RECORDS OF CHEMICAL SCIENCES

Study Exploring the Key Challenges of Climate Change and Its Effects on Fisheries: A Review.

Accepted: 07th March., 2025
Published: 25th March, 2025

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https://doi.org/10.33003/frscs_2025_0401/08

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FRsCS Vol.4 No. 1 (2025)
Official Journal of Dept. of Chemistry, Federal University of Dutsin-Ma, Katsina State.
ps://rscs.fudutsinma.edu.ng/index.php

ISSN (Online): 2705-2362
ISSN (Print): 2705-2354

Abstract

Climate change is undoubtedly a defining feature of this century, yet it is often attributed to human activity in ways that may not accurately reflect reality. This paper challenges the dominant narrative, arguing that global warming and climate shifts are natural occurrences in Earth's history and not solely driven by human actions. It suggests climate change policies impose unnecessary economic burdens on nations and hinder technological progress. The paper scrutinizes scientific claims of human-induced climate change, highlighting instances of manipulated data and selective presentation that reinforce the idea of an impending global disaster. The effects of climate change on fisheries and aquaculture are complex, influencing ecosystems, economies, and communities worldwide. Addressing these challenges necessitates coordinated global efforts to mitigate climate change, implement sustainable practices, and invest in innovative solutions. The focus on reducing greenhouse gas emissions is criticized for leading to expensive and ineffective measures, ultimately hindering economic growth and job creation. This study questions the prevailing discourse surrounding climate change, the challenges fisheries face, and the socio-economic issues linked to climate migration. It advocates for a more nuanced understanding that considers historical climate variations and calls into question the validity of current research methodologies, encouraging a thorough exploration of the complex dynamics and potential societal impacts of climate change.

Keywords: Climate Change, Exaggeration, Fisheries, Global Warming, Greenhouse gases

Introduction

Climate change has emerged as a significant concern in recent decades, with many people believing it is primarily caused by human activities. Climate change refers to the long-term alterations in the Earth's average climate, including temperature, precipitation, wind patterns, and other factors (FAO, 2022). The primary drivers of climate change are human activities, particularly the burning of fossil fuels and deforestation, which release substantial amounts of greenhouse gases into the atmosphere (Magawata and Ipinjolu, 2013 & IPCC, 2001). These gases, such as carbon dioxide and methane, trap heat from the sun and prevent it from escaping back into space, resulting in a warming effect known as the greenhouse effect. The impacts of climate change on fisheries are pivotal to understanding the future of marine ecosystems and food security. Multiple studies illuminate the intricate mechanisms through which climate change threatens fisheries and aquaculture, reflecting a consensus that without intervention, global fish stocks are at risk of severe declines. Notably, Liu et al. (2021) and Nababa et al., 2020 conducted a systematic review and meta-analysis of climate change research and traditional ecological knowledge related to Philippine fisheries and Nigerian fishers, revealing that 56% of the reviewed studies focused primarily on impact assessments, identifying significant gaps in adaptive management and stakeholder engagement.

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Introduction

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In a parallel investigation, Neokye et al. (2024) focused on oyster aquaculture and elaborated on the multitude of stressors from climate change, including temperature rise, ocean acidification, and increased salinity. They systematically reviewed data concerning the threats posed to oyster production globally, calling attention to how these factors not only jeopardize marine species but also threaten the livelihoods dependent on them. Their findings indicate critical gaps in research focused on long-term trends and cumulative effects, suggesting a need for comprehensive, integrated assessments of climate change that encompass both ecological and socio-economic variables.

Crucially, the 2023 report by Romanello et al. (2023) extends the inquiry into health implications due to climate-induced changes in fisheries. The research positions human health critically within the climate change dialogue, signaling how disruptions in fish stocks could exacerbate food insecurity and nutritional deficits, particularly in marginalized populations reliant on fisheries for sustenance. This multi-dimensional approach advocates for aligning climate mitigation strategies with public health imperatives, urging cohesive policy frameworks that encompass environmental health, occupational safety, and food security (Magawata and Ipinjolu., 2013).

The consequences of climate change are far-reaching and include rising sea levels, more frequent and severe natural disasters, changes in ecosystems and biodiversity, and impacts on human health and well-being. To fully understand the issue of climate change, it is essential to examine the background information and various perspectives related to it (IPCC, 2014).

However, upon reevaluating the evidence and considering alternative viewpoints, it's important to recognize that climate change is not solely driven by human factors (Karl & Trenberth, 2003; Idris et al 2023). This paper challenges the prevailing narrative surrounding climate change and explores the argument that global warming and climate shifts are inherent to the Earth's history rather than primarily the result of human activities. It critically examines the research supporting anthropogenic climate change, raising concerns about manipulated data, biased methodologies, and political agendas (Hegerl et al., 2019).

Furthermore, the paper argues that climate change policies can impose unnecessary economic burdens on nations and hinder technological advancement. It emphasizes the need for a comprehensive understanding of the physics of climate and climate change, presenting this information in an accessible manner for the general public. Fortunately, continuous advancements in computer hardware and software are enabling researchers to tackle these optimization challenges using computational resources applicable to the renewable and sustainable energy sectors. Reevaluating the issue of climate change requires a thorough examination of its dynamics and impacts, considering alternative viewpoints and critically analyzing the research that supports anthropogenic climate change. Climate change has increasingly become a critical concern in recent decades, capturing the attention of scientists, policymakers, and the public alike (Nababa, et al., 2020 &

Sadauki et al., 2024). There is a widespread belief that human activities are the primary drivers of these changes. At its core, climate change refers to the long-term shifts in the Earth's average climate, manifesting through alterations in temperature, precipitation patterns, wind behaviors, and various other environmental factors.

Human actions, particularly the combustion of fossil fuels and widespread deforestation, play a significant role in this phenomenon. These activities release vast quantities of greenhouse gases like carbon dioxide and methane into the atmosphere (Nababa, et al., 2020 & Sadauki et al., 2024). These gases act like a blanket, trapping heat from the sun and preventing it from radiating back into space, which leads to a warming effect commonly referred to as the greenhouse effect.

The repercussions of climate change are extensive and multifaceted. They include rising sea levels that threaten coastal communities, an increase in the frequency and intensity of natural disasters such as hurricanes and floods, shifts in ecosystems that jeopardize biodiversity, and serious implications for human health and well-being. Understanding climate change requires a thorough examination of the rich background information and diverse perspectives that shape the conversation around it (IPCC, 2014).

However, a closer analysis of the existing evidence reveals the necessity of considering alternative viewpoints. Some experts argue that climate change is not solely a product of human influence (Karl & Trenberth, 2003). This paper seeks to challenge the dominant narrative, positing that global warming and climatic variations are part of a natural cycle inherent to Earth's history rather than being predominantly driven by anthropogenic activities. It undertakes a critical examination of the research supporting the concept of human-caused climate change, raising concerns about potential data manipulation, biased methodologies, and political motivations affecting the scientific discourse (Hegerl et al., 2019).

Additionally, the paper highlights the potential economic impacts of climate change policies, suggesting that while these measures are well-intentioned, they can impose unnecessary burdens on nations and slow technological innovation. It is crucial to cultivate a deeper understanding of the fundamental principles of climate and climate change, making this important information more accessible to the general public (Sadauki et al., 2024). Fortunately, ongoing advancements in computer technology are equipping researchers with enhanced computational resources to address these complex challenges, especially within the realms of renewable and sustainable energy.

Reevaluating the climate change discourse necessitates a careful exploration of its dynamics and impacts, encouraging a robust consideration of alternative perspectives alongside a critical analysis of the research that underpins the notion of human-driven climate change.

Key Characteristics of Climate Change:

Global Warming: An increase in average global temperatures caused by higher concentrations of greenhouse gases (GHGs).

Ocean Changes: Variations in ocean temperature, increased acidity (known as ocean acidification), and shifts in circulation patterns.

Weather Extremes: A rise in the frequency and intensity of extreme weather events, such as storms, droughts, and heatwaves.

Sea Level Rise: The melting of ice caps and glaciers, along with the thermal expansion of seawater, leads to rising sea levels.

Climate Change and Marine Ecosystems

Climate change has profound effects on marine ecosystems which comprises of the following;-

(i) Ocean warming; rising sea temperatures causes habitat shifts, migration of fish species to cooler waters, and loss of biodiversity. Species adapted to specific thermal ranges may face extinction.

(ii) Ocean acidification: Increased carbon dioxide absorption by oceans lowers pH levels, weakening shell-forming organisms like mollusks and coral reefs, which are crucial for maintaining marine biodiversity.

(iii) Sea-level rise and habitat loss: Coastal habitats, including mangroves and estuaries, are at risk, affecting breeding and nursery grounds for many fish species.

Shifts in fish distribution: Traditional fishing areas may become less productive as fish migrate toward the poles or deeper waters, impacting the livelihoods of fishing communities.

(iv) Reduction in fish stocks: Overfishing combined with climate-induced stresses reduces the resilience of fish populations, leading to declining stocks and economic losses (Nababa et al., 2022).

(v) Altered Ecosystems: Changes in temperature and precipitation patterns affect freshwater systems and estuaries, altering fish productivity. Eutrophication and oxygen depletion ("dead zones") can harm fish habitats.

(vi) Extreme weather events: Storms, hurricanes, and cyclones disrupt fishing operations and destroy infrastructure, leading to reduced productivity and increased risks to fisher folk.

Socioeconomic Implications

(i) Food security risks: Fish is a primary source of protein for billions worldwide. Declining fisheries and aquaculture output could exacerbate food insecurity in vulnerable regions.

(ii) Livelihood disruptions: Coastal and rural communities that depend on fisheries face job losses, reduced income, and increased poverty.

(iii) Economic impacts: Climate change affects international trade and export revenues for countries reliant on fisheries and aquaculture.

(iv) Cultural Impacts: Coastal and fishing communities often have deep cultural ties to fishing practices, which are threatened by changing marine ecosystems.

Mitigation and Adaptation Strategies

Sustainable fisheries management is crucial for our oceans' future. By implementing quotas, creating marine protected areas, and fostering community-based management, we can significantly enhance the resilience of our marine ecosystems.

Let’s take action for sustainable seas.

i. Climate-resilient aquaculture practices: Adopting technologies like recirculating aquaculture systems (RAS) and selective breeding of climate-tolerant species can improve sustainability.

ii. Policy interventions: Governments and international bodies must collaborate on climate adaptation strategies, including financial support for affected communities and research funding.
iii. Aquaculture Innovation: Develop temperature- and disease-resistant species. Promote integrated multi-trophic aquaculture (IMTA) to improve resource efficiency and ecosystem health.
iv. Habitat Protection and Restoration: Protect critical habitats like mangroves, coral reefs, and wetlands to buffer against climate impacts.
v. Early Warning Systems: Establish systems to predict extreme weather events and changes in fish migration patterns.
vi. Community Empowerment: Support local communities through education, diversification of livelihoods, and access to technology and resources.
vii. Reduction of Greenhouse Gas Emissions: Transition to low-carbon technologies in fisheries and aquaculture operations (e.g., renewable energy, efficient gear).

An additional layer is added through Wanner et al. (2022) overview of "Mid-to Late Holocene climate change" which challenges assumptions that recent changes are solely attributable to human activities. The exploration extends into societal dimensions, with Danilo Brozović's review of "Societal collapse" which contemplates potential socio-economic repercussions of climate change, considering how environmental disruptions may contribute to societal vulnerabilities. The intertwining of political dynamics and climate change policies is explored through Danny Osborne and Chris G. Sibley's "The Cambridge Handbook of Political Psychology." It scrutinizes the role of political considerations in shaping climate-related policies, unveiling potential biases and distortions.

The psychological motivators behind environmental activism are examined through Sarah E.O. Schwartz et al.'s study on "Climate change anxiety and mental health" which explores how heightened awareness influences individuals' behaviors, shaping broader societal responses through activism. Hannes Zacher's exploration of "The dark side of environmental activism" injects a note of caution into our analysis. By delving into potential drawbacks and unintended consequences associated with fervent environmental activism, it encourages a more balanced evaluation of activism's role in addressing climate change. In exploring this unconventional perspective, we draw inspiration from Jerome R. Corsi's "The Truth about Energy, Global Warming." Corsi's critical examination forms the foundation, encouraging us to question the scientific basis underpinning anthropogenic climate change. By scrutinizing data accuracy, methodologies, and potential political influences, this section establishes a framework for a more discerning analysis of climate science.

Historical Perspectives on Climate Change

Understanding and studying the historical perspective on climate change is crucial in comprehending the complexity of this global issue. One key aspect to consider is the occurrence of natural climate variations throughout history. Historical climatology provides evidence of significant climate fluctuations over long periods, demonstrating that climate change is not solely a modern phenomenon. Researchers have analyzed various proxies, such as ice cores, tree rings, and sediment records, to reconstruct past climate patterns and understand their drivers. For instance, the Medieval Warm Period between the 9th and 13th centuries saw a comparatively warmer climate, followed by the Little Ice Age from the 14th to the 19th centuries characterized by colder temperatures.

The Earth's climate has varied greatly over its geological history, marked by cycles of glacial (cold) and interglacial (warm) periods that extend over hundreds of thousands of years (Clark et al., 2012). These changes have been largely driven by a variety of natural factors, including but not limited to, variations in solar radiation, volcanic eruptions, shifts in ocean currents, and changes in the Earth's orbit and tilt, which affect the distribution and intensity of sunlight received by the planet (Milankovitch, 1941; Sigman & Boyle, 2000).

During the ice ages, large parts of the Earth were covered by thick ice sheets, and these were interspersed with warmer interglacial periods. We are currently living in an interglacial period known as the Holocene epoch, which began approximately 11,700 years ago following the end of the last glacial period (Petit et al., 1999). One of the warm phases within the Holocene, often referred to as the Holocene optimum, occurred roughly between 9,000 and 5,000 years ago (Alley et al., 2003). During this time, global temperatures were somewhat warmer than they are today, which contributed to a stable climate that allowed human civilizations to thrive and expand. One of the most revealing of these proxies is found in ice core records. Ice cores are extracted from the polar ice sheets of Greenland and Antarctica, as well as from mountain glaciers elsewhere. These cores provide a detailed and continuous record of ancient climates, containing tiny air bubbles that are essentially time capsules of the Earth's atmosphere, trapping gases from thousands of years ago (EPICA Community Members, 2004). By analyzing the chemical composition of these trapped gases, scientists can deduce the concentrations of atmospheric constituents like carbon dioxide and methane at various points in the past (Smith et al., 2010). Moreover, the isotopic ratios of hydrogen and oxygen in the water molecules that make up the ice can be used to infer past temperatures (Jouzel et al., 2007). These data clearly illustrate a relationship between greenhouse gas concentrations and global temperatures over geological timescales.

Beyond ice cores, dendrochronology and sediment analysis provide important insights into Earth's climatic history. Dendrochronology, or tree-ring dating, enables researchers to reconstruct past climates based on the understanding that tree growth is influenced by climatic conditions. Each tree ring represents one year of the tree's life, and the thickness of each ring indicates the growth rate for that year (Fritts, 1976). By comparing growth patterns in trees from different periods or regions, scientists can create a picture of past climate conditions. Similarly, sediment analysis reveals information about temperature, precipitation, and the types of vegetation that dominated landscapes at different times, as sediments can contain fossils, pollen, and other materials (Hansen et al., 2013).

Together, these methods illustrate the dynamic nature of Earth's climate, which has experienced both gradual shifts and abrupt transitions. The geological record indicates that Earth's climate has never remained static, with natural factors contributing to periods of warming and cooling long before humans significantly impacted the planet (Broecker, 1987). These historical variations enhance our understanding of climate dynamics and the role of natural processes in shaping Earth's climate system. By studying past periods of warming and cooling, scientists can distinguish between natural climate variations and the human-induced changes observed in recent years (James Rodger Fleming, 2005-07-14).

Throughout Earth's history, carbon dioxide (CO2) levels in the atmosphere reached up to 4,000 ppm approximately 500 million years ago during the Cambrian period. Conversely, during the Quaternary glaciation within the past two million years, CO2 levels dropped to as low as 180 ppm. Temperature records spanning the last 420 million years show that atmospheric CO2 concentrations peaked at about 2,000 ppm during the Devonian period (around 400 million years ago) and the Triassic period (220–200 million years ago). During the Jurassic period (201–145 million years ago), CO2 levels were four times higher than today's levels. It would not be inaccurate to suggest that the current cycle of climate change is merely a natural occurrence in Earth's history.

Overview of the Carbon Dioxide Theory of Climate Change

The carbon dioxide theory of climate change states that rising atmospheric CO2 levels primarily drive global warming. The burning of fossil fuels releases significant CO2, creating a greenhouse effect that increases Earth's temperature. This theory is backed by empirical evidence showing the correlation between CO2 levels and global temperatures over the past century, as well as predictions from climate models. While other factors like volcanic activity and solar radiation can influence climate, the overwhelming consensus is that human-induced greenhouse gas emissions are the main cause of current climate change.

Since the late 19th century, scientists have recognized CO2's potential impact on climate, with the theory gaining support in the 20th century. However, some scientists have questioned the evidence and proposed alternative explanations, such as natural climate variability. Despite these alternative views, the majority of climate experts agree that human activities, particularly fossil fuel combustion, are the primary drivers of climate change, as reinforced by the IPCC reports and extensive scientific research.

Temperature records indicate a consistent increase in global temperatures, supported by melting glaciers and rising sea levels.

The consensus among climate scientists highlights the urgent need for action to mitigate climate change's impacts on our planet.

Some theories propose solar variability as a significant driver, suggesting that changes in solar radiation output, particularly sunspot activity, could correlate with climatic fluctuations (Lockwood & Fröhlich, 2007). Volcanic activity is also cited, as major eruptions emit aerosols and gases that can lead to short-term global cooling by reflecting sunlight; however, such activity does not account for the sustained warming trend observed in recent decades (Robock, 2000). Milankovitch cycles, the long-term changes in Earth's orbital parameters, are recognized for their role in initiating ice ages and interglacial periods but occur over tens of thousands to hundreds of thousands of years, making them an implausible explanation for the rapid warming since the industrial revolution (Hays, Imbrie, & Shackleton, 1976). Ocean currents and their variability, including phenomena like the El Niño-Southern Oscillation, can cause significant regional and short-term global climate variations, but these do not explain the consistent upward trend in atmospheric warming. Theories concerning natural fluctuations in greenhouse gas concentrations, such as those arising from geologic or biological processes, fail to coincide with the marked increase in emissions post-industrialization, which is closely linked to human activities like fossil fuel combustion and deforestation. Hypotheses around cosmic rays suggest that these high-energy particles could influence cloud cover and climate; however, empirical evidence for this mechanism remains sparse and contested within the scientific community (Svensmark, 1998).

Lastly, internal climate variability, such as the Pacific Decadal Oscillation or the Atlantic Multidecadal Oscillation, indeed contributes to weather and climate patterns but does not suffice to explain the long-term global temperature rise. While these natural factors undeniably play a role in climate variability, the overwhelming scientific consensus, as outlined by the Intergovernmental Panel on Climate Change (IPCC), is that the pronounced increase in global temperatures in recent history is primarily due to anthropogenic factors, primarily the surge in greenhouse gas concentrations from human activities (IPCC, 2013).

Societal Collapse as a Potential Consequence of Climate Change

One potential consequence of climate change is the collapse of societies as we know them. The effects of climate change such as rising sea levels, extreme weather events, and food shortage can lead to social unrest, political instability, and economic decline. Societies that heavily rely on industries vulnerable to climate change, such as agriculture and tourism, are particularly at risk. For example, small island nations, coastal cities, and regions reliant on agriculture may face significant challenges in adapting to the changing climate. The collapse of societies due to climate change can result in the displacement of large populations, increased conflict over resources, and heightened inequality. Policymakers and society as a whole need to acknowledge and address these potential consequences to mitigate the impacts of climate change.

Research shows a strong connection between concerns about climate change and increased psychological distress, anxiety, and depression. The overwhelming sense of worry and helplessness many individuals feel when confronted with the reality of climate change can significantly affect mental well-being. This relationship underscores the need for comprehensive strategies and support systems to address the psychological toll of climate change on individuals and communities. By recognizing and addressing the negative emotions associated with climate change, mental health professionals and policymakers can work towards building resilient communities and enhancing overall well-being in the face of this global challenge. (Inka Weissbecker, 2011-08-04)

The role of environmental activism in mitigating climate change anxiety is multifaceted and complex. On one hand, environmental activism is crucial for raising awareness about the urgency and severity of climate change. This awareness can help alleviate anxiety by empowering individuals with a sense of agency and purpose in tackling the issue. Activism often involves advocating for policy changes, organizing protests and demonstrations, and promoting sustainable practices in daily life. These actions not only contribute to tangible solutions for addressing climate change but also create a sense of community and solidarity among activists, providing emotional support and reassurance in the face of anxiety.

On the other hand, environmental activism can also contribute to climate change anxiety by highlighting the dire consequences and uncertain future that our planet faces. Constant reminders of environmental degradation and the overwhelming nature of the problem can exacerbate anxiety levels, particularly among those already predisposed to anxiety disorders. Therefore, environmental activists need to strike a balance in their messaging and approach, offering hope and actionable solutions while also acknowledging the gravity of the situation. A comprehensive understanding of the role of environmental activism is essential for effectively addressing climate change anxiety and paving the way for a sustainable future. (Inka Weissbecker, 2011)

Exaggerations of the Effects of Climate Change

The troposphere is the Earth's dynamic climate zone, extending from the surface to about 40,000 feet. It is deeper where the air is warm, such as in the tropics, and shallower at higher latitudes. All notable storms from massive winter tornadoes to summer rainstorms occur within the troposphere.

Examining temperatures in the troposphere versus those at the surface is beneficial because rain and snow are often influenced more by the temperature differences between the surface and the mid-troposphere. When there is little temperature contrast, discussion within the lower atmosphere does not rise, which means that the vertical movement needed to create clouds is absent. Conversely, when there is a significant temperature difference, the moisture-laden air near the surface becomes highly buoyant, leading to severe rainfall events.

Pat Michaels and Chip Knappenberger have done considerable work in this field. The anthropogenic impact on the earth's climate specifically through emanations of greenhouse gases is close to the moo conclusion of the "mainstream" (e.g., IPCC) evaluated run of impact, and the models created to recreate the behavior of the earth's climate have for the most part overestimated the impact of anthropogenic greenhouse gas outflows. A major portion of the reason that climate models run as well hot is that the earth's harmonious climate affectability is considerably less than depicted by the climate models. Very few realize that the watched warming rate has been beneath the show's cruel desire for periods expanding back to the mid-20th century for a long time. They illustrated with their comparison of the watched warming rate to that of the run of climate model-predicted warming rates for all periods from 1951 finishing with the foremost later accessible information. Amid all periods from 10 years (2006-2015) to 65 (1951-2015) a long time in length, the watched temperature drift lies in the lower half of the collection of climate show reenactments, and for a few periods, it lies exceptionally near (or indeed underneath) the 2.5th percentile of all the show runs. Over shorter periods, such as the final two decades, plenty of instruments have been put forth to clarify the modeled divergence, but none do so totally, and numerous of the clarifications are conflicting.

If this is often not solid proof that the climate models foresee as well much warming, there's an extra comparison that can be made, one which is to a great extent free from the inspecting issues raised above an examination of the climate demonstrates behavior in the mid-troposphere. It is in this parcel of the free air where the climate models venture that the temperature (all-inclusive) ought to warm most quickly as the concentration of carbon dioxide grows. One other exceptionally empowering result, utilizing the toady and swell information, is that the watched patterns are very flat, meaning that they are steady, not one or the other expanding nor diminishing depending upon the length of the record. Greenhouse material science predicts this, so what we are seeing may exceptionally well in truth be the greenhouse-gas-generated reaction, not arbitrary noise. It is basically that the rate of warming is distant from what has been estimated.

The amount of that over-prediction comports well with a developing body of logical discoveries and developing understanding that the affectability of the earth's surface temperature to rising air greenhouse gas levels as specifically decided from observations lies towards (and however inside) the moo conclusion of the standard (IPCC AR5) surveyed likely to run. Since 2011, at least 14 ponders distributed within the peer-reviewed scientific literature provide solid proof that the balance climate affectability (ECS) how much the earth's normal surface temperature will rise beneath a multiplying of the air carbon dioxide concentration lies close to the moo conclusion of the IPCC gauges. This later inquiry incorporates examinations of the earth's thermal response to changes in climate elements that have taken over the past century, thousand years, and over frosty periods.

A few of these investigative discoveries were distributed ensuring the 2013 discharge of the IPCC's Fifth Appraisal Report (AR5), and in this way were not included in that Evaluation. Others were considered within the IPCC AR5, and still others were overlooked. And whereas the IPCC AR5 did reflect some influence on these modern moo ECS estimates by growing its "likely" run of ECS estimates downward to incorporate 1.5°C (the low end was 2.0°C in the 2007 IPCC Fourth Evaluation Report) and excluding a "best estimate" esteem (which had already been given as 3.0°C within the 2007 report) it still obstinately held on to its tall conclusion "likely" appraise of 4.5°C. This was an injury to the most recent science but was a vital step to protect the IPCC's reliance on climate projections made by models with an ECS averaging 3.2°C and extending from 2.1°C to 4.7°C.

Political and Psychological Factors Affecting Climate Change Concerns

Another significant aspect of climate change concern is the influence of political and psychological factors. Politically, the level of concern for climate change varies across nations and is often related to the nation's policies and political leaders. In countries where climate change mitigation is prioritized by the government, such as Sweden and Germany, the level of concern among citizens tends to be higher. Conversely, in nations where climate change is not a major political agenda, the level of concern may be relatively lower. Additionally, psychological factors play a role in shaping climate change concerns. Research has shown that personal experiences with extreme weather events, such as hurricanes or droughts, can increase an individual's concern for climate change. Furthermore, social and cultural factors, such as social norms and values, can also influence the level of concern individuals have for climate change. These political and psychological factors highlight the complexity of climate change concerns and the need for multidisciplinary approaches to address them effectively. (Susan Clayton, Christie Manning, 2018)

Political psychology is a field that examines how individuals' psychological processes influence their political beliefs and behaviors. In the context of climate change, political psychology is relevant because it helps explain why individuals hold different attitudes and perceptions toward this global issue. Research in political psychology has identified several factors that contribute to the formation of beliefs about climate change, such as political ideology, preexisting values, and social identity. Political psychology also explores the role of emotions and cognitive biases in shaping climate change attitudes. Understanding the psychological underpinnings of climate change beliefs can inform the development of effective communication strategies and policy interventions aimed at addressing this pressing issue. (Jon et al., 2016)

In climate science, potential biases such as confirmation bias and echo chambers can influence research and discourse. Confirmation bias occurs when researchers or individuals favor information that confirms their existing beliefs about climate change, potentially leading to the overlooking of contradictory evidence. This bias can shape the interpretation and communication of data, thereby affecting the overall understanding of climate phenomena. Furthermore, echo chambers can develop within the scientific community, where individuals predominantly interact with those who share similar views. This can reinforce existing beliefs and potentially exclude dissenting perspectives.

The darker aspects of environmental activism have significantly impacted public perception of climate change. While environmental activists play a crucial role in raising awareness and advocating for positive change, there are instances where their methods and messaging can be counterproductive. Some environmental activist groups have been involved in illegal activities, such as vandalism or sabotage, which can damage their credibility. These negative incidents can overshadow the genuine concerns and efforts of the larger environmental movement, contributing to a divide in public opinion. To effectively address climate change concerns and build public support, environmental activists must prioritize transparency, credibility, and constructive dialogue.

The Importance of Critical Assessment in Addressing Climate Change

Critical assessment plays a vital role in tackling climate change. By thoroughly analyzing data, evaluating strategies, and questioning existing practices, we can develop more effective solutions to this pressing global issue. It is essential to remain vigilant and critical in our approach, ensuring that our actions are based on sound evidence and realistic assessments of their potential impacts. This way, we can better address the challenges posed by climate change and work towards a sustainable future. Emphasizing critical assessment in addressing climate change is vital for effective decision-making and policy development. It enables the evaluation of scientific evidence, helping us distinguish fact from opinion and identify biases. This evaluation leads to informed choices and strategies grounded in sound scientific knowledge. Such an approach ensures our actions are evidence-based, promoting transparency, accountability, and collaboration toward a sustainable future.

A different approach to climate change that emphasizes adaptation and market mechanisms can drive technological innovation and economic growth. Instead of viewing mitigation as a burden, it can be seen as an economic opportunity to stimulate advancements and create new industries.

By setting ambitious emissions reduction targets, governments can boost demand for low-carbon technologies and encourage private sector investment in research and development. This could lead to breakthroughs in renewable energy and carbon capture technologies. Additionally, policy tools like carbon pricing can make cleaner alternatives more financially attractive, fostering competition and innovation among businesses. This competition can reduce costs and improve efficiency, making low-carbon solutions more accessible and promoting economic growth.

Moreover, adaptation strategies also present economic opportunities. By investing in infrastructure that is resilient to climate change, there is an opportunity not only to protect existing assets but also to build new, more efficient, and sustainable ones. Infrastructure projects, such as coastal defenses and upgraded urban designs, can generate employment and drive economic activity. Additionally, developing climate-resilient crops and agricultural practices can open up new areas for investment and innovation in the biotechnology sector.

There is a need to acknowledge the urgent need for further research and collective efforts to tackle this global crisis. Although we have substantial knowledge about climate change, there is still much to explore, understand, and apply. By encouraging interdisciplinary collaborations, investing in research and development, and establishing strong monitoring systems, we can gain deeper insights into the complex dynamics of climate change and its effects on various societal and environmental aspects. Governments, policymakers, scientists, and citizens need to unite in addressing this pressing issue.

Conclusion

Fisheries are profoundly affected by climate change through several mechanisms, including temperature changes, ocean acidification, and alterations to food webs. Some researchers argue that the impacts of climate change are overstated and that human activities have a limited effect on global temperatures. However, a significant body of scientific evidence supports the existence of anthropogenic climate change and emphasizes the need for action. The consequences of climate change are observable through rising temperatures, melting ice caps, and increasing frequency of extreme weather events especially in the tropical regions. If these issues remain unaddressed, the anticipated effects are projected to become more severe in the future.

Recommendation

Climate change requires policymakers, businesses, and individuals to take proactive measures, such as transitioning to renewable energy, implementing sustainable practices, and adopting climate-friendly policies, to mitigate its effects.

References:

Acemoglu, D., Aghion, P., Bursztyn, L., & Hemous, D. (2012). The Environment and Directed Technical Change. American Economic Review, 102(1), 131-66.

Alley, R. B., Marotzke, J., Nordhaus, W. D., Overpeck, J. T., Peteet, D. M., Pielke, R. A., ... & Webster, P. J. (2003). *Abrupt climate change*. Science, 299(5615), 2005-2010.

Amina, A.I; Ali, A., Mahmud, I.D., Muhammad, S.S., Sufiyyanu, S., and Aminu, N. (2024). Perceived effects of climate chang on farmers livelihood in North Western Nigeria. *International Journal of Environment, Agriculture and Biotechnology* 9(3) https://ijeab.com DOI:10.22161/ijeab

Bernauer, T. (2003). Genes, Trade, and Regulation. Princeton University Press.

Berner, R.A., and Zavareth K. (2001) GEOCARB III: a revised model of atmospheric CO2 over Phanerozoic time. *American Journal of Science* 301.2 (2001): 182-204.

Bird, A. (2009). Red Herrings and Global Warming. Publish America Incorporated.

Broecker, W. S. (1987). Unpleasant surprises in the greenhouse? *Nature*, 328(6126), 123-126.

Brozović, D. (2023). Societal collapse: A literature review. Futures, 145, 103075.

Clark, P. U., Archer, D., Pollard, D., Blum, J. D., Rial, J. A., Brovkin, V. & Ganopolski, A. (2012). The Last Glacial Maximum. Science, 325(5941), 710-714.

Clayton, S., & Manning, C. (2018). Psychology and Climate Change. Academic Press.

Corsi, J. R. (Year). The Truth about Energy, Global Warming. Publisher.

Dascal, M., & Boantza, V. D. (2011). *Controversies within the scientific revolution*. John Benjamins Publishing.

Earth.org. (2020) A Brief History of CO2. Earth.org. https://earth.org/data_visualization/a-brief-history-of-co2/

Engelhardt, E. K. (2022). The 'overlooked' riverine cichlids of Southern-Central Africa and their role in seeding the adaptive radiations of the African Great Lakes.

EPICA Community Members. (2004). Eight glacial cycles from an Antarctic ice core. Nature, 429(6992), 623-628.

Fleming, R. J. (2019). Creation of the Universe.

Fleming, R. J. (2019). The Rise and fall of the Carbon Dioxide Theory of Climate Change. *Springer*.

Fritts, H. C. (1976). *Tree rings and climate*. Academic Press.

Ghezelbash, A., Khaligh, V., Fahimifard, S. H., & Liu, J. J. (2023). A Comparative Perspective of the Effects of CO2 and Non- CO2 Greenhouse Gas Emissions on Global Solar, Wind, and Geothermal Energy Investment.

Hansen, J., Sato, M., Russell, G., & Kharecha, P. (2013). *Climate sensitivity, sea level, and atmospheric carbon dioxide*. Phil. Trans. R. Soc. A, 371(2001), 20120294.

Hays, J. D., Imbrie, J., & Shackleton, N. J. (1976). Variations in the Earth's Orbit: Pacemaker of the Ice Ages. Science, 194(4270), 1121-1132.

Howells, W. D. (1883). *A Foregone Conclusion. Edinburgh*: D. Douglas.

Intergovernmental Panel on Climate Change. (2023). Climate Change 2021 – The Physical Science Basis.

IPCC (Intergovernmental Panel on Climate Change. (2014). Fifth Assessment Report.

IPCC. (2014). Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II, and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. IPCC.

Jouzel, J., Vaikmae, R., Petit, J. R., Martin, M., Duclos, Y., Stievenard, M., & Silberzan, P. (2007). The two-step shape and timing of the last deglaciation in Antarctica. Climate Dynamics, 29(3), 397-412.

Kaufman, D., & Broadman, E. (2023). Revisiting the Holocene global temperature conundrum, 614, 425-435.

Kingsnorth, P. (2017). Confessions of a Recovering Environmentalist and Other Essays.

Krosnick, J. A., Chiang, I. A., & Stark, T. H. (2016). *Political Psychology*. Psychology Press.

Liu JM, Borazon EQ, Muñoz KE. 2021. Critical problems associated with climate change: a systematic review and meta-analysis of Philippine fisheries research. *Environmental Science and Pollution Research*, DOI: 10.1007/s11356-021-15712-6, PMID: 34345986, PMCID: PMC8330821.

Lockwood, M., & Fröhlich, C. (2007). Recent oppositely directed trends in solar climate forcings and the global mean surface air temperature. *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 463(2086), 2447-2460.

Milankovitch, M. (1941). *Canon of insolation and the ice-age problem*. Zavod za Udzbenike i Nastavna Sredstva.

Neokye EO, Wang X, Thakur KK, Quijon P, Nawaz RA, Basheer S. 2024. Climate change impacts on oyster aquaculture - Part I: Identification of key factors. *Environmental Research*, DOI: 10.1016/j.envres.2024.118561, PMID: 38437901.

Ogunbode, C. A., et al. (2021). Negative emotions about climate change are related to insomnia symptoms and mental health: Cross-sectional evidence from 25 countries. Current Psychology, 1-10.

Osborne, D., & Sibley, C. G. (Eds.). (2022). The Cambridge handbook of political psychology. Pat Michaels & Chip Knappenberger, Climate models versus climate reality, https://judithcurry.com/2015/12/17/climate-models-versus-climate-reality/

Petit, J. R., Jouzel, J., Raynaud, D., Barkov, N. I., Barnola, J.-M., Basile, I., and Stievenard, M. (1999). Climate and atmospheric history of the past 420,000 years from the Vostok ice core, Antarctica. *Nature*, 399(6735), 429-436.

Reimers, F. M. (2020). Education and Climate Change. *Springer Nature*.

Robock, A. (2000). Volcanic eruptions and climate. Reviews of Geophysics, 38(2), 191-219.

Romanello M, Napoli CD, Green C, Kennard H, Lampard P, Scamman D. (2023). The 2023 report of the Lancet Countdown on health and climate change: the imperative for a health-centred response in a world facing irreversible harms. Lancet, DOI: 10.1016/S0140-6736(23)01859-7, PMID: 37977174, PMCID: PMC7616810.

Royal Society, National Academy of Sciences. (2014). Climate Change. National Academies Press

Sadauki, M.A. ,Nababa A. S., Bichi A.H., and Hadiza Y.B (2024) Fisher's perception and mitigating strategies on climate change: Before and after the commencement in Katsina State, Nigeria. *Life Sciences: an International Journal (LSIJ)* Vol. 1, No. 1, 2023

Schwartz, S. E. O., et al. (2023). Climate change anxiety and mental health: Environmental activism as a buffer. *Current Psychology*, 42(20), 16708-16721.

Sigman, D. M., & Boyle, E. A. (2000). Glacial/interglacial variations in atmospheric carbon dioxide. Nature, 407(6806), 859-869.

Smith, H. J., Wahlen, M., Mastroianni, D., & Taylor, K. C. (2010). The CO2 concentration of air trapped in GISP2 ice from the Last Glacial Maximum-Holocene transition. Geophysical Research Letters, 18(8), 1555-1558.

Svensmark, H. (1998). Influence of Cosmic Rays on Earth's Climate. Physical Review Letters, 81(22), 5027-5030.

Weissbecker, I. (2011). Climate Change and Human Well-Being. *Springer Science & Business Media*.