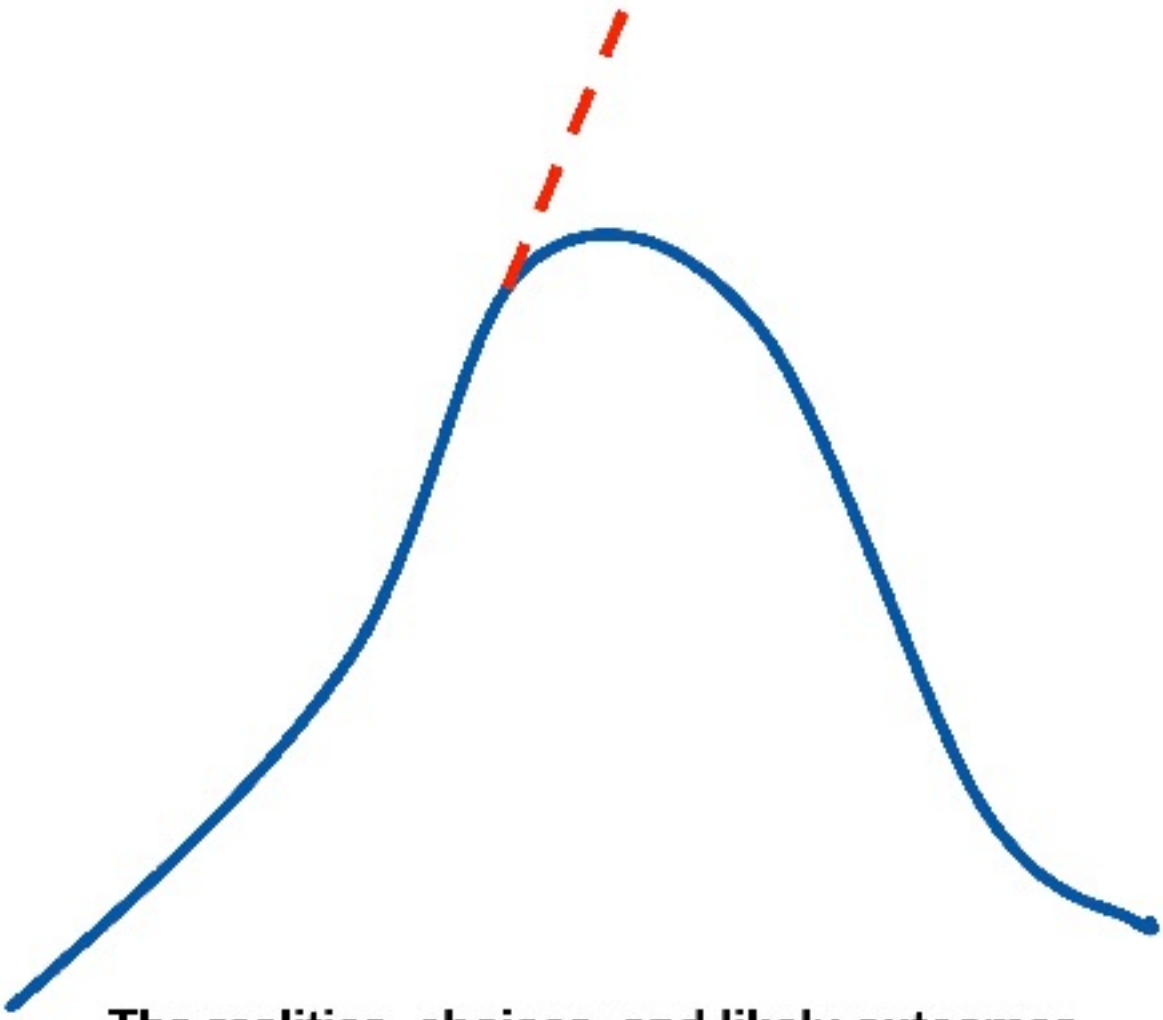
Scarcity

Humanity's Final Chapter?



The realities, choices, and likely outcomes associated with ever-increasing nonrenewable natural resource scarcity

Christopher O. Clugston

Foreword by William R. Catton Jr.

Scarcity is a book about humanity's "predicament": Our persistent utilization of enormous and continuously increasing quantities of finite, non-replenishing, and increasingly scarce nonrenewable natural resources (NNRs) - i.e., the fossil fuels, metals, and nonmetallic minerals that enable our modern industrialized way of life, and that are essential to perpetuating our modern industrialized way of life - is undermining our very existence as a species. Scarcity explores the causes, implications, and imminent consequences associated with humanity's predicament.

Scarcity – Humanity's Final Chapter?

Scarcity

Humanity’s Final Chapter?

ISBN 978-1-62141-250-2

Published by Booklocker.com, Inc., Port Charlotte, Florida.

Printed in the United States of America on acid-free paper.

Booklocker.com, Inc.
2012

First Edition

Introduction—Human Misperceptions

Unfolding today among humankind is
the most colossal self-inflicted tragedy in the history of the world.

During the course of human history, there have been two fundamental shocks to humanity's prevailing worldview. The first occurred when Pythagoras discovered that the earth is not flat; the second occurred when Copernicus discovered that the earth is not the center of the universe.

The third and potentially fatal fundamental shock to humanity's worldview is about to occur. We will soon discover that we can no longer provide continuously improving material living standards for ever-increasing numbers of our ever-expanding global human population. The earth no longer contains "enough" nonrenewable natural resources.

Scarcity is a comprehensive, multidisciplinary assessment of the realities, choices, and likely outcomes associated with ever-increasing nonrenewable natural resource scarcity.

Scarcity is also the story of a species, Homo sapiens, whose superior intellect should have caused it to eschew natural resource utilization behavior through which lower order species often experience population "irruptions" followed by "die-offs". No such luck…

Industrialism and NNRs

It is understandable that we human beings would seek to improve our societal wellbeing—the material living standards enjoyed by our human populations—through industrialism. The material living standards associated with industrialized lifestyles such as those enjoyed by Americans and Western Europeans are far superior to the material living standards afforded by pre-industrial agrarian and hunter-gatherer lifestyles.

Seemingly unnoticed, however, is the fact that our industrial lifestyle paradigm is enabled almost exclusively by enormous and ever-increasing quantities of nonrenewable natural resources (NNRs)—fossil fuels, metals, and nonmetallic (industrial and construction) minerals—which serve as the raw material inputs to our industrialized economies, as the building blocks that comprise our industrialized infrastructure and support systems, and as the primary energy sources that power our industrialized societies.

As an example, NNRs comprise approximately 95% of the raw material inputs to the US economy each year. America currently (2008) uses nearly 6.5 billion tons of newly mined NNRs per annum—an almost inconceivable 162,000% increase since the year 1800—which equates to approximately 43,000 pounds yearly per US citizen.

NNR Scarcity

Unfortunately, NNRs are finite; and as their name implies, NNR reserves are not replenished on a time scale that is relevant from the perspective of a human lifespan. More unfortunately, economically viable supplies associated with the vast majority of NNRs that enable our industrialized way of life are becoming increasingly scarce, both domestically (US) and globally.

In fact, NNR scarcity had become epidemic by 2008, immediately prior to the onset of the Great Recession:

- Sixty eight (68) of the 89 NNRs that enable our modern industrial existence—including bauxite, copper, iron/steel, manganese, natural gas, oil, phosphate rock, potash, rare earth minerals, and zinc—were scarce domestically in 2008.

- Sixty three (63) of the 89 NNRs that enable our modern industrial existence—including aluminum, coal, copper, iron/steel, manganese, natural gas, oil, phosphate rock, potash, rare earth minerals, uranium, and zinc—were scarce globally in 2008.

While there will always be "plenty of NNRs" in the ground, there are **"not enough economically viable NNRs"** in the ground to perpetuate our industrial lifestyle paradigm going forward.

The episode of NNR scarcity that occurred immediately prior to the onset of the Great Recession marked transition points for both America and the world. The number of permanently scarce NNRs had become sufficiently large by 2008 to permanently depress future economic growth trajectories and societal wellbeing trajectories at both the domestic (US) and global levels.

Implications of NNR Scarcity

Domestically, US economic output (GDP) and societal wellbeing levels "peaked" permanently prior to the Great Recession. As a result, US economic output (GDP) and societal wellbeing levels will trend generally downward going forward, forever.

Globally, future worldwide economic output (GDP) and societal wellbeing trajectories "diverged" permanently from pre-recession trajectories. As a result, global economic output (GDP) and societal wellbeing levels will trend upward at a continuously declining rate (at best) over the near term, peak in the not-too-distant future, and trend downward thereafter.

Ironically, through our incessant pursuit of global industrialism, we have been eliminating—persistently and systematically—the finite and non-replenishing NNRs upon which our industrialized way of life and our very existence depend.

Because this natural resource utilization behavior, which enables our current "success"—our industrialized way of life—and which is essential to perpetuating our success, is simultaneously undermining our very existence, neither our natural resource utilization behavior nor our industrial lifestyle paradigm is sustainable. This is our "predicament".

So while global industrialism and its extraordinary levels of societal wellbeing are understandable human objectives, they are also physically impossible objectives. Our historical reality of "continuously more and more", which we have experienced since the dawn of industrialism, is being displaced by our new reality of "continuously less and less", as NNR scarcity becomes increasingly pervasive.

Consequences of NNR Scarcity

Humanity's fate was sealed in the 18th century, at the inception of our industrial revolution. The NNR genie had been let out of the bottle and could not be put back. The episode of epidemic NNR scarcity that occurred in 2008, immediately prior to the Great Recession, was merely a harsh reminder that the historically unprecedented population levels and material living standards associated with our temporary era of industrialism are coming to an end.

Humanity's transition to a sustainable lifestyle paradigm, a pre-industrial lifestyle paradigm within which a drastically reduced human population will experience subsistence level material living standards derived exclusively from renewable natural resources (RNRs)—water, soil (farmland), forests, and other naturally occurring biota—is therefore inevitable. Our choice is not whether we "wish to be sustainable"; our choice involves the process by which we "will become sustainable".

We can choose to alter fundamentally our existing unsustainable natural resource utilization behavior and transition voluntarily to a sustainable lifestyle paradigm over the next several decades. In the process, we would cooperate globally in utilizing remaining accessible NNRs to orchestrate a relatively gradual—but horrifically painful nonetheless—transition, thereby optimizing our population level and material living standards both during our transition and at sustainability.

Alternatively, we can choose to squander Earth's dwindling NNR supplies in futile attempts to perpetuate our unsustainable industrial lifestyle paradigm, perhaps for a few decades (at most). In the process, we will deplete remaining NNR reserves to levels at which they will become insufficient to support the economic output (GDP) levels, population levels, and material living standards associated with our industrialized and industrializing nations.

Global competition for increasingly scarce natural resources will escalate into resource wars, which will escalate into global societal collapse by the middle of the 21st century, under the most optimistic scenario.

It would appear that we have made our choice, if only by default.

The NNR Scarcity Analysis

At the core of ***Scarcity*** is the NNR Scarcity Analysis (Analysis), which assesses current and future NNR scarcity, both domestically (US) and globally. The Analysis provides overwhelming if not irrefutable evidence to support the preceding assertions.

The Analysis is based on comprehensive quantitative and qualitative criticality and scarcity evaluations associated with the 89 NNRs that enable our modern industrial existence, and for which the US Geological Survey (USGS) and the US Energy Information Administration (EIA) maintain detailed information regarding domestic (US) and global NNR demand, supply, pricing, and utilization.

The criticality and scarcity associated with each of the 89 analyzed NNRs are thoroughly profiled in Appendix A.

Christopher Clugston

Scarcity is essential reading for those who correctly perceive that the world, especially the industrialized world, is in a state of decline—decline that cannot possibly be reversed by our relentless barrage of misguided economic and political "fixes". ***Scarcity*** will enable you to make sense of a world that is experiencing the most profound paradigm shift in human history.

In viewing the world from our firmly entrenched anthropocentric (human-centered) perspective[1], there is always hope for a brighter future, because the implicit assumption underlying our anthropocentric perspective is that there will always be "enough" NNRs to enable a brighter future—and that humankind need only be concerned with using these NNRs to provide ever-improving material living standards for ever-increasing numbers of our ever-expanding global population.

In viewing the world from the broader ecological perspective[2], however, there is no hope for a brighter future, because the fundamental assumption underlying our limited anthropocentric perspective is wrong.

Scarcity is a book about humanity's "predicament": Our persistent utilization of enormous and continuously increasing quantities of finite, non-replenishing, and increasingly scarce nonrenewable natural resources (NNRs) - i.e., the fossil fuels, metals, and nonmetallic minerals that enable our modern industrialized way of life, and that are essential to perpetuating our modern industrialized way of life - is undermining our very existence as a species. Scarcity explores the causes, implications, and imminent consequences associated with humanity's predicament.

Scarcity – Humanity's Final Chapter?