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Perceptions of Climate Change and Vulnerability in Upper Svaneti, South Caucasus, Georgia

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PERCEPTIONS OF CLIMATE CHANGE AND VULNERABILITY IN UPPER SVANETI, SOUTH CAUCASUS, GEORGIA

by

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Abstract

Incorporating localized perceptions of climatic impacts to livelihoods and traditions is critical to shaping effective adaptive climate change and disaster risk reduction strategies in the Greater Caucasus Mountains of Georgia. This study uses a phenomenological research framework to investigate the lived experience of climate and the associated impacts of its change in Upper Svaneti. In addition, a vulnerability assessment examines the social and environmental aspects of disasters, including localized perceptions. Results are drawn from eight months of field research conducted from 2012-2013. Multiple in-depth qualitative methods were implemented to generate rich descriptive data, giving way to the roles that environmental changes, disasters, and glacial recession play across six villages. Semi-structured interviews, key informant interviews, informal conversations, observations, participation, and six vulnerability assessments were undertaken. A thematic analysis of respondents' narratives yielded themes of helplessness, fear, and perceived benefits. The resulting vulnerability assessment explores the social, economic, and political aspects that are constraining local capacities to prevent, mitigate, and recover from natural disasters.

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TABLE OF CONTENTS

CHAPTER ONE

INTRODUCTION

Incorporating human dimensions of global environmental change is critical to creating comprehensive and ethical policies that address climate change adaptation, disaster risk reduction, and economic development. Physical and ecological changes have been documented over the past century (Parmesan and Yohe 2003; IPCC 2007), and the scientific community is 90%-100% certain that human activities have influenced natural systems through the use of fossil fuels and land-use changes (IPCC 2007). Many strategies for the mitigation, prevention, and recovery from the ill effects of climate change have been developed, but increased awareness of the related impacts on disasters and the local economy is needed. The human and social elements that are affected by climatic and environmental change cannot be entirely safeguarded unless they inform the policies designed to protect them.

Since the creation of the Intergovernmental Panel on Climate Change (IPCC) in 1988 and the adoption of the United Nations Framework Convention on Climate Change in 1992, there have been calls to reduce the amount of greenhouse gases in documents such as the Kyoto Protocol to the UNFCCC in 1998 and the *United Nations Millennium Development Goals*. Most of the actions stemming from those initial meetings involving climate change produced macro-scale goals to decrease the production of greenhouse gases and protect the infrastructure of economic ventures and agricultural productivity. Early research contributed greatly to the theoretical understanding of potential climate change impacts but used global scale (coarse

resolution) climate models and focused heavily on future climate change impacts (van Aalst et al 2008: 166).

How the benefits of actions that cause climate change, and the accompanying consequences, will be distributed is one of the greatest ethical dilemmas we are facing today. Some people, social groups, or even countries, will "carry an unfair burden in suffering the negative consequences of climate change to the course of which they made little or no contribution" (COMEST 2010: 14). Mountainous communities, for example, have been found to be amongst the most vulnerable to the effects of climate change for various reasons. Globally, mountains are home to 17% of the world's population, 80% of which live below the poverty line (Brodnig and Prasad 2010). People in mountain communities are not only generally marginalized and poor, but maintain high dependence on natural resources for their livelihoods, and have comparatively higher exposure to extreme events (Macchi 2011).

Countries around the world and international organizations have already identified the need for strategic planning to mitigate the effects of climate change. Droughts, flooding, and mass-wasting events encompass some of the physical threats to communities in mountainous areas. Temperature rise accompanied by heavy rainfall in early spring increases the rate of snow and glacier melt. The resulting floods have changed the river paths through mountainous communities destroying property, displacing families, and interrupting access to areas. Climatic changes may also affect plant and animal diversity as well as their distribution, further threatening subsistence-based communities. Studies conducted and reported in *Georgia's Second National Communication to the UNFCCC* (SNC) by the Ministry of Environment Protection and

Natural Resources (MEP 2009: 12-13) detail the following for the mountainous regions of Georgia:

- Kvemo Svaneti has been identified as an ecosystem vulnerable to various disastrous weather events, significantly enhanced by global warming. As a result of the increased frequency and intensity of these phenomena (floods, landslides and mud torrents), land erosion has intensified and greatly damaged agriculture, forests, roads and communications.

- As a result of the intensification of landslides and floods, the population of the Lentekhi region has decreased by 40% since 1986, and it is believed that this process will continue until decisive adaptation measures are taken to mitigate the adverse impact of climate change in the region. The mean annual air temperature and level of precipitation in this region have increased by 0.40C and 106 mm (8%) respectively, for the past 50 years.

- Analysis of observation data on floods for the period of 1967–1989 has demonstrated that in the second half of the period the recurrence of floods grew by more than two-fold, and the maximum discharge has increased by 9%. At the same time, the duration of floods has decreased by 25%, which could explain the rise in intensity and severity of floods.

- Since 1980, the number of landslides has increased by 43%, reaching a total of 117 at present. This especially steep rise in the number of landslides was provoked by the abundant snowfall in the winter of 1986-1987. The increase in heavy precipitation for the last two decades in Kvemo Svaneti has also caused an almost two-fold growth in the frequency of mud streams.

- Despite sufficient provisions of precipitation in the Lentekhi region, its territory is affected by drought from time to time, the duration and recurrence of which have increased by 38% and 17% respectively since 1991, compared with the 1956-1972 period.

- Assessments of Central Caucasus glaciers, including in the Svaneti region, have indicated that up to the present time the total area of glaciers in Kvemo Svaneti may have decreased by 25%, and their total volume may have been reduced from 1.2 km3 to 0.8 km3. Projected rises in temperature by the year 2050 may result in the total disappearance of Kvemo Svaneti glaciers.

The scenarios illustrated above paint a disconcerting picture for the mountainous region across Georgia. It is abundantly clear that this region needs comprehensive adaptation strategies, which the MEP and United Nation Development Program (UNDP) recognize. What is missing in the report to the UNFCCC is a component that addresses the social impacts of environmental and climate changes. They suggest that populations are in decline because of devastating flooding and, while temporary evacuations have prevented a loss of life, there must be plans to enable people to continue to live in these culturally and historically important areas. The government of Georgia has been increasing its budget to assist the communities affected by flooding events, but reactive measures are not able to increase the adaptive capacity of vulnerable communities.

Policies to mitigate the effects of climate change and adaptation strategies have been discussed from various methodological and epistemological perspectives. A growing imperative of climate change science is to understand the social impacts in addition to the physical changes on the landscape while involving stakeholder communities in risk assessments to ensure adaptation to climate change (please see Maguire and Cartwright 2008). The following research questions guide this research project and were developed to address the human dimensions of climate change and disasters in Upper Svaneti from a humanistic perspective:

- What are the perceptions of climate and its associated changes in Upper Svaneti? Are views universal, or do they vary across geographic dimensions?
- What do stakeholders identify as threats or benefits to their physical safety and economic stability? Are behaviors changing to adapt, in agricultural and social spheres, to variances in the climate and the changing environment?

- How vulnerable are the residents in Upper Svaneti to disasters? What is the current state of the development or implementation of strategies to enhance local adaptive capacities?

The work described herein is divided into three discrete sections relevant to perceptions of climate change and vulnerability to mountain hazards which aim to answer these questions. It begins by contextualizing the project regionally, examining the social transformations of Upper Svaneti. The empirical research begins with an analysis of local perceptions of climate and the related environmental changes that have occurred there, and ends with an assessment of the area's vulnerability to natural disasters using the pressure and release model (Wisner et al 2004).

By way of background, Georgia lies on the Black sea bordered along the Greater Caucasus Mountains to the north with the Russian Federation. Turkey, Armenia, and Azerbaijan share borders across the southern limits of the country. Georgia supports a population of approximately 4,942,157 people (CIA World Factbook 2013).

Figure 1 Georgia and the Countries of the South Caucasus (Z.O.I. 2013).

The region which is the focus of this research is the Mestia Municipality, part of the larger Samgrelo-Zemo Svaneti Region. The latest census estimates that 14,248 people live in the Mestia Municipality, roughly equal to the amount of ethnic Svans within the country. This area is characterized by high mountains, many reaching 5000 meters, and intermittent villages spaced between steep valleys. Given the remote nature of the Svan settlements and the rugged country they inhabit, access and interference in the area has been minimal by political entities.

Recent development of winter tourism in the city of Mestia has been impacting virtually all aspects of the local traditional subsistence farming and pastoralist livelihoods. In the context of climate change, social transformations may potentiate

vulnerability. It is of the utmost importance to engage with people as they navigate through changes in livelihoods, economic opportunities, and development because they are inextricably tied to the social construction of hazards. Vulnerability is further influenced by a changing and dynamic climate system and by political instability in the wake of the dissolution of the Union of Soviet Socialist Republics (USSR). My approach stems from feminist literature and ethical considerations highlighting the benefits of community participation in the creation of a vulnerability assessment for the residents of Upper Svaneti (e.g. van Aalst 2008; Walker 2002).

Chapter two is a foray into the history of the study area. Because of the linkage between society and environment in the social construction of hazards we must know the events that led up to present day. Georgia has had a turbulent past, enduring pressures from the Romans, Mongols, Ottomans, and Soviets. A heavy price has been paid for such a strategic location along the Black Sea and Silk Route. The Svan people have, however, done well to avoid conflict and by retreating into the Caucasus Mountains, but we will see the ramifications of their isolation as we approach modern day.

Chapter three introduces the phenomenological approach to the empirical research and illustrates aspects of the human and physical characteristics found in the study sites across Upper Svaneti. Chapter four is dedicated to understanding the lived experience of climatic and environmental change from the perspective of Upper Svaneti residents. Their intimate knowledge helps elucidate not only what they feel needs to be done in the development of adaptation strategies, but also helps the greater population

better understand the narrative of climate change and the meanings formed by mountain people.

Chapter five builds upon the historical background and analysis of perceptions of climate change and focuses on the area's vulnerabilities to disaster. The adaptive capacity, or ability to foresee, cope with, mitigate, and recover from the impacts of a disaster, is determined by the social, economic, and political structures that support a community. By combining historical and interview data with field-based observations of the current situation comprehensive assessment of Upper Svaneti's vulnerabilities to disasters can be analyzed.

In combination, the historical profile, perceptions of climate, and vulnerability assessment make up a holistic approach to addressing the implications of climate change, disaster risk reduction, and development while engaging local people in a way that is sensitive to their needs and desires. The reduction of risk, from natural and human sources, can be a complicated matter making it paramount that effective means of accomplishing these goals be formulated, and more importantly, implemented.

CHAPTER 2

SOCIAL TRANSFORMATIONS IN UPPER SVANETI

Introduction

Svaneti is one of Georgia's most scenic and important cultural regions. It is the highest inhabited area in Georgia and an integral part of the connection between Asia and Europe. The ethnic Svans who inhabit the area have been settled there for millennia, and their culture has remained largely intact. Like most mountain areas, the physical geography has been a constraint on interconnectivity to neighboring areas and played a part in the creation of local cultural identity. This paper explores the contemporary social transformations occurring in Svaneti within the historical and geographical context of Georgia, spanning from pre-history to Post-Soviet independence. By examining both the country's and Svaneti's socio-economic development through time it is possible to understand the contemporary situation. The history of Svaneti cannot be uncoupled from larger regional forces, so this chapter begins with a discussion of Georgian history before addressing Svaneti at length. Drawing from these insights and surveying current developmental strategies, we can make informed assertions about Svaneti's social vulnerabilities in the changing climatic and socio-economic worlds.

Georgian History: An Overview

The country of Georgia is located at the crossroads of Europe and Asia (see Figure 1). It is the westernmost part of the South Caucasus, which also includes Armenia and Azerbaijan. Transcaucasia signifies the intermountain region between the Greater and Lesser Caucasus Mountains between the Black and Caspian Seas.

Georgia borders the Black Sea to the west and Turkey, Armenia, and Azerbaijan flank across the southern border going east. The Greater Caucasus Mountains form a formidable barrier between Russia to the north with many peaks rising over 4,000 meters. These nation-state borders have been in flux over time as we will see, but that has not been the case of Svaneti, which is tucked into the mountains and whose people have rejected political subjugation through defensive mechanisms.

Pre-History

Archeological records show the Black Sea to have been settled during the Acheulian Period (~1.5 million years ago), and later in the Upper Paleolithic members of communities began to flesh out blood ties to ancestral properties, collectively produce goods, and create tribal customs and religious beliefs (Berdzenishvili 1962). With the advent of smelting and organized agro-pastoralism the region began to flourish. Metallurgy was an important part of the region's historical economy and minted coins from the 5^{th}-4^{th} centuries BC indicate the advanced nature of the Colchis society (Asatiani 2011). It is important to keep in mind the fragmented nature of civilizations inhabiting Transcaucasia, who were ethno-linguistically and geographically separated until the establishment of the Colchis Kingdom – considered to be the earliest Georgian formation (Toumanoff 1963). The South Caucasus region has been largely contested with the rise and fall of kingdoms and dynasties. Territorial and geopolitical issues persist today in the regions of Abkhazia, South Ossetia, and Nagorno-Karabakh, which seek self-determination and autonomy from the political borders that surround them.

In addition to internal conflicts and those with neighboring societies, Georgia's land was sought after by many foreign powers because of its strategic location. The

Romans made the first siege, followed by the Mongols, Persians and Ottoman Turks. Later, Russia would infiltrate Georgia under the guise of protection and help create the geopolitical landscape we see today. The tumultuous history of what would become Georgia was influenced by its oppressors and had direct effects on the development of contemporary social and economic structures.

In the higher mountainous areas people retained their tribal communal social systems much longer, buffered from foreign influences and control. Life in the lowlands was more like a boiling melting pot as a result of the continued interest in establishing political power in a geographically advantageous position. The Romans came to dominate the lowlands first and seized Armenia, Albania, and Iberia (Kartli) in their search for resources. One major impact from the Romans was the adoption of Orthodox Christianity in the 1st century, later proclaimed the religion of Georgia in 317 (Tugushi 1965). Social strata were redefined and the adoption of imperial policies began to shape the political structures that would govern Georgia. Struggles after the collapse of the Roman Empire persisted with the Byzantines and Persians until 978, when the Bagrationi family came into power unifying Georgia and several municipalities (including Svaneti) for the first time and beginning the Golden Age of Georgia (Urashadze 2005). The precipice of that period in military campaigns and cultural development was during the rule of Queen Tamar (1184-1213) (Rapp 2003). She was able to expand and unify Georgia and is romanticized in Georgian art and literature because of the economic and cultural prosperity that developed during her reign.

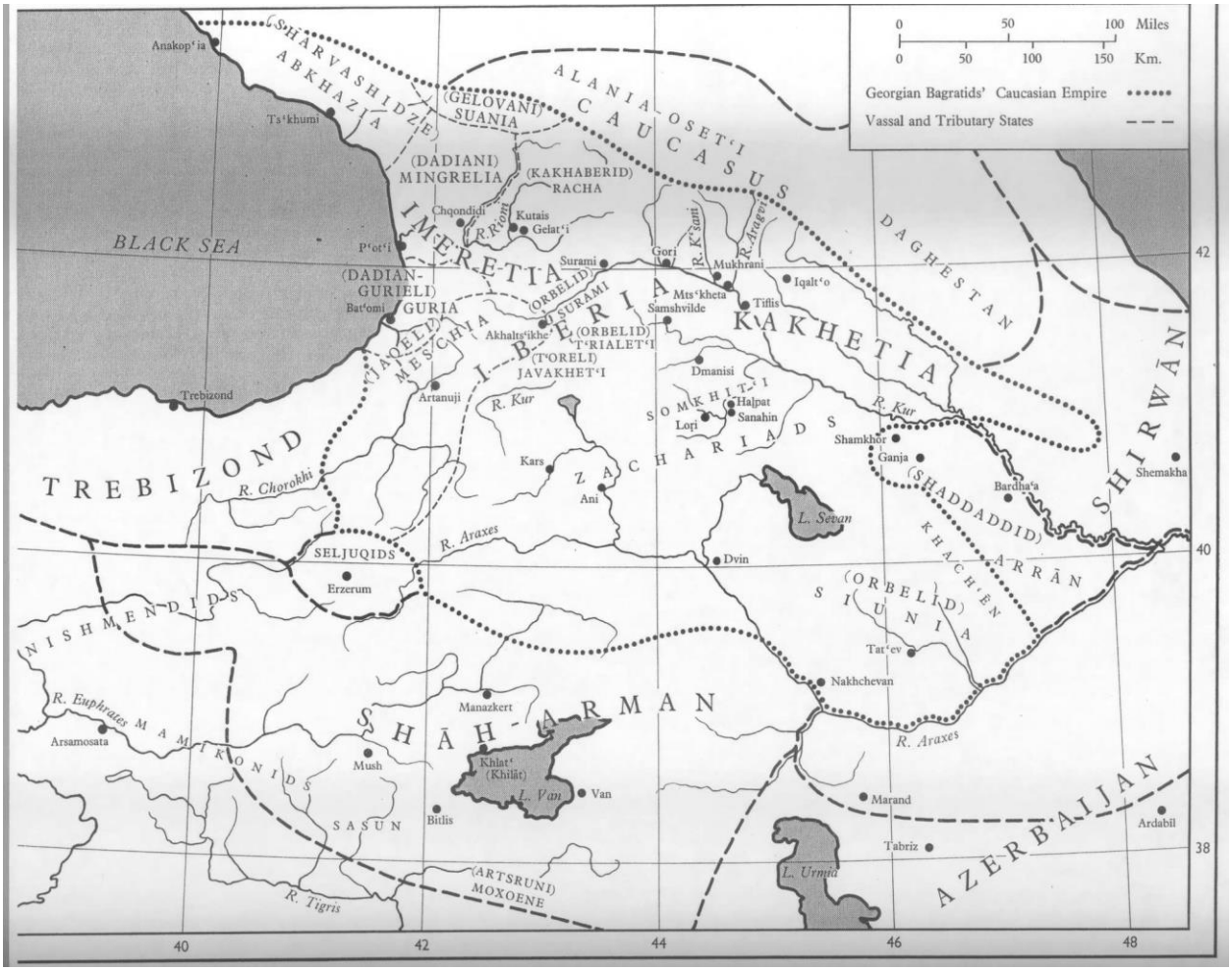

Figure 2 Caucasia in the 12-th to 15th Centuries (Toumanoff 1963).

Early Modern History (1400-1800)

Throughout the Bagrationi Dynasty Georgian culture thrived in the arts and in literature, and feudalism reached nearly every corner of the kingdom. However, the Bagrationi Dynasty deteriorated, and resulted in the collapse of the united Georgian state in the 15th century. In the western part of the Central Caucasus three independent czardoms reappeared at the same time—Imereti, Kartli, and Kakheti—and one princedom—Samtskhe (Ismailov 2006). This fragmentation of centralized power allowed

campaigns from the Mongols, Central Asians, and the Turks to continue. The continued conflicts had resounding impacts on the development of Georgian society. To alleviate pressures from foreign powers and once again consolidate its provinces and peripheral areas, Georgia sought protection from Russia. The first of many treaties was signed in 1783, casting off any sovereign rights from other countries and recognizing Russia's sovereignty and protection (Berdzenishvili 1962). This treaty aligned Georgia with Russia, forcing Georgia to take their side in any political or armed conflicts and paved the way for Russia to slowly infiltrate Georgian society.

Early Relations with Russia

Constant warring stifled the ability of Georgia to grow and diversify its economic bases. As a result, feudalism reigned supreme in Georgia up until the 1800s. Russian elites took control of the upper echelons of society and exploited the Georgian peasantry following the Russian – Turkish War of the late 1700s. Georgia sought economic revitalization and peace, though class struggles began to emerge in protest of feudalism. Georgia needed more support than the peace treaty of 1783 offered because of continued aggression from Iran and Turkey. On December 28th 1800 the decision was made to become an outlying province of Russia and implement the plans of the Russian government (Berdzenishvili 1962). Since that time, Georgia was progressively incorporated into the Russian Empire. It was seemingly the best alternative to eventually being taken under the rule of Turkey or Iran. As a colony of the Russian Empire, Georgia experienced russification, and its economy was developed in agricultural and trading sectors for the benefit of its colonizer. By the mid-19th century, feudalism was proving to be an inefficient means of governance and repeated uprisings

of serfs led ultimately to its disintegration. Troubles in Russia after the turn of the 20th century loosened the grip of its imperial control, and Georgia was able to claim its independence after the Russian Revolution in 1917.

The Democratic Republic of Georgia (DRG) was proclaimed on May 26th 1918, stoking Georgian nationalism in victory over the struggle against Tsarist Russia. However, loss of imperial control across Transcaucasia reignited territorial disputes. Armenia and Azerbaijan encroached on Georgia's southeastern flanks and separatist movements began in Abkhazia and South Ossetia. The biggest threat proved to be the Bolsheviks, who in 1921 took Tbilisi and claimed Georgia as a Soviet Republic.

Georgia in the Soviet Era

Integration into the Soviet Union and application of Leninist and Stalininst policy had a wide array of impacts in Georgia. While Soviet leadership was committed to merging all of the parts of the Union of Soviet Socialist Republics (USSR) and to the erosion of any barriers that might impede progress towards that end, Georgia appears to be an anomalous case (Parsons 1982). The efforts of collectivization and the New Economic Policy (NEP) were largely a failure through the 1920s and couldn't stimulate a recovery of Georgia's agricultural sector (Jones 1988). Indigenization or *korenizatsiya* could not dispel the nationalistic pride fostered during the DRG, maintained by intelligentsia and political elites until the dissolution of the USSR. The aim of *korenizatsiya* was to consolidate the nationalities into a multi-national state while at the same time accommodating cultural aspirations. It was during the indigenization that Abkhazians were granted their own republic in 1921, and South Ossetia was awarded

an autonomous region in 1922 which has been a recurring geopolitical issue for Georgia ever since. In the countryside there was a complete lack of trust for any state institution and lack of authority up to 1925. In the end, Georgia forfeited its political and economic autonomy to the Transcaucasian Federation, saw their national church suppressed, faced increased competition with Abkhazian and South Ossetian minorities, and lost their unique political institutions through the centralization of power in Moscow (Jones 1988). Conversely, modernization, mass education, urbanization, and economic development beginning in the 1920s fostered nationalism because of policies of affirmative action and *korenizatsiya* which created opportunities for national self-expression (Jones 1988).

Economically, there was incredible growth in agricultural, industrial, and urbanization sectors during the Soviet period. From 1920 to 1940 industrial outputs increased 670%, 240% between 1940 and 1958, and an additional 57% by 1965 (Nove and Newth 2012). Given the temperate climates in Western Georgia, these areas were able to enjoy a lucrative production of tobacco, tea, and wine. Trade with neighboring countries flourished. To ramp up production, reforms were enacted to redistribute lands, but to supply households with even the smallest land allotments was impossible. The minimum for sown lands set by the Georgian Bolsheviks required one and a quarter million *desyatiny*, but only three quarters of one million were available (Jones 1988). The start to agricultural development was slowed further because through the 1920s many households were without working animals, had no plough, or no means of transportation to get goods to market (Jones 1988).

Into the 1970s the Soviet economies were recognized as inefficient, cut off from the world markets, and unable to keep pace with globalization. Numerous attempts were made to repair the economic system, though no positive outcomes were attained (Asatiani 2011). An economic crisis in the USSR during the 1980s ended with the dissolution of the empire, allowing Georgia once again the chance to declare its independence.

Post-Soviet Georgia

March 31, 1991 marks the birth of Georgia as a modern nation-state. The country faces difficult challenges in the transition to a market economy while mitigating conflicts with Abkhazia and South Ossetia as they attempt to seize their own independence. Cease fires have been signed with these areas following wars in 1992 and 1993, though they are not recognized by the international community as being de-facto independent (Engel et al 2006). Strife in Abkhazia and South Ossetia are not only a domestic issue, however. Russia continues to support Abkhazia and South Ossetia in their bid for independence, and not in a purely ideological way; these secessionist movements are backed with Russian military fortifications along territorial borders within Georgian borders. Pressure from Russia's presence continues to impinge upon Georgia's ability to exert its political autonomy and strains economic ties between the two countries. Indeed, in all political and economic matters throughout the South Caucasus we continue to see Russia's influence. For Georgia, political and economic decisions must be carefully made given the historical relationships with Russia.

The struggles during the first two decades in modern Georgia were similar to previous eras, typified by a push and pull of opposing forces. The government's power, stretched thin from efforts to mitigate internal and external conflicts, was insufficient to achieve widespread social, economic, and political development during this time. The first elected president Zviad Gamsakhurdia (1991-1992), and his successor Eduard Shevardnadze (1992-2003), were unable to effectively reign in the post-revolution government, leaving a legacy of corruption, as well as severe budget and energy crises (Papava 2009).

The people of Georgia desire a more democratic society, purged of corruption and nepotism, as well as strides towards a stronger national economy and better social conditions (Papava 2009). In 2003, this desire manifested as what became known as the "Rose Revolution." The opposition leader, Mikheil Saakashvili, took the helm and ousted Shevardnadze in response to the public's dissatisfaction with his administration. Saakashvili did well to increase tax revenues to alleviate the budget crisis, began to tackle corruption, and quadrupled the national budget revenues (Papava 2009). His policies to modernize Georgia and unify Georgia's territory set off resistance in several provinces including South Ossetia and Abkhazia. By attempting to weaken Russia's influence and remove Russian peacekeepers in the conflict zones, Saakashvili underestimated the potential repercussions of his actions (Cheterian 2009). In 2008, Russia mobilized armed support in both Abkhazia and South Ossetia, escalating to bombings within Georgia and sustained military presence along territorial borders. These wars occurred at the same time as the global financial crisis, wreaking havoc upon the Georgian economy.

At the turn of the 21st century, as a result of the formation of independent states in the South Caucasus (Georgia, Armenia, and Azerbaijan), the region's countries had another opportunity to become integrated into a single economic union. Unfortunately, the post-Soviet Commonwealth of Independent States (CIS) failed as an international organization to protect Georgia's interests during the conflicts in Abkhazia and South Ossetia, resulting in their withdrawal in 2009. A modern Caucasian union can only be possible with a realistic model for integration and development. The Central Caucasus countries are all members of the IMF and World Bank and work directly with these organizations. Georgia itself was granted a total of 815.2 million USD from 1995 to 2003 (Ismailov 2006). Georgia is also a member of the World Trade Organization (WTO). There is great potential for Georgia's freight and shipment market, confirming the geo-economic importance of increased cooperation in the area. Georgia also has high hopes of joining the European Union; their future lies in building east-west and north-south communication axes and strategic geo-economic functions (Ismailov 2006). Efforts to upgrade the region's transit services is believed to be a huge benefit, but its implementation may kill the hopes of creating a self-sufficient economy (at least of the agrarian-industrial type) and destroy local culture and traditions (Mouradian 2000).

History of Svaneti

During Georgia's history, Svaneti has been a major historical-geographical and historical-ethnographic part of Georgia. Svaneti can be distinguished by its unique oral non-written language and Svans have always considered themselves as an inseparable part of the Georgian ethnos (Topchishvili 2009). Svaneti is divided into two parts: Enguri Gorge Svaneti and Tkhenistskali Gorge Svaneti, the latter called Lower Svaneti

including the Lentekhi Region and the former being Upper Svaneti housed within the Mestia municipality. In Upper Svaneti the highest village Ushguli is situated at 2200 meters at the head of the Enguri River Gorge; the lowest place above sea level is the village of Khaishi at 550 meters. The main access road follows the Enguri River down to the Samgrelo lowlands and was built in 1932 (Gilbert 1992), before which there were many shorter ways downstream by foot or horse. Another road connects Ushguli to Lentekhi, Lower Svaneti, though it is closed during the winter months.

Figure 3: Municipalities of Georgia. Note Mestia and Lentekhi, respectively, marking the regional capitals of Upper and Lower Svaneti (www.geohive.com).

Svaneti shares its northern border with Russia, defined by the Greater Caucasus Mountains, and its western border with Abkhazia. This mountainous part of Georgia is characterized by steep slopes, rocky and erosive mountains, glaciers, and wild rivers, all contributing to the fact that Upper Svaneti is a high risk area for natural disasters

(UNDP, UNEP, OSCE 2004). The humid alpine climate is influenced heavily by the proximity to the Black Sea. Precipitation is high and occurs year-round. Mestia, for example, receives 1,000 – 3,200 mm of precipitation a year (Schäfer 2003). Upper Svaneti has a population of approximately 14,000 people, distributed across 17 communities, with Mestia as the district capital. The total area of Upper Svaneti is 3,045 square kilometers. A small portion of that land is agricultural (6.7%), yet only 7% is arable (1,209 ha) (Engel et al 2006).

Like many mountainous regions, Svaneti is experiencing out-migration. From 1989 to 2002, the population of Upper Svaneti showed a decline of 3.1%, but rural areas (those outside of Mestia) saw a loss of 6.8% (Rowland 2006). Lower Svaneti, the Lentekhi Region, has seen a population loss of 40% since 1986. According to the Ministry of Environment Protection and Natural Resources (MEP) this is a direct result of the intensification of landslides and floods (MEP 2009). These numbers do not capture the nuances of the population dynamics completely, however. There are losses explained by difficult living situations, unemployment, disasters, and youths leaving to receive higher education (Engel et al 2006).

Strabo made the first known reference to the “Soanes” in the mountains behind Sokhumi who were ruled by a basileus, a type of monarch, and a council of 300 men. Svan culture has developed over time in a unique fashion due to the proximity with other ethnic groups and the physical geography. Mixed-grazing with farming has been in practice for millennia and excess potato yields are often sold in markets down-valley as a cash crop. Topchishvili (2009) maintains that locally produced foods were never entirely sufficient for Svan people, so they had been economically dependent on the

lowlands (for food and seasonal work) or with groups in the North Caucasus. This is reflected in their bilingualism found historically and which remains today. In social exchanges with the rest of western Georgia, they fiercely guarded their cultural systems, language, and unique cultural way of life.

During the 8th and 9th centuries, throughout the Caucasus a system of land ownership, tenure, and political organization developed and has been described as being medieval or feudal. One indication of the remnants of feudalism is rooted in the number of Georgian Orthodox churches found throughout Svaneti, many of which were constructed in the 9th to 13th centuries, mirroring the height of Georgian feudalism. Tuite (2002: 1) suggests that:

> In Svaneti … where feudal land-ownership was implanted, the appropriation of public spaces and the construction of Georgian Orthodox churches by the local nobility had a profound impact on the indigenous religious system, leading to, among other changes, a displacing of rituals to either the domestic interior or to sites outside the village.

The spatial distribution of churches changed with time as feudal class distinctions waned. Restructuring of the sociopolitical regime followed and indicated changes in religious structures, feudalism having left some marks on the Svan landscape, but left no traces in Svan religious thought (Tuite 2002). In Svaneti feudal relations were supposedly gone by the 15th century. Given the geographical situation of the communities it can be argued that the Svans would have not found it difficult to destroy feudal relations because they were superficial (Topchishvili 2009). Over time, fragmentation and political instabilities in the lowlands allowed some Svans to rise to a princely rank, but the reaches of Upper Svaneti became known as “free,” or lordless, because no one family rose to power even though social life was ruled by a hierarchical

system of classes. Councils were led by elected headmen (*maxwshi*), though social controls and local disputes were still handled by mediator-judges (Tuite 2007). People often took the justice system into their own hands to protect clan honor, resulting in vendettas and blood feuds that could span generations when members exacted revenge upon others for offenses such as family dishonor, or wounding or murdering clan members (Tuite 2007).

Throughout Georgia's gradual formation Svaneti was largely immune to conflicts in the lowlands and sustained political autonomy. Svaneti during the Middle Ages was an artistic center and cultural gem. The Svans maintained contact with lowland areas, and in the Bronze Age Svaneti was an important source of high-grade metals, primarily copper and gold. The remote communities were able to protect their ancestral homelands from foreign control and political subjugation until 1859 when the area was annexed and fully incorporated by the ruling Russian authorities (Mtchedlishvili 2006). The czarist powers soon abolished the Svan political structures.

Soviet Svaneti

The incorporation of Georgia into the USSR in 1921 had wide ranging impacts on Svaneti through a number of processes: the addition of basic infrastructure by the 1950s (road, medical clinic, school, school, pension disbursement, communications [telephone lines] and electricity generators); tourism development (some lodges for recreation and skiing); and access to materials not sourced locally – as was the tradition for building materials for centuries (Kay 2000). Svan vernacular architecture evolved over time to reflect environmental and cultural aspects of living in the mountains. Most notably, defensive towers (*koski*) some four to seven stories high are icons of Svaneti's

landscape. They serve several purposes: physical defense, look-out posts, and armory, with rations and weapons stored in the event of an attack from outsiders, or another clan member seeking vendetta. The living quarters were found in either fortress houses or *matchubis* – a two-story dwelling often connected to the *koski* to form the family complex (Kay 2000). A European style of house emerged as people had access to new materials and were influenced by Soviet planning starting in the 1930s, but they have been constructed much like the medieval structures. Local preservation of buildings has been virtually non-existent because of depressed economic conditions (Kay 2000). To maintain the local culture and preserve Georgia's heritage sites the ICOMOS Georgian National Committee was founded in 1993 and is working on a preservation plan for Svaneti's architectural treasures.

In the 1950s the Soviets forcibly resettled some Svans for agricultural production (collective farming) and mining. Some protection was put in place for Svan architecture beginning in 1980 when the Georgian Main Board of Monument Protection created an initiative to preserve Chazhashi, a neighborhood of Ushguli, as an example of a well-preserved feudal village. Stipulations affected residents by enforcing rules restricting reconstruction and new developments, effectively stifling the transition to 'modern' designs and local planning. People could be compensated for moving out of the area if they wished to not cooperate. Later, in 1996 UNESCO declared the area a World Heritage Site, initiating further evaluation of the neighborhood as maintaining a relic state (UNESCO 2010). These designations were beneficial in a cultural sense, because they preserve the look of an authentic part of Georgia's heritage. However, from a socio-economic perspective they could be viewed as a form of repression from

development and maintenance of older traditions (Kay 2000). The restriction of development in Svaneti has left deficits in local infrastructure and limits access to economic opportunities and social services.

Arguably the largest infrastructural development in Svaneti began in 1961 when the Georgian Soviet Socialist Republic, under the order of the USSR, began construction of the Enguri River Dam. It was the first of 6 dams planned to be built in the Georgian Caucasus. Finally completed in 1986, the Enguri dam and Hydroelectric Power Station (HEPS) went fully operational. Even though the HEPS provided Svaneti with free electricity, subsidized by the government, negative effects of the dam were felt almost immediately (Engel et al 2006; Amonashvili 1990). People complained that the humidity regime changed, and doctors steadily saw an increase in respiratory illnesses and chronic joint pain (Amonashvili 1990).

In response to critiques and public concerns, the Georgian Ecological Association (GEA) formed and became officially recognized in 1988. This is surprising considering the hostility unleashed upon people who voiced issues and ideas contrary to the Soviet agenda, often labelled as “enemies of the people” or “enemies of progress.” Upon completion of the Enguri HEPS the construction of a second dam in Svaneti, near Hudoni, began. The reservoir that formed behind the Enguri dam may have contributed to the devastating winter of 1987 when 64 people were killed in avalanches in the area and 1,500 people were evacuated immediately by the government, leaving the ruins of their houses moving to other regions (Amonashvili 1990). In some villages (Ushguli, Kala, and Mulakhi) populations were halved that winter. The GEA waged a campaign, supported by locals and scientists, against the

building of the Hudoni dam, which would have displaced a village of over 300 households and further exacerbated humidity problems. Articles were published and reports were drawn up showing that the potential ecological impacts of another large-scale project were unjustified. There was a temporary halt in construction of the dam in 1989, and after several hunger strike protests by Svans in Mestia the Council of Ministers of Georgia decided to stop the construction of the Hudoni HEPS altogether (Amonashvili 1990).

Post-Soviet Svaneti

Following the dissolution of the USSR, Svaneti was affected by the restructuring of society and economic disruptions. Through the 1990s the minimal infrastructure development continued to plague the region with a lack of social services, intermittent power, poor and unmaintained roads, and high unemployment rates. By 2004 some initiatives for social and economic development were implemented, before which programs focused on humanitarian efforts after disasters (Engel et al 2006). A poverty assessment conducted by the World Bank (2009) confirmed that while living standards in Georgia have improved since 2003, poverty continues to be entrenched in rural areas and mountainous communities.

The most recent developments in Svaneti have been those involving tourism. There are summer and winter recreation opportunities available in the form of trekking, skiing, mountaineering, and cultural site-seeing. Because Svaneti sits at the base of some of the largest peaks in the Greater Caucasus, it has developed a reputation as a mountaineering mecca. Historically, Douglas Freshfield opened Svaneti to the

mountaineering community after visiting in 1868 and publishing his journals. There are more than one hundred peaks above 4,000 meters, and notable expeditions have been led on Ushba (4,710), Tetnuldi (4,858), and Shkhara (5,201). In 2011, the Georgian National Investment Agency teamed up with the Ministry of Economic and Sustainable Development and released plans for the creation of a four seasons resort in Mestia to seek foreign investment funding (MESDG 2011; McCandless 2012). The project has been underway since, experiencing a hiccup during the political tensions surrounding the presidential elections in 2013. How the benefits of such a large-scale project will be distributed among locals is uncertain. One NGO, the Georgian Mountain Federation, is committed to examining the links of tourism development in Svaneti to other economic sectors, the impacts on nature, and culture conservation.

Svaneti's Future

Despite strides in economic growth, rural poverty is still a pervasive problem in Georgia, and since the Rose Revolution, inequity between rural and urban areas has increased (de Waal 2011). While the net-benefit of development and extraction of natural resources appears high in a cost-benefit analysis, impacts on local people's livelihoods may be negative, especially with the differences in decision–making between individuals, classes, and groups of people. Pressures operating at the national level to modernize and develop through timber and resource extraction are fueled by high-discount rates and preference for immediate benefits instead of sustainable management that yields long-term or future profits. As Georgia continues to develop and seek market solutions to socio-economic issues it puts increased pressure upon its forests and other natural resources (Synyakavych et al 2009). In Svaneti, tourism

appears to have the greatest potential for substantial growth and be the best alternative to classical strategies of development (Engel et al 2006). Tourism has been employed recently not only as a means to develop economically, but it also appears to be an integrated socio-cultural activity with benefits to material and spiritual life of the society (Piranashvili 2013). Conversely, tourism can also increase class differences, and without sufficient management the ecological, environmental, sociocultural, and economic problems stemming from the tourism industry will increase (Nepal 2000; Price 1992; Price 2013).

One more factor now complicating efforts of sustainable development and livelihood security across all mountain landscapes is climate change. Georgia made a major commitment to reduce its greenhouse gas emissions in acceding to the United Nation's Framework Convention on Climate Change in 1994. The Ministry of Environment Protection and Natural Resources published Georgia's SNC in 2009, emphasizing a set of adaptation strategies for the central mountainous region of Kvemo (Lower) Svaneti. Adaptation strategies proposed were for flood and landslide monitoring as well as land erosion abatement tactics – the planting of hazelnut trees. According to the IPCC (2007: 869) adaptation is defined as "Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities." The bulk of climate adaptation strategies have been funded and implemented by governments or multinational organizations utilizing broadly conceptualized strategies for different climatic regions. Unfortunately, ecumenical strategies produce generalized results, often overlooking the individual characteristics of the communities they are trying to help. In doing so, inefficiencies appear because

adaptation strategies were not tailored to the specific needs of the local communities. Implementation of non-specific strategies reinforces situations in which people exposed to the negative effects of climate change impacts are also least able to cope with the risks. By using community participation in the assessment of vulnerabilities and structuring of adaptation strategies, money and labor can be effectively applied in addressing the needs of at-risk communities.

Successful adaptation is the result of reducing vulnerabilities and improving adaptive capacity or "the ability of a system to evolve in order to accommodate environmental hazards or policy change and to expand the range of variability with which it can cope" (Adger 2006: 270). The adaptive capacity may refer to what is available to the vulnerable entity in the form of social, institutional, economic, or physical resources. Those resources then help to prevent, cope with, or recover from disasters. Affluent areas generally maintain a high adaptive capacity, but that does not implicate that development is synonymous with a higher adaptive capacity or that developed areas can be predicted to adapt successfully. Recent research (Pelling 2011 citing Fernandez-Gimenez et al 2008: 41) has shown that:

> ...the best outcomes measured by benefits in social learning, trust and community building, and application and communication of results came from projects where local actors had been given an opportunity to participate, not only in data collection and monitoring but also in design and objective setting, and where projects were supported by commensurately large budgets. *Of those projects with much more limited financial support the best results were found where community members participated in multiple roles* (Italics added for emphasis).

Integration of local communities into the assessment of vulnerabilities and development of adaptation strategies appears to be the most beneficial method for both local stakeholders and funding agencies to meet objectives.

In light of research linking disaster risk, social vulnerability, and economic development (Ward and Shively 2011; Guimaraes et al 1993; Noy 2009) it is becoming increasingly clear that combining the efforts of development with adaptation strategies to the effects of climate change are critical. In an effort to do so, Georgia is preparing the Third National Communication (TNC) to the UNFCCC. Svaneti received no results or outcomes from the objectives outlined since the SNC, as indicated in a recent project document (UNDP 2013). Recognizing the effects of climate change on mountain tourism development is now a priority, in addition to capacity building, consulting stakeholders, and reassessing Svaneti's vulnerabilities. On another front, the Georgian government, United Nations Development Program (UNDP), the Swiss Agency for Development and Cooperation (SDC) and the Austrian Development Agency (ADA) are joining together for an initiative to create sustainable development solutions for the mountainous regions (Tchitchinadze 2014).

Conclusion

Svaneti is undergoing its greatest social transformation since the Soviet occupation beginning in the 1920s. During Soviet occupation, Svaneti received improvements in access and communications, but Soviet policies also displaced people for collective farming and altered social norms. The area is sensitive to the economic and political shocks that resonate through Georgia and has been in a suspended state

since Georgia's independence. Efforts to retain Svan culture by preserving architectural relics have been successful, but restrictions for development have hampered the implementation of basic infrastructure.

Globalization and designation of Svaneti as a cultural heritage site and tourist destination raise issues for development in the future, especially as concerns regarding the effects of climate change grow. The Georgian government is addressing both sustainable tourism development and climate change adaptation strategies in Svaneti in its commitment to the UNFCCC. While this sounds promising, the latest update on the implementation of the strategies proposed in the SNC is a failure to obtain results and complete objectives (UNDP 2013). Additionally, given the geopolitical tensions with adjacent Abkhazia and South Ossetia, political stability will be critical for establishing tourism as a viable economic venture. As for the residents of Svaneti, participation is necessary in deliberative processes to ensure the equitable distribution of the benefits of economic development as employment opportunities, improvement of social service access, and infrastructure. Economic incentives from tourism may not be enough to curb out-migration if climate change adaptation strategies are not effective in mitigating disaster risk and protecting people and the agricultural practices they employ. Nevertheless, Svaneti is poised to become a major destination in Georgia because of the amenities it offers tourists. The future of Svaneti and its residents will need more than just a framework to address the ethical and social implications regarding its development.

CHAPTER 3

METHODOLOGICAL APPROACH AND STUDY SITES

Introduction

This study employed a qualitative approach to better understanding the lived experience of climatic changes and vulnerability to disasters in Upper Svaneti. A phenomenological methodology and thematic analysis were used to explicate the stakeholder's experiences of climate change in its myriad forms. The interviews conducted concerning the perceptions of climatic and environmental change elicited relevant descriptions of hazards and risks local people face every day. This chapter explores phenomenology and its role in geography and is followed by descriptions and photographs of the study sites and people that informed this study.

Phenomenology

Phenomenology is often associated with the writings of philosophers such as Emmanuel Kant and Martin Heidegger. Phenomenology as a philosophy was first discussed in writings by Kant (1781) and Hegel (1807), but really took shape as a methodology from work by the philosopher Edmund Husserl. Husserl developed the concept of *epoché*, which requires the technique of bracketing to eliminate preconceived notions and presuppositions. Bracketing is crucial for phenomenologists who believe that "knowledge based on intuition and essence precedes empirical knowledge" (Moustakas 1994: 26).

Phenomenology entered the field of geography through humanistic geography and inquiry into space and place. Yi Fu Tuan (1976) was integral in the development of

humanistic geography and drew heavily upon the philosophies of Husserl. Tuan was a major force in redefining the interpretations we have of space and place, moving beyond the physical. In *Space and Place: The Perspective of Experience*, Tuan (1977: 6) described the relationship between movement through abstract space and how it becomes place "as we get to know it better and endow it with value." Building upon his earlier works, he created a vision for a more humanistic geography, one that interprets human experience in its ambiguity and complexity in order to "clarify meanings of concepts, symbols and aspirations as they pertain to space and place" (Tuan 1976: 275). He was, however, doubtful of the acceptance of the humanist approach on the grounds that too few people care to probe deeply into themselves and that direct manipulation of the environment is more efficient (Tuan 1976). Tuan's work influenced his contemporaries Buttimer (1976) and Relph (1976) to incorporate phenomenological perspectives into the field of geography.

Relph contributed to our understanding of space as being realized through our lived experiences. He asserts that the foundations of geographic knowledge, and indeed all knowledge, "lie in the direct experiences and consciousness we have of the world we live in" (Relph 1976: 4). Furthermore, the experience of the world must be the original condition, the first possibility of knowledge. It is in that moment that self-evidence is the smallest common element of phenomenal presence in space and time (Ulf 1983). Relph (1976) also argues that a place is not just the location of something, rather, place is a meaningful phenomenon in and of itself. It follows, logically, that landscapes come to embody meanings. Such meanings change according to the type of landscape and according to the individual that interacts there. These dynamics begin

to show the complex nature of environmental perceptions and how, in the face of major changes, like those associated with of global climate change, the assumption is that there will be shifts in the meanings of the landscapes. In order to get to the phenomena as they really are, Buttimer (1976) expanded the use of peeling off successive layers of a priori judgment to the dynamism and tensions of conscious activity. Because much of our social experience is pre-reflective and our interactions occur in space, there are implications as to the spatial systems we navigate. It is in the physical space that our individual experience becomes part of the inter-subjective heritage of a place. The way we interact and make our way through space is dependent on the ability to construct networks as well. We all share a common external environment, one that exists with or without our presence. This means that each individual creates his or her own spatio-temporal network that relates to the environment. Furthermore, "it follows from the concept of intentionality that there is no single, objective world; rather there is a plurality of worlds-as many as there are attitudes and intentions of man" (Relph 1970: 194). Intentionality refers to our directed consciousness and implies consciousness of something in particular. It is through intentionality that we can better understand our actions, not only to the direction and purpose, but also the relationship of being a human in the world (Relph 1970).

A lingering notion remains from the growing backlash to positivism in the 1970s that there exists a danger of science, reification, and scientism because they rely on the disengagement and growing distance from the immediate data of experience and the needs of human beings (Pickles 1985: 59). The phenomenological methodology does not attempt to upheave positivist notions of science but seeks to better inform it before

assigning second-hand constructions. If traditional science builds upon the taken-for-granted lifeworld to meet its own ends, then it ignores original experiences and propagates structured views. Because the academic community desires testable, robust research, phenomenologists had to return to Husserl and Heidegger, who played a role in initially laying out the formal relationship to empirical science. Formal methodologies were developed on the premise that we all inspect, navigate, and manipulate the external world, acting not solely as subjects, but as beings in, alongside, and toward the world. From the foundations of regional geography we can see how the spatial ordering and hierarchies of entities occurs through our activities. The task of geographic phenomenology is to "clarify the regional ontological structure of the geographical, to provide a critique of the taken for granted conceptions of space and the geographical, and to explicate a place centered regional ontology of human spatiality" (Pickles 1985: 169).

Research Setting, Study Sites, and Data Sources

As mentioned previously, Georgia is a topographically diverse country with the northern border shaped by the Greater Caucasus Mountains and the southern border running along the Lesser Caucasus adjacent to Turkey and Armenia (Figure 1). The central band of Georgia acts as a valley between the Greater and Lesser Caucasus, with the Kolkhida Lowland opening westward to the Black Sea and the Mtkvari River Basin draining to the east.

This study is set in the Mestia municipality of Georgia, which is analogous to Upper Svaneti (Figure 4). The Mestia municipality is the northernmost municipality in the administrative region of Samgrelo-Zemo Svaneti, which spans from the Greater Caucasus to the Black Sea in the northwest portion of Georgia. The region is bound to the west by Abkhazia and to the east by three other regions: Guria, Imereti, and Kvemo (lower) Svaneti. Samgrelo-Zemo Svaneti is unique among the other regions of Georgia because it ranges from the lowest to the highest elevations in the country. Within the region, the Enguri River flows from its glacial headwaters at the base of Mt. Shkhara to the Black Sea. Small settlements straddle the hillsides of the Enguri River down to the Enguri Reservoir, formed by the building of the Enguri Dam in 1986. It is the world's tallest concrete arch dam, standing at 272 meters and is Georgia's most important source of renewable energy. The Enguri Dam contributes over 40% of the country's hydro-generated power (CDM-PDD 2006). Waters passing through the dam then flow by the regional capital of Zugdidi and on to the Black Sea, with diversions in the lower reaches for agricultural production. Upper Svaneti has a landscape characterized by steep valleys below mountain peaks pushing 5,000 meters and the rugged topography aided the ethnic Svans in remaining largely autonomous until Georgia's incorporation into the USSR.

Approximately 14,248 people live in the district of Mestia, distributed across seventeen villages along the Enguri River and its tributaries. Study sites for this research included 6 villages in Upper Svaneti from the highest settlement Ushguli (2,100 m) to Becho (1,450 m) at the southwest flank of Mt. Ushba. The Upper Svaneti area is listed among the UNESCO World Heritage Sites, and the city of Mestia is being

considered as the site for a four season ski resort (Ministry of Economy and Sustainable Development of Georgia 2011; UNESCO 2010). The local economy is based mainly on subsistence agriculture; animal husbandry, grain and hay crop production, vegetable production, and forestry are most developed in the region. Development of Upper Svaneti as a tourist attraction and exploration for additional hydropower sites is already under way. This makes strategies for the mitigation of and adaptation to projected climatic changes extremely important for infrastructure development and maintenance of local livelihoods.

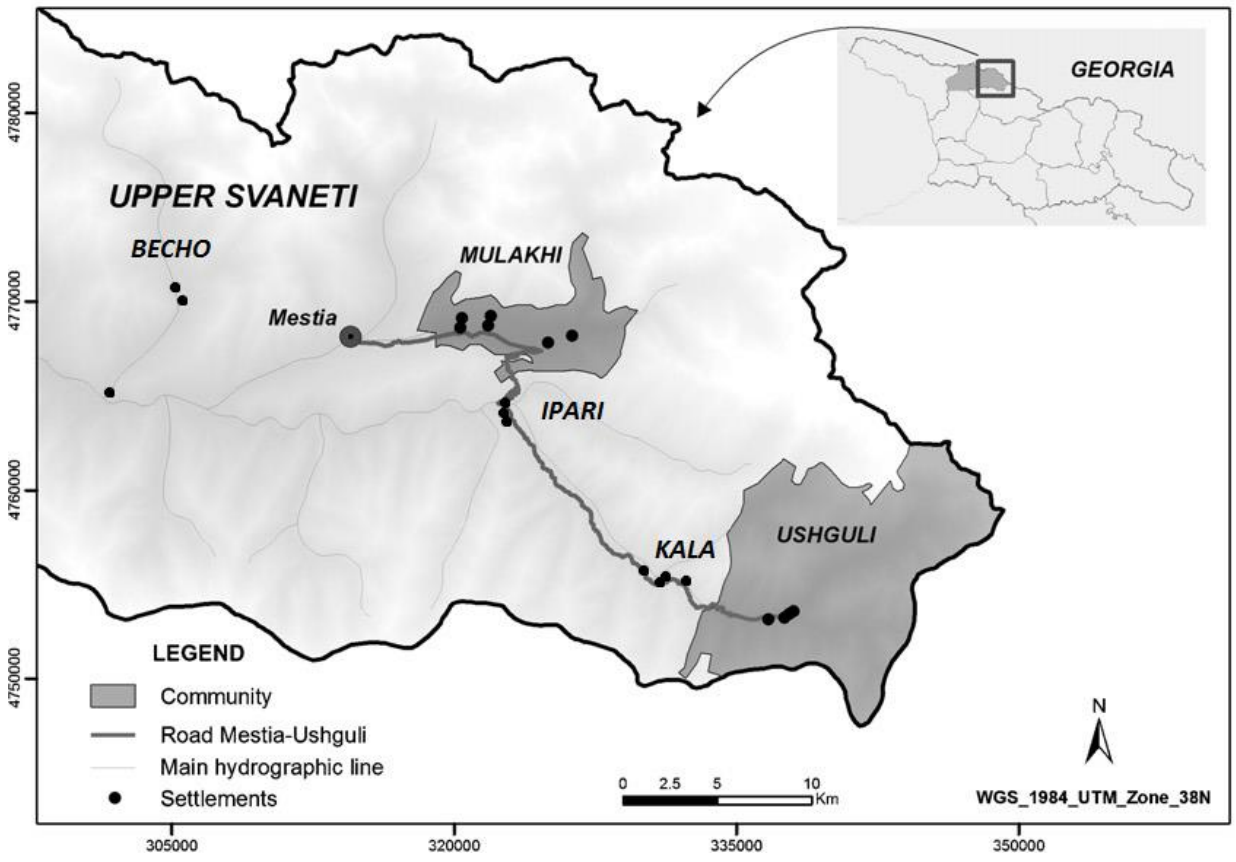

Figure 4 Study Site Locations (adapted from Tarraguel 2012).

I embarked for Tbilisi in September of 2012. A total of 8 months, from late September to early April, were spent in the field, living with families in Ushguli, Kala,

Ipari, Mulakhi, Mestia, and Becho (see Figure 3). This time in the field allowed me to witness and participate in the local daily activities through the winter at each location, thereby cultivating a personal connection to the environment and climate in relation to local views. A total of fifteen full length semi-structured interviews were recorded in Svaneti (N= Ushguli (6), Kala (2), Ipari (1), Mulakhi (2), Mestia (3) Becho (1)) with 17 active participants ranging from 38 to 75, 3 of whom were female. Another four interviews were conducted with key informants who are members of the faculty at Tbilisi and Kutaisi State Universities with specialties in geography, climatology, demographics, planning, and glaciology. Data were also collected through various ethnographic methods including observation, participation in daily activities, informal conversations, unstructured interviews, and field note taking following the guidelines of Lindlof and Taylor (2011).

Participants were selected using a systematic, purposeful sampling method because the particular nature of this study does not rely upon data collected from a large or random sample. When researching social processes, statistical representativeness is not a requirement, especially when experience of a particular phenomenon is necessary for a study (Lester 1999; Patton 1990; Hycner 1985). Criteria for stakeholder participation were that the participant be fluent in the Russian language, and be a current resident of Upper Svaneti, having lived there for more than twenty years of their life. Only two of the seventeen participants recorded were not born in Upper Svaneti, meaning all of them have had enough tangible experience pertinent to the phenomena being studied. Before conducting the interviews I received verbal consent from each participant, which involved describing their participation in this

research project, the purpose and procedures of the research, the voluntary nature of their participation and right to stop at any point, and the steps in place to protect confidentiality. Stakeholders also received a written copy (in Georgian) of the consent agreement to review before the interview. Following the completion of each household interview (HH), participants were asked to recommend additional potential informants to expand the sample. Snowballing was an effective means of recruiting supplementary participants because of the intimate nature of the communities and interconnectedness throughout the region along familial and social ties.

Village Vignettes

The following passages are sketches of the six fieldwork study sites investigated from September 2012 to April 2013. These villages are the sites for the following analyses concerning perceptions of climate change and vulnerability. This discussion seeks to illustrate aspects of the regional geography and daily life in Svan villages. The descriptions and photos of landscapes and people move down-valley sequentially, following the road from Ushguli to Mestia and then to Becho.

Ushguli

Ushguli is the highest year-round settled village in Europe and is composed of four hamlets, including Zhibiani, Chvibiani, Chazhashi, and Murkhmelia. Murkhmelia was the most severely damaged in the avalanche of 1987. It is regarded as the strongest and most important part of Ushguli, many locals said that if there is no Murkhmelia, there is no Ushguli. Murkhmelia was purportedly the first place to be settled in the area too. Lamaria church is nestled on a hill in a classic u-shaped valley opening its way northeast towards Mt. Shkhara. Approximately 60 families commit to

year-round residency, but during the summer relatives and tourists return to bask in the mountain paradise, and the population rises to around 300 people. Ushguli is a popular destination in the summer because of the scenic beauty, the hike to Shkhara glacier, and the ethnographic museum located in a fortress house in Chazhashi. Many tourists hike the 46 kilometers from Mestia through the rolling hills, while others brave the drive along the dilapidated dirt road which is impassable for most of winter. A pass to the southeast has a dirt road that leads to Lentekhi, Lower Svaneti. It is not maintained and remains closed during winter, often from October to May.

Figure 5 Mt. Shkhara with Zhibiani and Chvibiani in the foreground (Photo by Peter Bordokoff, October 2012).

Figure 6 Towers in Chazhashi, a UNESCO World Heritage Site (Photo by Peter Bordokoff, September 2012).

Figure 7 Daily, physically demanding work is required by all, even the elderly, to maintain livestock. Local agricultural systems also rely on animal by-products for fertilization. Manure is removed from the animal corrals periodically throughout the winter and carted to potato fields (Photo by Peter Bordokoff, February 2012).

Figure 8 The narrow stretch of road between Ushguli to Kala is most affected by debris and avalanche flows, requiring assistance from tractors to keep clear. The old Soviet-era machines are operated and maintained entirely by locals. The closest source of fuel is in Mestia, and the tractors are prone to mechanical failure and snow storms and other geohazards can stop vehicle traffic for days to weeks (Photo by Peter Bordokoff, November 2012).

Kala

Kala is the next village encountered on the way down-valley from Ushguli. This village has seen major outmigration. There was a total of 62 people that spent the winter of 2012-2013 in Kala, just a fraction of the 150 families that were still there in the 1980s. It is one of the least populated villages and the five hamlets, one of which is abandoned, that form Kala are spread out over a kilometer along the Mestia-Ushguli road. The conditions of the road are of the utmost importance for the people of Kala.

There is no store available, no market, no restaurants, and no doctor to treat people. Looking at the hill slopes in Kala you can see some houses, one last standing tower, pastures for grazing, and a school building next to the cemetery for the few children that are left. Some houses have been retrofit to accept tourists, although very few stay in Kala because of its proximity to Ushguli.

Figure 9 Standing on the Mestia-Ushguli road, looking at Lalkhore, which is the center of Kala (Photo by Peter Bordokoff, March 2013).

Ipari

Ipari has an interesting layout: there are three parts to the village situated on three small plateaus. The road passes through the lowest hamlet Bogreshi, going higher by foot you get to Ipari and finally to Zigani. Bogreshi was afflicted by flooding events in 2007, five buildings were damaged and nine were obliterated. There is a police station in Bogreshi and a house doctor available to locals. Ipari is approximately halfway to Mestia, and the next village Mulakhi lays on a sloped plain over a pass.

Figure 10 View of the hamlets of Ipari and Zigani on the higher plateaus with Bogreshi situated in the foreground (Photo by Peter Bordokoff, March 2013).

Figure 11 A local woman walks through the abandoned house in which she grew up. Her siblings have all left Ipari, leaving her to care for her elderly mother (Photo by Peter Bordokoff, March 2013).

Mulakhi

There are eleven hamlets that form Mulakhi, situated along the Mulakuhra River. The peak Tetnuldi (4858 m) is due east and Mount Ushba (4710 m) is visible to the northwest. The plain that Mulakhi is settled upon is exposed to drainages and gullies to the north side of the valley. An avalanche in 1987, which discharged from the largest drainage, devastated the community. Buildings were demolished and Mulakhi lost 26 people. The area that Mulakhi occupies is larger than Mestia but fewer people live there. The road that continues down-valley along the river, beyond a ridge, and into Mestia.

Figure 12 View of Mount Ushba with Mulakhi below (Photo by Peter Bordokoff, September 2012).

Figure 13 Young boys, loaded with plastic bottles, cross the Mulakhura River to collect mineral water from a spring (Photo by Peter Bordokoff, March 2013).

Mestia

Mestia is the regional capital of Svaneti and has the largest population, hovering around 3,000 people. Mestia is located on a sloped plain adjacent to a river. As the regional capital, there are many amenities available to residents that cannot be found in the more remote villages. There is a medical clinic, police station, bank, grocers, restaurants, paved roads, and a small airport that opened in 2010. It is a “metropolis” compared to other Svan villages and the first stop for services and goods available to

the other communities in Upper Svaneti. The next major city, Zugdidi, is 131 kilometers away. Mestia is the main area considered for tourism development. It has the basic foundations to support incoming tourists en masse (lodging, restaurants, reliable road access, and airport) and ski lifts within a fifteen minute drive, which are being expanded.

Figure 14 The valley of Mestia, from the top of a Svan tower. Note the airport and airstrip adjacent to the river on the right (Photo by Peter Bordokoff, April 2013).

Figure 15 New structures along the main strip through Mestia have been built in anticipation of more tourists. During the recent political transition, which ended Saakashvili's second presidential term, construction was stalled and these buildings remained empty and unattended through the winter (Photo by Peter Bordokoff, September 2012).

Becho

Becho is located in its own valley about 20 kilometers from Mestia. It is composed of several hamlets, Mazeri being the highest and most well-known. Above Mazeri in a plateau is an amazing view of Mt. Ushba (4710 m) from its southwestern flank. Becho is similar to other villages outside of Mestia, characterized by potato fields, roaming livestock, and medieval Svan complexes, but lacks the iconic Svan towers that were destroyed by the Russians in the early 1900s.

Figure 15. Mazeri Peak (center) and the South Horn of Mount Ushba to the right (Photo by Peter Bordokoff, April 2013).

Figure 16. The fragments of the last Svan tower in Mazeri (Photo by Peter Bordokoff, April 2013).

Conclusion

This chapter introduced the methodological theory and approach that informs this study and the study sites for the following empirical research. With a deeper understanding of how phenomenology teases out the essences of peoples' lived experience it will be possible to look at the phenomenon of climate change as more than simply fluctuations in the atmosphere. The meanings that surface for people can be quantified and interpreted through other methodologies and data collection methods, but this phenomenological approach uniquely touches on the value and meaningfulness of lived experiences that is justified *a priori*. The study sites have been captured with both textual and photographic media, illustrating the connectivity of people and their environment. The following chapters will explore two aspects of this interconnectivity specifically: perceptions of climate and an analysis of the nature of vulnerability to disasters that exists in these communities.

CHAPTER 4
PERCEPTIONS OF CLIMATE IN UPPER SVANETI, SOUTH CAUCASUS, GEORGIA

Introduction

One imperative of climate change science is to better understand the social impacts as well as the physical changes on the landscape while involving stakeholder communities in risk assessments (please see Maguire and Cartwright 2008; Folke 2006; van Aalst et al 2008). One notable physical change in mountain landscapes has to do with glaciers and glacial recession and the related social impacts. In the Republic of Georgia, glaciers play a critical role in sustaining mountain communities. Glacial runoff provides water for irrigation, domestic, and hydropower sectors. Throughout Georgia and the rest of the Caucasus Mountains efforts are underway to document and analyze the retreat of high elevation glaciers and their associated impacts (please see Bedford and Barry 1994; MEP 2009; Shahgedanova et al 2009; Stokes et al 2006; Sylven 2008). In 2009 the Ministry of Environment Protection and Natural Resources (MEP) published *Georgia's Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC)*, emphasizing a set of adaptation strategies for the central mountainous region of Kvemo (Lower) Svaneti. Adaptation strategies included flood and landslide monitoring as well as land erosion abatement tactics. There was, however, no inclusion of societal dimensions or community perceptions of components concerning climate change, the retreat of glaciers, or the associated hydrologic hazards.

This study examines the human dimensions of climate and the associated impacts from climate change from a phenomenological stance. The following chapter builds upon this work by incorporating people's lived experience into a social vulnerability assessment of Upper Svaneti, one of the most topographically complex municipalities in Georgia. The focus of this research is to present the data that reveal how people perceive and make sense of climate change in Upper Svaneti. How changes in the weather and climate are experienced and perceived, as well as how stakeholders interpret and cope with a dynamic and fluctuating environment, will be paramount to recommending ethical and appropriate adaptation strategies sensitive to the needs of stakeholders.

Data Sources and Methods

Data were collected through various ethnographic methods including semi-structured interviews, observation, participation in daily activities, informal conversations, unstructured interviews, and field note taking following the guidelines of Lindlof and Taylor (2011). There were fifteen semi-structured interviews with seventeen active participants ranging from 38 to 75 years of age, three of whom were female. Criteria for stakeholder participation were that the participant be fluent in the Russian language, and be a current resident of Upper Svaneti, having lived there for more than twenty years of their life. Only two of the seventeen participants recorded were not born in Upper Svaneti, meaning all of them have had enough tangible experience pertinent to the phenomena being studied.

Semi-structured interviews were deemed most appropriate for this research because they attempt to understand themes of the lived everyday world from the

perspective of the subject. “This kind of interview seeks to obtain descriptions of the interviewee's lived world with respect to interpretation of the meaning of the described phenomena” (Kvale and Brinkmann 2009: 27). The semi-structured interview aligns well with the objectives of phenomenological analysis and they were structured in a manner following Seidman's (2012) recommendations in *Interviewing as Qualitative Research*. The questionnaire was designed to establish the context of the participants’ experiences, reconstruct the details of their experiences, and reflect on the meaning their experiences hold for them. In this way it is possible to better understand the behaviors and experiences because they are contextualized in their lifeworld. Additionally, this co-production of knowledge transforms participants into co-researchers as they begin to reflect critically on the phenomenon and the meanings they associate with it. The original format for a phenomenological inquiry through semi-structured interviews outlined by Seidman (2012) was with three separate interviews; however, the structure was modified to be conducted in the form of one interview on the grounds that the same rational process was kept and the results are both repeatable and documented.

Interview Analysis

The data analysis was conducted following Hycner’s (1985) guidelines for the phenomenological analysis of interview data. This approach consisted of first translating the interviews from Russian into English and transcribing them. I then began the process of bracketing and the phenomenological reduction, which is a “conscious, effortful, opening of ourselves to the phenomenon *as a phenomenon”* (Keen 1975: 38). One important aspect of this process is evaluating one’s presuppositions regarding the

phenomenon in question, and the act of bracketing out (or epoché) prevents the projection of the researcher's meanings or a priori prejudices onto the data and findings.

The extended field experience aided immensely in allowing me to enter the world of the participants and guided me to a better understanding of what it is they were saying, not what I was expecting them to report as per my biases. The next stage was to listen to each interview for a sense of the whole, noting non-linguistic levels of communication (intonation, pauses, and emphases) which provided a context for specific units of meaning and themes as they emerge. With that sense in mind, and while continuously bracketing my presuppositions, I went over each word, sentence, and paragraph and delineated units of meaning - the essences of their communication as crystallized expressions using the literal words of the participant. The general units were then organized as relative to the research question at hand, all other statements were not recorded in this process. To verify the reliability of the units of relevant meaning I conferred with three colleagues, having trained them to carry out the same procedures as described above. No significant differences in our interpretations occurred, though because each person has a unique perspective there were some minor variations in their explication of the data that were discussed. Having safeguarded the validity of the analysis, I proceeded to eliminate redundancies across the lists of units, bearing in mind the number of times meanings were mentioned as well as how they were mentioned. The final stages of the phenomenological analysis involved clustering the units of relative meaning and determining themes from them. This reflexive process was repeated for each interview with common themes emerging from

the collection of unique themes identified in individual responses. This process is iterative and intimately connects the researcher with the data over time.

Results

Climate change is necessarily a complex phenomenon. Climate change has come to the forefront of political and international debate since the Earth Summit in 1992 and the ratification of the Kyoto Protocol in 1997 and will, arguably, affect every dimension of human life. Even before we came to understand the anthropogenic effects on climate and its implications, “western” societies have seen a deterioration of the ancestral link to climate in the quest for food (Knebusch 2008). In Svaneti, this has not been the case. Depressed economic conditions and the designation of the area’s communities as a UNESCO World Heritage site and well preserved medieval villages have not compromised the authenticity of Upper Svaneti (Kay 2000). The main livelihood strategy is still mixed-grazing and farming, with few people benefitting from recent tourism developments. Virtually every person participates in agricultural production and livestock maintenance; an estimated 99% of residents in Upper Svaneti are small-scale farmers (Engel et al 2006). Furthermore, research commissioned by UNDP in 2013 found that “73 percent of the families living in the mountainous areas of Georgia are vulnerable and the socio-economic and demographic development trends are highly negative” (Tchitchinadze 2014). Reliance on the natural weather systems is linked directly to local cultural traditions, subsistence, income generation, and climate. Climate, specifically, has also been found to be embedded in notions of personal and national identity (Golinksy 2003).

This study found perceptions of climate to be expressed in several ways: as changes in weather and weather events, changes in climate, changes in the surrounding environment, and changes in glaciers. Within each of these categories are trends that exhibit the structures of the phenomena of climate and climate change. From the narratives describing these changes, and their associated meanings, themes emerged that characterize the phenomenon of climate change as experienced by residents in Upper Svaneti. Before the discussion of these trends and themes, an important distinction must be made between the phenomena of weather and climate. It will then be easier to address some of the difficulties inherent in the perception of climatic changes.

Climate is defined as “the characteristic weather conditions of a country or region; the prevalent pattern of weather in a region throughout the year, in respect of variation of temperature, humidity, precipitation, wind, and so forth” (Oxford English Dictionary 1997). Phenomenologically speaking, climate exists in our sensitive perceptions as a landscape, operating on a meteorological timescale, and our climatic perceptions correspond to an experience of a *net* of time (Knebusch 2008). For people, through whose eyes and from whose vantage point make the landscape possible, climate is commonly associated with seasonal changes tied to a geographical space. Over time a person develops a familiarity and experience of seasons in his or her memories that may be described as *typical*, when it matches his or her expectations of seasonal shifts and changes (Howard 2013).

The cumulative observations that form one’s perception of climate are, in fact, observations of weather, defined as “the condition of the atmosphere (at a given place

and time) with respect to heat or cold, quantity of sunshine, presence or absence of rain, hail, snow, thunder, fog, etc., violence or gentleness of the winds" (Oxford English Dictionary 1997). Weather is ephemeral and only a temporary state that can vary widely over a short period of time. Patterns of weather over longer periods may seem stable, similar to the way that our understanding of climate assumes a sense of regularity over a long period of time. Yet, on a finer scale, the daily fluctuations in temperature or sunlight duration may be imperceptible or overlooked. Subtle changes do not always register as people go about their lives in the "natural attitude," the unquestioned pre-reflective acceptance of the world around us. We do, however, recognize gradual modifications in the transition between seasons, which elicits a temporal awareness that frames the human experience of weather (Howard 2013). Weather is perceived in the present and is immediate, but "subjectively, a season is always experienced from its center" (Knebusch 2008: 8). Both retain a singular and regional aspect (Bohme 2003).

Climate change, from a phenomenological perspective, is the modification and fluctuation of climate that we experience, which is not to be confounded with the academic, scientific, or political sense of the phrase. This hints at the differing ways in which climate change is perceived individually and is socially constructed as a collective perception. On the individual level, perceptions are directly interpreted and localized to one's experience - becoming part of our inner world. The global phenomenon of climate change, on the other hand, is simply a concept. For the purposes of this study, I maintain the phenomenological point of view because it focuses on the explication of the phenomenon of climate and how it changes and is experienced by individuals in

Upper Svaneti, not as the modern politically charged discourse that is ultimately disturbing our perception of climate.

The climate in Svaneti can be described as severe. Locals described the climate in several ways and one of the most common statements was that the year has only winter and summer seasons. As one participant put it, “you learn that here it is half winter and half summer. Because of that it is difficult to be successful at everything” (HH: 1). Preparing for winter is an arduous task, especially the further one gets away from Mestia, due to unreliable road access. Every home harvests their potatoes, hay for animals, and vegetables, and then stockpiles enough supplies (e.g. flour, medicines, wood, canned goods, toiletries, alcohol, etc.) for the winter months. Children received one week off from classes at the local school in Ushguli to help their families during the harvest and prepare for winter. Summer, on the other hand, is welcomed by all. Day to day tasks are easier, tourism brings in wages for some, and travel becomes much easier and reliable. Supporting a family requires a lot of work and labor in the rugged mountain communities of Upper Svaneti, but locals are accustomed to the lifestyle and climate, accepting it as “normal.”

Weather

Changes in weather were discussed by participants as extreme events and warming in both the summer and winter months. Although the weather that is experienced at a particular time cannot be attributed directly to climate change, weather anomalies unexplained by seasonal variability can challenge one’s preconceived notions of “normal” seasons. If, over time, the intensity and frequency of weather events change, it may increase concern and anxiety while establishing itself as a new climate

regime. Upper Svaneti has had several extreme events in the recent past that have had lasting impacts on the communities. In Russian, 'natural disaster' is translated as стихийное бедствие (*stikhinoye bedstvie*), literally meaning an elemental or spontaneous disaster. This is often reduced to стихия (*stikhiya*)," or "the elements." One such event occurred during the winter of 1987 when more than 5 meters of snow blanketed the entire area. Roofs caved in under the weight of the snow if not cleared, cows and pigs were roaming above the houses, and avalanches in Ushguli and Mulakhi wrecked whole hamlets. Two individuals recalled:

> I remember in 1987 or, yes 87, there was a tough winter. There were elements there… The avalanche totally, well, snow overtook them. The people too, one home was there, somewhere, with 10 people and the family, well [pause] not one of them was left. (HH: 5)
>
> The wind discharged there (pointing to the hillside), it was so strong that houses were totally broken, everything was broken. Only one tower was left. Everything else was all destroyed, Svan houses, the European houses that we have – everything was destroyed. Everything destroyed, and 27 people died… That was some kind of reckoning, a scoring. The devil did it. In Ushguli too. (HH: 10)

A history of natural disasters in the mountains, and their reoccurrence, suggests that locals are aware of the physical risks associated with living in the mountains. Unfortunately, mitigation and coping strategies in Upper Svaneti are still constrained on an individual and societal level. In the wake of the events in 1987 international aid became critical in supporting the affected areas. The government at the time decided to relocate individuals to southeast Georgia. 16,000 people were evacuated from Svaneti, more than 2,000 houses were damaged, and 409 families lost all their property to the disaster (Trier and Turashvili 2007). Forced migrations by the government reflect a

perception of disasters as a threat but the motivations for people to leave voluntary are more complex.

Precipitation in the form of rain and hail were also described as elemental and a few recent instances were considered out of the ordinary. “The rain falls really hard. Last year, for example, in the month of May rain fell every day. The farms didn't have enough time to work” (HH: 11). Snow and rain disrupt daily activities in agriculture and livestock maintenance. I noticed that on rainy days few or no people were occupied with tasks outside. When asked explicitly what constituted bad or poor weather, people who mentioned rain described that they could not work outside as a result. The following passages detail the various impacts of heavy precipitation and how people are beginning to connect these events to larger trends in the climate.

> Six years ago there were elements here. Everything was broken here. Even the leaves in the forest weren’t left, no birds, nothing. Everything was broken/hit. They were very dreadful elements. After that it was harder for the people because the land was taken, some houses were taken, and it became harder for people to live… The corn was ripe, it was already at that moment you couldn’t even re-plant. It was too late, for the potatoes too. It began to pour a lot of rain, then hail. It destroyed everything, not a leaf was left in the forest. After that, even a house was taken, it was that dreadful. Many houses and people were injured. Houses were taken, the city was taken, the land/earth was taken. The field was also deteriorated. There was no hay to cut for the village, no grass at all, it was very hard that year. The cows were injured like the people, the livestock was injured. (HH: 9)

> There is heavy rain, when there is rain there is erosion too. It is degraded, the uh, the countryside. The gardens deteriorated, the mowing deteriorates so much when there is strong rain. It was never that way before. The climate was quiet before. Right now it is very different, all changed. In the summer there is heat, it is really hot. It rains, and if it doesn’t rain then the sun is a very strong grade, a very strong grade. The hay has deteriorated, and now it is more of a problem. There is no hay sometimes, and no hay is a problem. (HH: 10)

Warming

Increases in temperature and precipitation were reported by participants throughout Upper Svaneti and are substantiated by analyses conducted by the MEP in the Second Communication to the UNFCCC (2009) which show a rise of 0.4°C and an increase of 106 mm (8%) of precipitation over the last 50 years. Indeed, across the South Caucasus there have been similar trends of increasing temperatures, shrinking glaciers, decreasing snowfall and an upward shift of the snowline, sea level rise, and a redistribution of river flows (Taghieyeva 2006). For the communities in Upper Svaneti there are direct implications for agricultural systems, public health, and the future of the glaciers. I found it interesting that descriptions of warming were not associated with particular events such as drought or heat waves; rather, people's experiences indicate that recent perceptions of warmer weather have already cumulatively distorted their seasonal memories of summer and winter.

> It has become warmer, uh, in my opinion winter is starting a little late for us, and summer is also starting late. The precipitation in summer has become more, in my opinion. Of course I don't measure it in summer, I don't know exactly, but I think it has been more. There has been more erosion, water erosion, there in Ipari. Very much, I have seen it with my own eyes. It became warmer, I already said. (HH: 5)

> The climate is warmer, in the summer, especially in the summer, there is more heat. In the winter, I am 51 years old now, and I don't remember such a warm winter as this winter. (HH: 10)

No accounts of drought were discussed, but if the mean annual temperature rises by 3.5°C in this area, as predicted by the MEP (2009), so does the chance of extreme or prolonged drought.

Climate Change

"What is climate change? Climate change is if it will be hot! [laughs]" (HH: 11)

Climate change, as abstracted for the purposes of this study, refers to perceived fluctuations over time at seasonal or greater time scales. This phenomenon is then explicated as a change in one's composition of generalized weather perceptions. To be able to explore this, the residency criteria for participants was critical. A longer residency ensured that extended climatic and environmental interactions had synthesized an accepted notion of local climate. People's reflection upon recent perceived changes in relation to prior notions evoked some strong responses. The following quotes demonstrate views on the interconnectivity between humans and their environment and how dissonance arises when there are conflicting realities to their expectations. For one participant, summer changes were most salient:

> In my childhood [pause] nature was really quiet. Nature was quiet, there were no cataclysms. Our river didn't rise so much, it didn't rise like it does now. Every summer it rises. Something is broken. Never back then, it was not like that. Nature was very good then. The fog was beautiful, and now it isn't like that. The fog is so, uh, how do you say, it is so dark. (HH: 10)

Others questioned the notion that climate is stable at all, yet recognized that within their lifetime there have been rapid shifts that have caused disturbances within their community:

> Climate change, well you can't call it law when it still changes, it has always changed, but climate change is a catastrophe. To me and to nature. I have an old mother, and the weather affects her a lot and the people too are becoming depressed with all of this. People complain to the angels and are saddened. They want to sleep all the time, even the young are saddened. Something is

> going on with the atmosphere. It is doing something to the circulation, and it is really impacting people. I noticed long ago. (HH: 12)

In the next excerpt, some commentary is made regarding modern migration patterns in Svaneti. Following the disastrous winter of 1987, many people opted to leave Svaneti, though some family members return to enjoy the summer months. Others have recently recognized the potential to benefit financially by opening guesthouses as prospects for tourism growth. In either case, for the next participant, perceived systemic changes are confusing and widespread:

> Some people have left here for the city to live. When the summer comes these old homes are remodeled, new roofs were made but they say, either way they say to the sky, to nature, that 'you changed'. To winter they say 'you're changing.' That is what we say, what the people say. (HH: 2B)

Narratives about the changing trends in climate were necessarily related to larger social commentary. The Svan identity is deeply connected to the local environment, and its sustenance is dependent upon it. Local livelihoods, traditional knowledge, and cultural practices were forged over time in this particular space, and these facets of the Svan identity are not independent of the local environment or the climate that created it. The above quotations touch on feelings of depression and confusion, and they question of the authenticity of nature and climate. Resulting from shifts in weather patterns, events, and overall climate are physical manifestations of environmental responses to the described warming and precipitation fluctuations. Examining the specific environmental, ecological, and glacial trends will support a deeper thematic analysis of the participants' perceptions as they make sense and create meanings associated with their changing climate and surroundings.

Environmental Changes

This next excerpt is one of many that touch on changes in air quality. There appears to be a strong geographical component to the distribution of comments about the deterioration of air and water quality that intensified as I traveled down valley. Interestingly, not just the properties of air masses were discussed, but for some, a deeper connection exists between the environment and health:

> Respondent: People were healthier and stronger, and now there are many illnesses that are not understood, the origins. Especially rheumatic phenomena, everybody has rheumatism because the climate is softened and this ash gray air comes, it isn't as clean as before.
>
> Me: The quality of air has changed?
>
> Respondent: Yes, yes, considerably, because it feels here like the air in the Caucasus, compared to other parts of Georgia, has become heavier, very. It is often very tough to breathe. We always had clean, transparent air when good weather came, it was never like this. Now it is a filthy color and the environment in winter is different, there are thunderstorms in winter, even two weeks ago. (HH: 12)

This view matches those voiced after the creation of the Enguri HEPS in late 1986. Residents complained of damp walls and doctors documented an increase in respiratory illnesses and chronic joint pain (Amonashvili 1990). The creation of dams has been shown to alter humidity regimes in addition to their negative ecological and social impacts. As a response to the completion of the Enguri HEPS, a successful ecological movement supported by the Svans was able to halt the development of the Hudoni Dam in Svaneti, which would have displaced nearly a quarter of Upper Svaneti's population (CEE 2011). Anthropomorphic influences on climate systems are not solely

restricted to greenhouse gas emissions. The Enguri Dam demonstrates a clear example of local regime change. The point is not that the perception of air quality and related health impacts are associated with the construction of the dam because they were never mentioned as such. Instead, they are a part of a comprehensive interpretation of experienced environmental changes.

One more important factor in the overarching environmental changes expressed by residents of Upper Svaneti is the state of water. Both atmospheric and groundwater changes demand attention. Trends in rain and snow as extreme weather events have been covered, but the properties of precipitation as it falls are equally important. Warming influences both the amount of water ambient air can hold and the physical state of precipitation as rain, sleet, snow, etc. These properties of local precipitation have been largely stable over geologic timescales, allowing glaciers to form. Shahgedanova (2005) has found that the retreat of glaciers in the Caucasus is driven by an increase in summer temperatures but more importantly there has been no compensating increase in winter precipitation. If winter snowfall is compromised there may be an additional intensification of melt. One respondent describes differences in snow quality that may fuel such a process: “Before, I remember, that the snow was different, dry. It was totally different snow. Right now the snow is totally different. It is wet. It isn't rain or snow. They are mixed” (HH: 11).

Fresh, potable water is necessary to support the Svan people and their mixed-grazing and farming practices. Mineral and fresh groundwater springs adjacent to villages have been the primary sources of drinking water. Earthquakes can disrupt the underlying geology and create or destroy these sources and heavy precipitation can

cloud or dirty water as well (Gorokhovich 2005; Swenson 1964). Every participant described groundwater as their source of potable water, whether or not it was pooled and plumbed to them, welled up on their property, or retrieved manually. No decreases in availability of water were suggested, but some assert that the quality and taste has changed as indicated in this statement:

> Changes in the water are generally, basically nothing has changed, but the taste of the water, for example, in one place I got it from in my childhood near where I lived and we got the water from a central source. It was delicious, and the day before yesterday I was talking to a friend, and I recounted how the water was so tasty and now I can't put it to my lips. Others have agreed, I thought it was my problem, my mouth, but others say that is right, it has changed a lot. Not only I say that. We see these places where it stumbles out of the ground and maybe it deceives us as something tasty, but it has disappeared. Something different is coming out, the taste of water has changed in many places. (HH: 13)

Ecological Changes

Mountainous environments are dynamic and ecological responses across altitudinal gradients display a breadth of diversity. Von Humboldt's (1807) research on altitudinal zonation of Ecuadorean vegetation spurred numerous classification systems for altitudinal belts, based largely on climatic factors. As climate systems develop and shift, so too does the local ecology. Rising altitudinal gradients on mountain slopes exert natural pressures on flora and fauna and recent acceleration of alpine vegetation shifts have been found to be consistent with climatic trends (Walter 2002; Walther, Beissner, and Burga 2005). The distribution and continued legacy of plants, animals, and people is dependent upon the ability to adapt. While humans are capable of employing any number of strategies to adapt to environmental conditions, plants are constrained

heavily by the climate and ecology. For the predominant crop of Upper Svaneti, the potato, a new pressure is appearing:

> There will probably be nothing here, I say that every kind of parasite has appeared here now, for example, in every meadow with potatoes. They are called ‘maxari,’ the Colorado beetle, all of those little bugs. If we don't use chemicals then there won't be any potatoes. They were never here before. I remember exactly, in my twenties, maybe twenty one, after I finished school and nobody used any chemicals. There were no chemicals here to destroy them. It has been maybe ten or fifteen years that they appeared here. Because the climate has changed they can live here, probably, it isn't that cold so they can live, and that’s it. They haven't made it to Ushguli, but will soon they will get up there. Mestia already has them, and even there, in Mulakhi, they probably have them too. But up to Kala and Ushguli, they probably haven’t made it and maybe it is still too cold for them to live there. Here, it is done. It’s all, all because the climate changed that you probably didn’t see the parasites before. (HH: 11)

The extreme temperatures in the mountains have limited not only the pests that threaten crops but also what can grow there in the first place. Continued warming trends and rising altitudinal belts may be exploited to diversify agricultural products.

> Well, I think it [the ground] has become warmer and it has become easier to grow some vegetables. There are even apples there [pointing]. It appeared here in Ushguli, and there were never apple trees that grew, and now there is fruit. (HH: 5)

Glaciers

Mountain glaciers are commonly referred to as the water towers of the world. They release water year-round from their termini, creating rivers that provide invaluable water resources for hydropower, agriculture, and support for all life forms. In Upper Svaneti, glaciers are iconic of the rugged alpine environment. Current predictions for glaciers by the MEP (2009) are bleak. Their models predict that temperature rise may

result in the total loss of Svaneti's glaciers as early as 2050. All of this study's participants have visited neighboring glaciers, many within half a day's walking distance. There was absolutely no question in their minds that the glaciers have been in retreat. Three participants describe their perceptions of glacier fluctuations in quantitative and qualitative terms as such:

> The reality is that it is going back… When it was earlier, it was colder, probably. Because of that it goes back. Thirty years ago was the first time I went to the Shkhara glacier. Then I, well, I saw it after thirty years. When I have guests, for example I take them there, and now I see how it goes back. It is probably because nature changed, yes? Probably. It rains often, for example, in March, April, and May. In general it has rained in these months, but the last 3 years – every day it rained and snowed. Rain and snow, rain and snow. Then after, in summer, it is just sun. Probably a difference of one or two degrees (Celsius) and because of that it goes back. (HH: 1)
>
> You know, if there is a glacier, it grows slowly. Where there is a meter now, 30 have gone back already. For nature it is very bad, very bad here. The natives, elderly people, say that they remember when there was ice before, and it went back. For nature it is very bad, and for local people. The weather breaks down, and that's that… My father says that in 100 years, this very glacier [Shkhara] went back 100 meters. (HH: 2B)
>
> It is simply a catastrophe. If it will continue this way, then in a few years all of the glaciers here will disappear. The climate has changed a lot, it rains in January, and now the snow is late. Around the whole world something terrible is happening. (HH: 12)

Glaciers here represent more than just a "water tower." After eliciting descriptions of the number and sizes of local glaciers, I would ask what they mean and symbolize to the individual and to the community. While some differences surfaced in the practical use-value of glaciers for people, the most common symbolic meaning stated was "life."

> They are important because they are the source of life, the source of water, the *most* important for us, of course… They symbolize might, power, beauty. I think

> that glaciers are the source of life for us, at least the source of water, and water is life. Glaciers are always greatly associated with the water of life, and have a very important meaning. (HH: 12)

Stakeholder meanings clearly transcend the calculated resource-based view of glaciers. Not only are glaciers in visible decline but they have had an expiration date assigned to them. For many people in this group the loss of glaciers is analogous to the loss of life. The corollary, then, is that not only the surrounding environment (land, flora, fauna, glaciers, etc.) is vulnerable to the effects of climate change, but the Svan identity and culture are at stake as well.

Emerging Themes

The themes that emerged from analysis of the data reveal a deeper perception of the phenomenon of climate change. The process of the thematic analysis is iterative, demanding immersion in the data, continuous bracketing, describing, and reflecting upon the phenomenon. From the clusters of relevant meaning came three themes realized as expressions of helplessness, fear, and benefits stemming from the perceptions of climate change.

Helplessness

Helplessness is characterized by a lack of power and support, feeling incapacitated, and/or having no control over the situation. Burton and others (1978) identified four behavioral responses to disasters, one being an acceptance of loss. They describe this response as passive in nature, exhibited when people become resigned to

action because they feel that disasters are unforeseeable and beyond their control. I found widespread instances of acceptance, exemplified in the following quotes:

> When there is so much winter people can't do anything. When there were the elements in the first settlement, Murkhmelia, everyone was taken by the snow there. (HH: 2)
>
> You can't do anything about the winter climate. It snows, it snows, it snows. You have to, when sitting at home, watch your own house and take the snow from the roof so it isn't destroyed. Never go on the road then. (HH: 10)
>
> The climate changes. From what? We don't know. From the cosmos, that's all! [laughs] (HH: 2B)

These excerpts show that people feel helpless not just with respect to disasters, but they show a similar response when discussing (winter) climate and the underlying mechanisms driving climate change.

Dismissive rhetoric may be related to cultural or religious outlooks, but a strong element contributing to this theme has to do with a lack of infrastructure and support from the government. Policies aimed at preserving Svaneti's heritage, culture, and architecture prevented building in the villages since the 1980s, before which only a dirt road, medical clinics, schools, communication, and power lines had been place (Judy 2000). Herein lies a dilemma: to pursue development or to preserve an "authentic" place. Each option has pros and cons, but participants voiced a sincere desire for more governmental support:

> Respondent: If the government helps the agricultural people, here for example, then it is possible to live and work. But there, there is no help from the government here, there are no people.
>
> Me: What is needed here?

> Respondent: Everything. People need everything. Wages, work, in the past there was a [collective] farm and now there is no farm. There are no stores, there is nothing here at all. Here the people, we just simply live. There are a few with a salary, it is a very low wage, it is little. The people here struggle. (HH: 9)

Following the winter of 1987, areas throughout the mountains were reevaluated for settlement suitability, based upon the government's sense of extreme weather as a threat. The next quotation touches on the fact that much of Upper Svaneti was deemed uninhabitable by the government, likely to justify resettlement programs. In spite of this, people feel very passionately about their ethnic homeland:

> There is erosion here, in this village, it is all visible up there. There is erosion and dirt falls a lot. It has deteriorated, totally. The countryside is deteriorated, the land is degraded. So much of the land has deteriorated. It is a big problem for our village, a very big problem. We have, uh, they gave us the second category, that we are never supposed to live here, and it is the geography that gave us this second category. We should get up and leave somewhere else. We didn't get up. It is better for us here, we like it here. Our village, our people, our nature. (HH: 10)

Only two participants have considered making a life outside of their village, while the rest are committed to staying "until the end." Even with despondent feelings about the changing climate, environment, and lack of support from the government, people choose to maintain their way of life in their villages. The decision for people to leave their homeland is complex because the motivation is dependent reviewing all of the structures of climate change, which are both socially and individually constructed. The identity and culture of Svans is infused in local perceptions of extreme weather and disasters, while the government focuses on them as a threat. Forced evacuations are a

pragmatic choice to protect citizens, however, the underlying logic of that decision fails to account for the local meaningfulness of place.

Fear

With change comes new and different circumstances. As new weather patterns have developed and begun to redefine what constitutes “normal” climate people’s assumptions have been tested. Given the implications that a changing climate makes on the future for Upper Svaneti and the unpredictable way that disasters can unfold, it may not be surprising that a discourse of fear surfaced in people’s narratives. Disasters evoke fear, but more insidious are the uncertainties that surround adaptation and Svaneti’s future. When asked what climate change means to them, one respondent replied:

> On one hand it is interesting. How something new is happening for people. We don't stay in one place, nothing develops, and nothing changes, it is also on one hand not nice. On the other hand, there is a precaution, there are feelings that everything is changing and what was good and precious you'll lose, people will lose, and it is not nice. And there is a thing, as if people fear, generally, people are afraid and cautious. (HH: 13)

Later in the conversation, I probed to get a sense of what local people’s capacities are to mitigate and cope with the effects of climate change, to which they responded:

> How do they know what to prepare for? What can we do? We have no scientists or anything. Not just the Svans, but Georgia as a whole. We don't know what to prepare for, for one. Second, we have a society at a low level. Not just what to prepare for, we have what is provided to us, everyone has had problems deciding. In such an instance, how do you know what to prepare for? Everyone waits. (HH: 13)

This answer illustrates another disconnection between decision-making for local people and the government. The respondent even commented on the social deficits they have noticed, alluding back to a sense of helplessness. In the context of increasing uncertainty, it follows that people may become more cautious and afraid for the future of what they hold dear: their land, the glaciers, their identity, and their culture. This response to uncertainty only applies to those who stay: “Because of the climate not many people want to remain here, but the summer is good here. Winter too, but, well, when the frost is bad it is difficult for everyone” (HH: 2). Following the shock of disasters in 1987 some people elected to move out of Svaneti. Again, a myriad of factors influence individual motivations, but if locals exhibit debilitating feelings of fear regarding disasters, climate change, and the associated uncertainties, it seems fitting that for some a sense of fear may have been the overriding element of that decision.

The fear associated with disasters is more acute than the generalized, almost existential, sense accompanying uncertainty. There have been events that demolished buildings, taken people’s lives, and shaken the core of Svan society. Natural disasters are not unprecedented in mountain areas; people are aware of the risks. For the residents of Upper Svaneti, I became interested in how people live in, and make sense of, a hostile environment. More importantly, what triggers fears related to the amount of rain or snow? As one participant described:

> They were always afraid when there was a lot of snow in winter. They were always afraid, always. There was a tradition, here in Zhibiani too, the grandmothers and grandfathers, elders, they would, on some date every year, butcher a lamb or something and go to a small forest, on that side where the avalanche went, in order to preserve/retain something. It means they were frightened. It means that at some time there was such an event, right? (HH: 5)

From respondent interviews a picture of the legacy and history of disasters became clearer. Tales of severe weather are passed from generation to generation, but interestingly, the tradition described above is no longer upheld. Regarding modern indicators of fear, a general consensus was revealed from informal conversations: when more than 2.5 meters of snow are on the ground feelings of fear begin, especially if it is continuing to snow. These thresholds change with time, in tune with the intensity and frequency of weather events. The accounts of rain-induced disasters indicate that they are developing as a newer, distinct phenomenon.

> A couple days it rained, I don't remember anything like that, *we* don't remember anything like that here. A few days isn't long, but after one or two days there was so much water. There is a small, not a river [a stream], with very little water flowing through it, but it grew so much that it took away a house. (HH: 5)

Snowfall is easily monitored and accumulates slowly over time. Rain, on the other hand, is difficult to both quantify and predict its effects. From Ushguli to Becho the sense is that fears are growing about natural disasters. Svaneti has lost population intensively since the 1980s, and the MEP believes that disasters are the main cause. Continued extreme or "elemental" disasters may exacerbate this trend, making agendas to improve the adaptive capacity of individuals and communities critical. In the meantime, people continue to do what is necessary to maintain their livelihoods.

Benefits

To this point the perceptions of weather, climate, its changing characteristics, and the thematic analysis of them have been, perhaps, alarming. At the same time, a

counter-narrative emerged, indicating that there are perceived benefits to climatic fluctuations. The same warming that drives temperature and precipitation changes and the storms that wreak havoc in the mountains is making life easier throughout the winter. “Tough winters have a lot of snow. This year there is little snow, only this year. This is a good winter” (HH: 9). Livestock maintenance is a daily task. Cows are milked, animals must be fed, they are all released into the streets for the day (often led to drink water) and collected by twilight, and lastly, cows receive another milking. With so much time spent outside, warmer temperatures and less snowfall make these activities much easier and more comfortable. There is also no need to shovel the roof when there is less snow, meaning there is less of a threat to it collapsing. A reduction in snow throughout winter would also facilitate travel in and out of the more remote areas because keeping the road clear would be easier.

Rise in the mean annual temperature is making it easier for farmers to grow some crops, and a diversified plot will reduce dependence on markets to source fresh fruits and vegetables. The highest reaches of Upper Svaneti now have an apple tree, which is unprecedented for Ushguli. Grapes, too, are moving further and further up valley. “They are not tasty, but they grow. In the neighboring village they have some. Mestia has them, and from Mestia down they have them already” (HH: 10). Viticulture, an inseparable part of the country’s national identity, and the potential for more locally grown fruits may reduce transportation costs for these mountainous communities. The agricultural sector is already developed in this region, and the assumption locally is that people will benefit greatly with the availability of more crop options.

Conclusion

Perceptions of climate change in Upper Svaneti are diverse and nuanced, yet threads tie together the Svan's lived experiences. This study elucidated perceived changes in weather and climate and the accompanying manifestations in the environment and impacts to glaciers. The resulting distillation of themes draws our attention back to the phenomenon of climate. The essence of climate, and the perceptions of recent climatic change, elicit feelings of helplessness and fear as people are forced to examine their previously constructed understanding of climate. Conversely, the structure of these phenomena display positive aspects because some associated impacts are beneficial for daily and economic life. From this analysis and description of the phenomenon of climate change comes a new meaning, stemming from the Svan identity and culture, rooted in the local environment.

The meanings and feelings evoked from the questions posed in this study are poignant in and of themselves, but they have additional value. The content of this analysis may be useful for the development of strategies for mitigating and adapting to the ill effects of climate and environmental change. Before any adaptation strategies can be implemented it is necessary to assess the current capacity of the communities to mitigate, adapt, and cope with the specific issue in question. As previously stated, the Georgian government has assessed the vulnerability of Lower Svaneti to climate changes, using various statistical analyses (MEP 2009). While the government of Georgia has released its own adaptation strategies, the literature has shown that resource-dependent, subsistence-based communities often identify threats to livelihood success as a primary concern (see Adger et al 2004; Osbahr et al 2008). Indeed, while

in the field, discussions revolving around the lack of infrastructure, job opportunities, and governmental support were common.

Livelihood success in Svaneti is inextricably tied to the land, pointing to the primacy of investing in strategies and developing local capacities that allow people to maintain their way of life. The ethnic Svans have expressed that they do not want to leave their land or lose their culture to climate change. To better understand what makes the communities in Upper Svaneti vulnerable to potential disasters I draw upon the findings of this study to inform a social vulnerability assessment in the next chapter. The resulting report is grounded in and built upon the findings discussed above, reflecting a sensitivity to the perception, needs, and concerns of local people. How the government will achieve an increase in the capacity of the Svan people to cope with and become resilient to disasters is uncertain. Even so, the MEP, UNDP, and UNFCCC are working on assessing future climate impact scenarios on local livelihoods and the viability of expanding tourism development in Svaneti (UNDP 2013).

CHAPTER 5
VULNERABILITY IN UPPER SVANETI
Introduction

Mountainous regions across the globe are experiencing a wide array of rapid changes today. There are physical changes to landscapes in response to climatic changes and the effects of globalization are continuing to change societies around the world (Rosenzweig et al 2008; Goldberg et al 2007). Disaster risk reduction (DRR), climate change adaptation (CCA), and poverty reduction have been overlapping recently in development and policy considerations because of the recognition that global environmental change affects, and is affected by, human development and growth (Schipper and Pelling 2006; Gero et al 2011; Innocenti and Albrito 2011; Thomalla et al 2006; Solecki et al 2011). The mountainous region of Upper Svaneti is generating interest in western Georgia because of its high potential for tourism development, but the area is experiencing climatic changes and has high potential for natural disasters (Engel et al 2006; MEP 2009). The government Georgian and the scientific community have conducted assessments of various vulnerabilities in this area, using mainly quantitative techniques (MEP 2009; MEP 2011; Tarraguel et al 2011; Varazanashvili et al 2012; Gaprindashvili 2011). Unfortunately, the assessments of physical hazards and the potential impact of further climatic change in Upper Svaneti have not addressed the social factors that determine vulnerabilities and local capacities to respond in the event of a natural disaster.

The country of Georgia acceded to the United Nation's Framework Convention on Climate Change (UNFCCC) in 1994 and has since demonstrated a commitment to fulfilling its obligations. Several communications to the UNFCCC have been published that detail what steps Georgia's various ministries and departments are making toward monitoring and reducing greenhouse gases and protecting areas vulnerable to the negative effects of climate change. The initial communication to the UNFCCC was in 1999. It included a survey of greenhouse gas emission sources over the previous ten years and a loosely outlined climate change adaptation plan focused on the Rioni River and the coastal zone around Poti. In 2009 the MEP released the SNC to the UNFCCC. The MEP identified two more areas as vulnerable to the effects of climate change in the SNC: the Dedoplistskaro region may see intensified desertification and Kvemo (Lower) Svaneti is prone to disastrous weather events, which are enhanced by global warming. Due to increased landslides in the Lentekhi region of Svaneti, which has led to an out-migration of 40% of the population since 1986, a project to increase slope stabilities by planting hazelnut trees was developed. In October 2013, a project report on the activities needed to complete Georgia's Third National Communication (TNC) revealed a lack of progress in meeting goals outlined in the SNC for the Svaneti Region:

> Unfortunately, the results achieved in local capacity building, adaptation project proposals identification and preparation lesser than in other regions and the reason for this is very low local capacity. Recommendation is to continue the work in this region in order to maintain and strengthen the capacity for preparation and implementation of adaptation projects. (UNDP 2013, 42)

This is alarming, considering the narrow scope of the one mitigation effort that was proposed. The revised objectives for the region are to assess the potential impacts of

climate change on the development of tourism and snow cover and examine the link between warming, avalanches, and climate change on cultural heritage sites (UNDP 2013). The recommendation quoted above hints that adaptation projects have not yet been prepared, and how local capacities will be maintained or strengthened remains unclear. In the meantime, there is merit in exploring the social, political, and economic processes that contribute to people's vulnerability to disasters in Upper Svaneti.

This research project contributes a vulnerability assessment of six communities in Upper Svaneti, drawing from extensive fieldwork and household interviews (HH). The assessments detailed in this chapter attempt to capture both the social and environmental aspects of natural disasters as they occur in Upper Svaneti. Large-scale global assessments have illustrated an uneven distribution of the impacts of climate change and indicate that the people who will be exposed to the worst of the impacts are the ones least able to cope with the risks (Smit et al 2001). This vulnerability analysis draws from the historical analysis and perceptions of climate change of Upper Svaneti's residents in previous chapters to address the political, cultural, and economic factors that generate the exposure and ability to respond to natural disasters. Incorporating local views and engaging stakeholders directly is paramount for comprehensive and ethical approaches to assessments or policy development that address localized hazards, livelihood sustainability, or resource management (Smit and Wandel 2006; van Aalst et al 2007; Pelling 2011).

Defining Vulnerability

The concept of vulnerability has been discussed in various disciplines from different perspectives and epistemologies. It first appeared in disaster literature in the

1970s (e.g. Baird et al 1975; Wisner et al 1977) and has since spread into literature discussing climate change and development (e.g. Bohle et al 1994; Chambers 1989; Devereux 2004). Gaillard (2010) describes the evolution of the meaning of vulnerability as a shift away from being simply a social construct that leads people to be fragile to natural disasters. Early interpretations of vulnerability focused on identifying hazard-independent factors of vulnerability, and now broader approaches have been developed that span across community or regional scales, incorporating both quantitative and qualitative data. This study employs the definition of vulnerability as "the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard (an extreme natural event or process)" (Wisner et al 2004: 11). In this working definition another important concept is introduced: capacity. While vulnerability is often approached as a metric for disaster risk reduction and development, the use of capacity here reflects recognition of people's ability to manage natural hazards, which is not fully captured in the negative concept of vulnerability (Gaillard 2010).

Methodological Note

This vulnerability assessment draws from and builds upon the analysis of a research project on perceptions of climate change in Upper Svaneti, Georgia. The analysis herein is an extension of the empirical data collected during an intensive field research period in six villages across Upper Svaneti between September 2012 and April 2013. The methodology included: (I) conducting 15 semi-structured interviews with current residents of Upper Svaneti, having had at least 20 years residency in the area; (II) taking visual surveys and assessments of the landscapes surrounding each of the

villages; (III) collecting additional data through the use of several ethnographic methods including many informal conversations with local residents, unstructured interviews, field notes, participation in daily activities, and observations; (IV) participation in a vulnerability and capacity assessment (VCA) and DRR training seminar in Ushguli conducted as a joint effort between Action Against Hunger (ACF) International and the Georgian Red Cross. The seminar approach was grounded in a community based disaster preparedness framework developed by the International Federation of Red Cross (IFRC) and Red Crescent Societies (please see Murtaza 2013); (V) analysis of secondary sources of data concerning the history of Georgia and Svaneti, climate change, and disasters from government documents, non-governmental organization (NGO) reports, and peer-reviewed science literature. Together, the data collected during the intensive field research with the supplementary secondary sources is sufficient to analyze the processes that create vulnerability to natural disasters critically.

Pressure and Release Model

One crucial piece to understanding why disasters happen has to do with their creation not only as natural events but as products of the social, political, and economic environments in which they occur (Wisner et al 2004). To capture the whole picture of what makes the people of Upper Svaneti vulnerable to the effects of climate change and associated disasters, it is necessary to address the social systems as well as the physical environment. The pressure and release (PAR) model (Wisner et al 2004) has been developed to recognize both the social vulnerabilities and natural systems that interact in the creation of a disaster.

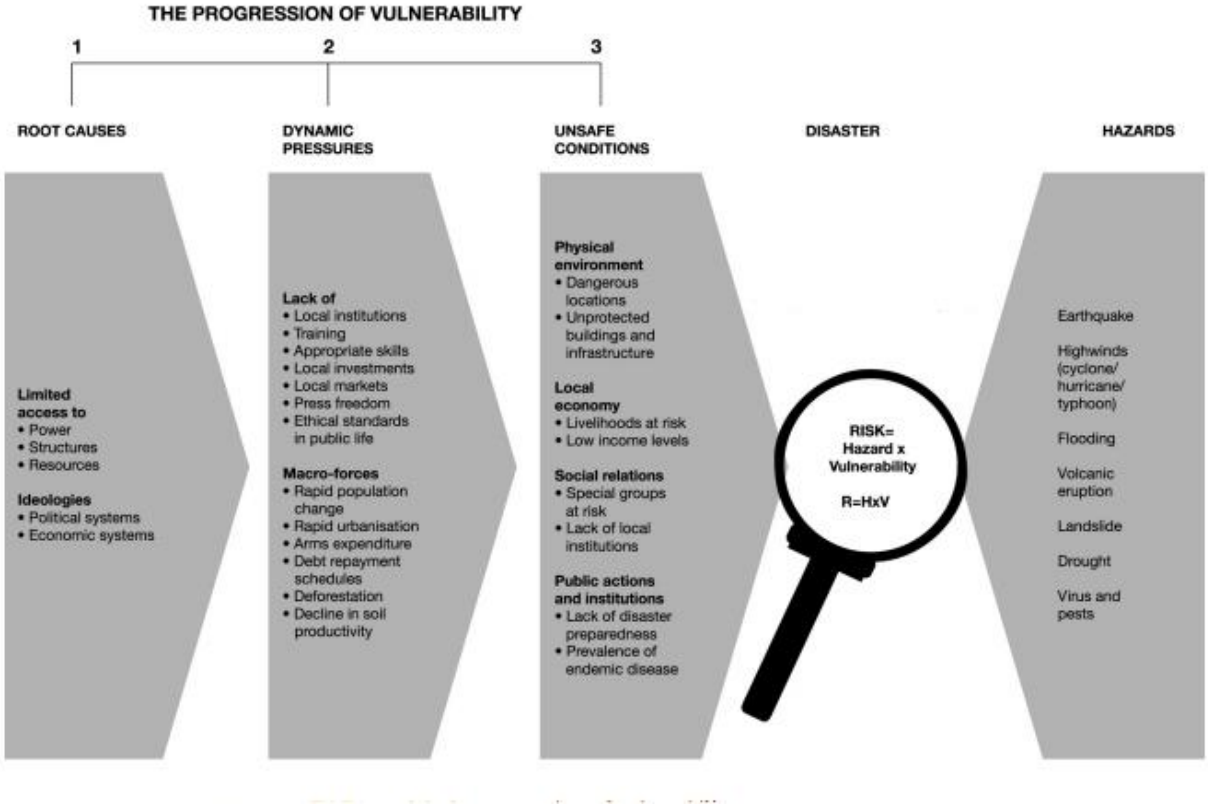

Figure 20. The Pressure and Release Model (Wisner et al 2004: 51).

There are two forces of “pressure” which meet in a disaster: the processes that cultivate peoples’ vulnerability and the hazards themselves (e.g. landslide, earthquake, flood, etc.). The idea of ‘release’ in the model operates at the point on which pressures from both sides exert their force. It conceptualizes the potential to decrease the risk of disaster. Disaster risk arises as the product of vulnerability and hazards and decreasing risk is a direct function of decreasing the vulnerability. Vulnerability and hazards are, by these definitions, mutually exclusive.

Three distinct links form a chain that explains disasters. The linkages of the chain begin with root causes, which can be both spatially and temporally distant from the disaster site. Wisner and others (2004) explain that the most important root causes of

vulnerability are economic, demographic, and political processes. These causes are related to the power in a society which may operate from a distance or be bound up in historical precedents and eventually engrained in the local culture. Those who are marginalized and/or poor have little power to access resources that bolster their capacity to mitigate and cope with disasters. How the larger regional context is managed and governed can affect communities, especially in times of conflict or war, which can effectively halt development. Next in the progression are the dynamic pressures that manifest root causes of vulnerability into unsafe conditions. Demographic shifts in response to economic root causes, for example, can exacerbate gender issues, environmental degradation, and the loss of local knowledge as people seek alternatives to maintain their livelihoods (ibid). Dynamic pressures operate differently across geographic and temporal scales, making site-specific analysis imperative to understanding the unsafe conditions that arise. Unsafe conditions, then, are "the specific forms in which the vulnerability of a population is expressed in time and space in conjunction with a hazard" (ibid: 55). Disasters occur at the intersection of hazards and sites with unsafe conditions and vulnerable people.

The Chain of Vulnerability

Root Causes

There are several root causes of vulnerability in Upper Svaneti that are translated through dynamic pressure and can be traced to unsafe conditions that arise today. Throughout its history, Georgia has experienced geopolitical strife both internally and externally which have slowed economic and political processes. Since the dissolution of the Union of Soviet Socialist Republics (USSR) in 1991 Georgia has experienced

various struggles while pursuing political and economic stability. Secessionist movements in Abkhazia and South Ossetia, supported by Russia, have escalated to armed conflict flaring up in the early 1990s and most recently in 2008. In the 1990s the Georgian governmental agencies were stretched thin from efforts to mitigate internal and external conflicts and unable to achieve widespread social, economic, and political development.

Constraints on the government's power to develop and fully incorporate remote areas has left many isolated communities, including those found in Upper Svaneti, lacking basic infrastructure and access to social and political structures. Furthermore, regulation of building codes were enacted in 1980 by the Georgian Main Board of Monument Protection to preserve Chazhashi, a hamlet in Ushguli, and UNESCO declared the same area a World Heritage Site in 1996 (UNESCO 2010). These actions were supposed to have been beneficial for the preservation of the medieval structures and appearance of Svan villages, but building regulations in the area may be implicated in the lack of development evident today. There is also evidence that indicate the preservation efforts in Upper Svaneti have been unsuccessful. Kay (2000) asserts that local preservation of buildings has been virtually non-existent because of depressed economic conditions. Additionally, a damage assessment on local cultural heritage objects in Ushguli and Mulakhi reported that "more than 40% of the objects show heavy roof damage or have no roof at all. These objects all show an overall state of conservation ranging from 'bad' to 'ruin'" (Tarraguel et al 2012: 457).

A lingering reminder of past natural disasters is still visible on the landscape today. Abandoned and dilapidated buildings still stand, long after the rapid out-migration

of people from their villages. In January of 1987 an extended storm blanketed Upper Svaneti with over five meters of snow. Roofs caved in under the weight of the snow if not cleared and avalanches in Ushguli and Mulakhi wrecked whole hamlets. 16,000 people were evacuated from Svaneti, more than 2,000 houses were damaged, and 409 families lost all of their property to the disaster (Trier and Turashvili 2007). The government at the time decided to relocate afflicted individuals to Gardabani in southeast Georgia and accommodated others who wished to leave. In the end, a combination of forced and voluntary evacuations halved the population of the region. The adjacent Lentekhi Region in Lower Svaneti has seen a population loss of 40% since 1986. According to the MEP this is a direct result of the intensification of landslides and floods (MEP 2009).

Dynamic Pressures

The only village in Upper Svaneti that has government offices and local representation, paved and regularly maintained roads, markets, and a medical clinic is the regional capital Mestia. It is the hub on which other villages in Upper Svaneti first rely for access to goods and services and is the terminus of paved roads and support from the government. It also represents a local urban bias for development and offers the majority of non-farming job opportunities in Upper Svaneti. An estimated 99% of residents in Upper Svaneti are small-scale farmers, and “in the most important economic sector, cattle breeding, the number of head of cattle exceeds the available fodder for optimal productivity by a factor of three” (Engel et al 2006: 93). The resulting class homogeneity, especially in rural areas, is reinforced by the lack of employment, livelihood resources, and capital for investing in self-protection.

Demographic shifts occur today as migration losses and can be explained by difficult living situations, unemployment, and youths leaving to receive higher education (Engel et al 2006). If communities here were to experience a sharp population increase in the future as tourism and infrastructure are developed, vulnerabilities may be further increased. Pressures on forest resources have been high and may rise in tandem with population increases unless a shift is made to alternative heating sources. Deforestation has increased since the 1990s, attributed to economic crisis, conflict, and poor living conditions (Kemkes 2011; MEP 2011). The MEP (2011) claims uncertainty of the current state of all of Georgia's forests because no proper inventory has been conducted in the last 20 years. However, the MEP (2006) published a report stating that for Upper Svaneti, 41% of its 3,045 square kilometer area was forested. Based upon field observations, wood stoves were used exclusively for cooking and heating in the households outside of Mestia. Many households within Mestia rely on local timber for the same purposes. Deforestation in rural areas contributes to slope instabilities, potentiating the risk of landslides and avalanches. Resource management will be critical to ensure that the potential for landslide and avalanche disasters are reduced (WWF 2011; Engel et al 2006).

Unsafe Conditions

Given the topographic diversity of the landscape, settlements in Svaneti have been positioned in the most suitable locations: on flat plateaus or moderate slopes. After discussion with local experts, Tarraguel and others (2012) have concluded that structures in Upper Svaneti were probably constructed by people with knowledge of potentially dangerous locations. Landslides and avalanches do not pose the only threats

to structural integrity though; flood and earthquake hazards can have sudden and disastrous onsets as well.

Land and soil erosion operate as slow-onset disasters (Pryor 1982; Blaikie 1985) that impinge upon livelihood resources and lead to increased vulnerability. The lack of social protection that exists on individual and social scales means that livelihoods are fragile to disruptions. Property owners in Svaneti have assumed de-facto rights to their lands from historical familial lineages and are financially unable to insure their assets for damages in the event of a disaster. The absence of social and governmental support networks today are reflective of the causes rooted in the past. Across Upper Svaneti the social, political, and economic processes discussed above are operating negatively upon the capacity for residents to prevent and mitigate disasters.

Hazards

Upper Svaneti occupies the highest mountainous region of Georgia and is characterized by steep slopes, rocky and erosive mountains, glaciers, and wild rivers, all contributing to the fact that Upper Svaneti is a high risk area for disasters (MEP 2009; UNDP, UNEP, OSCE 2004). Economic losses in Georgia from flood and landslides have been calculated at 650 million US dollars from 1995 to 2009 (Melkonyan and Hovsepyan 2011). Studies of high elevation mountain region responses to climatic warming indicate that responses are occurring faster than previously anticipated (Dyurgerov 2003; IPCC 2007; Thompson et al 2009; WMO 2009). Snow avalanches, landslides, and flooding have been addressed by the Georgian government in the SNC as pressing matters in Svaneti, but frost, drought, earthquakes, and biological hazards are other potential triggers of disaster situations.

Landslides and Avalanches

Tarraguel et al (2012) have published one of the few works on disasters specific to Svaneti, concentrating on the potential impact of landslides and avalanches on cultural sites in two Svan villages. The hazard maps generated in their study show “high hazard” percentages for landslides at 79.2% in the area of Ushguli and 62% in Mulakhi (Tarraguel et al 2012). Slope failure is commonplace in areas with high relief, and the entire Caucasus region is on the list as one of the world’s landslide and avalanche hotspots (Nadim et al 2006). It is worth quoting Tarraguel and others (2012) at length for a description of the environment surrounding Svaneti’s villages:

> On the valley slopes at lower altitude surficial landslides and debris flows are very common. On very steep, near to vertical slopes rock fall frequently occurs. The higher parts of the slopes, above the tree line, are also frequently affected by snow avalanches. Where the glaciers retreated denudational landforms have formed. Under the influence of glacial melt and corresponding water erosion, a number of narrow and deep gorges have formed in the landscape. Periodic debris flows and mud flows have formed numerous debris cones at the bottom of these gorges. The outlets of secondary streams in the main valleys are also often characterized by debris cones that are formed by periodic debris flows, mud flows and snow avalanches. (454)

Avalanches occur following snow, and the types (slab or powder) are influenced by the temperature and the air masses that deposit the precipitation. For Western Georgia, the prevailing winds blow west to east, and the air is laden with moisture coming off the Black Sea. Three factors are key to the formation of alpine snow avalanches: the weakness of snow in avalanches is due to it being approximately 80% air and 20% ice (the strength comes from hydrologic bonds); the snow is normally found at 90% of the melting point so processes of snow creep and deformation happen under

its own weight; the introduction of more water, from snow melt or rain, lubricates the surface below and adds weight (McClung and Schaerer 2009).

Household interviews captured many descriptions of the avalanche dangers people face during winter. Road closures and power outages occur sporadically and come as no shock for seasoned mountain inhabitants. There are also incidents of large-scale avalanche disasters, such as in the winter of 1987. One respondent in Ushguli recalled his experience at the time:

> As I remember, 11 days of snow fell without pause. They closed the road. We didn't walk to Murkhmelia, not even in Chvibiani here, its 300 meters [away]. And then an avalanche went... Seven people died there. Houses were destroyed. (HH: 5)

The amount of snow was problematic for movement within villages and so much covered the road that the arrival of rescue efforts was delayed for several days. A participant in Mulakhi recalled:

> Well, with the snow you couldn't get there, where the small settlement was. The wind discharged there, the wind was so strong that it totally, houses were totally broken, everything was broken. Only one tower was left. Everything else was all destroyed. The Svan houses, the European houses that we have – everything was destroyed. Everything was destroyed and 27 people died. (HH: 10)

Every account of the 1987 event was coupled with commentary about the population losses that followed, highlighting one of the secondary effects of disasters that allow vulnerability to persist:

> Few people live here now, when I was in school there was a lot, 100 families lived here. Then there were the elements in 1987, they happened here, and then they left to Jandari. Half, almost half the people went to Jandari. (HH: 3)

Floods

A sudden onset of seasonal snow melt can trigger not only avalanches but can also result in extensive flooding. In April and May of 2005 many mountain areas in Georgia experienced flash flooding, landslides, and mudflows activated by heavy precipitation and snow melt (Matcharashvili 2012). Interview respondents (HH: 5, 9, 10, and 13) described destructive flash flooding in the village of Ipari in 2007; the accompanying heavy precipitation and hail damaged corn and potato crops and injured livestock as well. While flash flooding in mountain areas is difficult to predict by nature, potential danger areas should be easily identifiable (Wisner et al 2004).

River flooding is an occasional event in Upper Svaneti and has been known to damage the road and interrupt vehicle access. Sites in Ushguli, Mulakhi, and Mestia were noted for having *gabioni* reinforcements (wire structures filled with rocks that act as a barrier) along riverbanks to prevent erosion and protect structures from flooding. Local residents understand river fluctuations on a seasonal basis and the criteria for flood hazards. One respondent remarked when asked if there are floods:

> Yes, when the snow flows quickly, and the temperature rises quickly. Well, yeah, the temperatures rises, at the end of February. Really, after the 22nd of March the temperatures and things slowly flow a little higher, but if it goes up quickly then it is a natural disaster. (HH: 1)

Impacts of floods are not localized to just the mountainous communities and highland-lowland interactions are not restricted to social or economic relations. Immediately following the massive snow event in January 1987:

> …floods in Western Georgia submerged 200 km', damaged 3.2 thousands and completely ruined 2 thousands of dwelling houses and 650 public construction works, 1.5 thousands of hydrotechnical construction works, 16.5 railway lines,

> 1.3 thousand kilometers of highways, broke 1.1 thousand kilometers of power transmission lines and 0.7 thousand kilometers of communication lines, and more than 16 thousand people were evacuated. The total damage caused was about US $300 million. (Bondyrev et al 2004: 37)

Frost

A sudden onset of cold conditions can wreak havoc on crops, destroying part or all of a harvest. Simply put, frost is characterized by a drop of the minimum air or ground temperatures below 0°C quickly following a period of mean positive temperatures. The process begins in the soils before the temperatures reach freezing, meaning that atmospheric frost is always accompanied with frozen soils (Varazanashvili et al 2012). Agriculture is important for subsistence through the long winters and excess potato yields can be sold down-valley as a cash crop. Temperatures drop in altitude at adiabatic lapse rates, it follows that villages situated at higher elevations are disproportionately susceptible to frost conditions in comparison to lower areas. In Ushguli, the highest village in Svaneti, respondents described several instances in which “there was frost, and they took the potatoes with shovels from the frost… we only have potatoes here. There, in Kala, there are apples, and there are pears too. Here there is nothing” (HH: 2). The elevation of a village is also a factor in determining what can or cannot not grow in each village, following distinct zones across the altitudinal gradient.

There are both positive and negative perceptions concerning the effects associated with altitudinal shifts in temperature throughout Svaneti. Discussions with interviewees and farmers revealed that many people believe growing some crops has

become easier. If warming trends continue it will allow farmers to diversify what they grow. Apples, for example, have now appeared in Ushguli – the first known apple tree there is now bearing fruit. Conversely, pests such as the Colorado potato beetle are following suitable conditions up-valley. Biological disasters from infestations could result if measures are not in place to safeguard crops.

Earthquakes

The Caucasus Mountains are seismically active and earthquake prone, as it lies on the fault between the Eurasian and Arabian tectonic plates (Chitadze 2012). The geologic complexity under the area has most likely diffused the seismicity, so Svaneti has not experienced disastrous earthquake activity for hundreds of years (Javakishvili et al 2012). The potential for tremendous loss of life and property is still present. People's dwellings and cultural sites are built with landslide and avalanches in mind and have weathered past events (Tarraguel et al 2012), but seismic disruption coupled with continued soil erosion and decomposition could lead to further dilapidation and loss of these pieces of historical and present day use-value. Reinforcement and infrastructure is needed, along with concrete rules and guidelines for the preservation of objects. Inadequate education of the local population and government about earthquake hazards and risk complicate the situation.

Drought

The mean annual air temperature and level of precipitation in this region have increased by 0.4° C and 106 mm (8%) respectively, for the past 50 years (MEP 2009). In spite of the precipitation received because of the regional climate, there have been

increases in the frequency and duration of drought in Svaneti and throughout Georgia (MEP 2011). There are compounded risks for mountain people if crops are damaged or do not yield sufficient supplies for winter stockpiling. Livestock too are dependent upon hay reserves which are locally sourced for the winter. As one respondent put it, “It is very bad when it is hard to collect hay, and if there is no hay then there is no cattle and nothing to eat. No milk or meat – nothing. It is bad, yes. It is disastrous, disastrous” (HH: 1). In previous times of distress such as this, people have relied on surplus resources at higher villages and intermountain pastures. However, if drought and heat continue to intensify systematically across the region this strategy may become unreliable.

Water resources may be stressed throughout Upper Svaneti in the near future as melting of the Caucasus glaciers has persisted over the last century. The second half of the 20th century has seen enhanced melt of mountain-valley glaciers, attributed to climatic warming (Dyurgerov 2003; Oerlemans 2005). Retreat of the Caucasus glaciers is driven by an increase in summer air temperatures, though more importantly there has been no compensating increase in winter precipitation (Shahgedanova et al 2005). In the Georgian part of the Greater Caucasus, glaciers have been retreating on average by 5-10 meters per year, up to a maximum of 25 meters per year (Gobejishvili 1989). The MEP (2009) predicts the loss of Svaneti’s glaciers as early as 2050, raising issues of potable water availability and management of water resource for mountain and lowland farmers that depend on late-summer glacial melt.

Analysis

Review of the chain of vulnerabilities and hazards in Upper Svaneti show the social, political, and economic processes involved in the creation of disaster. One clear distinction is apparent upon examination of the capacities available to the sites of this investigation. Mestia, as the most heavily urbanized and institutionally supported location, has more resources, better access to resources and capital (human, social, and financial), and more economic opportunities than all other sites across Svaneti. Ushguli, Kala, Ipari, Mulakhi, and Becho (and other communities outside the scope of this research) suffer from deficiencies of governmental, social, and economic support. These rural communities are not equivocally vulnerable to disasters, in the sense that geographic and topological variability manifest the risk of hazards such as avalanche, landslide, frost, and flooding risk at differential and specific intervals.

The region, as a whole, is affected by the same processes that generate vulnerability to natural disasters rooted in historical and political causes. A legacy of disasters is present across the villages of Upper Svaneti as collective events, such as in 1987, and localized disasters like the flash flooding in Ipari. The dynamic pressures that lead to unsafe conditions operate as a function of the access to resources and support a community has before, during, and after a disaster. Population loss in places like Kala and Becho is one such pressure that disproportionately affects residents. The workload to maintain livelihoods is culturally separated between sexes, but women bear additional burdens of working in agriculture, in the household, and sometimes in employment (Engel et al 2006). The temporal aspect of dynamic pressures is integral in shaping the immediate and long-term outcomes of a disaster. The relief and

reconstruction of a community will shape how hazards are perceived and handled in the future and present. Opportunities to identify the causes of vulnerability, improve local informational and resource capacities, and implement protective measures arise following disaster relief.

Two geographic considerations should be made for unsafe conditions related to the villages considered in this study. The distance to Mestia from each location becomes important for several reasons. The farther one must travel for goods, healthcare, or assistance in the event of an emergency increases costs and travel time. The conditions along the Ushguli-Mestia road control vehicle access; impediment from rockfall, avalanches, and flooding can prevent travel for hours or days. Generally, the distance from each village to Mestia is correlated with a rise in elevation. The location of villages across the altitudinal gradient means that the thermal elements of climatic and biologically induced hazards are influenced proportionately. On a finer scale, topographic and geologic specificities at each village and hamlet determine the initiation point of mass wasting events, and the run out potential is site specific to each feature in each community.

Recommendations

This chapter has sought to clarify the underpinnings of vulnerability to disasters across Upper Svaneti. Extensive fieldwork provided interview and observational data unique to each location for this analysis. From this assessment, the following recommendations can be made as to what measures and research are necessary to alleviate the risk of disasters for the mountainous communities in Upper Svaneti. These areas include:

1. *Education*

Increased awareness of the hazards and associated impacts that disrupt daily life is necessary for Svan villagers, through both continued formal education and training seminars. The discussion of disasters, and related topics of climate change and vulnerability, is the first step to developing community emergency plans and evaluating what is needed locally in the event of a disaster. NGOs like the IFRC are making the first strides in beginning the discussion and preparation for disasters in Svan villages. Coordination with governmental institutions and other NGOs will be important for sharing local knowledge pertinent to policy development. Education can also change behavioral responses to perceived changes and inspire confidence in communities to seek the changes they desire.

2. *Vulnerability and Hazard Assessments*

No comprehensive assessment or mapping of hazards has been conducted for each of the villages in Svaneti. Inclusion of the full spectrum of hazards is necessary, not just landslides, avalanches, and floods, in order to develop thorough mitigation and adaptation strategies. Programs for monitoring risks could be implemented as another means of increasing academic and stakeholder knowledge of the various regional hazards and risks. Increased participation would provide data for improved forecasting and also serve as another avenue of education.

3. *Economic Development*

The development of Upper Svaneti for tourism can have resounding positive impacts on local communities if their views, concerns, and vulnerabilities are included in deliberative processes. Sustainable tourism ventures and business models that empower women should be explored as additional avenues for local economic development. Economic initiatives need to be considered in ways that impart benefits to local agricultural practices and diversify economic options from a tourism/agropastoralist dualism. A strengthened regional economy will help empower local capacities.

4. *Infrastructure Development*

Dynamic pressures can be reduced by the development of institutions and basic infrastructure. Roads, employment opportunities, communication networks, and governmental institutions need investment in order to effectively mitigate, respond to, and alleviate disasters and their risks. Projects for waste management, water filtration, and irrigation are needed to safeguard public and environmental health. Homes and roads require reinforcing, as they are continually deteriorating, and collapse of these structures pose immediate threat to safety. Livelihood, health, and economic resiliencies to disasters would benefit greatly by strengthening the capacity of state institutions and increasing local involvement.

5. *Increase Participation of Stakeholders*

To respect local perceptions of disasters and the related meanings, local communities need to be involved in the development and implementation of strategies and policies that affect them. Additional sensitivity can only be incorporated and reflected in policies by engaging stakeholders and incorporating their beliefs directly, meaning that participation is necessary from locals as well as the regional and national powers. Together, both can be empowered and better informed, fostering ties that may improve the communication and relationships between peripheral areas and the governmental institutions across regional and national scales.

CHAPTER 6

Conclusion

This research project was designed to address the local perceptions of climate change and analyze the factors that create vulnerability to disasters in Upper Svaneti. The topics discussed here all work together to show how history and geography are connected to the intersection of people and the physical environment.

Chapter two introduced the history of the Caucasus region, beginning with the first settlements along the Black Sea. Through time, civilizations developed and battled one other for control of the South Caucasus region. Georgia's formation came with assistance from Russia, but the protector soon became a colonizer. Episodes of political and military strife have recurred through time, diverting power and resources from the government to incorporate and develop the country's remote areas. Svaneti, in its current state, is an example of an area overlooked until recently. It shows potential for the development of tourism, but considerations must be made for the future impacts of climate change upon any investment in the area.

Chapter three explored the phenomenological approach of the empirical research and introduced the study sites in this project. In chapter four, perceptions of climate change are analyzed. The interviews analyzed in this chapter yielded descriptions of the changing weather, climate, and physical environment. Trends of warming and glacier retreat and environmental responses to climate changes were outlined from respondent descriptions. The resulting thematic analysis determined that the essence of climatic change spurs feelings of fear and helplessness in respondents. Perceived benefits

arose as well, reflecting positive aspects and opportunities emerging from the changing environmental conditions.

Narratives about extreme weather events were useful for characterizing the dynamics of the local climate and elicited descriptions of natural disasters. Chapter five paired the historical background of Svaneti and interview data with extensive field-data to assess the vulnerabilities of villages in Upper Svaneti. In short, deficiencies in governmental, social, and economic support, coupled with outmigration, are constraining the ability to prevent, mitigate, and respond to an array of potential disasters. A situational component exists for each of the villages along elevational and proximal lines to Mestia. Disaster risk reduction, climate change adaptation, and development strategies for Upper Svaneti are in their infancy. Involving local stakeholders throughout the development, implementation, and monitoring of such strategies is beneficial for locals, investors, and the agencies involved, which is reflected in the recommendations coming out of this study. Svaneti, unfortunately, is not exceptional as an underdeveloped and underrepresented area vulnerable to disasters and the negative effects of climate change. Since the dissolution of the USSR the entire country of Georgia has been impacted by political instabilities, military conflict, and the persistent effects of poverty on economic development.

Several aspects of the researcher's experience demand attention, in addition to consideration of the limitations to the interview process and analysis. As a Russian speaking Caucasian male with a Russian name in a patriarchal society, I was able to quickly establish rapport with people. My gender, family background, skin color, and language skills all contributed to having a unique experience. The identity and social

situatedness of another researcher may have led to having accessed different data, seen variations in observations, and having had a very different experience, the results of this study owing to those differences.

To accommodate my linguistic capabilities, interviews were conducted in Russian and translated by myself. For the participants, Russian had been learned as a foreign language in addition to Georgian and the local Svan dialect, which is spoken at home. Some potential respondents declined participation in recorded interviews, afraid that their grasp of Russian was insufficient, but generated information through informal conversaton. In an ideal situation, the interviews would have been conducted in Georgian or Svan, coupled with a larger sample of interviews with even participation among men and women. While I believe the content in the analyses would reflect the same outcome, conversing in the native language of participants may have yielded additional intricacies and connections. During the translation and transcription process I had to be cautious of the specific terms used. Some adjectives, for example, can be translated in multiple ways and preference for one word over another could introduce bias. Bracketing and reflection were critical for minimizing researcher bias introduced in interviews.

There are ample opportunities to continue this line of inquiry. Research in Upper Svaneti could be continued on mapping the physical hazards specific to each community and analyzing the relative of climate change impacts and disasters across genders. Monitoring of climatic changes and the continued effects upon the environment are needed for future forecasts, and it would be interesting to see studies that focus on the social transformations that result from tourism and economic

development. The phenomenological approach used in this study could be reapplied and refined by studies on other communities affected by natural disasters and climate changes as well.

As indicated by the themes of helplessness and fear generated in chapter four, the feelings and meanings associated with climate change and natural disasters are both individually and socially constructed. It has been noted by the Swiss Agency for Development and Cooperation (2006) that:

> A common belief from the Soviet times says that the government should take care of all disaster issues. This ideology leads individuals to not take any responsibility for disaster prevention and preparedness, and it leads the government to assume that all disaster prevention and preparedness efforts are government responsibilities, despite of severe financial constraints.

The government is demonstrating progressive action to move away from a centralized economy and towards economic globalization, but the ideology that the government is responsible for taking care of disaster issues persists in Svaneti. Local responses to disasters have been reactive in nature and local measures to prevent and mitigate disasters are impossible because of minimal capacities and constrained access to resources. The Georgian government has the power to facilitate economic growth and implement CCA and DRR strategies in Svaneti - both of which can reduce vulnerability by reducing dynamic pressures and increasing community capacities. Indeed, initial assessments have been made and project development is underway, although results have been suboptimal for Svaneti (MEP 2009; UNDP 2013).

This research project has made several contributions to aspects of theoretical, methodological, and empirical literature. The phenomenological method and approach

of this study demonstrate a unique way of interpreting not only climate and climate change, but also the meaningfulness of place that is overlooked by other approaches concerned with CCA and DRR. Exploring human dimensions of climate with a phenomenological lens offers a deeper understanding of people's connections to their environment and the meanings expressed through their culture. The ontology of climate and climate change has been questioned herein, stemming from the distinction between academic, political, and personal meanings. The specific meaning of "climate" and "climate change" that a person creates, adopts, and reifies has many ramifications. The processes that create perceptions, meanings, and beliefs are reflexive across the connections between individuals, their society, and the environment. Phenomenological research challenges accepted norms and ideologies, thereby creating an opportunity for epistemic change. The discourse of climate change, and all other phenomena, is subject to change, but only if intuition and bracketing guide our production of knowledge.

The use of the Pressure and Release model (Wisner et al 2004) for the vulnerability analysis has shown a link between the larger governmental powers and the progression of vulnerability. This model may overemphasize the role of the government and larger regional forces as causes of vulnerability disproportionately to the power and agency of individuals who can protect themselves in various ways. One adaptive response of Svans to their environment was the creation of a particular vernacular architecture that affords better protection from avalanches and landslides than contemporary buildings in Russian or European styles. Stone *koskis* and *matchubis* are still standing today, over a thousand years after they were erected. This form of

adaptive culture has, unfortunately, deteriorated over time. The building techniques are no longer employed and have been replaced by other methods and materials. The PAR model has its merits as an analytical tool, and limitations because of the focus on social determinants of vulnerability. To augment the static framework of the PAR, another model was developed to reverse the progression of vulnerability. Applying the Access Model (Wisner et al 2004) to Upper Svaneti may further elucidate the adaptive capacities of specific communities while clarifying the specific impacts of governmental and infrastructural deficiencies in relation to the dynamic role that the environment plays.

Climate change and economic globalization are complex ongoing processes that create winners and losers based upon the differential impacts expressed across spatial and temporal axes (O'Brien and Leichenko 2000; Kelly and Adger 2000). The communities in Svaneti should not be disaggregated from Georgia when examining the ethical dimensions and arguments concerning the winners and losers of climate change and development. Impacts to the national capacity to adapt in turn influence community level abilities. Unless the full range of social, economic, and political issues are addressed in CCA and DRR plans across local, regional, and national scales, there will be continued vulnerability to disasters and the negative effects of climate change.

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Appendix

Stakeholder Interview Guide

Context

- How old are you?
- How did you come to live here?
- How many years of school did you attend?
- What do you do for a living?
- What is it like for you as a resident here?
- What is your relationship to the land here like?
    - What was it like that as a child?
- Could you describe what a day in your life is like for me?

Reconstruction of Experience

- How do you interact/relate to with the weather and seasons?
    - Has it always been like that?
- Have you been affected by environmental hazards?
    - What happened?
    - How did it impact the community?
    - Did it impact the country?
- What things threaten your community and livelihood?
- What things benefit your community and livelihood?
- Have you seen changes in your community that came from environmental changes?
- Are there glaciers in this area?
    - Where?
    - How many?
- Are glaciers important to you or to the community?
- What do glaciers symbolize to you?
- Do you tell stories about glaciers to children, or have you heard any stories about glaciers?
    - Could you tell them to me?
- Have you noticed a change in the glaciers during your life?
    - What? When? Where? Why do you think that is?
- Have you noticed a change in the land during your life?
    - What? When? Where? Why do you think that is?

- Have you noticed a change in the water during your life?
    - What? When? Where? Why do you think that is?

Meanings

- What do weather changes and hazards mean for you?
- What does it mean for the community?
- Is there a way to plan or prepare for these changes?
- Have you done anything to prepare for these changes?
    - Has the community?
- Given what you have said in this interview, where do you see yourself in the future?
- What is the future for your community?

Key Informant Interview Guide

Context

- What is your work? What do you do exactly?
- What is it like for you to do what you do?
- How did you become a …?
- Could you explain your life history up to the point you became aware of climate change?

Reconstruction of Experience

- Is Georgia affected by climate change?
- Could you explain why or why not?
- What is your relationship to climate change and adaptation? How have you, or your family, been affected?
- Are you aware of any strategies for hazard risk reduction and adaptation?
- How concerned are you about the recession of glaciers?
- Do you think mountainous communities are vulnerable to climate changes?
    - How?

Meanings

- What does adaptation mean to you?

- Given what you have said in this interview, what does the future look like for Georgians?
- What is the future of Georgia's glaciers?
- What is the future of the residents of Upper Svaneti?