

CHAPTER 1

INTRODUCTION

Conflict and Environment in North Lebanon: Vulnerability in a Volatile Socio-Political Context

Irna van der Molen and Nora Stel

Abstract: This chapter constitutes the introduction to our edited volume. It offers an overarching conceptual framework on vulnerability revolving around the notions of exposure, sensitivity and resilience. Drawing out the overlaps and tensions between the various chapters making up the book, this chapter provides a tentative conceptual linkage between vulnerability and political economy, asking where and how political fragility and institutional hybridity affect vulnerability.

Keywords: Conflict, environment, vulnerability, political economy

1. WHAT IS AT STAKE? ISSUES AND CONCEPTS

Conflict and the natural environment are closely linked. Homer-Dixon's work (1994, 2001) has been instrumental in staging a lively academic debate on the question whether, to what extent, under what conditions and in what way(s) natural resource scarcity contributes to armed conflict. The discourse on the relation between environment and war, or environment and security, has been further added to by studies on the 'resource curse', where the abundance and lootability of natural or mineral

resources were said to cause conflict, rather than its scarcity (LeBillon, 2001, 2012; Bannon and Collier, 2003; Collier, 2010).

Lebanon's recent history and current socio-political climate are volatile and conflict-ridden. The 1975-1990 Civil War left many scars and the 'post-war' period has been characterized by an almost ceaseless sequence of clashes, attacks, assassinations and bombings. North Lebanon has known its own trajectory of conflict, including the infamous clashes between the Lebanese Armed Forces (LAF) and militants in the Nahr al-Bared Palestinian refugee camp in 2007 and the recent sectarian clashes in Tripoli flaring up as a proxy to the Syrian war.¹ These violent conflicts have left their marks in various ways, ranging from psychological trauma (Gannagé, 2012a, 2012b; Khamis, 2012), social fragmentation (Choueiri, 2007) and economic deprivation (Salti and Chabaan, 2010; Acra and Acra, 2006) to political marginalization (Volk, 2009).

Less well-known, but certainly not less substantial, have been the effects of armed conflicts on North Lebanon's natural environment. These effects are often direct, as is the case with, for instance, war-related debris, coastal and groundwater contamination as well as land pollution as a result from oil spills after the Israeli War on Lebanon in 2006. Other direct impacts were land degradation, people's displacement, and major infrastructural damage. Apart from such direct environmental damage, Lebanon's repeated episodes of violence² have had a more indirect effect on the natural environment as well. Repeated

¹ In the empirical chapters, the authors specifically focus on three episodes of violent conflict: Israel's 1982 invasion of Lebanon; the 2006 War between Israel War on Lebanon; and the 2007 Nahr al-Bared clashes.

² When we talk of 'repeated episodes of armed conflict', we refer to various episodes of conflicts of a different nature, not to a repetition of one conflict in the same area, with the same conflicting parties and about the same conflict issues.

episodes of armed conflict have affected the ways in which agriculture, fishery, industries, tourism and water and waste sectors are governed and regulated. Lack of regulation and enforcement results in soil erosion, depletion of underground water resources, pollution from pesticides, fertilizers and agricultural by-products and seawater contamination from unregulated industrial waste disposal (Integrated Management of East Mediterranean Coastlines Program (IMAC), 2007b).

In this book, we explore these direct and indirect impacts of violent conflict on North Lebanon's natural environment and their effects on the livelihoods of the population of North Lebanon. We do so through a series of stand-alone studies. All studies, however, draw on an analytical framework revolving around the concept of vulnerabilities, on which we further elaborate below. The starting point for the research program 'Conflict and Environment in North-Lebanon' has been the vulnerability framework by Turner et al. (2003:8075), without, however, the intention to "develop appropriate metrics and measures for assessments, models and tests", and without the illusion we would be able to quantify "the stochastic and non-linear elements operating on and within the coupled system."

When we define vulnerability as the susceptibility of particular communities or systems to specific risks and hazards (Turner et al., 2003),³ three components are essential in the analysis: *exposure* (the extent to which a human or biophysical system is confronted with the risk or hazard in question, here: violent conflict); *sensitivity* (the likely damage the conflict will do to these systems); and *resilience* (the coping or response

³ Turner et al. (2003:8074) define vulnerability as: "The degree to which a system, subsystem or system component is likely to experience harm due to exposure to a hazard, either a perturbation or stress/stressor." For an overview of different approaches, definitions and analytical frameworks of vulnerability, see Birkmann (2006) and Wisner et al. (2004).

mechanisms available to the systems to mitigate the impacts of conflict).

Although it seems difficult to measure *exposure* of an area to armed conflict, we argue that some areas in Lebanon were more affected by armed conflict than others, depending on the proximity to borders (with Syria, Israel); polarization among the population (resulting in sectarian violence), the history of violence in the area; the proximity to refugee camps – specifically the Nahr el-Bared camp in Tripoli and the Ain el-Hilweh camp in Saida, and the influx of refugees. Similarly, not all municipalities were equally *sensitive* to the damage that conflicts do to its population and the natural environment, including its resource-base.

Finally, *resilience* is – in this particular book – related to the capacity of citizens, households, and stakeholders in the public and private sector to cope, respond and adjust to the impacts of conflict on the natural environment and livelihoods. We add livelihoods, as these are intrinsically related to the natural environment, in particular among populations that are more vulnerable (more poverty-prone) than others. Poorer communities are not, by definition, more vulnerable to violent conflict in terms of exposure,⁴ but, without adequate facilities, services, human resources, and institutional capacity, they are less capable to cope with the environmental degradation that is the direct or indirect effect of these conflicts.

We explore various manifestations of resilience, that have developed in the absence of contingency planning, disaster management plans, emergency response mechanisms or government recognition of a population, or acknowledgement of

⁴ Although some commentators argue that North Lebanon's relative deprivation results in a relative over-representation of the region among recruits for both the LAF and non-state militias and terrorist cells.

an emergency situation.⁵ Resilience requires cooperation; moreover, it requires a minimum capacity to address the environmental degradation that has either emerged from the conflict(s) itself, or could flourish in the absence of governance structure.

The conflicts⁶ that took place in North Lebanon during the last four decades – from the Civil War, to the Nahr el-Bared crisis and the current ‘Syrian spill over’ – and their environmental consequences are intricately related to the fragile nature of Lebanon’s political system.⁷ In Lebanon, ‘vulnerability’ should therefore be positioned in the context of fragility of the political system. Lebanon’s consociational system constitutes a paradox. It is remarkably protracted on the one hand: the overarching logic of an elite bargain managing the distribution of state positions and resources has not been seriously challenged since Lebanon’s independence. On the other hand, however, the dynamics within this relatively constant system are distinctly volatile: the balance of power between the political leaders representing Lebanon’s various sectarian communities is unstable and intra- and inter-sectarian alliances are shifting constantly.

This instability of the inter-sectarian balance, ironically generated by the stability of the consociational system, is

⁵ Government support starts with recognition of the existing population and emergency situation. Some villages in North-Lebanon are not registered as municipality and therefore do not have access to regular services of local authorities. Some emergencies are not officially acknowledged as such.

⁶ We use the general term ‘armed conflicts’, since Lebanon has experienced a variety of conflicts: the Civil War, inter-state wars (Israel and Hezbollah); intra-state war (Lebanese Army- Fatah al-Islam in Nahr el Bared), and non-state wars (clashes between supporters of Syrian President Bashar al-Assad in the Alawite neighbourhood of Jebel Mohsen and opponents of the Syrian President Bashar al-Assad, in the Sunni district of Bab al-Tabbaneh in Tripoli). (Sarkees, 2010).

⁷ Fragility here should be dissociated from the normative connotations of the failed state paradigm.

intimately related to the conflicts in Lebanon. Consequently, in one of the chapters, we position our exploration of environmental and human vulnerability firmly in the context of political fragility. The coping capacity and resilience of communities is affected by: (i) the multiplicity of political authorities (state *and* non-state); (ii) a plurality of political institutions (de jure policies *and* de facto practices); and (iii) the before-mentioned dynamism of political structures (protracted sectarianism *and* changeable alliances). This has been conceptualized as ‘political hybrid order’ which is characterized by:

diverse and competing authority structures, sets of rules, logics of order, and claims to [that] power co-exist, overlap, and intertwine, combining elements of introduced Western models of governance and elements stemming from local indigenous traditions of governance (Boege et al., 2009:17).

Vulnerability, the overarching theme of this volume, is thus analysed from different perspectives in the various chapters. Yet, all chapters indicate that municipalities in North Lebanon have been differentially at risk to armed conflict (exposure); that the human and environmental conditions in North Lebanon are quite diverse, resulting in differential environmental and livelihood impacts (sensitivity); and that communities have different coping capacities and that resilient communities strongly rely on networks and cooperation (resilience). This reveals, clearly, that environmental degradation cannot and should not be attributed to armed conflict only. For example, the 2007 Israel-Lebanon war resulted in large oil spills due to the bombing of the oil plant in Jiyeh. Illegal oil spills from ships are, however, a continuous problem for the marine environment in North Lebanon.

Moreover, specific forms of environmental degradation are linked to recovery and economic growth, in other words to resilience. The built environment, for example, depends on large amounts of sand and stones from the quarry industry, which has

been documented of circumventing environmental regulations (Leenders, 2012). Vulnerability and resilience are, in other words, not easy to pinpoint to one community, or one hazard, and communities that have been vulnerable in one sense, have been resilient in another.

2. OUTLINE OF THE BOOK

We start this book with two review chapters, one focusing on vulnerability and the other conceptualizing resilience. These chapters discuss current theory, approaches, and concepts and identify gaps. These conceptual chapters (Chapters 2 and 3) will be then followed by a chapter describing the socio-economic, political, and bio-physical features of the case study area. Subsequently, we offer eight empirical chapters that follow the main themes of exposure, sensitivity, and resilience. In the final discussion, we return to theory, with the question how the application of vulnerability and resilience can be applied in a context of repeated episodes of armed conflict.

The empirical chapters are divided over three parts. Part one – encompassing Chapters 5, 6 and 7 – particularly focuses on exposure and sensitivity. Part two – consisting of Chapters 8 and 9 – deals predominantly with resilience at individual, community and municipal level. Part 3 – comprising Chapters 10 and 11 – looks at the international aspects of resilience and the choices that donors make in their allocation of aid.

2.1. Part One – Exposure and Sensitivity

In Chapter 5, we start with a historical overview of recent conflicts, which shows how particular areas in North-Lebanon have been more exposed to clashes and episodes of armed conflict than others due to its proximity with borders (Syria), the influx of refugees (Syrian, Palestinian); existence of Palestinian refugee

camps with their own governance system; and political polarization among the population, in particular in some neighbourhoods of Tripoli. Based on documentary analysis, we then examine the relations between armed conflict, degradation of land and changes in land use, both as a manifestation of, and in response to, biophysical and human vulnerability. To identify land degradation and analyze land use changes, we used an evaluation model based on satellite data. We also looked at other factors, such as artificialization of the coastline and increase in population. Based on our findings, we argue that, while armed conflict directly contributes to land degradation, it also changes the human system in ways that eventually result in further land degradation.

In Chapter 6, we explore the spatial variation of the impacts of conflict on the natural environment and peoples' livelihoods (sensitivity) and contrast potential exposure and sensitivity across different areas in North Lebanon's coastal zone. The mapping of spatial variation of 'sensitivity' was achieved through a combination of literature and document research, a survey of 500 interviews with citizens across all 24 municipalities of the coastal zone in North-Lebanon,⁸ and semi-structured in-depth interviews

⁸ The aim of the survey was to collect data that was not available in secondary literature, such as age, family size, education level, occupation, income per capita, membership of any organization or group, entitlement to land or resources (such as land and home ownership), informational assets (such as number of people connected to the internet and landlines, and the number of people with a mobile number and television), and material assets (such as type of lighting, sources of water, and type of health services).

The sample size was calculated using the formula $n = \frac{N}{1+N(e)^2}$ (Israel, 1992:4);

where n is equal to the sample size, N to the population size, and e to the level of precision which is equal to 10% for each region and 5% for the entire study area. The level of precision for the entire region was set as 5% for more precision. After calculating the number of questionnaires for each area, the number of questionnaires to be returned in each village or city was determined based on the population of each village and city as a proportion to the total population of each area. The participants were chosen based on simple random sampling. This approach was chosen for two main reasons. The first being the

with the heads of those municipalities and other stakeholders encompassing representatives of institutions that were involved in post-conflict interventions such as United Nations Development Program, Ministry of Environment, Ministry of Social Affairs, and Ministry of Agriculture. This resulted in a social vulnerability index.

Having explored the meaning and manifestation of both exposure and sensitivity in the preceding chapters, Chapter 7 tackles vulnerability in a comprehensive way by developing a nascent framework to measure the political components of exposure and sensitivity that builds on existing data from the Human Development Index (HDI). The chapter identifies and discusses the change in rankings of countries and governance indicators and critically explores the various indexes and calculations used in HDI rankings. We find that governance plays an important role in terms of enhancing or reducing human development and thereby vulnerability.

2.2. Part Two – Resilience

We devoted a number of chapters on resilience; resilience not only to the impacts of armed conflict on the natural environment as described above, but also to environmental problems that exist independent of armed conflict. We look at resilience at several levels: at the individual level, taking ‘agency’ and ‘opportunity structure’ as variables affecting ‘empowerment’ and involvement in decision-making processes at community level (Chapter 8) and at the municipal level, focusing on cooperation between citizens and municipalities (Chapter 9).

lack of official statistical reports providing detailed information about age, gender, education, etc. at the local level. The second was the complex nature of the population in Lebanon in general, and in the north in particular, which is characterized by diverse religious, political, and ideological affiliations. Before distributing the survey, a pilot test was carried out for acceptability and accuracy, and the questionnaire was subsequently adjusted as required.

In Chapter 8, we use the same dataset as in Chapter 6 to analyze how agency and opportunity structure have affected the empowerment of individuals in North Lebanon, and what this means for individuals participation in decision-making processes.⁹ For this, we use the analytical framework by Alsop et al. (2006).¹⁰ Empowerment can not only be considered as extension of agency. The factors that affect individuals' likelihood to be involved in decision-making at community level shows great variation; while the probability of their involvement increases in some

⁹ Additional focus groups were organized to gather data on indirect indicators of the opportunity structure and understand the relationship between citizens' agency and the opportunity structure, and its influence on the degree of empowerment.

¹⁰ In the survey, data on indirect indicators of agency and direct indicators of empowerment were collected from citizens. Indicators were selected from Alsop et al. (2006). Some of the indicators were adjusted to fit the context of the study site. To assess agency, asset endowments covering information, material, financial, organizational, psychological, and human assets were used as indicators. Information assets indicators were access to various sources of information such as television, internet, telephone, and mobile subscription. Materials assets indicators were home and land ownership. Financial assets indicators were occupation, income, and employment history. Organizational asset indicators were membership of organizations, effectiveness of organization, and benefits from organization membership. Psychological assets indicators were self-perceived exclusion from community activities and capacity to envisage change. Human assets indicators were education level, age, gender, marital status, and family size.

In addition, direct indicators of empowerment were measured in three domains: the state domain (with a focus on public service delivery), the market domain (with a focus on labour) and the society domain (with a focus on community). Indicators for the public services were: quality of public services used, percentage of individuals that complained about public services delivery, satisfaction with the outcome of a complaint, equitability in addressing needs and concerns, influence of political and religious characteristics on the authorities' treatment of people. Indicators for empowerment in the labour sub-domain, were: control over employment or occupation choices. To measure empowerment in the community sub-domain, indicators were: awareness of the main local public service decision-makers, involvement in community decision-making processes, aspiration to be more involved in community decision-making processes, and influence in community decision-making processes..

municipalities with the individual's level of education; in other municipalities it is correlated to gender, age and aspiration for life change. The willingness of citizens to participate in decision-making is dependent on whether they trust or distrust the outcomes of the decision-making process.

The influence of trust on citizen's willingness to cooperate with the authorities is again taken up in Chapter 9. Here we use the same survey data as in Chapters 6 and 8, but complemented these data with participatory data solicited through the Fuzzy Cognitive Mapping technique.¹¹ We look at the extent to which citizens themselves indicate their preparedness to comply with existing regulations and to volunteer for environmental management initiatives. Their cooperation is, amongst others, related to their trust in the functioning of government authorities, and directly touches upon the legitimacy of the fragile political system. The findings show a complex reality: while trust and cooperation, between citizens and stakeholders in the public and private sector are indeed important to jointly address

¹¹ This participatory data was collected from the stakeholders for the case study of solid waste management in Al-Fayhaa Union. The Fuzzy Cognitive Mapping (FCM) approach was described using an unrelated map representing a neutral problem domain. Participants represented stakeholders from the public sector (municipalities, municipality union, ministries, public institutes); the private sector (private companies; experts; academic and research centres; sectors that produce waste; and chambers and syndicates related to solid waste management); and grassroots NGOs. Each working group consisted of a maximum of six participants and one moderator to facilitate the exercise. Every working group was asked to draw a cognitive map to answer the following questions: What are the factors that affect or are affected by the solid waste management in Al-Fayhaa area? and How do these factors affect each other and what is the particular role of trust on these variables?

To analyze the five maps aggregated by the workshop participants according to graph theory, the maps were transformed into adjacency matrices attributing values between -1 and 1 to the strengths of relations as mentioned by participants (Özesmi and Özesmi, 2003) with 0 being the value of "no relation" (Elpiniki and Areti, 2012). These matrices were processed in the FCMapper Software Solution and the Fuzzy Cognitive Mapping Aggregator Vs 0.1 (Bachhofer and Wildenberg 2010. www.fcmappers.net).

environmental problems, trust and personal relations are also used to jointly circumvent existing environmental regulations. The natural resource base is so important for peoples' livelihoods, that the lack of capacity to address environmental degradation, is an important manifestation of limited resilience at municipal level.

2.3. Part Three – International Policy

In Chapter 10, we explore resilience at an international level, with specific attention for the role of aid in reconstruction, linking resilience to international policy. Based on a regression analysis of statistical data gathered from document databases, the chapter explicitly addresses both the contributions for aid and reconstruction in Lebanon,¹² and peoples' perceptions in the area, on the effectiveness of aid to areas that were affected by armed conflict.

In the final chapter, Chapter 11, we investigate the role of development aid in North Lebanon's post-war reconstructions and scrutinize the extent to which development aid to post-war reconstruction contributes to the region's coping capacity¹³ to address the environmental effects of conflict. We argue that political deliberations substantially shape donors' allocation considerations. To explore the perceptions of both recipients and donors, we used Q-methodology to analyze their discourses in use.¹⁴ These discourses were solicited in interviews with participants representing municipalities (recipients), non-

¹² No figures are available for North-Lebanon for longer periods of time.

¹³ One should question, though, to what extent donor aid has contributed to resilience. When the effects of donor aid are more structural (increasing the institutional capacity and human resources), one can answer this question positively. If, however, it results in donor dependency, it could achieve the opposite.

¹⁴ For a detailed description of the methodology see Takshe et al. (2010). The method combines both qualitative and quantitative techniques to extract discourses in as subjective way as possible by structuring of opinions, judgements and understandings of risk.

governmental organizations, research centres, United Nations specialized agencies (intermediaries), national and international donors, and ministries. The Q-methodology allows us to demonstrate that overseas development aid per capita in Lebanon is positively linked to not merely GDP per capita, but also to the occurrence of armed conflict, which highlights the importance of political factors in aid allocation. We thereby question dominant claims that development aid is predominantly dependent on socio-economic development considerations. Moreover, our findings show that political motivations for allocating development aid are skewed towards some concerns, while disregarding others. While the number and intensity of measured violent conflict decisively determine aid flows, other crucial concerns – such as perceived corruption – do not.

3. CONCEPTUAL CONTRIBUTIONS

Our point of departure with this book has been to critically explore the conflict-environment nexus with an empirical focus on North Lebanon. Our contributions to academic knowledge follow from this.

Empirically, we have put North Lebanon on the map as a region meriting analysis in its own right – in this case of its vulnerability to conflict-induced natural dangers. The North is Lebanon's socio-economically most marginalized region. As a consequence of Lebanon's preoccupation with its original heartland in Beirut and Mount Lebanon, moreover, the area is often treated as a political periphery as well. This lack of interest has for a long time manifested itself in a relatively low number of scholarly publications on with North Lebanon (as compared to the Mountain and the South).

Often discussing concrete case-studies, our chapters have made clear that, even within this one region, exposure, sensitivity

and resilience vary per community, depending on spatial and socio-economic features. The diversity of the academic methodologies applied to our object of study – ranging from analyses of remote sensing data to the use of fuzzy cognitive mapping and participant observation – makes clear that vulnerability should not merely be measured, as in the traditional positivist approach to exposure, but interpreted as well, meriting a more innovative and constructivist approach to particularly the sensitivity and resilience aspects of vulnerability.

Our findings clearly indicate that, in many cases, armed conflict does not so much straightforwardly cause environmental risks, but exacerbates or reveals existing environmental issues. The bulk of the relations between conflict and environment, furthermore, even in an extremely conflict-prone setting like North Lebanon, are indirect. The effects of armed conflict on the natural environment are mediated by socio-economic and political institutions and so are the subsequent effects of these environmental hazards on society. It is in understanding these mediating variables – governance, institutions, relations – and incorporating them in our models or frameworks to analyse vulnerability, then, that our main conceptual contribution lays.

We argue that it is necessary to integrate lessons from the complex political reality as explored in detail in this book into our vulnerability approach, particularly where it regards the multiplicity of political authorities, the plurality of political institutions and the instability of political structures that we highlighted above. As such, our book does not only offer innovative analyses of the multifaceted relations between conflict, vulnerability and the natural environment. It also calls for a re-positioning of the notion of vulnerability in relation to state fragility and political hybridity.

This can be achieved, in large part, by making explicit the political economy dynamics inevitably implied in each analysis of vulnerability in conflict-affected situations. In our chapters, we have done this by demanding attention for three – out of many more possible – aspects of political economy. We have shown how *trust* and accountability, severely undermined by the same conflicts that generated the environmental risks in question, are crucial in addressing war-induced environmental problems. This is however, no clear-cut dynamic: trust and personal relations are used to create and bolster environmental regulations, but also to jointly circumvent them. Building on the idea of trust, we have also investigated in detail how the notion of a *social contract*, so essential in a situation where political institutions and authority are contested, determines the distribution of material and institutional resources and thereby variations in resilience. The importance of informal governance institutions – personal networks, *wasta*, corruption – also serves to illustrate the significance of political economy dynamics for understanding how communities are equipped to deal with natural hazards caused by conflicts.

In essence, what we found is that communities' vulnerability to the environmental effects of war in North Lebanon varied per community and that this variance depended not so much on spatial as on socio-political differences (between richer and poorer municipalities, between those communities with extensive political ties and those without). Based on these findings, we would encourage analysts interested in vulnerability to move away from the dominant emphasis on *exposure* (the extent to which a system is confronted with the hazard in question) towards more attention for *sensitivity* (the likely damage the hazard will do to these systems) and *resilience* (the coping mechanisms available to mitigate the impacts of hazard).

Often, it is not the extent to which a community is confronted with environmental threats that is determined by dynamics of conflict, but the likely damage such a threat will do to the community in question and the response mechanisms available to mitigate a threat. A focus on explicating the currency of informal and formal institutions shows that vulnerability to environmental problems depends on a particular institutional setting and it is this setting that, in a 'post'-conflict and fragile political order, is inevitably and importantly shaped by a multitude of violent conflicts. Even where war does not affect exposure to environmental risk, it crucially determines sensitivity and resilience. In this light, the fact that in our studies communal structures often seemed more important for determining resilience than individual empowerment logically reflects Lebanon's communal political system, where citizenship depends less on individual rights than on group membership.

Focusing on the conflict dimension of environmental hazards forces one to acknowledge the politics of vulnerability. While the conceptual linkage between environmental vulnerability and political economy explored here is still tentative, we would ultimately argue to reconfigure the place of 'politics' in the vulnerability framework, placing it in the centre rather than at the margins where it all too often is treated as 'context' instead of 'essence.' We should not only concern ourselves with the 'politics of environmental resources' as causes of violent conflict, but also with the politics of exposure, sensitivity and resilience that determine vulnerability to the environmental consequences of violent conflict.

Turner et al.'s authoritative vulnerability framework would gain much from incorporating insights from the state fragility and hybrid political order literature, just as the study of state fragility could be enriched by including notions of vulnerability. State fragility is, among other issues, concerned with how the

consequences of past violent conflict make countries prone to future violent conflict. What we have done in this volume, essentially, is explore one avenue through which this relation operates: we have shown how past conflict affects a country's vulnerability to natural hazards (whether these hazards are caused by that conflict or predate it), which, if we want to close the circle, in turn might generate susceptibility to future conflict.

The above, however, demands caution with regard to the celebration of resilience, as suggested in Chapter 3 as well. Informal trust relations, alternative social contracts and unsanctioned institutions can produce effective coping mechanisms in the short run. In the longer run, however, such instances of resilience risks reinforcing rather than overcoming existing vulnerabilities. Indirect, informal and politicized coping strategies can set strong precedents and authorities and donors might feel less pressured to move towards rights- and equity-based measures to boost resilience. This is particularly the case with reference to dynamics of international aid. While such aid can, of course, contribute to communities' resilience to the environmental effects of war, Part 3 of our book showed that the allocation of international aid is privy to political concerns just as the internal distributions of resources and social capital in Lebanon and in the North are. Lebanon's multiplicity of political authorities, plurality of political institutions and dynamism of political structures, ultimately, does not (only) determine how much aid it receives, but it does affect who receives this international aid on behalf of whom, again underlining the prevalence of community over individual in the dynamics that determine people's vulnerability to war-induced environmental threats in North Lebanon.

REFERENCES

- Acra, S.A. and Acra, S.M. 2006. "Impact of War on the Household Environment and Domestic Activities: Vital Lessons from the Civil War in Lebanon", *Journal of Public Health Policy*, 27 (2): 136-145.
- Alreck, P. and Settle, R. 2004. *Survey Research Handbook*. New York: McGraw-Hill.
- Bachhofer, M. and Wildenberg, M. 2010. "FCM Aggregator," Available at: www.fcmappers.net. (Accessed December 2010)
- Bannon, I. and Collier, P. (eds.) 2003. *Natural Resources and Violent Conflicts. Options and Actions*. Washington: the World Bank.
- Bevir, M. "Governance as Theory, Practice and Dilemma." In: *The SAGE Handbook of Governance*, ed. Bevir. London: Sage.
- Birkmann, J. (ed.) 2006. *Measuring Vulnerability to Natural Hazards. Towards Disaster Resilient Societies*. New Delhi: TERI Press.
- Choueiri, Y.M. (ed.) 2007. *Breaking the Cycle: Civil Wars in Lebanon*. London: Stacey International.
- Collier, P. 2010. "The Political Economy of Natural Resources", *Social Research*, 77(4): 1105-1132.
- Elpiniki, P. and Areti, K. 2012. "Using Fuzzy Cognitive Mapping in Environmental Decision Making and Management: A Methodological Primer and an Application, International Perspectives on Global Environmental Change" In *International Perspectives on Global Environmental Change*. ed. Young, S.S. and Silvern, S.E. Rijkea: InTech.
- Gannagé, M. 2012a. "Understanding Transmission of Traumatic Experiences", *Neuropsychiatrie de l'Enfance et de l'adolescence*, 60(5): 78.

Gannagé, M. 2012b. “After the traumatic event, what other life? Thinking the clinic of trauma in Lebanon”, *Neuropsychiatrie de l’Enfance et de l’adolescence*, 60(5): 372-376.

Higgins, E., Taylor, M., Jones, M. and Lisboa, P.J.G. 2013. “Understanding community fire risk – A spatial model for targeting fire prevention activities”, *Fire Safety Journal*, 62: 20-29.

Homer-Dixon, T.H. 1994. “Environmental Scarcities and Violent Conflict: Evidence from Cases”, *International Security*, 19(1): 5-40.

Homer-Dixon, T.H. 2001. *Environment, Scarcity and Violence*. Princeton: Princeton University Press.

IMAC. 2007a. *Status Report*. Balamand: University of Balamand.

IMAC. 2007b. *Assessment of the institutional and legal setting for coastal zone management in Lebanon: Final report*. Balamand: University of Balamand.

Israel, G.D. 1992. *Determining Sample Size* (Fact Sheet PEOD-6) United States: University of Florida.

Khamis, V. 2012. “Impact of war, religiosity, and ideology on PTSD and psychiatric disorders in children and adolescents from Gaza Strip and South Lebanon.” Presentation at the Physiological Colloquium, American University of Beirut – 4 December.

Le Billon, P. 2001. “The Political Ecology of War: Natural Resources and Armed Conflicts”, *Political Geography*, 20(5): 561-584.

Le Billon, P. 2012. *Wars of Plunder. Wars, Profits and the Politics of Resources*. London and New York: Hurst and Columbia University Press.

Özesmi, U. and Özesmi, S. 2003. “A participatory approach to ecosystem conservation: fuzzy cognitive maps and stakeholder group analysis in Uluabat Lake, Turkey,” *Environmental Management*, 31: 518-531.

Sarkees, M.R. 2010. "The COW Typology of War: Defining and Categorizing Wars," Correlates of War Website: <http://www.correlatesofwar.org/> (accessed 17 April 2014).

Salti, N. and Chabaan, J. 2010. "The role of sectarianism in the allocation of public expenditure in postwar Lebanon", *International Journal of Middle East Studies*, 42: 637–655.

Takshe, A.A., Frantzi, S., Huby, M., and Lovett, J.C. 2010. "Dealing with pollution from conflict: Analysis of discourses around the 2006 Lebanon oil spill," *Journal of Environmental Management*, 91(4): 887-896.

Turner, B.L., Kasperson, R.E., Matson, P.A., McCarthy, J.J., Correll, R.W., Christensen, L., Eckley, N., Kasperson, J.X., Luers, A., Martello, M.L., Polsky, C., Pulsipher, A. and Schiller, A. 2003. "A framework for vulnerability analysis in sustainability science", *Proceedings of the National Academy of Sciences*, 100(14): 8074-8079.

Volk, L. 2009. "Martyrs at the Margins: The Politics of Neglect in Lebanon's Borderlands," *Middle Eastern Studies*, 45(2): 263-282.

Wisner, B., Blaikie, P., Cannon, T. and Davis, I. 2004. *At Risk. Second edition. Natural hazards, people's vulnerabilities and disasters*. New York: Routledge.