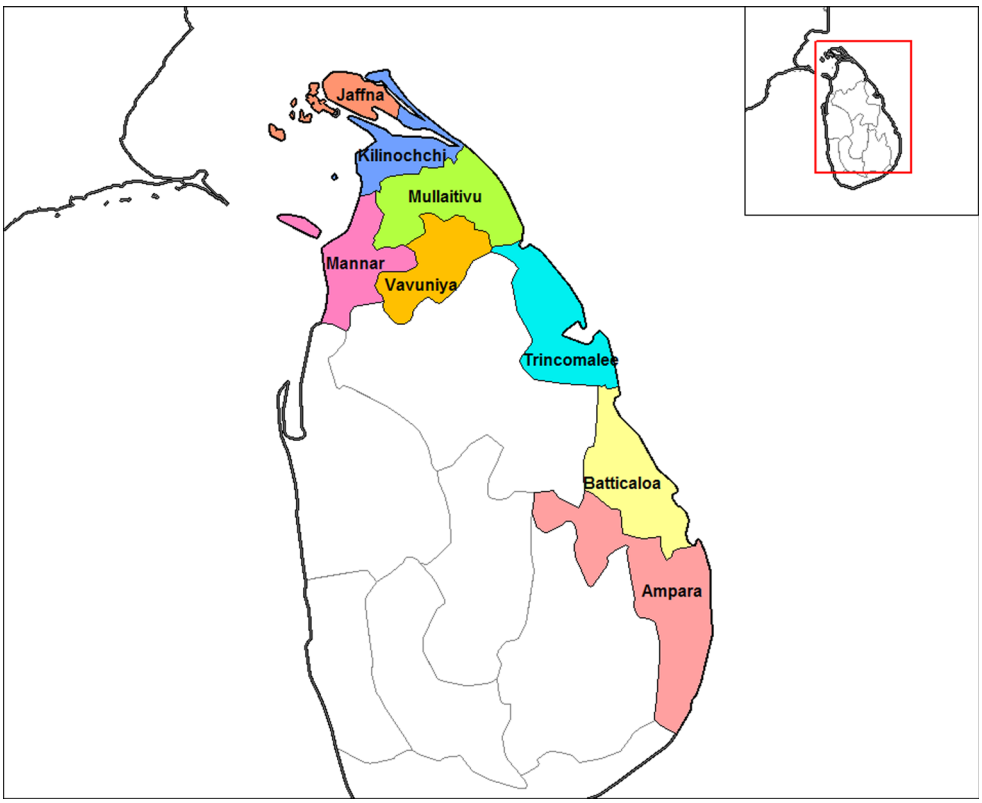

Fig. 1 War affected areas of Sri Lanka

further deterioration of the situation" (Lokuge and Munas 2012: 43).

However, with the end of the war in 2009, most of the restrictions have been relaxed, a bulk of the displaced population has returned home and development initiatives targeting infrastructure and livelihoods are in motion. Although studies have been conducted on post-war coping strategies of farm households, we see a lack of studies that focus on fisher households. Therefore, we analysed the data from a 1,377 household survey carried out in the three districts of the war-affected north and east of Sri Lanka (Fig. 1): Trincomalee, Mannar and Jaffna, with the aim of adding to the literature on the subject.

Factors affecting ability to cope with shocks

We hypothesise that the pattern/severity of households' coping strategies depends on a set of household characteristics; livelihood diversity, asset ownership, level of education and ability to borrow. Sen's (1981) entitlement approach argues that the ownership of tangible assets and the speed with which they can be turned into food determine the ability of a household to deal with risks. Households with more assets either sell these assets or take formal loans against them in times of shock (Rashid et al. 2006).

Activity choice and income diversification determine the coping strategies of coastal communities and households. They are influenced by household size and endowments and other factors such as social institutions, informal markets, property rights and geographic location (Brück 2003). Coastal communities are rarely homogenous and many have a diversified livelihood portfolio (Pomeroy et al. 2006). It is argued that if this diversification is into other economic activities other than expanding existing fisheries-related livelihoods, then it is likely to lead to more sustainable development (Brookfield et al. 2005).

The level of education influences the movement into non-traditional enterprises (Smith et al. 2001) and influences a household's coping strategies (Rashid et al. 2006). Education increases chances of receiving a secure income and facilitates access to information on costs of different coping strategies. But lack of financial capital to invest in alternative livelihoods and lack of institutional support for livelihood diversification affect the ability to cope with shocks. Lack of financial capital negatively influences improving physical capital and causes challenges for livelihood diversification (Islam et al. 2014). In the war-affected north of Sri Lanka, households coped by diversifying their livelihoods (Morais and Ahmed 2010). But in some situations, households facing shocks opt to minimise their livelihood options rather than diversify them (see Korf 2002 and Brück 2003).

Based on the above discussion, and the available data from the household survey, we have identified livelihood diversification, level of education, asset ownership and access to credit as the characteristics that will affect the severity of coping strategies adopted by fisher households. The hypotheses are set out below for each variable and are described in more detail under methodology.

- Higher livelihood diversification will enable households to use less severe coping strategies to face shocks
- Higher education levels of households reduce the severity of coping strategies
- Higher asset ownership will increase the likelihood of adopting less severe coping strategies
- Having the ability to access short-term (distress borrowing) credit facilities will decrease the severity of coping strategies

Methodology

Selection of locations, variables and defining the variables

District (main administrative divisions in Sri Lanka), Divisional Secretariat Divisions (the administrative sub division of the Districts) and Grama Niladhari Divisions (the smallest administrative subdivision) were selected purposively based on conflict affectedness and experience of displacement and shocks. Given the focus of research on fisheries livelihoods, locations with substantial fisher populations were selected. In addition accessibility, security and the practical feasibility of carrying out the data collection was also taken into consideration. A total of 1,377 households were interviewed in the Trincomalee, Mannar and Jaffna districts for the survey to achieve representativeness and statistical significance at GND level. We have categorised the surveyed households into fisher households and non-fisher households. Fisher households are those in which at least one household member is engaged in fisheries as the primary livelihood activity. Households engaged in any other forms of livelihoods are categorised as non-fisher households.

Types of shocks faced

War-related shocks

The Sri Lankan government's military victory over the in May 2009 ended a 26-year protracted war that directly affected the north and east of Sri Lanka. The violence led to loss of lives, property and equipment, damaged roads and irrigation tanks, lost cultivable land and access to the

sea for fishing. (Arunatilake et al. 2001: 1484). War-related violence Trincomalee was at its highest from 2005–2007 and from 2007–2009 in the northern districts. From the northern districts, Mullaitivu, Kilinochchi and Mannar were worst affected by the war with Jaffna and Vavuniya suffering relatively less damage. This household survey was carried out in the second half of 2012 and does not capture the direct impact of war on households.

However, the war resulted in an exodus of people from different parts of the north and east, and the impact of this displacement is still evident. By April 2013, 8,141 families remained displaced from Jaffna, Kilinochchi and Trincomalee districts (Ministry of Resettlement). Our survey showed that more fisher households were displaced than non-fisher households.

Other shocks

Through the survey, we analysed 9 types of shocks and the coping strategies that the sample population adopted. Since the ending of the war in 2009, the sample population has faced mostly exogenous shocks such as natural disasters and macro-economic instability. Both fisher and non-fisher households claim that they were affected by floods, followed by inflation/price hikes. Forty-one per cent of sample households have faced floods, and 29 % claim that inflation and price hikes were a shock. This trend is similar to the results of the food security survey conducted in the same areas in 2011 (Ministry of Economic Development, HARTI, World Food Programme 2011).

The north-east monsoon (November–March) results in floods in the northern and eastern areas of the country. In late 2010 and early 2011, floods from excessive monsoon rains damaged crops and houses, limited physical accessibility and temporarily displaced a large number of people. In the 2010/2011 north-eastern monsoon period, fishermen in the north and east were not able to fish for 23 days and for 30 days, respectively (Petersson et al. 2011). However, when the sample is disaggregated by fisher and non-fisher household types, it would seem that inflation and price hikes, and not floods, are the main shocks that households have faced.

Severity of coping strategies

Although it may seem that households adopt coping strategies in a haphazard manner when faced with shocks, we can identify a sequence to these responses (Corbett 1988). The study used a method of severity ranking to classify how households dealt with shocks. The classification of the different severity categories was based on the findings in the global literature and on the war-affected Sri Lankan context (Watts 1983; Cutler 1986; De Waal and El Amin 1986; De Waal 1987). The strategies households used were aggregated according to the severity of action in terms of negatively affecting the longer term household well-being and eroding the subsistence base. For example, eating less is categorised as low-category 3 while eating seeds which impacts the human resource and labour productivity more drastically than eating less is categorised as medium 3. Households that had not faced any of the shocks that the study identified or had faced other shocks that were not in the study's categorisation were grouped under "zero shocks faced". The study assumed that those households who have faced a shock but have not adopted a coping strategy are more resilient to shocks. They are categorised as "zero severity". Households that adopted coping strategies are categorised as low, medium and high as given in the Fig. 2.

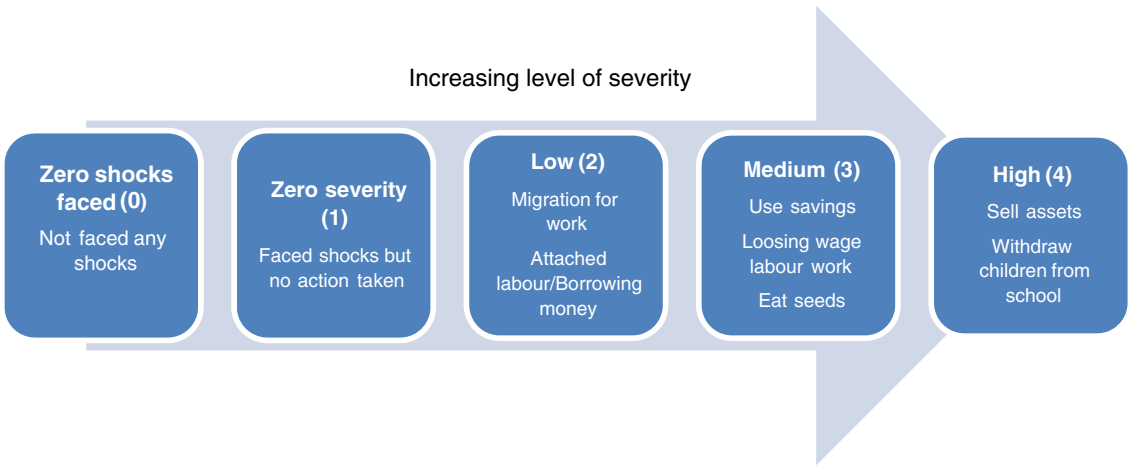

Fig. 2 Severity levels of coping strategies adopted by households

Among the sample households, the main coping strategies used by both fisher and non-fisher households were borrowing money or using savings. Overall, non-fisher households are adopting more severe coping strategies than fisher households, even though the proportion of fisher households in the most severe category is higher than the proportion of non-fisher households.

Hypotheses and variables

Livelihood diversification

We hypothesised that higher livelihood diversification will enable households to use less severe coping strategies to face shocks. For this purpose, we calculated a household livelihood diversification as a sum of all the livelihood sources of all the individuals in a household. Based on the number of livelihood sources, households are classified as mentioned below (Table 1):

Level of education

We attempt to test whether education contributes to dealing with adverse shocks among the war affected fisher and non-fisher populations. We hypothesise that higher education levels of households reduce the severity of coping strategies. The study ranked households according to the average range of education in each household, as per the computation below. Based on the computation, four education rankings were selected: 1-basic, 2-low, 3-moderate and 4-high.

$$\textit{Average range of education of household} = \frac{\varepsilon\, \textit{Range of education} > 14\, \textit{years old}}{\varepsilon\, \textit{Number of household members} > 14\, \textit{years old}}$$

Asset ownership

Asset ownership is the strength in dealing with shocks, and households with fewer assets are unable to take risks and enter low risk income livelihoods (Dercon 2002). It may take longer to recover from asset destruction because of war, and those households with better assets feel more secure (Brück 2003). Households at risk use asset disposal as a coping strategy (Rashid et al. 2006). We hypothesise that higher asset ownership will increase the likelihood of adopting less severe coping strategies. The Morris Score Index (Morris et al. 2000) was developed as a proxy for household wealth using data on asset ownership. It is a weighted asset indicator that weights each durable asset owned by the household by the share of households not owning the asset. This means that those households that owned assets that only a few households in the sample own are considered asset rich. Based on the Morris Index, we categorised the households as asset poor, asset medium and asset rich. The durable assets included livelihood-related assets such as farming and fishing equipment, livestock, household appliances and vehicles.

Table 1 Household classification based on income sources

Rank	Income sources
0	Households with no income sources
1	Households with only one income source
2	Households with 2 income sources
3	Households with 3 income sources
4	Households with >3 income sources

Access to credit

In a war-affected high-risk context, credit markets become imperfect, volatile and unavailable (Dercon 2002; Brück 2003; Collier and Gunning 1999), and access to formal financial services become constrained (Amarasinghe and Bavinck 2011). The linkage between access to credit and coping mechanisms of war affected communities is unclear. In an attempt to establish this link, we hypothesise that having the ability to access short-term (distress borrowing) credit facilities will decrease the severity of coping strategies used. Given the importance of short-term credit for households at risk, we have picked the short-term credit (50 USD) for the purpose of analysis. Responses to the question, "if you suddenly need 50 usd (converted roughly as Rs 5,000.00) to pay for a health treatment, would you be able to borrow this money from anyone?" were used as a proxy to determine the households' ability to access distress loans and financial capital.

Results and discussion

Here, we analysed the coping strategies the communities have used and provide a description of the variables such as livelihood diversification, asset ownership, education and the ability to borrow and discuss the cross tabulations and correlations between severity of coping strategies used and the above variables.

Livelihood diversification

Almost all of the households (94.7 %) had at least one income earner. Those that did not were displaced, not yet resettled and dependent on social welfare, and comprised more non-fisher households. Remittances was not a major livelihood resource—only 16.7 % of the whole sample received remittances (Table 2).

Table 2 Secondary occupations, off-season livelihoods and remittances received by sample households

Type of household	Secondary occupation—number of sources (%)						Engaging in off-season livelihoods	Receiving remittances
	0	1	2	3	4	Total		
Fisher	79.9	18.4	1.4	0.3	0.0	100	56.1	4.9
Non-fisher	82.6	16.0	1.1	0.1	0.1	100	11.6	11.8

Table 3 Cross-tabulation between severity of coping strategies and livelihood diversity

Type of household	Severity level	Range of livelihoods (%)					
		0	1	2	3	4	Total
Fisher	0	0	24.4	48.8	12.6	14.2	100
	1	0	33.3	48.5	15.2	3	100
	2	0.4	23	44.3	17	15.3	100
	3	0.6	16	45.4	24.5	13.5	100
	4	0	18	43.8	21.3	16.9	100
Non-fisher	0	10	45.3	30	10.7	4	100
	1	7.7	53.8	23.1	10.3	5.1	100
	2	8.7	43.1	31.2	13.8	3.2	100
	3	6.9	45.2	29.9	13	5	100
	4	8.1	35.5	25.8	24.2	6.5	100

Even though 56.1 % fisher households engaged in off-season livelihoods compared to 11.6 % non-fisher households, there is still a significant proportion (43.9 %) of the fisher households in the sample who are not engaged in an off-season economic activity.

Fisher households have a greater diversity of income sources than non-fisher households, possibly because of the seasonality of their primary livelihood, and their need for a secondary livelihood or off-season activity to supplement household income. Among fisher households, only 21.3 % rely on a single income. Among non-fisher households, the percentage is 44.2. Forty-five per cent of fisher households rely on two livelihood sources, 18.5 % on three and 14.2 % on four.

The cross-tabulation of severity of coping strategies with livelihood diversification shows that non-fisher households seem to be more resilient towards facing shocks (Table 3). Despite their diversified portfolio and multiple income earners, fisher households still use more severe coping strategies than no-fisher households. Among fishers using most severe coping strategies, 43.8 % have two livelihood sources, which reveals that a minimum of 2 livelihood sources is not sufficient to ensure resilience.

There is a positive correlation between the level of livelihood diversification and the severity of coping strategies adopted for fisher families and a negative correlation for non-fisher families. Neither is statistically significant. So the hypothesis that greater livelihood diversification will enable households to use less severe coping strategies does not hold for the fisher community.

The rejection of the hypothesis challenges the idea that diversification into other non-directly fisheries-related income sources ensures sustainability of the activities (Brookfield et al. 2005). Diversification could, as has been pointed out, divert labour and capital from the key activity (Berkvens 1997), and it may not always lead to spreading the risks (Collier and Gunning 1999). It would seem that income diversification is not a decisive step forward, but rather a fumbling attempt to 'make do' in a severely deficient market environment (Bryceson 1999).

Education

A comparison between fisher and non-fisher households shows that education levels of fisher households are lower (60 % in the low education category) than those of the non-fisher (50 % in the low education category). Cross-tabulation of education and level of coping severity shows that education does not have an impact on the severity levels of the coping strategies chosen by fisher households. But, the level of severity of coping strategies of non-fishing households decreases with the increase of the level of education, and there is a significant negative correlation between the two variables.

In terms of correlations between level of education and severity of coping strategies adopted, fisher households and non-fisher households show a difference. While as hypothesised, non-fisher households show a significant negative correlation between level of education and severity of coping strategies adopted, fisher households show a positive correlation between the two variables which is not significant.

The hypothesis that higher education levels of households reduce the severity of coping strategies holds true only for non-fisher households. The low level of education in fisher households makes the contribution of education towards managing risks also low. There is limited literature on the impact of education on coping strategies of fisher families. But our findings seem to challenge the findings of some researchers who found no link between education and farm output Brück (2003), because the link between education and non-fisher households was significant. However, this could be because only about 10 % of our sample of

non-fisher households was engaged in agriculture, and the rest were engaged in trade, business and formal sector employment.

Several researchers support the findings that education has marginal impacts on coping strategies. Brück (2003) states that there is no link between education and farm output, and the adoption effects of education are limited. Work done by Rashid et al. (2006) says that level of education of household head has limited impacts on coping strategies adopted.

Education also has an indirect impact on coping strategies, by affecting the livelihood diversification of households. Lack of education has been identified as a critical constraint inhibiting diversification by several researchers (Evans and Ngau 1991; Dercon and Krishnan 1996; Smith et al. 2001). Rashid et al. (2006) state that education provides households a stable income making them able to cope better by reducing their vulnerabilities related to borrowing due to their high financial literacy level. Ellis (1998) states that families that are better off, such as the well-educated, are able to diversify their income sources/livelihoods compared to poor households. Education plays a significant role in diversifying livelihoods into non-farm activities (Reardon 1997; Newman and Canagarajah 1999). In conclusion, the analysis suggests that fisher households do not have sufficient levels of education that helps them to cope with external shocks, in contrary, non-fisher households are using education to cope by diversifying their livelihoods.

Asset ownership

Fisher households own more assets than non-fisher households, though very few households in either category can be considered asset rich.

The analysis shows that the higher the asset levels, the lower the severity of coping strategies adopted by both fisher and non-fisher households. Across all severity levels, there is an inverse relationship between coping severity and asset ownership. The impact of asset ownership on severity is more marked among the non-fisher households than among fisher households. For example, of the non-fisher households in the highest severity category, 4, 82.3 % are asset poor. Among fisher households in this category, 62.9 % are asset poor. The lower level of asset ownership among non-fisher households and the difference in the types of assets owned by the two communities could be influencing factor. Non-fisher households are likely to own immovable assets such as land, whereas fisher households will have movable assets such as fishing equipment and boats (Table 4).

Fisher households and non-fisher households show differences in correlations between asset ownership and severity of coping strategies adopted. Fisher households show a positive correlation between the two variables which is not significant, while non-fisher households show a significant negative correlation between the two variables.

Table 4 Cross-tabulation between severity of coping strategies adopted and asset range

Type of household	Severity level	Asset range			
		Asset poor (%)	Asset medium (%)	Asset rich (%)	Total (%)
Fish	0	62.2	37.0	0.80	100
	1	60.6	36.4	3.0	100
	2	72.8	26.0	1.3	100
	3	56.4	42.3	1.2	100
	4	62.9	37.1	0.0	100
Non-fish	0	65.3	33.3	1.3	100
	1	71.8	28.2	0.0	100
	2	83.9	16.1	0.0	100
	3	71.6	28.4	0.0	100
	4	82.3	17.7	0.0	100

As Thorpe et al. (2007) state that fisher households' heterogenic vulnerability to the external environment makes them difficult to cope with external shocks. This is true with the coastal communities especially fisher communities that are prone to many natural disasters. Their assets such as fishing crafts and equipment are more vulnerable to cyclones, rough seas, floods and tidal waves. Their inability to cope irrespective of the fact that they possess a high asset score can be explained by this vulnerability. The hypothesis that higher asset ownership will increase the likelihood of adopting less severe coping strategies holds true for non-fisher households, but not for fisher households. In fisher households, asset ownership is greater but it does not influence the severity of the coping strategies.

Short-term borrowing

A higher proportion of fisher households in comparison with non-fisher households stated having a better ability to take distress loans at all the severity of coping strategies levels except in the most severe category. In the least severe category, 100 % of fisher households are able to take a distress loan which could mean a safety net for fishers. Because of the high collateral requirement prevailing in the formal lending sector, fishers opt to borrow from the informal sector despite having to pay high interest rates (Amarasinghe and Bavinck 2011). In a rural, war affected context, the credit market is under developed and

the availability of formal and informal credit can be constrained because of high risks and contracting issues (Brück 2003; Collier and Gunning 1999). In the absence of the formal market, war affected coastal communities tend to borrow from informal lenders which could be attributed to the high borrowing ability of fisher households. Fisher households have a practice of borrowing from their employer or from middlemen during the lean season, and they are able to draw on these established networks.

Fisher and non-fisher households show differences in correlations between ability to access distress loans of 50 USD and severity of coping strategies adopted. While fisher households show a negative correlation, non-fisher households show a positive correlation between the two variables. However, correlation is not significant for both types of households.

Conclusions

In our study, we hypothesised that the coping strategies of people living in war affected contexts varies depending on their livelihood diversification, level of education, asset ownership and access to credit. It aimed to verify these assumptions through analysis of a household survey data from fisher and non-fisher families in the north and east of Sri Lanka, collected in the second half of 2012.

The study carried out a statistical bivariate correlation analysis between the severity of coping strategies and four independent variables (livelihood diversification, level of education, asset ownership and borrowings) which showed that there were differences between fisher and non-fisher households. The findings suggest that policy directives on strengthening resilience or the coping ability of fisher and non-fisher households need to take their intrinsically inherent characteristics into consideration.

Three of the hypotheses that drove this study can be held as true in the case of non-fisher households. These households use livelihood diversification as a means of reducing the severity of their coping strategies; higher educational levels and greater degree of asset ownership lead them to adopt less severe coping strategies. The data seems to suggest levels of severity of coping strategies do not change with access to short (distress borrowing) term credit.

The particular nature of fisher households, however, means that they present a very different and contrary picture. The seasonal nature of fishing means that fisher families have a diversified livelihood portfolio, but this does not seem sufficient for them to face shocks. Therefore, policy decisions linked to the promotion of diversification need to be based on further study, specifically in post-war contexts. Fisher households typically have low levels of education, but incremental increases in their educational levels do not affect the severity of their coping strategies. Higher education levels do not necessarily guarantee employment in the formal sector especially for coastal community members whose social and political networks may not provide them access to the formal sector employment. There is a tendency for children and youth from coastal communities to take up fishing at a very young age, often times at the cost of their education, which may have negative impacts on a fisher household.

Fishing households seem to have a stronger asset base than their non-fisher counterparts, but this does not translate into a reduction in the severity of coping strategies. The risky nature of their livelihood means that their assets are in danger or being destroyed and the fact that they live close to the coast makes them vulnerable to the natural disasters especially during the monsoons. Fisher families also have better access to borrowings, particularly distress borrowing, which serves as a safety net to some extent. However, this safety net compromises their longer term household well-being. They become entangled in a vicious cycle of debt, usually to the fish-dealer to whom they are bound to sell the fish catch during the high season, irrespective of the price they offer.

The study challenges some of the received wisdom on coping strategies and raises conundrums that require further thought. It is important to understand the nature of secondary and off-season livelihoods that fisher households engage in and their contribution to the household income before we make policy recommendations on which type of secondary livelihoods need to be encouraged and strengthened. We also need to explore why fisher household assets do not translate into less severe coping mechanisms.

Acknowledgments This paper is based on data collected for a panel survey conducted as part of the research portfolio of the Sustainable Livelihoods Research Consortium, a six year DFID funded programme, led by the Overseas Development Institute in London, working with organisations in seven conflict affected countries in Asia and Africa. We gratefully acknowledge the editing and reviewing support provided by Priyanthi Fernando, Roshni Alles and K Romeshun, the analysis support provided by Pulasthi Amerasekera and Secure Livelihoods Research Consortium for providing us with the data set to base this paper on.

References

Acheson JM (2000) With blinders and hobbles: management of the Maine lobster industry. In: Durrenberger EP, King TD (eds) State and community in fisheries management: power, policy, and practice. Bergin & Garvey, Westport, pp 151–168

Adger WN (1998). Indicators of social and economic vulnerability to climate change in Vietnam. East Anglia: University of East

Anglia, Centre for Social and Economic Research on the Global Environment. CSERGE Working Paper 02/98
Allison E, Ellis F (2001) The livelihoods approach and management of small-scale fisheries. Mar Policy 25:377–388
Amarasinghe O, Bavinck M (2011). Building resilience: fisheries cooperatives in southern Sri Lanka. In: Poverty mosaics: realities and prospects in small-scale fisheries. Springer, Netherlands, pp 383–406
Apostle R, Barrett G, Holm P, Jentoft S, Mazany L, McCay B, Mikalsen KH (1998) Community, state and market on the North Atlantic rim: challenges to modernity in the fisheries. University of Toronto Press, Toronto
Arunatilake N, Jayasuriya S, Kelegama S (2001) The economic cost of the war in Sri Lanka. World Dev 29(9):1483–1500
Berkvens RJ (1997). Backing two horses: interaction of agricultural and non-agricultural household activities in a Zimbabwean communal area. Working paper, vol 24, African Studies Centre, Leiden
Blaikie PM, Cannon T, Davis I, Wisner B (1994) At risk: natural hazards, people's vulnerability and disasters. Routledge, London, New York
Brookfield K, Gray T, Hatchard J (2005) The concept of fisheries-dependent communities: a comparative analysis of four UK case studies: Shetland, Peterhead, North Shields and Lowestoft. Fish Res 72(1):55–69
Brück T (2003). Coping strategies in post-war rural Mozambique. DIW Discussion Papers, (384)
Bryceson DF (1999) African rural labour, income diversification & livelihood approaches: a long-term development perspective. Rev Afr Polit Econ 26(80):171–189
Chambers R (1989) Editorial introduction: vulnerability, coping and policy. IDS Bull 20(2):1–7
Chaudhuri S (2003) Assessing household vulnerability to poverty: concepts, empirical methods and illustrative examples. Columbia University, Mimeo
Clark WC, Parson EA (2000). Assessing vulnerability to global environmental risks. Belfer Center for Science and International Affairs, John F. Kennedy School of Government, Harvard University
Clay PM, Olson J (2008) Defining 'Fishing Communities': vulnerability and the Magnuson-Stevens Fishery Conservation and Management Act. Hum Ecol Rev 15(2):143
Collier P, Gunning JW (1999) Explaining African economic performance. J Econ Lit 37(1):64–111
Corbett J (1988) Famine and household coping strategies. World Dev 16(9):1099–1112
Cutler P (1986) The response to drought of Beja famine refugees in Sudan. Disasters 10(3):181–188
Davies S (1993) Are coping strategies a cop out?. IDS Bull 24(4):60–72
Davies S, Hossain N (1997) Livelihood adaptation, public action and civil society: a review of the literature. Institute of Development Studies, Brighton
Dercon S (2002) Income risk, coping strategies, and safety nets. World Bank Res Obs 17(2):141–166
Dercon S, Krishnan P (1996) Income portfolios in rural Ethiopia and Tanzania: choices and constraints. J Dev Stud 32(6):850–875
De Waal A, El Amin M (1986) Survival in Northern Darfur 1985–1986. Report, Save the Children Fund, Nyala, Sudan
Ellis F (1998) Household strategies and rural livelihood diversification. J Dev Stud 35(1):1–38
Evans HE, Ngau P (1991) Rural-urban relations, household income diversification and agricultural productivity. Dev Change 22(3):519–545
FAO (2004) The state of the world's fisheries and aquaculture. FAO Fisheries, Rome
Frankenberger TR, Goldstein (1990) 'Food security, coping strategies and environmental degradation', Arid lands newsletter, vol 30. Office of Arid Lands Studies, University of Arizona, Tucson, pp 21–27
Frerks G (2010). Principles ignored and lessons unlearned, a disaster studies perspective on the tsunami experience in Sri Lanka. In: McGilvray DB, Gamburd MR (eds) Tsunami recovery in Sri Lanka. Ethnic and regional dimensions. Routledge, London, New York, pp 143–162
Heinz Foundation (2000). Fishing grounds: defining a new era for American fisheries management. Report of the H. John Heinz III Center for Science, Economics and the Environment. Island Press, Washington
Holzmann R, Jørgensen S (2001) Social risk management: a new conceptual framework for social protection and beyond. Int Tax Public Finance 8:529–556
Islam MM (2011). Living on the margin: the poverty-vulnerability Nexus in the small-scale fisheries of Bangladesh. In: Poverty mosaics: realities and prospects in small-scale fisheries. Springer, Netherlands, pp 71–95
Islam MM, Sallu S, Hubacek K, Paavola J (2014) Vulnerability of fishery-based livelihoods to the impacts of climate variability and change: insights from coastal Bangladesh. Reg Environ Change 14(1):281–294
Jaspars S, O'Callaghan S (2010) Challenging choices: protection and livelihoods in conflict. Overseas Development Institute (ODI), London
Johnson JC, Orbach MK (1990) A fishery in transition: the impact of urbanization on Florida's spiny lobster fishery. City Soc 4(1):88–104
Korf B (2002). Rural livelihoods at risk: land use and coping strategies of war-affected communities in Sri Lanka. In: Deutscher Tropentag pp 9–11
Korf B (2003) The Commons at War: Fuzzy property rights and ethnicised entitlements in Sri Lanka. Common places and comparisons. Paper presented at the politics of the commons: articulating development and strengthening local practices, Chiang Mai, Thailand, 11–14 July 2003
Lokuge G, Munas M (2012) Survival of small-scale fisheries in the post-war context in Sri Lanka. In: Chuenpagdee R (ed) World small-scale fisheries contemporary vision. Eburon Academic Publishers, Eburon Delft, pp 39–50
Maxwell DG (1996) Measuring food insecurity: the frequency and severity of "coping strategies". Food Policy 21(3):291–303
McGoodwin JR (1990) Crisis in the world's fisheries: people, problems, and policies. Stanford University Press, Stanford
Ministry of Economic Development, HARTI, World Food Programme (2011). Food Security in Northern, Eastern and North Central Provinces, A Food Security Assessment Report
Morais N, Ahmed MM (2010) Sustaining livelihoods in complex emergencies: experiences of Sri Lanka. Dev Pract 20(1):5–17
Morris S, Carletto C, Hoddinott J, Christiaensen LJ (2000) Validity of rapid estimates of household wealth and income for health surveys in rural Africa. J Epidemiol Commun Health 54:381–387
Newman C, Canagarajah S, (1999) Non-farm employment, poverty, and gender linkages: evidence from Ghana and Uganda. Working Draft, World Bank, Washington
Petersson A, Nanayakkara L, Kumarasiri RHWA, Liyanapathirana R (2011) Food Security in the Northern, Eastern and North Central Provinces A Food Security Assessment Report Sri Lanka, April 2011. United Nations World Food Programme (WFP), the Ministry of Economic Development (MED) and Hector Kobbekaduwa Agrarian Research and Training Institute (HARTI). Colombo
Pomeroy RS, Ratner BD, Hall SJ, Pimoljinda J, Vivekanandan V (2006) Coping with disaster: rehabilitating coastal livelihoods and communities. Mar Policy 30(6):786–793

Rashid DA, Langworthy M, Aradhyula SV (2006) Livelihood shocks and coping strategies: an empirical study of Bangladesh households. In: A paper presented at the American Agricultural Economics Association Annual Meeting, Long Beach, California, July, pp 23–26

Reardon T (1997) Using evidence of household income diversification to inform study of the rural nonfarm labour market in Africa. World Dev 25(5):735–747

Salmi P (2005) Rural pluriactivity as a coping strategy in small-scale fisheries. Sociol Rural 45(1–2):22–36

Sen A (1981) Poverty and famines: an essay on entitlement and deprivation. Oxford University Press, Oxford

Smith DR, Gordon A, Meadows K, Zwick K (2001) Livelihood diversification in Uganda: patterns and determinants of change across two rural districts. Food Policy 26(4):421–435

Stites E, Akabwi D (2009) Changing roles, shifting risks: livelihoods impacts on disarmament in Karamoja, Uganda, Feinstein International Center

Thorpe A, Andrew N, Allison E (2007) Fisheries and poverty reduction. CAB Rev Perspect Agric Vet Sci Nutr Nat Resour 2(85):2–12

Thywissen K (2006) Glossary of core terms of disaster risk management. In: Birkmann J (ed) Measuring vulnerability to hazards of natural origin. United Nations University Press, Tokyo, pp 448–486

UNDP (2004) Reducing disaster risk: a challenge for development. United Nations Development Programme, New York

Vogel C (2001) Vulnerability and global environmental change. Stockholm, 17–19 May 2001. University of the Witwatersrand, Johannesburg

Watts M (1983) Silent violence, food, famine and peasantry in northern Nigeria. University of California Press, Berkeley

World Bank (2011) Measuring vulnerability [online]. http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTPOVERTY/EXTPA/0,,contentMDK:20238993~menuPK:492141~pagePK:148956~piPK:216618~theSitePK:430367,00.html. Accessed 15 May 2012

Web-based sources

Department of Census and Statistics (2013). http://www.statistics.gov.lk/DistrictStatHBook.asp. Accessed 25 Nov 2013

Ministry of Resettlement (2013). http://www.resettlementmin.gov.lk/idps-statistics. Accessed 2 Aug 2013