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Market engagement and food insecurity after a climatic hazard

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ABSTRACT

This paper conducts a systematic realist review to examine how market engagement interacts with vulnerability to food insecurity after a climatic hazard event, focusing on rural areas of the developing world. It examines who is able to engage in the market after a climatic hazard and the barriers and opportunities that this engagement presents to food security. In the review, households were less able to effectively engage in the market to maintain food security when they had limited pre-hazard resources and/or were unable to mobilize these resources due to the biophysical and socioeconomic context following the climatic event. It is important to consider the volition behind market engagement after a climatic hazard and the consequences of using the market to maintain food security.

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1. Introduction

Climatic hazards, including droughts, floods, and severe storms, can threaten both the biophysical and socioeconomic dimensions of food security by damaging food production and physical assets and/or exacerbating the pre-existing socioeconomic conditions that determine food access and availability (FAO, 2009). This may create famine in some households while creating opportunities for others, depending on the nature of the hazard and household characteristics (Eakin, 2005; Kronik and Verner, 2010; Eriksen and Silva, 2009; Brahmi and Poupphone, 2002; Carter and Barrett, 2006; Watts and Bohle, 1993; Ford, 2009; Sen, 1981).

Several studies have shown that the ability to engage effectively in the market following a shock differs between households and over time (Corbett, 1988; Ellis, 2000; Niehof, 2004; Devereux, 2007). The household's decision to sell physical assets (e.g. livestock, tools, equipment, etc.) in the market considers not only the immediate market value, but also risk perception, feasibility and the opportunity costs of the sale in the short- and long-term (Devereux, 1993; Owens et al., 2003; Baulch and Hoddinott, 2000). Initial household assets, social connections, institutional dynamics, the nature of the climatic event, and other contextual factors strongly influence the market strategies that are available and effective for poorer households (Devereux and Sabates-Wheeler, 2007; Eakin, 2005; Sabates-Wheeler and Devereux, 2007; Baulch and Hoddinott, 2000; Owens et al., 2003). Whereas better-off

households have the physical assets and social connections to use market engagement as a profitable risk-management strategy, post-shock market engagement among poorer households more commonly reflects a "last resort" involuntary coping response to a crisis situation (Ellis, 2000). The literature has also discussed how market engagement follows sequential phases. Households will initially attempt to utilize market transactions to expand and secure future livelihood capacity. When the crisis intensifies and/or endures, households may be forced to draw down on livelihood assets in order to survive (Corbett, 1988; Ellis, 2000; Niehof, 2004). These desperation sales often receive low prices and can seriously impair future livelihoods and household well-being (Devereux, 2001; Longhurst, 1986). Studies have shown that households on the threshold of poverty may seek to protect future welfare by modifying food consumption and/or borrowing over selling assets that might affect future livelihoods (Devereux, 1993; Harrower and Hoddinott, 2004; Hoddinott, 2006; Zimmerman and Carter, 2003). However, reducing consumption and/or borrowing may be insufficient under certain post-shock conditions and poor households may still need to draw down on physical assets, yet under unfavorable market conditions (Corbett, 1988; Eriksen and Silva, 2009).

The capacity of a household to cope with a shock has typically been discussed in the literature concerning poverty reduction and how to support poor households following a shock. Devereux and Sabates-Wheeler (2007) classify the poverty reduction literature as "instrumentalist", which examine the risk environment, economic growth, and efficiency in determining coping mechanisms, and "activist", which places a greater emphasis on structural determinants of poverty, livelihood security, and equity. Whereas instrumentalist approaches often use econometrics to quantify

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and model asset-based poverty traps, activist studies tend to employ a combination of quantitative and qualitative methods. Although these approaches have different causal interpretations and policy recommendations for rural vulnerability to shocks, both discuss the circumstances under which households cope with a climatic hazard by drawing down on a combination of nutritional, physical, financial, and social assets (Devereux, 1993; FAO, 2009; Hoddinott, 2006; Carter and Barret, 2006; Sabates-Wheeler and Devereux, 2007; Baulch and Hoddinott, 2000; Owens et al., 2003).

Despite the development of these topics in instrumentalist and activist literature, there has been little research that combines the findings of both study types (Devereux and Sabates-Wheeler, 2007), and to our knowledge no studies have systematically examined the literature to compare the food security implications of post-hazard market engagement across regions. In light of this gap, this study draws from both instrumentalist and activist studies to systematically review how market engagement interacts with vulnerability to food insecurity after a climatic hazard event. It examines who is able to engage in the market after a climatic hazard and the barriers and opportunities that this engagement presents to food security in the short- and long-term, drawing upon research focusing on rural areas in developing nations. Specifically we examine market transactions involving the sale or purchase of agro-pastoral products and productive assets.

2. Review methodology

A systematic literature review consists of a rigorous and transparent methodological approach for selecting, critically appraising, and synthesizing the results of several studies. Largely developed and applied in a health context, and of particular use where studies report contradictory outcomes, systematic reviews are increasingly being applied to the environmental change field (e.g. Ford and Pearce, 2010; Petticrew and McCartney, 2011; Berrang-Ford et al., 2011; Ford et al., 2011; Ford, 2012). As an extension of a systematic review, a realist review seeks to attain an in-depth understanding of

the mechanisms producing study outcomes, placing emphasis on context in the synthesis of results (Pawson et al., 2005; DeBono et al., 2012; Greenhalgh et al., 2007). A realist approach is most appropriate for this work since the ways in which households are able to cope with a climatic hazard is highly dependent on how the event unfolds in a given context.

2.1. Search strategy

A key word string to locate articles focusing on climatic hazards, food security, household-level responses and market engagement was developed and informed by MEDLINE headings (see Table 1). A search was conducted using these terms in Web of Knowledge (WOK)—widely recognized as one of the most comprehensive and powerful search engines (Jasco, 2005; Falagas et al., 2007)—which yielded 546 initial results. After screening results for relevance and applying inclusion/exclusion criteria (see Table 2; Supplementary material 1), 123 articles were selected for abstract review, of which 15 met the inclusion criteria and were included for full-text review. Forward and backward citation tracking were used to identify six additional articles that met inclusion criteria and were incorporated into the review (see Fig. 1; see Table 3).

2.2. Data analysis

Data was entered into Microsoft Access and analyzed using a codebook, whereby each article was coded according to biophysical and socioeconomic context, the impact of the climatic hazard event on food systems activities, food security before, during and after the climatic hazard, types of market engagement, who was able to engage in the market, and the effectiveness of market engagement, as well as alternative coping strategies used. Consistent with other realist reviews with a small sample of publications to examine (e.g. Thompson et al., 2010; Lehti et al., 2009), qualitative techniques were favored in the analysis.

Table 1

Keyword search terms (based off of MEDLINE's categories and pilot searches; used in Web of knowledge).

Keyword search terms
Flood* OR drought* OR "extreme weather" OR "climat* hazard" OR natural SAME disaster* OR precipitation OR rain OR temperature OR hurricane AND
Food SAME security OR food OR famine OR shortage OR food SAME crisis OR food SAME supply OR food SAME insecurity OR agricultur* OR livestock OR nutrition* AND
Farmer* OR smallholder OR household OR village OR community OR population* OR people* OR livelihood* AND
Coping OR recovery OR relief OR adapt* OR vulnerab* OR response* OR disaster SAME management OR hazard SAME management OR resilience AND
Market OR income OR employment OR entrepreneurship OR small business OR "forest-product sale" OR sale OR asset* OR microfinance OR financ* OR risk SAME management

Table 2

Inclusion and exclusion criteria.

Inclusion	Exclusion
Climatic hazards (specific events)	Climatic hazards that are wider trends, projections of the future, or occurred in the distant past (pre-1950)
Food security focus	Food security not discussed in detail
Developing countries	Developed countries
Rural setting	Urban/peri-urban setting
Household as unit of analysis	Analysis done above/below household level
English articles	Non-English articles
Peer-reviewed articles	Non-peer reviewed articles
Articles since 2002	Articles older than 2002

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