

# **Windfall: The Booming Business of Global Warming Study Guide**

**Windfall: The Booming Business of Global Warming  
by McKenzie Funk**

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## Summary

In his first book, *Windfall: The Booming Business of Global Warming*, journalist McKenzie Funk takes a hard look at global warming from a money perspective. Six years of research took Funk all over the globe, exploring the many ways the world's climate is changing and the many people and companies who are looking for ways to profit from those changes.

*Windfall* is divided into three sections, each tackling a different form of climate change. "Part One: The Melt" takes the author to Canada, where consideration is being given to the defense of the Northwest Passage as melting ice makes the area an increasingly attractive shipping route. Another chapter in the section looks at the opportunities opening up for the once isolated nation of Greenland, where vast amounts of minerals are becoming more accessible as the country's ice cap melts. Greenland's people must decide between seeking independence from Denmark as a means of keeping more of the wealth for themselves or remaining loyal to the country that has funded many amenities for them. Money is also at issue with Royal Dutch Shell's dilemma over the future of its energy interests and how technology devised in a desert country might save the melting Alps.

"Part Two, The Drought" looks at dry conditions that have led to the burning of massive parts of Southern California and the Southwestern United States. Funk also explores how water is becoming a commodity that can be bought and sold in some areas. He tells the story of one entrepreneur who stands to buy up essentially all the farmland in one struggling African nation. The section's final chapter introduces the concept of a wall of trees designed to hold back the encroaching Sahara while nearby European nations struggle to cope with Africans who want to migrate because climate change is taking away their livelihood.

"Part Part Three; The Deluge" looks at the plight of Bangladesh, which is being buffeted by a number of climate change issues. This section also includes Netherlands' ongoing success in fighting back water and helping other countries learn to do the same.

The book concludes with a look at climate genetics and the geoengineering concepts that could be the solution to the world's water problems.



# Chapter 1: Cold Rush

## Summary

Chapter 1, "Cold Rush," discusses the controversy over who owns and who can have use of the Northwest Passage, which is the sea route through the Arctic Ocean. The Passage connects the Atlantic and Pacific Oceans. While Canada owns the land on both sides of the passage, the United States and most of the world do not agree that Canada owns the waterway itself. It is considered to be an international strait. Previously, the waterway was difficult to navigate because of thick ice. However, as climate change has progressed, the ice has continued to melt, making it an increasingly attractive shipping route. The author centers this chapter around his description of a Canadian military exercise in which he participated, along with a number of military personnel, government dignitaries, and other journalists. The exercise was a mock interdiction in which three observation posts were set up on various islands in the Arctic. It brought no clear resolution.

As the ice continues to melt, Canada continues its struggle to maintain control of the Northwest Passage. Other nations vie for opportunities to use it for obtaining and transporting vast oil reserves. Arctic nations, such as Russia, see global warming as a positive occurrence because more of their land will be freed up for agriculture and industry.

## Analysis

In this first chapter, author McKenzie Funk sets the book's tone and premise. As a journalist, Funk travels the world and sets himself up as an observer, often using dark humor as he assesses what he sees around him. In this chapter, he describes with some humor the seriousness with which groups of actual military personnel, students, and tourists interact in the midst of a pseudo-conflict over seemingly useless Arctic land. However, the operation, which goes on for many days and ends with nothing resolved, has some level of significance because of the setting. Deciding who owns and who can use the Northwest Passage's waterways is becoming increasingly important as mineral-rich Arctic lands become more accessible through the changes brought about by climate changes. Global warming has the potential to be a political minefield as the stakes rise.

## Vocabulary

promenade, megatrend, tacit, inundate, epoch, conflation, apathy, visceral, impetus, exuberance, mitigation, sovereign, viable, flotilla, interdiction, relent, pinnacle, retrospect, ideological, grapple, bolster, fjord, disabuse, retaliation, unfettered, bravado, analogue, albeit, nondescript, nexus, furtive



# Chapter 2: Shell Games

## Summary

In Chapter 2, "Shell Games," the evolution of the Royal Dutch Shell company's approach to climate change is discussed. The company is among the largest of its kind in the world. For some time it has engaged "futurists" to develop various scenarios to determine how the future might play out and how the company should or would respond. In 2008, Royal Dutch Shell publicly released two scenarios describing the world up to 2050. Both warned of the dangers of climate change. The author describes conversations with several Shell officials. Their statements indicate that longer summer seasons in Arctic regions benefit them because they bring longer drilling seasons. Shell officials stated a preference for the scenario called Blueprints, which calls for front-end decisions and international cooperation. However, the company has gradually shifted from its purportedly green company stance by abandoning its stake in alternative energy sources like wind farms and solar energy. Royal Dutch Shell has spent \$2.1 billion on Arctic oil leases.

## Analysis

Switching gears from the previous chapter, "Shell Games" looks at the potential business of global warming from a strictly corporate perspective. Perhaps not surprisingly, oil companies – in this case, the author uses the example of Royal Dutch Shell – have long been looking further into the future than many other businesses simply because the nature of their business calls for long-term predictions and speculation. The chapter explores in detail the various scenarios the company's hired "futurists" concocted, including some that could have sent the company and the world in a different, more responsible direction. In this section, Funk provides insights into the thought process of global leaders in this arena and the reasons they opted, in the end, to maintain the status quo.

## Vocabulary

transcend, parable, peripheral, scenario, plausible, conglomerate, eccentric, heretical, evocative, polyglot, paradox, moratorium, stimulus, indigenous, inadvertently, amplify, indicative



# Chapter 3: Greenland Rising

## Summary

In Chapter 3, "Greenland Rising," the effect that climate change is having on Greenland is explored. As the global warming causes ice caps to melt, more usable land is being created. Also, deposits of oil, gold, zinc, diamonds, and uranium are being discovered when the glaciers recede. As a result, Greenlanders are considering seeking independence from Denmark, even though their country has received many amenities in recent years thanks to Danish funding. Many in Greenland feel that they would benefit more from gaining total control of the vast fortunes made possible by the discovery of the abundance of natural resources and increased oil drilling. The setting of this chapter is a week-long tour of Greenland by a group of politicians who speak to residents in various communities about the merits of secession.

## Analysis

In one of the book's most fascinating chapters, Funk explores the plight and the opportunities currently experienced by the little-known country of Greenland. Often forgotten because of its remote location and unforgiving landscape, Greenland actually holds vast stores of valuable minerals under all that ice – minerals that are becoming more accessible as the ice cap gradually melts away. As the country gains more land for farming and other uses, its people are realizing that they can capitalize on what lies underneath the surface. As a result, they are actively seeking a stronger voice in their future. As the author travels the country, attending town meetings and talking with government officials and others, he provides a portrait of the dilemma faced by a country that has benefited from the quiet generosity of the Danish government. The country now sees the potential for far greater benefits if it is brave enough to gain full independence.

## Vocabulary

secessionist, tundra, referendum, charismatic, benevolent, largesse, immaculate, remnant, stratified, explicit, masochism, utilitarian



# Chapter 4: Father of Invention

## Summary

Chapter 4, "Father of Invention," begins by describing the problems experienced by the Pitztal Valley of Austria, where ski resorts are suffering from lack of snow as the glaciers that feed them continue to melt. Like many such areas, Pitztal is resorting to snow-making technology. The irony in that situation is that its \$2 million device, which is capable of shooting out 35,000 cubic feet of snow every 24 hours all year long, is made by the desert country of Israel. The author describes meeting with Avraham Ophir, an Israeli who is technology chief of IDE, the company that makes the machinery. He recalls hearing Ophir's story of how his father developed technology for desalinating water while in a Russian gulag during World War II. That was the beginning of IDE. The company has now translated its knowledge into making equipment that supplies snow to European ski areas. Meanwhile, the Israelis continue to work on other technology to provide more usable water for its own needs and those of the rest of the world.

## Analysis

This chapter begins to draw a line between two aspects of global climate change – the melting that is taking place in far northern areas and the drought that plagues other parts of the world. Moving from Greenland, where climate change has the potential to bring a new economy, the author now travels to Austria, where the Alpine ski areas have long sustained the economy with tourism. The tables are turning here as the decreasing amounts of snow promise to destroy the ski economy and change the face of the landscape forever. The best hope seems to be coming from scientific processes learned by a prisoner in a gulag in Russia, another country that stands to gain usable land through global warming. The prisoner shared his knowledge with his son, Avraham Ophira. Ironically, his son is a native of dry, arid Israel. Having learned the scientific processes, Ophira has the potential answer to the problem. While Israel stands to gain economically from sharing scientific discoveries with the rest of the world, the author bridges this section with the next through the fact that the nation also needs to develop new processes to solve its own climate change problems, not just to make profits.

## Vocabulary

remnant, funicular, recede, absurdity, imperiled, modernistic, salvo, boon, pedigree, intertwine, desalination, gulag, supplant, auspicious, imperil, apace



# Chapter 5: Too Big to Burn

## Summary

Chapter 5, "Too Big to Burn," begins the second section of the book, "Part Two: The Drought." The chapter discusses the increasing problems of wildfires in Southern California. In the past, the fires usually occurred during specific season. Now, they are common throughout the year. One reason for the increase in fires is that climate change has created more fuel by making hot weather even hotter. This has lengthened growing seasons and summers. It has also created warmer winters in which parasitic larvae such as pine beetles and tent caterpillars can flourish, killing forests and creating more dead wood. In response, private firefighting agencies have begun to flourish, sometimes partnering with insurance companies and targeting areas with expensive homes, offering special fire retardant sprays, and other protection services. However, the private companies are seen by the author as grossly inefficient in many ways, noting the difficulties of getting the specific addresses they are authorized to protect from offices in other states as the public firefighters simply follow the fire itself and try to contain it and protect everyone in the area.

## Analysis

Chapter 5 is of particular interest as wildfires in Southern California and the rest of the western United States now occur more often. The fires are gaining increasing attention from news sources around the country and the world. The author does a good job of explaining in easy-to-understand terms the reasons that the fires are becoming more prevalent year-round and how they are tied to the area's desperate drought situation. Much of the chapter's is spent on how the fires are fought. From a financial standpoint, insurance companies sustain major losses during wildfire situations. The losses are so great that many have decided to hire private companies to assist in fighting the flames. However, the author describes a scenario in which they are not working for the common good, but rather cherry-picking specific homes – often the most expensive ones – to save. Often this means a private fire-fighting unit will arrive at one home and treat it, then ignore others in the immediate area that are also in danger in favor of driving several miles to the next home on its approved list. In addition, Funk describes situations in which these private companies receive inaccurate information. They are even in the way of the firefighters from public agencies who are simply trying to reach the fire that poses the most danger at that moment.

## Vocabulary

emblazon, paradoxically, convoy, obscure (verb), conspiratorial, desiccated, proprietary, libertarian, hedge (verb), prudent, converge, metaphor, mitigation, dexterous





# Chapter 6: Uphill to Money

## Summary

Chapter 6, "Uphill to Money," discusses how water came to be an asset class for investors. For example, as parts of California were experiencing record droughts, Al Gore's film "An Inconvenient Truth" garnered widespread attention for climate change. Financial managers like John Dickerson, founder and CEO of Summit Global Management, began to convince investors that water was a great investment because it is a tangible thing, unlike temperatures and carbon emissions. Dickerson began with "hydrocommerce" investments – things related to water – then decided to move toward owning water itself by buying the rights to physical water assets. Since water is heavy, it is expensive and difficult to move fresh water from one place to another. The author cites several failed attempts to place icebergs into huge bags and drag them to areas where fresh water is needed. The author goes on to discuss how water rights have differed throughout history in different parts of the world and how individuals who own water rights can sell to others. This gives them control over which facets of agriculture thrive as others fail. Finally, Funk tells of a visit to Australia, where in some places detectives are assigned to police water theft as people set up makeshift dams and surreptitious pumps or attach hoses to neighbors' spigots. Experts fear that water rights can actually redefine sovereignty in neighboring nations .

## Analysis

Whereas most people in the first world think of "owning water" simply as paying a monthly bill that gives them access to unlimited tap water, or purchasing bottled water for drinking, the concept takes on an entirely different meaning when water is thought of as a commodity of increasing value. It will be only a matter of time before enterprising entrepreneurs begin to look for ways to take financial advantage of a situation in which some places have vast amounts of water and others have far too little. The author uses humor to describe some of the more ludicrous ideas people have tried in order to move a plentiful, yet difficult to transport, commodity from one place to another. In the end, Funk paints a dark picture of what can happen if some people become increasingly desperate as others try to maintain what they have or make a profit. This is a far different situation from the earlier discussion of shipping rights in the Northwest Passage. It is a matter of having water for drinking and raising crops – the essentials of life itself.

## Vocabulary

quell, abstraction, tangible, ecosphere, compatriot, unscathed, adage, ubiquitous, riparian, depiction, tributary, profligate, evisceration, inundate



# Chapter 7: Farmland Grab

## Summary

Chapter 7, "Farmland Grab," opens with the author traveling to South Sudan to meet with Phil Heilberg, a former AIG trader from Wall Street who is now working with General Paulino Matip, deputy commander of the Sudan People's Liberation Army. As a result of the food crisis that preceded the 2008 financial crisis, Heilberg and others have been buying up massive amounts of land in Sudan and other countries like Ethiopia, the Ukraine, and Brazil. Heilberg is now here to get signatures enabling him to buy even more land. Although people whispered that it was illegal, in reality the government could proceed with the transaction if it pleased. Heilberg and his company named Jarch planned to farm the land with joint-venture partners and to sell crops locally before selling internationally. There was a large local market because Sudan and neighboring countries had been experiencing drought and needed food. However, there were other problems, including the fact that Heilberg's holdings covered 80 percent of a country containing 120,000 people. There was a precedent for previous leaders brutally clearing civilians from their homes to make way for oil drilling. The chapter ends with Heilberg's plans still in flux because of continuing clashes over South Sudan's independence, but Heilberg is unconcerned, saying he gives the people hope.

## Analysis

This chapter is one in which the reader is presented with the dilemma of distinguishing between the "good guys" and "bad guys." Heilberg is fearless in acquiring vast amounts of land in one of the most dangerous, war-torn and politically explosive places in the world. Much like the carpetbaggers who took advantage of impoverished Southerners after the American Civil War, Heilberg is unabashedly using his financial means to buy property that he thinks will enable him to make enormous profits. He tries to soothe concerns by saying he will provide food to the people of Sudan before offering his crops to other countries. Clearly, there is a danger in allowing one individual or entity to own nearly all of the property in a small country. However, it is also difficult to turn down immediate monetary assets when people are desperate. It remains to be seen how the situation will eventually be resolved as South Sudan continues to evolve.

## Vocabulary

savanna, fortified, arable, mercenary, mundane, volatile, accord, taciturn, savvy

# Chapter 8: Green Wall, Black Wall

## Summary

Chapter 8, "Green Wall, Black Wall," discusses efforts to keep the sands of the Sahara from further encroaching on certain areas of Africa even as parts of Europe struggle with increasing numbers of Africans who migrate there, many because of environment-related issues. The author meets Colonel Pape Sarr, Senegal's directorate of water and forests, who is one of the architects of the Great Green Wall, a proposed barrier of trees that would stretch 4,700 miles long and be 10 miles wide, crossing 11 countries from the Atlantic Ocean to the Arabian Sea. Proposed in 2005 by Nigeria, the work has barely begun and remains controversial. Sarr takes the author to an area where dozens of people are planting seedlings and shows him the current state of the wall, which is a mere eight inches tall. The project is difficult because there is not enough water to keep the new plants healthy. Also, there is not enough money or support to properly fund the project. Meanwhile, some countries in southern Europe are having problems with African refugees who are arriving in droves because they can no longer make a living in the fishing industry and other jobs because of climate change. Many die en route and others land by mistake in Malta, where they are jailed for up to 18 months.

## Analysis

The author seems to see the Great Green Wall as a noble concept but without much merit from a practical standpoint. The idea is far too grand to be feasible, particularly in an area without enough financial resources to fund such a grand scheme. In addition, in a chicken-and-egg type of scenario, the problem of shifting sands is caused by drought. Having sufficient water is essential to getting the new trees to grow, so it is clear that the project is not a real solution. At best it might provide some level of hope, which might be better placed elsewhere. In a parallel situation, the author explores the concept of climate change refugees – people who are being forced to leave their home countries because they cannot make a living any longer by fishing or farming. The situation promises to become more dire as nearby countries such as Spain and Malta struggle with their own economies and the problems imposed by unwanted immigrants.

## Vocabulary

cavernous, tract, arid, viability, bulwark, insurgent, phalanx, enclave, influx, onerous, internment, beatifically, xenophobia, epiphany



# Chapter 9: Great Wall of India

## Summary

In Chapter 9, "Great Wall of India," Funk addresses the serious problems faced by Bangladesh. The small country is surrounded on three sides by India and a 2,100-mile fence is quietly being built around that border to keep Bangladesh's people from crossing into India. The country is in serious trouble because of climate change issues including salinity, cyclones, and increased flooding. Also, a sea-level rise could permanently submerge at least the southern fifth of the country by 2100. At the same time, India is becoming increasingly vulnerable to climate change and there are fears that in time military conflicts will arise as people fight for food and shelter and countries try to protect their borders from migration. The author states that most of the people in Bangladesh do not want to emigrate permanently. Instead, they prefer to look for solutions to their climate change issues; but, there is frustration over the decreasing amounts of foreign assistance the country receives.

## Analysis

Following up on the previous chapter, the author describes the extreme measures India is taking to keep people from Bangladesh from crossing their borders. Throughout the book, the author discusses various attempts to use engineering as a means of battling climate change. However, in this case, it is a way to isolate one group of people without doing anything to improve the situation. While the Bangladeshi people look for answers that will save their country, many in India ignore the similarity of their own situation. Instead, they focus on constructing a physical barrier to keep their neighbors out.

## Vocabulary

indigenous, predominant, emit, extrajudicial, insurgent, relent, languid, tectonic, bastion, estuary, oligopoly, auspicious, vassal, putrid



# Chapter 10: Seawalls for Sale

## Summary

Chapter 10, "Seawalls for Sale," opens with a description of a conference held in New York the year before Hurricane Sandy's devastation of much of the area. The attendees were there to discuss what happens, legally speaking, when an island nation disappears under water. Representatives were there from a number of potential victims such as Grenada, the Bahamas, and the Marshall Islands. A representative from the Netherlands suggested that various Pacific states could merge into a new country with those whose land disappeared simply moving onto the new country's higher ground. Although the Netherlands is famous for its low lying land, the country is wealthy and has perfected the art and science of keeping water at bay, even making money by offering its leading-edge technology to other countries. The chapter ends with a discussion of previous suggestions for protecting Manhattan against a storm like Sandy and how the storm itself affected the outlying boroughs.

## Analysis

This chapter is particularly poignant because it makes it clear that there was extensive knowledge years before Hurricane Sandy actually materialized about what might happen to Manhattan and the surrounding boroughs in the event of a super storm . During the discussions described by the author, specific suggestions were made for constructing barriers in specific areas around Manhattan that would protect the island from storm surges. Yet, it would be at the expense of less expensive real estate in other areas such as Queens and Staten Island. Although the barriers were never actually erected, it is chilling to note that the very areas that would have been vulnerable are the ones decimated by Sandy. This chapter also brings into play the strange legalities that come with climate change. If an island nation eventually ends up under water, is it still a nation? What are its borders? What is the citizenship of its former residents who are now displaced? What happens to its fishing rights? These are questions that the average citizen has never considered. However, those questions will become very real problems if climate change continues along its current path. The chapter also takes a look at the Netherlands, a low-lying country that for years has been quietly and effectively coping with many of the issues with which other nations are just beginning to grapple.

## Vocabulary

atoll, verdant, abrogate, reparation, eschew, tout



# Chapter 11: Better Things for Better Living

## Summary

Chapter 11, "Better Things for Better Living," explores the concept of genetic modification and its implications for addressing climate change. Funk discusses the *Aedes aegypti* mosquito, which is a primary breeder of dengue fever. The mosquitoes lay eggs in pools of rainwater left outdoors. When people fail to clean up clogged gutters, it creates a habitat for them. Dengue fever is difficult to control and there is no vaccine. It causes thousands of deaths each year. The problem spread to the United States in recent years, particularly in very hot areas like South Florida. A British company called Oxitec has developed a genetically modified mosquito that breeds with the *Aedes*, carrying a suicide gene that eventually kills them. Other methods of eradicating deadly mosquitoes are mentioned, too.

The chapter shares about the involvement of financial giants. In particular, the Gates Foundation has contributed vast sums of money to battle mosquito-borne diseases in third world countries. In addition, it has promoted genetically modified crops that can grow in dry, hot climates.

## Analysis

In this chapter, Funk examines disease as another consequence of global climate change. As the world gets hotter, new problems emerge. For example, the dangerous dengue fever is being spread by mosquitoes that thrive as the climate warms. The disease is no longer a problem only found in third world countries. Now it has spread to places like Florida and California. The migration of the disease has garnered the attention of scientists and global organizations like the Gates Foundation.

The chapter also addresses how climate change is resulting in genetically modified food (GMOS) crops, which favor dry, hot climates. As the world struggles with feeding its people in the face of decreasing farmland and increasing drought, the debate about GMOS continues.

## Vocabulary

eradicate, detritus, incubation, dilapidated, contrail, transgenic, epidemiology, copse, genomics

# Chapter 12: Problem Solved

## Summary

In Chapter 12, "Problem Solved," the author visits Intellectual Ventures, a Seattle company established by scientist Nathan Myhrvold. Although the company is criticized for buying a large number of existing patents, Myhrvold insists that innovative research is being conducted, including the idea of spraying particles into the atmosphere to affect temperatures, stop hurricanes, and otherwise change the climate. Funk describes some of the history of geoengineering, including those who are proponents and those who oppose it. He discusses the involvement of philanthropist Bill Gates, whose influence and support has changed the conversation from "Can we do it?" or "Should we do it?" to "How do we do it?"

## Analysis

Much of this chapter involves discussion of intricate scientific methods of conducting geoengineering as a means of combating climate change. The primary points are to position the idea of geoengineering as an alternative to reducing emissions and to see renewable resources. Those are the only available solutions. Scientists such as Myhrvold broaches the idea that most people are not forward thinkers. They will not make changes until they are forced to do so. For example, some people continue to eat unhealthy foods or to smoke even though those actions cause serious medical issues. In the end, Funk favors of geoengineering as the best solution to the problem, even if it brings huge profits for some. It is the best remedy because the world is not ready to embrace solutions that would cause personal sacrifice or stem so-called progress.

## Vocabulary

retort, retrench, innocuous, efficacy, scenario, triage



# Important People

## McKenzie Funk

McKenzie Funk, a journalist in Seattle Washington, is the author of *Windfall: The Booming Business of Global Warming*. Funk undertook a six-year research project traveling the world to study the economics of global climate change. In crafting the book, he observed a wide variety of projects, experiments, and phenomena in countries from Greenland to South Sudan. The book is based on his interviews with the important players and his observations.

## Bill Gates

Bill Gates is the founder of Microsoft and an influential philanthropist. His interest in several of the matters covered in *Windfall: The Booming Business of Global Warming* and his monetary contributions to pertinent projects are noted in the book.

## Nathan Myhrvold

Nathan Myhrvold is a former futurist at Microsoft. He now heads a company called Intellectual Ventures that holds thousands of patents and conducts research on climate change matters.

## Lowell Wood

Lowell Wood was one of the first scientists to study climate change engineering, also known as geoengineering.

## Phil Heilberg

Phil Heilberg is an entrepreneur who is attempting to buy up massive amounts of farmland in war-torn Southern Sudan.

## Col. Pape Sarr

Col. Pape Sarr is an officer in Senegal's directorate of water and forests and an architect of the Great Green Wall designed to hold back the Sahara.





## **John Dickerson**

John Dickerson is founder and CEO of the Summit Global Management and a leading proponent of buying water as a commodity.

## **Chief Sam**

Chief Sam is the head of a for-profit fire fighting company. He introduces Funk to that concept.

## **Avraham Ophir**

Avraham Ophir is an Israeli scientist who has pioneered the process of desalination.

## **Mininnguaq Kleist**

Mininnguaq Kleist, or Minik, is head of the Office of Self-Governance who educates the author about the problems and opportunities global warming presents for Greenland.



# Objects/Places

## Northwest Passage

The Northwest Passage is the sea route through the Arctic Ocean. It connects the Atlantic and Pacific Oceans. While Canada owns the land on both sides of the passage, the United States and many other countries do not agree with Canada's assumption that it owns the waterway itself. Most of the world considers the Northwest Passage to be an international strait.

## Pitztal Valley, Austria

Pitztal Valley in Austria is the site of the Alps' most famous disappearing glacier.

## Greenland

Greenland is a country near the Arctic Circle that stands to benefit from climate change because as its ice melts, it gains more usable land.

## South Sudan

South Sudan is a war-torn African nation where many entrepreneurs are attempting to take advantage of the country's political and climate problems to make money.

## Great Green Wall

The Great Green Wall is a proposed barrier of trees that would stretch 4,700 miles long and be 10 miles wide, crossing 11 African countries from the Atlantic Ocean to the Arabian Sea. Its purpose would be to keep the sands of the Sahara from encroaching on more land and making it unfarmable.

## Malta

Malta is a country in southern Europe with a very large population density. Climate refugees coming from Africa often land there by mistake, resulting in a jail term of up to 18 months. The jail term is imposed because Malta cannot accommodate more people.

## Bangladesh

Bangladesh is a small country bordering India. It is in serious trouble because climate change is gradually causing increasing amounts of the land to go under water.

## **Netherlands**

The Netherlands is a low-lying European country that has long been a leader in finding ways to hold back encroaching water.

## **Key West**

Key West is the site of the first outbreak of potentially-deadly dengue fever in the United States.

## **Southern California**

Southern California is the site of increasingly devastating wildfires that are bringing the need for innovative firefighting techniques.



# Themes

## The Monetary Aspects of Climate Change

In *Windfall: The Booming Business of Global Warming*, McKenzie Funk takes a different slant on the effects of the issue by following the money. While he paints a clear picture of the geographical and physical changes caused by climate change, he focuses primarily on the business side of it.

In some cases, enterprising entrepreneurs are seizing opportunities to take advantage of unfortunate situations. One such case is that of a man who is buying up every scrap of available farmland in struggling South Sudan. It remains to be seen whether this will be a positive or negative development for the country's poor, war-ravaged people. Greenland is in a different situation. It is sitting on vast amounts of minerals that are becoming increasingly accessible as the country's ice cover melts. Russia is also discovering more available land for farming and industry.

Companies like Royal Dutch Shell must determine whether their biggest profits lie in working toward greener, more sustainable solutions or continuing to dig for oil at every opportunity. Countries like the Netherlands are taking advantage of Shell's expertise in dealing with too much water.

## Us Against Them

Since the geography of each country is different, climate changes have varying effects on different locations around the world. Funk points out the competitiveness it causes in some cases. He talks about "climate change refugees." They are being forced out of their homelands because jobs like fishing and farming no longer exist for them. Many are fleeing from parts of Africa, and they end up in European countries such as Spain. European countries, such as Spain, have their own economic problems.

Another situation is occurring in Malta. That country has a population so dense that it imprisons anyone who crosses its borders illegally before unceremoniously deporting them. In a more extreme case, India is building a high fence to separate it from Bangladesh, which it borders on three sides. This will prevent anyone in Bangladesh from crossing the border. The fence is considered necessary because Bangladesh is increasingly under water and out of options. Rather than bringing people together in a spirit of camaraderie and helpfulness, in some cases the specter of climate change is making enemies out of neighbors.

## Finding Solutions

While much of *Windfall: The Booming Business of Global Warming* is about turning global warming into a business, throughout the book is an underlying theme of finding



solutions and turning problems into opportunities. Israeli scientists are perfecting desalination techniques. New products are being developed to fight fires. The Netherlands is developing and sharing flood-fighting expertise. Climate genetics is working toward solutions for diseases like dengue fever, and geoengineering holds promise for actually changing the climate. Even unlikely ideas like the Great Green Wall demonstrate creative thinking about serious problems. Despite the glum picture painted by the book, it holds a great deal of hope that solutions do exist for some of the world's most serious problems.

# Styles

## Structure

Windfall: The Booming Business of Global Warming, by McKenzie Funk, opens with an Introduction. The book's main content is divided into three parts which include "Part One: The Melt," "Part Two: The Drought," and "Part Three: The Deluge." Each part is divided into four chapters. The chapters are numbered and titled. An Epilogue concludes the book.

"Part One: The Melt" includes Chapters 1-4. It focuses on situations in which global climate change is causing ice to melt in places like the Alps and the Arctic.

"Part Two: The Drought" contains Chapters 5-8. It discusses how drought is affecting various parts of the world.

"Part Three: The Deluge" contains Chapters 9-12. It focuses on rising sea levels and rainfall.

The book concludes with the author's Acknowledgements, Notes on Sources, and a detailed Index.

## Perspective

## Tone



## Quotes

Nothing as big and universal as climate change could be all bad. An ecological catastrophe was not necessarily a financial catastrophe for everyone.

-- Author (Introduction paragraph 1, Page 2)

**Importance:** The author is setting up his premise that as bad as climate change promises to be for millions of people all over the world, there are people who are poised to benefit from it financially.

Only Russia would say out loud what the other Arctic nations were beginning to recognize. 'Global warming is not as catastrophic for us as it might be for some other countries,' declared a spokesman for the Ministry of Natural Resources. 'If anything, we'll be even better off. More of Russia's territory will be freed up for agriculture and industry.

-- Author and Russian Spokesperson (Chapter 1 paragraph 1, Page 37)

**Importance:** This speaks to the concept that Greenland, Russia, and other Arctic countries stand to gain from global warming. As ice melts, more usable land will appear.

Oil companies are future oriented by their very nature. It takes decades to conduct seismic surveys, secure leases, drill test wells, hit pay dirt, find partners, erect rigs, start production, and suck a reservoir dry. At Shell, futurism became part of corporate identity.

-- Author (Chapter 2)

**Importance:** This introduces the author's account of Shell's extensive study of global warming before others got involved. It is also addressing Shell's Blueprints and Scramble scenarios.

Greenland had been a colony of Denmark for three centuries, and now it was on the verge of an oil and mineral boom that could help it become something else: the first country in the world created by global warming.

-- Author (Chapter 3 paragraph 2, Page 61)

**Importance:** This introduces the author's discussion of the benefits Greenland stands to gain as its ice continues to melt, as well as the political and financial issues this opens up.

If there's a market for anything," he said, "it's water. Nature is working for us. Nature is our best PR. Why? Because there is no water! Look at Cyprus. In Greece, it is the same. In Ivory Coast, no rain at all anymore. And I'm not talking about desert regions. I'm talking about places where they used to have a lot of water.

-- Etan Bar (Chapter 4 paragraph 5, Page 92)

**Importance:** This is a good example of the author's premise that there are people all



over the world actively looking to make a profit from the misfortunes caused by climate change.

If the first way to profit off climate change -- that found in the Arctic -- was to expand, to push into virgin lands and virgin resources, this was a new phase. The opportunity here was also a kind of growth, yes, but it was growth born of scarcity, of someone else's crisis -- the zero-sum economics of distress. For there to be winners, there also necessarily had to be losers.

-- Author (Chapter 5 paragraph 2, Page 102)

**Importance:** Using the example of firefighting, the author begins to explore the ways in which unscrupulous people and companies have begun to exploit climate change and its effects to make a profit.

We still have the exact same amount in our ecosphere," he continued, "but the ultimate effect of global warming is that percentage that is freshwater is getting smaller, the percentage that is salt water is getting larger, and the maldistribution of freshwater is getting much more severe.

-- John Dickerson (Chapter 6 paragraph 2, Page 119)

**Importance:** This succinctly explains the author's chapter focusing on water supply issues.

That water theft was being taken so seriously helped make sense of what else I was seeing in the world's most liberated water market. The idea that water could be stolen, like the idea that it could be bought and sold, was predicated on the increasingly accepted idea that it was something that could be owned in the first place.

-- Author (Chapter 6 paragraph 2, Page 135)

**Importance:** This concept speaks to the idea that water is increasingly becoming a valuable commodity as climate change moves forward.

Insofar as he believed in climate change, he believed in the effects, not the cause: the desertification and droughts and fights over water and land that only made his farmland investment smarter.

-- Author (Chapter 7)

**Importance:** This is used as an example of someone who is trying to profit from climate change without worrying about what causes it or what might be done to make the situation better.

The government framed the Great Green Wall as a matter of national survival. 'Rather than let the desert come to us,' said the minister of agriculture, 'we will take the fight to it.

-- Author and Unnamed Minister of Agriculture (Chapter 8 paragraph 1, Page 163)





**Importance:** This succinctly sums up the concept of the Great Green Wall and its purpose of stemming the infiltration of the Sahara into farmable land.

What Enamul wanted was a perfect fence, something that could keep the Bangladeshis out no matter how unlivable Bangladesh became. He had been a communications student when he first joined AASU, but like many people today he now approached social problems with the mentality of an engineer. The question was not what we could do but what we could build, and India's razor-wire-and-steel response to migration -- much blunter than Europe's varied responses to its African migrants -- seemed to me even more representative of what was beginning to happen in this third stage of climate distortion, as the world faced up to rising seas in addition to melt and drought. Walls. From here on, in one sense or another, this is what those of us who could afford them were engineering against climate change. Those who could not afford them would be stuck on the other side.

-- Author (Chapter 9 paragraph 2, Page 191)

**Importance:** This is a good example of one of the book's central themes. Rather than bringing people together to solve a problem that affects the entire world in some form or another, climate change is, in many cases, turning people against each other and bringing about an us-against-them mentality.

Advocates of geoengineering, or at least of geoengineering research, tend to fall into three categories: scientists deeply afraid of runaway climate change; free-market advocates deeply afraid of mandated carbon cuts; and the capitalists or philanthrocapitalists who sustain them both.

-- Author (Chapter 12 paragraph 2, Page 265)

**Importance:** This previews the author's upcoming discussion of the pros and cons of geoengineering.



# Topics for Discussion

## Epigrams

Choose an epigram used at the beginning of one of the three sections. Discuss how it relates to that section and why the author chose it.

## Shell's Scramble and Blueprints Scenarios

Discuss Shell's Scramble and Blueprints scenarios described in Chapter 2. What were the relative merits of each? Why did Shell eventually choose the route it took?

## Great Green Wall

Discuss the Great Green Wall described in Chapter 8. What was the thinking behind the concept? Why do many people think it is unlikely to be effective?

## Climate Change Refugees

What is a climate change refugee? Describe several areas in the world where this is a problem and discuss the reasons for it as well as what potential solutions exist.

## Bangladesh Four Horsemen

Describe the four horsemen of climate change affecting Bangladesh. What effect is each having on the country/ What steps are being taken to combat them?

## Comparing Bangladesh and the Netherlands

Bangladesh and the Netherlands are both low-lying countries profoundly affected by rising seas. What is different about them and how do they differ in their approaches to the problem?

## Global Warming and Disease

Discuss the connection between global warming and disease. Why is this particularly concerning for third world countries?



## **Greenland's Choices**

Discuss the various issues facing Greenland as a result of its melting ice cover. What does the country stand to gain and lose? Why is independence a controversial issue among its people?

## **Fighting Fire**

Why has the issue of private fire-fighting companies been raised in Southern California? What problems are they solving? What problems are they causing?

## **Geoengineering**

Discuss the pros and cons of geoengineering as described in the book's final chapter. Why does the author consider it the solution to global warming? Do you agree? Why or why not?