Socio-Economic Impacts on Social Vulnerability: 
Studies of a Zambian village

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Abstract Vulnerability and resilience are useful and fertile concepts for understanding social and ecological systems. However, because these concepts are value-laden and difficult to measure, they are perceived as challenging not only in the practical domain, but also theoretically. One of these challenges pertains to the insistence of some geographers that as scale-dependent concepts, vulnerability and resilience should be conceived in relation to a specific area. Endorsing this view, we present a series of studies of one area as an example that will contribute to a better understanding of vulnerability and resilience. In these studies, we have focused on a single rural society in Zambia in which we have had longstanding research experience extending from 1992 to 2011. This long-term field experience enables us to analyze historically contingent changes in human-environmental relations, revealing wide ranging and frequently interconnected factors that have influenced changes in the vulnerability of small-scale farmers in this area.

Keywords Vulnerability, resilience, Zambia, political ecology, small-scale farmers

1. Introduction

In this series of studies, we focus on the increased vulnerability of small-scale farmers in Zambia as illustrated in a rural society in the country’s Central Province.

Vulnerability, defined as “defencelessness, insecurity and exposure to risk, shocks and stress” (Chambers, 1989: 1), has been a key concept since the 1970s, particularly within the field of “Third World” political ecology (Blaikie, 1985; Blaikie and Brookfield, 1987; Bryant, 1977; Watts, 1983; Watts and Bohle, 1993). Political ecologists have linked local social oppression and environmental degradation to wider socio-political and economic concerns. Specifically within the scholarship on hazards, vulnerability has emerged as an essential component to which geographers have made significant conceptual and methodological contributions, (Bohl et al., 1994; Cutter, 1996; Kasperson and Kasperson, 2001; Mortimore, 2005; Peet and Watts 1993).

Political ecologists perceive natural hazards as a trigger for disaster, the underlying causes of which can be found in the vulnerability of individuals or communities. This perception has advanced the study of the social construction of vulnerability. This focuses on a social construct
that influences the ability of individuals or communities to cope with external stresses. Watts and Bohle (1993) have identified two aspects of vulnerability: external and internal. The external aspect of vulnerability entails exposure to risk, and the internal aspect entails an incapacity to cope with trigger events and limited potential to recover from difficulties.

In the development of vulnerability research, the term “resilience” has emerged as a concept that is both attractive and challenging for the study of society–nature relations. Resilience is viewed as the capacity to bounce back to a normal state after a crisis (Van der Geest, 2004: 18). A high resilience level is linked to security and a low resilience level is conversely linked to vulnerability. Weichselgartner and Kelman (2014: 1) write: “‘resilience’ has been replacing ‘vulnerability’ and ‘sustainability’ as a currency in academic and policy discourses and as a guiding principle in development planning.” However, the value-laden character of resilience studies poses a challenge. Resilience thinking is apt to adhere to or be captured within theories about ideal societies. Specifically, if we reject a simple equilibrium model of resilience, we will inevitably face the question of determining what the desirable state to revert to is after a crisis (or experience of vulnerability). Some scholars suggest that resilience theory has a less normative element than vulnerability thinking (Turner 2013: 620). However, as Cote and Nightingale (2012: 484-485) point out, resilience thinking has a more value-laden framing. When we discuss resilience, we have to ask ourselves whose environments and livelihoods do we seek to protect and why.

Vulnerability also has power-laden characteristics. It is, therefore, important that when we choose factors to enable us to analyze vulnerability, we draw attention to those that are more tangible. However, it is especially important when studying vulnerability that we are conscious of our own power-laden or value-laden characteristics. This is inseparably related to the measurement of vulnerability.

Many scholars have argued that measurements of vulnerability and resilience are profoundly difficult in the context of constant transformations of complex social-ecological systems. Different approaches and perspectives evidently lead to different conclusions about the same systems (Resilience, 2007: 5). Thus, to avoid hasty formalization of measurements, we require additional explanatory social theories as well as methodologies for measuring vulnerability and resilience. Weichselgertner and Kelman (2014: 1) argue that it is very important to look beyond the quantitative streamlining of resilience into one all-encompassing index.

Many geographers have insisted that vulnerability and resilience depend on scale. They have also pointed out that the concepts of vulnerability and resilience should be conceived in relation to a specific area or geographic domain (Cutter, 1996). However, there has been less agreement on which scale is important. Endorsing the view that a scale sensitive approach is vitally important for the study of vulnerability, we present an example in this series of studies which will contribute to the measurement of vulnerability and resilience.

In these studies, we have focused on a single
rural society in Zambia in which we have had longstanding research experience since the 1990s. This long-term field experience in a specific region enables us to study historically contingent changes in human-environmental relations.

2. Some features of the study area

One of the features of our research site that attracted us at the outset of our field studies in 1992 was the innovative utilization of *dambo* (wetlands) for agriculture and small-scale irrigation by small farmers (Shimada, 1995). As shown in the Fig. 1, our study area locates at approximately 90 km north of Lusaka. That is the head-ward area of one of tributary of river Zambezi which is blessed with headwater *dambo* (Fig. 2). (See photograph 1 which shows panoramic view of one of *dambo* in the Fig. 2)

While wetland management has been one of the most controversial issues in the field of development and environmental protection, sustainable use of wetlands for agriculture and livelihoods in rural Africa has recently emerged as an area of interest among scholars and development practitioners.

In a pioneering contribution, Wood, Dixon and McCartney (2013) have criticized the conventional perspective that views agriculture simply as a threat and disregards its important contribution to livelihoods. Drawing on nine empirical studies, they advocate approaches that recognize the critical role of wetlands in supporting peoples’ livelihoods. In light of the tremendous increase in the use of wetlands for agriculture in recent years, they argue that wetlands have become a “new agricultural frontier” in Africa (Wood, Dixon and McCartney, 2013 : 8).

We concur with Wood, Dixon and McCartney (2013) on the importance of wetlands for agriculture and livelihoods, and with their advocacy of a more people-centered approach. Our series of studies also emphasizes the changing and sometimes deepening vulnerability entailed in small farmers’ adaptations to rapidly changing socio-economic and ecological environments, including innovative uses of wetlands.

Wood, Dixon and McCartney (2013) offer
diverse reasons for the development and use of wetlands, ranging from environmental/ecological reasons to economic and technological ones. Our case studies of a Zambian village also reveal wide ranging and frequently interconnected factors that influenced how farmers developed and changed the use of wetlands as well as uplands and forests. We trace how people’s responses to the combined effects of population growth, land disputes, shortages, and increased prices of fertilizers under structural adjustment programs, as well as political liberalization, have led to rapid expansion of vegetable production in wetlands. Moreover, these responses have led to the spontaneous opening up of the forest reserve adjacent to the village, resulting in the migration of some villagers into this forest area.

Our studies further emphasize that technological factors such as the introduction of treadle and engine pumps, together with the expansion of vegetable production in wetlands are likely to result in reduced ground water availability, especially during years of drought. We specifically show how the introduction of pumps was related to village micro-politics involving new actors such as development NGOs and agribusinesses, as well as “old” actors such as traditional authorities who would benefit from the new technologies.

3. Geography and History of the Study Area

All three papers presented in this series are based on field studies conducted in village “C” from 1992 to 2011. A brief description of the geographical setting and history of the village are given below.

3.1. Location and physical environment

Village C is located approximately 90 km north of Lusaka, close to the national highway that runs from Lusaka to Kapiri Mposhi (see Fig. 1). This highway connects the Copperbelt and Lusaka and continues further south. It takes approximately 1 hour to drive to Lusaka from the highway junction to the village. The feeder road from the highway junction to the village is not paved, and it takes about 30 minutes using an animal-drawn “Scotch cart” or 10 minutes by car to reach the village center. During the rainy season, some portions of this road can be difficult to traverse.

To the north of the village, there is a rocky mountain at a height of over 1300 m, and to the east is a forest reserve (see Fig. 2). Although the area is still officially designated as a Forest Reserve, it was extensively cleared and opened up to provide farmland in 2000. While the occurrence of natural vegetation (miombo forest) has become rare in the village, it can still be seen in the reserve.

The average annual rainfall is 900 mm, but the actual amount of rain fluctuates widely. The rainy season starts in November and ends in April in normal year, but this also vary considerably year by year. The area experienced drought during the rainy seasons of 1993-1994, 1999-2000, 2003-2004, and 2004-2005, and heavy rain during the 1994-1995, 2000-2001, and 2001-2002 seasons.

3.2. A short history of the village

The land belonging to village C was granted by Chief Liteta to the first headman, C-1, in the 1970s. Since the area was covered by miombo forest, C-1 and his eldest son lived along the
trunk road in a small settlement that later developed into a market center. C-1 and his son C-2 sent a charcoal maker of Tanzanian origin, who was one of the original members of village C, to clear the forest for them. In the mid-1970s, C-1 and C-2 settled in the present village area, together with some of their family members and relatives. Some Tonga and Lenje families also settled there around the same time. The land south of the village was inhabited by a Shona farmer, while the boundary between the village and the neighboring village to the north was demarcated before 1983. Around 1980, some Shona villagers who had settled in the adjacent protected forest shifted to the village when they were evicted by the Forest Department. Thus, from its early history, the village was composed of a variety of ethnic groups.

According to data collected for 120 households that were surveyed during three rounds of field research conducted in August 1992, August 1993, and September 1994, all the interviewed household heads and their wives were born outside of the village. Of the 120 household heads and 121 wives interviewed, 45 household heads and 64 wives reported that they came to the village after 1989. The birth places of the respondents were distributed all over the country with the exception of the North-Western and Luapula Provinces. Moreover, a total of 28 of the respondents were born outside of Zambia.

4. Lineup of papers

The first paper, contributed by Shiro Kodamaya, discusses the development of dry season irrigation farming in the village. Kodamaya first reviews government agricultural policies in Zambia since the 1960s, which have substantially influenced farming in the village. He then sheds new light on the ongoing discussion on the positive effects of irrigation systems on the use of improved maize seeds and fertilizer. Kodamaya’s findings are that “Green Revolution” types of innovations have been partially realized in the village, but that these have expanded income disparities among farmers. Consequently, farmers’ reliance on subsidized inputs has increased, which has brought about a new type of vulnerability.

The second paper, contributed by Kazuo Hanzawa, discusses significant changes in agricultural production in the village. The boom in the Zambian economy since 2000, caused by the high price of copper and implementation of the “New Deal Policy” by President Muwanawasa, has provided a substantial amount of subsidized and affordable inputs for small-scale farmers. Many farmers have started to purchase motorized pumps in addition to fertilizers, seeds, and chemicals, and they have attained high rates of economic growth. However, Hanzawa’s findings suggest a strong possibility that this high cost agricultural production may increase the vulnerability of some farmers who cannot afford to pay for these costs.

The third and final paper, contributed by Shuhei Shimada, discusses changes in the vulnerability of households within the village. Shimada examines factors that have influenced vulnerability by analyzing consecutive socio-economic changes and what consequently happened in the village. He shows that while farmers’ vulnerability increased during the first half of the previous
decade from 2000 to 2010, it decreased during the second half of that decade. Shimada’s analysis draws attention to the intricate and multi-faceted nature of vulnerability.

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References

Blaikie, P. (1985): The political economy of soil erosion in developing countries. London: Longman.
Blaikie, P. and Brookfield, H. (1987): Land degradation and society. London: Methuen.
Blaikie, P., T. Cannon, I. Davis and B. Wisner (1994): At risk: Natural hazards, people’s vulnerability, and disasters. London: Routledge.
Bohle, Hans G., Downing, T.E. and Watts, M.J. (1994): Climate Change and Social Vulnerability: Toward a Sociology and Geography of Food Insecurity. Global Environmental Change 1994(4): 37-48.
Bryant, R.L. and Bailey, S. (1977): Third world political ecology. London: Routledge.
Chambers, R. (1989): Editorial Introduction: Vulnerability, coping and policy. I.D.S. Bulletin 20(2): 1-7.
Cote, M. and Nightingale, A.J. (2012): Resilience thinking meets social theory: Situating social change in socio-ecological systems (SES) research. Progress in Human Geography 36(4): 475-489.
Cutter, Susan L. (1996): Vulnerability to environmental hazards. Progress in Human Geography 20(4): 529-539.
Kaspersson, R.E. and Kaspersson, J.X. (2001): Climate change, vulnerability, and social justice. Stockholm: Environment Institute.
Mortimore, M. (2005): Social resilience in African dryland livelihoods: Deriving lessons for policy. In: Gausset, Q., Whyte, M.A. and Birch-Thomsen, T. eds Beyond territory and scarcity: Exploring conflicts over natural resource management. Uppsala: Nordiska Africainstitutet, 46-69.
Peet, R. and Watts, M. (1993): Introduction: development theory and environment in an age of market triumphalism. Economic Geography 69: 227-253.
Resilience and realities and research in African environments (Report of workshop 18 June 2007) (2007): Oxford: University of Oxford.
Shimada, S. ed. (1995): Agricultural production and environmental change of Dambo. Sendai: Institute of Geography, Faculty of Science, Tohoku University.
Turner, M.D. (2013): Political ecology I: An alliance with resilience? Progress in Human Geography 38(4): 616-623.
Van der Geest, K. (2004): We’re managing!: Climate change and livelihood vulnerability in Northwest Ghana. African Studies Centre, Research Report 74. Leiden: African Study Centre, Leiden University.
Watts, M. (1983): Silent violence: Food, famine and peasantry in Northern Nigeria. Berkeley: Univ. of California Press.
Watts, M.J. and Bohle, Hans G. (1993): The space of vulnerability: The causal structure of hunger and famine. Progress in Human Geography 17(1): 43-67.
Weichselgartner, J. and Kelman, I. (2014): Geographies of resilience: Challenges and opportunities of a descriptive concept. Progress in Human Geography (downloaded on August 18, 2014 from http://phg.sagepub.com/)
Wood, A., Dixon, A. and McCartney, M. eds. (2013): Wetland Management and Sustainable Livelihoods in Africa. London: Routledge.

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Photo 1  A scenery of a *dambo* in the village. People used the *dambo* for vegetable cultivation in dry season (July 1995, Shimada).

Photo 2  Irrigation by small engine pump (August 2008, Hanzawa)

Photo 3  New engine pump for irrigation (September 2010, Hanzawa)

Photo 4  Treadle pump (August 2002, Hanzawa)

Photo 5  Barrage for small irrigation (August 2010, Hanzawa)

Photo 6  Irrigation for tomato garden (August 2008, Hanzawa)

Photo 7  Small scale Irrigation introduced in 2001 (Shimada)

Photo 8  Maize cultivation in rainy season: Most of adult members in an extend family will join (Shimada)
社会の脆弱性に対する社会経済的影響：ザンビアの一農村の研究から

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脆弱性（vulnerability）やレジリエンス（resilience）は、社会・生態システムの理解にとって有効で且つ豊かな可能性をもつ概念である。しかしながら、それらが価値依存的概念であるという性格をもち、さらに計測することが容易ではないことから、開発援助といった実践レベルでも理論レベルでも検討すべき点が多いことが指摘されている。検討すべき問題点の1つに地域スケールの問題がある。地理学者やポリティカル・エコロジー論者の中には、脆弱性やレジリエンス概念はすぐれて地域スケールに依存する概念であり、特定の地域に限定して理解される必要があることを強調する研究者が少なくない。我々もこのような見方にたち、以下の論文では1つの地域の事例を示すことで、脆弱性とレジリエンスについて考えてみることにした。焦点をあてたのは、1992年から2011年にわたり現地調査を行ったザンビアの1農村である。長期の現地調査によりこの地域の人間・環境関係の歴史的変化を検討し、小規模農民の脆弱性に影響を与えている多様でしばしば相互に関連する諸要因に関する分析を行った。

キーワード：脆弱性、レジリエンス、ザンビア、ポリティカル・エコロジー、小規模農民

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