CHAPTER 3. HUMAN VULNERABILITY, INSECURITY AND ENVIRONMENT

3.1 Vulnerability in the Local Setting

In the majority of cases of human-nature interactions, the chain of events starts within human society, triggered by problems of societal development (economic, social, cultural, etc.). These problems may then be "imposed" on nature, either accidentally or deliberately, causing changes there and re-emerging as environmental problems. Afterwards, this chain of events may cause feedback effects on society, presenting what resembles an absolutely new set of problems. Interaction with nature does not create new problems; it just makes evident problems already existing in human society. It also often magnifies the negative consequences of human activities, leaving them to be solved by people who did not cause them in the first place, and often by moving the process far away, from where they were physically initiated.

Even when people encounter unavoidable natural phenomena ("acts of God") such as earthquakes or tropical cyclones, tornadoes etc., this chain of events still may have begun within society. There are social-economic factors that determine why people are located in harm's way in the first place, what they know about a potential hazard and how well they are prepared to deal with it.

Thus, even in cases when human vulnerability appears to be caused by environmental factors, its real driving forces may be socio-economic. Vulnerability is a potential state, which is often case-specific; that is, attributable to either social, economic or environmental factors that activate it.

As a result, human-nature interactions are well-known for being complex. Causes and effects are hard to trace and chains of events are usually so intermingled that following them to their source is a near-to-impossible task. Hence, there are obvious difficulties in perceiving human-nature interaction problems, reaching efficient solutions and undertaking effective mitigating measures. Associated difficulties in planning and problem solving usually lead to a lack of preventive initiatives, with mitigating measures applied after the fact and on visible effects, rather than to the causes of a given problem.

These general problems in case of the Caucasus are further exacerbated by the disintegration of the USSR and subsequent weakening of the economy, governmental structures and social safety nets, along with armed conflicts and the like. The enormous changes have been negative for the vast majority of the local population, and are associated with huge gains for a very few and poverty, insecurity and struggle for day-by-day survival for the majority. For people under such circumstances environmental considerations are very low on the agenda. They come to people's attention only when negative environmental changes hit people in some drastic way, as in the case of some natural catastrophe. Environmental problems will certainly become more important to people if they are affected by large-scale environmental degradation. Nevertheless, right now environmental concerns are over-shadowed by the more pressing problems of poverty and insecurity that are considered the leading causes of vulnerability in the region[6].

Local vulnerability in the Caucasus is very different from what is observed in other less developed regions of the world. For many (if not the majority) it has resulted from the extremely rapid - virtually overnight - deterioration of relatively high living standards after the disintegration of the USSR. One of the main characteristics of local vulnerability is rooted in the traditionally high level of dependency on the government. By the end of the communist era, hardly anyone really trusted or respected the government, but strange as it seems, viewed it as the sole provider of services and ultimate protector in time of need. When governments began to fail in their missions as protectors and providers, for many, especially the previously affluent, poverty moved into a psychological dimension. It is often associated with not only material deprivation, but also the feeling of powerlessness and humiliation - a phenomenon clearly visible in Georgia for instance[7]. Now ten years following the collapse of the Soviet Union, the authorities still lack coping strategies and resources to ameliorate the condition of vulnerable people, while the frequency and scale of extreme events has sharply increased.

In considering causes of vulnerability in the Caucasus, it should be understood that the ongoing transition in the region is actually the third such transition in a relatively short historical period[8]. Each transition has profoundly altered existing ideas, beliefs and value systems. As a result, the vast majority of population has a value system much at odds with what is accepted in civilized society in terms of rights and wrongs. In such value systems, environmental concerns occupy very little space, if any.

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6 We understand vulnerability as inability of individual or group of people to resist adverse socio-economic and/or natural phenomena as well to cope successfully with their consequences.

7 As a result the less developed and previously less affluent communities and individuals usually find themselves better positioned to resist vulnerability as a whole and poverty in particular. They lose less, expect less, and are more dependent on informal security nets (extended families, local clans) than their previously richer counterparts.

8 Traditional society in this region was under already under a strong pressure of successful capitalist transformation when Bolsheviks got it under control. In turn, the current stage of transformation started when vast majority of population at last began to come to terms with rules of games offered by Communists. As a result, we deal with two cases of aborted development and one incomplete transformation during one century.

3.2 The Most Vulnerable Groups

Vulnerability in the region today primarily hinges on the economic situation. One is naturally much less vulnerable to various hazards in an economically developed country than in the Caucasus, which is still in the midst of prolonged economic hardships almost after a decade of widely publicized economic reforms[9]. Even armed conflicts, for whatever reasons they were started, are mainly sustained because there are plenty of people earning their livelihood from them[10]. Chechen youngsters are dying planting mines to kill young Russian soldiers since this is the only opportunity for them to earn a few dollars to support their families. Thousands of people in the mountains of the South Caucasus are felling trees on steep slopes directly above their villages since this is the only way to earn some money to live. Hence the obvious conclusion - whatever the visible reasons of vulnerability, its ultimate solution lies in the improvement of the general economic situation throughout the region, raising standards of living and increasing state funding for social programs.

Poor people are obviously the most vulnerable. The smaller national autonomies of the North Caucasus are characterised by extremely high poverty levels. Ingushetia (where 95.1% of population is poor based on per capita monetary income in 1999)[11] and Dagestan (63.2%) are classified in Russia as belonging to "the less developed autonomous republics and units in very critical condition[12]". Two more - Karachaevo-Cherkessia (64.6%) and Kabardino-Balkaria (46.6%) are classified as "underdeveloped republics". These republics have the worst social indicators in Russia and the only other areas of the Russian Federation that bear any comparison to them are remote areas of Siberia and the Far East. According to a survey of average monthly per capita incomes in 1999, Ingushetia occupied the last (79th) place in Russia, and Dagestan 77th, Karachaevo-Cherkesia 76th, Adygeia 70th, Kabardino-Balkaria 64th place respectively. The average Ingushetian earned just 22.8% of the average Russian wage. On the other hand, all these republics have the highest rates of social transfers in terms of the population's monetary income - for the average Russian it was 13.6%, in Ingushetia 28.2%, Dagestan 27.3 %, Adigeya 24.1 %, Karachaevo-Cherkessia 26.6% (State Committee of Russian Federation for Statistics, 2000).

Ingushetia (82.6%) and Dagestan (75.1%) had the highest rates of food expenditures in household budgets in the Russian Federation, closely followed by Karachaevo-Cherkessia and Kabardino-Balkaria. The former two had the lowest levels of pensions. Ingushetia is the only place in the Russian Federation where the number of pensioners exceeds the number of employed persons. The same trends are observed almost in all other republics, including Alania. Naturally, unemployment levels here are among the highest in Russia.

The vulnerability of the population here is basically caused by a lack of economic development. Even in Soviet times, these areas were underdeveloped. Dagestan may be the only place in the region where high population pressure coupled with underdevelopment directly causes land degradation.

All other territorial units of the North Caucasus are similar to the average Russian level, and are representative of a country in transition, just starting to overcome deep economic and social crisis[13]. The formal state social security system plays the lead role in mitigating vulnerability; although it is not as reliable, it once was under Soviet administration. Pensioners and families of unemployed workers are especially vulnerable if they cannot find some supplement to formal state support. It is interesting that in these areas collective farms are still the leading agricultural enterprise. Some of them continue to maintain social safety nets, providing mutual

9 It should be ceaselessly emphasized - whatever the difficulties of transition human deprivation here does not goes as far as in majority of vulnerable countries of Africa or Asia where it is associated with famine or mass epidemics claiming huge amounts of human life. And especially there is not noticeable deprivation of population due to overexploitation of environmental resources.

10 There are also plenty of people making money on these conflicts, but this is not directly related to vulnerability issue. Although one of the main (if not the main) reasons of the South Ossetian conflict preserved in a state of suspended animation is that the uncertain status of the disputed territory provides may be the largest regional smuggling opportunities.

11 Naturally this number is rather inflated since cannot estimate undeclared monetary incomes, which here should be rather high and does not count income in kind too, but even adjusted it may be very high.

12 There are seven such units altogether in Russia. Chechnya is of course left out of any database.

13 Alternatively, may be they have not still encountered the real crisis. What will become to local agriculture after Russian parliament finally permits to sell agriculture lands is hard to predict.

support to their members through the period of hardship. Although such enterprises are inefficient from an economic point of view, they continue to play an important social role.

All three South Caucasus republics have similar poverty/vulnerability trends. Poverty levels in Georgia and Armenia have been stable for the past several years at 50-55% (calculated as the percentage of households with incomes below the official subsistence level). This is very high, especially considering that these countries had some of the highest standards of living in Soviet times. In Azerbaijan according to the latest available data dating back to 1995 - poor households amounted to 61.5% of the total. How the situation has changed since then is difficult to determine (there is no data available) but it is not likely to have improved much, except for employees of the leading industries, like oil extraction. Azerbaijan follows similar patterns as its regional neighbours and "the most acute social problem continues to be extremely low level of satisfaction of the minimum material and spiritual needs of absolute majority of population". One more indicator if not of poverty but rather fragility, is the relatively high percentage of total household expenditures spent on food, in excess of 2/3 household budgets on average. Some studies even suggest that 63% of Armenia's entire population for instance is spending their entire income on food (IFRCRCS Delegation in Armenia, Yerevan, 2000). As a whole, the majority of population here is either poor or vulnerable to poverty in the sense that any unforeseen expenditure, like health care expenses (not to mention natural disasters, armed conflicts and like), may push the household over the poverty threshold. The capacity of most local households to cope with such changes is very low.

Pensioners living alone, with children or with a single adult, extended families with children and female-headed households account for the biggest percentage of poor households in the sub-region. The unemployed is another extremely poor and vulnerable group. Financial and other resources available to local social security systems are not nearly enough to improve the conditions of the millions of people who depend on them. Pensions and other social payments are well below 1US$ per day - the absolute poverty level adopted by the World Bank. In Georgia, old age pensions amount to about US 20 cents per day.

Official minimum salaries and actual remuneration also compare very unfavourably with officially adopted minimum subsistence levels, meaning that employment alone is not a safeguard against poverty and vulnerability[14].

All these vulnerable groups are subject to impoverishment and are supported mainly by informal kinship ties. These ties are obviously the most widespread means of survival for poor families in the country, government support being next to nothing. Support by various international donors and/or by some local NGOs does not play a significant role. Rural households, having direct access to food production, usually cope with hardships better than urban households do.

Internally displaced persons (IDPs) form another group of the poor/vulnerable population. Numerous regional conflicts have forced thousands to flee their homes. In the South Caucasus there are about 1 million IDPs registered in Azerbaijan, 400,000 in Armenia and 290,000 in Georgia[15]. While the IDPs themselves are very vulnerable, their displacement sharply increases vulnerability of the population in places of resettlement through strain on locally available communal services, material and financial resources, housing, the labour market, etc. It naturally leads to increasing social tensions and poverty. We do not comment specifically on the fact that no government in the region is able to provide decent

14 The only exception was Armenia where level of remuneration for employed was usually well above the poverty line. Average monthly salary of employed person exceeded 193% of poverty line. Of 16 branches of economy only in social sectors, such as education, culture and health care it was near the poverty line. Even administrative employees received salaries in excess of 277% of poverty line - a rare exception in the former USSR.

15 As to the reliability of this data, for instance almost all IDPs in Georgia are registered as displaced from Abkhazia and almost all are later registered as Georgians. This number clearly exceeds the amount of Georgians registered in Abkhazia in 1989 (234,0000). Obviously this cannot be even if one assumes that they are characterized by very high natural increase and all of them migrated to Georgia (that clearly is not so). On the other hand this is a good indicator of a real socio-economic situation in the country, where a general quality of life has deteriorated to such extent that it is clearly beneficial for many to register as IDPs. At least this way people are entitled to some kind of welfare benefits and rights to accommodation for instance. In Tbilisi, especially, this leads to numerous conflicts, open marauding and illegal trade in floor space.

material and financial support for these people. They receive assistance well below any acknowledged poverty levels and otherwise are primarily left to their own resources.

Despite the evident socio-economic causes for IDPs' vulnerability, the main reason for their current vulnerable status is that they are politically tradable assets and are usually treated as such, although the country approaches vary[16].

Most IDPs live in refugee camps, converted public buildings, boxcars, shipping containers and other accommodation hardly fit for habitation. These accommodations are usually overcrowded and unsanitary. Depending on where the refugee camps are situated, people are either subjected to adverse environmental conditions, or they mercilessly exploit any natural resources available (especially forests), since this is the only way to earn a livelihood.

Many of these people manage to find their way to major urban centres where they still remain an isolated, marginalized group, but otherwise no different from any other economic migrants.

What distinguishes them from other vulnerable groups is that their vulnerable status is formally acknowledged by international donor agencies and they receive some kind of "preferential treatment." Being rather isolated they tend to stick together and put forward their demands as a group.

The problems of forced migration may take a very long time to mitigate. First, because many people are clearly interested to use IDPs in pursuit of their private political ends, and secondly, difficult economic conditions do not leave many resources to change their conditions for the better. Extensive international assistance (as everywhere in the world) can only ameliorate their condition to some extent but clearly cannot replace local government efforts.

3.3 Access to Health Care, Environmental Quality and Vulnerability

Human health is affected by a broad spectrum of factors including social, economic, sanitary-hygienic and environmental conditions, life style, access to health care services and the quality of health care systems. According to WHO data, up to 80% of morbidity is due to exposure to different environmental factors of a physical, chemical and biological character.

The Caucasus was traditionally characterized by moderate to serious environmental and hygienic conditions in urban and industrial areas, linked to its underdeveloped sanitation infrastructure, environmental pollution from industries and traffic, and serious sanitary-hygienic and environmental problems in rural areas connected to the intensive use of pesticides and other chemicals and poor sanitation infrastructure or the lack thereof (Ministry of Environment and Nature Resources Protection, Russian Federation, 1994).

High figures of infectious diseases were traditionally reported in some parts of the region. High morbidity due to typhus, dysentery and viral hepatitis was observed in the cities of the North Caucasus. In rural areas, gastrointestinal diseases and poliomyelitis caused morbidity figures of higher than average values. High morbidity due to typhus was observed in cities of Armenia and Azerbaijan as well (Ministry of Environment and Nature Resources Protection, Russian Federation, 1994). Apart from this, there has always been and continues to be a high risk for epizootic outbreaks in the North Caucasus, since the region has natural sources for contagious diseases such as plague, tularaemia, brucellosis. Lack of animal vaccination and poor sanitary-epidemiological conditions only aggravate the situation.

Since 1990, sanitary-hygienic conditions have been worsening in the region. Outbreaks of infectious diseases, especially gastrointestinal ones, have become routine. They have also occurred in areas where they hardly ever occurred before, namely Georgia (State Committee of the Azerbaijan Republic on

16 See "Poverty Reduction Strategy Paper" (Interim Report), Azerbaijan Republic, p.24 (http://www.imf.org/external/NP/prsp/2001/aze/01/index.htm) Governments of the region are clearly reluctant to undertake efficient measures to integrate this people into local communities in places where they live now. They try hard to preserve their numerous IDPs as a reserve and a driving force for the future resettlement on the territories now outside their control. Armenia may be the only exception since realistically there is no place in Azerbaijan for Armenians in the near future.

Nature Protection, 1993; UN-ECE/MNP of Armenia, 2000; WHO/MoH of Georgia, 2001; Ministry of Environment and Nature Resources Protection, Russian Federation, 1996).

This may be traced to sharply reduced abilities of state sanitary-hygienic services to conduct regular inspections of food products and drinking water due to lack of finances and technical equipment. Existing water supply and sewage systems are inadequately maintained and frequently cross-contamination of sewage and drinking water occurs. Water intake facilities are not properly protected and do not meet sanitary and hygienic requirements. In many locations, the lack of chlorine does not allow for proper treatment of drinking water. Over-loaded landfills that do not meet health and environmental requirements, and illegal dumpsites cause the contamination of ground waters, which are the major sources for drinking water in many of parts of the region.

The overall situation is such that the population in general has become vulnerable to infectious diseases. The need to treat foodstuffs and drinking water with utmost caution has become a fact of daily life - an absolutely new situation that has not been necessary for decades. The poor and IDPs living in refugee camps are especially vulnerable. Considering existing economic problems and general mismanagement, the above problems will continue to fester in the short to medium term.

Although it is very difficult to establish links between environmental pollution and morbidity rates, there is some scientific evidence linking high ambient concentrations of different pollutants emitted from stationary and mobile sources to increases in the morbidity rate for specific diseases like respiratory and cardiovascular diseases, specifically, hypertension and heart attacks, skin and endocrine diseases, cancer, and lowered children's IQ. All these have been routinely documented in leading industrial centres of the region.

Recent ambient air quality data for selected major cities of the Caucasus indicate declining or stable trends for most pollutants, due to the fall in industrial activities and hence, industry-related emissions. However, this is offset to some extent by an increase in traffic-related emissions. In the South Caucasus, there is noticeable trend of concentration of population and economic activity in the few largest urban centres. These have led to a dramatic increase in vehicles that are old (10 years or older), poorly maintained and use low quality fuel. Traffic is poorly organised, and congestion is routine. Since traffic is a major source for ambient air pollution in most Caucasus cities, particulates and lead are assumed to be the most serious health concerns. There are a number of studies supporting this thesis, for instance, the study of health effects of short-term exposure to TSP for the city of Yerevan (MNP of Armenia, 2001), studies for the cities of Baku, Sumgayit and Ganja on PM10 concentration (State Committee on Ecology and Control of Natural Resources Utilization, Azerbaijan, 1998), and studies on lead impact on health for Tbilisi (NORCE & MoE of Georgia, 2000).

During the Soviet era, the morbidity and mortality rates due to neoplasm and birth defects were traditionally high among the rural population of the Caucasus, mainly due to unsustainable use of pesticides. At present, whereas the overall pesticide use has declined here, health concerns related to pesticides still exist. Specifically, many individual farmers are not aware of health and environmental requirements for pesticide use, and pose a high threat to their own and other people's health and environment. Another problem is related to obsolete pesticides and other agrochemicals that are not properly stored and cause the contamination of ground waters and soil. This poses a high risk to human health through drinking water and food contamination.

The situation in the public health care system has also dramatically changed. While during Soviet times it was never very advanced or efficient, it did provide universal access and was free. The post-Soviet transition crisis has resulted in a marked deterioration of this system, although this process has been uneven. Russia has managed to retain the previously existing model and is even expanding the system. On the other hand, a crisis in the system is obvious, and quality is falling. It has become especially more discriminatory towards the less affluent population since under-the-table payments are almost mandatory. In the South Caucasus, the poor are virtually alienated from the health-care system, in Armenia and Georgia quite perverse

ly because of the WB sponsored reforms[17].

Even for the more affluent families paying for medical treatment can often mean sliding below the poverty line. People routinely postpone visits to doctors or self-medicate, causing additional aggravating factors in the case of contagious and infectious diseases.

More importantly, health-care systems have lost their ability to practice preventative medicine and usually treat people in advanced stages of disease. Poor infrastructure facilities, and the lack of technical and financial resources to conduct the most routine sanitary and hygienic oversight services are too much for the people in the system to cope with. Although qualified professionals in the system still exist, they too lag behind in their knowledge of recent tools and methods used in contemporary toxicology and epidemiology. Environmental and other authorities responsible for data collection also do not have enough resources to regularly monitor ambient environment quality, detect high pollution episodes and take specific measures for human health protection. Existing ambient standards are out of date and need revision. Besides, more often than not authorities simply do not react to easily observable trends and situations with obvious health hazards, while the public in general lacks information, understanding, organization and effective means to alter the situation[18].

3.4 Conflicts and their Environmental Impact

During the final years of the USSR, armed conflicts became one of the most important determining factors of environmental quality in some parts of the Caucasus. The type of impact and its level depends on the ongoing status and intensity of the conflict.Except for in Chechnya, all other military operations in the Caucasus are in a state of suspended animation and have no direct impact on the state of environment. Of those, the South Ossetian and Ossetia-Ingushetia conflicts were of very low intensity and their environmental impact was negligent.

As for the Karabakh and Abkhazian conflicts, military operations were intensive, affecting the environmental quality noticeably; especially forests and vegetation cover. Hundreds of hectares were badly damaged, mostly by fire because of aerial bombardments and artillery shelling. Minefields that were left behind still represent a major hazard to both people and local fauna.

On the other hand, these operations have in a broad and unintended sense led to a certain improvement in the state of the natural environment. Although the scars of war are still visible here, the territories are mainly depopulated. This is well-illustrated in the case of Abkhazia, where 550,000 people lived before the conflict. At present, its population is less than half of this figure, with a number of villages and arable lands abandoned; and life in cities (e.g. Sukhumi) concentrated only in their central parts. Because of the humid subtropical climate, which is favourable to the rapid growth of plants, weeds have begun to take over highways and railroads, wild vegetation is covering large areas and forests are recovering. The total collapse of the economy contributes to the reduction of pollution of the environment, as all industrial enterprises are standing idle.

Indirect impacts are reflected in the disruption of pre-existing, traditional land-use. In mountainous Karabakh and Abkhazia, agricultural lands formerly intended for vineyards and fruit gardens have been turned into pastures and lands for annual crops. This was caused mainly by the damage to and breakdown of irrigation systems. Selective cutting is damaging the forests of Abkhazia, which had not undergone industrial logging for the last 50 years. Valuable species such as chestnut and box-tree are being cut down for firewood and illegal sale.

A similar picture can be seen in Karabakh, and particularly in the territories outside of Karabakh proper. The city of Agdam, which had 40,000 inhabitants before the conflict and was known all over the Soviet Union for its wine industry, is now completely destroyed.

17 Obviously, absence of these reforms would have resulted in the same alienation, but in the popular perception, reforms caused this misfortune. We also do not specifically comment on the quality of health services. High quality is rare and usually accessible only for a very restricted stratum of the population.

18 For instance, malaria that was virtually non-existent in Georgia for decades started to re-emerge recently. It is mainly imported from Azerbaijan as well as from Asian countries with a high prevalence of this disease. High incidences in the Kakheti region adjacent to Azerbaijan are primarily caused by the cessation of regular chemical processing of few local reservoirs that naturally harbour the malaria vector. This fact is widely known but no mitigating measures are undertaken, even though resumption of processing is rather cheap and well within the abilities of impoverished Georgian health-care budget.

Even the foundations of earlier buildings do not exist any more. Once highly fertile, lands along the frontier line in Karabakh are completely abandoned. The only known reserve of plane trees has nearly disappeared. One of the most unpleasant consequences of the landscape transformation here has been a plague of mice in neighbouring areas of Azerbaijan.

Some of these processes cannot be directly ascribed to military operations, but rather to general economic decline, breakdown of law and order in the region and wide spread corruption. Analogous processes observed throughout the Caucasus are described elsewhere in this report.

The ongoing conflict in Chechnya is the most prolonged and intensive, with many modern weapons used. As a result, both the direct and indirect impacts of this conflict on the environment surpass all others in the region. At least one-third of local forests (thousands of hectares) have been seriously impacted as a result. This has been caused not only by shelling and aerial bombardment, but also by mass felling of trees and cutting openings for new communication pathways. Erosion has intensified, creating "hot spots" in the mountainous areas of Azerbaijan, Chechnya and Dagestan. The roads that appeared due to the movement of heavy equipment have also greatly contributed to the degradation of such areas (IUCN, 2000).

Military actions have also resulted in environmental pollution, namely, the contamination of soils, sub-soil, atmosphere, surface waters, water supply systems and settlements by chemicals. All this had a negative impact on human health (IUCN, 2000).

In Chechnya, which used to have advanced manufacturing and mining industries, military operations have had severe environmental consequences. Bombing destroyed many oil wells, refineries and storage tanks, resulting in oil spills and soil and ground water pollution. Oil ponds having detrimental environmental impacts have been found in some places. According to recent estimates, about 30-40% of the total area of Chechnya is heavily polluted by oil products. In some locations, oil products have seeped two meters into the soil[19].

An additional local, albeit serious hazard stems from police operations to eliminate illegal, primitive petroleum refineries, often situated in backyards, which abound here. Such "refineries" even in operational condition are extremely dirty and polluting. Elimination means that they are simply blown up, scattering dirty waste across a rather large area. Left in this condition, the refineries leak oil into the soil. During one recent operation, 36 such backyard refineries were destroyed, and operations of this type are rather routine[20].

Pollution and noise from military operations also have a high impact on local fauna, causing the destruction of habitat and migration routes. Some areas are marked by a reduction in the diversity of fauna (species impoverishment). For instance, in Dagestan in 1999 when armed operations "spilled over" from Chechnya, a significant loss of fauna in broad-leaf forests was observed.

Environmental implications are perceived not only in conflict zones but in bordering areas as well. This is reflected in the migration of animals, particularly large mammals. In recent years animals, particularly predators, have been more frequently migrating from Chechnya to Georgia and into Kabardino-Balkaria (IUCN, 2000). The local population reports that the number of wolves has significantly increased in the areas of Dagestan bordering with Chechnya, and their attacks on cattle have become more frequent (IUCN, 2000)[21]. The majority of migrating animals have become victims of poachers.

A particularly high degree of pollution of air and surface waters was observed in neighbouring Dagestan (and was reported in the official "Reports on the State of Environment in the Russian Federation". Prevailing westerly air currents that often carry polluted air from Chechnya cause such high levels of pollution in Dagestan. In addition, all rivers in Chechnya flow toward the Caspian Sea and pass through Dagestan. Hence, explosion of oil refineries and reservoirs resulting in the discharge of oil and

19 Ecological Situation in Chechnya (http:/www.domaindom.net.moscow/ecology.html)
20 http://gazeta.ru, information as of 12 May, 2002.
21 The same was observed during other conflicts as well. For example, in Azerbaijan, from front - mountainous and low mountain landscapes large mammals migrated to the neighbouring areas (IUCN, 2000). During the conflict in former South Ossetia (Georgia), aurochs, deer, brown bear, and wild boar abandoned this area for Chechnya.

other matters into the Terek River has been reflected in deterioration in the ecological state of the northern part of the Caspian Sea (Ministry of Environment and Nature Protection, the Russian Federation, 1996).

In general, there is very limited "hard information on the environmental implications of military activities in the Caucasus region. Whereas some studies, although not comprehensive, have been conducted for some of the conflict areas, there is lack of information on all the conflicts. The studies that do exist are only qualitative assessments and no quantitative studies have been conducted yet. There is a definite need for a detailed assessment of environmental conditions in all conflict areas. In addition, the impacts on neighbouring countries and/or republics should be studied as well.

3.5 Coping Capacities

The region as whole is vulnerable to environmental hazards that may occur both as natural phenomena and human-initiated processes. The hazard itself is not as important as the chain of events that triggered by it, which often causes the most suffering[22].

During the years of transition the local population largely has lost the ability to cope with these "aftershocks" and is much more vulnerable to these hazards than before. The main reason is the drastically reduced coping capacity of both the population and governments due to insufficient financial and material resources at their disposal, dwindling infrastructure, institutional inefficiencies, wide-scale corruption, etc.

There are two distinctive models of coping with environmental hazards and their consequences in the region.

The Russian model is still based on the "paternalistic" approach to hazard mitigation inherited from the Soviet Union. It is based on the idea that the state should play the role of "insurer" for its subjects. It provides whatever protection possible against hazards undertakes emergency care and mitigates consequences. The system worked quite well as long as the country was strong and wealthy, especially in case of large-scale earthquakes like ones that took place in Ashgabad or Tashkent. It did not work as efficiently in the case of the large-scale natural hazards that took place in the South Caucasus in the 80s primarily because the USSR was already quite weakened and disorganized by then.

The Russian Federation still responds to hazards based on this model and is to some extent successful. Learning from the negative experience of the Spitak earthquake, it created the Ministry of Emergency Situations that has achieved wide acclaim as one of the most efficient rapid reaction forces worldwide. Thus, in the event of a real hazard Russians can receive assistance as quickly and efficiently as in any other developed country[23].

The real problems begin during the stage of "aftershocks," when it comes to evaluation of losses, planning and implementing reconstruction, paying compensation to the population etc. These kinds of activities usually are late and inefficient, if they are implemented at all. Insufficient resources, especially financial, are only part of the problem. Whatever compensation the population may be formally entitled to is usually extremely small-the maximum being a few thousand US dollars - absolutely not enough to cover property losses and especially loss of life. General institutional incapacity and universal corruption, especially on the local level, are the main obstacles to efficient hazard mitigation. There is no information available on how funds are allocated during natural hazards in North Caucasus, but according to numerous reports by various Russian TV stations, money allocated for reconstruction in Chechnya does not reach the target population. Since Russia remains a centralized country, such problems need interference from top-level officials, all the way up to the president, to find efficient solutions[24].

Another emerging problem is managing the deteriorating infrastructure inherited from the USSR. For example, heavy mudflows in Tirnyauz in 2000, and constant interruption of traffic and loss of lives on Trans-Caucasus

22 These hazards are considered in different part of this report and are not subject of analysis here.

23 Kabardino-Balkaria has recently went one step farther and united under one roof all emergency services including rescue, fire, first medical aid, community infrastructure accidents, etc. (Russian TV, First Channel, May 16, 2002)

24 For instance, President Putin's personal control led to the prompt and efficient rebuilding of a whole city destroyed by flood in Siberia last year. However, such events are the exception and are hardly applicable to all hazard mitigation.

highway in North Ossetia due to avalanches. These are recurring events caused primarily by improper management and over-ambitious planning, which sacrificed economic and environmental considerations to political ones. The case of the Trans-Caucasus highway is an especially telling example. It was constructed on the present location mainly to provide a connection between Russia and Georgia, even though this route was known to be hazardous from the beginning. How Russian authorities will cope with this situation and other similar ones is difficult to tell, give the country's many other pressing problems. Most likely, it will take an event of truly catastrophic proportions to attract the attention of the central authorities and lead to some efficient mitigating measures.

The South Caucasus model of hazard mitigation is not based on Paterism d'etat approach due to the simple reason that the weakened governments of the three republics are unable to perform "parental" functions any more. The shortages of government resources, inefficient management and corruption have lead to situation where the governments if not formally, in effect, have transferred responsibility for hazard mitigation to international relief organizations as well as to the population proper. Although disaster mitigation authorities formally exist, the extent of their actual ability to cope with dangerous situations and operational efficiency are rather doubtful[25]. NGO and public interest group activities at the community level are also close to non-existent.

The coping abilities of the modern Armenian government have been tested during its response to the consequences of the 1988 earthquake and have proved to be unsatisfactory. The regions, where the earthquake took place, are some of the poorest in the country; many people there are not re-settled yet and continue to live in private garages and shacks. Restoration work is carried out almost exclusively by international agencies or funded by the Diaspora. There is an analogous situation in Georgia, where thousands of families moved from Ajara in the 80s were conveniently forgotten by the authorities and continue to live under the most adverse conditions, even in places like cowsheds.

Thus the population here is left with little or no efficient assistance from governments and very little if any information about potential hazards[26]. Poor households are naturally the most vulnerable since virtually everything they possess is concentrated inside their homes. If something happens to a home in an earthquake, flood or mudflow, almost all family possessions are lost. Poor families can do little or nothing to avoid dangers, by moving, or making their homes safer; they are also the most helpless in dealing with government agencies and local administrations. In the absence of any government disaster insurance there is no other form of insurance available to them. The emerging system of private insurance is naturally unattainable to poor and vulnerable people, but even the most affluent are still reluctant to insure their property. Credits when they are available are based on unrealistically high interest rates and most people have nothing to put up as a collateral.

Thus, the population of the South Caucasus republics is more vulnerable to environmental hazards than it was before. People are usually left dependent on resources available to them, their families or kin; very little if any assistance comes from outside.

The most telling example of this is the series of earthquakes that shook Tbilisi in April 2002. The most damaging earthquake on April 25th was estimated at a magnitude 6-7 by the MSK scale adopted in the USSR. Quite fortunately, the loss of human life was minimal-only 7 people were killed in a city of approximately 1.5 million inhabitants. However, the material damage was excessive. The most preliminary damage estimate was in excess of US$ 150 million; thousands of houses were damaged, many of them beyond repair[27]. By the most optimistic calculation, at least 1,700 families need relocation. Whole neighbourhoods in Tbilisi were isolated, with many buildings on the brink of collapse.

The very first conclusion drawn from this disas-

25 During the Baku earthquake in 2000, these bodies were not up to their requested performance, but due to regrettable habit of circumventing any negative information regarding Azerbaijan the true situation is hard to evaluate.

26 The reasons behind absence of information are primarily based on assumption is that it may create panic; that it will increase the current high level of apathy and fatalism; or that the information is not useful to people who do not have the means to mitigate their situation. Vulnerability Profile Update: The Social Dimension of the Causes of Disaster Vulnerability. A literature review. IFRCRCS, Delegation in Armenia. Yerevan May, 2000.

27 Much of this damage was pre-existing since old parts of the city were virtually falling apart already decades ago.

ter was that it damaged the poorest, old districts of the city where inhabitants were already the most vulnerable and had the least capacity to cope with its consequences.

It was obvious that the authorities had no contingency plan and were not ready to deal with emergencies like this. They acted spontaneously to provide help for victims during the very first, most difficult hours after the major tremor. Receiving hospitals had no emergency power supply and had to rely on portable electric generators (and fuel) provided by victims' relatives; local TV channels were collecting information about hot-spots and passing it to authorities, etc. Representatives from the Emergency Situations Department of the Ministry of Internal Affairs, which was created under an ambitious UNDP program and is formally charged with being the first to help and rescue, were simply nowhere to be seen.

All other activities undertaken since to mitigate consequences of the earthquake appear to be improvisation rather than some coherent plan. For instance, in a huge city like Tbilisi shelter could not be found for a few hundred homeless families and many of them were still living in tents by mid-May. Government stated that it would purchase flats for families whose houses were the most damaged and provide some monetary assistance. A detailed inventory and evaluation of damage was underway in May 2002, but there were obviously no funds available for reconstruction and no definite promises as to the exact time when it might take place. The prevailing mood of local authorities was such that President Shevardnadze during one of Cabinet meetings said that they preferred to "conveniently forget" the whole accident.

The only people who actually provided some real assistance to earthquake victims were local businessmen turned politicians who by mid-May 2002 managed to collect just over US$ 700,000. They donated about US$ 4,000 to each of the 38 poorest families among the victims and promised to extend this assistance to two more groups of roughly the same size[28]. This may cover less than 10% of all the most affected families.

All in all the vast majority of earthquake victims seemed to be left to their own resources for an indefinite time. Even more, this earthquake coincided with the beginning of local electoral campaign, one of the toughest in the modern Georgian history. This event promptly pushed the earthquake away from the attention of the local mass media and the population as a whole.

The main lessons learned:

- Local authorities were informed about the possible earthquake hazard, its probability, possible outcomes and the scope of potential damage many years before. The ministry of Urbanization of Georgia evaluated residen tial buildings in Tbilisi for their potential damage in a magnitude 7 earthquake back in the 90s, and provided their exact location in the city[29]. It was estimated then that 3,500 residential buildings were at a high risk of destruction and the cost of safeguarding them against possible earthquakes was set at about US$ 35 million[30]. Still they did not and/or could not undertake any proactive planning and preventive measures.
- The roots of this disaster can be seen in man

- Hazards and disasters are often almost artificially created by shortsighted activi ties of population, untimely and ill-planned reforms, omnipresent corruption, absence of the rule of law, etc. There are the numerous instances of this.
- Local authorities in Baku, a city that is well known for its very active landslides, are routinely issuing building permits for sites where safe construction is impossible. As a result high-rise residential buildings are being built on active landslide zones. Structures are constantly replacing each other during rela tively short period of time as soon as they are damaged and demolished.
- In Yerevan local authorities did not spare efforts to preserve the centralized heat ing systems at least in relatively new parts of the city, but now the population has to bear the high cost of heating. Quite naturally as soon as these costs are not met the heat supply is suspended and people are turning to local parks or trees in their yards to get themselves some firewood. There are no protests and no law enforcement is used against such offenders.
- In the mountainous Dusheti district in Eastern Georgia forests perform an impor tant water protection role. They have been overexploited during recent years by mainly illegal commercial logging by the local population. As a result numerous villages that depend on springs for water supply were left without water at all and their inhabitants are facing migration. Local authorities are well aware of this but are unable to mitigate the situation.
- One of the emerging hazards is manifested in loss by local farmers of collective knowledge of individual, private agriculture accumulated during centuries. This is especially noticeable in areas of previously large scale, industrial agri culture. Since centralized, state supported agronomy consulting services have disappeared and have not been replaced by something viable, farmers are mainly left to their own resources. People are simply turning to each other for assistance in the easiest procedures for the lack of more viable alternatives. This routinely results in mistreatment of land.

28 The very first reaction to this assistance by local officials was that these people received phone calls from city hall informing them that due to receiving assistance from private sources they were not eligible to official government support any more.
29 This information was provided for Georgia: Vulnerability and Capacity Assessment by IFRCRCS back in 1999 but for reasons unknown did not find its way into the final draft available to us.
30 I.e. about four times less than mitigating consequences of this earthquake will cost now. Actual type and spatial distribution of damage during April earthquakes exactly coincided with what was predicted by the Ministry. Its scope was smaller mainly thanks to the fact that the earthquake was less intensive than envisaged.

agerial practices adopted by then Soviet authorities some 25-30 years ago, when it seemed cheaper and easier to build new housing in the outskirts of the city, rather then to reconstruct the old, overcrowded his torical centre. In addition, sewage water leaking for decades has damaged founda tions there. This was also caused by general mismanagement and the most primitive mis appropriation of funds. Districts under con sideration were doomed many years ago. The earthquake simply accelerated the inevitable.

- People living here fell victims of ill-planned privatisation of state housing some 10-12 years ago. They were virtually tricked into the ownership of strongly depreciated, potentially hazardous assets. No one at the time explained them that as new owners they were ultimately responsible for mainte nance and reconstruction and the state was not obliged to render them assistance any more. It took this major catastrophe to make them at least understand these realities if not to come to terms with them.

Local developers emerged as net winners from this catastrophe. Now they will be able to build within the prestigious historical centre, which previously was off limits for new development, obtaining land at lower prices. It seems as if these are the people who will ultimately "solve" the problem of resettling earthquake victims by moving them to low quality, cheap housing at the city margins.

The main conclusion is that the Caucasus as a region (and the South Caucasus in particular) is still in a transition stage when authorities are loosing or have already lost their ability to efficiently manage disasters, carry out strategic planning and undertake preventive or mitigating activities. Emergence of new systems and policies may take a long time, considering the ongoing systemic crisis.

The population has basically lost its accumulated knowledge of dealing with nature, and is too weakened by current hardships to be able to cope efficiently with them. Absence of civil society and weakness of basic democratic institutions also keeps it uninformed or misinformed as to the type and scope of potential hazards, precluding it from organizing to lobby its interests or take independent mitigating actions.

These aspects of vulnerability are unlikely to be ameliorated in the short to medium run. Only isolated cases of well-planned intervention by national governments, bilateral donors, NGOs and concerned citizens groups may produce positive results.

Emerging hot-spots

The territory at the junction of three South Caucasus republics is one of the most important agricultural areas of the region, providing livelihood for hundreds of thousands of local families. Its well-being is primarily dependent on an extensive irrigation system that uses the Kura River and its tributaries. During the late Soviet years and afterwards this system fell victim to mismanagement and neglect.

Deterioration is the most advanced in Georgia, where during spontaneous land privatisation and distribution of property previously belonging to collective farms in the early 90s the irrigation infrastructure stripped of everything of value by the local population. Now this part of the irrigation system is hardly operative and it has no legal ownership. The WB is currently investing relatively small sums into repair and reconstruction of the system, but the actual need is measured in hundreds of millions of US$. The WB has recommended passing local irrigation systems into hands of farmers associations, which many fear will mean monopoly by the few richest landowners. Meanwhile local agriculture is in a deep crisis-- the amount of land under cultivation is constantly dropping, crops are failing, farmers are going bankrupt etc. This part of Georgia has become the source of intensive out-migration. The main reason for this as cited by local and international experts is lack of water.

Armenia and Azerbaijan are following a similar pattern, also with adverse effects on the natural environment. Agricultural lands both abandoned and exploited without sufficient water supply, are subject to desertification and salination. Merciless felling of riparian forests observed throughout the area also leads to bogging, disruption of rivers and activation of local geological processes.

The situation is further aggravated by a noticeable reduction of amount of water supplied by the Kura and other rivers due to purely natural causes. It has already led to some discussions between Georgia and Azerbaijan about water distribution priorities. Dealing with this situation calls primarily for joint efforts by all three republics of South Caucasus, developing a comprehensive action plan, financing it and organizing efficient, transparent control over its implementation. Considering the most recent history of interaction among these countries as well as their visible inability to carry out large-scale programs, the prospects for mitigating this situation before it turns into a full-scale humanitarian and environmental crisis are rather dim.

Another environmental hot-spot may be emerging in Western Georgia where tens of thousands of hectares of tea plantations were abandoned in recent years. They have not been re-stored so far (which in any case is difficult and expensive) and are infested by imported exotic invasive species. If these "spill out" into indigenous landscapes, the consequences for the whole sub-region (population included) may be catastrophic. There are no indications that authorities are even aware of this danger to say nothing of the need for planning and undertaking some mitigating measures.

The North Caucasus will definitely face an environmental crisis of catastrophic proportion as soon as the Chechen conflict is over. Even the most fragmentary information available to us suggests that mitigating negative environmental impacts of war may be at least as costly as all other post-war reconstruction activities.

Another hot-spot may emerge in Krasnodar and Stavropol krays after the sale of agricultural land is finally legalised. This will definitely lead to the break up of the existing agricultural management system, which is still based on Soviet-type collective farms. Based on the experience of previous Russian reforms this process may be rather unruly. Most likely, it will develop along the lines of analogous reforms in Georgia, with the appropriate negative environmental implications.