

Title: Climate Change and Its Influence on Personal Spending Habits for Food

Lee Wai Yan

University Utara Malaysia

School of Economics, Finance and Banking

lee_wai_yan@sefb.uum.edu.my.

Abstract

This study investigates how much climate change has affected people's personal food spending patterns. Climate change influences the agricultural production, the price, and the supply of food in a negative manner for the entire world food security apparatus (Alam et al., 2016). People are thus forced to adjust the way they organise their finances and the kind of foods they purchase in a bid to reduce the impact of the climate related challenges to their daily life. (Shankar et al., 2018). This study offers an extensive understanding of how climate change affects individual food spending patterns through an examination of the psychological aspects driving consumer behaviour, the scientific underpinnings of climate change, and current changes in food pricing trends.

The study explores how behavioural economics affects consumer behaviour in relation to food purchases by looking at cognitive constraints, social norms, and psychological biases. People can adopt ways to deal with the issues posed by climate change and make more informed decisions about how much food they spend by knowing these behavioural mechanisms.

The report also covers advocacy, legislation, and policy initiatives from the government that support people in their attempts to adapt to climate-related difficulties and advance sustainable food systems. This study provides useful information to those who wish to take steps in order to mitigate climate change and improve the outcomes of their lives. It does so by analysing new trends in sustainable food systems to establish possible challenges and barriers to the shift to more sustainable food practices as well as predicting the future trends of climate change. Evidentially, individuals with the right knowledge make wise choices and join forces to ensure that the future is healthier, safer for everyone, and more equitably distributed.

Keywords: *Climate Change, Personal Finances, Personal Food Expenditure, Sustainability, Managing*

Chapter 1: Introduction

The global food system is facing previously unheard-of difficulties due to the acceleration of climate change, which will have a significant impact on people's individual spending patterns. People must adjust their spending habits and financial plans in response to the disruptions to agricultural output, changes in food costs, and effects on food availability and quality caused by climate change (Lovendal et al., 2006). This study explores the complex relationship between personal food spending patterns and climate change, looking at the various ways that climate-related issues influence people's financial planning and food purchase decisions.

Fundamentally, human activity is the main cause of climate change, specifically the release of greenhouse gases like carbon dioxide, methane, and nitrous oxide. Due to the trapping of heat in the Earth's atmosphere by these emissions, regional and global climate patterns are altered. Widespread effects of climate change on food systems include decreased agricultural production, increased food security, and higher global food prices. Gaining an understanding of the scientific underpinnings of climate change is crucial to realising how urgent it is to address its effects on personal finances and agricultural systems.

In addition, the study looks at how behavioural economics theories and psychological aspects affect people's decisions on what to buy when it comes to food in the context of climate change. Consumer behaviour is greatly influenced by psychological biases, societal conventions, and cognitive constraints. These factors affect the kinds of food people choose to purchase, how much they are willing to spend, and how they manage their finances in general. People can adopt measures to lessen the effects of climate change on their personal finances and make better decisions about how much they spend on food by being aware of these behavioural mechanisms.

The overall goal of this research is to clarify the intricate relationship between personal food expenditure patterns and climate change. Through investigating the scientific, economic, and psychological aspects of this connection, our goal is to enable people to confront the obstacles posed by climate change and create more robust and sustainable ways of living. By making well-informed decisions and working together, people may endeavour to build just, resilient, and ecologically sustainable food systems in the future.

Chapter 2: Understanding Climate Change

2.1 Overview of Climate Change

Climate change is one of humanity's most pressing issues in the 21st century. Long-term changes in regional or global weather patterns are referred to as "climate change." The procedure is intricate and multifaceted. The ramifications affect every aspect of our lives, but they are notably noticeable in relation to food consumption and personal finances. To understand how climate change affects individual food consumption habits, it is crucial to examine the scientific foundations of climate change, existing patterns, future projections, and the demographic and geographic shifts it effects. (Fischer et al., 1994 & 1996) and (Rosenzweig et al, 1994).

It is necessary to explain the concept of global warming and the fact that climate change is a result of human activities once more, focusing on the deforestation and releasing the greenhouse gases such as CO₂, CH₄, and N₂O that increase the Earth's temperature once more (Goldemberg, J., 2012). Greenhouse gases such as these mentioned above cause the general term known as global warming whereby, they trap the heat in the atmosphere (Arrhenius, S., 1896). Scientists have already collected great amount of information in order to prove the reality of climate change. Some of the evidence of climate changes include reading instruments to measure temperatures; observing melting ice sheets and glaciers; as well as changes in weather condition and ecological systems. (Kotlyakov, V. M., 2000). Climate models that replicate the Earth's climate system reliably forecast more warming and related consequences for varying pollution scenarios.

Cause of Climate Change

The increased greenhouse effect, which results from a complex interaction between natural and man-made variables, is the cause of climate change. Even though life on Earth depends on the greenhouse effect, human activity has significantly changed the equilibrium

One main point about this is that the excessive use of fossil fuels may be leading to climate change. Coal, oil, and natural gas are fossil fuels that are responsible for the emission of the predominant greenhouse gas carbon dioxide when they are used in the transportation sector, in generating electricity, and in other industrial activities. Combustion of these fuels results in the liberation of energy and carbon dioxide gas, a greenhouse gas that accelerates global heating when combined with oxygen (Kurup et al., 2014). This process leads to the accumulation of vast amounts of carbon dioxide in the atmosphere since no natural process can expel as much carbon dioxide as human society expels with the use of such tonnage of fossil fuels every day.

The use of fossil fuels is however not the only reasons such as deforestation and alterations in farming practices that have contributed to climate change. The forests remove the CO₂ molecules from the atmosphere and fix them in the biomass and soil through photosynthesis (Peplau et al., 2023). Trees also have another important function of being carbon sinks. It is done through the destruction of naturally occurring forests for the cultivation of agricultural products or the construction of cities in addition to the burning of trees for wood or other reasons. It is the release of carbon dioxide gas that enhances the greenhouse effect and further increases temperature on earth.

Furthermore, agricultural practices significantly influence greenhouse gas emissions (Galic et al., 2020). Humans get food that comes from agriculture, but some of its practices contribute to greenhouse gas emissions. A few of the nitrogen compounds in intensive farming which are generally used include nitrous oxide (N₂O) and methane (CH₄). Livestock husbandry is a chief reason for methane emissions as endorheic livestock creatures like cattle give off methane in digestion of food (enteric fermentation) (Rahman et al., 2016). Another important greenhouse gas released by agricultural practices such as soil and farm management and other agricultural inputs is nitrous oxide. The following are the emissions that originate from agricultural activities as well as add to the greenhouse effect. It can also be said that clearing land for agriculture also leads to deforestation hence making the problem even worst.

Effects of Climate Change

There are many ways that climate change shows up, affecting different facets of the environment, ecosystems, economics, and human society. For instance, fewer food items being available, problems with food delivery systems, and eventually increased food costs for consumers. Wide-ranging and frequently linked, the consequences of climate change range from altered weather patterns to increasing sea levels.

Extreme weather occurrences are the first consequence of climate change. The growing occurrence and severity of extreme weather events is a defining feature of climate change. This includes strong storms, heat waves, droughts, and floods. Warm weather can burn crops, lowering yields and affecting produce quality (Tripathi et al., 2016). Droughts may cause water shortages, which can make it challenging to irrigate crops and sustain agricultural output. Floods have the power to completely destroy crops and ruin food delivery systems on farmers. In addition to reducing the quantity of food available, these occurrences may also harm the infrastructure, resulting in delays in transit and higher costs for customers (Alam et al., 2011).

Secondly, the qualities of food may be influenced by climate change. Shortage of rainfall and high temperatures can make crops weaken and easier for them to be affected by diseases or pests. This may affect the nutritional nature of the products produced by lowering the production and at the same time heightening the need for chemicals. (Fanzo et al., 2021). Furthermore, a greater percentage of bruised or damaged produce that would not be suitable for sale results from crop damage caused by extreme weather events.

Then, one more consequence of climate change will be rising sea levels (Gomez-Zavaglia et al., 2020). Coastal towns and agricultural land are under risk due to rising sea levels caused by melting glaciers and ice caps (Titus et al., 1990). This results in sea level rise and leads to erosion, increased flooding, and saltwater intrusion into freshwater resources, thereby endangering the environment, infrastructure, and coastal populations. High saltwater intrusions that cause the contamination of freshwater sources used in irrigation render them unsuitable for agricultural purposes. Furthermore, less territory may be accessible for food production if coastal land is lost. Food costs may rise because of these variables causing a decline in agricultural output overall.

2.2 Impact of Climate Change on Food Production and Prices & Global food system

Climate change has also caused severe concerns to the global food system from food prices, distribution, and production. Food and economic security and agricultural production have been disrupted by altered precipitation patterns, extreme events, and climatic shifts associated with ongoing global warming. It is important to understand the food production and costs due to climate change in order to comprehend how they influence individual food budgets.

Climate Change and Food Production

By changing the growing conditions for cattle and crops, climate change has a direct impact on food production. Diminished crop production and timing of cultivation and harvest as well as more incidences of pests and diseases are some of the likely consequences of the temperature and precipitation changes. Extreme weather conditions including heat waves, droughts and floods or storms can expose cattle and destroy crops hence there would be no food for domestic consumption and high prices would prevail. (Nayak et al., 2022). Customers may also pay more because of this.

Besides the direct effects mentioned above, the prevailing climate change has indirect effects on soil, water resources, and agricultural systems. Increasing temperatures and changes in precipitation also have implications for natural habitat loss and destruction; soil erosion; and water deficit. It is possible that in some regions losses due to climate change will affect the availability or cost of various fruits and vegetables. It may be necessary for consumers to take a more flexible approach when making their grocery lists, choosing regionally or seasonally accessible options instead. The difficulties farmers confront are compounded by these environmental changes, which make it harder to maintain resilient and sustainable food production systems (Ruane et al., 2018).

Climate Change and Food Price

Food prices are affected by climate change in a complicated and diverse way. Short-term price spikes may result from interruptions to food production brought on by climate change, but long-term consequences of climate change may also have an impact on food costs through several indirect channels. For instance, variations in weather patterns can cause supply chain disruptions on a worldwide scale, resulting in lost transportation time, storage, and higher production costs (Gomez-Zavaglia et al., 2020). In addition to potentially causing changes in markets, food prices, and supply chain infrastructure, these disruptions may have a major impact on local animal output and crop yields (Wesley, J., 2010; Kumar et al., 2015).

In addition, global warming influences the price and supply of some essential farming raw materials such as water, land and energy. Due to climate change, increased temperatures mean less availability of water for irrigation due to changes in the precipitation pattern hence increased competition for the supply of water to be used for irrigation moreover, high demands may lead to increased cost of irrigation. Further, changes in food production costs may arise due to changes in agriculture and land use in response to climate change via changes in land value and rental rates may also result.

In addition to these supply-side variables, the influence of climate change on demand also has an impact on food costs. People may be compelled to spend a higher portion of their income on food as a result of catastrophic weather events and environmental degradation

endangering food security and livelihoods. This will boost demand and push prices upward. This can worsen food insecurity and poverty, especially for vulnerable groups (Debebe, 1995).

Climate Change and the Global Food System

Climate change is affecting international food systems globally through various ways and at various stages of the food value chain. Peculiarities of climate, productivity of the land utilized, and measures taken in different countries of the world have an influence on food availability, consumption, and quality in the world. Because the whole food system is interrelated, disruptions in one area can affect food prices and availability in other regions by sending ripples around the system. Global price increases for consumers could result from this as well. Furthermore, harsh weather conditions or interruptions to trade routes might also result in higher transportation costs (Gregory et al., 2005).

Moreover, climate change exacerbates existing vulnerabilities and inequalities within the global food system, disproportionately affecting small-scale farmers, rural communities, and marginalized populations (Gregory et al., 2005). These groups often lack the resources and adaptive capacity to cope with climate-related shocks and stresses, making them more susceptible to food insecurity and poverty (Kahiluoto et al., 2009).

2.3 Link between Climate Change and Personal Finance

While the impacts of climate change remain visible in the world today, the link between climate and individual finances is also getting close. Climate change affects various areas of personal finance such as insurance, investment, expenditure, and more in terms of stability. For the people, the changing climate has an impact on the way we spend our money through such things as food. To help eliminate climate issues and make appropriate financial choices, this link must be understood.

Increased Expenses

There are various ways that climate change might raise household and individual costs. The growing expenses of adjusting to and reducing the effects of climate change are one important aspect (Tucker, M., 1997). Disaster events like the hurricanes, floods, and wildfires which are forms of natural disasters can damage properties and hence need to be reconstructed. Also, changes in weather conditions may necessitate using money to insulate houses or buy energy conserving devices and many others measures that would help to reduce the dangers of climate change. (Bellman, L., 2016). In addition, as insurance companies raise their rates to reflect the increasing risks associated with climate change, individuals may have to pay higher insurance premiums.

Impact on Investments

Because climate change impacts investment, in this way it can also have direct implications for personal finance. Some of the direct impacts of the increase in carbon emissions include potential financial and regulatory risks for industries and businesses which are considered as heavy carbon emitters since the world economy aims to transition to the low carbon economy (Zen et al. , 2021). Thus, the evaluating of companies that have something to do with emissions like coals, oils, and gasses may be at risk of having lower values in the future. At the same time, investment in clean technologies, green business, and renewable power can open opportunities for steady and tangible financial returns. Moreover,

adaptation with reference to properties, infrastructure and real estates may be harmed through climate-related perils for instance, fine weather and deterioration of environmental quality hence affecting retirement benefits and investment funds (Ginglinger, E ., 2020).

Chapter 3: The Relationship Between Climate Change and Food Prices

Systems for producing and distributing food face substantial problems due to climate change on an international scale. Temperature variations, precipitation patterns, and extreme weather events all have an immediate impact on food production in agriculture. For example, protracted droughts can result in water scarcity, which lowers crop yields and quality (Alam et al., 2018). Weather pattern changes can have a particularly big impact on staple crops including corn, wheat, rice, and potatoes. For instance, the incapacity of rice to effectively self-pollinate in warmer climates is predicted to result in a 40% reduction in rice yields by the end of the century (Ramos, U. C., 2024). On the other hand, excessive rain and flooding can harm crops, obstruct roads, and postpone harvests, which can cause food to decay and cause problems in the supply chain.

Additionally, the distribution and behaviour of agricultural pests and illnesses are altered by climate change. Pests may be able to flourish in new areas due to warmer temperatures and shifting seasonal patterns, raising the possibility of crop damage and output losses. Changes in precipitation patterns can also have an impact on food production and distribution by fostering the growth of plant diseases.

Furthermore, it is pertinent to note that there are numerous other climate variables that influence food prices including relations between supply and demand, instances of production fluctuations, and market influencing factors including speculation. Climatic changes such as droughts, floods, freeze, cut supply channels of produce from the farmers and may lead to short terms scarcities or gluts. The greatest and most reliable relationship between changes in average monthly temperatures and food prices and inflation rates was discovered by researchers at the European Central Bank and the Potsdam Institute for Climate Impact Research (Jacobo et al., 2024). Food prices may rise as a result of these disturbances since there may be less food available and more food produced, which would mean farmers paying more for crop protection, pest management, and irrigation.

Furthermore, the hazards associated with climate change have the potential to impact investor behaviour and market sentiment, intensifying price volatility and uncertainty (Alam et al., 2024). For instance, market players' proactive actions in reaction to climate-related risks may cause panic purchases or food commodity stockpiling, which would raise prices even further. Furthermore, because the world's food markets are interrelated, disruptions in one area might have a domino effect on supply and prices in other areas, increasing the influence of shocks related to climate change on food prices globally (Nam, K., 2021).

The relationship between climatic events and increases in food prices is demonstrated by a number of case studies and examples, offering concrete proof of how environmental changes affect food markets. For example, the 2012 drought in the United States caused large crop losses, especially for soybeans and maize, which raised the cost of these commodities both locally and internationally. Similar to this, rice production and export markets were interrupted by the 2011 Thailand floods, which led to an increase in rice prices globally (Willenbockel, D., 2012).

Another case study which is impact in 2022, repeated heat waves in Europe dried up rivers, snarling major shipping routes and devastating farmland. The resulting crop failures in Europe, combined with Russia's war in Ukraine, drove up food prices by an additional 0.67 percentage points. In Italy, the rising cost of staples caused the price of pasta to soar (Ivanova, I., 2023).

Altogether, the relationship between food prices and climate change, as well as the links with the social and economic dimensions, bring the understanding of how the tangible aspects of the contemporary food world are woven together. It is important for policymakers, businesses, and consumers to consider the potential impacts of climate change on the price of food products in light of integrating the various risks to supply chains, market competitiveness, and farming yields. For climate change to have less impact on food prices and to ensure supply of adequate food for societies many interventions need to be made to support climate-resilient agriculture, to tackle the causes of climate change and to promote sustainable food systems.

Chapter 4: Behavioural Economics and Personal Spending Habits

4.1 Introduction to behavioural economics and its relevance to personal financial planning

The introduction to behavioural economics and personal financial planning delves into the fundamental principles that underpin the application of behavioural finance in the context of financial decision-making. The conventional assumption of rationality in economic theory is questioned by behavioural economics, which acknowledges that people frequently make irrational decisions because of cognitive biases, emotional factors, and prior financial experiences within social systems (Altman, M., 2012; Goud et al., 2024). When it comes to personal financial planning, people might have to make difficult decisions about investing, saving, and budgeting, but they might not have the time, knowledge, or drive to make the best judgements possible. They might therefore turn to oversimplified decision-making techniques, which aren't necessarily the optimal ones. Therefore, financial planners use behavioural economics to help them better understand money psychology, deal with unhelpful financial ideas, and help their clients make better, more sensible financial decisions.

Moreover, behavioural economics offers a unique perspective on how psychological factors influence economic decision-making. Unlike traditional economic theory, which assumes individuals always make rational choices based on complete information, behavioural economics recognizes that human decision-making is often irrational and influenced by cognitive biases (Liestyowati, L., 2024). This field of study has significant relevance to personal financial planning, as it helps explain why individuals may struggle to make optimal decisions about their spending habits, including food purchases (Abhyankar, A., 2019).

Furthermore, behavioural economics integrates knowledge from psychology and economics to comprehend how people make decisions, especially when it comes to personal financial planning. People can make better decisions that are in line with their values and long-term goals by incorporating behavioural economics concepts into their financial planning (Messer et al., 2023). Making sustainable and cost-effective decisions requires an awareness of the psychological influences and cognitive biases influencing consumer behaviour in the context of climate change and its effects on food prices.

4.2 Psychological factors influencing individual food purchasing decisions.

Particularly in light of climate change, psychological variables are important in determining how each person purchases food as well as their preferences, attitudes, and eating habits. When making purchases, people's opinions on food quality, health, and environmental sustainability, for instance, may have an impact. People may prioritise eating foods that are ethically and sustainably derived, even if they are more expensive, due to worries about climate change and how it affects food production. Risk perception is a crucial component in climate change adaptation, as people evaluate the risks linked to climate-related issues such extreme weather occurrences that impact food supply. This perception of risk influences how consumers prioritize spending on food and adjust their consumption patterns in response to price fluctuations driven by climate change (Zielinska, E. B., 2006).

Social influences also play a significant role in food purchasing decisions. Family, friends, and cultural norms can all shape individuals' attitudes towards food and influence their dietary choices (Zielinska, E. B., 2006). Social media and advertising further reinforce these influences by promoting certain food products or dietary trends (Higgs et al., 2016). Moreover, emotional factors such as stress, mood, and self-control can impact food choices, leading individuals to engage in "emotional eating" or impulse buying in response to climate-related stressors or uncertainties (Erkul et al., 2023).

4.3 Cognitive biases and their impact on consumer behaviour in response to climate-related challenges

Thus, cognitive biases are characterized as systematic departures from rationality in the context of judgements and decision-making. By the following aspects, the modes in which people tend to perceive and respond to changes in costs and availability of foods, and the environmental risks can be significantly impacted by this; they can causatively relate to consumer behaviours concerning climate related matters. One of the most well-known cognitive biases is the availability heuristic that inhibits people from calculating probabilities correctly since they rely upon what comes easily to their mind. Thus, when people are making decisions about food choices, they also might probably be influenced by TV reports or a vivid picture of the natural disaster corresponding to climate change and, therefore, might overemphasize the risks of shortages and higher prices.

Loss aversion is another cognitive bias that affects consumer behaviour. It is the propensity to value avoiding losses over realising comparable gains. People may take preventative steps or avoid specific food products entirely because they are more likely to be adversely affected by possible losses linked to climate-related difficulties, such as decreased food availability or increased food prices (Knobloch, 2019). Furthermore, it might be challenging to prioritise sustainability or healthfulness when people have present bias, which is the propensity to place a higher value on immediate gratification than long-term advantages.

Chapter 5: Challenge and Opportunities for the future

As one of the major challenges that the global society is struggling to deal with at the moment, climate change remains a major issue (Bilandzija et al., 2014). Incentives arising from the global recognition of climate change and its impact has made the general population more conscious of the future effects of their spending and how sustainable the food chain is over the recent past years. One emerging trend in the future sustainable food system is the

increased demand for food with plant-derived proteins and other analogues. The climate change positive impact of the plant-based diets has made many people adopt them due to the declining rate of animal cruelty and concerns on preservation of the natural resources through conservation of greenhouse gas emissions.

Furthermore, an increasing emphasis on eating locally and seasonally is encouraged by community-supported agriculture (CSA) programmes and the farm-to-table movement. Customers are seeing the advantages of eating produce that is grown nearby, supporting small farmers, and cutting down on food miles for the environment and their health. Since locally sourced goods frequently offer better value and freshness than imported alternatives, this trend is in line with personal financial planning tactics that prioritise budgeting and conscious spending (Farmer et al., 2014).

Although there is a growing interest in sustainable food practices, their general adoption is hampered by a number of obstacles and constraints. The cost and availability of sustainable food options represent a major obstacle (Clonan et al., 2012). Despite the fact that sustainable foods are sometimes seen as high-end goods, people with tight budgets may be discouraged from include them in their meals due to their greater cost. Furthermore, discrepancies in food access and consumption habits are made worse by food deserts and underprivileged populations' lack of access to fresh produce (Reisch et al., 2013).

Second, the development of sustainable behaviours may be prevented by social and cultural habits related to food selection. Consumers are used to certain diets and eating habits, cookery traditions, and societal expectations, which makes it challenging to quickly switch to environmentally friendly food choices. Furthermore, the practical knowledge and certainty customers have of quality sustainable food products can be hindered and diluted by wrong and exaggerated so-called green claims from food organizations.

The way that climate change is projected to develop will have a big impact on how much people spend on food in particular (Gbadegesin, T. K., 2021). Food production and distribution networks will be under more pressure to adapt as climate change exacerbates natural problems including harsh weather, water scarcity, and biodiversity loss. Food supply disruptions, price volatility, and modifications to customer preferences and purchase habits could result from this.

In addition, personal finances and household budgets are probably going to be impacted by the economic effects of climate change, which include increased production, transportation, and insurance expenses (Lafakis et al., 2019). People might have to pay more for food, pay more for healthcare because of the health effects of climate change, and possibly lose their jobs as a result of climate-related calamities. The aforementioned problems underscore the significance of incorporating climate resilience into individual financial planning tactics, including emergency fund construction, income source diversification, and climate-resilient asset investment.

In conclusion, investigating new directions in sustainable food systems, spotting possible obstacles to the general adoption of sustainable eating practices, and speculating on how climate change will develop in the future and how it will affect people's spending patterns will all offer insightful information to those trying to make sense of the complexity of climate change and create more resilient and sustainable lifestyles. Individuals have the power to significantly influence the development of a more fair and sustainable future for everybody by taking on these issues and seizing opportunities for good change.

Chapter 6: Conclusion

In conclusion, there is a complicated and multifaceted dilemma at the junction of climate change and individual food purchasing patterns that calls for thoughtful analysis and aggressive action. We have looked at several facets of how food production, distribution, cost, and ultimately individual spending patterns are affected by climate change throughout this study. Understanding the scientific underpinnings of climate change and investigating the relationship between food prices and climate events make it clear that climate change has a big impact on both the global food system and personal consumption habits.

Among the important lessons that should be taken out of the above analysis, the role that behavioural economics plays in defining consumers' choices and their personal finance in the context of climate change must not go unnoticed. The ability of people to save money or how they decide on the items to purchase for meals are among the many choices influenced by psychological, cognitive, and social consideration. Knowing these variables, people can ensure they still choose healthier and sustainable foods while buying them; control their budgets or wallets in a way to minimize the impact of climate change on them and also make better choices in regard to their overall health.

Based on the extending routes of global climate change, individuals willing to build better and sustainable life worlds will find themselves with both advantages and challenges. New opportunities for a sustainable food supply, novel innovations, and changing consumer preferences contain opportunities for people to align the food they eat with the values they embrace and be impactful. But more than that, the change requires an extraordinary coordination and collaboration between different industries and key stakeholders about practical problems and concerns that are associated with pricing, availability, and culture that are still hindering pro-environment practices and policies from gaining broader public acceptance.

In conclusion, by understanding the complexities of climate change and its influence on personal spending habits for food, individuals can empower themselves to make informed choices, advocate for change, and contribute to building more sustainable and resilient food systems for future generations. Through a combination of personal action, policy advocacy, and community engagement, we can work towards a more equitable, sustainable, and resilient future for all.

Acknowledgement

I acknowledge the valuable assistance of AI tools in conducting research and generating insights for this report.

Reference

- Abhyankar, A. (2019) Behavioural Economics Towards Better Decision Making. *Journal of Global Economy*, 16(2).
- Alam, M. M., Tahir, Y. M., Saif-Alyousfi, A. Y. H. & Pahlevi, R. W. (2024). Climate change-induced firms' initiatives and investors' perceptions: evidence from Bursa Malaysia. *Emerald insight*. <https://www.emerald.com/insight/content/doi/10.1108/SAMPJ-08-2021-0344/full/html>
- Alam, M. M., Siwar, C., Molla, R. I., Mohd Ekhwan, T., & Talib, B. (2011). Climate change and vulnerability of paddy cultivation in North-West Selangor, Malaysia: A survey of farmers' assessment. *Voice of Academia*, 6(1), 45-56.
- Alam, M. M., Siwar, C., & Wahid, A. N. M. (2016). The impacts of climatic and non-climatic factors on household food security: A study on the poor living in the Malaysian East Coast Economic Region. *Asia-Pacific Development Journal*, 23(1), 79-104. <https://doi.org/10.18356/be439b1f-en>
- Alam, M.M., Siwar, C., Talib, B., & Wahid, A.N.M. (2018). Climatic Changes and Vulnerability of Household Food Utilization in Malaysian East Coast Economic Region. *International Journal of Environment and Sustainable Development*, 17(4), 331-346. (online) <https://www.inderscienceonline.com/doi/abs/10.1504/IJESD.2018.096860>
- Altman, M. (2012). Implications of behavioural economics of financial literacy and public policy. *The Journal of Socio-Economics*, 41(5), 677-690. https://www.sciencedirect.com/science/article/pii/S1053535712000868?casa_token=X2KTpqYuLhIAAAAAA:vXs2udXyvwVp9Osa2kYba1zGsMrvEtGKCKSm4wZ-GpgkR0nZS3kcq6ukPICVbUMwPJ6DNDqOTxpJ#aep-abstract-id5
- Arrhenius, S. (1896). On the Influence of Carbonic Acid in the Air upon the Temperature of the Ground. *Philosophical Magazine*, 41, 237-276. https://geosci.uchicago.edu/~archer/warming_papers/archer_galleys/9781405196178_4_003a.pdf
- Bellman, L., Ekholm, S., Nygren, K. G., Hemmingsson, O., Jarnkvist, K., Kvarnlöf, L., Lundgren, M., Olofsson, A., & Ohman, P. (2016). Climate Change, Insurance, and Households: A Literature Review. *Risks and Crisis Research Centre*. <https://www.diva-portal.org/smash/get/diva2:1059520/FULLTEXT01.pdf>
- Bilandzija, D., Zgorelec, Z., & Kisic, I. (2014). The Influence of Agroclimatic Factors on Soil CO₂ Emissions. *Coll. Antropol*, 38, 77-83. <https://hrcak.srce.hr/file/178974>
- Clonan, A., & Holdsworth, M. (2012). The challenges of eating a healthy and sustainable diet. *The American Journal of Clinical Nutrition*, 96, 459-60. <https://doi.org/10.3945/ajcn.112.044487>
- Debebe, H. 1995. Food security: A brief review of concepts and indicators. In Multa, D., Wolday, A., Simeon, E. & Tesfaye, Z. (ed.). *Food security, nutrition and poverty alleviation in Ethiopia problems and prospects*, pp.1-18. Addis Ababa: Agricultural Economics society of Ethiopia.

- Erkul, C., & Ozenoglu, A. (2023). Psychosocial Stressors Affecting Food Choices. *International Journal of Gastronomy Research*, 2(2), 62–69. <https://doi.org/10.56479/ipeak.2023.12191>
- Fanzo, J. C., & Downs, S. M. (2021). Climate change and nutrition-associated diseases. *Nature Reviews Disease Primers* 7, 90. <https://doi.org/10.1038/s41572-021-00329-3>
- Farmer, J. R., Chancellor, C., Robinson, J., West, S. T., & Weddell, M. (2014). Agrileisure: Farmers' Markets, CSAs, and the Privilege in Eating Local. *Journal of Leisure Research*, 46(3), 313-328. <https://doi.org/10.1080/00222216.2014.11950328>
- Fazil, K. N. M., & Kumar, D. D. (2015). Impact of Climate Change on Agricultural Labourers' Livelihood Diversification and Food Insecurity. *International Journal of Management (IJM)*, 6(1), 438-442.
- Fischer, G., Frohberg, K., Parry, M. L., & Rosenzweig, C. (1994). Climate Change and World Food Supply, Demand and Trade: Who benefits, who loses?’, *Global Environmental Change* 4(1), 7–23. <https://www.sciencedirect.com/science/article/abs/pii/0959378094900183?via%3Dihub>
- Fischer, G., Frohberg, K., Parry, M. L., & Rosenzweig, C. (1996). Impacts of Potential Climate Change on Global and Regional Food Production and Vulnerability. *Springer Link*, 37, 115-159. https://link.springer.com/chapter/10.1007/978-3-642-61086-8_5
- Galic, M., Mesic, M., & Zgorelec, Z. (2020). Influence of Organic and Mineral Fertilization on Soil Greenhouse Gas Emissions. A Review. *Agriculturae Conspectus Scientificus*, 85(1), 1-8. <https://hrcak.srce.hr/file/342555>
- Gbadegesin, T. K. (2020). A Review on Impact of Changing Climate on Sustainable Food Consumption. *IGI Global*. <https://doi.org/10.4018/978-1-7998-5354-1.ch050>
- Ginglinger, E. (2020). Climate risk and finance. *HAL open science*. https://shs.hal.science/halshs-02975207/file/Climate_risk_BMI_Ginglinger.pdf
- Goldemberg, J. (2012). Climate Change and “historical responsibilities”. *SciELO Brazil*, 15(1). <https://doi.org/10.1590/S1414-753X2012000100013>
- Gomez-Zavaglia, A., Mejuto, J. C., & Gandara, J. S. (2020). Mitigation of emerging implications of climate change on food production systems. *National Library of Medicine*. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7176580/>
- Goud, K. A., Kumar, K. V. R. S., & Chakradhar, D. P. (2024). A Study on Behavioural Finance and Its Impact on Decision Making of an Investment. *EPRA International Journal of Economics, Business and Management Studies (EBMS)*, 11(3). <https://eprajournals.com/IJHS/article/12649/abstract>
- Gregory P. J., Ingram, J. S. I., & Brklacich, M. (2005). Climate change and food security. *Philosophical Transaction of the Royal Society B*, 360, 2139–2148. <http://doi.org/10.1098/rstb.2005.1745>
- Higgs, S., & Thomas, J. (2016). Social influences on eating. *Current Opinion in Behavioral Science*, 9, 1-6. <https://www.sciencedirect.com/science/article/pii/S235215461500131X>

- Ivanova, I. (2023). How climate change is raising the cost of food. *CBS News*. <https://www.cbsnews.com/news/climate-change-food-prices-inflation-3-percent-study/>
- Jacobo, J., & Peck, D. (2024). Food prices could increase further due to climate change's effect on inflation around the world: Study. *ABC News*. <https://abcnews.go.com/International/food-prices-increase-due-climate-effect-inflation-study/story?id=108273854>
- Kahiluoto, H., & Rotter, R. (2009) Implications of and possible responses to climate change. *University of Helsinki*. <https://orgprints.org/id/eprint/17114/1/DP39.pdf>
- Knobloch, F., Huijbregts, M. A. J., & Mercure, J. F. (2019). Modelling the effectiveness of climate policies: How important is loss aversion by consumers? *Renewable and Sustainable Energy Reviews*, 116. <https://doi.org/10.1016/j.rser.2019.109419>
- Kotlyakov, V. M. (2000). Glaciology of Antarctica. *Nauka, Moscow*, 384 p.
- Kurup, P., & Kurup, P. A. (2014). Climate Change and Global Warming Is Produced by Human Endosymbiotic Archaeal Overgrowth and Methanogenesis. *Advances in Natural Science*, 7 (4), 1-5. <https://core.ac.uk/download/pdf/236293178.pdf>
- Lafakis, C., Ratz, L., Fazio, E., & Cosma, M. (2019). The Economic Implications of Climate Change. *Moody's Analytics*. <https://www.moodyanalytics.com/-/media/article/2019/economic-implications-of-climate-change.pdf>
- Liestyowati, L. (2024). Behavioral Economics and Decision Making: Understanding Irrationality and Biases in Economics Choices. *Economics Studies and Banking Journal*, 1(3). <https://journal.ppiabr.com/index.php/demand/article/view/148>
- Lovendal, C.R. & Knowles, M. (2006). Tomorrow's hunger: A framework for analysing vulnerability to food security. *UNU- WIDER*, Research Paper No, 2006/119.
- Messer, K. D., Ganguly, D., & Xie, L. S. (2023). Applications of Behavioral Economics to Climate Change. *University of Delaware*. https://nap.nationalacademies.org/resource/26874/Applying_Behavioral_Economics_to_Climate_Change_Messer_Ganguly_Xie.pdf
- Nam, K. (2021). Investigating the effect of climate uncertainty on global commodity markets. *Energy Economics*, 96. https://www.sciencedirect.com/science/article/pii/S0140988321000281?casa_token=nz2DOMarEB4AAAAA:iJMujukgg6fzlA6TimN_KS-YnbTCLzhRaBMQz4hwdUJgtrNZRy81A5QJv4fXbYvLQ6ZON8lZPapL
- Nayak, P., & Solanki, H. (2022). Effect of climate change on crop production in India. *International Association of Biologicals and Computational Digest*, 1(2). <https://typeset.io/papers/effect-of-climate-change-on-crop-production-in-india-3pzjmlt8>
- Peplau, T., Poeplau, C., Gregorich, E., & Schroeder, J. (2023). Deforestation for agriculture leads to soil warming and enhanced litter decomposition in subarctic soils. *European Geosciences Union*, 20(5), 1063-1074. <https://bg.copernicus.org/articles/20/1063/2023/>
- Rahman, S., Gautam, D. P., Borhan, M. S, & Engel, C. (2016). The effect of feeding high fat diet to beef cattle on manure composition and gaseous emission from a feedlot pen

- surface. *Journal of Animal Science and Technology*, 58(22).
<https://link.springer.com/article/10.1186/s40781-016-0104-6>
- Ramos, U. C. (2024). We need to talk about food prices. *Yale Climate Connections*.
<https://yaleclimateconnections.org/2024/03/we-need-to-talk-about-food-prices/>
- Reisch, L., Eberle, U., & Lorek, S. (2013). Sustainable food consumption: A overview of contemporary issues and policies. *Sustainability: Science, Practice and Policy*, 9(2), 7–25. <https://doi.org/10.1080/15487733.2013.11908111>
- Rosenzweig, C. & Parry, M. L. (1994). Potential Impact of Climate Change on World Food Supply, *Nature* 367, 133–138.
- Ruane, A. C., & Rosenzweig, C. (2018). Climate Change Impacts on Agriculture: Challenges, Opportunities, and AgMIP Frameworks for Foresight. *NASA Technical Reports Server*.
<https://ntrs.nasa.gov/api/citations/20190025372/downloads/20190025372.pdf>
- Shankar, S., & Shikha. (2018). Chapter 7 – Impacts of Climate Change on Agriculture and Food Security. *Biotechnology for Sustainable Agriculture*, 207-234.
<https://doi.org/10.1016/B978-0-12-812160-3.00007-6>
- Titus, J. G. (1990). Effect of Climate Change on Sea Level Rise and the Implications for World Agriculture. *HortScience*, 25(12), 1567-1572.
<https://journals.ashs.org/hortsci/view/journals/hortsci/25/12/article-p1567.xml>
- Tripathi, A., Tripathi, D. K., Chauhan, D. K., Kumar, N., & Singh, G. S. (2016). Paradigms of climate change impacts on some major food sources of the world: A review on current knowledge and future prospects. *Agriculture, Ecosystem and Environment*, 216, 356-373.
https://www.researchgate.net/profile/Ashutosh-Tripathi17/publication/283786421_Paradigms_of_climate_change_impacts_on_some_major_food_sources_of_the_world_A_review_on_current_knowledge_and_future_prospects/links/59d7232fa6fdcc52acac4233/Paradigms-of-climate-change-impacts-on-some-major-food-sources-of-the-world-A-review-on-current-knowledge-and-future-prospects.pdf
- Tucker, M. (1997). Climate change and the insurance industry: the cost of increased risk and the impetus for action. *Ecological Economics*, 22(2), 85-96.
[https://doi.org/10.1016/S0921-8009\(96\)00556-3](https://doi.org/10.1016/S0921-8009(96)00556-3)
- Wesley, J. (2010). Will Climate Change Affect Food Production. *Illinois* (1).
<https://hdl.handle.net/2142/16446>
- Willenbockel, D. (2012). Extreme Weather Events and Crop Price Spikes in a Changing Climate: Illustrative global simulation scenario. *Oxfam Research Reports*.
<https://oxfamlibrary.openrepository.com/bitstream/handle/10546/241338/rr-extreme-weather-events-crop-price-spikes-05092012-en.pdf?sequence=4>
- Zen, I. S., Amin, A. Q. A., Alam, M. M., & Doberstein, B (2021). Magnitudes of households' carbon footprint in Iskandar Malaysia: Policy implications for sustainable development. *Journal of Cleaner Production*, 2021, 315, pp.128042.
[ff10.1016/j.jclepro.2021.128042ff. ffhal-03520198](https://doi.org/10.1016/j.jclepro.2021.128042)

Zielinska, E. B. (2006). Role of Psychological Factor in Food Choice – A review. *Polish Journal of Food and Nutrition Science*, 15/56(4), 379-384.
<https://www.cabidigitallibrary.org/doi/pdf/10.5555/20073031571>