

# Habitable Land Will Soon Become the World's Scarcest Resource: Why Appalachia Should Choose Climate Change Havens over Millionaire Estates and Golf Courses

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## Abstract

This research advocates for the construction of Climate Change Haven Communities across the Appalachian Region. The proposed development plan can be extended to the northern tier states across the US and also to the northern and mountainous regions of Europe and Asia. We present an analogy to the earlier climate change period of the Last Glacial Maximum/“Ice Age” in which these same northern regions of the planet were covered in ice sheets making them uninhabitable for most humans and many plant and animal species. In some significant ways, the Ice Age scenario can be a reverse-model for our current climate crisis. We also advocate strongly for the prevention of upscale real estate development projects in these same regions of the globe, as these will foreclose the possibility of safely sheltering the millions of persons who will be displaced by climate change over the next 5 to 10 years.

## Keywords

Climate Change, Appalachia, Habitable Land, Climate Change Haven Communities, Two-Caste Economic System, Migration, Ice Age Analogies

## 1. Introduction

Sometimes the past really can be a prologue to the future. We propose that the Earth's current global warming is one of those times and that considering Earth's past weather crises can provide valuable knowledge for dealing with the

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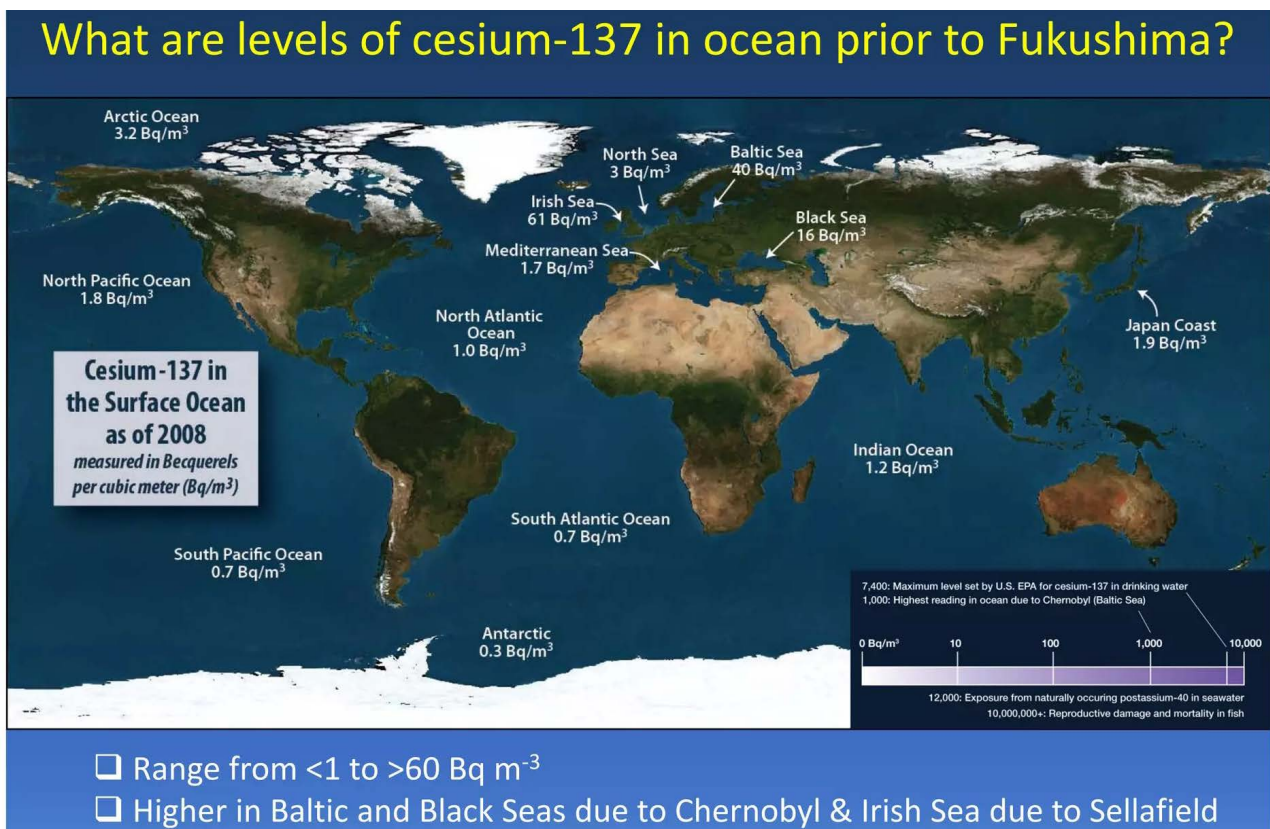
#The Hill Richmond Gott Professor of Business.

current one. Around 28,000 to 20,000 BCE, humans, many plant species and most animals faced their last major climate change event: The Last Glacial Maximum (LGM). During the LGM ice covered much of Northern America, Northern Europe and Asia. These glacial formations profoundly affected Earth's climate by causing a major expansion of deserts and a large drop in global sea levels [1] [2] [3].

Around 18,000 BCE, deglaciation began, causing an abrupt rise in sea levels. Decline of the West Antarctica ice sheet occurred between 14,000 and 15,000 years ago, consistent with evidence for another abrupt rise in the sea level about 14,500 years ago [4].

As shown in **Figure 1**, there were ice sheets across the Northern Hemisphere and also along the western coast of South America. Glaciers extended across what is now modern Tibet, as well as in Baltistan and Ladakh. In Southeast Asia, many smaller mountain glaciers formed, and permafrost covered Asia as far south as Beijing. However, the environment along the coast of South China was not very different from that of the present day, featuring subtropical evergreen forest.

Many hominid species, as well as animal and plant species, were eliminated during the Ice Age, with *Homo Sapiens* emerging as the sole survivor, albeit still carrying admixture with earlier hominids. These survivors found refuge in southern Europe [5]. These refugia are shown above in **Figure 2**.



**Figure 1.** Map of the world during LGM showing ice sheets.



**Figure 2.** Human refuge regions during Last Glacial Maximum shown in brown (Solutrean Culture) and purple (Epi-Gravettian Culture).

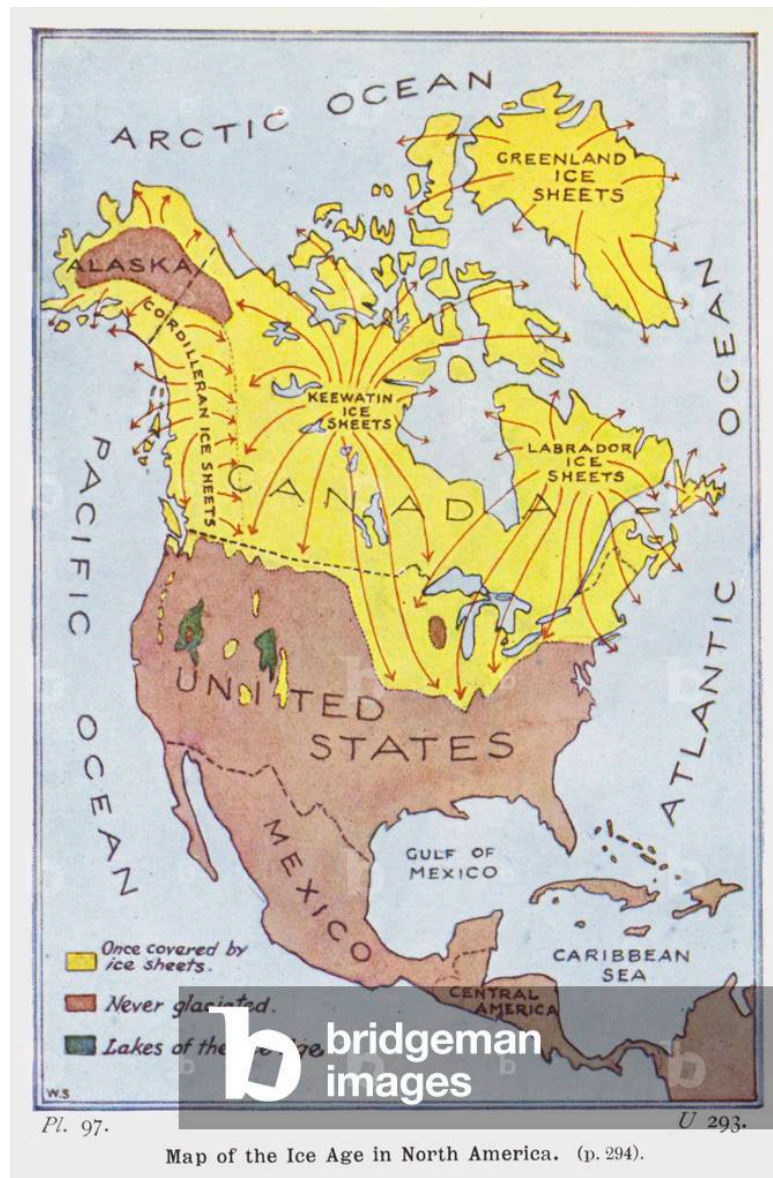
As shown in **Figure 3**, in North America, glacial ice extended from Greenland downward through Canada and most of Alaska to the northern tier of the Continental United States. Coastal areas as far south as New York City and even the upper Midwest experienced glacial coverage [6].

Presently, the Earth is experiencing a historic period of global warming due largely to the use of fossil fuels since the advent of the Industrial Revolution in the mid-1800s [7]. The Industrial Revolution greatly expanded the global economy over the past two centuries, but it at a disastrous cost to the planet's habitability. As a result, the alterations in climate we are now experiencing will essentially act to reverse the pattern of Earth's habitability by forcing humans, and most plant and animal species, to migrate northward to those areas that were once under glaciers or permafrost.

## 2. The Current (Very Shortsighted) View of Scarcest Global Resources

Entering the search term "scarcest global resources" into Google brings up the list below:

- 1) China, which produces around 90% of the world's rare earth metals, claims that its mines might run dry in just 15 - 20 years [8].
- 2) Rare Earths, Scarce Metals, and the Struggle for Supply Chain [9].
- 3) Recycled Plastics: According to BCG analysis, about 45% of the demand for recycled polyethylene terephthalate (rPET) will be unmet by 2025. This will be a problem for consumer-packaged goods companies that have set ambitious rPET packaging goals [10].
- 4) Battery Inputs: As a result of these developments, the transition to clean energy technologies is projected to drive demand for many raw critical minerals, such as lithium (Li), cobalt (Co) and nickel (Ni), for lithium-ion batteries used in EVs.1. These critical materials are used to fabricate cathodes for lithium-ion batteries [11].



**Figure 3.** The ice age in North America.

5) Water, our No. 1 resource, is rapidly depleting and AI is accelerating this risk. Water covers 70% of the Earth, and it is our most essential and important ingredient to survive [12].

6) Resource scarcity will change our world in unpredictable ways...

The resources that will be most scarce in the future, according to the report, are water, biodiversity and air, rare earth and metals, agriculture, waste disposal, processing power [13].

We propose that even the articles above citing water, air, and biodiversity as critically important global resources are overlooking the fact that at least 1 billion people, their businesses, crops, and farm animals, together with the surrounding plant and animal species making up their current eco-system, will have to be re-located within the next decade in order to survive [14] [15] [16].

Notably, the only viable locations for their re-settlement are in the northern regions of the globe that (quite ironically) were once largely covered by ice sheets and/or permafrost. In the United States alone, over 100 million residents will have to migrate to the northern tier of the Continental US (*i.e.*, Washington State, Idaho, North Dakota, Minnesota, Wisconsin, Michigan, New York, Vermont), the Appalachian Region or Alaska, if they do not want to live in constant danger of devastating climatic events, e.g., floods, tornadoes, hurricanes, excessive heat, and drought. Habitable land is now the global scarcest resource.

There are signs that this stark reality has already become abundantly clear to those persons who currently possess the largest share of global wealth [17]. Since the present study focuses on the Appalachian Region, generally, and in particular the Virginia Highlands, which border Western North Carolina, we examined the real estate market in Western NC for price trends and current listings. WNC has served as a bellwether for high-income entry into the Appalachian Region since the late 1800s.

A Brief History of Western North Carolina: Western North Carolina (WNC), and especially its regional capital of Asheville, first came to national attention in the late 1800s when George Vanderbilt, the grandson of financier William Henry Vanderbilt, decided to build a large-scale mansion there. Vanderbilt viewed WNC as representing the primal wilderness of early America. He purchased a total of 125,000 acres upon which he grew a variety of farm crops and experimented with various tree species [18]. The house is shown in **Figure 4**.

“Biltmore Estate is a French-style mansion constructed for George Washington Vanderbilt II between 1889 and 1895 and is the largest privately owned house in the United States, at 178,926 sq-ft (16622.8 m<sup>2</sup>) of floor space and 135,280 sq-ft (12,568 m<sup>2</sup>) of living area. Still owned by George Vanderbilt’s descendants, it remains one of the most prominent examples of Gilded Age mansions” (see **Figure 5**) [18].



**Figure 4.** Train used to bring materials and visitors to Biltmore House.



**Figure 5.** The Biltmore estate in Asheville, NC.

Biltmore House was constructed of the finest materials then available and stocked with antiques from around the world [18]. Soon Vanderbilts' wealthy business associates in New York City followed him to the surrounding mountains in WNC. They viewed the region as a healthful escape from the machinery, noise, coal fumes, constant construction, and overcrowded tenements of immigrants then characteristic of New York and its environs. Additional mansions were built [18]

(<https://www.biltmore.com/our-story/biltmore-history/key-figures/george-washington-vanderbilt>) and Vanderbilt even installed a coal-fired train line, shown in **Figure 6**, to bring the new residents directly to their mountain haven [18].

The 1929 stock market crash marked the initial phase of the Great Depression and brought the "gold rush" of northern wealth into this section of Appalachia to a quick and decisive halt [19]. Asheville and the surrounding area of WNC remained largely ignored as a destination for the wealthy over the next several decades. After several failed revitalization efforts during the 1980s and 1990s, Asheville and WNC "came to life" again in the early 2000s, as more sophisticated offerings were added to the shopping, entertainment and dining options [20] [21] [22].

Affluent Americans and Europeans again began visiting the Western North Carolina Region, and soon the area became known as a desirable "second-home and country club" location for the extremely wealthy. As knowledge of and fears about climate change began to circulate, they too realized, just as George Vanderbilt did, that the region was likely to be an excellent refuge for their retirement and perhaps even a desirable place to raise children [23].

A search on Zillow (April 2024) of homes for sale in Western North Carolina, brought up a total of 832 properties listed at \$1000000.00 and above; most are clustered near the North Carolina border with Virginia and Tennessee. The most expensive offering was listed at \$4999999.00 and is shown in **Figure 6**.



**Figure 6.** Residence for Sale in western North Carolina.

### **3. Climate Change Haven Communities versus Billionaire Safe Houses: Why We Need to Act Now**

In four prior research articles ([24] [25] [26]) plans were developed to establish a series of Climate Change Haven Communities across the Appalachian Region and northern tier of the United States. These are the areas of the Continental US that will remain habitable by the years 2030-2035. Much of the Southeastern and Southwestern US will become too hot, dry and/or flooded to support human communities, livestock, and crop farming by that time [27] [28].

Concurrently, the Pacific, Atlantic and Gulf of Mexico coastal areas of the US will be periodically inundated by severe tropical storms and atmospheric rivers, making living there virtually impossible, due to excessive insurance costs [27] [28]. These same conditions will hold true for countries such as France, Spain, Portugal and Italy in the Mediterranean, as well as for Wales and southern England [29].

Thus, there is an urgent need for areas of the globe that will be able to support human communities past 2030/2035 to begin building housing, business parks, medical and educational facilities and eco-agricultural enterprises that can support the incoming migrants in ways that do not do further damage to the environment. In earlier writings we have termed these Climate Change Haven Communities [24] [25] [26].

Climate Change Haven Communities are newly established (or expanded) towns having 20,000 to 30,000 residents located in those regions of the United States (and globally) that will remain habitable for humans, their crops and animals, as well as wildlife accustomed to temperate climates. They will be safeguarded against flooding by the erection of flood control dams and equipped with local AM radio stations for emergency use and in case of cyber-attacks on

phone and internet services [24] [26].

Each CCH community will be able to supply its own electricity through the use of hydro-power generators placed on nearby lakes, rivers and reservoirs. The communities will be equipped with their own educational systems (ages pre-school through high school), medical and health care facilities, administrative service facilities, shopping, entertainment, public parks and recreational options. Business parks will be included for persons living and working in the community. An electric bus service will provide low-cost transportation to all those who live in the community, negating the need for most private vehicles. The town plan for these communities is shown below:

The majority of residential, business, educational, medical and service buildings will be constructed using eco-certified, (often modular), construction materials. This will be done in order to insure sustainability and to meet the looming time deadlines of 3 to 5 years. Traditional brick-and-mortar buildings will be too slow, eco-hazardous and costly to create the CCH communities in time (see e.g., [blog.coversix.com/choose-modular-construction-vs-Modular-vs-Traditional-Construction: A Comparative Guide](http://blog.coversix.com/choose-modular-construction-vs-Modular-vs-Traditional-Construction-A-Comparative-Guide), [douglascutlerarchitects.com/modular-vs-Modular-vs-Traditional-Construction-Infographic](http://douglascutlerarchitects.com/modular-vs-Modular-vs-Traditional-Construction-Infographic)) [30]

Extensive plans for the construction of these CCH Communities for 13 counties in the Virginia Highlands are presented in a subsequent section (see **Appendix**) of this research. However, we first need to delve more deeply into the social and cultural aspects of the two models of economic development now confronting the United States and the global community with regard to climate change response.

**Why We Must Act Now**

### Why We Must Act Now

If efforts are not made immediately to prevent the exceptionally wealthy from acquiring land and water resources in the Climate Change Haven regions of the world (these are primarily in the Northern Hemisphere as discussed earlier), migrating human populations will be effectively “priced-out” of moving to safe havens within the United States and elsewhere. Many of these migrants will simply perish in the next 10 years. As noted earlier, the global estimates are in excess of 1 billion persons. In the United States, this figure is estimated to be around 100,000 million persons.

If preventive actions are not taken by local, state and national governments, the ultra-rich will soon move themselves and their families (and businesses) into the narrow areas of habitability globally and here in the US. This will result in the current local populations in these same regions becoming the “service class” for their newly arrived landlords, much as the serfs who provided agricultural, building maintenance and other craft/domestic services for their landlords during the Middle Ages [31]. The educational, medical, recreational and administrative services available to this “working/service” class of original inhabitants will be of poorer quality; while the very wealthy dominant class will provide itself with privately funded hospitals, educational services, recreational activities, and shopping/dining facilities. In effect, a two-caste economic system will be-

come operative in the US and elsewhere.

Those who find this projection too extreme, may wish to take a careful look at the residential, educational, medical and recreational options currently available to residents living in and around New York City, London, Boston, Los Angeles and Northern California. In those cities, and others around the globe, there is already a clear demarcation between the Haves and their private services versus the Have Nots with their “public” services.

Consider the description below of the Medieval Feudal system [31]. “The feudal system was a political and social structure that defined relationships between individuals in medieval Europe. Under this system, land was considered the most valuable asset, and was granted by higher-ranking individuals, such as lords or nobles, to lower-ranking individuals in exchange for their loyalty and service. The exchange of land for service formed the basis of the feudal relationship. Manorialism was closely tied to the feudal system and focused on the economic aspect of medieval society. It revolved around the manor, which was an agricultural estate controlled by the lord. The lord owned vast stretches of land, and the peasants, known as serfs, worked the land in exchange for protection and the ability to cultivate their own small plots.”

#### **The Class Structure of Medieval Society**

“Medieval society was organized in a hierarchical structure that reflected the unequal distribution of power and wealth. At the top of this structure was the monarch, who held supreme authority... The monarch relied on the support and loyalty of the nobility to maintain his/her position and control over the land. The nobility, consisting of dukes, counts, and other high-ranking individuals, held significant power and influence within their respective territories. The clergy also played a crucial role in medieval society... The clergy held immense religious authority and often wielded considerable political power as well”.

Beneath the nobility and clergy were the peasants and serfs. Peasants were free individuals who worked the land and had certain rights. Serfs, on the other hand, were bound to the land they worked and were considered the property of the lord. They were obligated to provide labor, pay taxes, and abide by the rules set by the lord [31].

In current global society, the formerly important roles of the clergy and monarch are no longer relevant. However, we can easily apply the notion of nobility to the extremely wealthy on both a national and international basis [32].

There are four key elements that unite the members of the Superclass and give them power over world affairs: geography, pedigree, networking and luck [33]. Later writings by Philips (2018) characterized this group as one which “function(s) as a nongovernmental network of similarly-educated wealthy people with common interests of managing, facilitating, and protecting (their) concentrated global wealth and insuring continued growth of (their) capital”. It is members of this group who would be desirous of purchasing the \$50,000,000 house and lands in Western North Carolina described earlier. Notably, the offering de-

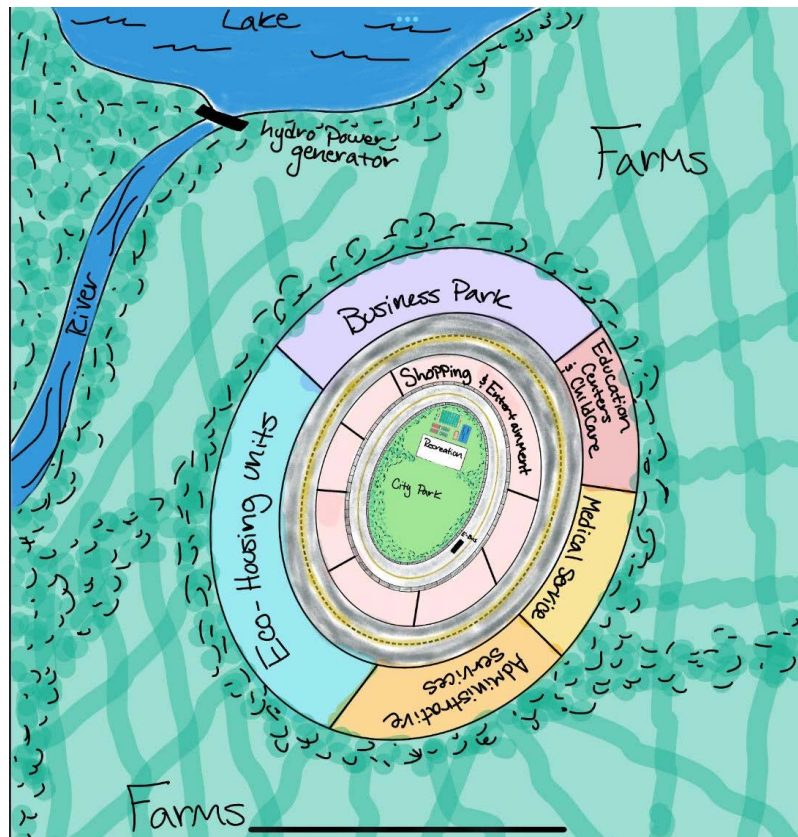
scription for this property reads as follows:

“Awe-inspiring and perched majestically at 4000 feet above exclusive Highlands, NC, recently named America’s Best Mountain Town by *Travel and Leisure*, Sagee Manor emerges for consideration from a decade-long, eight figure enhancement to its grounds, manor home, and guest lodge. Centered among 40+ acres of pristine gated mountaintop enclave, Sagee’s panoramic vistas take in long range views of three states, yet position her just 7 minutes from dynamic Highlands, NC and its thriving arts and cultural scene. For outdoor enthusiasts, the region boasts world class golf, hiking, and 2000+ miles of trophy fly fishing streams. Recently enhanced and expanded, the Manor’s primary residence offers unrivaled appointments, a grand two-story great hall, imported design selections and millwork, an exquisite sitting room and salon served by a private elevator, classic dining, kitchen, and library areas complimented by covered outdoor pavilions, a helipad, infinity pool, English gardens & guest lodge.” [34]

Semiotically, some of the key words in this description are: “perched majestically”, “above exclusive Highlands, NC”, “Travel & Leisure” (a magazine targeted to the very wealthy), “world class golf”, “pristine, gated mountaintop enclave”, “private elevator”, “helipad”, “English gardens”, and “guest lodge” which evoke cultural superiority and personal dominance. Notable also is the mention of 40 acres of mountain land which presumably will not be available for eco-farming in the region.

To counter this concerning scenario, we advocate the construction of Climate Change Haven Communities in the regions of future habitability across the globe. Detailed land preparation, cost estimates and construction plans for Climate Change Haven Communities in 13 counties in the Virginia Highlands are available from the first author (eh9b@uvawise.edu). These counties vary in topography from steep wooded mountains to low rolling hills, and climates range from temperate to subtropical. Readers are encouraged to download these plans and consider if they would be appropriate to develop for the areas in your country that can serve as Climate Change Havens.

Importantly, the time estimates for constructing a Climate Change Haven Community range from 3 to 5 years (see **Figure 7**), depending upon the topography and condition of the land. Four of the counties in the Virginia Highlands have been surface-mined and will require land remediation using switch grass to stabilize the soil; this will take an additional two to three years and must be completed before construction can begin [24]. Across the Appalachian Region several states have been extensively surface-mined; Eastern Kentucky, all of West Virginia, and much of Western Pennsylvania will require extensive surface-mining remediation using switch grass before any CCH communities can be built there. Thus we are looking at a very tight time-frame for purchasing the necessary land and beginning the CCH Community building program across the Appalachian Region.



**Figure 7.** Climate change haven community (copyright UVA-Wise/Ruth Ann Kennedy).

#### 4. End Game Scenarios

In the best of all possible worlds, each state in the US that is able to serve as a Climate Change Haven will purchase available internal land within the next year and begin the remediation and construction process. This must be done prior to the arrival of the hundreds of thousands of American citizens who will shortly be crossing their borders. These persons will be desperate to find a safe place to live and work. Climate Change Haven areas in the US (and CCH countries such as Sweden, Norway, Scotland, Greenland) must be ready to receive and resettle them.

We strongly encourage these Climate Change Haven states (and countries) to reach out in advance to specific companies and eco-agriculturalists which they would desire to relocate to their state, and offer them the opportunity to purchase residential housing, business parks and agricultural land in their Climate Change Haven Communities at a reduced cost. By sharing the development expenses for each Climate Change Haven Community, a much more efficient and less stressful migration can be undertaken [26].

##### **The Unavoidable Downside**

We believe that although many lives can, and will, be saved through this process, it is also likely that many families who desire to migrate will be bankrupted by an inability to sell their houses, farms and businesses in the climate change impacted areas where they now live.



**Figure 8.** California flooding during March 2024.



**Figure 9.** California flooding during March 2024.



**Figure 10.** Wildfires in the Texas Panhandle burned over 1.1 million acres in March 2024.

Additionally, states such as California, Arizona, Texas, New Mexico, Louisiana, Mississippi and Florida are likely to become bankrupted by the loss of revenue from state income taxes, real estate taxes and business taxes due to climate change damage to their economies. Because of this, they will be unable to assist those who want to leave the state (photos of recent climate events in California and Texas are shown in **Figures 8-10**). Families from these states will probably have to leave much of their “worldly goods” behind as they migrate toward Climate Change Haven states, because there will be no one remaining to buy their



**Figure 11.** The dust bowl era in the American Midwest.

homes, their fields or their companies. These areas ultimately may come to resemble the Dust Bowl era of the 1930's writ large (see **Figure 11**).

Likely the Federal Government will become the “Buyer of Last Resort” for these unsellable houses, farm lands, and corporate office parks [35] [36]. This situation cannot be avoided, but it can be moderated if decisive, effective steps are taken now.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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