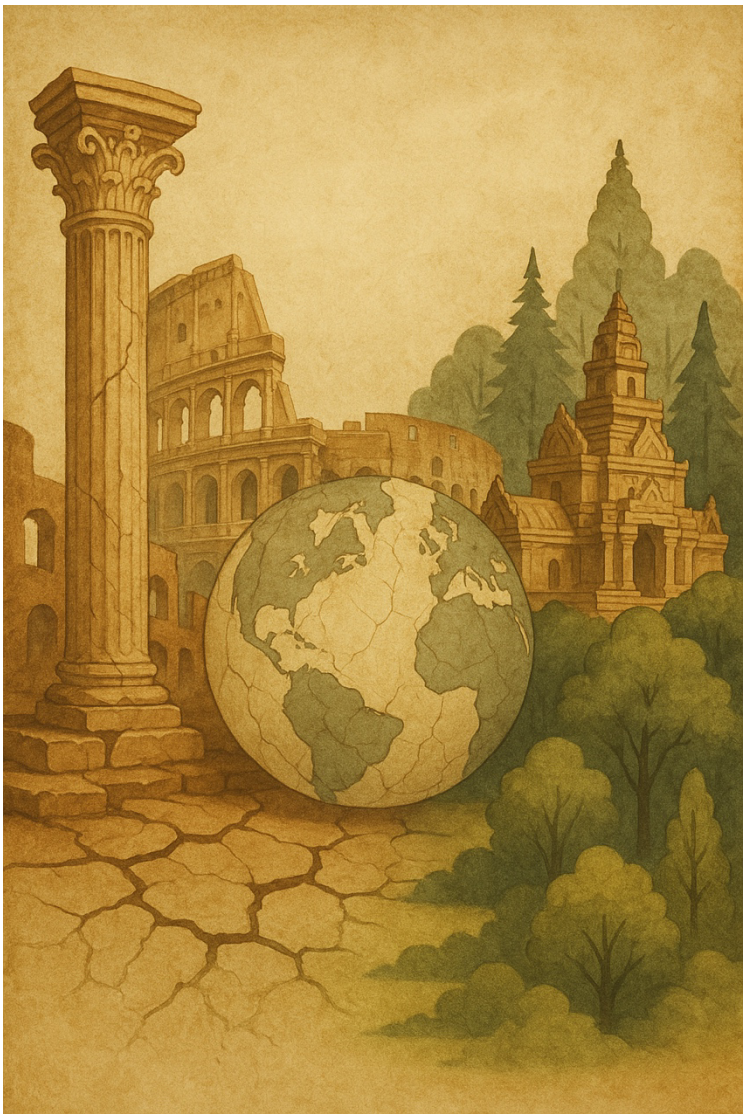
READING PASSAGE 3

*You should spend about 20 minutes on **Questions 27–40**, which are based on Reading Passage 3 below.*

Five causes of collapse of civilizations



A first set of factors involves damage that people inadvertently inflict on their environment, as already discussed. The extent and reversibility of that damage depend partly on properties of people (e.g., how many trees they cut down per acre per year), and partly on properties of the environment (e.g., properties determining how many seedlings germinate per acre, and how rapidly saplings grow, per year). Those environmental properties are referred to either as fragility (susceptibility to damage) or as resilience (potential for recovery from damage), and one can talk separately of the fragility or resilience of an area's forests, its soils, its fish populations, and so on. Hence the reasons why only certain societies suffered environmental collapses might in principle involve either exceptional imprudence of their people, exceptional fragility of some aspects of their environment, or both.

A next consideration in my five-point framework is climate change, a term that today we tend to associate with global warming caused by humans. In fact, climate may become hotter or colder, wetter or drier, or more or less variable between months or between years, because of changes in natural forces that drive climate and that have nothing to do with humans. Examples of such forces include changes in the heat put out by the sun, volcanic eruptions that inject dust into the atmosphere, changes in the orientation of the Earth's axis with respect to its orbit, and changes in the distribution of land and ocean over the face of the Earth. Frequently discussed cases of natural climate change include the advance and retreat of continental ice sheets during the Ice Ages beginning over two million years ago,

the so-called Little Ice Age from about A.D. 1400 to 1800, and the global cooling following the enormous volcanic eruption of Indonesia's Mt. Tambora on April 5, 1815. That eruption injected so much dust into the upper atmosphere that the amount of sunlight reaching the ground decreased until the dust settled out, causing widespread famines even in North America and Europe due to cold temperatures and reduced crop yields in the summer of 1816 ("the year without a summer").

Climate change was even more of a problem for past societies with short human lifespans and without writing than it is today, because climate in many parts of the world tends to vary not just from year to year but also on a multi-decade time scale; e.g., several wet decades followed by a dry half-century. In many prehistoric societies the mean human generation time—average number of years between births of parents and of their children—was only a few decades. Hence towards the end of a string of wet decades, most people alive could have had no firsthand memory of the previous period of dry climate. Even today, there is a human tendency to increase production and population during good decades, forgetting (or, in the past, never realizing) that such decades were unlikely to last. When the good decades then do end, the society finds itself with more population than can be supported, or with ingrained habits unsuitable to the new climate conditions. (Just think today of the dry U.S. West and its urban or rural policies of profligate water use, often drawn up in wet decades on the tacit assumption that they were typical.) Compounding these problems of climate change, many past societies didn't have "disaster relief" mechanisms to import food surpluses from other areas with a different climate into areas developing food shortages. All of those considerations exposed past societies to increased risk from climate change.

Natural climate changes may make conditions either better or worse for any particular human society, and may benefit one society while hurting another society. (For example, we shall see that the Little Ice Age was bad for the Greenland Norse but good for the Greenland Inuit.) In many historical cases, a society that was depleting its environmental resources could absorb the losses as long as the climate was benign, but was then driven over the brink of collapse when the climate became drier, colder, hotter, wetter, or more variable. Should one then say that the collapse was caused by human environmental impact, or by climate change? Neither of those simple alternatives is correct. Instead, if the society hadn't already partly depleted its environmental resources, it might have survived the resource depletion caused by climate change. Conversely, it was able to survive its self-inflicted resource depletion until climate change produced further resource depletion. It was neither factor taken alone, but the combination of environmental impact and climate change, that proved fatal.

A third consideration is hostile neighbors. All but a few historical societies have been geographically close enough to some other societies to have had at least some contact with them. Relations with neighboring societies may be intermittently or chronically hostile. A society may be able to hold off its enemies as long as it is strong, only to succumb when it becomes weakened for any reason, including environmental damage. The proximate cause of the collapse will then be military conquest, but the ultimate cause—the factor whose

change led to the collapse—will have been the factor that caused the weakening. Hence collapses for ecological or other reasons often masquerade as military defeats.

The most familiar debate about such possible masquerading involves the fall of the Western Roman Empire. Rome became increasingly beset by barbarian invasions, with the conventional date for the Empire's fall being taken somewhat arbitrarily as A.D. 476, the year in which the last emperor of the West was deposed. However, even before the rise of the Roman Empire, there had been "barbarian" tribes who lived in northern Europe and Central Asia beyond the borders of "civilized" Mediterranean Europe, and who periodically attacked civilized Europe (as well as civilized China and India). For over a thousand years, Rome successfully held off the barbarians, for instance slaughtering a large invading force of Cimbri and Teutones bent on conquering northern Italy at the Battle of Campi Raudii in 101 B.C.

Eventually, it was the barbarians rather than Romans who won the battles: what was the fundamental reason for that shift in fortune? Was it because of changes in the barbarians themselves, such that they became more numerous or better organized, acquired better weapons or more horses, or profited from climate change in the Central Asian steppes? In that case, we would say that barbarians really could be identified as the fundamental cause of Rome's fall. Or was it instead that the same old unchanged barbarians were always waiting on the Roman Empire's frontiers, and that they couldn't prevail until Rome became weakened by some combination of economic, political, environmental, and other problems? In that case we would blame Rome's fall on its own problems, with the barbarians just providing the coup de grâce. This question continues to be debated. Essentially the same question has been debated for the fall of the Khmer Empire centered on Angkor Wat in relation to invasions by Thai neighbors, for the decline in Harappan Indus Valley civilization in relation to Aryan invasions, and for the fall of Mycenaean Greece and other Bronze Age Mediterranean societies in relation to invasions by Sea Peoples.

The fourth set of factors is the converse of the third set: decreased support by friendly neighbors, as opposed to increased attacks by hostile neighbors. All but a few historical societies have had friendly trade partners as well as neighboring enemies. Often, the partner and the enemy are one and the same neighbor, whose behavior shifts back and forth between friendly and hostile. Most societies depend to some extent on friendly neighbors, either for imports of essential trade goods (like U.S. imports of oil, and Japanese imports of oil, wood, and seafood, today), or else for cultural ties that lend cohesion to the society (such as Australia's cultural identity imported from Britain until recently). Hence the risk arises that, if your trade partner becomes weakened for any reason (including environmental damage) and can no longer supply the essential import or the cultural tie, your own society may become weakened as a result. This is a familiar problem today because of the First World's dependence on oil from ecologically fragile and politically troubled Third World countries that imposed an oil embargo in 1973. Similar problems arose in the past for the Greenland Norse, Pitcairn Islanders, and other societies.

The last set of factors in my five-point framework involves the ubiquitous question of the society's responses to its problems, whether those problems are environmental or not. Different societies respond differently to similar problems. For instance, problems of deforestation arose for many past societies, among which Highland New Guinea, Japan, Tikopia, and Tonga developed successful forest management and continued to prosper, while Easter Island, Mangareva, and Norse Greenland failed to develop successful forest management and collapsed as a result. How can we understand such differing outcomes? A society's responses depend on its political, economic, and social institutions and on its cultural values. Those institutions and values affect whether the society solves (or even tries to solve) its problems. In this book we shall consider this five-point framework for each past society whose collapse or persistence is discussed.

I should add, of course, that just as climate change, hostile neighbors, and trade partners may or may not contribute to a particular society's collapse, environmental damage as well may or may not contribute. It would be absurd to claim that environmental damage must be a major factor in all collapses: the collapse of the Soviet Union is a modern counter-example, and the destruction of Carthage by Rome in 146 B.C. is an ancient one. It's obviously true that military or economic factors alone may suffice. Hence a full title for this book would be "Societal collapses involving an environmental component, and in some cases also contributions of climate change, hostile neighbors, and trade partners, plus questions of societal responses." That restriction still leaves us ample modern and ancient material to consider.

Issues of human environmental impacts today tend to be controversial, and opinions about them tend to fall on a spectrum between two opposite camps. One camp, usually referred to as "environmentalist" or "pro-environment," holds that our current environmental problems are serious and in urgent need of addressing, and that current rates of economic and population growth cannot be sustained. The other camp holds that environmentalists' concerns are exaggerated and unwarranted, and that continued economic and population growth is both possible and desirable. The latter camp isn't associated with an accepted short label, and so I shall refer to it simply as "non-environmentalist." Its adherents come especially from the world of big business and economics, but the equation "non-environmentalist" as opposed to "pro-business" is imperfect; many business people consider themselves environmentalists, and many people skeptical of the claims of environmentalists are not in the world of big business.

Sources
Diamond, J. (2005). *Collapse: How societies choose to fail or succeed*. New York, NY: Viking.
Compiled, formatted, and lightly proofread by ZYZ Reading Walks.