STUDY OF COMMERCIAL BANKS' RESPONSES TO CLIMATE CHANGE. A CASE OF COMMERCIAL BANKS IN KITUI COUNTY KENYA

FESTUS KITONGA

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DECLARATION

I understand that plagiarism is an offence and I therefore declare that this thesis is my original work and has not been presented to any other institution for any other award

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FESTUS KITONGA WAMBUA

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This research thesis has been submitted for examination with our approval as a university supervisor.

Signature: …… Date: …….…….

Dr. Bonface O. Manono

Signature: …… Date: …….…….

Dr. Muusya Mwinzi

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LIST OF ABBREVIATIONS

ATM	**:**	Automated Teller Machine
BBK	**:**	Barclays Bank Kenya
CBA	**:**	Commercial Bank of Africa
CBK	**:**	Central Bank Kenya Limited
CEO	**:**	Chief Executive officer
CS	**:**	Customer Service
Danida	**:**	Danish International Development Agency
DFID	**:**	Department for International Development
EBL	**:**	Equity Bank Limited
FCB	**:**	First Community Bank Limited
GDP	**:**	Gross Domestic Production
HNW	**:**	High Net Worth
IPCC	**:**	Intergovernmental Panel on Climate Change
ISO	**:**	International Organization for Standardization
IT	**:**	Information Technology
KBA	**:**	Kenya Bankers Association
KCB	**:**	Kenya Commercial Bank Limited
KSHS	**:**	Kenya Shillings
KWFT	**:**	Kenya Women Finance Trust
NIC	**:**	National Industrial Credit Bank Limited
ROCE	**:**	Return on Capital Employed
SCB	**:**	Standard Chartered Bank Kenya Limited
SIDA	**:**	The Swedish International Development Cooperation Agency,
UKCIP	**:**	UK Climate Impacts Programme
UNDP	**:**	United Nations Development Programme
UNEP FI	**:**	UNEP Finance Initiative
UNEP	**:**	United Nations Environment
UNGC	**:**	United national Global strategy
USD	**:**	United states Dollar

ABSTRACT

The world has set targets to reduce the global warming that requires every sector of the economy to take measure to mitigate climate change. Banks and other financial institutions can play a central role in achieving these targets since climate change presents financial risks that should be treated accordingly. To assess and manage these risks, banks should apply scenario analysis and adopt climate related risk disclosure recommendations. This study analysed how Commercial banks operating in Kitui Town have adopted different response initiatives related to climate change risk disclosures, how they implement and report these scenarios and the effect of adopting these initiatives to the banks' performance. Empirical data was collected through questionnaires distributed to 65 respondents working in the ten commercial banks operating in Kitui Town.. The questionnaire response rate for the study was 93.3%. The collected data was analyzed using Ms excel and SPSS statistical software. From the study, it was indicative that banks are in a learning phase characterized by uncertainty and lack of data that may affect strategic scenario analysis decisions especially when disclosing climate related information. In spite of this, the study established that 42% of the respondents consider climate change and environmental risk as major risk with 25.7% considering it as an average risk. The study also established that Kitui commercial banks are faced mostly faced with ligation and regulatory risks at 35.7%. This was closely followed by financial risks and then credit risks at 25.7% and 15.7% respectively. On adoption of climate change response initiatives, corporate governance initiatives were most adopted with 70% of respondents reporting to this adoption. On the other hand, climate change disclosures were the least adopted imitative. Here, over 65% of respondents lack adoption on this initiative. On the impact of the response to performance, it was determined that the climate change response initiatives had a significant positive impact on the commercial banks' performance. Climate change strategy imitative had the highest impact on banking performance (rho=0.6530, p-value <0.05) while corporate governance had the second highest impact on banking performance (rho =0.608, P value <0.05). Climate change disclosure and disclosure had (rho =0.608, P value <0.05 and rho =0.608, P value <0.05) respectively. The study recommended that commercial banks and other institutions need to reevaluate the exposure to climate change and environmental risks, encouraged to develop and adopt climate change policy and corporate governance parties, and the bank regulator to structure a universal carbon reporting and exposure calculation method and policy. This will improve the accessibility of needed data for establishing standard models and common practices for enhanced transparency and accountability. This study recommends further research to be replicated in other towns to study environmental policies, effectiveness to respond to climate change and on the less adopted initiatives.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

The recent increases in the global temperature have led to natural disasters such as flooding and droughts, heatwaves, rising sea levels, and many other natural occurrences becoming increasingly common (Intergovernmental Panel on Climate Change (IPCC), 2014; World Health Organization (WHO), 2018). Thus, climate change is a critical issue that imposes threats to ecosystems, human health, and economies (United Nations Environment Programme (UNEP), 2021; IPCC, 2019; WHO, 2021). It is increasingly recognized as a fundamental challenge for businesses. Therefore, there has been a growing concern to protect the environment and avert further climate change challenges (Hoffman & Woody, 2008). The effects and threats to human beings and the corporate world resulting from changes in climate have been intense (Kolk & Pinkse, 2005). For example, according to the IPCC, over the 21st century, the global average temperature has gone up by an estimated 0.7°C, and indications point to an increasing trend, forecasting an average of 0.5°C to 5°C every ten years (IPCC, 2013). High average global temperature affects the precipitation patterns; increasing sea levels, drought, and massive increases in weather-related natural catastrophes are consequences of climate change (IPCC, 2015).

The most important drivers of change in climate are the high-level concentration of greenhouse gases released into the atmosphere. They include; emissions of carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (NO_2) (IPCC, 2015). The world report indicates that the volume of greenhouse gas emissions has increasingly doubled in the global environment and continues to increase. The continued greenhouse gas emissions in the entire world are attributed more to transportation systems and energy consumption. (IPPC,2022).Statistics show that, by over 95% probability, human activities majorly contribute to these emissions.(Canadel *et al*., 2010). The major contributing gas, Carbon dioxide released in the atmosphere is believed to have increased by 35% in the past two decades. This by far exceeds natural variations over the past 650 thousand years, and the past 10,000,000 years (IPCC, p. 2015)Climate change thus, remains a major hindrance to development (United Development Programme; UNDP, 2007).

In response to these threats, climate change and how to reduce carbon emissions are being addressed globally (European Environment Agency, 2020). Climate adaption, meaning anticipating the impact of climate change and acting towards preventing and minimizing the damage, is needed on both local and international levels (European Commission, 2021). According to the Adaptation Gap Report 2020 (UNEP, 2021), the world's climate adaption is now widely embedded in policy and planning. However, the report underlined that public and private finance should also be involved in reducing the negative effects of climate change. Climate change vulnerability and perpetual climate change related events such as extreme weather like El Nino and La Nina continue to ravage infrastructure and livelihood systems i.e., social, economic, and political and ecosystems (U.S. Global Change Research Program, 2017). Population in the developing countries like Kenya, the marginalized, low income, and people in areas with unequal development bear the most brunt of the effects of climate change and in some instances it impacts on people's live expectancy (Settele et al., 2014).

According to Global action report, meaningful slicing of climate change causing gas emissions can have a great positive impact in reducing climate change extreme events and climate change vulnerabilities and subsequently offer the population a chance to better their livelihood thereby increasing life expectancy (U.S. Global Change Research Program, 2017). Extreme weather events keep posing increased risks and breakdown of livelihood systems. (IPPC 2015). The most critical livelihood supporting system under threat is food production including agriculture, trade (both international and national trade), security, and health (UNEP, 2011). The overall risks posed by climate change remain interlinked and cut across jurisdictional and political boundaries. The risks keep compounding.

Despite the eminent threats from the extreme weather events and other climate change unrealities, institutions including banks remain without coordinated climate change response practices (Godfrey *et al*., 2009).The physical climate risks that arise from climate change events (e.g., droughts and floods) and the transitioning risks that come with the adjustments towards a climate change resilience society can affect company returns, asset values and financial stability (UNEP, 2021). For example, a study in Miami established

that frequent and severe flooding led to increased mortgage defaults and losses (Eceiza et al., 2020). Another study found that 15% of European banks are exposed to increased risk from climate change as a result of their exposure towards industries where climate adaption is difficulty (Eceiza et al., 2020). This clearly means that investments will be affected by climate change albeit differently over time (Stenek et al., 2011).

It is therefore critical to incorporate climate risk into financial institutions risk management processes and to disclose how climate considerations are being addressed. This is even more important for establishing efficient markets and an assurance of green financial flows and climate change adaptations (UNEP, 2021). What this means is that climate change related risks should be treated as financial risks. Lack of adoption of climate change response and mitigation practices in these institutions has been blamed on tirade reasons ranging from lack of knowledge, lack of accountability among other reasons (Christianson, 1999). This leaves the area of financial institutions' response to climate change a germane topic for study.

1.2 Statement of the Problem

Climate change is threatening every aspect of life. Variability of existing climate has significant economic costs in the Republic of Kenya. While there may be a big agreement that climate change is the greatest moral and economic challenge now, there is far less agreement about how to address it. (Bowman 2010). Periodic droughts and floods result in major macro-economic costs and reduced economic growth in Kenya (Stockholm Environment Institute report 2009). Future change in climate will result to exceptionally large economic costs, almost 3 percent of GDP loss each year by 2030 in (Stockholm Environment Institute 2009). Every institution and individual must act to limit greenhouse gas pollution within their own sphere of influence. As the epicenter of a country's economy, there is a need to establish the current in place initiatives and the extent of adoption of the initiatives by commercial banks to respond to the threats of climate change to actualize the proposal of reducing green gases emissions and meet the word target of limit warming by 1.5°C. Banking sector like any other investment, is also at risk of climate change risk impacts (Demertzidis et al. 2015). Banks, need to take action to address, mitigate, and

disclose their climate risks and how they are dealing with them as they transition towards carbon free financial flows. It is expected that banks should incorporate climate change related scenario analysis into their risk management processes to properly adapt to climate change and mitigate the climate risks. It is therefore important to assess how banks disclose potential climate change impacts on their business strategies and how they address the risks towards a stable, and efficient financial market.

1.3 Objectives of the Study

1.3.1 General Objective

To determine how Kitui Town commercial banks have responded to climate change and its impacts on their performance.

1.3.2 Specific Objectives

i. To determine the climate change risks which the commercial banks in Kitui Town are exposed to.
ii. To illustrate how Kitui commercial banks have adopted and responded to climate change policies.
iii. To determine the impact of climate change responses on Kitui Town commercial banks' performance.

1.4.2 Specific Questions

i. What are the major climate change risks affecting Kitui Town commercial banks?
ii. What is the extent of adoption of climate change polices by Kitui Town commercials banks?
iii. What is the impact of the adopted climate change responses on Kitui Town commercial banks' performance?

1.5 Significance of the Study

This study will increase our understanding of climate change risks Kenyan commercial banks are exposed to through a case study of assessing them in in Kitui County commercial banks. Responding to these risks and the effects of these responses to their performance.

The results of this study will help the management of commercial banks in understanding climate change related risk, the adopted actions to respond to climate change and impacts to their organization's performance. This will help commercial banks make informed and appropriate decisions on the best responses to employ not only for their risk management but also for achieving individual bank performance endeavors in bottom line as well as the global endeavor of the low carbon economy. Findings of this study would also highlight important points in relation to the industry which can help the government authorities in policy formulation. It will also enhance the Central Bank of Kenya's capacity to regulate commercial banks for better climate change response and creation of a positive impact to the banks and the country economy.

Finally, the study will contribute towards existing knowledge on the extent of adoption of the various climate change response initiatives by banks and provide a launching pad for future research on areas the banks will need to improve.

1.6 Scope of Study

The banking sector in Kenya is made up of several commercial banks that operate branches that carry out banking business in different parts of the country. For this study, the research delimited to studying the commercial bank branches in Kitui Town. The respondents were drawn from the staff working in these commercial bank branches in Kitui Town.

The study focused on the types of risks and the adoption of established climate change response practices that is, corporate governance, climate change strategy, climate change polies and climate change disclosures as the major initiatives commercial banks and institutions can adopt to respond to climate change risks. The study was limited to the effects these climate change response practices had on their performance.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Historical Awareness of Climate Change

In 1988, World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) established the Intergovernmental Panel on Climate Change (IPCC). The IPPC, has since come up with scientific reports about climate change. These has enlightened economic decision makers and industry leaders with more information and awareness of climate change in their decision making. The financial system however lagged behind in spite of the enormous scientific proofs on climate change and its impacts. It was until early 2000s' when climate change projects centered on project finance activities with risk management framework were adopted by financial institutions (Chenet, 2019; Equator Principles, 2013). Later in 2005, the Kyoto Protocol emerged as the leading international emission trading system emerged (European Commission, 2013; Chenet, 2019).

In 2007, the European Investment Bank and World Bank issued the first green bond which were followed by low carbon stocks the following year. China launched the Green Credit Guidelines in 2012 and finally the Climate related Financial Disclosures established after the adoption of the Paris Agreement in 2015 (Chenet, 2019). This developments led to an increased debate on climate change among financial institutions (O'Dwyer and Unerman, 2020; FSB, 2020; Campiglio et al., 2018). The importance of incorporating climate risk and risk management processes and disclosures as become clearer and the financial sector has put sustainable finance and climate related risks higher in their agendas. There is an agreement that climate change financial risks that should be addressed by commercial banks for their financial stability.

2.2 Climate Change and Banking

Climate change is a reality, and its adverse effects are visible. They include, extended droughts, food insecurity, ferocious cyclones, infrastructure destruction, livelihood disruptions and mass migration. The main action believed to bring great effects in averting climate change is the ability to shift the business world from fossil fuel to renewable and

clean sources of energy (IPCC, 2015). This shift cuts across the big businesses like automakers shifting their investments to cleaner vehicles manufacturing. This will shift household power from fossil source to green source (Dlugolecki and Lafeld, 2005). This remains an intricate work in progress especially in measuring the economic costs of change in climate which if not well done can throw corporates out of business. A study by Gold, Russell (2019) on the First Climate-Change Bankruptcy assessed the immediate costs of responding to changing patterns of weather frequently and extreme natural disasters that comes with it. The current cost and the potential costs range over the horizon of the typical economic analysis (Olhoff, 2016). The economic effect of the change in climate is having a negative impact of the corporate world including the banking sector. Policy decisions now will affect the degree of damage to the environment and thus remain a concern for the coming generation's existence.

Investors and policymakers see climate change implications for the financial sector in two ways. The first is the risk climate change impacts on financial system. Among the major risk include the physical risks, which arise from physical damage to assets like property, land, and infrastructure (Baylis, 2021). The second is the transition risk which results from the changes in climate policy, consumers, and the market sentiment during the adjustment to a lower-carbon economy and technology ("Climate Change, Central Banks and Financial Risk - IMF F&D") (Bowman et al 2010). This risk exposures change significantly from one country to another. Physical risks for example are highly associated with lower and middle-income economies like Kenya.

In banking, exposures reveal themselves via increased default risk, lower values of assets or of loan portfolios. For example, high sea levels and an increased incidence of large weather events can lead to losses for diminished property values resulting in greater risks in mortgage portfolios. Corporate credit portfolios also, are at risk, as shown by the bankruptcy of California's largest utility, Pacific Gas and Electric, which the Wall Street Journal named the first "climate-change bankruptcy" (Gold 2019). Rapid changes in climate associated long droughts in California have dramatically increased electricity operations and the risk of drought fires from Pacific Gas. The California fires for example

are said to have caused loss over 16.8 billion dollars to banks through mortgage (Siddhartha 2017).

Although banks insure their assets and liabilities, physical climate change risks attack both the asset and the liabilities of the banks. It is evident that losses resulting from natural disasters are already going up. This is because climate change events raise the likelihood risks or the effect of events which were considered uncorrelated previously, such as floods and drought. Billings et al. (2022).

Transition risks highly materialize on the asset side of financial institutions, which could lead to losses on exposure within those firms with business models not built around the economics of low carbon emissions (Carney, (2015); Wellington & Sauer, 2005). Fossil fuel companies could find themselves saddled "literally unburnable" in a world going towards low-carbon global economy. Earning decline could be witnessed in these firms coupled with disrupted businesses, and increased funding costs because of policy action, change of technology, and investor and consumer needs for alignment with policies for tackling climate change (Olhoff, 2016). An example is where coal producers should engage with new or other expected policies to lower carbon emissions. Some of large the banks have already committed not to offer financing for new coal facilities to achieve these (Rainforest Action Network (RAN), BankTrack, Indigenous Environmental, 2020). This "carbon discount" reflects in the share prices of the US coal mining companies as well as the increased costs of financing and have been giving poor results relative to those companies having clean energy assets.

In the economy at large, risks may also materialize, especially when the shift to a low-carbon economy proves abrupt (because of prior inaction), difficult to coordinate globally (with consequent disruptions to international trade) and being poorly designed. When the prices of assets adjust rapidly financial stability concerns go up reflecting unexpected realizations of transition or physical risks (Weber, Scholz, & Michalik, 2010).

Evidently, markets are pricing partly in climate change risks, but prices of assets May not in fullness reflect the extent of policy action and potential damage needed to bare global warming to less than 2˚C as per the world commitment.

Financial regulators and Central Banks acknowledge the financial instability gestures of climate change. For example, supervisors for Greening the Financial System (NGFS) and Network of Central Banks, an expanding group currently comprising of 42 members has settled on the task of integrating climate change-related risks into financial stability monitoring and supervision. Putting into consideration the high shifts prices of assets and catastrophic weather-related losses that may result from climate change, prudential policies that recognize systemic climate risk e.g., through calling for financial institutions to take in climate risk scenarios into their stress tests. Prudential regulators in the United Kingdom, have been able to contain climate change scenarios into stress tests of insurance firms covering both transition and physical risks (Cambridge Institute of Sustainability, 2015).

Efforts to contain the banking climate-related risks into regulatory frameworks within the banking sector face tremendous challenges. However, this requires assessments over the horizons that are long-term and introducing new methodological approaches to capture climate risks properly. This will ensure that prudential frameworks reflect actual risks. (Tucker 2018). It is crucial to ascertain that the efforts to bring in climate risks strengthen prudential regulation rather than weakening them. Policies like giving financial institutions permission to hold less capital against the debt simply because the debt is green labeled could easily backfire through financial instability and increased leverage if the underlying risks in that said debt have not been measured and understood.

Further, monetary policy decisions will be affected by climate change by lowering productivity growth (for example, via damage to infrastructure and health), heightening inflation volatility and uncertainty. With the challenges found within the limits of central bank mandates, this can justify this adaptation of monetary policy. Central banks are expected to revise the frameworks for their refinancing operations to contain climate risk analytics, possibly to apply larger interest to assets exposed materially to transition or

physical risks Campiglio, et al., 2017. An example is where central banks can lead through sustainability projects that integrate green technology considerations into the investment decisions for the portfolios under their management (i.e., pension funds, their own funds, and, to the extent possible, international reserves), as given out by the (NGFS 2019) in its first comprehensive report (Cullen, 2023).

Financial industry is considered as an important sector for increasing sustainability by The World Business Council for Sustainable Development. Various top financial institutions such as the United Nation Global Compact (UNGC), United Nation Environmental Program Financial Initiative (UNEP-FI), the Equator Principles, the International Finance Corporation Standard, and the United Nations supported Principle for Socially Responsible Investment (UNPRI) are now required to comply with international standards and codes of conduct. This promotes corporate accountability, climate change mitigation, transparency, and sustainability. Non-Governmental Organizations such as the Rainforest Network and Bank Track review the banking industry to raise accountability and to make sure that bank operations will make a good contribution to society and take care of the ecological wellbeing of the planet. To discover how banks have adapted unto the problem of change in climate, researchers have looked keenly on the strategies and the actions of banks in response to environmental issues (Bihma & Nhamo, 2013; Bowman, 2010; CERES, 2008; Furrer et al., 2012; Jeucken & Bouma, 1999). Research on climate change and banking has been limited, as prior research conducted on climate change has primarily focused on manufacturing-related industries (Balon et al., 2016; Kolk & Pinkse, 2005; Lee, 2012; Sprengel & Busch, 2010; Weinhofer & Hoffman, 2010).

2.3 Financial Sector, climate Change Risks and Opportunities

The major banks risks include liquidity risk, credit risk, and currency risk. Unfortunately, these three are unable to capture the risks associated with climate change, ““*...the potential negative impacts of climate change on an organization*.” (Task Force on Climate related Financial Disclosures, 2017). These risks can be categorized into two (i) physical risk and (ii) transition risk. Their impact on organizations’ is dependent on the specific risks they are exposed to and how they strategically formulate decisions to manage them.

2.3.1 Physical Risks

These are risks related to the physical impacts of climate change. They can either be chronic or acute. Acute ones occur through extreme weather events such as floods. In contrast, chronic ones occur as a result of long term changes in climate change patterns such as continuous higher temperatures leading to sea level rise. Both of these risks can have financial implications to organizations through reduced revenue or increased capital costs. Reduced revenues can be caused by for example decreasing production because of interruptions to the supply chains, unexpected low sales, and transport disruptions.

2.3.2 Transition Risks

These are the risks associated with transitioning to a low carbon (green) economy. The transition can be a result of changes in policy, legal, market, technology, market, and organization's reputation (TCFD, 2017). Failure by organizations to these risks or adaptations to climate change can actually result in litigations claims by clients. These risks can further entail increased operating costs, e.g. in innovating for green (renewable) energy, changing customer preferences, and changing customer or community perceptions. Figure 1 below shows how these climate related risks and opportunities are linked with financial statements.

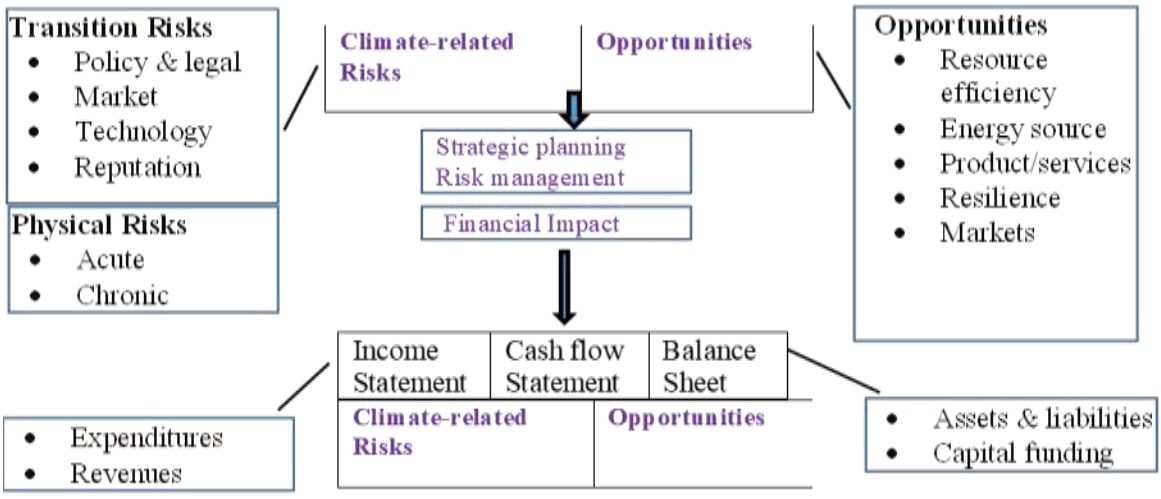


Figure 1.1 A schematic picture of the financial impact of climate risks and opportunities. Adapted from TCFD, 2017.

To achieve a low-carbon economy, it will require the banks to come up with policies directed at having banking and financial institutions direct their resources to climate-friendly ventures without the risking to destabilize them Campiglio, et al., 2017. According to World Bank, pricing of carbon and other fiscal policies have a basic role in lowering emissions and mobilizing revenues (World Bank, 2021) However, the financial sector has an important complementary role. Financial institutions and markets, through insurance and other risk-sharing mechanisms, already provide financial protection, e.g. catastrophe bonds, to absorb partly the cost of disasters. But the financial system by mobilizing the resources required for climate mitigation investments and adaptation in response to price signals can play an even more fundamental role, like the carbon pricing. Similarly, the financial system can help attain these goals efficiently, by policy making, extending implementation of policies to include the price of externalities, and providing incentives for the transition to a low-carbon economy (Barkawi, 2016).

Global investment tools for addressing change in climate are estimated in the trillions of dollars, with investments in infrastructure alone needing about $6 trillion annually up to 2030 (OECD 2017). The majority of these investments are likely to be intermediated via the financial system. In reference to this, climate change represents a broad source of opportunity as is a source of risk for the financial sector. The rising of sustainable finance (the integration of environmental, social, and governance criteria into investment decisions) across all the asset classes reveals the importance that investors attribute to climate change, among other considerations that are nonfinancial. Estimates of the asset size of sustainable finance globally range from three trillion dollars to thirty one trillion dollars (World Bank, 2016). While sustainable investments were rooted in equities, strong investor demand and policy support spurring the issuance of green bonds, raising the stock to an estimated 590 billion dollars in August 2019 from 78 billion dollars in 2015. Banks also are beginning to adjust their lending policies by, for example, giving discounts on loans for sustainable projects (“Climate Change, Central Banks, and Financial Risk - IMF F&D 2019”).

By availing incentives for firms to adopt less carbon-intensive technologies and specifically financing the development of modern technologies, sustainable finance can contribute to climate change mitigation (Liang & Renneboog, 2020). Ways through which investors can achieve this goal include advocating for low-carbon strategies as investor activists, engaging with company management, and lending to leading firms that care about sustainability. All these actions send, directly and indirectly, price signals in the capital allocation (Dafermos & Galanis, 2018). However, weighing the effect that sustainable investments have on their environmental targets remains challenging. There are concerns about greenwashing, which is the issue with an asset green nature. It is claimed that such as asset may not attract adequate investors to an extent that is able to counter climate change, especially when policy action is not sufficient to address climate(Vermeulen et al., 2018).

2.4 Role of banking sector in rolling back climate change

Banking is the heart of any country's growth. Worldwide, banking is among the biggest sectors with nearly $7.5 trillion in market capitalization (Statista 2022). The world's major capital providers are the banks. Managing and identifying investment risks and opportunities is very vital to the banking sector. (Finansinspektionen, 2019)Through their investment, lending and other financial services, commercial banks play a significant role in allocating resources. This includes the high-energy sensitive sectors responsible for high greenhouse gases emissions. Among the major cause of global warming is energy, especially gas, and coal. (Heffa et al 2011). A typical coal plant cost around US$ 2B; those producers depend heavily on lenders for finance either as corporate loans, syndicated loan, or bonds (Heffa et al 2011). These loans most times remain as silent portfolios in bankbooks and offer a classical example of how banks are influencing climate change and how they can determine which side the economy goes through their financing role. It is worth noting that Kenya is about to establish its first coal plant in Lamu county. Further, Kitui County has deposits of coal (Mui basin) which commercial banks are expected to finance mining. The biggest source of carbon dioxide emissions is coal-fired power plants (IPPC 2015). Ending emissions from coal will provide an 80 percent answer to the global warming crisis(James Hansen 2008)

It is believed that with this kind of influential position, a special responsibility comes for banks to involve in a leadership role aimed at addressing the challenges of climate change. The Paris agreement states that there is a need to consistently make finance flows with a goal to climate-resilient development and low greenhouse gas emissions (IPPC 2015). It is in this role that banks can provide a leading role in driving the world to a low carbon and clean economy.

As a business the baking sector is also exposed to the risk and threats of change in climate. It is estimated that up to five percent of market capitalization could be risking the consequences of climate change (Innovest 2004). Among the climate risk which could affect banking include physical risks, litigations risks, reputational risks, and regulatory risks (CDP, 2011; Coburn et al., 2011). The physical risks are related to the impacts of extreme weather events (e.g., hurricanes, droughts, floods, etc.), on business operation and production or on the different supply chain stages. The reputational risks are associated to the harmful actions of local communities and consumers against businesses (e.g., boycotts, protests) due to the improper day-to-day operation of businesses concerning various climate change aspects (e.g., greenhouse gas emissions). The regulatory risks are related to the additional costs that might load heavily on the financial structure of businesses when they try to follow the values of climate change regulations (e.g., Clean Air Act, Carbon Dioxide Emissions Act, energy taxes). Lastly, litigation risks relate to the offences done by businesses in concern to the climate change aspects of legislation (Coburn et al., 2011). Climate change litigation risks in America, have held banks liable and ordered cleanup of contaminated land and payment of hefty fines (Bowman 2010). Climate change risk to banks are categorized broadly into physical and financial risks (French Treasury, 2015). The risks start with the physical occurrence of climate change calamities. The banks' exposure to climate change risk can has been described by the below diagram.

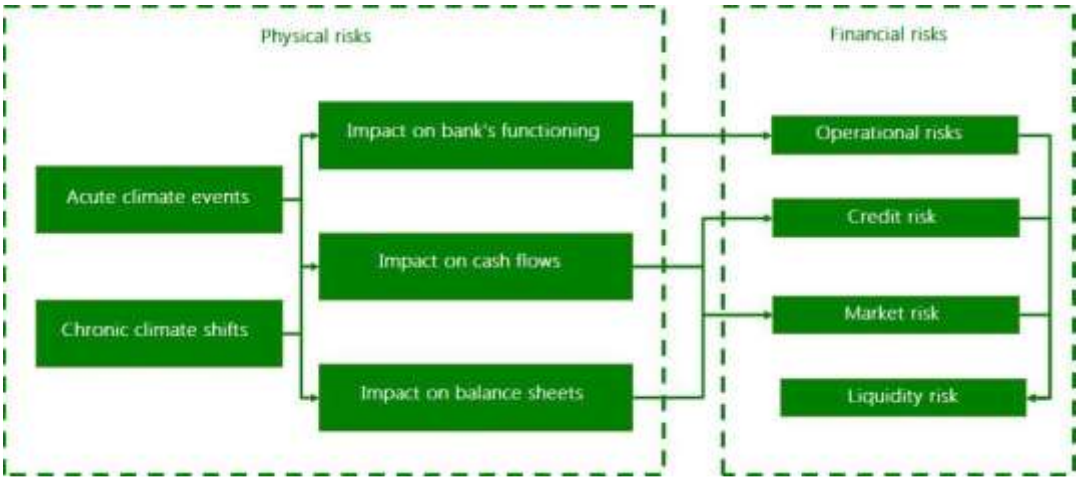


Figure 1.2: Climate change risks in banks (source: DG Tresor)

In order for banks to properly manage and evaluate their exposure to climate related financial risks, the first step is to understand where these risks come from and how the banking sector might be affected. In perspective to banking sector, learning the magnitude of climate-related risks and the circumstances under which they are most likely to face them will help the banks to develop the best response and climate mitigation initiatives. This may include stress-testing approach which captures well the materialization of risks along an adverse climate change calamity scenario (French Treasury, 2015). As much as the climate change is a complex environmental challenge to business, it is not only providing threats and risks but also opportunities to sectors like banking (stern 2014).

Capital investment need innovative technologies, products, and infrastructure. Changing consumer and investor preferences to climate-friendly products and investments will create business opportunities for all sectors, including banking. It is estimated that USD 20 trillion of capital will be needed to decarbonize the global energy sector over the next twenty five years (Cogan 2008). This is a major opportunity for banks if well braced. Well blending of this factor can lead to banks playing a key role in finding practical, cost-effective, and timely solutions to mitigate climate change. Each business area of a bank directly or indirectly has a different (positive or negative) look out on climate change in regard to the specific characteristics of its own activities (Furrer et al., 2010). Direct climate change affects banks' operations and indirect affects through the financial services offered to

clients. The interaction of banking sector and Climate change can be explained by a below diagram as developed by Ferrer 2010 (Furrer, et al., 2010). It shows in summary the relationship between climate change and banks. It depicts the opportunities and risks that climate change presents for banks, which are significantly indirect. It identifies that corporate actors can be by influenced by banks' (clients and suppliers). Also, greenhouse gas emission reductions through climate-related decision-making processes and market/product innovations (Bowman, 2010).

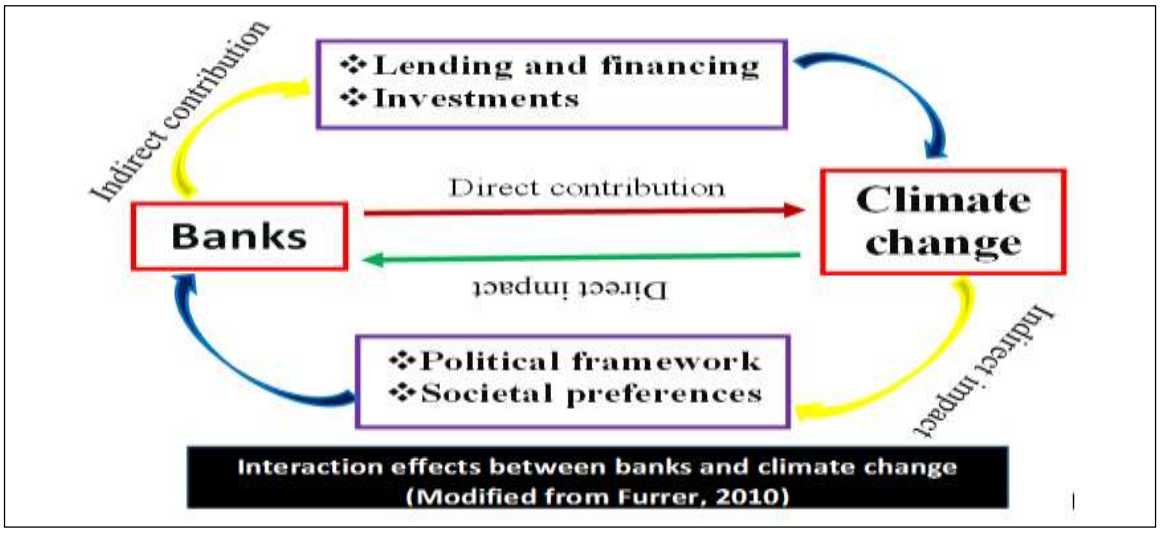


Figure 1.3: Interaction between climate change and banking sector, Furrer (2010)

2.5 Empirical Study of Climate Change Response in Kenya

2.5.1 Climate Change Response

The response to climate change and the environment is supremely secured by Kenya's supreme law. The constitution clarifies that citizens have a right to a clean environment, right for sustainable development among other rights. (GoK Constitution 2010). The constitution also tasks the government to protect the environment. The section of the constitution supporting climate change is in article 2. It provides that any treaty the government ratify forms part of the laws of the country (GoK Constitution 2010). This has led to development of precedence law and Kenyan authority by courts applying international treaties in climate and environmental issues. The legislative body, the parliament acted law to guide in responding to environmental issues among them climate

change threats. Specific to climate change, the notables the Climate Change Act of 2016 and the drafted Climate Change Authority Bill. Climate Change Authority Bill is to establish an authority to coordinate adaptation and mitigation to the impacts of climate change on all sectors of the economy including banking. The authority is mandated to develop strategies of response to climate change, provide mechanism on financing, governance, coordination of county and national government, and provide conceptual frameworks on reduction of greenhouse gas emissions. The authority is expected to be an independent advisory body, which ensures evidence-based decision-making and safeguards against political backsliding with mandatory progress accountability and monitoring. On the other hand, the Climate Change Act of 2016, draws it motivation from the UK Climate Change Act (2008), one of the earliest framework laws which has been used highly in advancing British climate change policy over the ten years it has been in enforcement. It has put the UK in a good picture on climate change response issues (Fankhauser et al., 2018). It is believed that the Climate Change Act will replicate the UK Act in its efficiency in terms of long-term emissions target, economy-wide carbon budgets that define the path towards the long-term target. The act is regarded to be effective like the UK Act in achieving continual adaptation planning towards climate resilience, (Fankhauser et al., 2018).

A study shows Since the Kyoto protocol inception, national climate laws around the world continue to increase. Increasing to almost 500 in 2014 from 40 in 1997 (Globe International, 2014). Therefore, legislative actions of the country are coordinated with the globe climate change response actions.

In terms of institutional framework, the Kenya government within its ministry of environment has created a unit for Environment and climate change. This unit is responsible to tackle climate change issues in a national context. It also facilitates the government's high-level policy efforts for sustainable development initiatives at both national and county level, The National Climate Change Coordinating Office pursuant to the requirements of the UNFCCC (IPCC, 2017). Every ministry in the Kenya government maintains an environment and climate change focal point in their activities Patrick (2013).

The national Environment Management Authority (NEMA) acts as the country's Designated National Authority (DNA), for regulation of the country's national compliance and enforcement mechanisms. Going by the country's Constitution, the implementation of the draft Environmental Policy that gazettes Climate Change Authority, finalization of the National Climate Change Action Plan (NCCAP) and preparation of the LPAR illustrates that Kenya is making some efforts in terms of policy to address climate change (Patrick 2013). Kenya, through its development master plan 'Vision 2030', aspires to grow to a middle-income country by the year 2030, focusing to increase annual GDP growth rates to 10% from around 6% (UNEP 2015). It is estimated that 42% of the country's GDP is sourced from natural resources, such as mining, fishing, forestry, agriculture, and tourism (UNEP Inquiry 2015). These main pillars of the country's economic master plan are under intense threat of Climate change extreme events which accounts for 70% of all disasters in the country. Responding to climate change together with other environmental difficulties is an important aspect to enabling the success of this Kenya development master plan and also to help secure a sustainable economy ("GoKb 2016).

In January 2016, the world adopted the Sustainable Development Goals (SDGs) to solve urgent challenges globally over the next fifteen years (UN 2016).. Goal No. 13 of SDGs is to urgently take action to combat climate change together with its impacts. This makes Kenya obliged to act and respond to climate change. Kenya being a signer to the Paris agreement, an ambitions commitment holding the rise in the average temperature globally to well below two degrees celsius higher than pre-industrial levels and pursuing efforts to hinder the temperature increase to 1.5°C above pre-industrial levels (Paris Agreement and Nations 2015). As a party, Kenya is expected to prepare and communicate the nationally determinate contributions (NDC) on how to reduce emissions and mitigate the impacts of climate change as per the article 4 of the agreement after. Kenya deposited its NDC in December 2016. In its NDC, the country has an ambitious plan of reducing greenhouse gas emission by 30% by 2030.(Ministry of Environment, 2017). To achieve its ambition, it will require banks input both directly and indirectly as capital supplier to projects and business operating in line with the country's climate change ambition. This calls for more research

and investment on clean energy, smart agriculture transport and among other sectors this makes banks a critical player.

The national Government recognizes natural variability in existence and historic climate change stress and variability, relating to La Niña and El Niño years and other climate change events, which has resulted to major impacts interruptions, stress, and economic costs and during previous years (SEI, 2009). The country's environmental policy treats the climate change variabilities as a priority and to pursue green economy path and to build capacity to adapt to climate change stress through developing comprehensive climate change policy and deliver the citizen constitutional right to clean and healthy environment (NEMA 2013). The country has adopted the two broad main categories of responses to change in climate which are adaptation (addressing effects) and mitigation (Addressing causes). Mitigation efforts are directed to bringing down of greenhouse gases, particularly carbon dioxide and prevent future climate change occurrence (Ans Kolk et al., 2010) while adaptation are goals looked upon to adapting to physical impacts such as extreme weather events and drought (Ans Kolk et al., 2010)

The country approach to climate change has been spontaneous supported by countries constitution, which created the equalization fund to respond towards the impact of climate change to the ASAL regions (GoKa, 2010). The important sectors to focus in responding are identified as water, agriculture, sustainable livelihoods, and infrastructure (road and energy). For agriculture, which is mainly affected by droughts and floods, the country has invested in irrigation schemes such as the Galana Kulalu irrigation scheme with total investment of around KSH 7 billion financed by Leumi bank of Israel; Construction of water reservoirs like Arror and Kimwerer multipurpose dams in Elgeyo Marakwet also financed by a loan from an Italian bank. In the energy sector, investment in wind and geothermal power generating energy in Turkana is an investment that has made Kenya a leader in green energy worldwide (IFC, 2016). All this provide opportunities for Kenyan commercial banks to partaker in responding to climate change in Kenya.

The country's 2010 constitution also established the 47 counties, which were given responsibilities over sectors affected by climate change such as county transport, agriculture, county planning and development together with implementing government policies on the natural resources. These devolved units have developed different sectorial adaptation towards climate change. Most notable is the ban of charcoal burning by Kitui and Makueni county governments, training and capacity building on climate change, smart agriculture in most arid counties all funded by World Bank (World bank 2018).According to report on the countries adaptation report, climate change response has been through the consolidated fund from developed countries and international bodies like the United Kingdom's Department for International Development (DfID), EU, and USAID with the National Environmental Management Authority (NEMA) has coordinating body to the sectorial adaptation fund (Omuko 2015).

Kenya as a country is also a witness to the UNFCCC and the Kyoto Protocol and commits together with all other hundred and ninety seven ratifiers to the Paris Agreement explicitly to address climate change to low-carbon economies through national policies or laws (Nachmany and Setzer, 2018). The Nation has been an active party in the Conferences of the Participants (COP) and it has associated itself with the Copenhagen Accord in 2010(Norrington-davies and Thornton 2011). Pursuit to these accords, the Kenya developed the National Climate Change Response Strategy (NCCRS) of 2010 as framework for consolidating climate concerns into development priorities, government budgeting and planning. To assist in implementing the NCCRS, the Kenyan government has established the Kenya National Climate Change Adaptation Plan (KNCCAP). It is estimated that the full implementation of the plan will cost 3 billion dollars per year over a period of 20 year (Stockholm Environment Institute 2009). The KCCAP is set out on an ambitious set Programme of different activities, and investments that, if delivered, can take Kenya to a low-carbon, climate resilient trajectory(Stockholm Environment Institute 2009). The purpose of global treaties and agreement is to provide directives for countries to prepare communities for climate change through adaptation and mitigation measures. There has been increasing energy and commitment by institutions and government to prepare the communities for impact of Climate change.

The Kenya government has scored well in the development of clean energy (Norrington-davies and Thornton 2011).. The latest review has shown that Kenya faces serious challenges in integrating the climate change responses within its national, sectorial, and cross-sectorial policies and regulatory frameworks. There is also no national frame work for reporting climate change and most of the responses are yet to be incorporated in government books including the national budget (Norrington-davies and Thornton 2011). However, in reference to Kenya Institute for Public Policy Research and Analysis Report, 2015, there are currently 127 active climate-relevant projects in Kenya with Africa Development Bank, World Bank and EU being the three major financiers. Other partners in climate change projects are SIDA, KFW, Danida, DFID and IFC. The projects revolves mainly around energy, agriculture, forestry, coasts and water ("Kenya Institute for Public Policy Research and analysis : Development Partner Climate Change Activities in Kenya" 2012). 85% of the project are implemented by the government and Parastatals while private sector and corporates implement only 7%(GoK 2018).The private sector provide mitigation efforts while the Government and NGO's mostly are focused in adaptation and reducing carbon emissions (Omuko, 2015). Among the barriers to effective response to climate change in Kenya as spelled in KCCAP is the access to cheap finance, inexperience in commercial banks and some other financial institutions to finance low carbon projects and energy efficiency sectors, collateral requirement, and lack of project money in banks (Kenya climate change action plan, 2012). This leads to a conclusion that banks have a chance in responding to climate change through climate change financing.

2.5.2 Climate Change Response in Kenya's Banking Sector

The financial sector ought to be a key player in responding to the challenges arising from climate change (Bowman, 2016). Major commitments by financial institutions point towards financing the transition towards a sustainable, low carbon economy in both developed and emerging markets (Sustainability Institute, 2010). In addition, financial sector supervisory authorities worldwide are enhancing their efforts towards promoting sustainability as an area of strategic focus in their respective jurisdictions (World Economic Forum, n.d. 2018) This includes the issuance of policy guidance on climate-related risk management. Among most adopted strategies to respond to climate change is climate

financing where commercial banks are to play part in financing deserving climate change projects (GoKb, 2012). Central Bank of Kenya, the supervisory body over the commercial banks in the country issued guidelines on responding to climate change. In its yearly 2019 report, the Central Bank of Kenya guided banks to grasp business opportunities and respond to climate change through mitigation and adaption practices in tandem with global standards (Njoroge, 2021). The regulator as guided banks to incorporate climate change risk management as a way of incorporating climate change disclosures (CBK, 2021). Within this guideline, CBK was to work with commercial banks and other partners to build capacity and integrate climate response practices in their management and in their day-to-day operations. All banks were to submit their board approved implementation climate change resource plans by June 30, 2022 (CBK 2021). It was expected that disclosure templates and commence disclosures be ready by June 2023. Based on quarterly updates by the banks, most of them have made significant progress in integrating climate-related risks in their governance and strategy frameworks. However, they are at initial stages in respect to risk management and disclosure frameworks (Ceres 2021). The bank also patterned with the Kenya Bankers Association to create sustainable financing training for the baking staff and catalyst award to failing well in response to climate change actions which 46 banks are participants (KBA,2018 n.d.).

The four scenarios which commercial banks have adopted to respond to climate change are: (i) bank corporate governance, (ii) Climate change policy, (iii) Climate change strategy and (iv) climate change disclosure. These have been certified as the most appropriate ways(Furrer et.al., 2010. Corporate governance deliberates consisted and planned actions to secure institutions target result. In a climate change perspective, governance involves an all institution inclusive climate change response and management structure, as well as coming up with climate change specialized products(Furrer et al., 2010). Climate change response has through corporate governance been remarkable in Bangladesh banking sector where banks allocate considerable amount of money in their budget for green finance products, climate risk marketing and staff training(Hassan et al. 2014).

Commercial banks can also respond to climate change through climate change policies. Through climate change Policy Framework, commercial banks show indicators of existence of written polices to respond to risk and grasp available opportunities (Dunn, 2002). Climate change policies can stem or be replicated from international frame works like Equator principle (Bowman 2010). Commercial banks can respond to climate change through climate change related disclosures – that is internationally embraced climate change responses. Taskforce for Climate Change related financial Disclosure (TCFD) established by the Financial Stability board to set up financial institution disclosure standards on climate change related risk and opportunities. Climate change disclosure include discussions, presentations and making known climate change, environmental data, and activities that include risks, exposure, and opportunities (Mete Feridun et al., 2020).

Banks can also practice calculating carbon exposure, cost benefit analysis of climate change issues and disclosing the same by briefing shareholders, regulators and stake holder (Furrer et al., 2010). Kenyan commercial banks respond to climate change disclosures by becoming member coalition like CDP, Carbon trust or subscribing to existing frameworks on carbon disclosure like the Carbon Principal. Climate disclosures do not only have to be an institutions private practice but also public partnership around emissions disclosure and participating in national debates on climate change response disclosures.

The fourth way commercial banks respond to climate change is through climate change strategies where they undertake watertight climate change response strategies to deal with climate change opportunities risks (Porter & Reinhardt, 2007). Climate change response via strategy indicators include climate and environmental related audits, human resources training, research on mitigation and assessing mitigation strategies of clients, partners, and suppliers and all-inclusive climate and environmental policies in institution departments. According, to McKinsey, 61% of world CEOs contends that the bottom line will have a positive impact if institutions manage environmental and climate change issues effectively (McKinsey, 2007). Consequently, this study focused on studying the extent the Kitui Town commercial banks are adopting these our climate change responses and the impact to their performance.

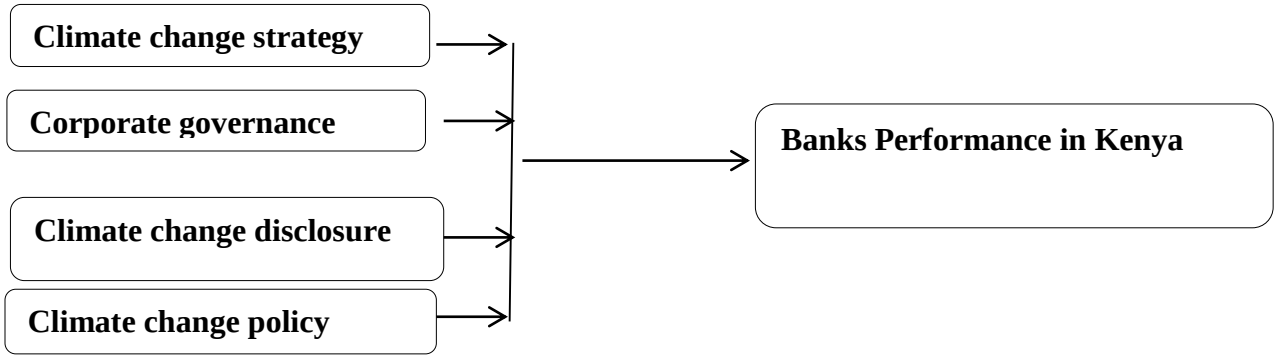
Tables 2.1 Summary of the four scenarios commercial banks can respond to climate change and their indicators.

Scenario	Climate Change Response Indicators
Climate change strategy	Regular environmental and climate change audit
	Regular environmental and climate change training in intellectual property
	Environmental and climate change standards for suppliers
	Continuous research on environmental and climate change training
	Environmental and climate change policy
Corporate governance	Carbon lending
	Mobile banking
	Green insurance
	Green fiscal funds
	Paperless Banking
Climate change disclosure	Carbon exposure evaluation
	Presence of pricing carbon credits
	Costing climate change issues
	Risk matrix
Climate change policy	should be regular climate change risk analysis
	Existence of plan for climate change risks
	Caution when dealing with climate change issues

2.6 Conceptual Framework

A conceptual framework of a study is a flow structure of how the idealized study variables, under a standard accepted principles ingrained in the fields of study affects the dependent variable of the study (Myers, 2013). It shows how the variables (independent and the dependent variables) in play relate. In the current study, the independent variables were the adoption of corporate governance, climate change strategy, climate change disclosure, and climate change policy.

The researcher believes that dependent variable was influenced by the independent variables. A perception on independent variables and the dependent variable relationship is illustrated in figured 2.1 below.



Independent variable Dependent variable

Figure 2.1: Conceptual Framework of the study.

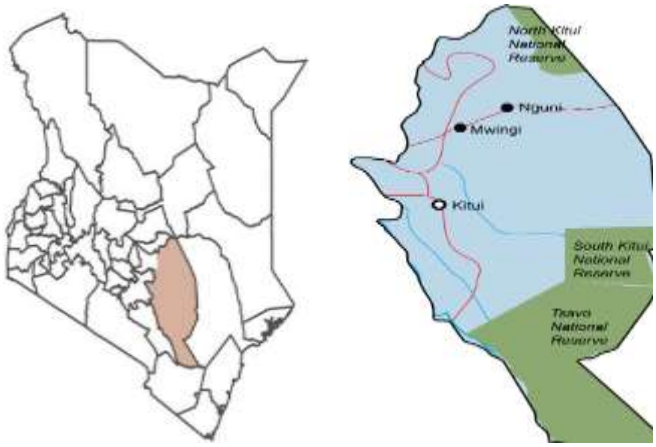
CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Study Area

The objective was to study how commercial banks were responding to climate change through a case study of commercial banks in Kitui town. Kitui Town is the head quarter of Kitui County as created by the Constitution of Kenya 2010 (GoKa 2010). Kitui town is located 158 km, east of the capital city of Kenya, Nairobi. It is on the Coordinates 1° 22′ 0″ S and 38° 1′ 0″ E.

Map of Kenya showing Kitui County and Kitui county showing Kitui town



Source: GIS office Kitui county

Figure 4.1: Map of showing the position of Kitui county and Kitui Town.

3.2 Research Design

This study adopted descriptive survey design the survey that was more of qualitative than quantitative. In reference to Mugenda and Mugenda (2010). The advantage of this design is that, it is good for information collection about a large group of people. Secondly, it a flexible standardized medium that can be varied to fit into the phenomena the researcher wishes to study. It is less susceptible to error and finally easy to administer.

3.3 Target Population

The study population is all the possible target, and due to restraining factors, sampling becomes imperative (Greenland, 2005). Being a case study, the target population of this study was all the commercial banks operating in Kitui town. According to Kenya central bank annual supervision report, there are forty-three commercial banks operating in Kenya. A total of 10 commercial banks has a representative branch in Kitui (Kenya Banker Association, 2019). All the commercial banks operating in Kitui were considered for the study. This represented 23% of all commercial bank operating in the country. A sample size of between 10% - 30% is good for representation of a total population according to Mugenda and Mugenda (2003).

3.4 Sampling Frame

Sampling frame are the units of the population from which the respondents are to be selected to form a study sample. (Cooper & Schindler, 2014). The sampling frame in the present study included all ten commercial bank branches in Kitui where the bank staff formed the respondents.. commercial bank staffs work by implementing institutions polices, and governance guidelines geared towards achieving the bank's target and results (Barney, 1991). Since they are involved in the daily running of commercial bank activities, it can be deduced that they have a good knowledge of the banks operation activities hence competed for study objectives (Barney, 1991). According to the Commercial Banks Human Resource Information Systems, the commercial banks in Kitui had a total of 93 workers (Kenya Banker Association, 2019), as shown in Table 3.4 below.

Table 3.1 Distribution of commercial banks staff in Kitui

Serial number	Commercial bank branch	Number of staff
1	Kenya Commercial Bank Limited	10
2	Equity Bank Limited.	11
3	Co-Operative Bank of Kenya Limited.	8
4	Barclays Bank of Kenya Limited	8
5	Kenya women finance bank	6
6	National Bank of Kenya Limited	7
7	Family Bank Limited.	8
8	Sidian bank	7
9	Faulu bank	7
10	Post bank	6
	Total	**78**

3.5 Sample Size and Sampling Procedures

3.5.1 Sample Size

Sample is the individual specific respondents drawn from the population of all respondents with the aim of estimating the characteristics of the population. In reference to this, the study, being a case study of the commercial banks in Kitui town, respondents were drawn from commercial bank workers in Kitui Town banks, whose total is 78 individuals.

In order to obtain this sample, the formula by Yamane (1967) was applied because the population sampled was less than 50, 0000.

The formula is $n = \frac{N}{1 + (N * e2)}$

Where:

n= sample size

N= Total population size of the respondents

e= desired level of confidence. (Confidence level of 0.05 at 95% was applied)

Thus, the sample (n) = 78/ (1+ (78*0.05*0.05)

n=65.2

Therefore, the study adopted a sample size of 65 individuals

3.5.2 Sampling Procedures

The study population was already stratified into branch units; therefore, purposive sampling was used to select the specific number of respondents in each bank branch. A sampling frame showing the distribution of respondents per commercial bank branch was determined and the sample size per branch was calculated as a percentage of the total population.

Table 3.2 Distribution of sample size per commercial banks branch

Commercial bank branch	Total Number of staff(population)	% Of Sample size	sample picked
Kenya Commercial Bank Limited	10	12.82	8
Equity Bank Limited.	11	14.10	9
Co-Operative Bank of Kenya Limited.	8	10.26	7
Barclays Bank of Kenya Limited	8	10.26	7
Kenya women finance bank	6	7.69	5
National Bank of Kenya Limited	7	8.97	6
Family Bank Limited.	8	10.26	7
Sidian bank	7	8.97	6
Faulu bank	7	8.97	6
Post bank	6	7.69	5
Total	**78**	**100.00**	**65**

With an established number of respondents per branch, random sampling was used to select the specific respondents in each bank from the total number of works in the branch.

Random sampling per branch was used since the sample for strata (branch) was homogenous only bank staff.

3.6 Research Collection Instrument

The study adopted both a primary and secondary sources of data. Data collection methods ware confirmed by the study objectives as used in the (Tashakkori and Teddlie 2010).

3.6.1 Primary Data Collection instruments

A questionnaire method was used to collect primary data. The questionnaire consisted of four parts. Part A enquired about the respondent's demographic information and their level of climate change affects knowledge. Part B enquired about their knowledge on the effect of climate change. Part C of the questionnaire enquired if commercial banks were responding to the climate change effects while Part D enquired on the climate change effects response practices in different within their banks and branch departments. Questionnaire administration was done through self-administration to the respondents who individually filled in the details as requested and then returned to the researcher for coding, processing, and analysis

3.6.2 Secondary Data Collection.

Secondary data in a study is the data is which is readily available having been collected and used by another researcher in another researcher (Ngechu, 2004). Donald and Delno (2006), indicate that both primary and secondary sources of data can be used in research. Secondary data is used to corroborate the primary source of data (Schriesheim, 1995). The common sources of secondary data are published literature including online literature. The literature sources for the study data were annual reports of the respective commercial banks and Kenya bankers' association reports. Central Bank of Kenya reports provided another useful source of data. The secondary sources were reviewed for relevant information for the study. Secondary data collected was used to complement and validate the primary collected data.

3.6.3 Reliability of Research Instruments

For research credibility, reliability of research instruments is important and involves measuring its consistency (Delno, 2006). The test for reliability is evaluated in two dimensions, that's equivalency and stability (Weiner 2007). Reliability also establishes the latitude to which a study tool can be relied upon to present consistent results on repeated use (Kothari 2009). To assess the reliability, Cronbach's Alpha coefficient was applied.

3.6.4 Validity of Research Instruments

Validity of research instrument to fit the study objectives was imperative for the research. To assess the validity of the research instrument, the standardized, appropriate, within the meaning and useful content guided by the research objectives pass the test (DeVellis, 2003).To maintain validity of the research instruments, expert opinions where incorporated and informed the researcher construction of the research instrument (Kothari 2009) Kaiser-Mayor-Olin measures adequacy of sampling (KMO) and Bartlett's test was applied to test validity. The test showed the value of test statistic as 0.57 and p-value <0.05.on the Bartlett's test of sphericity had a chi-square value of 476.426 p-value of 0.000. Since the p value is less than 0.05, the test results showed there we correlation and validity between the study variables and hence fit for further statistical analysis.

Table 3.3 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.577
Bartlett's Test of Sphericity	Approx. Chi-Square	476.426
	df	78
	Sig.	.000

3.7 Data Analysis and Presentation

3.7.1 Data Analysis

Quantitative Information was summarized and analyzed using appropriate simple percentage, frequency and mean. Mixed methods data analysis techniques were employed in this study incorporating both descriptive and inferential data analysis. Pearson's Product Moment Correlation Coefficient (r) and Regression analysis was used.

In the current study, the response (criterion) variable (Y) is performance while the independent (predictor) variables are climate change strategy, corporate governance, climate change disclosure, and climate change policy. Computer statistical software Statistical Package for Social Sciences (SPSS) was used to analyze the data in this study.

3.7.2 Data Presentation

Tables were used to present quantitative data while qualitative data was descriptively presented through vie charts and graphs.

CHAPTER FOUR

4.0 RESULTS

4.1 Introduction

The research was set out to study extent of adoption of climate change response practices scenario by a case study of commercial banks in Kitui County. The study was also to analyze the influence adoption of the selected climate change response practice had to the performance of the banking sector in Kenya. The reports of study the data analysis and interpretation, to show the research findings. The information obtained from data analysis is presented in tables and graphs, with accompanying explanations form the interpretation of the findings.

4.2 Response Rate

In the study, 65 questionnaires were sent out of which 60 were returned duly filled and were used for data analysis. The 60 duly filled questionnaires give a response rate of 93.3%. Such a response rate is adequate to form generalized findings on the entire population under study, as stated by Mugenda & Mugenda (2008).

Table 4.1 Response Rate

Returned	60	92.30%
Non-Returned	5	7.30%
Total Distributed	65	100%

4.3 Reliability Results

To evaluate reliability of the instrument results, Cronbach's Alpha was applied. A coefficient above 0.7 lenders the research instrument adequate for analysis in as study research (Nunally, 1978). The Cronbach test results showed a reliability coefficient of more than 0.7 on all the research variables that is climate change strategy, corporate governance,

climate change disclosure, and climate change policy adoption by commercial banks leading to the conclusion that the research instrument was adequate for further analysis.

Table 4.2 Cronbach Alpha for Reliability Assessment

Variables	Cronbach Alpha	Remarks
climate change strategy	0.700	Accepted
corporate governance	0.739	Accepted
climate change disclosure	0.750	Accepted
climate change policy	0.870	Accepted

4.4 Demographic Information of the Respondents

The study sought the background information of the respondents which included name of the banks, type of bank ownership, number of years the bank has operated in Kenya, highest level of education respondent, employment position of the respondent, number of years the respondent been working with the bank and whether the bank is listed and trading in the Nairobi Stock Exchange.

Table 4.3 Demographic information of the respondents

Demographic Characteristic	Category	Frequency	Percent
Gender	Male	34	56%
	Female	26	44%
	Total	60	100
Highest level of education	Diploma	10	16.7%
	Undergraduate	39	65%
	Masters	11	18.3%
	Total	60	100%
Work Experience in the bank	Below 5 Years	9	15%
	6-10 Years	15	25%
	11-15 Years	13	21.7
	16-20 Years	7	11.6
	21-25 Years	6	10%
	Above 25 Years	10	16.6
	Total	60	100

Of the 65 respondents, 34 were male, representing 56%, while the female respondents were 31, which was a percentage of 44%. Majority of the respondents were undergraduate degree holders, at 65% while Diploma holders were 16.7% and those with postgraduate education were 18.3%. This can be used to deduce that the respondent had basic knowledge to read and answer the questioners. Respondents with work experience of less than 5 years were 15%, between 6 and 10 years were 25%, 11-15 years were 21.7%, 16-20 years were 11.6%, 21-25 years were 10%, and above 25 years were 16%. This showed that over 85 % of the respondent had served in the banking sector for more than 5 years; hence they had a good knowledge of bank operations to answer the questionnaire.

4.5. Banks General Information

The study comprised of 10 commercial banks in Kitui County. The study sought to establish the banks ownership from which respondents worked, and if the banks are listed and trading in the Nairobi Stocks and Securities Exchanges. The respondent showed that majority of the banks (60%) are privately owned while 20% of the banks in Kitui ownership shared between the government and private owners. Ownership of the bank was important in underrating the decision making organs in bank which include decisions on responding to climate change. According to the Nairobi Stock Exchange, the Board of the company including banks, on behalf of the shareholder bear the burden to promise and deliver sustainability of the company.

Table 4.4 Banks General Information on bank ownership

Type of ownership	**No. of banks**	**Percentage**
Government owned	2	20.0
Fully Privatively	6	60.0
Both private and government	2	20.0
Total	**10**	**100.0%**

On listing and trading in security exchange, respondents who indicated that their banks are listed in the Nairobi Stock and Securities Exchange were 78.6%, while 21.4% indicated

that their bank were not listed. A cross tabulation between the bank and whether they are listed or not was done to establish which banks were listed or not, as shown in Table 4.4 below.

Table 4.5Cross Tabulation between Bank and listing on the Nairobi Stock Exchange

	Is you bank listed in the Nairobi stock exchange		
	Yes	No	Total
Family Bank	6	0	6
Faulu Bank	0	5	5
Absa Bank of Kenya	7	0	7
Post Bank	0	5	5
Co-operative Bank of Kenya	7	0	7
Equity Bank Limited	8	0	8
Kenya Commercial Bank Limited	7	0	7
Sidian Bank	0	6	6
Kenya Women Finance Bank	0	4	4
National Bank of Kenya	5	0	5
Total	40	20	60

Banks listed in the Nairobi Stock & Securities Exchange as at the time of this study were Family Bank, ABSA Bank, Co-operative Bank, Equity Bank, Kenya Commercial Bank and National Bank of Kenya. Those not listed were Faulu Bank, Post Bank, Sidian Bank and Kenya Women Finance Bank. Trading in stock exchange is important aspect in data and reporting. As listed banks, stock exchange issue direction on reporting and among the can directing on reporting on the extent climate change risk and carbon risk exposure.

4.6. What are the major climate change risks affecting the bank?

The study was to examine the major climate change risk affecting the banks, the reports is tabulated below.

Table 4.6 Major climate change risks affecting the banks

		Frequency	Percent
By ticking, which of the below climate change risk is your bank exposed by a big extent	Physical risk	7	10
	Litigation and regulatory risk	25	35.7
	Market risks	9	12.9
	Credit risk	11	15.7
	Financial risk	18	25.7
What is the perception of your institution towards the climate change risks	Major risk	30	42.9
	Average risk	18	25.7
	Minor risk	19	27.1
	Unsure of risk	3	4.3
How do you rate consideration of climate change issues in your banking business operation	Not important	8	11.4
	Somewhat important	18	25.7
	Important	31	44.3
	Very important	13	18.6

According to 35.7% of the respondent's banks are faced by litigation and regulatory risks due to climate change. Financial risk follows with 25.7%, then credit and market risks at 15.7% and 12.9%, with physical risk being the least, at 10%. Banks perceive climate change risks as a major risk, with 42.9% of the respondents stating so, while those who believe it is an average and minor risks being 25.7% and 27.1% respectively. 4.3% of the respondents were unsure. Banks consider climate change issues as important, according to 44.3% of the respondents, and according to 18.6% as very important. 11.4% believed that from their bank operation, climate change issues are not considered important, while 25.7% chose somewhat important.

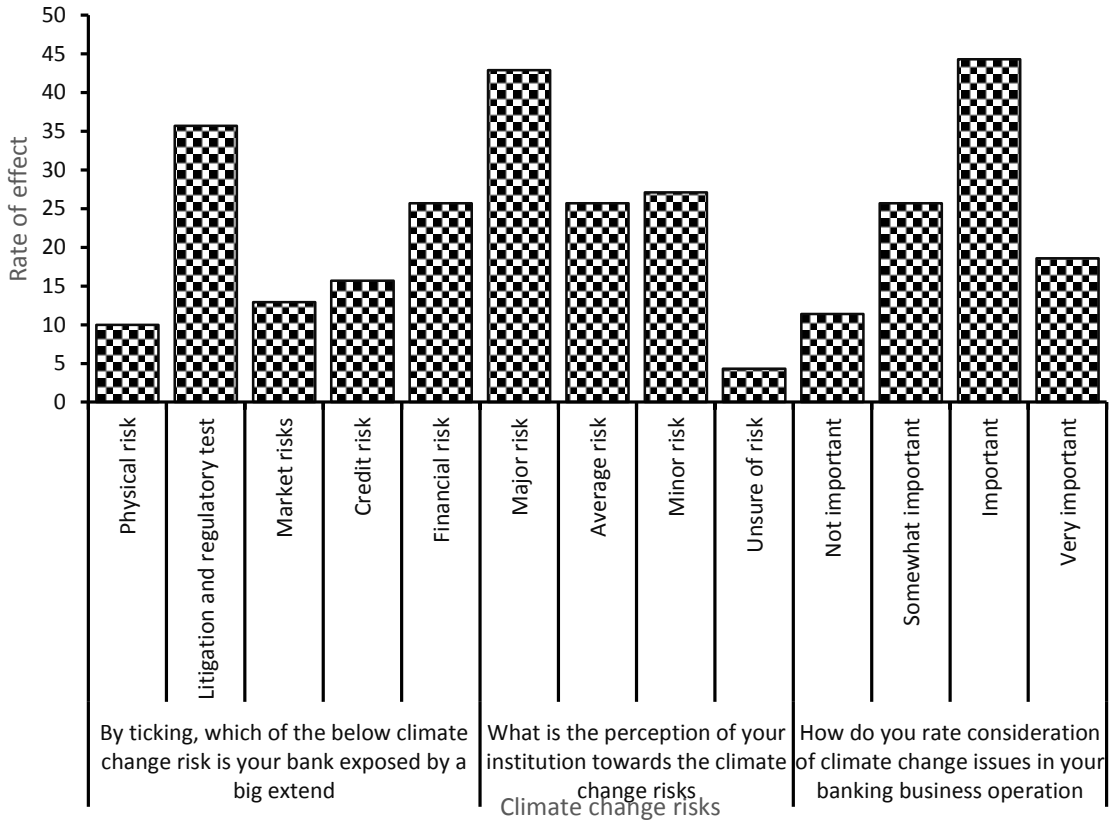


Figure 4.2 Major climate risks affecting banks

4.7 Climate Change Response Practices Adopted by Commercial Banks

The study second objective sought to assess the adoption of climate change response scenarios by the commercial banks. The key used to gauge the extent of adoption was 1= no extent, 2 = little extent, 3 = moderate extent, 4= great extent, 5= very great extent. The research studied adoption of climate change strategies, corporate governance practices, Climate change disclosures activities and climate change policy as climate change response scenarios by the commercial bank in their business. The study results on the adoption of the four climate change scenarios are discussed below.

4.7.1 Descriptive analysis of adoption of Climate Change strategy.

Table 4.7 Adoption of climate change response strategy scenario in commercial banks strategy.

Indicators	1	2	3	4	5	Mean	Standard deviation
Regular environmental and climate change audit	4 6.7%	10 6.7%	20 33.3%	21 35.0%	5 8.3%	38.6	1.3
Regular environmental and climate change training	4 6.7%	5 8.3%	12 20.0%	28 46.7%	11 18.3 %	43.4	6.1
Environmental and climate change standards for suppliers	22 36.7%	26 43.3%	8 13.3%	3 5.0%	1 1.7%	23.0	14.3
Continuous research on environmental and climate change training	12 20.0%	14 23.3%	18 30.0%	9 15.0%	7 11.7%	33.0	7.3
Environmental and climate change policy	2 3.3%	3 5.0%	10 6.7%	20 33.3%	25 41.7%	48.6	11.3

The study established that to a great extent the initiative of regular environmental and climate change audits were practiced by most banks with a standard deviation of S=1.3. This was the smallest standard deviation implying smallest deviation in responses

4.7.2 Descriptive analysis of the corporate governance practices adoption to respond to climate change.

Table 4.8 adoption of corporate governance practice initiates in terms for climate change response

Indicators	1	2	3	4	5	Mean	Std dev
Carbon	12	20	14	9	5	31.0	3.2
lending	20.0 %	30%	23.3%	15%	8%		
Mobile	2	5	10	15	28	48.4	5.6
banking	3.3%	8.3%	16.7%	25%	46.6%		
Green	2	4	8	16	30	48.6	11.4
insurance	3.3%	6.7%	13.3%	26.6%	50%		
Green	1	3	9	11	36	51.6	12.5
fiscal funds	1.7%	5.0%	15.1%	18.33%	60%		
Paperless	2	5	4	20	29		
Banking	3.3%	8.0%	6.7%	33%	48%	49.8	4.3

Corporate governance initiatives, centered on climate change products are among the most adopted initiatives by the commercial banks.

4.7.3 Descriptive Analysis on the Adoption of Climate Change Disclosure to Respond to Climate Change.

The study sought to determine the extent of adoption of climate change disclosure by commercial banks.

Table 4.9 Adoption of the climate change disclosure initiatives to respond to climate change

Indicators	1	2	3	4	5	Mean	Std. Dev.
Carbon exposure evaluation	40 66.3%	10 16.7%	5 8.3%	3 5.0%	2 3.3%	19.4	3.1
Presence of pricing carbon credits	50 83.3%	5 8.3%	1 1.6%	2 3.3%	2 3.3%	16.2	23.0
Costing climate change issues	42 70.0%	12 20.0%	2 3.3%	3 5.0%	1 1.6%	17.8	22.5
Risk matrix	30 50.0%	18 30.0%	8 13.3%	3 5.0%	1 1 .6%	21.4	18.5

Climate change disclosures came out to be overly the least adopted climate change response imitative. Majority (over 65%) of the respondent's content there was no adoption except the climate risk which 50% of respondent contenting to no adoption. Comparing amongst themselves, carbon pricing scored the least in adoption extent with 83.3% of the respondents indicating no extent in adoption.

4.7.4 Descriptive Analysis of the Adoption of Climate Change Policies to Respond to Climate Change by Commercial Banks

Table 4.10 Adoption of climate change policies to response by commercial banks

Indicator	1	2	3	4	5	Mean	Std dev
There is regular climate change risk analysis	5 8.3%	6 10.0%	10 16.7%	34 56.6%	6 10.0%	42.6	3.1
Existence of plan for climate change risks	3 5.0%	5 8.3%	8 13.3%	29 48.3%	14 23.3%	52.6	13.1
Caution when dealing with climate change issues	12 20.0%	35 58.3%	10 16.7%	2 3.3%	1 1.6%	23.2	16.3

On the adoption of climate change polices, majority (56.6%) of the respondents indicated that the existence of over great adoption of for climate change risks analysis. This can be attributed to the fact that banks are risk takers and are much more concerned with risks. However, 58.3% indicated that there was little extent to adoption of caution when dealing with climate change.

4.8 Correlation Analysis on the Impacts pf the Adopted Climate Change Responses on Commercial Banks' Performance

The also sought to establish how the adoption of climate change response practices was affecting the banks performance. Correlational analysis was done to study how climate change strategies, corporate governance for climate change response, climate change

disclosure, and climate change policy adoption were affecting the commercial bank performance.

The results shown in Table 4.10 indicate that there was a significant positive impact of climate change strategy on banking performance (rho=0.6530, p-value <0.05). This implies that a unit change in climate change strategy increases banking performance by 65.3%. Secondly there was a positive and significant impact of corporate governance in terms of climate change on banking performance (rho =0.608, P value <0.05). This implies that a unit change in corporate governance in terms of climate change increases banking performance by 60.8%. Thirdly, there was a positive and significant impact of corporate governance in terms of climate change on banking performance (rho = 0.514, p value <0.05).

This implies that a unit change in corporate governance in terms of climate change increases bank performance by 51.4%. Finally, there was a positive and significant impact of climate change policy on banking performance (rho = 0.521, p value <0.05). This implies that a unit change in climate change policy increases banking performance by 52.1%.

Table 4.11 Correlation Analysis of adopted initiative with the bank's performance

	Bank Performance	climate change strategy	corporate governance	climate change disclosure	climate change policy
Bank Performance	1				
Climate Change Strategy	.653**	1			
Corporate Governance	.608**	0.441	1		
Climate Change Disclosure	.514**	0.403	-0.508	1	
Climate Change Policy	.521**	0.303	0.305	0.280	1

** * 2-tailed Correlation is significant at the 0.01 level

CHAPTER FIVE

5.0 DISCUSSION

5.1 Introduction

The current study brought bare the lack of knowledge on the efforts bank have put to align with the global goal of responding to climate change and the effects the efforts have on banking performance as profit institutions. (Chenet, 2019).Many previous studies done on the impact of climate change have focused impact of climate change on business performance. (UNEP FI, 2018) On the other hand, this study has gone further by examining the impact of climate change responses of the business, specifically banks.

On this regard, the study assessed how Kenya commercial banks are responding to climate change, and consequently the impacts of climate change on their performance through a case study of banks in Kitui town, Kitui County. The study adopted descriptive research design while stratified sampling technique was used to select a sample of 65 employees of the commercial banks in Kitui town, Kitui County, Kenya. The primary data was collected by issuing questionnaires to the selected employees. Out of the 65 questionnaires issued, 60 were dully filled and returned, representing a 92.3% response rate. The study assessed climate change strategy, corporate governance, climate change disclosure, and climate change policy initiatives adoption in these banks as the independent variables. Descriptive analysis such as frequency and percentage were used to analyze the data which was presented a summarized information in table and figures. Based on the results from the interviews, it is possible to discuss how the Kenyan banking sector is responding to climate related risks, makes decisions to manage them and how the decisions they make impact their profitability. One thing that came out of the study is that the banking sector needs to view climate change as an iterative process and embrace the learning things by doing mentality. These will help them to build their own structures, data sets and tools that will help them to effectively respond to climate related challenges and in the process enhance their climate change adaptation and mitigation capabilities over time. However, there is need to improve on their reporting to improve consistency and compatibility (O'Dwyer and Unerman, 2020).

5.2 Major climate change risk and banks perception

Majority (40%) of the respondents indicated that climate change affected the banking in Kenya. They indicated that acute climate change events are main thing the banks are exposed to. The specific acute climate change events affecting banks mostly is drought, storms and credit risks. Mostly brought about by the physical risks and exposure to acute climate events to the bank or to bank customers. An average number of respondents (46.7%) indicated that the business department was mostly exposed to climate change risks. These is an average number and indicates that Kenyan commercial banks are averagely affected to climate change and it contrasts a 2019 study done by the central bankers in the world which established that over 70% bankers considered climate change and other environmental related risks as a major risk and threat to financial institutions stability (Wishnick, 2021).This observation raises a possibility that the study did not bring into attention most material risks, or that in the Kenyan banking sector, it would be impractical to assess all potential climate change risks. There is also a possibility that Kenyan banks have not been able to conduct scenario analysis on the climate change risks to enhance climate change perceptions of their workers. These can likely bring out other deficiencies in terms of availability of resources, capacity, and data.

The three top reported climate change events affecting banking (drought, storms and credit risks) are the same that affects people's businesses. This may mean that they may have depended on customers' reporting on climate related risking affecting their operations. If this is the case, then respondents' perception may have been dependent on the information from borrowers and existing literature on climate change. This raises a major challenge in data availability and reliability as was noted by (Monnin, 2018 and Hubert et al., 2018).

5.3 Adoption of climate change strategy by commercial banks in Kitui County.

The study showed that out of the studied six indicators of adoption of climate change strategy to respond to climate change, environmental and climate change standards for suppliers and continuous research on environmental and climate change training were the least adopted. These results agree with the study done by Hubert which showed that banks

are less concerned with the climate change true effect of their associated business.((Hubert et al., 2018). This can also be an indication that commercial banks think this is not a good initiative in dealing with climate change effects or it by sheer lack of knowledge on this climate change response imitative.

Another difficulty is the perception that climate change may have not happened meaning that there is no data to analyze to come up with results. Such a scenario may mean that bank staff have no knowledge of climate change impacting their operations directly. Such quantification was mentioned by Monnin (2018) and also expressed by Thomä and Chenet (2017) by reporting that climate change happening today will have its impacts in the future and therefore difficult to perceive the risk now. It is this lack of historical events that may have made it difficult for bank workers to connect the outcome with risk probability. Further, the complexity and uncertainty climate scenarios and the nature of climate change risks differ from the day to day normal financial risks the bankers in their management and quantification. These therefore means that continuous research on environmental and climate change training is necessary for the adoption of climate change policies in the Kenyan banking sector.

5.4 Adoption of Corporate Governance for a Climate Change Response by Commercial Banks in Kitui.

Corporate governance for climate change involved five initiatives. Out of these, paperless less banking was the most adopted with 88% of the responds contending it had at adopted at a great extent. All of the corporate governance indicators scored well with over 60% saying that there was adoption to a great extent. However, carbon lending scored very poorly with only 8% contending great adoption while majority indicated less or no adoption. Apart from paperless banking, mobile banking and green fiscal funds also scored highly and were among the initiatives that banks greatly adopted. This observation is consistent with the observation of Furrer et al., (2010) and Zurich and Furrer (2010). They observed that most banks are reacting to rising demand for environmental friendly products and investments and not necessarily to adapt or mitigate climate change.

Thus, these practices may not be a response to climate change per se but for the economic benefit of the banks as they will contribute to higher profit margins through cost cutting. This was actually reported by the Canadian Bankers Association (2014), in a study twhose conclusion was that banks develop green products and services such as paperless statements to cut on the cost of mailing, printing and for easy of accessibility by customers. There is a concern with carbon lending which was the least adopted initiative in spite of the persistent global campaign for adoption. It maybe because of the banks risk averse nature and they were shying away from lending because of climate change uncertainties.

5.5 Adoption of climate change disclosure commercial banking in Kitui County.

On the adoption of climate change disclosure by commercial banks, the extent of adoption of four initiatives was studied and majority of the respondents (80%) contented there no little or no adoption of all the initiatives. It can be concluded that this is the less adopted that this is the less popular climate change response practice by the commercial in Kitui County. With climate change disclosure indictors revolving around data and with the low adoption, there is high likelihood that the technicality in disclosure and the conservative nature of the banks is affecting adoption of this initiative. With the old saying that you 'Can't manage what you can't measure,' there is need for commercial banks to improve on their climate change data and disclosures for effective response to climate change.

There is also need to acknowledging that without full disclosure, it is difficult to estimate the business impact. In an earlier section, the challenge regarding data accessibility was mentioned. This can be a bottleneck in the process since it can impact the next steps such as disclosures and drawing conclusions regarding the bank's profitability. In this case, it can be concluded that the unreliability of data, the tools used to work out this important step are still evolving and the banks are taking care to strategize on financial implication since the outcomes may not be accurate. From the observation it can be concluded that the banks are in a knowledge building process demonstrated by difficulties of converting climate change risks into monetary terms. They are unsure how the future plays out and therefore exposed to risks in exposing their long-term disclosures.

5.6 The impact of climate change policy on banking performance in Kitui County, Kenya

Three initiatives were studied as indicators for adoption of climate change practices by commercial banks. It was established that climate change policies indicators, caution when dealing with climate change issues was least adopted with over 78% responds indicating there was little or no extent of adoption. The other two initiatives, that is regular climate change risk analysis initiative and existence of plan for climate change risks initiative where majority of respondent indicated that there was moderate extent of adoption.

This observation can be attributed to the fact that banks are risk takers and are much more concerned with risks. Adoption of caution when dealing with climate change. This is in line with study which showed that most bans are adopting symbolic response in climate change response instead of substantive (Heffa Schücking 2011).

It can be noted that there was no incentive for the bank to provide climate change related services. It is clear that with more convincing data, accompanied by regulations to increase climate change financing, may enhance the banks willingness to increase their funding in climate change related activities. It is true that banks recognize the potential financial impacts resulting from climate change physical and transition risks. They should focus on evaluating these impacts on credit risks inherent in their operations more so in the lending portfolios and also broaden this analysis in assessing market and operational risks to prepare for future happenings.

5.7 Impact of climate change response practices to the commercial bank performance

The final objective was to establish how the adoption of the climate change response practices was affecting the banking performance. The study established all the climate change response practice had positive and significant impact to the commercial bank performance. Climate change disclosure had the strongest impact on commercial banks performance, with a relative strong relationship existing between the two variables (the change disclosure practice and performance). Correlation analysis indicated there was a positive and significant impact of the climate change disclosure on commercial banks

performance in that a bank exercising climate change disclosures was 6 times more likely to have it performance influenced compared to those that do not. There was a positive and significant impact of climate change policy on banking performance in Kitui County, Kenya. However, the degree of influence between climate change policies and bank performance was weak, implying a weak relationship between the two variables.

The significant outcome of the study is the lack of granular data and the costs of such modeling that can bring out the impact of climate change response practices to the commercial bank performance in Kitui Town and the country at large. It is possible that this will definitely improve as data and tools develop that will detail best approaches to the developing climate change scenarios.

CHAPTER SIX

6.0 CONCLUSTION AND RECOMMENDATION

6.1 Conclusion

1. From the study, it can be concluded that commercial banks are exposed to climate change risk and they consider them as threat.
2. From the findings of study, it can be concluded that there is significant adoption of climate change response practices, and the practices were impacting on their performance of commercial banks in Kenya which was the third study objective.
3. From the findings of the study, commercial banks had embraced climate change strategy and there was a positive and significant impact of this climate change response initiatives on banking performance in Kitui Town.
4. The study did not establish any significant impact of corporate governance in terms of climate change responses on banking performance. Here, climate change disclosures were found to significantly influence the bank performances in Kitui Town and hence a conclusion that a positive and significant impact of climate change disclosure on banking performance in Kenya.
5. The study concludes that, there is a positive and significant impact of climate change policy on banking performance in Kenya.

6.2 Recommendations from the study

1. Based on the findings of this study, it is recommended that, Commercial banks need to reevaluate the exposure to climate change and environmental risks. This is because of the strength of the threats surrounding climate change impacts on commercial banks and their response to climate change.
2. Commercial banks and other institutions should be encouraged to develop and adopt climate change policy for third parties.
3. The bank regulator (Central Bank of Kenya) needs to develop a universal carbon reporting and exposure calculation method and policy to help banks calculate and report their carbon foot prints and exposure. This practice is gaining momentum worldwide.

4. The government should put in place banking policies requiring all commercial banks to develop and implement climate change mitigation and offset strategies.
5. Further research is recommended to provide the status and structure more comprehensive solutions in regard to commercial banks, climate change and environmental policies.

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APPENDIX 1: QUESTIONNAIRE

Section A: Basic Demographic Information

1. What is your gender

   Male ☐

   Female ☐

2. What is your highest Level of Education?

   Diploma ☐

   Undergraduate Degree ☐

   Postgraduate Degree ☐

3. How long have you been in the banking business?

   Below 5 Years ☐

   6-10 Years ☐

   11-15 Years ☐

   16-20 Years ☐

   21-25 Years ☐

   Above 25 Years ☐

Section B: Banks General Information

4. Which bank are serving currently? ……

5. Is you bank listed in the Nairobi Stock & Securities Exchange?

   Yes ☐

   No ☐

Section C: Questions based on Study Objectives

6. By ticking, which of the below climate change risk is your bank exposed by a big extent?

Risk	(Tick your choice)
Physical risk	
Litigation and regulatory test	
Market risks	
Credit risk	
Financial risk	

7. What is the perception of your institution towards the climate change risks?

Risk	(Tick your choice)
Major risk	
Average risk	
Minor risk	
Unsure of risk	

8. How do you rate consideration of climate change issues in your banking business operation?

   Not Important ☐
   Somewhat important ☐
   Important ☐
   Very important ☐

9. Please choose and indicate on the box provided, your honest opinion of how the below climate change responding actions are practiced in your bank.

   Adoption climate change strategy: The key used to gauge the extent of adoption was 1= no extent, 2 = little extent, 3 = moderate extent, 4= great extent, 5= very great extent

Statements	**1**	**2**	**3**	**4**	**5**
Regular environmental and climate change audit					
Regular environmental and climate change training					
Environmental and climate change standards for suppliers					
Continuous research on environmental and climate change training					
Environmental and climate change policy					

   Adoption corporate governance practices to respond to climate change: The key used to gauge the extent of adoption was 1= no extent, 2 = little extent, 3 = moderate extent, 4= great extent, 5= very great extent

Statements	1	2	3	4	5
There is Carbon lending					
There is Mobile banking					
There is green insurance					
There is Green fiscal funds					
There is Paperless Banking					

Adoption climate change responding policies : The key used to gauge the extent of adoption was 1= no extent, 2 = little extent, 3 = moderate extent, 4= great extent, 5= very great extent

Statements	1	2	3	4	5
There is regular climate change risk analysis					
Existence of plan for climate change risks					
There is caution when dealing with climate change issues					

Adoption climate change disclosures : The key used to gauge the extent of adoption was 1= no extent, 2 = little extent, 3 = moderate extent, 4= great extent, 5= very great extent

Statements	1	2	3	4	5
Carbon exposure evaluation					
Presence of pricing carbon credits					
Costing climate change issues					
Risk matrix					