

Deforestation in the Republic of Armenia:
A Human and Environmental Crisis

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by

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Dedicated to mountains
and to all human struggle.
To Siranush,
and
to the Swineherd,
but most of all,
to the Woods,
for showing me what cannot be taught.

Medz Shnorhaka lutyun
(Great Thanks)

I owe my gratitude to those who understood my project from its inception and assisted me through to its completion.

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I thank my family members for each of their contributions to my understanding of this world. My mother is patient and undeterred in all things. My father has taught me to appreciate food and heat. My sister Ruby is the bravest woman I know, and my brother Von lives his life boldly, with no strings attached.

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INTRODUCTION

Worldwide, environmental degradation is inseparable from economic poverty. Developing countries, which house the majority of the world's poor, experience some of the worst forms of environmental damage. This concentration poses numerous consequences for the future of the natural environment and the human livelihoods that directly depend on it. In the tiny, mountainous nation of Armenia, nestled in the southern pocket of the former Soviet Union, this relationship is observed firsthand in the country's recent history of deforestation. Armenia's untold story illustrates how recent economic events, which resulted in mass impoverishment, were the catalysts to deforestation throughout the 1990s and that they are the impediments to reforestation today. This linkage of human crises to environmental ones suggests that a solution to deforestation without a remedy for poverty will necessarily fall short of truly solving the issue.

In the foreground to the discussion of the symbiosis between the poor and deforestation, this paper examines the simultaneous rise of poverty and rise of deforestation in Armenia following the collapse of the Soviet Union. The author argues that Armenia's geography, combined with its recent economic and geopolitical history, have created the current scenario, in which an economically insecure population is thrust against a rapidly deteriorating resource base that is estimated to be "completely eliminated within twenty years."¹

Part One of this paper discusses Armenia's natural systems as a precursor to their economic and physical functions in society. The country's borders, topography, forest distribution, land zones, and species diversity must be understood as a backdrop to the discussion of rural dependency on forests.

¹ Karanian and Kurkjian, 82

Part Two determines why and how Armenia's forests have become critically threatened by examining how post-Soviet events increased the country's economic hardships, which translated into pressures on the environment. Poverty struck soon after the demise of the Soviet economic and political structure, and the effects of war and an energy blockade aggravated the circumstances. The latter half of Part Two demonstrates how the country's difficulties materialized at the village level. It is here that the author perceives a competition between humans and fragile land resources.

As forests recede, and the costs of purchasing fuel wood and gas rise, more rural households in Armenia have little choice but to forego fuel, while the remaining forests are cut quicker than they regenerate. Rising land and soil degradation multiply the challenges to forests' regeneration. As it currently stands, only 8% of the country has forest cover.² Despite environmental protection legislation, international aid, and annual economic growth³, spiraling trends in poverty and land degradation continue. This raises the question as to why and how Armenia, which has a current poverty rate of over 50%, and wherein 80% of the land is experiencing desertification⁴, is fulfilling a prophecy similar to many of the world's developing nations that face the hardships of 21st century economic survival. Although this correlation has been observed elsewhere, deforestation originates and persists within the unique socioeconomic conditions of different regions.⁵ Deforestation is often "a result, a symptom and a cause of

²Karanian and Kurkjian, 80

³ The Armenian economy grew an at average annual rate of 5.5% from 1994-2000.
Source: World Bank Country Brief 2004. www.worldbank.org.am

⁴ Kelly, 107.

⁵ RA (2003), 73.

⁶ Odihi, 250.

poverty”;⁷ therefore, its study must look at the social, economic, and cultural context in which it takes place.⁸

After the primary causes of deforestation are established, Part Three of the paper seeks to isolate the impediments to reforestation in Armenia. These impediments stem from the same economic troubles, which Part Two discusses. Problems such as illegal logging and corruption are rooted in the poverty of a nation and its people. The challenge of regenerating deforested lands seems daunting given the insolvency of the population, pervasive corruption, and a lack of legal legitimacy of enforcement agencies.

The Armenia Tree Project (ATP) is the subject of the final chapter. ATP is a small NGO that has been operating for over a decade throughout the former Soviet republic as an operational center for reforestation and poverty alleviation. Recognizing the relationship between poverty and tree-cutting in Armenia, and emerging in response to extensive urban and rural tree felling by natives in the early 1990s, the Project aims to employ Armenians in the replanting of urban and rural sites throughout the country while renewing hope in disillusioned part of the world.

Throughout this discussion, it must be remembered these are real themes involving real people, with real successes and real failures. Perhaps, from a Western vantage point, we can take for granted such values and concepts as hope, community development, environmental education, cooperation, trust, and social empowerment. However, in Armenia, prospects for reforestation are found in the ability of an organization to acquire funds, bypass rampant corruption, reinstate hope to a disillusioned populace, and yield fruitful results. In other words, in Armenia, these terms carry meaning, and they have absolute and unmistakable impacts.

⁷ Odihi, 250

⁸ Due to the constraints of this paper, I did not explore the cultural context. However, I have found that the effects of culture, in Armenia’s case, are less central to deforestation than the other two.

The environmental condition of post-Soviet Armenia and the sources of years of deforestation and deepening poverty are complex. By no means can I address each in as much detail as I would like. Similarly, the solutions that ATP aims to implement are complex. As representatives of the NGO have explained to me, the challenge of reforestation is not simply more trees, because reforestation is a symbolic reference to deeper barriers to progress in a given society. It requires case sensitive, multilateral approaches. In addition, resources on this narrow and recent topic are limited. Nevertheless, I offer the broadest and most comprehensive analysis possible based on extant materials and new data generated by my own research.

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PART 1: INTIMACY BETWEEN THE POOR AND THE LAND

-Resource Dependency-

The effects of deforestation are not separate from the economic poverty of a nation or from the poverty of those who live there. In 2003, the Armenian Ministry of Nature Protection declared, “human uses of forests [had] resulted in profound structural changes in the natural reproductive ability of woods, [had] lowered fertility, activated erosion, and [had] breached the hydrological regime of forests.”⁹ When one considers that the people who populate these regions in developing countries tend to be marginalized groups of society with minimal security, a picture of desperation emerges. The regions suffering the greatest degradation in Armenia were the regions Lori, Tavush, Syunik and Gegharkunik.¹⁰ The impacts on humans in the cities and villages of these regions are accelerating in the form of severe erosion¹¹ and mudslides that are wiping out or damaging homes, other buildings, agricultural land, and people in some cases.¹²

Two of the world’s most persistent and unresolved phenomena are those of deforestation and human poverty. Increasingly, the former dichotomies that divided the two are fading; deforestation has been thought of as having a benefactor, either the cultivators of the converted forests into agricultural land, the loggers, or the people who benefited from forest byproducts. This view, which does not incorporate the significance of human poverty, is changing. It is gradually replaced with the reality that deforestation has inherent problems because of its devastating impacts on the poor¹³ and their reliance on forest resources. Variety and methods of deforestation aside,

⁹RA (2003), 68.

¹⁰ RA (2003), 68.

¹¹ Severe to moderate soil erosion affects two-thirds of the country; Moreno-Sanchez and Sayadyan, 11.

¹²RoA (2003), 69.

¹³Sunderlin et al., 2.

"the central theme everywhere in developing countries experiencing high rates of forest loss is the poverty of, and lack of options for, the people who live in and near forests or who migrate to them in search of a better life."¹⁴ Let us consider the reasons for this fatal intimacy.

More than any other ecosystem, forests provide humans with the greatest stock of natural resources and it is the poor who depend on the abundance and reliability of these resources more than any other class of people. Throughout the world, forest resources compensate for the absence of material wealth; it follows that the world's poorest in income are disproportionately located in forest ecosystems where they benefit in varying degrees from food, fuel and shelter.¹⁵

It is relevant to consider what the reliance on natural resources means because the Western standpoint blurs the concepts of subsistence and resource dependency insofar as the differences between a choice and a condition are lost. For the rural poor, or for those who live on the outskirts of cities in developing countries, resource dependency refers to a state of living that may be defined solely as a lack of choice. The poor often reside within or near forests because subsistence, or the effort to support one's self, is best achieved in the most secure and productive ecosystems. The primary uses of forests by the poor throughout the world include firewood collection and forest byproducts such as foods and medicinal herbs for consumption or barter. In Armenia's case, the most significant use of forests by the poor is for non-timber forest products (NTFPs) such as edible plants and medicinal herbs. (See Appendix A)

¹⁴ Schmidt et al., 11.

¹⁵ Shelter does not only refer to a dwelling place. Shelter is often sought by the poor as a means of protection from conflict and/or the negative externalities of urbanization.

The concentration of the poor within or near forest ecosystems is underscored by the fact that the world's poor inhabit a disproportionate share of the most degraded and fragile ecosystems worldwide. That "severe rural poverty and remaining natural forests in developing countries tend to share overlapping space" is a phenomenon that has received "scant documentation," according to the Center for International Forestry Research (CIFOR).¹⁶ However, the statistics speak for themselves. The World Bank estimates that 240 million people live in forested areas, and they constitute 18.5% of the 1.3 billion who inhabit the world's most fragile ecosystems.¹⁷ Much of this inhabited land suffers from erosion, contamination, pollution, or the threat of natural disaster. Meanwhile, the rate of deforestation worldwide from 1979 to 1991 increased 80%.¹⁸ Increasingly, the reliance on these ecosystems to deliver adequate resources for community livelihoods grows. As increasing social inequality limits the opportunities for the poor residing in these areas, the number of suitable environments shrinks.

The ability of forests to regenerate and support organisms continuously through time is conditional on their viability. As land stabilizers, trees keep topsoil rich and situated; they shade groundcover and reduce disease; they maintain the hydrological regime of the land and moderate the climate. Lastly, they provide habitats for wild animals. The disruption of any one of these services sets off the rest, for they operate cyclically. For the poor, a disruption of these services breaches the security of daily life. For instance, the loss of habitats for wild animals affects hunters who enter forests to acquire food. It also affects villagers who count on the fact that wild animals live outside of human settlements. However, for the first time, Armenian villages are experiencing the loss of valued livestock to wolves,

¹⁶ Sunderlin et al., 3

¹⁷ Sunderlin, et al., 3.

¹⁸Gillis.

which emerge from thinning forests to hunt in rural communities. A true comprehension of conflicts like this one, between nature and the poor, cannot take place without understanding Armenia's natural systems: its geography, land zones and species.

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-Armenia's Geography-

The land mass known as the South Caucasus rests between the Black and Caspian Seas, to the south of Russia.¹⁹ This region sits atop the Transcaucasian highlands, formed by the southeastward thrust of the Lesser Caucasus Mountains. Prior to the dissolution of the Soviet Union in 1991, the area was comprised of three Republics, currently the independent states of Georgia, Azerbaijan and Armenia. Located at the southernmost tip of the Southern Caucasus, Armenia is the smallest of the three and was the smallest republic within the Soviet Union as well. The geographic location of the Caucasus has rendered it an ethnic and biological corridor, having served for centuries as a crossroads between the cultures and species of Europe and Asia. The region also forms an ethnic bridge between the Slavic Christian world and the Islamic Middle East. Thus, the Southern Caucasus houses significant linguistic, cultural and religious diversity, as well as unique biological diversity.

Armenia is a landlocked and mountainous nation bordered by four others: Azerbaijan, Turkey, Iran and Georgia. At roughly 11, 506 sq mi, it is roughly the size of Belgium, and it stretches vertically such that its eastern and western borders are its largest. The entire eastern border divides Armenia from its Muslim neighbor Azerbaijan; the latter partitions

¹⁹The South Caucasus is also referred to as the Transcaucasus, and the terms will be used interchangeably throughout the paper. Some consider ‘Transcaucasus’ to be Russocentric since it refers to the land south of the Caucasus range, *i.e.*as seen from the vantage point of the Russians to the north and not the residents of the isthmus.

Armenia from the Caspian Sea. Turkey and Nakhichevan, an Azerbaijani enclave, buffer Armenian's western border. At its southernmost tip, Armenia shares a minuscule border (21.75 mi) with Iran. To the north, Armenia borders Georgia, its only Christian neighbor (both nations preserve some of the oldest Christian roots worldwide), but Iran is its only consistently reliable trade neighbor.

Geographically, Armenia is characterized by snow-capped peaks, extinct volcanoes, undulating plateaus, steep gorges and fast-flowing rivers. Situated atop the Armenian Plateau, Armenia is 80% mountainous. The altitudinal variations, which range between 375 m and 4,095 m (13,432 ft), have in turn created a rich and diverse, yet closely juxtaposed cluster of ecosystems with their respective climates and biota.²⁰ For the most part, though, Armenia is rocky and dry, forests are uncommon, and natural hazards include drought and seismic activity. The unheeded message of Armenia's geography is that this is land to be treaded upon lightly.

-Deforestation and Poverty-

Armenia's recent deforestation is not a unique case. It differs superficially from, say, Haiti's deforestation, or China's, but when the issue is viewed from the perspective of poverty, the similarities between the cases come forth. In any country, the poor suffer the greatest from deforestation and wield the least control over their circumstances. Aside from the superficial differences in deforestation, Armenia, Brazil, China, Eritrea, Haiti, Indonesia, and Mexico, all experience a symbiotic relationship between the poor and the forests. In biology, the term "symbiosis" connotes the dependency between two species, wherein one or both

²⁰ Armenia has a highland continental climate, meaning hot dry summers and frigid winters.

rely on the other's existence. These beneficial relationships take a few shapes. Mutual symbiosis is the variety in which both organisms benefit from the presence of the other. In contrast, parasitic symbiosis describes the case in which one organism suffers harm while the other benefits from its weakening. Amensalistic symbiosis is the relationship in which one organism suffers, while the other is unaffected.

The symbiosis that characterizes the human-environmental codependence is both beneficial and deleterious for both partners. For example, land, which people inhabit, will thrive so long as humans restrain their use of it. On the other hand, people rely on ecosystems for a continuous stock of resources. Once this relationship falls out of balance, a cycle begins and ensues, in which both parties suffer. As the cycle endures, the question of survival for both partners comes into question. First, that of the forests comes into question, and next, the survival of the people who directly benefit from them.

Author and geographer Jared Diamond illuminated this chain of events in his history (2005) of deforestation on Easter Island, wherein the island's isolation and natural fragility aggravated its deforestation.²¹ After people exploited the forests for domestic resources such as rope and canoes, the land was tree-less. Its geographic isolation prevented many from escaping this crisis, which led to the collapse of the island's Polynesian Kingdom. Easter Island's story is comparable to small developing countries with minimal bargaining power on today's globalized world grid. Often, they rely on their own resources to survive, and environmental cries such as those in Armenia ensue when these natural resources run out.

Armenia's network of swift mountain rivers, scarce forests, abundant rock, and dry arresting mountain winds warn of the consequences of erosion,

²¹ Diamond, 118.

mudslide, drought, and desertification. However, man has not treaded lightly on this land in the past century. He has encroached upon the forests, drained the lakebeds to the degree of climate change, poisoned the air and water, and carved hillsides.²² While a human-environmental chasm has opened in the last century, the gulf grows virtually unrestrained due to a number of local social, political, and economic factors, most notably poverty and a lack of access to resources. The following section discusses the poor state of Armenia's remaining forests.

-Armenian Land and Species-

Within this country of stones, as natives refer to it, the remaining forests are unevenly distributed and of poor productive quality. The current distribution of forests is 62% in the northeast in Lori and Tavush marzes,²³ and 36% in the southeast in Syunik marze.²⁴ Only two percent of forests are found in central Armenia.²⁵ The region around Lake Sevan in the central east, supporting a large impoverished refugee population, holds only 1.2% of the nation's forests.²⁶ The distribution is uneven due in part to the natural variation in climate and periodic droughts and partly to the poor management of forests in the past.²⁷ Both factors continue to breach the reproductive capacity of forests, which are shrinking annually. Currently, over 70% of Armenian forests are degraded,²⁸ and it is estimated that at current rates of

22 Feshbach and Friendly.

²³The term marze denotes the 11 administrative regions (districts) in Armenia. These marzes will be referred to by their names throughout the paper. (See Armenia Map)

24 Ghulijanyan.

25 Ghulijanyan.

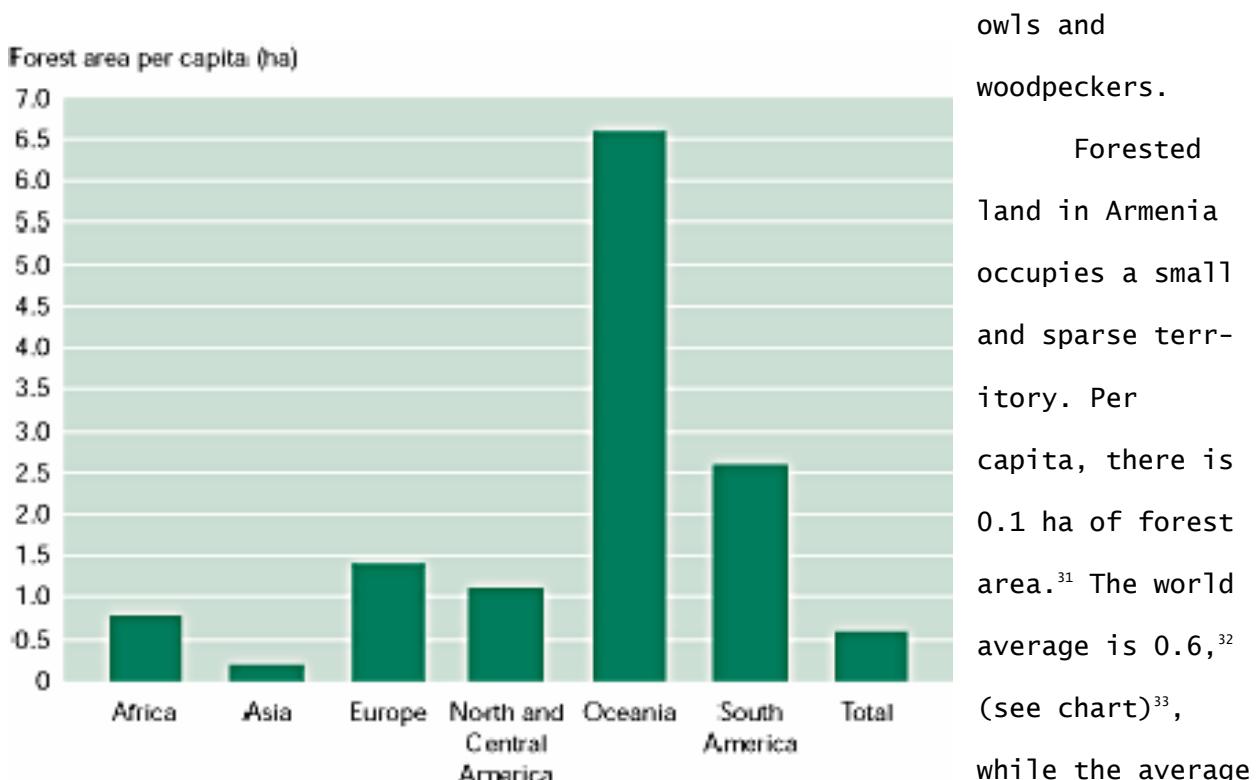
²⁶RA (2002), 42.

²⁷CENN.

²⁸RA (2003), 68.

reforestation, which are less than 500 ha per year, deforested areas will not recover for another 60 years.²⁹

97% of Armenia's forests are broad-leaved.³⁰ The forest species distribution is 1/3 oak, 1/3 beech and 1/3 hornbeam. There are also dry scrub forests in the north and south of the country. Together, the forests support 80 species of xeric trees and shrubs such as juniper, pistachio, Georgian maple, and almond. These forests also shelter shrubs such as buckthorn, cherry and jasmine. Forest fauna includes wolf, brown bear, red fox, red deer, roe deer, wild boar, European badger, stone marten, weasel, wildcat, lynx, moles, shrews, bats, and hedgehogs. Avifauna includes raptors, eagles,



for the Commonwealth of Independent States (CIS)³⁴ is 2.7 ha.³⁵ In addition to

²⁹ Nalbandyan.

³⁰ Nalbandyan

³¹ Nalbandyan

³² FAO (2001)

³³ FAO (2001)

³⁴ The Commonwealth of Independent States refers to the post-Soviet economic alliance between 12 of the 15

a small percentage of forested land mass, Armenian forest density is only in the 0.9-1.0 range, meaning only 0.9% of the forested area in the country is “very” dense.³⁶ In area, this amounts to a mere 300 ha. “High” density forests occupy 14.4% of the forest area, or 48.2 ths. ha (thousand hectares).³⁷ “Medium” density forests account for 62.6%, or 209.1 ths. ha., and “low” density forests, which do not include those that are unproductive, occupy 22% of forested land, which amounts to 73.8 ths. ha.³⁸ With such low density, it takes no stretch of the imagination to see how the major effect of deforestation has been the inability of forests to regenerate.³⁹

If much time elapses before cut forests rejuvenate, they lose this capacity, and this is the tragedy of deforestation. The thinning of forest cover invites unwanted sunlight, which raises the temperature of the forest and exposes the ground to increased heat. This interferes with the natural cycles between the soil, plants, and hydrological regime that normally function under cool and moist conditions. The removal of trees also deposits brush, which settles on the forest floor. As these branches and leaves decompose in the warmer temperatures, they generate niches conducive to the proliferation of pests and disease. Disease and pests have indeed become a serious problem in many of Armenia’s remaining forests.⁴⁰

Another consequence of deforestation affecting Armenia’s forests is the alteration in composition of tree species. High value species that are associated with economic and biological benefits were cut first. The Ministry of Nature Protection reports that forests of oak, beech, and ash are now being replaced by less efficient and less hardy species that are better

former Soviet republics not including Estonia, Latvia and Lithuania.

³⁵UNEP GRID/ARENDA, <http://enrin.grida.no/htmls/armenia/soe2000/eng/forest/fstate.htm>.

³⁶Ghulijanyan

³⁷Ghulijanyan

³⁸Ghulijanyan

³⁹Ghulijanyan

⁴⁰RA (2002), 43.

suited to the desert and semi-desert climates in which they find themselves, post-deforestation.⁴¹

Despite these misfortunes, Armenia's landscape, climate, and species diversity are high for the small confines of the country. This diversity results from the fact that 37% of the country is in the form of mountain steppes or large plateaus.⁴² Within its borders, Armenia contains nearly every type of vegetative ecosystem found in the Caucasus, though it makes up only 5% of the region.⁴³

In order of elevation, Armenia's six landscape zones are alpine and sub-alpine terrain, forests, steppe, semi-desert and desert. Alpine and sub-alpine meadows are found above 2,100 m and account for 28% of Armenia's land area.⁴⁴ This elevation is above the timberline, so human development is rare, but the land is nevertheless home to many robust species. Mountain steppes are located at 1,300-2,400 m and take up 37% of the land. While rich in vegetation, much of the steppe region is still too high for arboreal species. Forests, woodlands and shrubs are located between 600-2500m and comprise 20% of the country.⁴⁵ Finally, deserts and semi-deserts exist between 700-1,300 m and form 10% of the landscape.

Armenia's flora and fauna are distinct both for their diversity and for the threats they currently face. The non-profit organization Conservation International applies Hotspot science, which is a technique used to distinguish regions faced with immediate threats such as combined endemism, low land coverage, and a prior loss of over 70% of vegetation.⁴⁶ The organization counts 34 biodiversity hotspots in the world, one of which is

⁴¹RA, (2002), 43.

⁴²CI, p. II-II.

⁴³ CI, p. II-I.

⁴⁴ The numbers in this paragraph are derived from Chemonics International (CI), chapter 2.

⁴⁵ This does not mean that 20% of the country is forested. The category includes all woody-mass, which includes small trees and woody shrubs.

⁴⁶ Conservation International

the Caucasus region. The World Wildlife Fund labels the region's conservation status as Critical/Endangered.

Much of Armenia's biodiversity generates economic value. Species of economic importance are 40% of Armenia's woody plants, or non-timber forest products (NTFPs). These fruit and berry plants are critical sources of food and income for rural populations.⁴⁷ High-valued fruits include dog rose, pear, apple, Cornelian cherry, currant, dewberry, raspberry, gooseberry, hawthorn, walnut, beech, fig, pomegranate, blackthorn, cherry plum, hazel and sea-buckthorn plants.⁴⁸ Medicinal plants, which occupy large proportions of forests and alpine meadows, are sea-buckthorn, dog rose, hawthorn, lime, juniper, dewberry, and oak and barberry. The forests also contain edible plants such as gooseberry, currant, raspberry, dewberry, hawthorn, dock sorrel and asparagus. Currently, approximately half of Armenia's plant species risk extinction.⁴⁹ In part, this is due to rising forest pressures that resulted from the increase in rural poverty in the early 90s. Yet, it is this group, the poor, who have come to rely most on the well-being of these species. Conservation International notes that, "the conservation situation in the Caucasus region has deteriorated because of the social and economic crises that have plagued the region since 1992."⁵⁰ Let us now turn to these crises.

⁴⁷Nalbandyan.

⁴⁸ Nalbandyan.

⁴⁹ Karanian and Kurkjian, 81.

⁵⁰ Conservation International

PART 2: ECONOMIC DEVOLUTION: RISE IN POVERTY AND DEFORESTATION

What led to the poverty crisis that wiped out green spaces in Armenia's cities? What led to the poverty in rural regions where the only option was to chop trees? The catalysts to these present-day circumstances are largely recent events. The economic and political responses, from the 1988 Gyumri/Spitak earthquake, to the controversial reinstatement of electricity in 1995, resulted in a rapid and deep-cutting economic devolution throughout the country. It was during this time that the country "...experienced an energy crisis, which [was] directly associated with Armenia's deforested lands. In 1994, Armenians were joking that, 'the country is not only independent of Russia, it's also independent of gas, light, warm water, and heat.'⁵¹

-Soviet Industrialization, Trade, Economic Security-

Part of the disorder that took place in Armenia after the fall of the Soviet Union was not unique; it was characteristic of most of the former republics. Since the 1920s, these states, which accounted for one-sixth of the world's inhabited land, existed within the boldest experiment of the 20th century: a state-led economy. Stalin's reforms of the 1920s transformed the education, population, labor and trade patterns of each Soviet republic in order to fulfill predetermined economic positions in the USSR grid. Armenia was selected to be an industrial center, and by the mid-20th century, it was indeed thriving as one of the most industrialized republics. It continued thereafter to prosper. In 1989, it boasted the fourth largest per capita income of the Soviet Republics.⁵² This characterization however, was misleading. Numerous social and economic problems came to a head after the

⁵¹Isaryan. This was due to the war between Armenia, and neighboring Azerbaijan, over the disputed territory of Nagorno-Karabakh, and the imposition of an effective energy blockade by Azerbaijan and its ally Turkey.

⁵²Bejlock, l.

Soviet system collapsed, forcing the country into economic isolation and abject poverty.

Between the two World Wars, the economy experienced a massive transition from an agrarian society such that between 1929 and 1939, Armenia's industrial work force grew from 13% to 31% and in 1935, 62% of the country's production had become industrial.⁵³ It came to specialize in metal works, electronics, machinery, building materials and chemical production in fertilizers and petrochemicals (chemical production in Armenia is notorious for severely polluting air and water, but ironically, it was the most profitable output).⁵⁴ Armenia also exported raw industrial parts to other countries for finishing.⁵⁵

Prior to independence, 40% of the country's production was funneled into the Soviet defense complex.⁵⁶ When the Soviet defense budget declined as the state approached its demise, some industrial enterprises lost 60-80% of their business.⁵⁷ Thus, while the Soviet system sheltered its republics from the harshness of competitive markets, it also left them ill prepared to stand on their own two feet, economically speaking, because there was no substantial regional or international market for Armenia's industry once the Soviet complex was gone.

Even under Soviet rule, "the Armenian economy showed few signs of self-sufficiency" from 1930 until its independence in 1991.⁵⁸ Along with Estonia and Tajikistan, Armenia had one of the highest import rates of all 15 republics.⁵⁹ Its imports relied fully on a government-guaranteed system of connecting

⁵³Curtis, 42.

⁵⁴Curtis, 45.

⁵⁵Curtis, 57.

⁵⁶Curtis, 43.

⁵⁷Curtis, 43.

⁵⁸Curtis, 43.

⁵⁹Curtis, 57

trade routes and pipelines.⁶⁰ Following the collapse of this structure, from 1991 to 1993, Armenia's real output fell 60%.⁶¹

The socialist distribution of goods between republics through a closed trading network was critical for the delivery of fuel into Armenia. In order to bolster the massive industrialization earlier in the century, the Soviets established a reliable import system for fuel. Russian natural gas reserves, which entered the country via an Azerbaijani pipeline, met Armenia's primary energy needs. Having negligible deposits of oil, petroleum and gas of its own, these became crucial to Armenia's stability for much of the 20th century.⁶² Immediately after independence however, as a form of political pressure against Armenia, Azerbaijan denied access to this pipeline, which had been delivering 90% of the country's imports.⁶³

After the dissolution of the Soviet Union, individual states inherited the discretion to decide how they would engage in trade. Armenia was at a disadvantage in this sense. Its bargaining advantage was only as strong as its industrial or natural resources were of value.⁶⁴ Perhaps its greatest disadvantage, economically, was its "extreme paucity of energy sources,"⁶⁵ which had always been an issue, and limited its ability to achieve self-sufficiency in the post-Soviet climate.

Armenia did possess domestic and regional alternatives to the Russo-Azeri pipeline. Domestic sources included hydroelectric plants and thermal nuclear plants, but these ceased operation in the last years of the Soviet Union. As for imports, Armenia was surrounded by four countries, two of which

⁶⁰Curtis, 43

⁶¹ World Bank Country Brief 2004. www.worldbank.org.am

⁶²A country study in 1995 reported that oil deposits existed in Armenia, but they remained untapped due to complex geology and the costs of extraction. Also, significant deposits of coal had been located but their extraction would require massive deforestation. (Curtis, 44, 48).

⁶³Curtis, xxix.

⁶⁴Curtis, xxix.

⁶⁵Curtis, xxix.

(Turkey and Azerbaijan) allied and imposed the trade embargo in 1991.⁶⁶ Georgia, to the north, shared a pipeline and railway with Armenia, however, its own violent secessionist wars divided the country, and its pipelines, roads, and railways were routinely sabotaged or shut down. In the winter of 1993, when Armenian fuel imports were of dire significance, the pipeline blew up seven times.⁶⁷ Armenia's final neighbor Iran was the only reliable partner in the early 90s despite being Islamic. It continued to deliver fuel to Armenia via truck during these years.

-War: Environmental Side-Effects-

The environmental composition in Armenia would be very different today had there been no war was with Azerbaijan. Throughout the world, it is well documented that the bloodiest conflicts are often fought in the poorest countries. During war, natural habitats and natural resources decline in value. Deforestation especially, has become an indicator of violence.⁶⁸ Of 30 countries that have lost over 90% of their forest cover, 14 have been third world countries and 12 have recently suffered violent disorder.⁶⁹ The breakdown of the social and political framework during conflict facilitates the destruction of the environment. Conflict obscures the priorities of social welfare and economic security by diverting resources such as labor, industrial inputs, and government spending toward military needs.⁷⁰ As social provisions decline, the poorer class is pushed beyond its usual form of subsistence and this means further encroachment upon and reliance on natural resources.

⁶⁶Turkey had distanced itself from Armenia during the war and officially closed its borders in 1993 (de Waal, 205).

67 Isaryan

Isaryan
68 Schmidt et al., xiii.

Schmidt et al., XIII.

Schmidt et al., XIII

In the Soviet aftermath, the three newly independent states of the South Caucasus were engaged in armed conflicts, three secessionist wars in Georgia alone and war between Armenia and Azerbaijan over the region of Nagorno-Karabakh. The South Caucasus formed one of the most unstable post-Soviet regions to such a degree that it is characterized as the Yugoslavia of the former Soviet Union.⁷¹ These ethnic and territorial wars have resulted in the 1.1 million refugees and internally displaced people who live in the region today. They have also lain to waste the human and natural resources of the region.⁷² One major environmental consequence was the deforestation, compounded by the pressures of a massive migratory group.⁷³

The Armenian-Azerbaijani war erupted in 1988 and continued until a cease-fire in 1994. Since then, peace negotiations have been futile, but the dispute has nevertheless created international implications as allies, enemies and interested parties (*e.g.* Exxon/Mobil) are forged. Meanwhile, the ordinary citizens of each country are suffering the effects of economic drain, government neglect, corruption, and the effects of a highly politicized and nationalistic front between Azerbaijan and Armenia. Since the cease-fire, the border between the two countries has become a 200-mile no-man's land. As the journalist Thomas de Waal pointed out during his visit there in 2001, "no border is more closed than this one."⁷⁴

Six years of combat over the ethnically Armenian enclave located within Azerbaijan's borders resulted in thousands of deaths (6,000 Armenians and 11,000 Azerbaijanis), many more wounded (50,000), and expelled ethnic

⁷¹Batalden, 91.

⁷²OXFAM.

⁷³ I have not been able to find information on the effects of war on Azerbaijan's forests. Azerbaijan absorbed a much larger migratory class than Armenia, but it did not face an energy crisis since it is the 32nd largest oil producer in the world, according to the CIA World Factbook.

⁷⁴De Waal, 1.

refugees on both sides numbering 353,000 and 750,000, respectively.⁷⁵ The war diverted national resources, including male labor,⁷⁶ from the rebuilding of each society, and most of all for this discussion, it resulted in the energy blockade. Each of these continues to enable desertification. The number of single-mother households, which constitute one of the most vulnerable groups in Armenia, burgeoned in the aftermath of the war and the subsequent drop in socio-economic conditions. As of 2002, estimates counted 55,000 single women raising 64 thousand children. Excluding divorcees and single mothers, 45% of the households had lost their male breadwinners.⁷⁷ The causes for many of these are the war's death toll and the inability to support a family, which have caused many to emigrate in order to send money back to their families.

-Energy Blockade: Challenge to Self-Sufficiency-

As a fuel importer, Armenia was not equipped for the trade embargo gradually imposed by Azerbaijan and Turkey beginning in 1988. Although its sole reliance was not on imported fuel, Armenia's domestic sources were terminated in the 1980s due to the hazards they posed. In 1976 and 1980, the Soviets built Armenia's two VVER-440 nuclear reactors, collectively known as the Metzamor plant. The plant formerly supplied 36% of Armenia's energy. In 1989, the plant shut down following the 1988 earthquake, which had awakened the public to the threat of seismic activity near the plant. However, it reopened in 1995 amidst regional and international protest. International criticism surrounds the plant for its failure to meet Western safety

⁷⁵ These are the numbers of statistician Arif Yunusov, who's numbers are often cited as a non-partisan source. Cited in De Waal, 285.

⁷⁶ Daniszewski. The current female to male ratio is estimated at 57 to 43.

⁷⁷ RA (2002)B, 46.

standards. However, as of 2005, Armenia had been cooperating with the International Atomic Energy Agency (IAEA) in regular inspections, which had not yet resulted in significant violations.⁷⁸

The Soviets also built hydroelectric power plants, which constitute Armenia's second significant domestic energy source. Several hydroelectric stations were built along the Hrazdan River, which flows out of Lake Sevan. Electricity generation during Armenia's heavy industrialization required that this 500 square mile lake be virtually drained.⁷⁹ Between 1940 and 1978, the level of the lake plummeted fifty feet, and in 1979 scientists warned that it was on the verge of becoming a marshland.⁸⁰ Soon after, the Soviets decided to halt the drainage, which they considered a threat to the country's drinking water and irrigation. Aside from nuclear and hydroelectric power, Armenia was virtually dependant on imported fuel.⁸¹ The extent of this dependency would reveal itself in the aftermath of the initial imposition of the blockade.

Azerbaijan and Turkey's economic blockade of Armenia was a political as well as a symbolic move, and the countries did not waver in their decision. Prior to the blockade, Armenia received 70% of its wheat from Russia via Azerbaijan. Immediately after the blockade, food imports such as sugar and wheat halted.⁸² During this period, while schools, shops and government buildings shut down, urban residents formed early ques to receive foreign aid that was delivered in the form of bread and kerosene. During this period,

⁷⁸Danielyan

⁷⁹There are six hydroelectric plants in the Sevan-Hrazdan system. Armenia sold these to Russia's, United Energy System (UES), to help pay off its debt. They value \$25 million. (Alimov)

⁸⁰Bonner (1993).

⁸¹Batalden, 103.

⁸²Bonner (1994).

Turkey rerouted these relief agencies around its borders in order to increase pressure on Armenia.⁸³

Shortly after the complete blockade of energy imports through Azerbaijan, during the winters of 1991-1994, Armenia was thrust into “pre-modern living conditions” in which residents came to rely on well water, candlelight, and chopped wood.⁸⁴ Throughout the following winters, thousands died from cold or starvation.⁸⁵ It was during this period that Armenian residents cut parks, forests, and hillsides surrounding villages, on a massive scale to burn for heat and cooking.

The Armenian Energy Crisis refers to the period, from 1991-1994, when the country was nearly devoid of fuel. I was seven or so at the time and I remember the sole bumper sticker that peeled from the back window of our pick-up truck in Massachusetts: “No heat, No water, No light. Help Stop the Energy Blockade in Armenia.” Although I was born and raised in the U.S. and little was even spoken about the actual blockade, I remembered the sticker over a decade later when I traveled to Armenia in 2004. There, few missed the opportunity to recount the hardships of those years, although it appeared painful. It was difficult for me to elicit details. During this period, I awoke to the environmental destruction that accompanied those years. Lack of fuel led people to burn everything they could find, ranging from trees, to books, to doors and furniture. Reports indicate that in some cities today, concrete benches are still without their wooden seats and in the rural areas, forests are still completely devastated.⁸⁶

During those years, Armenia was not completely without fuel because it received international aid (kerosene) and imports from Iran. However,

⁸³ Bonner (1994).

⁸⁴ De Waal, 205.

⁸⁵ Bonner (1993).

⁸⁶ Kaeter, 47.

rationing fuel, which occurred mainly in urban regions, was unreliable and susceptible to corruption. Yerevan rationed fuel for a couple hours each day to its residents, but each month, city blocks would compete to receive an additional few hours of energy per day from an “energy mafia” that had developed out of ties between city energy officials and their friends. The ability of a block to garner enough money bought certain regions (*i.e.* those blessed with successful businessmen or government officials) extra energy.⁸⁷

The effects of the energy blockade were particularly difficult in rural areas in the north of the country, which were contending with the aftershock of the earthquake as well as pressures from war refugees. In 1994, some 300,000 people in northern Armenia were still living in temporary housing since over half the housing that was destroyed by the 1988 earthquake, which had killed 24,917 people,⁸⁸ remained in ruins.⁸⁹ In these regions, wood was the most reliable source of fuel.⁹⁰ Even though rural dependency on fuel wood has decreased since the reinstatement of fuel in 1995, rural poverty continues to necessitate wood fuel and promotes the spread environmental degradation.⁹¹

- The Rural Poor-

Rural villages in Armenia are only a sample of the world's 2.5 billion people who inhabit rural areas of developing countries. They are but a fraction of the half billion who live in poverty compounded by environmental degradation. As part of this group, they experience the same cyclical conundrum, in which the natural environments that support them, shape and

87 Isaryan.

⁸⁸ De Waal, 64.

89 Isaryan.

90 Isarvan.

⁹¹ Moreno-Sanchez and Sayadyan, 123.

oftentimes serve to deepen their poverty by increasing their insecurity. By illustrating the circumstances of daily rural life in some of Armenia's poorest villages, this section seeks to identify the causes and extent of the rural dependency on fuel wood and illuminate the subsurface relation between the poor and their environs.

Before advancing to actual rural sites in Armenia, it is important to recognize that while the rural struggle is the same, rural poverty in Armenia differs from that of many other developing countries. First, one will not find the population problem, as perceived by the West, within Armenia; the reverse is true. Second, the majority of the poor are not pastoral, but because many of these villages are not part of the formal cash economy, the structure of daily life nevertheless, is the struggle to subsist. Prior to 1991, this picture was quite different; the need for non-agricultural activity to accompany a meager form of economic security was non-existent.

Prior to the transition to capitalism, rural villages were incorporated into state farms, which in Armenia, supported the Soviet agroindustrial complex. By the 1940s, the process known as collectivization had placed nearly all Soviet farms under state ownership. Peasants continued to operate these and received either wages or a portion of their production. This arrangement reflected the ideological motives of Stalin that aimed to free peasants from the oppression of landlords, but the economic motives of collectivization were drastic increases in production. Between 1920 and 1960, extensive irrigation canal works, electricity, and machinery had industrialized rural farms. During this period, arable land in Armenia extended by 20%.⁹² Within these state-owned farms, land and labor were subdivided to meet target outputs that were determined from Moscow by the

⁹²Curtis, 44

State Planning Committee (Gosplan). All produce was collected and distributed between and among Soviet Republics within in a closed economy. Thus, rural dwellers were laborers under the state. They sold their produce to the state, which provided their major source of income.

The Soviet arrangement of state farms enabled what is unheard of in most developing capitalist countries; villagers could live in isolated areas without suffering the types of neglect and desperation that are associated with rural isolation. One difference between the Soviet period and now is that then, the government guaranteed villagers employment. If there was no local availability, the Soviets subsidized transportation between villages and to and from cities. Often, people worked in the nearest agroindustrial complexes such as food processing plants rather than on farms. Second, under a subsidized education system, both males and females had guaranteed access up until the university level so nearly all rural people were highly educated. Local schools, libraries, shops and medical centers lessened the hardships of isolation. Lastly, villages and rural areas received gas and electricity.

Collectivized farms and interstate trading dissipated in 1991 with the collapse of the Soviet Union. During this period, the orientation of farms shifted from markets to subsistence. This marked a profound transition in agricultural production. Since the ‘market’⁹³ for agricultural products was gone, and the state no longer guaranteed rural provisions, farm production shifted toward subsistence production to compensate for the loss of state subsidies.⁹⁴ While there was no need for villages to engage in non-farm activities to generate income during the Soviet era, today, the purpose of farming is either for household consumption or for bartering. These

⁹³I put market in quotations because the market for agriculture was not a market in the capitalist sense. Nevertheless, there was a demand for the products.

⁹⁴Janowski, 7.

activities often fail to meet household needs. Thus, the loss of the agricultural ‘market’ was the initial impetus for much of the village poverty encountered today.

Prior to the problems associated with the shift from market-based to subsistence agriculture, another shift had taken place in the village populations of Armenia, adding stresses to new rural struggles and to the land. Immediately following the Soviet collapse, there was an initial surge in agricultural production. The loss of nearly all state employment had resulted in a contraction of industry. Across cities, people were suddenly unemployed and insecure. Many returned to those villages from which they or their parents had migrated during urbanization in earlier decades. In Armenia, for example, 492,400 jobs in industry were lost and 282,900 people joined the agricultural work force, representing a 99.7% increase in the agricultural work force and a 63.7% drop in the industrial work force.⁹⁵

Meanwhile, Armenia established land privatization laws shifting farmland to private ownership faster than in any other republic.⁹⁶ Within a year, private farmers had acquired 63% of cultivated fields, 80% of orchards and 91% of vineyards from state ownership;⁹⁷ agricultural output increased by 15% in the one year between 1990 and 1991. However, these successes reversed themselves in the coming years. The underside of higher agricultural productivity of the early 1990s was that by the mid-90s, as Soviet infrastructure degraded and the war escalated, many of these villages experienced economic and social isolation from one another. This led to the contemporary problems of mass unemployment and the reliance on non-farm activities.

⁹⁵Janowski, 8.

⁹⁶Curtis, 44.

⁹⁷Curtis, 44.

During this period, villages in the north of Armenia absorbed additional pressure from refugees fleeing war-torn border regions and the thousands of urban dwellers who were homeless after the 1988 earthquake. De Waal estimates that the Nagorno-Karabakh war resulted in 353,000 refugees fleeing Azerbaijan for Armenia and Russia and roughly 80,000 internally displaced Armenians who left their homes on the Azerbaijani border due mainly to artillery shelling and land mines.⁹⁸ De Waal describes the unique refugee crisis of this war:

Wholesale expulsion of civilians was the most terrible feature of the Armenian-Azerbaijani war...The conflict saw fewer casualties than other comparable wars, such as Bosnia or Chechnya, with perhaps twenty thousand dead on both sides. But the refugee crisis it created, with hundreds of thousands of people displaced, was one of the most terrible in the world.⁹⁹

The majority of refugees, both from the earthquake and from the war, were urban people. Having few resources, they settled in villages and currently constitute some of the most vulnerable groups in Armenia. Those arriving from Azerbaijan faced a language barrier while those arriving from cities had difficulty adapting to agrarian life.

-Village Conditions, Economic Insecurity-

Conditions have deteriorated for the rural poor since the early transition years and have increased their reliance on the vitality of their surrounding environments. Today, Armenian villages have come to experience the foe of rural poverty worldwide, that is, income insecurity. This is relevant for the topic of deforestation; minimal income diversity prevents the poor from mitigating their circumstances. Small increments of cash can

⁹⁸ de Waal, 285.

99de Waal, 194.

significantly ‘buy’ change. For example, in the village of Aygut, where people still forage the surrounding forests for fuel wood, a gas pipeline enters the village and could supply the region with gas from Georgia. However, it remains unused as long as there are insufficient village funds to pay a 25% advance on the fuel supply. In many rural communities, the costs of connector pipes that run from the home to the community network are too expensive.¹⁰⁰ Thus, despite economic developments, the poor often remain chained to their circumstances.

Other than remittances (mostly sent from Russia) and social welfare checks, many poor villages in Armenia lack cash (see table).¹⁰¹ One prospect for income generation is the sale of agricultural produce, but this endeavor requires that farmers sell first to middlemen through a notoriously corrupt process in which the farmer is often cheated out of a profit. In a 2002 survey of villages in post-socialist Armenia, Georgia and Romania, the consistent finding in each was that, “the middlemen exploit the villagers;...in Armenia, they make more profit than the producers,” and according to villagers, a “trade mafia” prevents village goods from ever reaching urban markets. A farmer may otherwise decide to barter his goods locally, but this system is disadvantageous since it does not produce cash. Thus, despite the inequalities associated with middlemen, farmers still choose to sell some goods to them as a way of obtaining cash.¹⁰²

¹⁰⁰ World Bank (2004), 147.

¹⁰¹ Mirzakhanyan (UNDP 2005), 89.

¹⁰²Janowski, 8.

<i>Source of income</i>	<i>Very poor</i>	<i>Poor</i>	<i>Lower than average</i>	<i>Average</i>	<i>Higher than average and rich</i>
Wages	16.7	24.3	42.5	54.1	64.7
Agricultural self-employment	40.5	47.8	46.5	51.6	38.2
Non-agricultural self-employment	8.0	6.7	11.6	12.8	22.6
Old-age pension	66.1	62.6	54.4	46.6	38.9
Family benefit	32.5	28.9	17.3	9.9	5.7
Stipendium	1.1	1.2	1.8	2.1	3.0
Other state benefits and pensions	5.7	6.1	5.4	4.3	3.4
Assistance from persons inside Armenia	15.2	16	14.1	9.9	8
Assistance from persons outside Armenia	7.2	9.2	14.8	20.4	26.1
Loans/credits	26.7	29.9	25.8	19.8	13.3
Humanitarian assistance	10.3	7.9	4.8	4.8	1.1
Sales of property, land or valuables	8.0	8.2	6.4	3.9	4.5
Savings	0.9	1.6	4.1	4.6	7.3
Income from property and land rented out	1.1	0.7	1.4	1.3	3.0

Distribution of income sources by households with various levels of self-assessed living standards, %.

While agriculture is the source of income for 84% of rural populations in developing countries, most of these households rely on non-farm sources of income to survive.¹⁰³ As the table above shows, individuals rely on agricultural self-employment, remittances or state support, yet all of these are highly insecure. Pensions are the only consistent means of income, but they amount to roughly \$10 per month are known for their irregularity. Because of the fact that non-farm income “is very small-scale, does not involve cash, is not declared and may be illegal or semi-legal, it is difficult to record its significance quantitatively.” Nevertheless, this “pitifully small amount” is the backbone of contemporary village life.¹⁰⁴

In Gegharkunik marze, in the village of Zovaber, for example, villagers find themselves at an economic impasse. Most residents are former Soviet factory workers, middle class citizens who lived in villages, yet who worked nearby in local industrial centers. After state-owned enterprises closed,

¹⁰³ FAO (2006).

¹⁰⁴ Janowski, 12

these residents had little choice but to turn to subsistence production on their newly privatized plots. In this village however, the soil is infertile, primarily composed of clay and unsuitable for agriculture. As for livestock, the number of bulls has dwindled each year to the point where there are no new births. The prospect for traditional crafts presents itself; however, wages for work such as carpet weaving are below the requirement to ensure a daily bread supply.¹⁰⁵ This example encapsulates how the economic and political events, at the state level, have complicated life for rural populations, such that land is central to their survival, but also faced with degradation.

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-Highland Poverty-

Mountains add a dimension of complexity to the poor's reliance on natural resources, such as those provided by forests. Three quarters of the world's rural poor, including those in Armenia, are mountain dwellers.¹⁰⁶ Yet, increasingly, highland ecosystems are approaching their carrying capacities.¹⁰⁷ By definition, mountains are remote, inaccessible and often forgotten. The economic and social impacts for the marginalized populations therein are considerable and pertinent to the discussion of the rural poor and deforestation within Armenia.

	< 1,300 meters	1,301-1,700 meters	> 1,701
Poor	42.35 %	54.93%	57.99%
Extremely Poor	16.37%	24.86%	28.28%

Incidence of Rural Poverty in Armenia by Altitude

¹⁰⁵ Badeyan.

¹⁰⁶ Starr, 5.

¹⁰⁷ Samal et al., 157.

1998-99 (percentages)¹⁰⁸

The geographic isolation of mountains ensures the social and economic isolation of mountain dwellers. Technological developments elsewhere in a region reach mountains less often, and transportation and communication with urban centers is difficult because roads are often primeval and railways are unreliable or non-existent. When transportation infrastructure fails, repairs are more likely to go unattended by the government. The lack of transportation infrastructure contributes to the poverty of those areas by adding to their isolation. Frederick Starr, chairman of the Johns Hopkins University Central Asia-Caucasus Institute concludes, "Despite their isolation, or perhaps because of it, mountain peoples have been shortchanged in all the infrastructures needed to participate in the modern world."¹⁰⁹

Most of the infrastructure that is vital to rural mountain communities in Armenia is obsolete. Access to the capital city and other regional centers via national highways is crucial, yet the roads that connect villages to these main roads are in dire condition. The World Bank estimates that between 1994 and 2004, these secondary roads received almost no capital or investment and 61% of these were in "very poor" or "poor" condition. Only 11% were "good" condition.¹¹⁰ During winter, only 16% of these secondary roads are of use. Public transportation to the rural sector is also low. Less than 10% of these communities have access to a railway and much of this population lacks any, or must walk between 3 and 20 km to a station.¹¹¹ A similar picture exists for access to drinking water; 12% have no access to piped drinking water and over 50% have no home taps while the water quality is very poor.¹¹²

¹⁰⁸Kelly, 101.

¹⁰⁹Starr, 5.

¹¹⁰World Bank (2004), 30.

¹¹¹World Bank (2004), 33.

¹¹²World Bank (2004), 2.

Natural resources are particularly vulnerable in conjunction with the “slope, altitude, terrain conditions, [and] seasonal hazards... [all of which] make mountain areas inaccessible, manifesting in isolation, distance, poor communication and limited mobility with serious socio-economic dimensions.”¹¹³ Because steep slopes exacerbate the effects of environmental disruption, the productivity of agriculture declines with greater elevation. For those who depend, day-to-day, on cultivating land, extracting natural products from the land, grazing animals on the land, collecting fuel wood, or even acquiring water, the hazards associated with mountainous land pose threats to the subsistence of daily life. Threats such as landslides, mudslides, wind erosion, sedimentation, sludge buildup, and flooding highlight the risk associated with mountainous living. These impacts are increasing with the recent and continued deforestation on slopes, and they are causing shortfalls in irrigation and drinking water supplies as well as frequent flooding and salinization, all of which destabilize agrarian living.¹¹⁴

Rural mountain populations must be viewed as living with finite resources. Although forests can regenerate, technically classifying them as a renewable resource, their rapid, widespread or careless removal prevents regenerative processes. Thus, while the initial consequence is the severe shortage of fuel wood, the land inches closer to infertility in the meantime. This is the current state of many of Armenia’s forests, and the impact on rural Armenians is found in their newfound difficulties in obtaining forest resources such as fruit and medicinal herbs.¹¹⁵

¹¹³ Samal, 158.

¹¹⁴ IMF, 89.

¹¹⁵ IMF, 89.

As hardy forests recede from villages, households venture further in collection of firewood and non-timber forest products. This is unsustainable because the labor-intensive work required for collecting firewood is not always an option for vulnerable groups such as women and elderly men. These groups are increasingly foregoing the option of wood collection since they cannot withstand the additional physical exertion that is required. Instead, they are diverting much needed income toward purchasing expensive firewood¹¹⁶ or foregoing heat.¹¹⁷ This is associated with a higher risk of morbidity (see table).¹¹⁸ That the poor are going without fuel because they have cut their forests is indicative of the destructive relationship between poverty and the environment.

	Morbidity of household members, % of total										
	Yerevan	Aragatsotn	Kotayk	Gegharkunik	Tavush	Lori	Shirak	Ararat	Armavir	Syunik	Vayots Dzor
Households with no heating	49	71	46	53	70	59	52	55	35	35	54
All households	34	35	25	30	33	41	32	41	29	38	40

Morbidity of members of households without winter heating, %

Although mountains contribute significantly to rural poverty, in Armenia, during the early transition years, it was the urban populations, not the rural ones, which suffered a higher rate of impoverishment. According to 1989-99 data, urban Armenians were 35% more likely to become poor than rural populations and 76% more likely to experience severe poverty.¹¹⁹ The reason for this was that during the transition, land reform was rather egalitarian. Most

¹¹⁶ The cost of firewood is two times that of gas.

¹¹⁷ IMF, 89.

¹¹⁸ Mirzakhanyan (UNDP 2005), 99.

¹¹⁹ Kelly.

villagers were able to secure plots of land that guaranteed (in the short term at least) a supply of food and income and decreased the reliance on wages. In Armenia's cities, people had no such 'coping mechanism' during the aftershock of the collapse of the Soviet labor market. Nevertheless, fuel has been reinstated to most of Armenia's cities since the energy crisis of the early 1990s, but many poor villages continue their reliance on forests for fuel due to their lack of income and geographic isolation.¹²⁰

-Case Study: Peru-

The percentage of very poor in Armenia has decreased in recent years (primarily due to international aid that targets the poorest sector), but the size of the poor class has not wavered from its wartime numbers.¹²¹ Meanwhile, energy has returned to Armenia's cities, but the conditions of many villages remain unchanged from the early 1990s. The threat to Armenia's forests persists so long as poverty trends continue. A case study carried out in mountainous, agrarian villages in the Peruvian Altiplano concluded that income poverty was the strongest predictor of deforestation.¹²² While it is no revelation that the poor cut trees for fuel, it is telling that with other social and economic variables controlled, income poverty still comes out on top as the catalyst to deforestation.

The Peruvian case study, published in 2003 in *World Development*, analyzed 1999 farm survey data. Through the analysis of a regional natural resource base, and its relation to the farmers in the region, the authors aimed to discover whether poverty (defined as a lack of human, social and

¹²⁰ Mirzakhanyan (UNDP 2005), 98.

¹²¹ RA (2002), 14.

KRI (2002), 14.

asset capital), determined the farmers' choice to employ certain agricultural practices that deplete land resources. These practices, which are commonly associated with high rates of rural poverty and land degradation, are soil erosion, soil fertility decline, overgrazing, and deforestation. Results of the study concluded that the lack of capital, within farming households, consistently resulted in the practice of tree cutting.¹²³

In the first case of land degradation, soil erosion and nutrient loss, it was found that the use of fallow and or vertical furrows lessened the impact on soil fertility. Next, the authors found that the use of rotational grazing greatly reduced the impacts of overgrazing. Fallowing is an agricultural practice that reduces soil erosion and fertility loss, but it requires additional labor. Rotational grazing and tillage require land. Thus, it is possible to decrease each form of environmental degradation, irrespective of wealth or investment capital; the primary constraints to these practices are labor and land access, not investment capital. In the fourth case, that of deforestation, the lack of various types of capital, such as land ownership, access to credit and access to roads *was* the determinant of the rate and extent of deforestation.

In the impoverished region in the study, the lack of fuel was the impetus for tree cutting. Those households that owned the least land, had the least access to credit and community lands, and minimal access to roads, were the households most likely to cut the native trees and bushes. The authors point to the opportunity cost of not cutting, which is the financial cost of purchasing alternative fuels.¹²⁴ Thus, tree cutting is the consequence of income poverty. The conclusion here is that even incremental improvements in

¹²³Swinton and Quiroz, 1917.

¹²⁴Swinton and Quiroz, 1917.

access to cash and credit can reverse the necessity by the poor to forego fuel options and cut their territory.

-Case Study: India Himalaya Region-

In similar regions of the world, where rural livelihoods have depended on forests for decades, a vicious cycle between man and land has surfaced. In the case of the Indian Himalayan Region (IHR), in which rural households heavily depend on local forests for fuel wood, a cautionary tale emerges for Armenia concerning the longevity of poor populations and forests.

The mountainous region of the Central Himalayas in India is plagued with poverty and an extreme scarcity of fuel. Similar to Armenia, altitudinal variations between 200 m and 8,000 m create five distinct physiographic regions that have distinct climates and biota. Here, people live at altitudes up to 3,500 meters where winters are at their worst. There is a current dilemma between the region's deepening poverty, population growth and isolation on the one hand, and mounting pressures on the forests, grasslands and water sources on the other. There is a need for more arable land yet the consequences of clearing forests to meet this need are too great, and technological innovation is absent or not feasible because of the lay of the land.¹²⁵ Population has increased in the decade prior to 1991 at 25.5%, but food production has grown at a slower rate of 12.1%. Overall food production has been steadily declining; from 1990 to 1991 alone, it fell from 1,506,897 tons to 1,486,943 tons.¹²⁶

There is a pressing need for more agricultural land. This could be achieved by entering the forest periphery, yet a greater loss in forests would in turn endanger the fragile agricultural economy. Samal et al

¹²⁵Samal et al., 162.

¹²⁶Samal et al., 162.

summarize these effects.¹²⁷ Uncultivated lands such as forests are a variable in the productivity of farms. The proximity of forests aids in depositing organic matter and nutrients to cultivated land. Biomass from forests serves as fodder to feed livestock and animal dung fertilizes cultivated land. Dry leaves from forests are used in animal pens and for compost. Moreover, by generating wood fuel, forests replace the reliance on dung for fuel, the use of which would directly affect the deposit of nutrients into agricultural land. In this sense, forests are agricultural support land. Thus, further encroachment upon the forest periphery would damage the agricultural economy.

Since the local reliance on natural resources is rising while quality land is receding, Samal et al argue that human poverty must be conceptualized in terms of ecological poverty. Similarly, in Armenian villages, barter systems and other subsistence activities support the local economies. These activities are not standard measures of income and consumption because they are not monetized and it makes little sense to use per capita income or GDP to measure the region's economic well-being.¹²⁸ In societies where people live on the periphery of the money economy, it is necessary to consider the broader causes and impacts of ecological poverty.



¹²⁷Samal et al., 162.

¹²⁸Samal et al., 152.

PART 3: IMPEDIMENTS TO CHANGE

-Illegal Logging, Lack of Funds-

The insolvency of the rural poor, at the micro-level, is one obstacle to rural reforestation, but the impediments to reforestation that exist at the state level are as acute and render both poverty alleviation and reforestation all the more difficult. As it stands, the war is in abeyance, fuel is reinstated, there is steady annual GDP growth and an influx of foreign investment and aid, yet deforestation is predicted to accelerate¹²⁹ primarily due to the persistence of illegal logging, an under funded forestry ministry, and a disillusioned populace. However, each of these problems is traced to society-wide corruption, a legacy of Soviet rule and contemporary desperation. This section reviews additional threats that are contributing to desertification, and it concludes with a discussion of corruption and the prospects, if any, for a change in current trends.¹³⁰

After the collapse of the Soviet Union, illegal and legal commercial logging gave rise to a newfound export industry. This is telling, since the country recently imported much of its wood. Between the 1960s and 1980s, 90% of the demand for forest products was met through Russian imports.¹³¹ These imports, in conjunction with forest plantations outside Yerevan, Vanadzor and Lake Sevan, enabled Armenian forests to recover from the cutting that took place during WWII industrialization. By the 1970s, forest cover in Armenia had increased

¹²⁹ Moreno-Sanchez and Sayadyan, 113.

¹³⁰ Each year, roughly 7,000 hectares are eliminated and .5 million cubic meters are burned. Only 10-12% of the cutting and burning is reported according to the government. RA (2002), 42.

¹³¹ Moreno-Sanchez and Sayadyan, 123. These Russian timber imports fell to about 0% in the decade after the collapse of the Soviet Union. It was then that illegal logging grew in order to feed Armenia's forest industry.

by 1.88%,¹³² and by the 1980s, forest cover was the highest it had been during the Soviet era at 11.2%. According to the most conservative figures, the national forest cover has decreased to 7-8% today.¹³³ Given these numbers it is alarming that raw timber of prized species such as oak, beech, and walnut are exported to France, Germany, Iran, Russia, Spain, Turkey, and the U.A.E. for furniture construction, brandy and wine barrels, and the interiors of luxury cars.¹³⁴ Illegal woodcuts also sell domestically as expensive fuel wood.

Poor forest management is partly to blame for the high rate of illegal timber extraction, yet it is unclear whether this insufficiency is caused solely by a lack of funding, or because of government-level corruption. Soviet expenditures covered 97-98% of the cost of proper forest oversight. Today, the state lacks sufficient funds, and it meets only 25-30% of the required costs. Environmental taxes and the sale of secondary forest products generate additional funding.¹³⁵ Environmental groups argue that the failure of forest protection is rooted in collusion between the Armenian government and the business sector. There is truth to each of these, but whereas employees of the National Forestry Ministry accept bribes, they may have few options since their wages are so low, yet, it is the insufficiency of state funding that creates this problem in the first place.

There is good reason to believe that state corruption plays a heavy role in illegal cutting. The Investigative Journalists of Armenia (HETQ) have exposed the collusion of the logging lobby and the government. The state is often pressured by loggers to breach Armenian

¹³² Moreno-Sanchez and Sayadyan, 121.

¹³³ Moreno-Sanchez and Sayadyan, 123.

¹³⁴ Bagdasaryan, (2005).

¹³⁵ RA (2003), 69.

forestry codes and there is incentive to cooperate with loggers because the lucrative industry enables the government to claim that it is achieving economic growth. For example, HETQ reports that timber sales alone had contributed about \$1.8 million to the state budget in 2002.

While it is important to distinguish the genuine causes of illegal logging, one must question whether this type of tree cutting is any worse or more reprehensible than residential cutting. On the one hand, the answer is yes because the profits generated by illegal timber sales do not trickle down to village residents. In other words, businessmen are able to pocket illegal profits at the expense of the population and the land on which they depend. Yet, if illegal logging is seen as a byproduct of economic hardship, there is little difference, except in scale, between the latter and residential cutting. One represents a country's survival mechanism, in the face of poverty, while the other represents the individual's strategy. I do not aim to excuse illegal logging, but the reality of the roots of this practice ought to be clarified in light of blind commentary such as the following, which is a UNDP premonition regarding poverty in Armenia. It warns, "in conditions of continuous forced poverty, motivations for economic activity will gradually fade away and poverty will become the usual way of life."¹³⁶ The statement implies that at a certain point, people will become so poor and so hopeless about being poor, that they will lose their motivation to engage in "economic activity".

This statement skirts the fact that illegal logging is an economic activity, and that there already is plenty of motivation for it. Incentive to engage in economic activity does not fade with a rise

¹³⁶ Mirzakhanyan (UNDP 2005), 15. I believe 'forced poverty' refers to the fact that poverty is new to people who were recently middle class citizens.

in poverty. Desperation and insecurity drive nearly all black markets and motivate people to engage in income generating activities. Statements such as these are discriminatory against poor nations because they categorize one type of economic activity as wholesome while denying the centrality of the other within developing countries. Forms of economic activity such as illegal logging exist because they are byproducts of economic struggle, not an adopted “way of life”. Moreover, the suggestion that poverty is a “way of life”, as if it were a chosen path, such as religion, is odd and inappropriate. Poverty, for those whom it affects, is not a gradual or comfortable process. Once individuals are poor, life becomes the daily struggle to resist the effects of poverty with any means possible. For some, it means drug trafficking, sex trafficking, prostitution, etc. For others, it means cutting the nation’s backyard forests.

Logging aside, the efforts to reforest are hampered by a lack of inputs required for the large-scale rehabilitation of forests. These are tangible inputs, which the Diaspora or development organizations could supply, yet it is likely that these are not strictly monetary problems; they can be traced to corruption as well. First, there is a severe shortage of state nurseries. As of 2003, state forestry agencies possessed 300 ha of nurseries, yet only 192 ha of these were irrigable. Many nurseries are defunct, and those that are currently utilized are estimated by the Ministry of Nature Protection to operate at 15-20% of their capacity.¹³⁷ Species diversity within these nurseries has dwindled. Nurseries are producing only between 10 and 15 varieties, compared with 60 species of trees and shrubs in the past.¹³⁸ It is estimated that a

¹³⁷RA (2003), 69.

¹³⁸RA (2003), 69.

healthy reforestation rate in Armenia is accustomed 40-50 million nursed plants per year, which cover 6-7 thousand ha per annum.

-Corruption and Social Disillusionment-

The impediments to reforestation are tied to a deeper paralysis within this transitioning country. Corruption constrains the development of the Armenian economy, and society as a whole, by invalidating the legitimacy of legal institutions and causing mass disillusionment and pessimism regarding the future.¹³⁹ The latter effect must be underscored. The absence of hope can cripple development agendas, yet its absence throughout nearly all post-Soviet countries has challenged each of their transitions. This has resulted in cleavages between the government, as law enforcer, and society, as law-abider. Thus, the reciprocity, or the give and take relationship that is required for social order and stability, is lost. In Armenia, corruption has trumped the effectiveness, appeal, and legitimacy of law and order. Meanwhile the cycle is exacerbated by the deep pessimism, cynicism and tolerance for corruption that are prevalent throughout all levels of the government, business and social dynamic.

Armenia is encountering a somewhat subtle though major developmental challenge, which the advent of written laws and the formation of new ministries will and cannot bypass. With regard to the environmental sector, and deforestation in particular, law enforcement could potentially relieve the massive threat from illegal logging. As it stands, environmental laws exist, but the legal framework and institutional capacity for their enforcement does not, or it is

¹³⁹ USAID, 6.

illegitimate.¹⁴⁰ Andre Mitchell, a British forestry consultant who contributed to a recent World Bank report on Armenia, notes that legal penalties for logging are of little consequence since current illegal logging restrictions are not lucid and do not even specify what constitutes illegal logging. ¹⁴¹

The illegitimacy of law in Armenia, while comprehensible, is complex and felt throughout society, and it is compounded by extensive disillusionment. For example, 97.5% of governmental and non-governmental parties concur that the Armenian court system is unfair and/or unpredictable.¹⁴² Attitudes toward social change are cynical while those toward the legal system are skeptical. These attitudes have historic roots that date back to centuries of near-constant conquest and foreign rule. This history has resulted in psychological damage to national identity and insufficient practice in the development and application of its own form of legal structure. The following section will pertain to Armenia's recent history in discussing the origins of these attitudes.

Widespread disillusionment formed more recently out of the transition years, the harshness of which has forced many to resort to doing-what-it-takes tactics to survive. Whereas Armenia has laws and it has very powerful social norms and values, it suffers the hardships of a land plagued with high unemployment, high inequality, and weak economic and governmental foundations. In essence, cash rules. The prevalence of this phenomenon, throughout all levels of society, has established its legitimacy. Part and parcel to this phenomenon is

¹⁴⁰ Greenspan Bell, 10771.

¹⁴¹ Stambolsian

¹⁴² Beilock, 15.

disillusionment, especially among the poor, toward the likelihood of change.

Despite the independence from 70 years of Soviet rule that accompanied the collapse of the USSR, the newly independent states of the Caucasus and Central Asia experienced a breakdown in social morale. The end to a centralized political structure (Moscow) in 1991 would test the self-sufficiency of the emerging states. The Western world watched to see what would become of these states now that their ‘dictatorships’ had finally eroded.¹⁴³ The governments that emerged in the wake of the Soviet collapse lacked the ideological and organizational strength of the Communist party and failed to usher in sweeping democratic or market-based change. However, unlike many other Soviet republics, in which officials were indiscreetly elected, the first post-Soviet Armenian leaders were heroes in the eyes of most Armenians for their leadership role in earthquake relief and the territorial struggle with neighboring Azerbaijan; yet, they quickly saw the end of the Soviet system and privatization as an opportunity for personal enrichment. The high regard in which most Armenians held them quickly dissipated.

In 1998, the Armenian Embassy in Washington found that Armenia retained such Soviet traits as “the predominant use of cash in the economy, widespread bribery, and the absence of effective law enforcement mechanisms.”¹⁴⁴ Ruth Greenspan Bell of the non-profit organization, Resources for the Future, argues that this has translated into collusion between the government and the private sector, which affects all levels of formal transaction from national to local

¹⁴³ Fairbanks, 49.

¹⁴⁴ Greenspan Bell, 10772.

governing bodies. The result is an overpowered executive branch associated with the promotion of self-interest.¹⁴⁵ It is little surprise that against these odds, businesses are discouraged from investing in Armenia, while civil society has largely remained dormant.¹⁴⁶

While modern-day disillusionment in Armenia peaked at the culmination of events during the transition of the early nineties, it is partly rooted in the history of Armenia and its people. Of the Soviet republics, Armenia was the most ethnically homogenous, at 93.3%, in 1989.¹⁴⁷ Armenians hold high reverence for their religion, national language and culture, which they perceive as distinct and historically uncompromised, in an essentialist way, despite centuries of near-continuous foreign rule.¹⁴⁸ A beneficial outcome of this past is that it has engendered a loyal and cohesive Diaspora that contributes sizable investments and income in the homeland. Kirk Kirkorian is an Armenian American entrepreneur who at one time donated \$100 million to the improvement of Yerevan roads and other infrastructure.¹⁴⁹ Yet, in absolute terms, remittances form the largest Diaspora contribution to the Armenian economy, serving primarily to keep much of the population afloat.¹⁵⁰

The negative effect of Armenia's historical struggles can be seen in the internalized pessimism of many citizens toward the future of the nation. Centuries marked by few historical triumphs, foreign domination, genocide, war, a major earthquake, and the fear and uncertainty that resulted from the disorder following the collapse of a

¹⁴⁵ USAID, 3.

¹⁴⁶ USAID, 4.

¹⁴⁷ Curtis, 31. After 1989, the Armenian and Azeri minorities from each country were expelled back to their homelands, so the homogeneity is near 97% ethnic Armenian today.

¹⁴⁸ Curtis, 36-38.

¹⁴⁹ Libaridian, 258.

¹⁵⁰ The middle class is very small because of great income polarization. Libaridian, 259.

central government have colored attitudes toward the likelihood of improvement. For better or for worse, these events have strengthened the nationalism of the population while raising the general skepticism of the average Armenian toward authority, both domestic and international.

Disillusionment tends not to be an unfounded attitude in the Former Soviet Union (FSU). The consequences of unremitting setbacks are feelings of hopelessness and despair, and in Armenia, these setbacks have struck the poor the hardest. Attitudes among the poor, who are well over 50% of the population, are likely to be the least hopeful or trustful of their government or of international groups (see table). Because the past 15 years or so have delivered multiple blows to the livelihoods of the poor, today, the most impoverished groups in Armenia are the most pessimistic.

In case of economic difficulties or crisis situations, real economic assistance is usually received from (three responses ranked by importance are allowed)	average and higher than average	lower than average and poor	very poor	TOTAL
No one	36.8	34.6	40.2	35.8
Community authorities	2.0	3.1	4.9	2.8
Marz authorities	0.4	0.2	0.6	0.3
Central Government	0.4	0.7	2.0	0.7
Non-governmental organizations	1.0	0.4	0.0	0.6
The Church	0.2	0.5	0.9	0.4
International humanitarian organizations	0.4	0.9	1.1	0.7
Relatives	48.3	44.5	34.5	45.5
Friends/neighbors	7.8	10.8	9.8	9.5
Commercial organizations	2.1	3.6	4.6	3.0
Informal authorities of the district/community	0.1	0.2	0.0	0.1
Other	0.5	0.5	1.4	0.6

Source: NHDS, 2003.

Indicators characterizing population's trust in various public institutions
by social status of respondents (% in the number of highest ranking responses).¹⁵¹

¹⁵¹Mirzakhanyan (UNDP 2005), 73.

Each of the post-socialist transitioning countries experienced economic decline and the rapid onset of poverty. The UNDP describes the resultant poverty as ‘transformative.’ This distinguishes FSU poverty from other kinds.¹⁵² In the Soviet aftermath, the onset of widespread poverty was sudden. Resulting from the collapse of internal distribution mechanisms, the newly independent states faced challenges in compensating for the loss of economic structure. Poverty came suddenly to a population, in which starvation had been eradicated. Meanwhile, the economic transition proved to be slower than expected.

Shocks to an economic system are especially damaging, socially, given a populace with high expectations, and “one of these peoples are the Armenians, who [had] high consideration for their entrepreneurial capabilities and individuality.”¹⁵³ The Armenians expected that the transition to markets would enable the nation to prosper economically and socially,¹⁵⁴ yet it was not anticipated that this would take much time, and that poverty could not be counterbalanced by the skill and ingenuity of the citizens.

Transformative poverty, as it is called, is characterized by a sense of betrayal. Poverty affected nearly all Armenians in the early nineties, but these conditions were somewhat artificially created in the sense that “the poorer groups of the population [were] essentially formed by people who would otherwise form the middle class in developed countries.”¹⁵⁵ Although equally as unjust as poverty that has existed for generations, this type was characterized by distinct feelings of injustice and betrayal.

¹⁵² Mirzakhanyan ([UNDP 2005](#)), 15.

¹⁵³ Mirzakhanyan ([UNDP 2005](#)), 15.

¹⁵⁴ Mirzakhanyan ([UNDP 2005](#)), 15.

¹⁵⁵ Mirzakhanyan ([UNDP 2005](#)), 15.

Another source of Armenian frustration during the early transition was the end to an economy that necessitated the skills and work of its people. As demand for their labor dissipated, the population was left somewhat helpless, forced into finding a new life. In addition, the onset of poverty was an alien phenomenon. People were not accustomed to subsistence lifestyles, or to coping with poverty, so much of the shock of the new life was characterized by feelings of alienation and isolation.

In 2003, disillusionment was a central finding to a countrywide UN National Human Development Survey (NHDS) of Armenian demographics and poverty. Of the households which considered themselves poor or very poor, 39% were found to be optimistic about assistance, but 49.1% of the households admitted to a complete loss of will and faith in overcoming their poverty.¹⁵⁶ The data found that “pessimism and hopelessness with regard to success and the future in general [was] more underlined in this group.”¹⁵⁷ In addition to pessimism, there is a general feeling of uncertainty. 68% of the 6,000 participants in the NHDS survey did not have clear objectives and could not speculate as to how or whether their living situation would change in three years.¹⁵⁸

These numbers represent the actual and problematic emotions of a large population within Armenia. The following narrative, which is extracted from a 2003 *Los Angeles Times* article about Armenian emigration, illustrates the grave realities, which are not captured through vague phrases such as pessimism.

Masis Kocharian is a typical resident of this town, which is to say that he is tired, poor and yearning to be gone. He is so

¹⁵⁶ Mirzakhanyan (UNDP 2005), 77.

¹⁵⁷ Mirzakhanyan ([UNDP 2005](#)), 77.

¹⁵⁸ Mirzakhanyan (UNDP 2005), 78.

desperate to get away- like half of the town before him- that given the chance he will offer you his two-room apartment in a worker's dormitory and all the furnishings. All he asks for in return is bus fare to Russia and a few dollars to get settled there-maybe \$250 at most. 'And I promise,' he adds, 'you will never see me again.'...Standing in the square of this poverty-ridden factory town, where all nine plants have shut down, it's easy to see why [people leave]. Clothes are shabby. Cheeks are hollow. Belts are cinched tight. Desperation is written on almost every face. And almost every day, the buses leave for Russia and beyond, carrying a new cargo of emigrants.¹⁵⁹

Here, we see the centrality of uncertainty and the concomitant pessimism in daily life. That people perceive emigration as a common outlet is an indicator of future uncertainty. The willingness with which he and others would leave without turning back is testament to pessimism toward their circumstances.

For the most part, disillusionment in Armenia targets the government; many people blame the poverty crisis on the failures of governance and the prevalence of corruption.¹⁶⁰ The IMF perceives this mentality as a national and cultural construct, centered on national identity. According to its research, the new context in which Armenia finds itself is widely considered (by natives) to be rooted in "exploitation, the trampling of human dignity and values; a society for the rich and mired in social injustice."¹⁶¹ While the IMF warns that these are self-defeating generalizations made by the Armenian people,¹⁶² these feelings stem from day-to-day realities. Widespread corruption, for example, has led to a "lack of trust toward all levels of authority and their staffs, especially officials, alienation and voluntary

¹⁵⁹ Daniszewski.

¹⁶⁰ Mirzakhanyan (UNDP 2005), 68.

¹⁶¹ IMF, 88.

¹⁶² IMF, 88. In reference to Armenian society, the report states, "Kindness, fairness and flexibility are values that are in no demand whatsoever. Such a generalized perception of the new system reinforces the notion of the inevitability of poverty and the conviction that there is nothing to hope for."

isolation of people from political and public life.”¹⁶³ The implications of such attitudes are significant in the challenge of environmental protection, or any law for that matter.

-The Rule of Law and Social Accountability-

In the early 1990s, the newly independent states lacked the experience of establishing an executive regime of their own since they had formerly relied on central governance from Moscow. Establishing governance in a new setting requires trial and error, but the ultimate ingredient in a new executive framework is acceptance. A law is of little use if it is not recognized by anybody, including the enforcers of the law. For the most part, the newly independent republics were faced with the conundrum of how to proceed to establish the rule of law.

Professor of Law, Denis Galligan, perceives the challenge as one of establishing legitimacy; in other words, the rule of law must gain acceptance under the social norms of society before it can achieve authority over a populace. According to theorists, the rule of law is intricately related to social norms. The social space in which law operates is known as the "legal culture."¹⁶⁴ Trends of post-Soviet countries demonstrate that law does not mean the same thing as it does in the West, for example. Based on the social norms, law is perceived differently, (*i.e.* the concept of law, the concept of breaching the law, the idea of law enforcement), and therefore it has an entirely

¹⁶³ Mirzakhanyan (UNDP 2005), 68.

¹⁶⁴ Kurkchiyan, 25. Legal culture here is the embeddedness of law within a given social texture. Kurkchiyan argues that law will vary in form, substance, social functions, and impact, based on the social context in which it is created and exists.

different effect over its jurisdiction. Armenia experiences a seemingly contradictory combination of laws and values, where the former are constrained and delegitimized in the context of the latter, social norms.

In 1999, corruption in Armenia was very high, and it remains high by world standards.¹⁶⁵ Not only is the rule of law weak, but people do not respect its jurisdiction, and most simply do not believe in it. Kurkchiyan's case study of corruption in Armenia, the Ukraine and Russia finds that even today, "after a decade of transition the most distinctive feature of post-Soviet society has become its near-universal cynicism about law."¹⁶⁶ This is a complex matter. It does not suffice to argue that people are lawless and prefer to disobey laws. The state of distrust toward law is rooted in a cultural perception, or a "negative myth", which promotes a different concept of what law is and is not, and it is shaped by the social norms of a society. The negative myth that permeates many sectors of post-Soviet territory is that law is an illegitimate and insufficient means for the conduct of society.¹⁶⁷ Consequently, there is a lack of accountability¹⁶⁸ that grows as more people assume that this is the norm.

Part of the corruption in Armenia is left over from the Soviet era. In the early transition era, corruption had merely transferred political hands when the republics gained independence. This comparison of Soviet and post-Soviet Armenia sets the backdrop for the discussion

¹⁶⁵ Transparency International's Corruption Perception's Index (CPI) for 1999 ranked Armenia 2.5., or number 80 out 99 surveyed nations. This has gone down to 2.9 for 2005. The CPI index measures perceptions regarding the degree of corruption, as seen by business people, risk analysts and the general public, and ranges between 10 (highly clean) and 0 (highly corrupt). Link:

http://www.transparency.org/policy_and_research/surveys_indices/cpi/previous_cpi_1/1999

¹⁶⁶ Kurkchiyan, 26.

¹⁶⁷ Kurkchiyan, 27.

¹⁶⁸ Kurkchiyan, 29.

of the impediments that corruption poses for realizing a strong legal system. The following description illustrates the concept that former Soviet republics have traded names, but remained, at the roots, highly corrupt. In Beilock's view, Armenia has exchanged:

Dependence on Moscow for cheap resources and assured markets.	for	Dependence on Western assistance and remittances from workers living abroad.
Trade constrained by Cold War alliances	for	Trade constrained by its enmities with Azerbaijan Turkey
A corruption-ridden government, bureaucracy with a Communist face	for	The same, but with a market veeue. ¹⁶⁹

Corruption transcends all levels of society; its prevalence can be observed in the following survey, for which a sample population made up of foreign investors evaluated the following statements:

Bureaucratic red tape is the main factor inhibiting business activity in Armenia.

Businesses frequently have to pay [government officials] some irregular "additional payments" to get things done.

Over three quarters of the sample answered positively to the first, and over 90% agreed with the second.¹⁷⁰ Given that this behavior extends to nearly all legislative areas, one must question the feasibility of reducing poverty and protecting the environment. I now return to the idea that establishing an executive framework requires the reduction of corruption and tolerance for it.

If law, or simply positive change, was to take place, there needed to be an example or precedent on which Armenians could build.

¹⁶⁹ Beilock, 1.

¹⁷⁰ Beilock, 15.

This model would have to teach accountability and dispel the notion that responsibility could be passed onto others. It would also have to have a trust-building mechanism. This would prove especially important by dispelling popular beliefs that outside organizations were necessarily exploitative. Lastly, the model would need to provide people with the experience of generating incentives without the use of bribery. Besides corruption, there was the obvious problem of inexperience. This meant that neither governing bodies, nor the private sector, nor civil society, were experienced in drafting and executing laws within the perimeters of a “robust working legal system.”¹⁷¹

It would appear that corruption and the inexperience with legitimate law is a hopeless conundrum. Greenspan Bell notes, “Observers can reasonably ask what difference environmental loans and outside assistance can make in conditions so bleak.”¹⁷² This raises the possibility of civil society. In some countries such as China, a strong civil society fills gaps where the government is insufficient. Environmental NGOs are especially popular, considering the environmental problems associated with rapid urbanization and deepening rural poverty. In recent years, the Chinese government has invited environmental action in the form of GONGOs (Governmental NGOs).¹⁷³ In Armenia, the stage is set for civil society, as a third actor, to bypass corruption, reinstate hope, and institute social and environmental change.

¹⁷¹ Greenspan Bell, 2.

¹⁷² Greenspan Bell, 4.

¹⁷³ The Chinese Government is criticized by Western advocacy groups, because GONGOs are said to defeat the purpose of NGOs, since they must work within the constraints of the government. While Chinese NGOs do need to operate within confines unknown to Western style NGOs, many Chinese consider them huge victories for civil society.

Civil society is an avenue to self-realization; it allows citizens to realize their power in society. While the legal system and corruption fail to circumvent illegal profiteering at the expense of the environment and the poor, there is little guarantee that stricter mandates will change the conditions of impoverished groups, because “a fresh crop of villains will quickly emerge to replace those who are removed.”¹⁷⁴ Civil society, or the collaboration of non-governmental, non-familial social collectives, such as NGO’s and churches, can better address the problems of poverty and disillusionment by demonstrating, on a grassroots level, that alternatives exist, and that change is not so hopeless. Civil society is the avenue through which people “become effective agents of improvement in the political and civic realm.”¹⁷⁵ Thus, an NGO response to the poverty, deforestation and the disillusionment in Armenia outlined thus far, offers fruitful prospects, which perhaps are limited to such grassroots, multilateral approaches.

¹⁷⁴ Starr, 12.

175 Starr, 12.

PART 4: AN NGO RESPONSE

The preceding chapters lay out the complexity of deforestation in Armenia- where it comes from, who and what is responsible, and why it persists with no foreseeable solution. The wounded economic and social fabric is deep and messy, and I predict that economic development and environmental prescriptions will fall short of their respective goals unless the problems of poverty and deforestation are wholly embraced and applied on a case-by-case basis. In other countries, this vision is often lost due to foreign, top-down oversight, failure to appeal to local knowledge, and rigidly narrow goals that, although altruistic, sometimes require alterations to fit local contexts. Given these predicaments, there is currently a timely grassroots operation in Armenia whose mission incorporates the circumstances and recent history of the country. Through creative, minimalist, flexible project designs, the Armenia Tree Project has simultaneously addressed the urgent crises facing poor populations and the most threatened land of Armenia.

-The Armenia Tree Project-

The Armenia Tree Project (ATP) emerged in 1994 just as dust was settling from the three years known as the dark years. As people celebrated a partial return to normalcy, that is, the reinstatement of electricity and heat, there were new crises with which society would once again have to contend. One of these was a civilian crisis; it was the culmination of years of deepening poverty, unemployment and internally displaced people. The second crisis was environmental. Three bitter winters without fuel resulted in Armenia's new signature

environmental crisis, deforestation. Throughout the coming decade, deforestation would retain the status of a land cancer, growing, spreading and generating new victims.

Since 1995, despite positive changes such as energy availability, humanitarian aid and international investment, the problems of 1994 are multiplying, albeit at a slower pace.¹⁷⁶ Perhaps it was the anticipation of this scenario, which drove the Project's founder, Carolyn Mugar,¹⁷⁷ to act to mitigate the deforestation while the damage was still reparable. Arriving in Yerevan in 1994, Mugar observed that the end to the energy crisis had produced a "time of intense and immediate need[, which] was the exact moment to plant for the future."¹⁷⁸ Shortly thereafter, in 1994, the Armenia Tree Project (ATP) began its work.

With funding from the Armenian Diaspora, the NGO's original goal was to rejuvenate the former parks and hillsides in the capital city, Yerevan. Today, however, ATP has found a method to provide the rural poor with monetary income while reducing the impacts of deforestation in the mountains. This section traces the progression of ATP's work over a decade and discusses how working from within Armenia gives new shape, depth and increasing significance to the projects. Throughout this process of realization, trees become inseparable from the symbolic meaning that they conjure. For many, the "tree" project is an effort to improve human livelihood. ATP plants trees, which represent life, sustenance, and rejuvenation in an almost broken part of the world.

176 Libaridian, 259.

¹⁷⁷ Executive Director, Farm Aid.

¹⁷⁸ "Message From Our Founder: Carolyn Mugar", <<http://www.armeniatree.org/whoweare/founder.htm>>

-Testing the Waters: Urban Tree Projects

ATP's initial projects were limited by the constraints of a small NGO operating in a region where there was no precedent for this kind of activity. It was necessary to set modest goals because there was no telling whether they would survive. Would residents cooperate with ATP? Would trees reach maturity? Would donors approve of the turnout? Moreover, it would not have been wise to design projects without the consent or input of locals. After all, it was the condition of their backyards and community centers that were the subject of change. Possible obstacles for the NGO ranged from governmental restrictions, to distrust and miscommunication, to a lack of cooperation. ATP began modestly by offering to assist in rejuvenating the capital's green spaces.

By 1994, nearly all greenery that had formerly been concentrated in parks, community centers, and the surrounding urban hillsides of Yerevan had been transformed into stump yards. The natural aesthetic was depressing; there were no trees to provide shade or trap the dust and emissions hovering in a valley, enclosed by mountains. The loss of parks was the loss of a valued communal gathering space. It would be years before these urban wastelands would regenerate themselves, yet the prospects for speeding up the process at a time when economic recovery was the post-war priority were low. ATP emerged on the scene as an actor which, having both U.S. and Armenian headquarters, could distance itself from dependence on the government and pursue an alternative agenda. That said, did ATP's agenda even matter in the post-war climate? Could urban regreening really improve the condition of the environment or the status of local livelihoods?

Economically speaking, ATP's early projects were not profound.¹⁷⁹ However, they were critical steps for the NGO. During this period of continuous albeit small-scale successes, ATP fostered a reputation and credibility among native and Diaspora Armenians. Meanwhile, it established commitments from donors and urban communities who were pleased with the work that they witnessed. After the initial years, ATP adopted more complex projects, but the community tree plantings have expanded to urban regions throughout the country, a testament to the sincerity of ATP's early objectives.

ATP was financially restricted at its inception, yet it circumvented this issue by adapting its methodology. Ideally, the solution to widespread deforestation is the costly and labor-intensive rehabilitation of land, via tree planting, but the NGO lacked the resources to carry this out. Thus, it applied the silvicultural practice of coppicing in and around Yerevan. This is the process of stump rejuvenation in which all but one of the shoots that grow out of a stump are cut back to reduce the competition for nutrients and speed the ascension to a mature tree. This was an appropriate method for Yerevan where trees were primarily chopped down, not uprooted. After two years of coppicing, tree planting became central to ATP's projects.

In 1996, with some successes under its belt, ATP built its first two nurseries in Armenia, marking the extension of urban projects beyond coppicing. The nurseries provided ATP with more choice in designing its projects. Now it could choose the location, the density and the species of its projects. As a result, these took on new shape and the relationship between ATP and participants in reforestation

¹⁷⁹However, the passage of time has revealed how much greenery has actually been added to the city. (See Appendix photos).

projects became more personal in some respects. Urban community projects primarily took place in public spaces such as senior centers, schools and parks. When ATP met with the locals, people often had preferences and choices that ATP could now fulfill. For example, fruit trees were highly preferred for schoolyards and senior centers because of their edible produce.

Urban tree planting helped relieve the mess that the energy crisis left behind in cities, but it was not influencing regions throughout the country, in which the bare hillsides surrounding cities began eroding. The establishment of ATP nurseries was the first major step toward higher impact reforestation and poverty alleviation. As the ATP's director, Susan Yacubian Klein, noted, coppicing around cities was "just a drop in the bucket."¹⁸⁰

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-Shift to Rural Projects-

In 2001, after seven years of experience, ATP had established sufficient momentum to undertake mountain reforestation. Yet the reality of the post-Soviet disorder was that the most deforested lands were in northern regions of the country that had been devastated by the impacts of the earthquake, internally displaced populations, the trade embargo, and isolation from Yerevan. Consequently, these regions sheltered some of the poorest villages in Armenia. ATP knew at its inception that poverty was inextricably tied to environmental degradation, which is why its urban projects were rooted in community

¹⁸⁰ Agence France-Presse, 2004.

development, but the challenge for rural reforestation became one of integration between the rural dwellers and their land.

The Tree Project had decided to conduct a pilot phase for a project that would reforest a portion of the local landscape in one of the most impoverished and deforested regions in Armenia, Gegharkunik marze, which surrounds Lake Sevan in the northeast of the country. In 2002, when ATP staff members entered the region to survey land for appropriate sites and consult with locals, they were surprised by the severity of the poverty they encountered. Mher Sadoyan, the Organizational Director of ATP's Yerevan headquarters recalled his first visit to the village of Aygut, "Children were so malnourished they were picking grass from the ground inside their homes and eating the roots."¹⁸¹ After these types of encounters, ATP concluded that there was no way to prioritize the environment while local poverty was so deep; Sadoyan felt it was illogical to plant trees when people were starving, living on less than \$1 each day. However, one might inquire as to the drawbacks of strict reforestation. Could not this in itself improve the lot of the poor?

Let us consider the implications of planting the hillsides without addressing the human crisis. Any form of environmental rehabilitation work ought to be concerned with sustainability because a newly planted tree is meaningful only so long as it is given a chance to take root. One of my initial and recurring questions to ATP staff was simply, "what is to prevent people from cutting the planted trees?" I did not receive the simple answer that I had naively expected. I would have liked to have heard about electric fencing, a watchtower,

¹⁸¹ ATP (2006), personal communication.

floodlights, a new penal code and video surveillance. Upon second thought, I realized that I was asking a loaded question. The only security ATP could provide would be through a combination of spreading environmental education, focusing on community development and cultivating hope for the future.

The challenge of protecting the trees was not about security, I realized; it was about sustainability, the idea that societies can progress without sacrificing their environments. The work was less about getting trees into the ground than it was about taking fewer out. This is the reason that it would be unwise to reforest without improving the lives of the poor. As the case studies demonstrated, land resources were central in the daily subsistence of rural households. So long as basic needs were unmet, the threat to marginal lands persisted.

The Tree Project understands this. Its vision incorporates a model that promises at least partial sustainability as well as rural income generation. The following section conveys exactly how ATP has managed to provide the rural poor with monetary income while reducing the impact of deforestation.

-Backyard Orchards-

The rural equivalent of urban community tree planting is the backyard orchard. It is an atypical method of reforestation because it utilizes the tree as an economic tool. The project, initiated in 2003, invites villages to adapt sections of their backyards into miniature fruit orchards. Fruit yields are used either to nourish households or to barter. ATP intends for the orchards to provide households with enough food (on a very basic level) to make it through the last stretch of winter. Twelve trees per orchard hardly brings to mind

reforestation, yet ATP's flexibility and willingness to adapt to the local context of its working environment are crucial to the success of greater endeavors. I reiterate, reforesting a plot in the Getik River Valley would fail to recognize the deeper problems of the land.

The concept of developing small orchards for households grew out of ATP's interaction with locals and the recognition that 1) most families were running out of the fruit and nut preserves that carried them through the winter and 2) many of the fruit trees were too old to produce significant harvests. Backyard orchards were a simple and partial means of ameliorating the subsistence issue. Through a contractual relationship and on a voluntary basis, families signed up to receive and manage 12 fruit trees for their backyards. Four of these were delivered to the majority of villagers in the spring. The rest were delivered in the fall, conditional on the survival of the first four. This system generates incentive to adhere to the commitment with ATP just long enough to demonstrate to the villagers that the program is not a trick. It also requires villagers to adopt personal accountability, since it is their own work, in the maintenance of the orchards that generates produce.

-Backyard Nurseries-

A step up in size from the backyard orchard is the backyard nursery. This project shares the quality of the backyard orchard in that it is a joint ATP and community effort, and both are parts of the mountain reforestation effort. Backyard nurseries differ from the orchards in scale and purpose. While the fruit trees that grow in backyard orchards are intended to stay with the household, the backyard nurseries are family businesses. ATP helps families build backyard

nurseries by offering supplies and training. Then ATP purchases the seedlings for about 50 cents apiece. This generates an additional \$300-\$500 a year on top of the average \$200-\$300 annual household income. Next, the Tree Project employs locals to plant the seedlings in the surrounding hillsides. Throughout this process, locals benefit economically as well as ecologically. Those who choose to participate diversify and increase their incomes while directly participating in local reforestation.¹⁸²

During its pilot phase from 2003-2005, sixteen households participated in backyard nursery production in Aygut village. Over 20,000 seedlings were produced. In 2005, two hundred village households grew 200,000 seedlings. Each year, ATP gains footing. For 2006, the project plans to expand to 330 participant families, which are expected to produce 400,000 seedlings.¹⁸³

-Fruit Production-

Integrating local needs is crucial to developing lasting projects that will yield positive results for the poor. The story of ATP's first rural project, the establishment of a school fruit orchard in Aygut, illustrates how communication and local sensitivity shaped ATP's intentions into an unforeseen realization for the village and its environs. Upon its early visits to the village, ATP was informed that food shortages were especially affecting schoolchildren's ability to

¹⁸² An added advantage is that trees for reforestation do not need to be shipped from larger nurseries. They labor and resources are locally supplied.

¹⁸³ These projects are a continuous process of trial and error, adapting as problems arise. For example, ATP is currently adapting its pricing system for the seedlings it purchases from households. Trees mature at different rates and people tend to plant those that reach adulthood the fastest. Yet, oak forests, which have suffered the greatest loss in the last 15 years grow the slowest. They take two seasons to mature instead of one. To encourage people to plant this needed species and equalize incomes among villagers, ATP is raising the purchasing price of oak trees.

remain alert and energetic. The local principal conveyed to ATP that she had dreamt of converting the barren schoolyard into a fruit orchard. The Tree Project continued its meetings with the principal, and by 2002, it had completed the orchard. For several years, the orchard's fruit yields have met the student's basic nutrition needs. The current rates of growth however, imply that the orchard is nearing capacity for marketable fruit harvests. The school can use this needed revenue for supplies and renovations.

At the time of its inception, it was not known that the school orchard, which was a pilot project, would become the blueprint for villages throughout the Getik River Valley. ATP discovered that it was applicable in many villages that similarly lacked the capital to jumpstart an effective fruit orchard. In the nearby village of Dzoravank, ATP established one two-acre fruit orchard with a 500-tree capacity. In 2005, another fruit orchard of 220 pear and apple trees was built for a village elementary school in the village of Dprabak, also in the Getik River Valley. Each of these orchards was modeled after the Aygut orchard. ATP is gradually spreading fruit production throughout the region through either Aygut-styled orchards or backyard orchards. It foresees transforming the impoverished region into an economic stronghold by anchoring it in fruit production and export.

-Large-Scale Reforestation-

Throughout its first decade, ATP approached reforestation indirectly by prioritizing human needs. Each of its projects began by determining what Armenian communities required, then, by asking how it could meet these needs through a tree-based initiative. This was a

necessary approach early on, yet ATP always envisioned dramatic regeneration of the fractured land. Backyard nurseries and orchards are a creative integration of reforestation and economic development, but given Armenia's illegal logging industry, under funded forestry ministry and local and state corruption, much more is needed to tip the scale in favor of the land.

ATP's proven successes are drawing the support of the Diaspora, which increasingly hesitates to donate money to projects that operate within an unstable and corrupt climate. This enables ATP to increase tree production by the thousands each year. Its nurseries throughout the country train and employ Armenians in nursery production. Currently, there are nurseries in the villages of Karin, Khachpar and the city of Vanadzor. The former two produce trees that are exported to Yerevan and other cities for community regreening projects. The Vanadzor nursery exists solely for reforesting hillsides. It is a traditional nursery and cut and dry in its approach to tree planting. In 2005, it generated 300,000 trees for mountain reforestation.

The Karin and Khachpar nurseries, constructed in 1996, have a capacity of 50,000 trees per year. They house over 53 indigenous tree species; after approximately one year, ATP exports these to about ten sites throughout the country during the planting season from May to June. I inquired as to whether species were selected for their fruit yield, growth rate, or aesthetic value. Trees are chosen for their hardiness, but constituent demand also influences the mix.

The Vanadzor nursery is located outside the third largest city in Armenia. The surrounding hillsides to this city are notorious for the massive deforestation that ensued during the energy crisis. Here, the 15-acre nursery has a minimum one million-tree capacity and these are

targeted for reforesting the 5,000 acres of barren hillsides to the south of the city. Native species including beech, oak, maple, black locust, pine and ash are grown in the nursery.

-Sustainability-

Large-scale reforestation is finally in ATP's near future, but the author maintains that ATP's greatest successes are also its most modest. The work of an environmental group that operates in impoverished regions ought to promote what is best for both the land and its dwellers, but the current relationship between rural poverty and deforestation deteriorates the condition of both the poor and the forests. Successful environmental changes will aim to reverse more than ecological damage and even more than poverty; they should address the attitudes and behaviors that can accompany desolation because these problems are less obvious, but most destructive in the long term.

Local conceptions about the future can be damaging to families, communities, and the land. The rural poor often resort to the next-best alternatives, which translate into actions that destabilize communities. This may mean foraging further to obtain wood, or it may mean eliminating the option of heat altogether.¹⁸⁴ Sometimes, the next best option is to emigrate from a desperate situation in search of work or education in cities. Emigration is a sad reality throughout Armenia and it causes emotional suffering and damages the labor force. The backcountry districts outside Yerevan and its jurisdiction have lost some 72 thousand people from 1992 to 2002 due to the lack of hope that

¹⁸⁴ In the 2003 NHDS survey (Mirzakhanyan (UNDP 2005), it was reported that 8.9% of the population of the capital city Yerevan do not heat their homes. Most of this group is comprised of lone pensioners. It is likely that collecting firewood is not feasible and other heating options are not affordable.

resulted from the economic standstill in rural areas.¹⁸⁵ While emigration can reduce the political tension that results from people staying and demanding work, it is problematic, according to Sociologist Gevorg Poghosyan, because “families are breaking up, and those who are leaving are the ones who are the most economically active.”¹⁸⁶ On the macro level, Armenia continues to lose young intellectuals (brain drain) as the country becomes an undesirable place to earn a living.¹⁸⁷ These population shifts are representative of a lack of opportunity within communities. In other words, there is no longer hope for a secure life, so people hope for and pursue foreign aspirations.

If new incentives offer people the opportunity to remain in their villages, or country, and improve their livelihoods, the relevant question asks how hope is generated in rural Armenia. The noun hope is defined as “a thing in which expectations are centered” while the verb hope is “to look forward to with desire and reasonable confidence.”¹⁸⁸ Thus, hope is not merely optimism, it is a condition of expectation. The verb, “to hope,” requires that one assess, and then assign value to his or her future. It requires asking both “What is going to happen” and “Is the future scenario worth anticipating?” In order to determine what the future will be like, one must rely on current and recent empirical history. Given the circumstances of many Armenians laid out in this paper, widespread hopelessness is a logical conclusion.

Returning to the question of what fosters hope in Armenia, the answer lies in the antithesis to the current state of affairs and

¹⁸⁵ RA (2002) B, 39.

¹⁸⁶ Daniszewski

¹⁸⁷ It cannot be generalized that all Armenians want to leave Armenia and make money living elsewhere. Based on personal discussions with young Armenian adults in 2004, I encountered many who would not leave their families. They also considered emigration a form of cultural and national abandonment.

¹⁸⁸ Random House Webster’s College Dictionary, 2nd ed. (1997)

recent history. In other words, hope will be generated by employment, the ability of villages to retain residents, the diversification of income, availability of food, land stability, demonstration of genuine concern for the poor and non-corrupt exchanges between groups. Each of these will serve to counter the negative circumstances that overwhelm the positive and lead people to despair.

Sustainability, which is the simultaneous promotion of human and natural well-being, rests on the reinstatement of hope. This dependency reveals that the very changes that are required to generate hope in Armenia are the same ones that ensure sustainability. For example, spiraling deforestation (an unsustainable situation) cannot be tempered until people achieve decent living conditions (the preconditions to hope). Thus, any attempt at sustainability must also generate hope. This all boils down to self-sufficiency, which is the ability to provide for one's self without external aid.

Self-sufficiency is independence; it is freedom. In the case of rural Armenians, this freedom refers to the liberation from geographic, economic and political constraints. As the ATP director for rural development projects noted, "without cash, villagers are not free."¹⁸⁹ Establishing local sources of income increases options and decreases reliance on unreliable assistance or corrupt middlemen. Thus, to be self-sufficient, is to be knowingly confident that the future will work out. Self-sufficiency first requires hope. The following section views ATP's contribution to establishing self-sufficiency among the poor. Throughout the examples, ATP's methods serve to increase hope by reversing current realities.

ATP has joined many international humanitarian organizations to

¹⁸⁹ ATP (2006), personal communication.

deliver dynamic forms of assistance to the poor in Armenia. While ATP promotes self-sufficiency by reducing immediate need, as a small environmental NGO, it lacks the capacity to tackle the myriad needs associated with poverty. It has found however, that its interests often overlap with current humanitarian projects in the country.

For example, ATP has cooperated with the Norwegian Refugee Council (NRC), a non-governmental humanitarian assistance group, to address the refugee crisis in Armenia. NRC has worked in Armenia since 1988 when the war erupted with Azerbaijan, and its activities revolve around establishing individual and community self-sufficiency of refugees and internally displaced people (IDPs). Food, shelter, disease information and information on legal rights are common necessities of IDPs, but they vary among populations. In Armenia, the NRC focuses on housing. Since 1995, it built 500 homes for refugees.

The NRC and ATP mutually benefit from joint projects because while ATP seeks to engender rural self-sufficiency, the NRC seeks to establish relations with other aid agencies and NGOs, so that it can gradually reduce its presence as others adopt and continue its operations.

Throughout 2003-2004, the two organizations collaborated and assisted refugees in the Silikyan district of Yerevan. The first year, they worked side by side assisting 48 refugee families. ATP specialized in horticulture and tree planting; it brought 48 households the tools to plant over 550 trees and 725 shrubs. They also worked in the Kotayk region in central Armenia, which has the second highest rate of internally displaced people (31,580) after Ararat marze.¹⁹⁰ This tree-planting project had an 86% success rate. The collaboration sends the

¹⁹⁰ UNHCR 2002 Statistical Yearbook, Armenia.

message to disillusioned regions that there are international organizations concerned with working with and improving conditions of poverty.

The following year, the two organizations established refugee housing in the Silikyan district of Yerevan. NRC built the actual homes, but ATP created backyards for each of these homes. The backyard is central to the social dynamic in Armenian cities. Behind each apartment building, there are small, but lush, well-kept, gardens and fruit orchards. In the oppressive summer heat, family and social gatherings take place outside, under the shade. The space offers a clean play area for children, and a peaceful setting for the elderly, who often live with their children until they decease. As the NRC built these dwellings, ATP established commitments from families who showed an interest in creating and tending to trees. ATP provided families with seedlings and aided in planting them. Based on the success rate of the first ten in the spring, it delivered an additional 10 in the fall. These numbers may seem small, but for an urban backyard plot, twenty trees is quite a few. Throughout the city, ATP established 48 of these orchards to accompany the new homes for the displaced.

In each of these projects, the tree is an emblem for social rehabilitation and hope.



CONCLUSION

Thus far, this paper has sought to unravel the relationship between poverty and the natural environment, which the author perceives a necessary step in understanding two of the world's increasingly united, yet undercited crises. In the case of Armenia's deforestation, it is neither the scale nor the impact that establishes its relevancy. Rather, it is its sheer commonness. Armenia's recent history encapsulates the complexity of ties between land, society and poverty.

Armenia's own features, mountains and aridity, contribute to the pace of the country's desertification. Understanding that Armenia's remaining 8% of forest cover is of poor quality, is a precursor to these issues because it highlights the natural fragility of the land while signifying the unsustainability of unabating trends. Next, recent trends in deforestation are traced to their origins in Armenia's economic, political and social transformation in the late Soviet years; these events simultaneously altered the rural structure of economic and social life and increased natural resource dependency by generating a massive impoverished class. The manner in which these impacts materialize at the local level is evidenced in the structure of village life. Here, insolvency perpetuates the competition between humans and their environments by increasing the reliance on fuel wood.

Armenia's case, as presented here, is an appeal to the reader to step back and view this case within the world context. The current reality is that 1.6 billion people in the world do not have access to electricity.¹⁹¹ Of these, 80% are rural people,¹⁹² and three quarters of the rural poor live within mountain ecosystems where nearly every

¹⁹¹ IEA (2005).

¹⁹² IEA (2005).

requirement for rural subsistence falls short due to isolation, climate, or war.¹⁹³ Within these regions worldwide, people's dependency on the stability and productivity of their natural environments is great, but land degradation serves to deepen their poverty. Given their economic condition and national issues such as corruption, many are helpless in altering their lives or improving their environments. In Armenia's case of impending desertification, and in the case in nearly every ecosystem that supports the poor, separating environmental degradation from the poor's resource dependency is blind-sighted; if Armenia fulfills its predictions of complete desertification in the next two decades, a dependant group of people will lose their single-most important form of subsistence. However, a lack of legal legitimacy and its consequent effects on the trust and hope of the population suggest that there is little hope in the mitigation of this prophecy. Through cooperative, grassroots, modest initiatives, and proven successes, which combine the environmental and human issues of the region, the Armenia Tree Project offers hope where economic, social, political and geographic circumstances obscure it.

193 Starr, 5.

APPENDIX A

Uses of Wild Plants in Armenia

Source: Chemonics International, "Biodiversity Assessment for Armenia".

Over 200 species of edible plants are collected in Armenia, and are used fresh, cooked, pickled, or dried. Commonly used plants include longleaf (*Falcaria*), asparagus (*Asparagus*), and chervil (*Chaerophyllum*).

Around 120 species of wild berries and nuts are collected, including walnut (*Juglans*), hazelnut (*Corylus*), pear (*Pyrus*), apple (*Malus*), dogwood (*Cornus*), blackberry and raspberry (*Rubus*), and currant (*Ribes*).

A great variety of plants are used for animal fodder (around 2,000 species), including clover (*Trifolium*), sainfoin (*Onobrychis*), and alfalfa (*Medicago sativa*).

Around 10% of plants found in Armenia have some medicinal use, and species of hawthorn (*Crataegus*), buckthorn (*Rhamnus*), juniper (*Juniperus*), barberry (*Berberis*), rose (*Rosa*), and St John's wort

(*Hypericum*) are collected for traditional remedies.

Around 150 species of plants are known to produce essential oils, mainly species of thyme (*Thymus*), helichrysum (*Helichrysum*), and wormwood (*Artemisia*).

Plants used in producing dyes (120 species) include spurge (*Euphorbia*), buckthorn (*Rhamnus*), elder (*Sambucus*), and madder (*Rubia*).

A number of plants (c. 350 species) have an important role in attracting bees, including representatives of aster (*Acer*), sainfoin (*Onobrychis*), alfalfa (*Medicago*), lime (*Tilia*), and clover (*Trifolium*).

A number of species are also used for their vitamin, tannin, or resin contents

APPENDIX B ARMENIA TREE PROJECT (ATP) ARCHIVES: Selected Photos



Maturing seedlings at the Karin and Khachpar nurseries. They are watered using drip irrigation, a water saving method.



This is an image of the Aygut fruit orchard, which was built on an unused plot behind the school.



Villagers working at a reforestation site.



Villagers preparing the land for tree planting.



ATP trees in the Capital, Yerevan. These were planted in 1994 as part of the community planting projects.



Pine trees at Vanadzor nursery.



A target for large-scale reforestation. Bare slopes surrounding city of Vanadzor.



Saplings ready for planting.



Sprouting conifer seeds in plastic containers.



These photos depict a Yerevan resident, Grisha Hovaspayan, beside ATP's first planting site at the Nork Senior Center. He is pictured in 1994 and 1999.



Grisha is beside the tree in 2004.



Before and after photos of historic church, Khor Virap.



Severe erosion of deforested slopes.

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