Impact Investing and Climate Change – An Assessment of Impact Investors Addressing Climate Change

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

The financing of climate change solutions is extremely urgent as countries face increasing negative impacts from climate change that pose severe threats to current and future generations. Damages from environmental disasters that have been linked to climate change, such as the Australian wildfires, Cyclone Idai, Cyclone Fani, Hurricane Dorian, and extreme flooding events in many countries across the world, have resulted in more than $100 billion dollars of damage in 2019 alone. The financial sector has the power to invest in solutions that positively affect the environment and meaningfully contribute to sustainable development. Impact investing is the practice of investing by prioritizing positive social and environmental impact while still seeking financial returns. The MaRS Centre for Impact Investing defines impact investing as the investor intention to create measurable positive environmental and social impact beyond financial returns. The ability of impact investing to catalyze climate change solutions is crucial to consider because nations urgently require monetary and material investment as they further develop infrastructure, increase resource consumption, and grow their economies while adapting to and mitigating climate change.

The research objective of this study aimed to assess the degree to which impact investing can be a driver for climate change solutions. To understand the relationship between impact investing and climate change in financial institutions that engage in impact investing and to assess how impact investing can positively contribute to climate change solutions, a review of academic literature and a quantitative analysis of impact investors was conducted. A review of academic literature illustrated a tendency within the impact investing space to focus more on social issues than environmental challenges. This study's quantitative analysis involved financial institutions that were Global Impact Investing Network (GIIN) members, the largest global community of impact investors, and assessed their propensity for addressing climate change. The quantitative analysis focused on the effects of geographic region, investor type, and assets under management on impact investors' focus on climate change.

The results of this research indicate that the effects of geographic region and investor type is significant for impact investors addressing climate change, while the effect of assets under management was found to be not significant. There is strong growth potential and large opportunity for impact investors to make investment decisions inclined towards climate change solutions. This research adds to the academic and theoretical impact investing subject matter in that it uses a real-world sample of financial institutions practicing impact investing to observe and assess the degree to which impact investing can be a driver for climate change solutions. The practical contribution of this research is relevant to and useful for investment decision makers, impact investors, the financial industry, and the field of sustainable finance. This research has made a first step in analyzing the degree to which impact investors focus on climate change.

Keywords: impact investing, climate change, theory of change, sustainable development, environmental impact, social impact, sustainability, climate finance, sustainable finance, ESG, responsible investing, socially responsible investing

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Dedication

Dedicated to those who overcome adversity and racism in any forms. May your personal struggles in life, other's perception and misjudgment of who you are, your character, the colour of your skin, or the sound of your name, never stop you from believing in your own ability to achieve greatness and a state of happiness.

And to my cat Cocoa, even though she would never have been able to comprehend sustainable finance theory or grasp the concept of impact investing or read any written text, she was a constant source of love and joy with the best little choochyface, and I'll miss her always.

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Chapter 1:
Introduction

1.1 Background and Problem Statement

Impact investing is the practice of investing by prioritizing positive social and environmental impact while still seeking financial returns. The MaRS Centre for Impact Investing defines impact investing as the investor intention to create measurable positive environmental and social impact beyond financial returns (Harji et al., 2014). MaRS defines a spectrum of investing that includes 5 categories; traditional investing, responsible investing, socially responsible investing, impact investing, and venture philanthropy (Harji et al., 2014). This research will use the MaRS Centre for Impact Investing's definition of impact investing as a basis for its research, analysis, and recommendations as this definition was found to encompass varying definitions found in academic literature. The ability of impact investing to catalyze climate change solutions is crucial to consider because nations urgently require monetary and material investment as they further develop infrastructure, increase resource consumption, and grow their economies while adapting to and mitigating climate change. Current academic literature and research shows that impact investing asset classes do not focus on climate change as a category at all (Weber, 2016). Furthermore, existing academic literature, industry whitepapers, and research on impact investing illustrates that there is a tendency within the impact investing space and impact investment methodology to focus more on social issues than environmental challenges.

Impact investors have the ability and enormous opportunity to lead the financing of climate change solutions. The financing of climate change solutions is extremely urgent as countries face increasing negative impacts from climate change that pose severe threats to current and future generations (United Nations, 2022b). Damages from environmental disasters that have been linked to climate change, such as the Australian wildfires, Cyclone Idai, Cyclone Fani, Hurricane Dorian, and extreme flooding events in many countries across the world, have resulted in more than $100 billion dollars of damage in 2019 alone (Harvey, 2019). Investments in environment and climate change are closely linked to poverty, hunger, and health which are challenges many developing nations are already experiencing (Sachs & Reid, 2006). The financial sector has the power to invest in solutions that positively affect the environment and meaningfully contribute to sustainable development.

The current academic literature on impact investing lacks perspective of how impact investing can be a catalyst for climate change mitigation and adaptation efforts. The outcomes of this research will

contribute to impact investment theory and knowledge and help close the aforementioned academic research gap, by connecting impact investing with climate change. This study's research findings and recommendations will be relevant to investment decision makers, impact investors, the financial industry, and the field of sustainable finance.

The research objective of this study aims to ***assess the degree to which impact investing can be a driver for climate change solutions***. To understand the relationship between impact investing and climate change in financial institutions that engage in impact investing and to assess how impact investing can positively contribute to climate change solutions, the research questions ask:

1) **Is there a difference between impact investors in different geographical regions in addressing climate change?**
    - Hypothesis: Different geographical regions address climate change differently

2) **Is there a difference between types of impact investors in addressing climate change?**
    - Hypothesis: Asset managers and asset owners address climate change differently

3) **Do assets under management of impact investors have an effect on addressing climate change?**
    - Hypothesis: Different levels of assets under management address climate change differently

This study was executed over two phases: Phase 1 involved a literature review of existing research on the field of impact investing and impact investment theories. Phase 2 involved using the Global Impact Investing Network (GIIN) members, the largest global community of impact investors, and assessing the degree to which they addressed climate change. The intended methods used in Phase 2 were to quantitatively analyze the GIIN member institutions' annual reports from 2018 to 2020, depending on availability. The GIIN member institutions annual reports varied in naming and titling, sometimes referred to as a sustainability report, impact report, integrated report, or governance report. These steps were carried out so that the research questions could be addressed and answered. Using data gathered from GIIN member annual reports, a quantitative analysis was conducted using descriptive statistics and applying a Kruskal-Wallis statistical test.

Chapter 2:
Literature Review

There is limited academic literature and grey literature connecting the topic of impact investing with the topic of climate change. Therefore, this literature review is largely based on academic literature and grey literature that discuss impact investing methodology in general.

Impact investing ideology and methodology in academic literature was found to have a tendency to focus on social challenges with limited considerations of environmental challenges. There appears to exist a gap in current impact investing literature in that the majority of literature reviewed leans towards the social goals of impact investing, with marginal or minimal references to environmental goals. When literature did mention that impact investing could address environmental impacts, rarely did the literature dive deeper into what environmental benefits could be derived from impact investing methodology or highlight any successful environmental cases. This indicates that there is a large research gap on the topic of climate change within the field of impact investing and the ability of impact investing to aid climate change solutions. More research is required on the topic of impact investing and climate change. The aforementioned research questions posed in this study can be a first step and catalyst for closing this research gap and shining a spotlight on the many potential positive environmental and climate outcomes that can benefit and result from the practice of impact investing.

2.1 Concepts of Impact Investing

Impact investing is differentiated from traditional financial investing as it seeks positive environmental and social impacts in addition to financial returns, yet on the other hand it is not considered philanthropy as it still seeks to generate financial returns (Weber, 2016). The practice of impact investing tends to be taken up by private and institutional investors, whereas banking institutions are more involved in product and service offerings such as savings accounts and loans (Weber, 2016). Impact investing challenges the notion that financial returns are sacrificed in the pursuit of environmental and social impact, as it often strives to create both (Ormiston et al., 2015).

The MaRS Centre for Impact Investing is a Canadian organization, with a highly regarded reputation in the impact investing community, works to catalyze impact investing partnerships, rally new capital, and stimulate innovation to tackle social and environmental issues in Canada (Harji et al., 2014). MaRS defines a spectrum of investing that includes 5 categories; traditional, responsible investing, socially

responsible investing, impact investing, and venture philanthropy (Harji et al., 2014). The category of "Impact Investment" is the only one of the five categories that is broken down into two sub-types, thematic and impact-first, as can be seen in Figure 1 below.

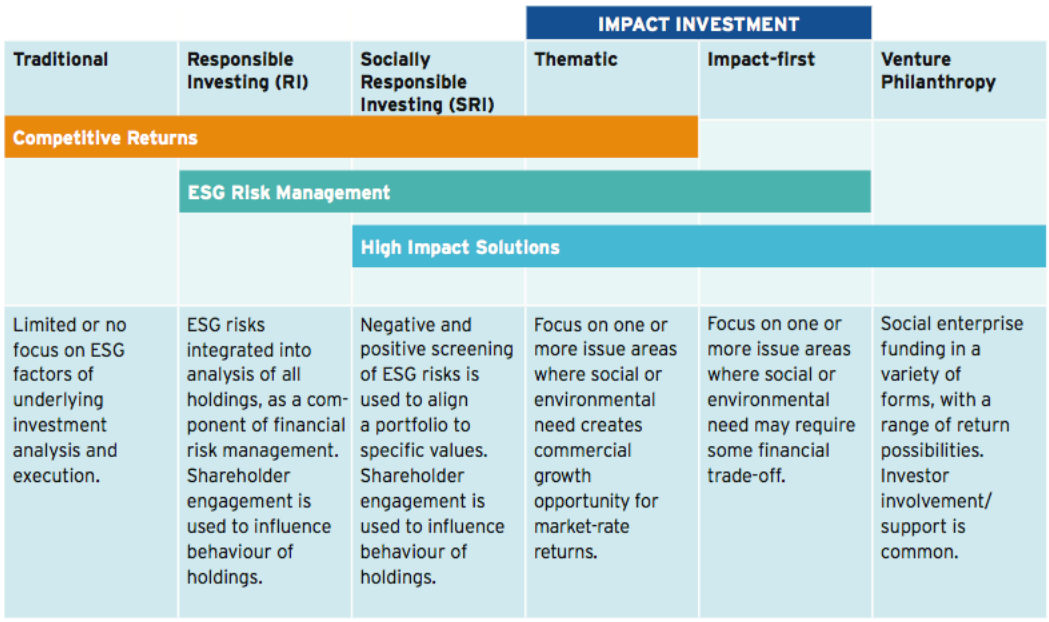

Figure 1: MaRS Centre for Impact Investing - Spectrum of Investing

(Harji et al., 2014)

The MaRS spectrum of investing, as seen in Figure 1 above, outlines traditional investing as only considering financial returns as its main goal. Followed by responsible investing, that begins to consider and is primarily focused on integrating ESG risks (environmental, social, and governance) into portfolio holdings, while engaging shareholders to influence investment institutions' behaviour and decisions on what to hold within their portfolios. The next step up from this is socially responsible investing that includes both negative and positive screening of ESG risks. Impact investing follows this and sees a combination of focusing on financial returns and ESG risk management, but is also concerned with high impact solutions that focus on one or more issue areas with social and environmental causes (Harji et al., 2014).

For impact investing to be implemented successfully and achieve its desired outcomes, four requirements and conditions are proposed (Bugg-Levine, 2011; Weber, 2016). The initial condition states

that impact investing is only possible if social problems are in need of significant financing that cannot already be provided by philanthropic donations and government funding. Second, a social enterprise opportunity has to exist with viable commercialization options that can generate a return on investment for impact investors. The third requirement demonstrates that business models that strive to solve social issues are still in early stages of development so that investment is not already engaged by conventional investors and can provide opportunities for impact investors. The final condition demonstrates that engaging the private sector in positive environmental and social impact must be supported by governments and civil society. Currently however, conventional investors are beginning to more widely adopt ESG criteria in their investment decision making (Busch et al., 2016). Incorporating ESG strategies allows conventional investors to begin to understand the environmental and social risks of their investments, while potentially providing opportunity for them to catalyze positive environmental and social impacts in the real world.

Brest & Born (2013) questioned whether impact investing can indeed create real positive environmental or social impact. They argue that the absence of data and analysis is a barrier for impact investors who seek to assess the impacts from the companies they invest in. Granted in the last 10 years since 2013 at the time of Brest & Born's publication, there is now potentially a greater availability of data coupled with stronger ESG strategies and regulations that may have lowered this barrier (Harvard Law School, 2020). This analysis of impact investing outlined the concepts of enterprise impact and investment impact. Enterprise impact is seen to be the positive environmental and social outcomes stemming from not only an enterprise's products and services, but also its operational impact. The impacts of products and services could be considered as the environmental and social benefits derived from the provisioning of these products and services, such as the positive effects of the generation and provision of renewable energy by utility companies. Meanwhile, operational impact is considered as the impact of the enterprise's internal operations, such as employee health and wellbeing or job creation for the communities in proximity to the enterprise, and the environmental impacts of its day-to-day operations or supply chains, such as water and energy consumption. Investment impact is defined by Brest & Born (2013) as the increase in quality or quantity of an enterprise's social or environmental output as a direct result of impact investing. Along the lines of the concepts of enterprise impact and investment impact, another study argues that there is a need to distinguish between impact-first investors and finance-first investors (Findlay & Moran, 2019). A key identifier of this distinction is described as intentionality, which is the genuine intention of an impact investor in seeking the achievement of its

stated environmental or social objective. Where funds are marketed as impact investments, Findlay & Moran (2019) argue that it is important that intentionality exists and is coupled with impact measurement.

Unfortunately, there is no agreed upon or standardized definition of impact investing in the financial industry. To describe the practice of impact investing, in the academic literature reviewed there appear to be terms used interchangeably, such as responsible investing, socially responsible investing, ESG (environmental, social, and governance), sustainable investing, ethical investing, and impact investing. One journal article even outlines the concept of "social impact investing" as private capital that is made available for non-profits and social enterprises (Phillips & Johnson, 2019). Although, "social impact investing" as a term was hardly identified in other academic literature or in grey literature. All of these terms appear to be quite similar in nature, but the aforementioned MaRS institute outlines that there is a spectrum of investing that places impact investing at an advanced level in the realm of finance striving for positive environmental and social impacts. Further, this financial field itself is often referred to by varying names such as sustainable finance or social finance. It is necessary to review existing research to observe how the implementation of impact investing attempts to achieve potential positive environmental and social benefits. Additionally, to understand impact investing's altruistic tendencies, defining impact investing is considered important in order to clarify how impact investing differs from other investment strategies. This review of literature revealed that there are varying terms used that describe the idea of investments that create positive impacts. In particular, the terms that recurred the most in the academic literature were "socially responsible investing" and "impact investing".

Socially responsible investing is quite prominent in altruistic-based investing literature. While it touches on similar notions of impact investing, it differs in that impact investing is mission and cause driven. A study conducted on the implementation of impact assessment in socially responsible investment (SRI) practices found that there is no common approach to impact assessment amongst socially responsible investors (Arjaliès et al., 2022). A research analysis of SRI, indicates that this investment methodology needs to be better understood in order to initiate proper positive impacts (Louche & Hebb, 2014). Louche & Hebb's (2014) description of SRI seems to be quite aligned to MaRS' Centre for Impact Investing's definition of impact investing and further discusses the potential of SRI. Particularly, they state that SRI requires better impact measurement by quantifying ESG risks so that SRI can be embedded within financial models and the mindsets of analysts (Louche & Hebb, 2014). SRI follows selection criteria and also screens out specific factors in investment portfolios depending on risk and social responsibility (Van Der Laan & Lansbury, 2004). However, a study conducted by Van Der Laan &

Lansbury (2004) highlighted a strong example of contradiction between SRI methodology and real SRI practices in the industry. Specifically, the Australian SRI sector's SRI portfolio holdings were still invested in fossil fuels because of fiduciary responsibility, the importance of the resource sector in Australia's economy, and market liquidity (Van Der Laan & Lansbury, 2004). Because of the limited long-term value and environmental harm of fossil fuel investments, these types of investments should not be and are typically not included in SRI portfolio strategies (Van Der Laan & Lansbury, 2004). SRI methodology tends to focus on the social benefits and may lack the inclusion of environment when social benefits outweigh environmental impacts. Where SRI might fall short, impact investing has the potential to step up in place and cover the areas missed, which in this case are environmental impacts.

2.1.1 Considerations of Climate Change

Impact investing can be a method to combat social and environmental issues together such as poverty, climate change, and social justice, while cultivating inclusive economies (Mitchell, 2016). Additionally, Mitchell defines existing factors that are behind the motivations of impact investors. These factors are influencing change in the status quo of corporations and governments, creating solutions to significant challenges within world markets and industries, aligning investments with the values and worldviews of investors, and performance in relation to financial return and risk management (Mitchell, 2016). Overall, this definition of impact investing and the investor motivations that it outlines are similar to those defined in other literature. Socially responsible investing's methodology of quantifying ESG risks is quite similar in nature to impact investing, because quantifying the environmental and social returns from an impact investment is a foundational pillar of impact investing methodology. Aligned with this notion, a study consisting of a systematic review of impact investing in social sector organizations found that impact investors use individual and organizational criteria when they evaluate the potential for impact investment projects (Islam, 2022).

An obstacle to the implementation and scaling of impact investing was deemed to be caused by a lack of effective funding models (Cohen & Sahlman, 2013). Cohen & Sahlman highlighted that many government agencies have explored the potential of social impact bonds at national, provincial, and municipal levels. Social impact bonds are financial instruments that pay investors if a social goal is achieved, such as a reduction in foster care times. Applicable to the field of impact investing, research on social impact bonds makes a suggestion to have independent evaluators validate the outcomes of investment in these bonds (Jackson, 2013a). Independent evaluation could have strong benefits to the

field of impact investing when it comes to verifying the accuracy of reported environmental and social impacts by institutional investors and corporate entities. Green bonds are also a similar financial instrument that seeks to have positive environmental impacts. As of 2022, the Government of Canada released a "Canada Green Bond" to further climate and environmental policies, including but not limited to clean transportation, energy efficiency, and climate change adaptation (Government of Canada, 2022). However, while social impact bonds and green bonds are seen as effective funding models, they are financial instruments that are primarily implemented by governments through public finance initiatives (Climate Bonds Initiative, 2023).

The McKnight Foundation, an impact investor, operates within the realm of private finance. It is a family foundation that engages in investments that aid a reduction in carbon emissions within investment portfolios (Peterson, 2016). Recently, the McKnight Foundation created a portfolio of lower-carbon investments as an impact investing strategy called the Carbon Efficiency Strategy (Peterson, 2016). Within their Carbon Efficiency Strategy, the foundation's low-carbon portfolio provided recognition of strong climate performers that assess environmental performance of firms by peer sector and not by company size. Additionally, the portfolio encourages engagement through proxy voting on relevant issues and promotes company reporting through a weighting process, thereby creating a performance indicator-like factor where investors would be more attracted to companies with a higher weightage.

As the McKnight Foundation's low-carbon portfolio project indicates, opportunities for investors will grow as more funds are allocated to the impact investing sector. The barriers between philanthropy and impact investing are dissolving, because there now exists an understanding that impact investing can amplify the charitable objectives of high net worth investors and family foundations (Cooper, 2016). Cooper (2016) defines impact investing as "an approach to investing that intentionally seeks to generate measurable social or environmental change alongside a financial return". Cooper differentiates SRI from impact investing by contrasting and relating the methodologies with the clashing examples of a mutual fund that avoids investing in a coal company versus a mutual fund that invests in a coal company to file shareholder resolutions on climate change. Cooper (2016) also demonstrates that the main investor challenge for impact investing is quantifying the passion for certain causes and understanding how social goals align with expectations around risk-adjusted financial returns.

A major shortcoming of Doyle's (2014) systematic case study review, and in fact almost all of the academic and grey literature reviewed, was that impact investing methodologies, descriptions, analyses,

and studies scarcely mention positive environmental impacts as a goal of impact investing, but even more rarely does the literature describe in any detail exactly what environmental benefits can be derived. More often, the goals of impact investing strategies have been socially aligned and if they are somewhat environmentally oriented, they tend to have the end goal of serving a social purpose. For example, the MaRS Centre for Impact Investing report on impact investing in Canada, mentions the word climate three times in its 100 pages (Harji et al., 2014).

The Global Impact Investors Network (GIIN) recently published its second edition of the "State of Impact Measurement and Management Practice" report with results from surveys of impact investors, which illustrated that the "climate as a target" impact category held 54% of impact investors surveyed (Bass et al., 2020). As respondents were allowed to choose multiple target impact categories, climate comes eighth out of seventeen categories, while ten out of the seventeen target impact categories can be considered as environmental (Bass et al., 2020). This indicates that nearly two third of those surveyed by the GIIN target environmental impact as either their only objective, or among other social objectives. This could possibly elucidate the shift in impact investor mindsets that is allowing them to focus on environmental goals alongside traditional social goals.

2.2 Impact Investor Missions and Values

A key factor in the practice of impact investing is the missions, perspectives, or values of the impact investor that is placing investments in causes or funds because of these inherent values. To name a few, these reasons can range from varied environmental preferences, social perspectives, political pressure, personal values, and religious values among a variety of other motives within financial institutions that practice impact investing. While there exist many studies on the advantages of implementing sustainable development practices within organizations, research on the missions and motives of impact investors has a large amount of room for growth. However, throughout the course of this research, a few studies were identified focusing on investor's values that affects investment decision making and asset allocation.

Historically, impact investors were exclusionary in their investment decision making process (Snider, 2018). Also known as negative screening, this exclusionary approach to investments excluded certain companies, stocks, or industries from investment portfolios based on the resulting negative impacts of those business activities (Snider, 2018). The practice of excluding negative activities from investment portfolios is thought to have originated as far back as the 1700s with a Protestant Christian religious

group identifying as the Quakers, formally known as the Religious Society of Friends, who refused to participate in buying and selling humans as a part of the slave trade (Corporate Finance Institute, 2021).

In more recent history, this exclusionary investment practice mainly emerged during the 1940s to 1980s, where investors were avoiding products and industries such as tobacco, liquor, gambling, weapons, political concerns about corporate involvements in the Vietnam War, and institutionalized racial oppression stemming from Apartheid in South Africa and the related companies conducting business in South Africa (Trelstad, 2016). The Ford Foundation, founded in 1936 by Henry Ford and Edsel Ford (of the Fort Motor Company), started a practice of program-related investments and mission-related investments in the mid-1940s with a focus on social areas of action in civil rights, education, arts and culture, human rights, poverty reduction, and urban development (Ford Foundation, 2022). In 1982, the firm Trillium Asset Management was started by Joan Bavaria purposely with a socially responsible investing mandate and from her legacy and endeavors in the impact investment space, she eventually became referred to as the "Founding Mother" of socially responsible investing (Trillium Asset Management, 2022). In 2007, the Rockefeller Foundation further encouraged this approach to investment decision making by assembling a group of investors and philanthropists that coined the term "impact investing" and helped form the Global Impact Investing Network (GIIN) (Rockefeller Philanthropy Advisors, 2022).

Currently, the field of impact investing seeks both financial returns and positive environmental and social impacts. Where initial opinions of this method of investment often predicted that a sacrifice of financial returns was required and should be expected in order to create positive environmental and social impact, present-day investments and market landscapes do not indicate that lower returns should be expected when practicing impact investing (BlackRock, 2022b). For example, a company with a seemingly successful product or service may cause environmental harm that results in boycotts against the company or harsh regulations from governments in regions which the business operates, which negatively impacts the company profits and bottom lines. This is made obvious when drawing a comparison between the high valuations of electric vehicle companies to oil companies whose market valuations have declined rapidly and significantly in recent years (BlackRock, 2022b).

However, there remains a convincing argument that all financial institutions, whether large or small in their company size and quantity of assets under management (AUM), should begin to consider their exposure to climate change risks because they will face impacts from climate change. For financial

institutions, climate change affects financial systems either through physical risks or transition risks (Grippa et al., 2019). Physical risks can be considered as damage to property, infrastructure or land, and can be realized directly through a financial institution's exposure to companies and countries that experience negative impacts from climate change. Physical risks can also be realized indirectly through wider effects on the economy and financial system. Financial exposure to these risks may present themselves through higher risks of defaults on loan portfolios or decreased asset values. For example, a higher incidence of extreme weather can cause property damage for homeowners and diminish property values, resulting in a higher default risk within mortgage portfolios. Transition risks are usually those that affect an institutions investments or assets that are not positioned well for a transition to a low carbon economic future. This exposure can be considered risky due to future environmental policymaking, technology advances, or consumer demands for conscientious actions to adapt to and mitigate climate change. Impact investors, whether invested in private equity or public equity, are likely to be exposed to climate risks in their investment portfolios through both physical and transitional either directly or indirectly.

Asset managers are financial professionals that manage investments for clients and are also known as investment advisors, financial advisors, wealth manager, stockbrokers, among other names (O'Connell & Curry, 2022). Asset owners are typically financial institutions with high assets under management amounts and include pension funds, charities and foundations, family foundations, insurance funds, sovereign wealth funds, and high net-worth investors (SRI-CONNECT, 2022). The GIIN members analyzed in this study consisted of both asset managers and asset owners with varying organizational types that included non-profit organizations, family foundations, pension funds, endowments, venture capital, private equity, public equity, public finance, investment management services, and other investment companies. The varying perspectives based on institutions' mission, values, priorities, stakeholder needs, political atmospheres, geographic location, regulations, social concerns, environmental concerns and investor priorities, can lead them to make different decisions in their investment practices.

A recent survey, the Annual Impact Investor Survey 2020 run by the GIIN, showed that the sectors most invested in were energy, financial services, forestry, and food and agriculture (Hand et al., 2020). As seen in the figure below, this was represented by the percent of assets under management across all of the organizations in the survey's sample, in terms of asset allocations by sector.

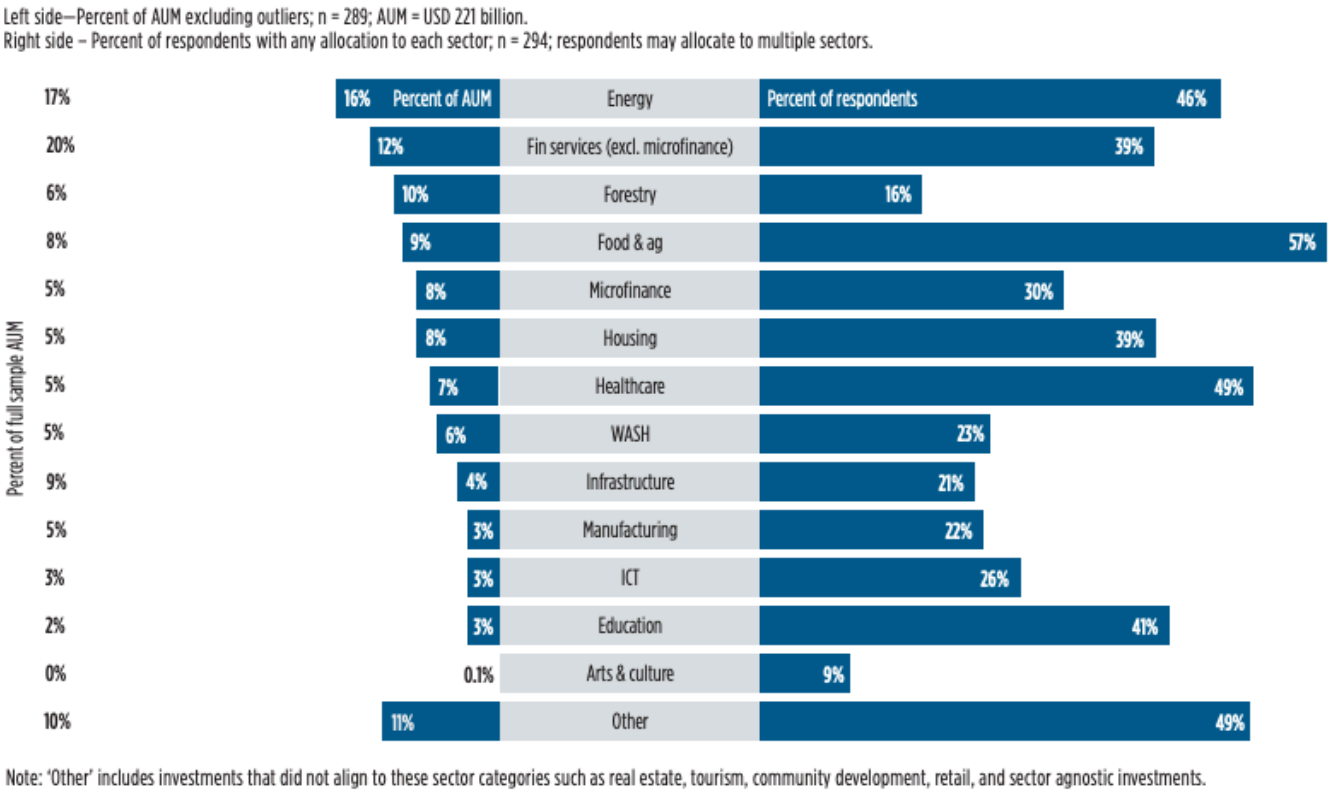

Figure 2: Asset Allocations by Sector - GIIN 2020 Annual Impact Investor Survey

Source: (Hand et al., 2020)

Further, the figure below represents the UN Sustainable Development Goals (SDGs) that are targeted as impact themes by the impact investors in the sample (Hand et al., 2020). Out of the 17 SDGs, it appears that the sample's impact investors are mainly targeting SDGs with a social theme, such as decent work and economic growth, no poverty, good health and well-being, reduced inequalities, and gender equality. In fact, the SDG "climate action" falls relatively in the middle of the 17 SDGs targeted as impact themes in this survey question at 54% of respondents.

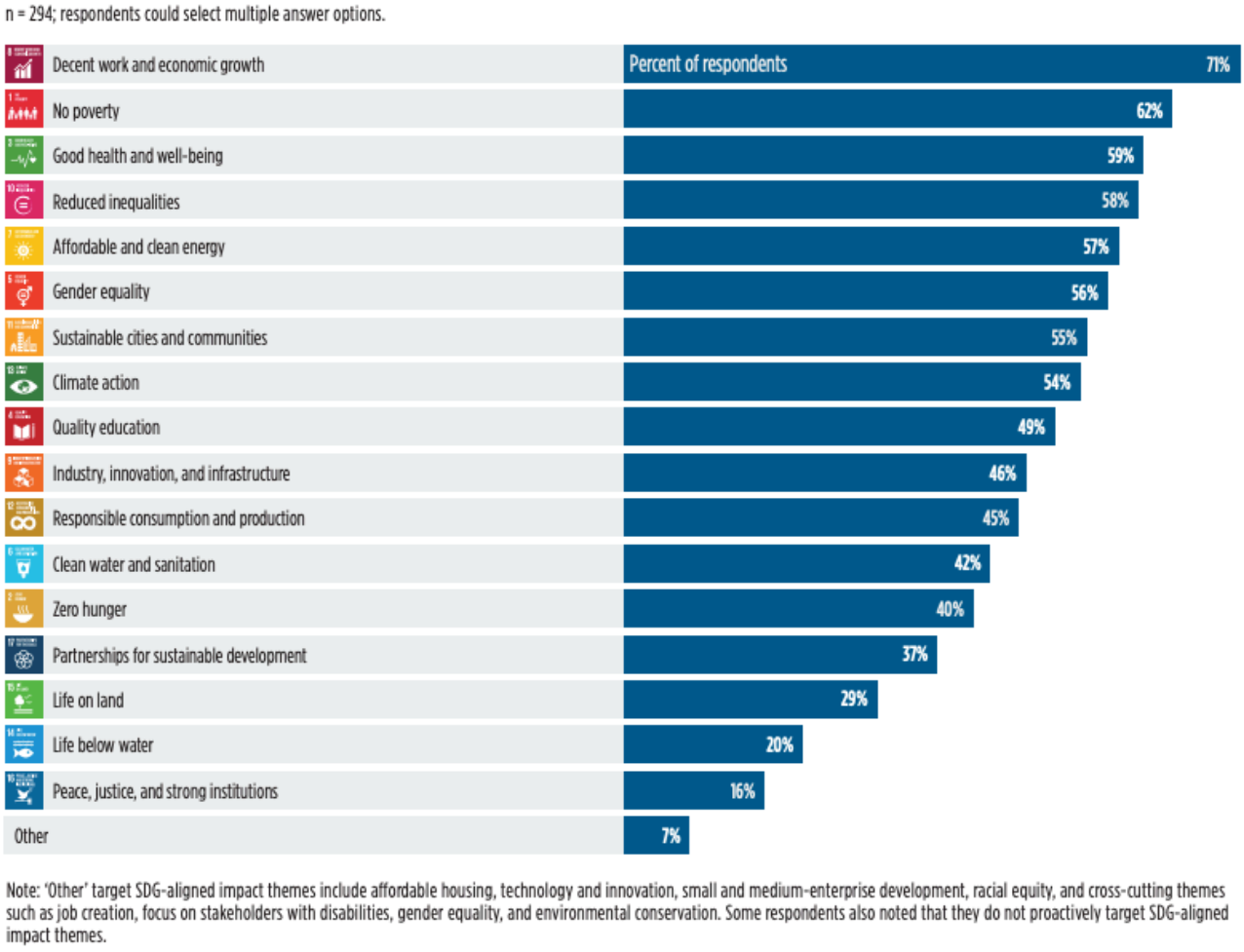

Figure 3: SDG-aligned Impact Themes Targeted by Impact Investors - GIIN 2020 Annual Impact Investor Survey

Source: (Hand et al., 2020)

Considerations of the environment are intrinsically related to climate change because the impacts of climate change directly impact the natural environment and can consequentially have social impacts on human life. As seen in Figure 2 and Figure 3 above for the GIIN survey sample, investments in energy are the highest asset allocations and of respondents surveyed, the targeted impact theme of "affordable and clean energy" is the fifth highest amongst the seventeen SDGs. Generally, impact investors' efforts to invest in climate change are not often explicitly stated or directly implied. Often what is seen are impact

investments focused on a particular environmental effort that can be connected to climate change mitigation and climate change adaptation. Impact investing with the goal of restoring ecosystems or species conservation is often tied to the negative impacts resulting from climate change, but the impact investment goal is often expressed as the particular restoration objective. For example, the Zoological Society of London's Rhino Impact Investment Bond sought to increase the dwindling rhino populations in Kenya, South Africa, and Zimbabwe (Endsor et al., 2020). This impact investment financial instrument can be considered within the realm of climate change mitigation and adaptation, but a loss of biodiversity from climate change impacts or species conservation in the face of climate change is not mentioned as a catalyst for this impact investment project (The Zoological Society of London, 2017).

2.2.1 Private and Public Finance

The practice of impact investing occurs both at a private financial institution level and at a public financial level. The financial costs of climate change in recent history have been witnessed through the events of the droughts and wildfires in Australia during 2019 and 2020, damage from annually stronger hurricanes in the Caribbean, and devastating cyclones in southeastern Africa in 2022, to name a few climate change induced events (Crabb, 2020). Both private finance and public finance play a key role in the financing of climate change efforts, either mitigation or adaptation.

Private finance impact investments include financial flows directly into private companies, publicly traded equities, or the issuing of financial instruments like impact bonds. It has been commonly misconceived that impact investments require an acceptance of a below market rate of return and are riskier than traditional investments, but private finance strategies in diversified public equity and fixed income strategies incorporating ESG criteria have provided market rate returns and even have the ability to outpace the market (Snider, 2018).

Meanwhile, public finance impact investments are shaped in the form of financial flows through government loans, grants, public pensions, government spending, development finance initiatives, the issuance of government bonds, and multilateral funding. Equitable distribution of funds between countries is a major challenge and assessing factors beyond general financial principles to ensure that vulnerable communities receive funding for climate change adaptation is difficult (Schalatek et al., 2010). The Green Climate Fund is a multilateral effort between countries in the United Nations to address the climate crisis and is currently the largest amount of public finance capital committed to climate change mitigation and adaptation efforts (Green Climate Fund, 2019). Currently, funding to the Green Climate

Fund is based solely on voluntary contributions from nations (Schalatek et al., 2015). The Green Climate Fund now has a total assets under management of $40 billion USD, which includes $10.8 billion USD that have already been committed and disbursed to climate projects (Green Climate Fund, 2022).

A new generation of investors has emerged that do not separate financial returns from environmental and social returns (Snider, 2018). This new generation's notions and perspectives is aiding in divestment initiatives away from carbon intensive industries and spurring greater investment in low carbon industries. The Green Climate Fund, a multilateral public finance initiative has assets under management sitting at $40 billion USD. While this may seem like a large amount of investment directed at climate change solutions, a much higher investment in climate change solutions is urgently needed to prevent catastrophic fallout on the natural environment and human society. For example, the Intergovernmental Panel on Climate Change (IPCC) recommends that to limit global warming to 1.5 °C, the annual average investment in the energy system requires approximately $2.4 trillion USD between 2016 and 2035 (Intergovernmental Panel on Climate Change, 2022). An emergence of family offices, foundations, non-profit organizations, charitable organizations, and philanthropic ventures has added to the amount of investment and funds directed at dealing with climate change impacts.

2.3 The State of Climate Finance

The financing of climate change adaptation and mitigation efforts has always been a key issue of negotiation at the United Nations Framework Convention on Climate Change (UNFCCC) conferences and increasingly so over the past few years (Haites, 2011). Climate finance is usually and primarily concerned with the flow of public finances to mitigation and adaptation efforts in developing countries (Haites, 2011). Currently, the largest known public finance initiative to finance climate change solutions is operated by the United Nations through its sub-organization, the Green Climate Fund (GCF). The GCF is a global fund created by the United Nations that acts as a multilateral financing entity serving under the UN Framework Convention on Climate Change (Green Climate Fund, 2019). The GCF now has a total assets under management of $40 billion USD, which includes $10.8 billion USD that have already been committed and disbursed to climate projects (Green Climate Fund, 2022). Their ability to disburse mass amounts of public funds from government pledges as fund disbursements into environmental and climate change projects, is the main method of public finance flows into climate change solutions. Climate finance policies that enable the movement of public funds for this purpose mainly include target lending,

green bonds, loan guarantee programmes, weather indexed insurance, feed-in-tariffs, tax credits, national development banks, disclosure policies, and national climate funds (Bhandary et al., 2021). The Paris Agreement, a legally binding international treaty on climate change adopted by 193 nations in December 2015 at the twenty-first UNFCCC conference, has a strong commitment to directing financial flows towards lowering greenhouse gas emissions and funding climate-resilient development (United Nations, 2022c). With the Paris Agreement's goal to limit global warming below 2 degrees Celsius, ideally at 1.5 degrees Celsius compared to pre-industrial levels, the integration of financing for this effort in the agreement represented a major milestone in climate finance when the agreement was adopted by nearly all United Nations parties in 2015.

Climate finance is predicted to be able to garner serious progress on environmental and social fronts. An increase in financial development assistance is estimated to directly increase climate change adaptation levels in developing nations (Eyckmans et al., 2016). For example, improving the access to renewable energy in sub-Saharan Africa shows strong potential to alleviate poverty, stimulate industrialization, improve gender equality, and reduce vulnerability to climate change impacts in the region (Chirambo, 2018). The European Commission predicts that the level of energy and infrastructure investments required to reduce the net greenhouse gas emissions from the European Union to zero by 2050 would require 2.8% of the European Union's gross domestic product, equalling $376 billion USD of investment annually (Hong et al., 2020). However, public finance within climate finance is different from private financial flows, because it generally does not seek returns and instead focuses on directly funding projects and efforts. One example that demonstrates the different consideration between public and private finance is that the macroeconomic impacts of climate change in capital markets are likely to have an effect on asset prices with cashflows that are sensitive to climate risks (Hong et al., 2020). Although, at the 2009 UNFCCC conference, an agreement for jointly mobilizing $100 billion per year by 2020 to support climate action in developing nations was made, but never realized and has been left in a rather ambiguous state (Westphal et al., 2015). In fact, currently the Intergovernmental Panel on Climate Change (IPCC) recommends that to limit global warming to 1.5 °C, the annual average investment in the energy system requires approximately $2.4 trillion USD between 2016 and 2035 (Intergovernmental Panel on Climate Change, 2022). This amounts to $48 trillion USD over the span of a 20 year period and with the GCF having assets under management totalling $40 billion USD in 2022, this is indeed not achieving anywhere near the amount of investment required to avoid catastrophic climate change fallout. However, to deem this a failure may be too early. Other academic literature states that climate finance

policies and legislation regulating greenhouse gas emissions is helping construct a business case for investors to finance climate change initiatives (Richardson, 2009). Mentioned earlier, a condition of impact investing to be successful requires public policies as they are often complementary and strongly aid private finance (Bugg-Levine, 2011). Supporting this notion, scenarios and projections of achieving the $100 billion USD figure all involve private sector leverage, defined as the ratio of private financing that is mobilized per dollar of public support (Westphal et al., 2015). Private finance can play a large role in climate finance as there are a variety of investment methods and vehicles that can aid climate change solutions.

As Haites (2011) argues, private financial flows for climate change mitigation and adaptation can play a role through offset purchases, commercial loans, and equity investments. Haites also states that climate finance is currently executed on a project basis and might be better suited with funding that is provided for mitigation and adaptation plans with national or regional scopes. Furthermore, another study on private climate finance indicates that private finance has a large and crucial role to play in low-carbon development and climate resilience (Stadelmann et al., 2013). Stadelmann also states that there is an alarmingly low amount of studies on private climate finance data, a definition of "private climate finance" needs to be standardized and agreed upon by policy makers, and that analysis is difficult because existing data on private climate finance is limited. Impact investing within private climate finance has a strong role to play in the development of climate change solutions. Although Stadelmann's concluding recommendations emphasize policy makers as the catalyst for private institutions to rally investments around climate finance, there is no direct recommendation to private firms about how and why they should allocate funds to climate change mitigation and adaptation. When it comes to demand for impact investing, recipients of impact investments are said to have barriers such as lack of knowledge of the investment market, inadequate financial literacy, and face difficulty measuring social impacts (Phillips & Johnson, 2019).

Impact investors are not the only participants in this space that face difficulty and barriers to entry, but they also possess an immense capacity to positively influence and engage with their potential stakeholders through their investments. With these factors in mind, it can be said that private firms that practice impact investing have a strong potential and huge opportunity to benefit climate change efforts through impact investment.

2.4 Impact Measurement and Frameworks

There exists a high frequency of discourse and criticism in the financial industry about measuring environmental and social impacts from impact investing (Bengo et al., 2022; Parisi, 2013). Recently and quite notably in the sustainable finance industry, an ex-Chief Investment Officer of Sustainable Investing for BlackRock, the world's largest asset manager with nearly $10 trillion USD in AUM, harshly criticized the ability of sustainable investments to create real and measurable positive impacts to the environment and society (BlackRock, 2022a; Fancy, 2021). In the history of impact investing, there has been no standardization or single, widely agreed upon set of rules or principles on how to measure the impact from impact investments.

Institutions with large investment assets are sources for substantial investment capital and have strong potential to be catalysts who can establish impact investment as a mainstream financial practice (Wood et al., 2013). Weber et al. (2019) assessed relevant metrics for assessing the climate progress of banks. The identified metrics, that banks primarily use, included greenhouse gas emissions accounting, "green/brown metrics" differentiating activities and technologies that are climate solutions or climate problems, and ESG scores (environmental, social, governance) based on quantitative and qualitative climate indicators. In contrast to Weber et al.'s research specifically on banks, the stated metrics are useful for the practice of impact investing in environment and climate change across many types of financial institutions that practice impact investing (Weber et al., 2019). There also exists research that suggests financial institutions should use a proactive systems approach when developing strategies that tackle sustainability issues rather than only reacting to sustainability issues that influence financial sector risks (Weber, 2014).

Only recently, have commonly adopted worldwide frameworks emerged to suggest how to uniformly standardize the way financial institutions and organizations involved in impact investing should approach measuring their impacts. For example, the United Nations Sustainable Development Goals are a list of goals that outline progress towards environmental and social impact in categories that encompass crucial environmental impacts and social areas (United Nations, 2020). Many organizations, not only financial institutions, have taken to use the Sustainable Development Goals as a way to measure and frame their impact on the environment and society. There also exist organizational bodies such as the Global Impact Investors Network (GIIN), the United Nations Principles for Responsible Investment (UNPRI), Carbon Disclosure Project (CDP), Task Force on Climate-Related Financial Disclosures (TCFD), and

International Sustainability Standards Board (ISSB) whose intentions are to standardize approaches to impact and sustainability.

Changes in the Earth's climate since the mid-20th century are unequivocally driven by human activity, specifically the burning of fossil fuels, causing greenhouse gas emissions that raise Earth's average surface temperature (NASA, 2022). Impact investing literature demonstrated that impact investing methodology generally looks at creating positive impact. Accordingly the MaRS definition, used as a basis for impact investing in this research, defines impact investing as **"the investor intention to create measurable positive environmental and social impact beyond financial returns"** (Harji et al., 2014). However, greenhouse gas emissions resulting from investments, can be considered negative environmental impact.

2.5 Regulatory Policies and Regional Differences

Regulatory policies have the potential to aid impact investors in meeting their objectives and can specifically help regulate financial contributions, including impact investment, to aid climate action and climate change solutions. However, the current lack of regulatory frameworks, policies, and legislation worldwide can be considered a difficulty that prevents impact investors from developing progress and action on climate change. Until recently, no governmental agencies or countries have put forth regulations that require financial institutions to disclose the environmental and social impacts resulting from their sustainable finance activities.

In early 2022, the European Union adopted regulation on sustainability-related disclosure within the financial services sector, which standardizes content, methodology, and presentation of sustainability-related information in relation to the impacts of financial investments on the environment and society (European Commission, 2022). This marks a huge shift in the financial industry as this regulation is a first of its kind to require all financial institutions in the European Union to disclose their sustainability related impacts. Historically, environmental policies have been controlled and implemented by governments, and financial institutions have adhered to the resulting policies and regulations (Ens & Guerin, 2022). Trends in this research related to geographic region, can be attributed to regulations in regions such as the sustainability finance disclosure regulations in the European Union. This European Union regulation is relatively new, at the time of this research only 1 year old, and no prior financial regulations connected to sustainability existed for financial industry in the European Union. North American financial regulators

are beginning to discuss releasing similar regulations, which can help drive sustainability-related disclosures from North American market players (Deloitte, 2022; Uddin, 2021).

2.6 Research Gaps in the Literature

The review of literature on impact investing, investor missions and values, private and public finance, climate finance, impact measurement and frameworks, regulatory policies, and regional differences highlight that there is a research gap and future research opportunities.

Impact investing literature generally tends to focus on social and environmental challenges. There exists a gap in current impact investing literature in that the majority of literature reviewed focuses on specific social and environmental impacts, with scant analysis of the larger topic of climate change. When literature did mention that impact investing could address environmental impacts, rarely did the literature dive deeper into what connections to climate change exist. This indicates that there is a large research gap on the topic of climate change within the field of impact investing and impact investing methodology's ability to address climate change solutions. This literature review provides evidence of the limited amount of financial-themed research that assesses the relationship between impact investing and climate change. The research questions posed and rationale for this study can be a first step and catalyst for closing this research gap and shining a spotlight on the potential positive climate outcomes that can be derived from impact investment.

2.7 Theoretical Framework

The theory of change stands out in the literature reviewed, which attempts to demonstrate causality in the practice of impact investing. The theory of change essentially speculates how an action causes an effect and may further evaluate causality. This theory originates from the implementation of program evaluation that dictates the causal linkages and expected outcomes of a project (Wendt, 2021).

Existing research poses the concept of the theory of change as being valuable to the field of impact investing (Jackson, 2013b). The theory of change is described as a model that often specifies certain criteria and causal linkages leading to an expected development or outcome. Jackson contends that because the practice of impact investing is increasingly data-driven, in addition to investor intentions and

impact measurement, the theory of change is crucial in order to evaluate impact investing. This in turn will help build up the impact investing industry by providing a method of holistically assessing impact investing (Jackson, 2013b). Evaluation and measurement of impact investing, its intentions, and its outcomes is required to increase accountability while validating the results of impact investments.

The theory of change is also observed in a number of pieces of literature and studies that include impact investing concepts. For example, within a recent study assessing regional impact investing ecosystems and their attributes that cause them to have high impact, which also included insights of the effect of different regions on impact investments (Roundy, 2020). Further, the theory of change is said to be intrinsic to impact investing because the action of investing in projects or businesses aligned with sustainability principles can be characterized as impact investments (Mattos et al., 2022). It is evident that the theory of change is applicable to a wide range of financial topics. A study investigating the impacts from an investment portfolio geared towards funding global mental health initiatives, proposes that the theory of change attracts investors wanting to evaluate their impacts (Esponda et al., 2021). This theory proves to be highly relevant for this research as it has even been applied to a comparison study of an organization's impact reports and its desired social impacts (Ruff, 2021). There exists application of evaluations based on the theory of change even in public financial initiatives that are focused on climate change, such as the United Nations Green Climate Fund. Measuring causal change or impact is built into a theory of change framework applied to the Green Climate Fund's investments (Puri et al., 2020).

The theory of change can be broadly applied to programs and initiatives and its inherent attribute of causality is especially pertinent to this research because impact investors seek to generate positive environmental and social outcomes. It should be noted that the research questions posed in this study are each focused on the independent variables of geographical region, investor type, and assets under management when looking for significance of these factors in impact investors addressing climate change. While these factors are not actions that can be controlled in the practice of impact investors, they are still considered to be relevant under the theory of change, given that they represent factors that influence the propensity of impact investors addressing climate change. The research gap identified from the literature review, regarding a lack of research connecting impact investing and climate change, justifies this theoretical framework because the theory of change helps frame the research questions as looking for causal linkages between the independent variables and impact investors addressing climate change.

Chapter 3:
Methods

3.1 Research Approach

This study focuses on a global geographic context because impact investing and the flow of financial investments affects the environment and society on a worldwide scale. Additionally, the GIIN is a non-profit organization consisting of more than 300 global members that are professional investment institutions ranging from asset owners, asset managers, and service providers. Using data gathered from GIIN member annual reports, a quantitative analysis was conducted using descriptive statistics and applying a Kruskal-Wallis statistical test. The strategy of inquiry used was a review of GIIN institutions' annual reports, sustainability reports, and impact reports. All of the GIIN member institutions included in this research are considered impact investors and also state that they are practicing impact investing. This study included a database of only impact investors and data was gathered and analyzed in the annual reports of the sample group of financial institutions on keywords related to climate change subject matter. The members of the GIIN are situated globally and using their annual reports as quantitative data for this study was highly effective as it provided a basis for depicting the global landscape of impact investing and its potential relationship to climate change solutions.

The expected results for this research, based on the hypothesis, are about the focus of impact investors on climate change. The objective of this research and its research questions is to assess the degree to which impact investing can be a driver for climate change solutions. This research aids in a discussion of what difficulties may exist that prevent impact investors from focusing on environmental impacts, and how impact investments can be better prioritized and allocated towards environmental problems in order to aid climate change solutions. This data was gathered from GIIN member institutions' annual financial reports, sustainability reports, and impact reports. The collection of this secondary data helped observe how frequently climate change subject matter occurs as a core priority for GIIN member institutions.

3.2 Data Gathering and Data Analysis

This section describes the data collection process and quantitative data analysis methods undertaken that were conducted as a part of the literature review and the quantitative research method. Descriptive statistics and Kruskal-Wallis testing allowed this study to achieve the research objective – "*Assess the degree to which impact investing can be a driver for climate change solutions".*

3.2.1 Sample and Data Collection

Secondary data was collected directly from GIIN member institutions' annual reports, also referred to as sustainability reports, impact reports, integrated reports, and governance reports. First, a sample was created by forming a list of GIIN financial institutions (listed in Appendices) that were identified via the GIIN website's current members page, and only those categorized as "asset managers" and "asset owners" were used. GIIN members that were categorized as "service providers" were not used, as these institutions are not involved in the investment or management of financial assets, but rather the provision of financial services such as banking products, credit cards, accounting services, and trading platforms.

The organizations varied in the naming and titling of their annual reports and often referred to their annual report as a sustainability report, impact report, integrated report, or governance report. All reports with these alternative titles were deemed to still be useful for the purposes of this study and included in the research. This research study began in early-2020, and therefore gathered 2019 reports from these institutions because these reports were the latest available reports published for the full 2019 year prior to 2020. When a report was not available or accessible for the 2019 year, and past reports could be found and were accessible, 2018 reports were collected and used in this study. Reports that were not written or available to analyze in the English language were excluded from this study. Similarly, GIIN members with reports that could not be located or were not made publicly available, were excluded from this study. This resulted in 127 out of 252 GIIN member organizations, or approximately 50% of the total GIIN members with potential for inclusion in the research, to be excluded from this study. 9 of the excluded institutions produced annual reports in other languages and 118 excluded institutions did not have an annual report available. The remaining 125 GIIN member organizations were included in this research.

Table 1: Number of GIIN Institutions Researched

Total GIIN Institutions	Included in research	Excluded from research
252	125	127

The GIIN member financial institutions were then categorized by organization type, investor type (asset owner or asset manager), estimated assets under management in local currency (standardized to estimated assets under management in USD for comparability), and geographic region. Assets under management represents the total assets under management of each institution. The total assets under management values were used because all GIIN institutions are considered to be impact investors. The

members' respective reports were categorized by file name, number of reports per GIIN member institution, report type, and total word count.

Subsequently, each report was reviewed for keywords and related terms that were necessary to address this study's research objective and research questions, approach the topic of impact investing and climate change, and the completion of this research. The following keywords were searched for in the annual reports of the sample group of GIIN members. Data collection and querying for the keyword "climate change" included querying for relevant keywords like "carbon", "carbon emissions", "emissions", and "greenhouse gas(-es)". The quantitative data analysis focused on the "climate change" keywords data collected, because climate change subject matter as a focus of impact investors represented the main topic of discussion in this study's research objective and research questions. Specifically, the number of appearances of the aforementioned keywords and related terms were summed up as a total "climate change" frequency per GIIN member institution. Creating the sample of GIIN member institutions, collecting organizational data on and categorizing the GIIN member institutions, and querying the "climate change" keywords and terms formed the basis for the beginning of the quantitative data analysis in this study. A validation check was conducted to ensure that the mentions of climate change were indicative of the institutions addressing climate change.

3.2.2 Quantitative Data Analysis

Quantitative data analysis commenced with the calculation of two main datapoints on the "climate change" keyword: the frequency of keyword appearance and the keyword intensity. Frequency is the total number of appearances of a keyword in each organization's report. Intensity is the magnitude to which a keyword was represented in each organization's report. Every GIIN member institution claims to already be practicing impact investing and therefore was assessed just for their frequency and intensity of the "climate change" keywords. Climate change frequency was calculated by summing up the total appearances of the "climate change" keyword and its related terms in an organization's report, resulting in a climate change frequency absolute number. Climate change intensity was then calculated by dividing the "climate change" keyword frequency by the total word count of the report, resulting in a climate change intensity percentage.

Group statistical data was then collated for the total "climate change" keyword frequency and percentage across the GIIN member institutions included in this study, total percentage of investor type, total percentage of geographic regions, and total percentage of total assets under management.

Additionally, the average climate change intensity was graphed and broken down by investor type, geographic regions, and assets under management ranges. Distribution of climate change intensity was graphed and broken down by investor type, by geographic region, and by assets under management.

Finally, Kruskal-Wallis equality-of-populations rank tests were conducted on the climate change intensity samples. Kruskal-Wallis is a nonparametric test that determines whether there are statistically significant differences between independent groups (Lund Research, 2018). Kruskal-Wallis testing has been conducted in other studies focusing on the topic of investment decision making and investor intentions, which was deemed to be highly relevant and applicable to the research conducted in this study (Alattar & Al-Khater, 2008; G. Noulas & Genimakis, 2014; Mohamad et al., 2021; Ubonsan & Hong-ngam, 2019). Kruskal-Wallis tests have been used in a similar study to test whether significant differences existed between demographics and investment decisions (Ubonsan & Hong-ngam, 2019). Similarly, financial firm characteristic variables, such as market environment, competition, and governance, were also used in Kruskal-Wallis tests to examine the behaviour of companies and their investment decisions (G. Noulas & Genimakis, 2014). Another study compared user views' on corporate annual reports, where Kruskal-Wallis tests were used to detect whether there were significant differences between responses of user groups on their views and opinions of corporate annual reports (Alattar & Al-Khater, 2008). There also exists implementation of Kruskal-Wallis tests to test whether there were significant differences of ESG scores across six countries within Asia (Mohamad et al., 2021).

In this research, Kruskal-Wallis tests were conducted using the factors of investor types, geographical regions of the asset owners and asset managers, and assets under management levels. Kruskal-Wallis tests were completed in order to determine whether the effect of these different factors were significant or not for climate change intensity across the GIIN member institutions. The inclusion of climate change intensity and climate change frequency in this study were deemed to be a worthy indicator of whether impact investors, that are members of the GIIN, address climate change. Although climate change intensity was derived from climate change frequency proportional to the report length of an institution and climate change frequency on its own represented only an absolute number which varies between institutions, both were used to present descriptive statistics. Kruskal-Wallis testing occurred only on climate change intensity given the proportional representation against the lengths of reports.

Justification for this analysis was due to the fact that the subject matter of organizations' annual reports, which the "climate change" keywords were collected and derived from, can be strongly indicative of the

impact investors' organizational culture, management practices, internal operations, external impact, values, and goals. Corporate reporting has been found to be immensely useful for investors and stakeholders, as these groups use the annual reports to dissect data and conduct analysis for financial valuation, forecasting models, or focusing on the content narrating the corporate governance and organizational management (Deloitte, 2016). Both financial and non-financial information from financial reports and annual reports of companies has been found to be valuable to investors and investment decision making (Davern et al., 2019). It was found that non-financial information helped investors decide whether or not to invest and even in valuation (Davern et al., 2019). Additionally, sustainability performance has been linked with investor decision making and investors judgements of companies (Reimsbach & Hahn, 2015). Many of the GIIN member institutions' reports included in this research communicate the organization's strategy and corporate governance in addition to its financial performance data, and include sustainability performance. Integrated reporting is becoming very common and is perceived to be of higher value as, in addition to financial performance, these reports include information that is not reflected and captured by current financial reporting methods (Chartered Professional Accountants of Canada, 2022). There exist a myriad of other academic research and studies that have successfully deployed similar research methods, also using keyword analysis and text analysis of corporate reports, for their results and findings (De-Miguel-Molina et al., 2016; Lee et al., 2018; Miklosik et al., 2021; Qian & Sun, 2022). For impact investors specifically, it is of crucial importance to convey, measure, and track the vision and impact of its investments and doing so annually in integrated reports that are dubbed as "annual reports", "sustainability reports", or "impact reports", etc., allows them to showcase their organizational goals and achievements within the scope of their impact investing missions. Because the GIIN member institutions were found to be publishing integrated reports, a review and quantitative analysis of the text for keywords in these reports was deemed to be effective and very valuable for the purposes of this research.

3.3 Limitations

There were four limitations identified in this research. First, one specific definition of impact investing was used and applied to the subject matter of this study as it appeared to be the most far-reaching and comprehensive definition after a review of existing literature related to the topic of impact investing. This definition is the earlier mentioned MaRS Centre for Impact Investing definition of impact investing which is "investor intention to create measurable positive environmental and social impact beyond financial

returns". This seems to be the best and most holistic definition of the term and methodology, but there may be other researchers in this field that potentially disagree with this perspective. While this can be considered to be a potential limitation in the scope of the research, the MaRS definition of impact investing widely applies to both social and environmental issues and concretely captures the practice of impact investing in the financial industry today.

Second, after a preliminary review of existing literature, it is quite apparent that there is a lack of existing research on impact investing and climate change. Existing research tends to tie impact investing with social issues or examines impact for only positive impact, without the negative impact connotation of climate change hazards and effects specifically. This can be a limitation as it does not provide a basis of understanding for how impact investing can impact climate change.

A third limitation identified was that examining keywords in annual reports does not always reflect the complete investment styles and practices of investors. This research did examine keywords, given that all the institutions analyzed were self-claimed to be impact investors with their participation and membership in the GIIN. However, there are limitations on how much of the investment style can be fully understood and assessed.

Finally, no organizations from South America were included in this study, because they did not have annual reports available for analysis and were excluded along with the organizations in other regions with no available reports, from the total potential sample of GIIN members.

3.4 Research Phases

This research was executed over two phases. Phase 1 involved a literature review of existing research on impact investment theories and how they can potentially relate to environmental benefits in a climate change context. Phase 2 involved data gathering and analyzing the GIIN members, the largest global community of impact investors, as a foundation for assessing the degree to which impact investors address climate change. The intended method in Phase 2 was to analyze the text and keywords in the annual reports of GIIN member institutions. The table below outlines the phase tasks executed to address and answer the research questions of this study.

Table 2: Research Phases and Tasks

Research Phase and Task
Phase 1, Task 1: Literature Review • *Reviewing existing research on impact investing (academic and grey)*
Phase 2, Task 1: GIIN Member Reports Data Gathering • *Gathering reports from GIIN Member institution websites* • *Extracting data from reports*
Phase 2, Task 2: Qualitative Data Analysis • *Qualitative data analysis*
Phase 2, Task 3: Quantitative Data Analysis • *Quantitative data analysis*
Phase 2, Task 4: Research Findings • *Developing research findings, analyses, discussion, and conclusions*

Chapter 4:
Results

This section presents the results of the descriptive statistics and statistical methods employed in this research, as described in the prior Chapter 4: Methods.

4.1 GIIN Institutions Statistics

For the purposes of this study, the term “climate change” was quantitatively analyzed across all GIIN Institutions included in the research. This was due to the nature of the research specifically looking at impact investing in relation to climate change. As all 125 GIIN institutions analyzed are considered to be impact investors, the “climate change” term was analyzed to aid in understanding the emphasis that GIIN institutions place on climate change. The overall breakdown of the climate change term assessed within this research resulted in 3778 instances of the term being referenced across the 125 GIIN institutions’ annual reports. All GIIN institutions included in the study were assessed for the “climate change” terms.

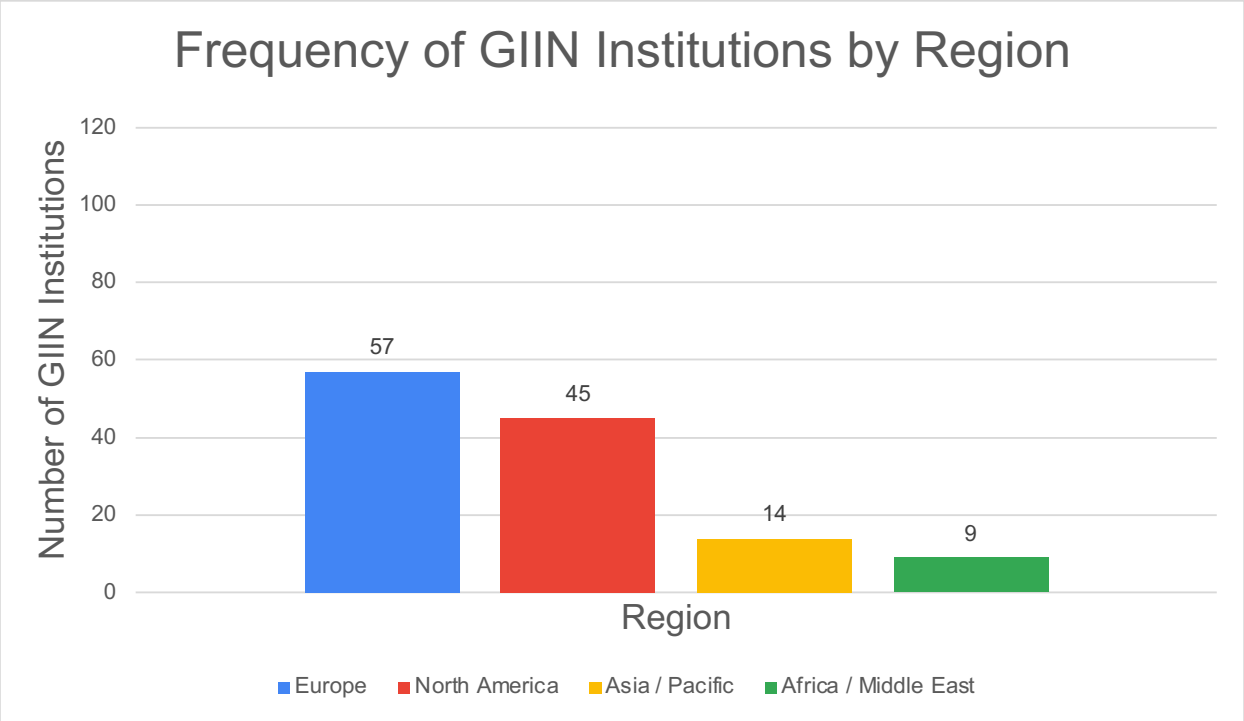

Figure 4: Frequency of GIIN Institutions by Region

The regional locations of the GIIN member organizations included in this study were gathered and represent Europe, North America, Asia/Pacific, and Africa/Middle East. Of the 125 GIIN member organizations analyzed, 57 (46%) were headquartered in Europe, 45 (36%) in North America, 14 (11%) in Asia/Pacific, and 9 (7%) in Africa/Middle East.

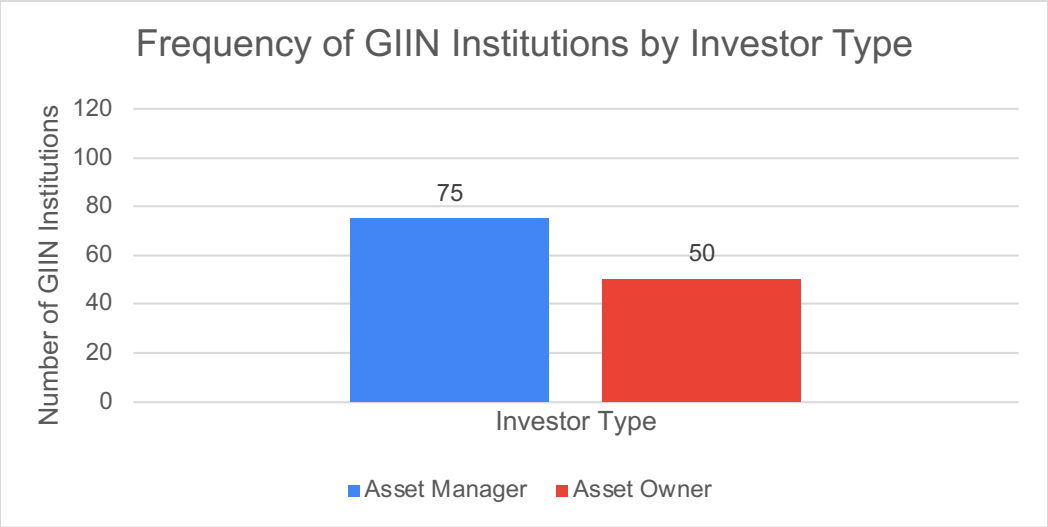

Figure 5: Frequency of GIIN Institutions by Investor Type

75 (60%) of the GIIN member organizations assessed in this study were asset managers, while 50 (40%) were asset owners.

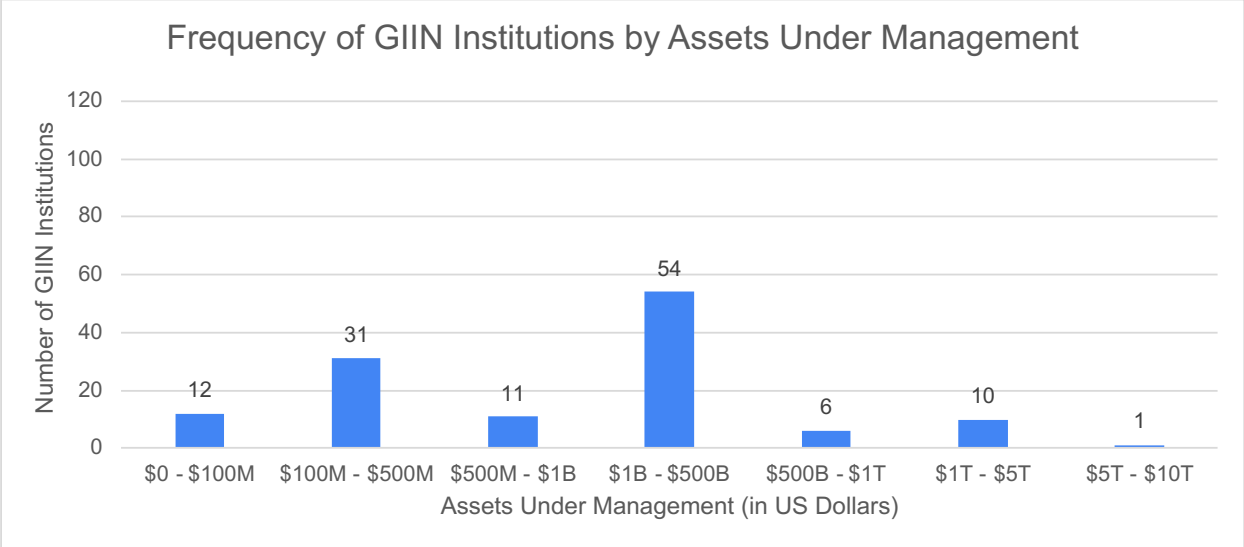

Figure 6: Frequency of GIIN Institutions by Assets Under Management

A majority, at 54 (43.2%) of GIIN members in this study, fell within the $1 billion to $500 billion range of assets under management. This is followed by 31 (24.8%) with an amount of assets under management within the $100 million to $500 million range.

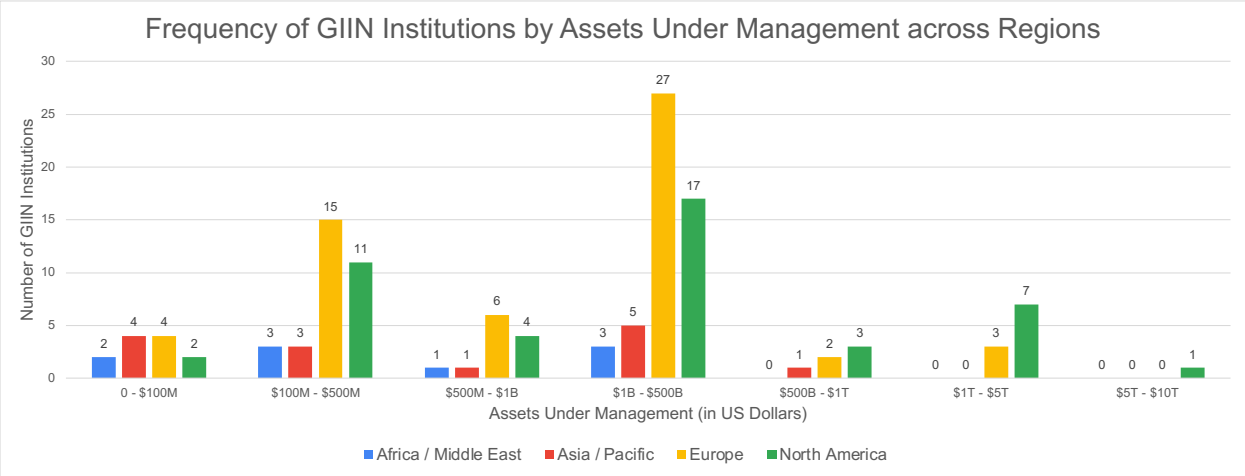

Figure 7: Frequency of GIIN Institutions by Assets Under Management across Regions

In the figure above, the sample of this study includes data regarding the assets under management (AUM) of organizations in four regions: Africa / Middle East, Asia / Pacific, Europe, and North America. The figure above indicates that financial institutions in Europe have the highest AUM out of the financial institutions in this study's sample, followed by North America, then Asia / Pacific, and finally Africa / Middle East. Notably, a high number of the financial institutions in the sample of this study have AUMs between 1 billion USD and 500 billion USD, followed by the 100 million USD to 500 million USD bracket. There are also organizations in Europe and North America with AUMs above 1 trillion USD, which represent approximately 11 institutions (7%) out of the study's sample size.

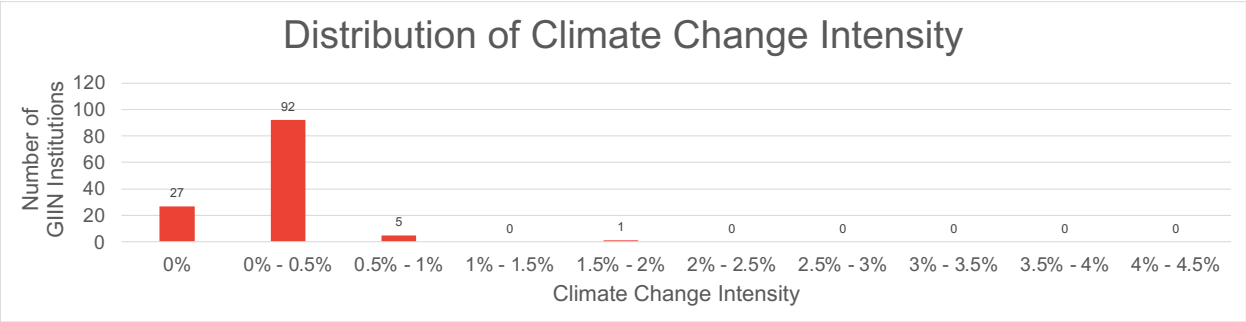

Figure 8: Distribution of Climate Change Intensity

The distribution of climate change intensity includes 92 (73.6%) of GIIN institutions falling in the 0% to 0.5% level as shown in the above figure. 27 (21.6%) of GIIN institutions have a 0% climate change intensity in this study. From all the reports analyzed across the 125 GIIN members, the average climate change intensity was 0.13%.

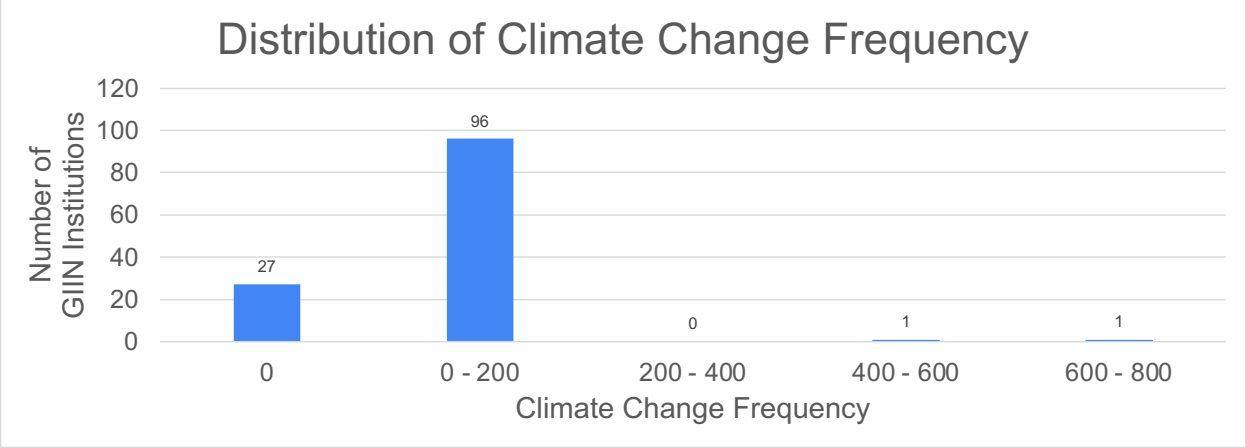

Figure 9: Distribution of Climate Change Frequency

The climate change frequency distribution reflects similar observations as in the climate change intensity distribution prior. 96 (76.8%) GIIN institutions in this study have climate change frequencies greater than 0 and less than 200, with 2 GIIN institutions falling in the 400 to 600 and 600 to 800 frequency levels. Climate change keywords did not appear for 27 (21.6%) of the GIIN organizations in this study, falling in the climate change frequency level of 0.

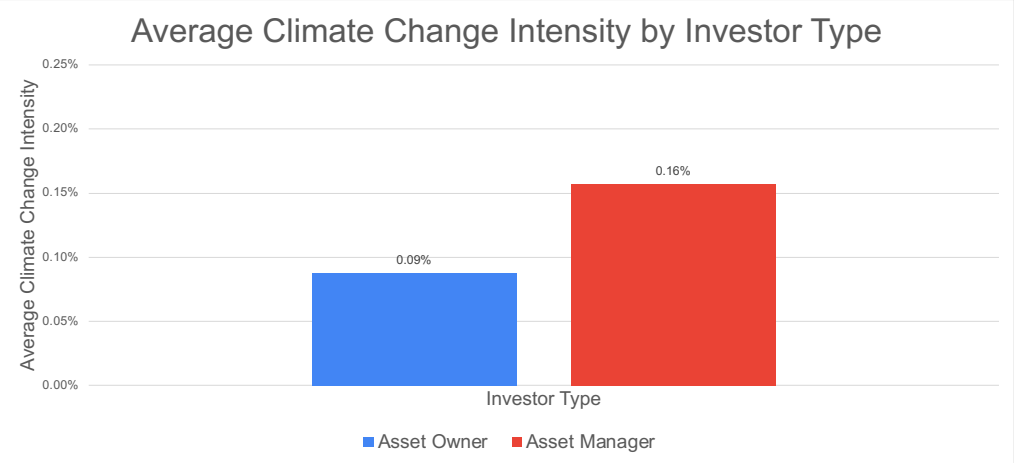

Figure 10: Average Climate Change Intensity by Investor Type

An interesting observation occurs when looking at average intensity by investor type for the terms analyzed. The average intensity of climate change is higher for asset managers (0.16%) than asset owners (0.09%). Asset managers have a noticeably higher average climate change intensity than asset owners at nearly two times higher. Asset managers may have higher average climate change intensity than asset owners due to having more stakeholders than asset owners. Asset managers have a responsibility to their stakeholders, whose money they manage, and varying stakeholders might have other priorities than addressing climate change.

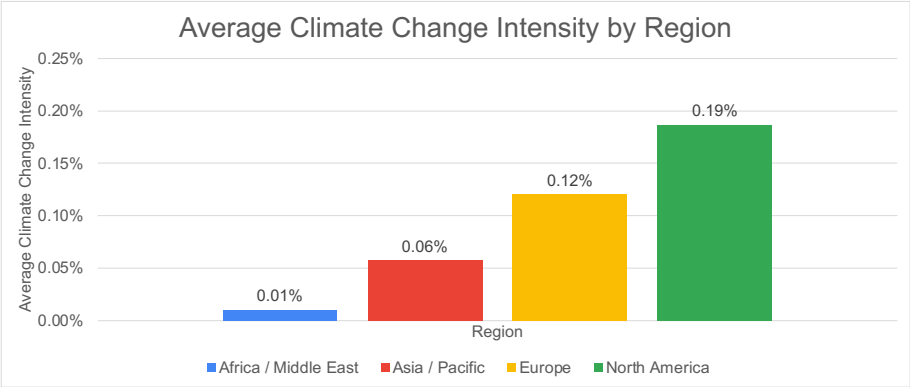

Figure 11: Average Climate Change Intensity by Region

When looking at the average intensity of the term "climate change", GIIN institutions in North America and Europe lead, while those located in the Africa/Middle East and Asia/Pacific regions have extremely low average intensities almost near 0%. Across all regions, GIIN institutions in North America and Europe have the highest average intensities at 0.19% and 0.12% respectively. European and North American institutions likely have the highest average intensities amongst the sample of GIIN institutions due to progressive policies enabling sustainable finance to be regulated in financial industry practice in (InfluenceMap, 2020; Jäger & Schmidt, 2020).

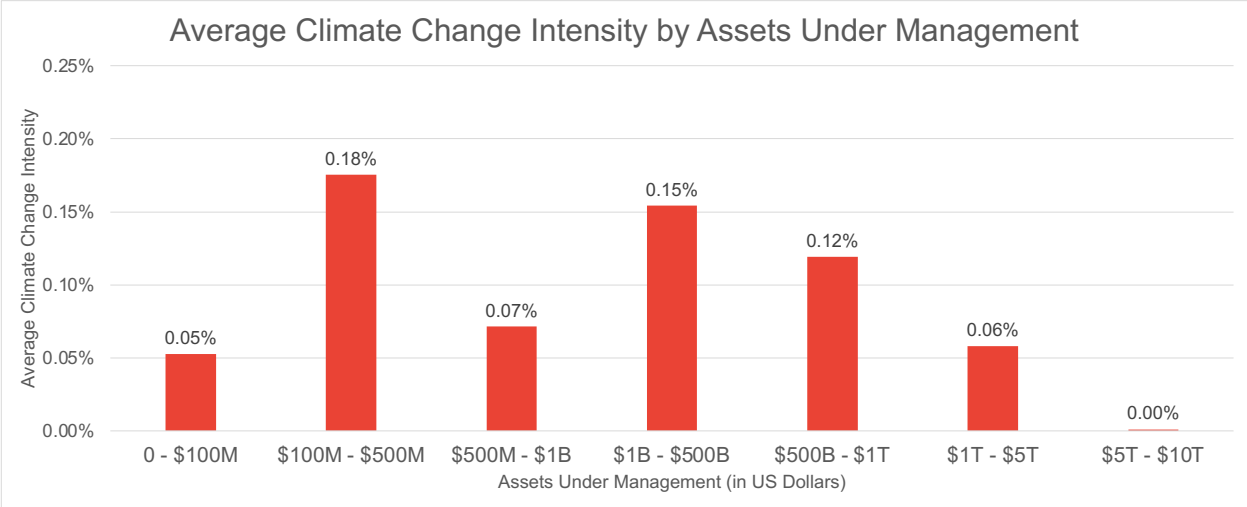

Figure 12: Average Climate Change Intensity by Assets Under Management

The highest average intensity across all AUM ranges is observed in the $100 million to $500 million AUM range at 0.18%. The lowest average intensity across all AUM ranges is observed in the $5 trillion to $10 trillion AUM range at 0%.

4.2 Distribution of Climate Change Intensity

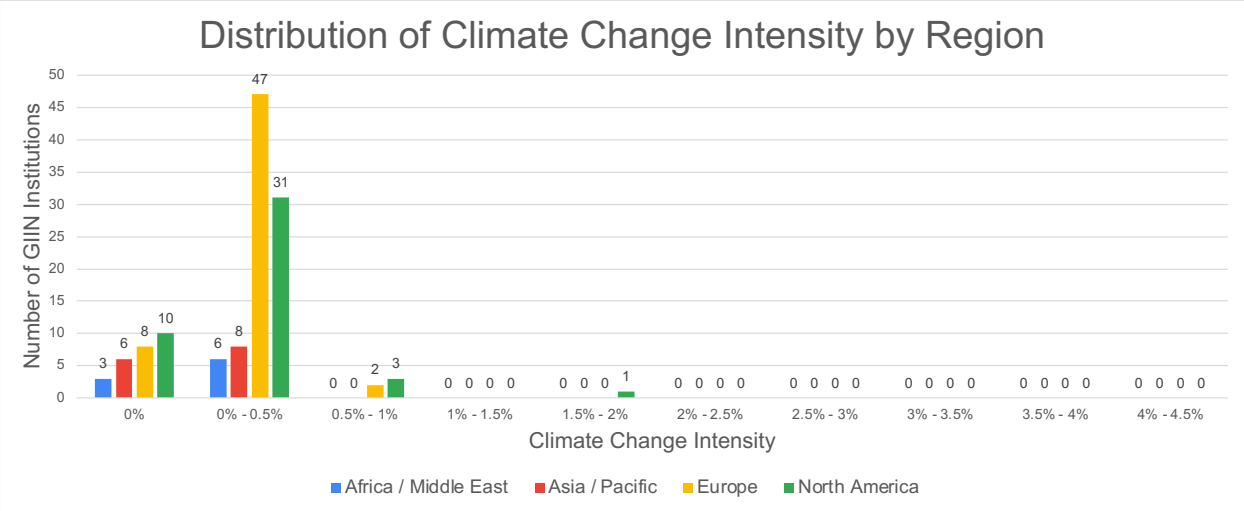

Figure 13: Distribution of Climate Change Intensity by Region

The regional distribution of climate change intensity has a high proportion of GIIN member institutions in the Europe and North America regions falling between 0% and 0.5%. GIIN member institutions in the Africa/Middle East and Asia/Pacific regions are almost equally split between the 0% to 0.5% climate change intensity level. Whereas European and North American institutions have a higher proportion with climate change intensity values above 0% and less than 2% and a lesser proportion with climate change intensity values of 0%.

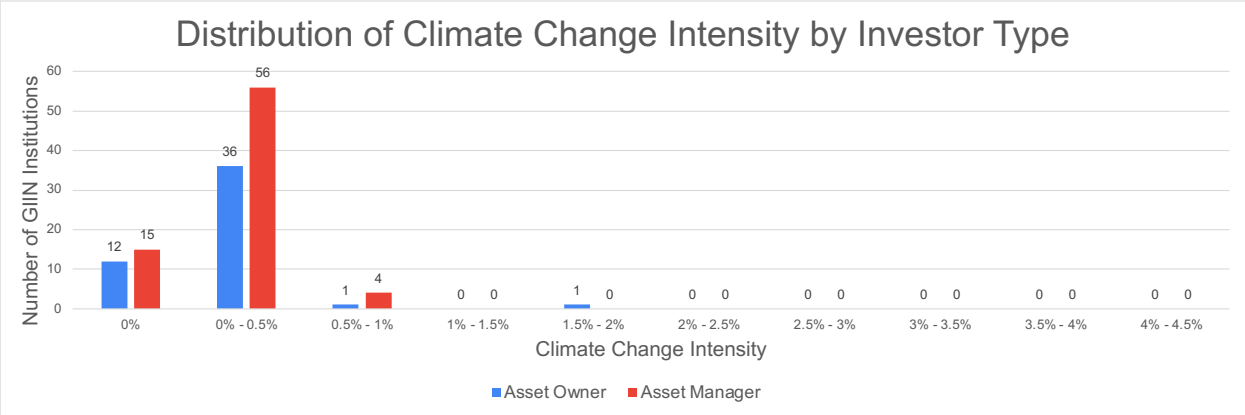

Figure 14: Distribution of Climate Change Intensity by Investor Type

Out of all GIIN member institutions analyzed, a majority of asset owners and asset managers, 36 (29%) and 56 (45%) respectively out of the entire dataset have climate change intensities between 0% and 0.5%. Notably, asset managers make up more of the climate change intensities greater than 0% than asset owners.

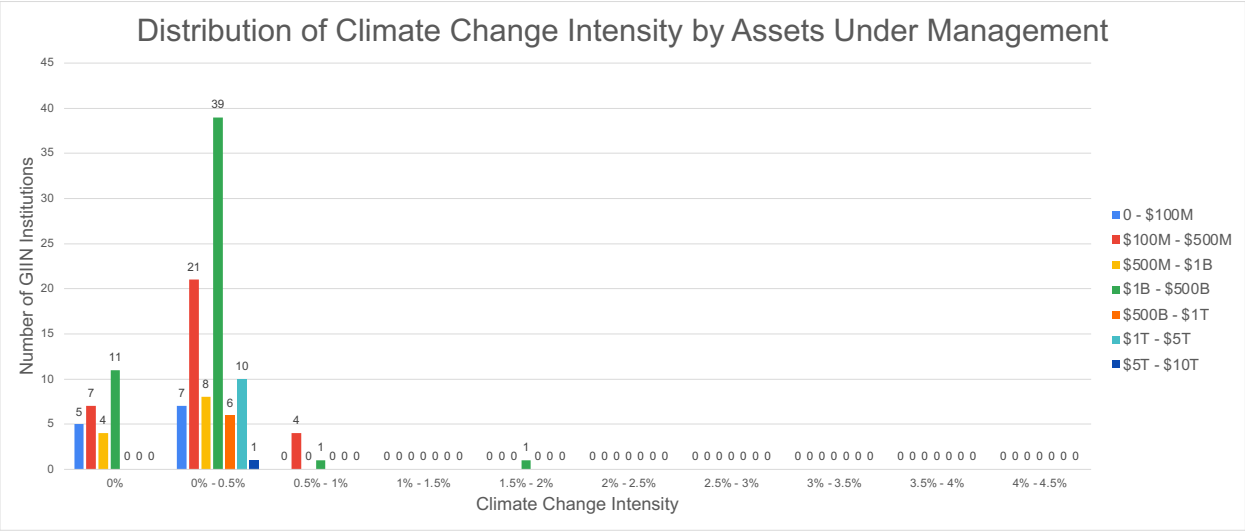

Figure 15: Distribution of Climate Change Intensity by Assets Under Management

A 39 (31.2%) majority of GIIN organizations analyzed in this study, with climate change intensities greater than 0% and less than 0.5%, have assets under management between $1 billion to $500 billion US dollars. Following, there are 21 (16.8%) organizations with climate change intensities greater than 0% and less than 0.5% in the $100 million to $500 million assets under management range.

4.3 Distribution of Climate Change Frequency

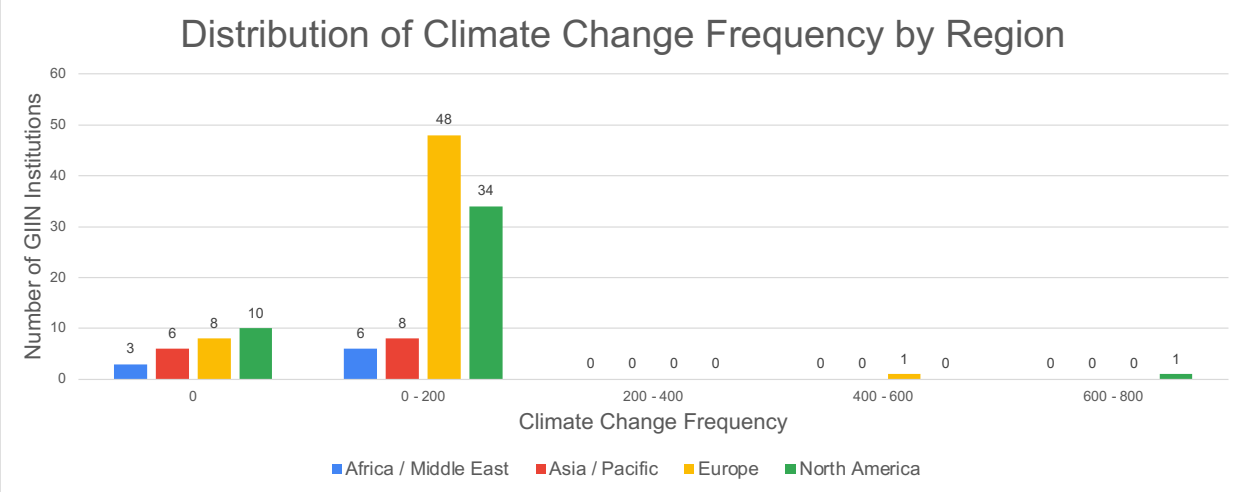

Figure 16: Distribution of Climate Change Frequency by Region

The distribution of climate change frequency by region in the figure shown above illustrates that there is a high proportion, 82 (65.6%), of GIIN member institutions in the Europe and North America regions falling in the greater than 0 and less than 200 climate change frequency level. GIIN member institutions in the Asia/Pacific have a marginally higher number of organizations than the Africa/Middle East regions in the 0 to 200 climate change frequency level. European institutions have a higher proportion of organizations with frequency values in every frequency range greater than 0 for climate change frequency, except for the 600 to 800 level where one North American organization appears. Observably, Europe has the highest proportion of GIIN institutions mentioning climate change out of all the geographical regions.

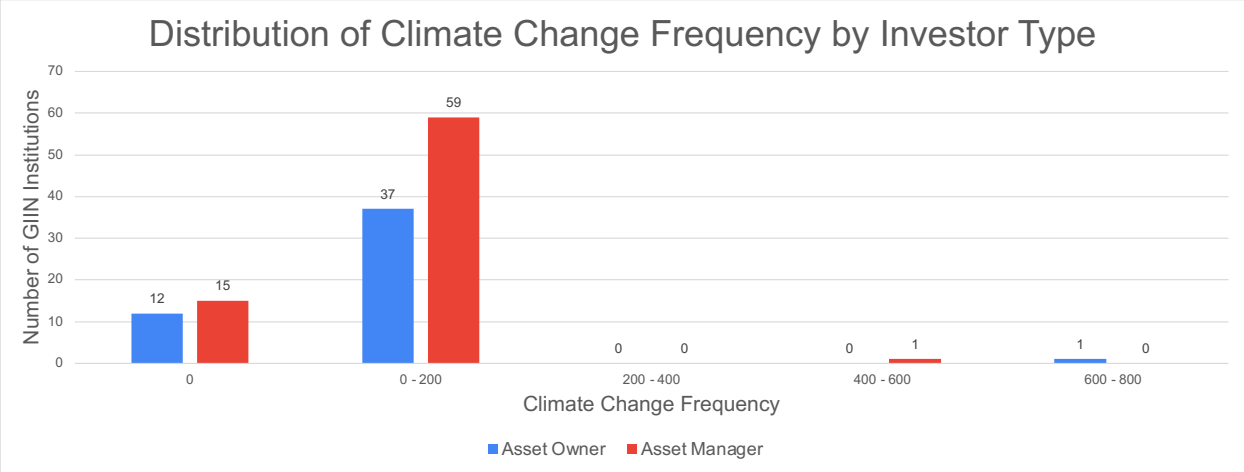

Figure 17: Distribution of Climate Change Frequency by Investor Type

Out of all GIIN member institutions analyzed, asset owners and asset managers mostly fall into the 0 to 200 frequency range for climate change. There is a markedly higher representation of asset managers mentioning the climate change term in the 0 to 200 frequency level, when compared to asset owners.

Overall, climate change is mentioned more often than not being mentioned at all, by both asset managers and asset owners. A smaller proportion of the sample at 27 (21.6%) of the GIIN institutions analyzed in this study, comprising a combination of asset managers and asset owners do not mention climate change at all.

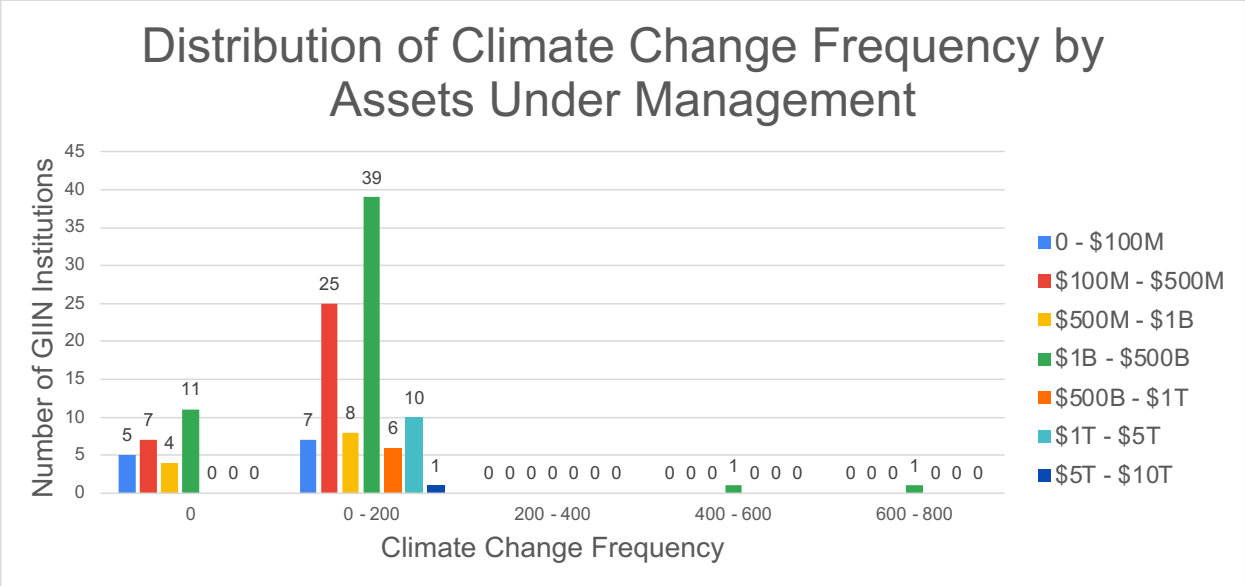

Figure 18: Distribution of Climate Change Frequency by Assets Under Management

A majority of GIIN organizations, 39 (31.2%), analyzed in this study with climate change frequencies greater than 0 and less than 200, have assets under management between $1 billion to $500 billion US dollars. This is quite similar to the trends for distribution of climate change intensity by AUM. Following this, notably, there are a high percentage of organizations with climate change frequencies greater than 0 and less than 200 that have $100 million to $500 million in assets under management. It is observed that the relationship between climate change frequency and climate change intensity is mainly the same for the different groups. This is likely because climate change intensity is derived from climate change frequency and the length of each report analyzed.

4.4 Kruskal-Wallis Equality of Populations Rank Tests

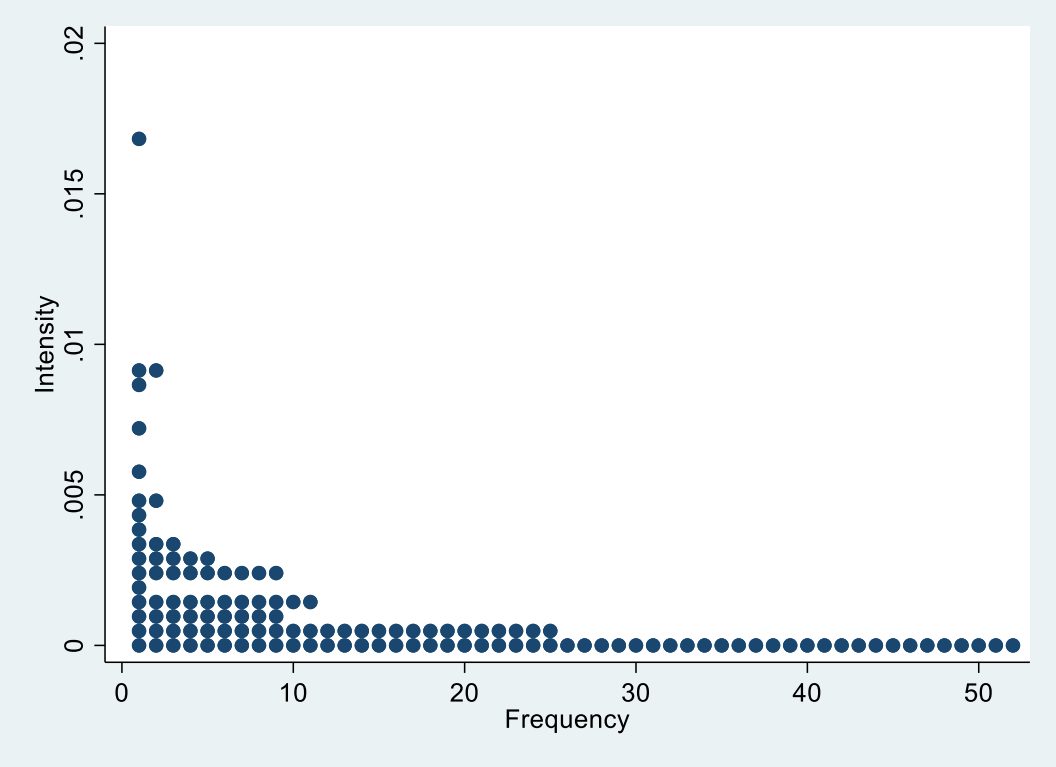

Figure 19: Overall Distribution of Climate Change Intensity

The above figure demonstrates that the distribution of climate change intensity is not normally distributed. Therefore, a non-parametric test, the Kruskal-Wallis test, was conducted to test the significance of the effects of geographic region, investor type, and assets under management levels. A non-parametric test was required because the distribution of the data is not normally distributed.

4.4.1 Kruskal-Wallis Equality-of-Populations Rank Test on Geographic Region

Table 3: Kruskal-Wallis Equality-of-Populations Rank Test - Climate Change Intensity, Regions

Region	Observations	Rank Sum
Asia / Pacific	14	707.00
Europe	57	3969.00
Africa / Middle East	9	334.00
North America	45	2865.00

$chi^2(3) = 8.188$

Probability (p-value) = 0.0423

A Kruskal-Wallis test was applied to research question #1: "**Is there a difference between impact investors in different geographical regions in addressing climate change?**" with the hypothesis that different geographical regions address climate change differently. The Kruskal-Wallis test demonstrated that the effect of different geographical regions was significant for climate change intensity, $chi^2(3) = 8.188$, $p = 0.0423$. Assuming alpha = 0.05, we reject the null hypothesis, that the independent samples have the same central tendency or that different geographical regions address climate change equally. Therefore, we fail to reject the research question hypothesis, indicating that there is significance in different geographical regions of impact investors addressing climate change.

Table 4: Kruskal-Wallis Equality-of-Populations Rank Test on Two Group Analysis - Climate Change Intensity, Asia/Pacific and Europe

Region	Observations	Rank Sum
Asia / Pacific	14	383.00
Europe	57	2173.00

$chi^2(1) = 3.058$

Probability (p-value) = 0.0803

This Kruskal-Wallis test was applied to research question #1: "**Is there a difference between impact investors in different geographical regions in addressing climate change?**" with the hypothesis that different geographical regions address climate change differently. This Kruskal-Wallis test demonstrated that the regions Asia / Pacific versus Europe was not significant for climate change intensity, $chi^2(1) = 3.058$, $p = 0.0803$. Assuming alpha = 0.05, we fail to reject the null hypothesis, that the independent samples have the same central tendency or that these different geographic regions address climate change

equally. Therefore, we reject the research question hypothesis and this indicates that these two different regions for impact investors addressing climate change is not significant.

Table 5: Kruskal-Wallis Equality-of-Populations Rank Test on Two Group Analysis - Climate Change Intensity, Africa / Middle East and North America

Region	Observations	Rank Sum
Africa / Middle East	9	188.00
North America	45	1297.00

$chi^2(1) = 1.907$

Probability (p-value) = 0.1673

This Kruskal-Wallis test was applied to research question #1: "**Is there a difference between impact investors in different geographical regions in addressing climate change?**" with the hypothesis that different geographical regions address climate change differently. This Kruskal-Wallis test demonstrated that the regions Middle East versus North America was not significant for climate change intensity, $chi^2(1) = 1.907$, $p = 0.1673$. Assuming alpha = 0.05, we fail to reject the null hypothesis, that the independent samples have the same central tendency or that these different geographic regions address climate change equally. Therefore, we reject the research question hypothesis and this indicates that these two different regions for impact investors addressing climate change is not significant.

Table 6: Kruskal-Wallis Equality-of-Populations Rank Test on Two Group Analysis - Climate Change Intensity, Asia/Pacific and North America

Region	Observations	Rank Sum
Asia / Pacific	14	355.50
North America	45	1414.50

$chi^2(1) = 1.321$

Probability (p-value) = 0.2505

This Kruskal-Wallis test was applied to research question #1: "**Is there a difference between impact investors in different geographical regions in addressing climate change?**" with the hypothesis that different geographical regions address climate change differently. This Kruskal-Wallis test demonstrated that the regions Asia / Pacific versus North America was not significant for climate change intensity, $chi^2(1) = 1.321$, $p = 0.2505$. Assuming alpha = 0.05, we fail to reject the null hypothesis, that the

independent samples have the same central tendency or that these different geographic regions address climate change equally. Therefore, we reject the research question hypothesis and this indicates that these two different regions for impact investors addressing climate change is not significant.

Table 7: Kruskal-Wallis Equality-of-Populations Rank Test on Two Group Analysis - Climate Change Intensity, Europe and Africa / Middle East

Region	Observations	Rank Sum
Europe	57	2072.50
Africa / Middle East	9	138.50

$chi^2(1) = 9.276$

Probability (p-value) = 0.0023

Europe vs. Middle East is significant (Europe is higher)

This Kruskal-Wallis test was applied to research question #1: "**Is there a difference between impact investors in different geographical regions in addressing climate change?**" with the hypothesis that different geographical regions address climate change differently. The Kruskal-Wallis test demonstrated that the regions Europe versus Middle East was significant for climate change intensity, $chi^2(1) = 9.276$, p = 0.0023. Assuming alpha = 0.05, we reject the null hypothesis, that the independent samples have the same central tendency or that different geographical regions address climate change equally. Therefore, we fail to reject the research question hypothesis, indicating that there is significance in different geographical regions of impact investors addressing climate change.

Africa / Middle East may be the lowest in this analysis due to the inclusion of only 9 GIIN institutions in this study that are located in this region. A potential explanation for low climate change intensity of the Africa / Middle East region could be due to historically low economic performance in the region and a dependence on economic development based on the oil industry (Abed & Davoodi, 2003).

4.4.2 Kruskal-Wallis Equality-of-Populations Rank Test on Investor Type

Table 8: Kruskal-Wallis Equality-of-Populations Rank Test - Climate Change Intensity, Investor Type

Investor Type	Observations	Rank Sum
Asset Manager	75	5362.00
Asset Owner	50	2513.00

$chi^2(1) = 10.305$

Probability (p-value) = 0.0013

A Kruskal-Wallis test was applied to research question #2: "**Is there a difference between types of impact investors in addressing climate change?**" with the hypothesis that asset managers and asset owners address climate change differently. The Kruskal-Wallis test demonstrated that the effect of different investor types was significant for climate change intensity, $chi^2(1) = 10.305$, $p = 0.0013$. Assuming alpha = 0.05, we reject the null hypothesis, that the independent samples have the same central tendency or that different investor types address climate change equally. Therefore, we fail to reject the research question hypothesis and this indicates that there is significance in different types of impact investors in addressing climate change.

4.4.3 Kruskal-Wallis Equality-of-Populations Rank Test on Assets Under Management

Table 9: Kruskal-Wallis Equality-of-Populations Rank Test - Climate Change Intensity, Assets Under Management

Assets Under Management	Observations	Rank Sum
$0 - $100M	12	598.50
$100M - $500M	32	2124.50
$500M - $1B	12	649.00
$1B - $500B	52	3600.00
$500B - $1T	6	417.50
>$1T	11	485.50

$chi^2(5) = 7.301$

Probability (p-value) = 0.1992

A Kruskal-Wallis test was applied to research question #3: "**Do assets under management of impact investors have an effect on addressing climate change?**" with the hypothesis that different levels of

assets under management address climate change differently. The Kruskal-Wallis test demonstrated that the effect of different levels of assets under management was not significant for climate change intensity, $chi^2(1) = 7.301$, $p = 0.1992$. Assuming alpha = 0.05, we fail to reject the null hypothesis, that the independent samples have the same central tendency or that different levels of assets under management climate change equally. Therefore, we reject the research question hypothesis and this indicates that different levels of assets under management of impact investors addressing climate change is not significant.

4.4.4 Climate Change Intensities of GIIN Members

Table 10: Climate Change Intensities of GIIN Members in Study

GIIN Members	Climate Change Intensity
The John D. and Catherine T. MacArthur Foundation	1.6826%
Althelia Ecosphere (Mirova Natural Capital)	0.9210%
ClimateWorks Foundation	0.9134%
Ecotrust Forest Management (EFM)	0.8636%
responsAbility Investments AG	0.7224%
SJF Ventures	0.5988%
Hancock Natural Resource Group	0.4889%
ClearBridge Investments	0.4882%
RobecoSAM	0.4095%
Jonathan Rose Companies	0.3792%
Allianz Global Investors	0.3305%
Wellington Management	0.3190%
RBC Global Asset Management	0.3143%
Domini Impact Investments	0.3120%
Root Capital	0.3002%
12Tree Finance	0.2962%
Neuberger Berman	0.2863%
MN	0.2730%
NN Investment Partners	0.2626%
La Financière de l'Echiquier	0.2608%
The European Bank for Reconstruction and Development (EBRD)	0.2596%
Impact Investment Group Pty Ltd	0.2576%
PG Impact Investments AG	0.2447%
The Forest Company	0.2440%

Calvert Impact Capital	0.2344%
Mesoamerica	0.2275%
Hermes Investment Management	0.2218%
Nuveen, a TIAA Company	0.2055%
AXA Investment Managers	0.1682%
Finnfund	0.1618%
Investisseurs & Partenaires	0.1541%
FinDev Canada	0.1514%
Kohlberg Kravis Roberts & Co. L.P.	0.1507%
Finance in Motion	0.1491%
Temasek International	0.1301%
One to Watch	0.1294%
Kois Invest	0.1241%
Developing World Markets	0.1236%
CDC	0.1231%
Mitsubishi UFJ Trust and Banking Corporation	0.1190%
International Finance Corporation (IFC)	0.1190%
BlueOrchard Finance	0.1007%
Blackstone	0.0948%
Swedfund International AB	0.0930%
FMO	0.0904%
Impax Asset Management	0.0863%
SilverStreet Capital	0.0760%
National Australia Bank	0.0730%
Sarona Asset Management	0.0721%
Bamboo Capital Partners	0.0713%
M&G Investments	0.0709%
Shell Foundation	0.0669%
DOEN Foundation	0.0637%
Symbiotics SA	0.0577%
The Kresge Foundation	0.0561%
Sycomore Asset Management	0.0554%
Wespath Benefits and Investments	0.0535%
Triple Jump	0.0521%
Incofin Investment Management	0.0515%
Christian Super	0.0506%
Cordaid	0.0505%
Bridges Fund Management	0.0473%
ABN AMRO Social Impact Fund	0.0438%
IDH Investment Management	0.0427%
Intermediate Capital Group Plc (ICG)	0.0378%
The Sasakawa Peace Foundation	0.0373%

Zurich Insurance Group	0.0342%
Van Lanschot Kempen	0.0322%
AlphaMundi Group Kenya	0.0321%
AHL Venture Partners	0.0317%
Belgian Investment Company for Developing Countries (BIO)	0.0299%
TriLinc Global	0.0297%
Swiss Investment Fund for Emerging Markets (SIFEM)	0.0244%
Glenmede	0.0226%
Acumen	0.0219%
Norsad Finance	0.0201%
ACTIAM Impact Investing	0.0196%
Bank of America	0.0164%
Grofin	0.0154%
Credit Suisse	0.0154%
Ferd AS	0.0103%
The Islamic Corporation for the Development of the Private Sector (ICD)	0.0092%
Palestine Investment Fund	0.0092%
CBRE Global Investors	0.0085%
Bertelsmann Stiftung	0.0080%
Northern Trust	0.0075%
International Islamic Trade Finance Corporation	0.0071%
UBS	0.0067%
Global Innovation Fund	0.0054%
J.P. Morgan	0.0048%
BNY Mellon	0.0044%
The Visa Foundation	0.0024%
Capri Global Capital Ltd	0.0018%
Morgan Stanley	0.0017%
Deutsche Bank	0.0015%
MetLife Investment Management	0.0013%
BlackRock	0.0012%
Prudential	0.0004%
Accion	0.0000%
Advance Global Capital Ltd	0.0000%
Ashburton Investments	0.0000%
Baillie Gifford	0.0000%
Big Society Capital	0.0000%
Foundation North	0.0000%
Global Alliance for Improved Nutrition	0.0000%
HCAP Partners	0.0000%
IDB	0.0000%
Impress Capital Limited	0.0000%

INOKS Capital	0.0000%
Janus Henderson Investors	0.0000%
Japan Social Impact Investment Foundation (SIIF)	0.0000%
Margaret A. Cargill Philanthropies	0.0000%
Narada Foundation	0.0000%
National Life Insurance Company	0.0000%
Northern Arc Investments	0.0000%
Pacific Community Ventures	0.0000%
Pakistan Microfinance Investment Company	0.0000%
Reyl	0.0000%
Sahel Capital	0.0000%
Sanlam Investments	0.0000%
The Church Pension Fund	0.0000%
The Salvation Army Netherlands (Stichting Leger des Heils)	0.0000%
Tides	0.0000%
Virginia Community Capital	0.0000%
W.K. Kellogg Foundation	0.0000%

The table above shows the full list of GIIN members that were included in this study and their associated climate change intensity percentage values. The list is ranked from highest climate change intensity to lowest climate change intensity. Of the GIIN members that have climate change intensity values that are greater than zero, the five highest and lowest members were further reviewed in the following discussion section for further insight on reasons for their high or low propensities.

4.4.5 Summary

The quantitative data analysis was completed through data collection, descriptive statistics, and statistical testing by using Kruskal-Wallis tests. Kruskal-Wallis tests were used to determine the effect of geographic region, investor type, and levels of assets under management on addressing climate change. The results of the statistical testing indicate that the effect of region and investor types is significant when addressing climate change by impact investors. However, the effect of levels of assets under management was found to be not significant when addressing climate change. The results of this study are discussed, with consideration of the research objective, in the following chapter.

Chapter 5:
Discussion and Conclusions

The research objective of this study aimed to:

(a) Assess the degree to which impact investing can be a driver for climate change solutions

To understand the relationship between impact investing and climate change in financial institutions that engage in impact investing and to assess how impact investing can positively contribute to climate change solutions, this study's research questions asked:

1) **Is there a difference between impact investors in different geographical regions in addressing climate change?**
    - Hypothesis: Different geographical regions address climate change differently
    - Null Hypothesis: Different geographical regions address climate change equally
2) **Is there a difference between types of impact investors in addressing climate change?**
    - Hypothesis: Asset managers and asset owners address climate change differently
    - Null Hypothesis: Asset managers and asset owners address climate change equally
3) **Do assets under management of impact investors have an effect on addressing climate change?**
    - Hypothesis: Different levels of assets under management address climate change differently
    - Null Hypothesis: Different levels of assets under management address climate change equally

5.1 Research Objective and Research Questions

The objective of this research was to *assess the degree to which impact investing can be a driver for climate change solutions.* In line with this objective, the research questions, focusing on the effects of geographic region, investor types, and assets under management on impact investors addressing climate change, were tested for significance by conducting Kruskal-Wallis equality-of-populations rank tests. From the results of this study, specifically through the Kruskal-Wallis tests on the climate change intensities of the sample group of financial institutions, the tests rejected the null hypotheses that the independent variables of geographic regions and investor types address climate change equally. However, the same Kruskal-Wallis test failed to reject the null hypothesis that the independent variable of assets under management levels address climate change equally. The effect of different geographic regions and investor types was found to be significant for addressing climate change, while the levels of assets under management was found to not be significant for addressing climate change by impact investors.

When looking at impact investor priorities, while two independent variables used in the Kruskal-Wallis tests were found to be significant in addressing climate change differently and one independent variable was found to be not significant, there exists a myriad of opportunities for climate change solutions to be highly funded by impact investors with environmental missions and climate-oriented perspectives. Further, many actors in the financial sector have the monetary power and strong influence to invest in solutions that successfully mitigate and adapt to climate change, positively impact the environment, meaningfully contribute to sustainable development, and help transition human society to a low carbon economy.

5.1.1 Impact Investor Missions and Values

When assessing various missions and values of impact investors, the type of financial institution and type of organization that is investing their funds was considered. This research included members of the GIIN that were made up of asset managers and asset owners. Asset managers are financial professionals that manage investments for clients and are also known as investment advisors, financial advisors, wealth manager, stockbrokers, among other names (O'Connell & Curry, 2022). Asset owners are typically financial institutions with high assets under management amounts and include pension funds, charities and foundations, family foundations, insurance funds, sovereign wealth funds, and high net-worth investors (SRI-CONNECT, 2022). The GIIN members analyzed in this study consisted of both asset managers and asset owners. The GIIN members are financial institutions with varying organizational

types that included non-profit organizations, family foundations, pension funds, endowments, venture capital, private equity, public equity, public finance, investment management services, and other investment companies. In this discussion of missions and values that affect impact investor intentions, the priorities of all the varying types of organizations in this research can differ because of reasons including, but not limited to, government policy and regulations, geographic location, environmental concerns, social concerns, political atmospheres, stakeholder needs, and investor priorities.

The table below displays the top five companies in this study's sample with the highest climate change intensities out of the GIIN institutions included in this study. This group of companies shows that there are a variety of organizations with similar values and a similar mission of combating climate change. Based on the missions and values of the organizations, it is easily observable that those with climate-related focuses in their missions and investment methodology, consider climate change more than those that do not have climate-related focuses. For example, The John D. and Catherine T. MacArthur Foundation explicitly mentions in their organizational mission that they concentrate their investment efforts on advancing global climate solutions (MacArthur Foundation, 2022). Althelia Ecosphere, as assessed in this study but now known as Mirova Natural Capital, believes that finance must be used to transform the current economic model to preserve and restore ecosystems and the climate (Mirova Natural Capital, 2022). The ClimateWorks Foundation directly states in its mission that it aims to end the climate crisis through its investments (ClimateWorks Foundation, 2022). Ecotrust Forest Management, while focused on natural forest management, believes that climate-smart strategies and approaches are of crucial importance to a low carbon economy (Ecotrust Forest Management, 2022). The investment company, responsAbility Investments AG, is committed to being a climate neutral company and actively monitors and reduces the carbon emissions of its investment portfolio (responsAbility Investments AG, 2022). Clearly, the missions of these five organizations indicate that climate change initiatives are baked into their impact investing strategies, as proven by their climate change intensities ranking as the five highest in this study's sample.

Table 11: Top Five Climate Change Intensities

Five Highest Climate Change Intensities	Asset Owner or Asset Manager	Financial Institution Type	Climate Change Intensity
The John D. and Catherine T. MacArthur Foundation	Asset Owner	Private foundation	1.68%
Althelia Ecosphere (Mirova Natural Capital)	Asset Manager	Investment management	0.92%
ClimateWorks Foundation	Asset Owner	Non-profit organization	0.91%
Ecotrust Forest Management (EFM)	Asset Manager	Investment management	0.86%
responsAbility Investments AG	Asset Manager	Investment management	0.72%

The table below displays the five companies in this study's sample with the lowest climate change intensities out of the GIIN institutions included in this study. This group of five companies indicates that there are a fairly similar group of financial institutions that indeed mention climate change in their investment methodologies and perspectives, but have a relatively low intensity when it comes to including climate change in their overall strategies, investment decision making, and investment approaches. This group of organizations is similar in that they are all large financial institutions, spread out across insurance, banking, and investment services. A potential explanation for the companies' low climate change intensities is that established traditional financial institutions traditionally did not address environmental or social risks. This is mainly due to the fact that historically, environmental policies have been controlled and implemented by governments, and financial institutions adhered to the resulting policies and regulations (Ens & Guerin, 2022). It should be noted that this study's data uses GIIN member institutions reports from 2019 as a basis, because the research began in 2020. Possible explanations for the low climate change intensity values of these institutions are that some of the institutions in this study may have significantly improved in addressing climate change since 2019. For example, BlackRock, which is now known as a sustainability leader in the financial industry, participated for the first time in 2021 in the climate-related disclosure process of the Task Force on Climate-related Financial Disclosures and filed a climate-related disclosure report (BlackRock, 2021). Another possible explanation for these low climate change intensities is that assets which are considered to be ESG assets are not necessarily climate change focused and can have other environmental or social priorities. For these specific

companies in the table of the lowest climate change intensities, climate change is not addressed as highly as the companies listed in the table of the highest climate change intensities.

Table 12: Lowest Five Climate Change Intensities

Five Lowest Climate Change Intensities (with non-zero values)	Asset Owner or Asset Manager	Financial Institution Type	Climate Change Intensity
Prudential	Asset Owner	Insurance	0.0004%
BlackRock	Asset Manager	Investment management	0.0012%
MetLife Investment Management	Asset Manager	Investment management	0.0013%
Deutsche Bank	Asset Owner	Investment banking	0.0015%
Morgan Stanley	Asset Owner	Investment management and financial services	0.0017%

Climate change has been defined as the most crucial issue in human society and the greatest threat to civilization (United Nations, 2022a). The history and development of impact investing demonstrates financial institutions that began refraining from investments in unethical or immoral industries and later started to fund efforts fostering human rights (Corporate Finance Institute, 2021). Through this history and the current pressing issue of climate change, there exists an established business case and onus on financial institutions to fund climate change mitigation and adaptation efforts with the impact theme of climate action as an impact investing mission. An alignment of impact investment efforts and objectives is required in order to position climate change together with social issues in impact investor missions and values and spur greater climate action in the field of impact investing.

5.1.2 Monetary Considerations

Assets under management was included in this study's analysis of financial institutions practicing impact investing in relation to climate change. Of the sample of 125 financial institutions in this study, the total estimated assets under management across all firms amounts to approximately $37 trillion USD. Notably high assets under management within the sample belong to insurance companies, pension funds, and banks. To put this into perspective, $37 trillion USD amounts to approximately a third of the total assets under management worldwide in the asset management industry (Heredia et al., 2021). While $37 trillion USD in assets under management appears to be very high, not all of these funds are directed to impact investing for environmental and social causes, let alone climate change.

An emergence of family offices, foundations, non-profit organizations, charitable organizations, and philanthropic ventures has added to the amount of investment and funds directed at dealing with climate change impacts. In this study's sample, non-profit organizations, foundations, and charitable organizations made up 20% of the sample as seen in the figure below.

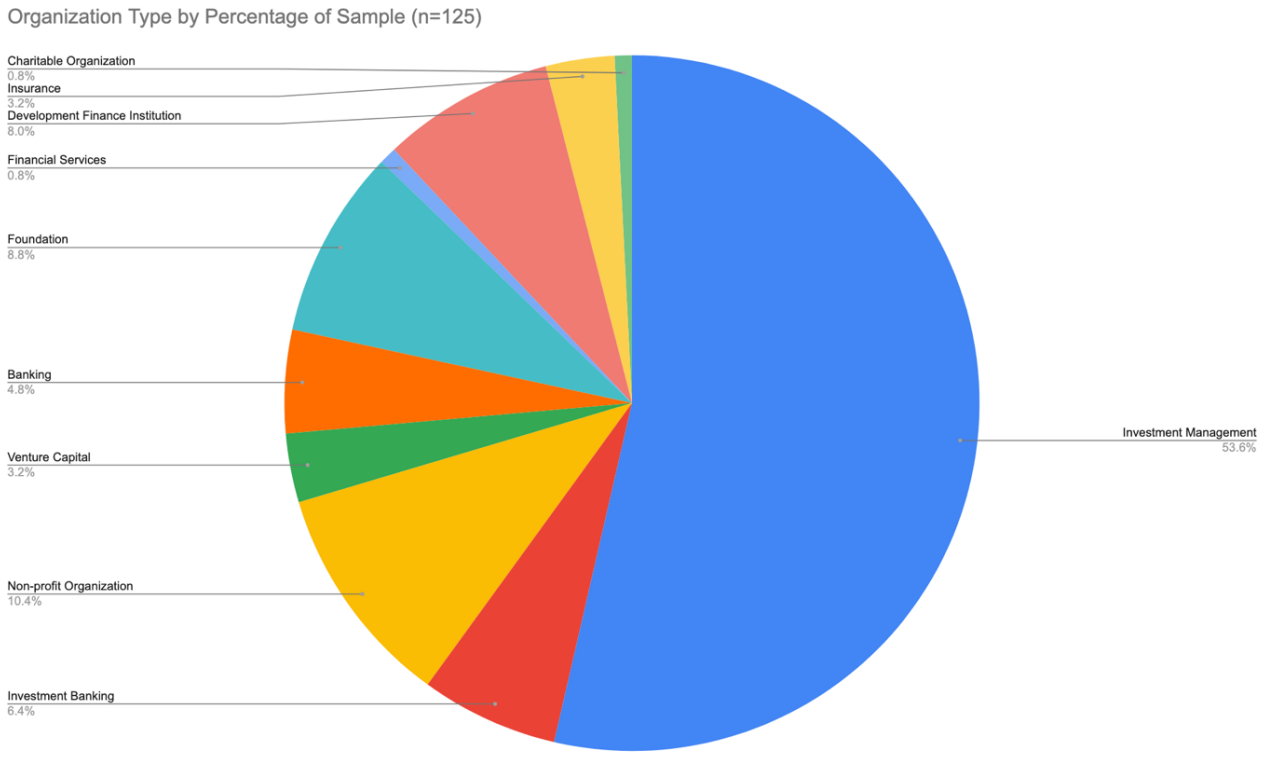

Figure 20: Organization Type by Percentage of Sample

5.1.3 Impact Measurement and Frameworks

This study's sample indicated that impact is measured and reported differently by almost every organization in the sample. When reviewing the annual reports, sustainability reports, and impact reports of the financial institutions in the sample, some of the sample institutions follow known credible frameworks, others adapt impact measurement practices into their own practices, and others create their own systems and frameworks of measuring impact.

There exists an opportunity for impact to be measured in positive or negative alignment with climate change solutions. Especially when considering impact investing in the context of climate change

mitigation and adaptation, reviewing evidence in the GIIN survey indicating energy as a priority sector for impact investors, and observing the results of this study showing that the sample group of financial institutions consider climate change and environment more than social causes. Therefore, an approach to measuring impact that is either positive or negative in relation to impacts on the environment and society should be implemented in order to truly measure impacts of impact investments.

5.2 Conclusion

As indicated by this study's sample data and statistical tests, the results of this research indicate that the effects of geographic regions and investor types is significant for impact investors addressing climate change, while the effect of assets under management was found to be not significant. This indicates that there is strong growth potential and large opportunity for impact investors and financial institutions practicing impact investing to make investment decisions inclined towards climate change solutions. As regulatory policies evolve to incorporate climate-related disclosures in finance, the effect of the independent variable of assets under management in this research could change. As impact investors of different investor types begin to consider impact investing more strongly, their financial flows and allocations of their assets under management in impact investments could change.

The objective of this research was to *assess the degree to which impact investing can be a driver for climate change solutions.* This thesis used the aforementioned research questions, with each question focusing on a different independent variable, directly in the statistical tests. These variables were geographic region, investor type, and assets under management. This thesis sought to understand if there was significance in these independent variables for impact investors addressing climate change. The variables of geographic region and investor type were found to be significant in influencing the climate change intensity of impact investors via their annual reports.

5.2.1 Recommendation

It was observed in this research, during the literature review, that impact investors are varied in their approach to measuring impact and considering theoretical impact concepts in relation to the environment and society. Some institutions follow known credible frameworks when they do not have their own approach, while other institutions create proprietary systems and frameworks for measuring impact. Although impact can be considered in different ways depending on what projects, initiatives, missions, and values the impact investments fund, it is recommended that a scientific approach to measuring impact

be applied. For example, Rockström's planetary boundary concept can be used as a foundational scientific basis for impact measurement. Rockström's planetary boundaries propose quantitative planetary boundaries where a zone of human development can be withstood by Earth's natural systems, and identified limitations in these systems and points of irreversible environmental change (Rockström et al., 2009).

This recommendation stems from the widely varying approaches to impact measurement observed in the GIIN members' annual reports, sustainability reports, and impact reports. In relation to climate change, using a planetary boundary framework allows for universal acceptance of the absolute limitations of natural systems on Earth from a science-based perspective, and can help inform regulatory policy and investment practices by using a benchmark of negative impact thresholds.

5.2.2 Academic Contribution of Research to Theory and Knowledge

The field of sustainable finance benefits from this research as during the literature review of this research, it was identified and noted that research on the field of impact investing in relation to climate change is nascent. This research adds to the academic and theoretical impact investing subject matter in that it uses a real-world sample of financial institutions practicing impact investing to observe and assess the degree to which impact investing can be a driver for climate change solutions.

The practical contribution of this research is relevant to and useful for investment decision makers, impact investors, the financial industry, and the field of sustainable finance. This research has made a first step in analyzing the degree to which impact investors focus on climate change. The research findings from the literature review and quantitative analysis highlights a growth opportunity for impact investors to consider climate change as a major area for impact investment. When considering the business case for this research in relation to impact investing, the study highlights the general lack of standardized impact investment measurement approaches and frameworks and the recent appearance of sustainable finance disclosure policy and regulations adopted in the European Union. The recommendation of applying a scientific-based or planetary boundary framework to better measure the positive and negative impacts of impact investments, may help advance the field of sustainable finance.

5.2.3 Opportunities for Future Research

A first opportunity for future research on the topic of impact investing and climate change within the context of this research study, would be to update and track the dataset of these GIIN member institutions

and their impact investing intensities and climate change intensities over a longer time period. This research used and focused on a 2019 sample of data from the GIIN members. Tracking the change in data over a 10-year period would prove to be a useful analysis on whether climate change becomes a greater focus for impact investors. This study also began in 2019, prior to the start of the COVID-19 pandemic in 2020, and used annual reports that precede the pandemic. If annual reports from beyond 2020 had been used in this study, the results may have been different than what was observed from 2019 data.

The next major stage, stemming from this research, would be to identify specific asset types and investment assets in relation to positive climate change contributions. A key consideration would be to dive deeper into the types of investments being made by the GIIN members, whether they are largely operating in the realms of public equity or private equity, and what asset classes are being utilized in their impact investments.

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Appendices

Table 13: Inclusion of GIIN Member Institutions in Study

GIIN Members	Investor Type	File Included In Study
12Tree Finance	Asset Manager	Yes
57 Stars	Asset Manager	No
ABC World Asia Pte Ltd	Asset Manager	No
ABN AMRO Social Impact Fund	Asset Manager	Yes
Accial Capital	Asset Manager	No
Accion	Asset Manager	Yes
ACTIAM Impact Investing	Asset Manager	Yes
Acumen	Asset Manager	Yes
Advance Global Capital Ltd	Asset Manager	Yes
Aegon	Asset Owner	No
AFIG Funds	Asset Manager	No
AgDevCo	Asset Owner	No
AHL Venture Partners	Asset Manager	Yes
Allianz Global Investors	Asset Manager	Yes
AlphaMundi Group Kenya	Asset Manager	Yes
alter equity	Asset Manager	No
Althelia Ecosphere (Mirova Natural Capital)	Asset Manager	Yes
Anthos Fund and Asset Management and Skopos Direct Impact Group	Asset Owner	No
Appolaris	Asset Owner	No
Ascent Capital Africa	Asset Manager	No
Ashburton Investments	Asset Manager	Yes
ASN Beleggingsfondsen	Asset Manager	No
Athena Capital Advisors	Asset Owner	No
AvantFaire Investment Management Limited	Asset Manager	No
AXA Investment Managers	Asset Manager	Yes
Baillie Gifford	Asset Manager	Yes
Bain Capital	Asset Manager	No
Bamboo Capital Partners	Asset Manager	Yes
Bank of America	Asset Owner	Yes
Barak Fund Management	Asset Manager	No
Belgian Investment Company for Developing Countries (BIO)	Asset Owner	Yes
Bertelsmann Stiftung	Asset Owner	Yes
Big Society Capital	Asset Manager	Yes
BlackRock	Asset Manager	Yes
Blackstone	Asset Manager	Yes
Blue like an Orange Sustainable Capital	Asset Manager	No
BlueOrchard Finance	Asset Manager	Yes
BNY Mellon	Asset Owner	Yes

Bridges Fund Management	Asset Manager	Yes
BrightEdge	Asset Manager	No
Calvert Impact Capital	Asset Manager	Yes
Cambridge Associates	Asset Manager	No
Capital Impact Partners	Asset Manager	No
Capri Global Capital Ltd	Asset Owner	Yes
Capricorn Investment Group	Asset Owner	No
CBRE Global Investors	Asset Manager	Yes
CDC	Asset Owner	Yes
Central American Bank for Economic Integration (CABEI)	Asset Owner	No
Christian Super	Asset Owner	Yes
ClearBridge Investments	Asset Manager	Yes
ClearSky	Asset Manager	No
ClimateWorks Foundation	Asset Owner	Yes
Community Investment Management	Asset Manager	No
Community Reinvestment Fund	Asset Manager	No
Conservation Resource Partners	Asset Manager	No
Convergence Partners	Asset Manager	No
Cordaid	Asset Manager	Yes
Cordiant Capital	Asset Manager	No
Creation Investments Capital Management	Asset Manager	No
Credit Suisse	Asset Owner	Yes
Crevisse Partners	Asset Manager	No
CrossBoundary	Asset Manager	No
Dalio Family Office	Asset Owner	No
DBL Investors	Asset Manager	No
Deutsche Bank	Asset Owner	Yes
Developing World Markets	Asset Manager	Yes
Development and Investment Bank of Turkey	Asset Owner	No
DOB Equity	Asset Owner	No
DOEN Foundation	Asset Owner	Yes
Domini Impact Investments	Asset Manager	Yes
EBG Investment Solutions	Asset Manager	No
EcoEnterprises Fund	Asset Manager	No
Ecotrust Forest Management (EFM)	Asset Manager	Yes
Ehong Impact Capital	Asset Manager	No
Elevar Equity	Asset Manager	No
Enterprise Community Partners	Asset Manager	No
Fajr Capital	Asset Manager	No
Ferd AS	Asset Owner	Yes
Finance in Motion	Asset Manager	Yes
FINCA International	Asset Manager	No
FinDev Canada	Asset Owner	Yes

Finnfund	Asset Owner	Yes
FMO	Asset Owner	Yes
Fondaction	Asset Owner	No
Fonds de solidarité FTQ	Asset Owner	No
Ford Foundation	Asset Owner	No
Foundation North	Asset Owner	Yes
Fund "Our Future"	Asset Owner	No
Gary Community Investments	Asset Owner	No
GAWA Capital	Asset Manager	No
Glenmede	Asset Manager	Yes
Global Alliance for Improved Nutrition	Asset Owner	Yes
Global Endowment Management (GEM)	Asset Manager	No
Global Innovation Fund	Asset Manager	Yes
Greenspring Associates	Asset Manager	No
Grofin	Asset Owner	Yes
Hancock Natural Resource Group	Asset Manager	Yes
HCAP Partners	Asset Manager	Yes
Helios Investment Partners	Asset Manager	No
Hermes Investment Management	Asset Manager	Yes
Heron Foundation	Asset Owner	No
i(x) investments	Asset Owner	No
IDB	Asset Owner	Yes
IDH Investment Management	Asset Manager	Yes
IDP Foundation	Asset Owner	No
Impact Community Capital	Asset Manager	No
Impact Investment Group Pty Ltd	Asset Manager	Yes
Impax Asset Management	Asset Manager	Yes
Impress Capital Limited	Asset Manager	Yes
Incofin Investment Management	Asset Manager	Yes
INOKS Capital	Asset Manager	Yes
Insitor Partners	Asset Manager	No
Intermediate Capital Group Plc (ICG)	Asset Manager	Yes
International Finance Corporation (IFC)	Asset Owner	Yes
International Islamic Trade Finance Corporation	Asset Owner	Yes
Investisseurs & Partenaires	Asset Manager	Yes
Irupé Creditech	Asset Manager	No
J.P. Morgan	Asset Owner	Yes
Janus Henderson Investors	Asset Manager	Yes
Japan Social Impact Investment Foundation (SIIF)	Asset Owner	Yes
Jonathan Rose Companies	Asset Manager	Yes
Jordan Park	Asset Owner	No
Kaizen Private Equity	Asset Manager	No

Kiva Capital Management	Asset Manager	No
Kohlberg Kravis Roberts & Co. L.P.	Asset Manager	Yes
Kois Invest	Asset Manager	Yes
La Financière de l'Echiquier	Asset Manager	Yes
LeapFrog Investments	Asset Manager	No
Lendable	Asset Manager	No
LGT Impact	Asset Manager	No
Lombard Odier & Cie	Asset Manager	No
Lumina Foundation for Education Inc.	Asset Owner	No
M&G Investments	Asset Manager	Yes
MAIF	Asset Owner	No
Margaret A. Cargill Philanthropies	Asset Owner	Yes
Maycomb Capital	Asset Manager	No
Mesoamerica	Asset Manager	Yes
MetLife Investment Management	Asset Manager	Yes
MicroVest Capital Management	Asset Manager	No
Milton A. & Charlotte R. Kramer Charitable Foundation	Asset Owner	No
Mitsubishi UFJ Trust and Banking Corporation:	Asset Manager	Yes
MN	Asset Manager	Yes
Morgan Stanley	Asset Owner	Yes
Narada Foundation	Asset Owner	Yes
National Australia Bank	Asset Owner	Yes
National Community Investment Fund	Asset Manager	No
National Life Insurance Company	Asset Owner	Yes
Nephila	Asset Manager	No
Neuberger Berman	Asset Manager	Yes
New Forests	Asset Manager	No
NN Investment Partners	Asset Manager	Yes
Nonprofit Finance Fund	Asset Manager	No
Norsad Finance	Asset Manager	Yes
North East Family Office Singapore	Asset Owner	No
Northern Arc Investments	Asset Manager	Yes
Northern Trust	Asset Owner	Yes
NOTS Impact Enterprises	Asset Owner	No
NREP	Asset Manager	No
Nuveen, a TIAA Company	Asset Manager	Yes
Obviam	Asset Manager	No
Oikocredit	Asset Manager	No
Omidyar Network	Asset Manager	No
Omnivore	Asset Manager	No
One to Watch	Asset Manager	Yes
Open Road Ventures	Asset Owner	No

Pacific Community Ventures	Asset Manager	Yes
Pakistan Microfinance Investment Company	Asset Owner	Yes
Palestine Investment Fund	Asset Owner	Yes
Pegasus Capital Advisors, L.P.	Asset Manager	No
PG Impact Investments AG	Asset Manager	Yes
Pharos Capital Group	Asset Manager	No
Phatisa	Asset Manager	No
Portocolom EAF	Asset Manager	No
Primestor Development, LLC	Asset Manager	No
Prudential	Asset Owner	Yes
Q-Impact	Asset Manager	No
Quona Capital Management Ltd.	Asset Manager	No
RBC Global Asset Management	Asset Manager	Yes
Realdania	Asset Owner	No
responsAbility Investments AG	Asset Manager	Yes
Reyl	Asset Manager	Yes
RobecoSAM	Asset Manager	Yes
Root Capital	Asset Manager	Yes
Sahel Capital	Asset Manager	Yes
Sanlam Investments	Asset Manager	Yes
Sarona Asset Management	Asset Manager	Yes
SBC	Asset Manager	No
SEAF	Asset Manager	No
Shell Foundation	Asset Owner	Yes
SilverStreet Capital	Asset Manager	Yes
SJF Ventures	Asset Manager	Yes
Small Foundation	Asset Owner	No
Solon Capital Partners Limited	Asset Manager	No
Soros Economic Development Fund	Asset Owner	No
Surdna Foundation	Asset Owner	No
SUSI Partners	Asset Manager	No
Swedfund International AB	Asset Owner	Yes
Swiss Investment Fund for Emerging Markets (SIFEM)	Asset Owner	Yes
Sycomore Asset Management	Asset Manager	Yes
Symbiotics SA	Asset Manager	Yes
Temasek International	Asset Owner	Yes
The Annie E. Casey Foundation	Asset Owner	No
The BELLE Michigan Impact Fund	Asset Manager	No
The California Endowment	Asset Owner	No
The Church Pension Fund	Asset Owner	Yes
The David and Lucile Packard Foundation	Asset Owner	No
The European Bank for Reconstruction and Development (EBRD)	Asset Owner	Yes

The Everstone Group	Asset Manager	No
The Forest Company	Asset Manager	Yes
The Islamic Corporation for the Development of the Private Sector (ICD)	Asset Owner	Yes
The John D. and Catherine T. MacArthur Foundation	Asset Owner	Yes
The Kenya Climate Innovation Center	Asset Manager	No
The Kresge Foundation	Asset Owner	Yes
The Lemelson Foundation	Asset Owner	No
The MasterCard Foundation	Asset Owner	No
The Minderoo Foundation	Asset Owner	No
The Rise Fund	Asset Manager	No
The Rockefeller Foundation	Asset Owner	No
The Salvation Army Netherlands (Stichting Leger des Heils)	Asset Owner	Yes
The Sasakawa Peace Foundation	Asset Owner	Yes
The Visa Foundation	Asset Owner	Yes
The Vistria Group	Asset Manager	No
ThomasLloyd Group	Asset Manager	No
Tides	Asset Owner	Yes
Tiedemann Wealth Management	Asset Owner	No
Treehouse Investments, LLC	Asset Owner	No
TriLinc Global	Asset Manager	Yes
Trinity Wall Street	Asset Owner	No
Triodos Investment Management	Asset Manager	No
Triple Jump	Asset Manager	Yes
Tufts University Investment Office	Asset Owner	No
Turner Impact Capital, LLC	Asset Manager	No
U.S. International Development Finance Corporation (DFC)	Asset Owner	No
UBS	Asset Owner	Yes
United Nations Capital Development Fund (UNCDF)	Asset Manager	No
Unovis Asset Management B.V.	Asset Manager	No
Van Lanschot Kempen	Asset Owner	Yes
VentureWave Capital	Asset Manager	No
Village Capital	Asset Manager	No
Virginia Community Capital	Asset Manager	Yes
Vital Capital Fund	Asset Manager	No
VOLTA Capital	Asset Manager	No
W.K. Kellogg Foundation	Asset Owner	Yes
Wallace Global Fund	Asset Owner	No
Wangara Green Ventures	Asset Manager	No
Wellington Management	Asset Manager	Yes

Wermuth Asset Management	Asset Manager	No
Wespath Benefits and Investments	Asset Owner	Yes
Wilstar Social Impact	Asset Owner	No
Yellowdog Corp	Asset Manager	No
ZAIS Group	Asset Manager	No
Zurich Insurance Group	Asset Owner	Yes