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AN ASSESSMENT OF THE IMPACT OF GREEN FINANCE ON INDIAN INITIATIVES AT THE GRASSROOTS LEVEL



DR. BHARATI

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at The Grassroots Level * Dr. Bharati**

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CHAPTER- 1

INTRODUCTION

1.1 Introduction

Industrial sector is very crucial for the growth of any economy. Small and medium enterprises in Asia are essential for economic development of this region. SMEs are the source of employment, economic-social growth and poverty alleviation. SMEs makeup for more than 96% of all Asian businesses. They also provide two out of three private sector jobs. In this way SMEs are set to play a crucial role in Asia's sustainable development. Given this importance it is highly desirable that they operate in a more sustainable way to ensure their long term sustainable growth and ensure progress towards sustainable development goals as set by United Nations. (Asia's Green Revolution: A look at SME Finance, 2021, a report published as a part of Asia House COP26 Programme). But achieving growth in a sustainable and environment friendly way remains a challenge. Sustainable means maintaining long term financial, environmental and social performance. In a speech, R. Gandhi, deputy governor of RBI mentioned "Sustainable development is development that meets the needs of the esent without compromising the ability of future generations to meet their own needs". Green finance means financial support for sustainable development. So, providing adequate green finance ensures sustainable development.

As development at the expense of environmental depletion is neither acceptable nor good for anyone, green finance is critical to the long-term sustainability of economic development and growth. Depletion of our natural resource and environmental degradation endanger public health and pose a serious threat to an economy's long-term economic growth. Nations all around the world have been concentrating on environmentally friendly technologies to improve environmental quality. Green finance employs a method of collecting and allocating finances. Green finance can improve the productivity of the companies through green finance initiatives by the financial institutions and handling of the monetary funds, currency funds movement as per the market demands. Green finance is one of the concepts which provides a potent solution to the problem of financial sustainable development and it has to be given due importance as it is causing a lot of problems to the sustainable development achievement goals and it has to realized that only a fraction of the sustainable development goals can be realistically be achieved from the public sources.

Thus, it can be safely said that the green finance market is one of the important pushes towards macroeconomic regulation and control. The important policies of green finance, if implemented by the SMEs properly, can relax the financing bottleneck that the various stakeholders face despite the different reforms undertaken and provision of innovative financial tools. We can say that green finance is an innovative and new financial pattern aimed at protecting the environment and the achievement of sustainable development goals. In an ecosystem which is focused on green mechanism then the entire operations of a company revolve around the green concepts which in turn guides the inflow and outflow of funds according to the green systems and finally help in achieving the effective management of environmental risk along with optimal allocation of resources for the benefit of the society and the company at large. Thus, the construction of an environmental protection mechanism for an effective green finance system creates a balance between ecology and finance strengthening the green finance initiatives taken by the government for the SMEs.

Therefore, in the above backdrop, the present study entitled “An Assessment of the Impact of Green Finance on Indian Initiatives at the Grassroots level” has been conducted to examine the implementation of the green finance initiatives in SMEs, the awareness level of SMEs and identify the challenges faced by SMEs in adoption of these initiatives.

1.2 Need of the study

The adoption of environmental friendly/green practices is a challenge for SMEs due to lack of resources, knowledge, awareness etc. This study tries to find out the initiatives by different sectors in India i.e. government, financial institutions and other agencies for green practices and green business adoption in SMEs and how it impacts them economically, socially and environmentally. India has signed the Paris Agreement and is taking a leading role in sustainable development efforts globally. India is also committed to achieve SDG within time frame and set various national goals to achieve SDGs. As is well known, India has already established a National Determined Contribution (NDC) and is actively encouraging the industrial sector—the main source of greenhouse gases that disturb the ecological balance—particularly the SME sector to adopt green business practices such as energy efficiency, technology advancement, waste management, the use of renewable energy sources, and improved procedures, practices, and methods. This research tries to study those initiatives at various level and their implementation i.e. whether the SMEs are aware of these initiatives, are they adopting and accepting these initiatives and whether their adoption will result in economical, social and environmental benefits to them. Also the adoption of green initiatives or sustainable practices poses many challenges to this resource restrained SME sector though India has adopted various monetary and fiscal measures to deal with this issue but the green investment at this large scale

requires alignment of its financial system with green goals (UNEP, 2015). There is also an urgent need to sensitise its financial and industrial segments to the significance of green finance initiative. India's financial sector is not fully aligned uniform actions to enhance green lending and investments.(CPI, 2020)

1.3 Significance of the study

This study will assist entities in enabling more accurate tracking of financial flows to green/environmentally friendly sectors and green practices, which will contribute towards the development of effective institutional mechanisms, plans and policies that are aimed at increasing both public and private funding and investments. Moreover, green finance helps an organisation resilient to climate change impacts. This study also helps in decreasing the vulnerability of the SMEs to the adverse effects of climate change.

1.4 Small and Medium Enterprises (SMEs)

Micro, small and medium-sized businesses make up the bulk of India's non-agricultural sector (MSMEs). With more than 63 million businesses, the MSME sector contributes 28% of India's GDP and over half of its exports (PIB, 2019). Over 110 million people are employed in this industry (NSSO, 2017). There are industrial clusters all throughout India, which is a feature of the MSME sector there. Over 200 energy-intensive clusters, including those for ceramics, foundries, glass, brickwork, textile, chemicals, forging, metal finishing, and other subsectors, were identified by TERI analysis.

This sector has been consistently supporting the large units by providing them essential goods and services. The income generated by the sector with limited capital and limited technology is generally equally distributed among the individual. This raises this standard of living and also leads to reducing poverty. The sector also promotes women empowerment as IT employees so many women in villages in cottage and village industries. So it could be said that small and medium enterprises are ensuring equitable distribution of national wealth and SME manufacturing units are often overlooked buy formal banking system. Even though they have some credit access through the unorganized sector or even formal banking sector, it is not adequate considering their capital requirements for their growth and modernization.

The small and medium-sized companies (SMEs) sector in India is diverse in terms of the items produced, firm size, techniques, quantity and forms of output, and technical advances, according to the MSME Ministry's 2017 report. Because it has demonstrated effectiveness in eliminating economic, social, and regional disparities through a more equitable allocation of the nation's resources, the SME sector is essential in every developing economy. On the other hand, the SMEs sector has mostly served as auxiliary units to the huge enterprises, despite the fact that this

sector is closely tied to giving rural regions so many developmental advantages. Due to SMEs' ability to reach a more extensive and distant territory, the SME sector serves as a bridge between major businesses and the undeveloped parts of countries. With a relatively cheap cost of capital, the SMEs sector is well renowned for being the main producer of job possibilities in our nation. According to estimates, this industry employs four times as many people as major industries. Because of their significant impact on a country's GDP, employment, exports, innovation, and exclusive economic progress, SMEs are referred to as the "Engine of Growth" and the "Backbone of Indian Economy." Additionally, SMEs will be at the forefront of employee skill development and training. The GDP contribution of this industry, which accounts for 45% of all industrial production, is substantial. The total contribution of MSME sector to the GDP is around 37% but there are some major challenges which this sector is facing related to physical infrastructure Technology adoption, forward and backward linkages, capacity building access to credit risk capital access sector these problems are hampering the development of this sector .The primary activity of these SMEs is the creation or preservation of products and services. Without a question, SMEs have greatly influenced the socioeconomic growth of the nation and generate a sizable amount of jobs. As per the Government report (2018-19), there are around six crore SMEs in India.

Table 1.1 Status of SMEs in India (2018-19)

Total Number	42.50 million
Employment Generation	106 million
GDP Contribution	6.11 by manufacturing sector 24.63 by service sector
Manufacturing Output	45%
Export Contribution	40%
Growth Rate	10%
Bank lending to SMEs	16%

Source : Annual report 2019, [msme.gov.in/KPMG/CRISIL/CII](https://www.msme.gov.in/KPMG/CRISIL/CII)

As per table total number of SMEs includes registered and unregistered and accounts for 95% of the industrial units. Around 40% workforce is engaged in this sector, highest after agriculture sector. SMEs contribution in service sector accounts for one fourth and is rapidly increasing. It supplements the manufacturing sector as SMEs ancillary are vital for growth of the manufacturing sector. Banking sector also relies on this sector for lending.

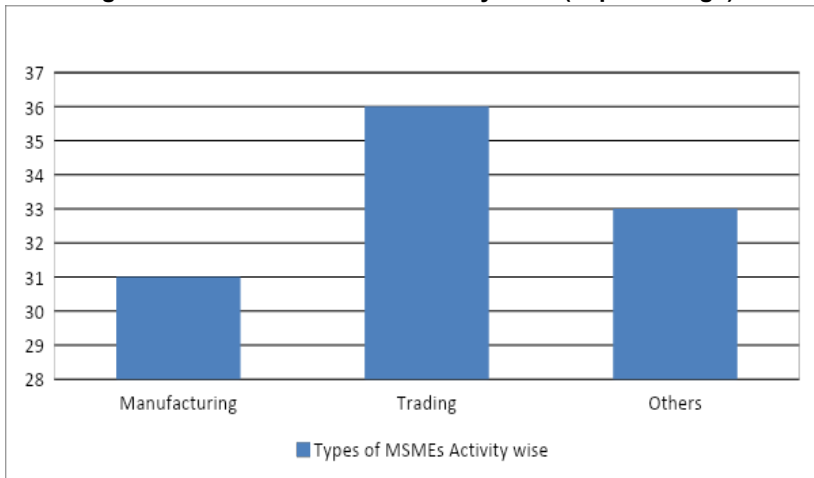
Figure 1.1 Registered MSMEs in India



Source : ibef.org

There are over 63million MSMEs across India as per Indian brand equity foundation (IBEF), a trust established by the Department of Commerce, Ministry of Commerce and Industry(GOI)

Figure 1.2 Estimated MSMEs Activity Wise (in percentage)



Source: MSME Annual Report 2020-21

There are different ways in which SMEs are in different parts of the world like on the basis of their assets, net worth, funding structure, shareholders and employee strength etc. In India, SMEs are classified in following categories, based on the nature of business.

Table 1.2 Classification of Enterprises into Micro, Small and Medium Enterprises (in INR)

Enterprise Type	New classification w.e.f. July,2020	
	All enterprises	
	Investment in plant & machinery (up to)	Annual Turnover (up to)
Micro	Up to 1 Cr	Up to 5 Cr
Small	Up to 10 Cr	Up to 50 Cr
Medium	Up to 50 Cr	Up to 250 Cr

Source: Ministry of MSME

The SME sector is critical to the growth and development of the Indian economy. However, establishing sustainable growth remains a difficulty. Green SMEs, by definition, focus on the basic concepts of resource conservation, efficiency, waste management, environmental protection, and sustainable development, all of which are required for the development of a green economy. In India, most SMEs that claim to be green in character and design usually lack the necessary facts to back up their claims across industries and states. Adopting green practices is difficult for SMEs due to a less resources, awareness, and understanding. As previously said, SMEs are critical drivers of employment, growth, and innovation. The main issues of SMEs which they are facing in the current scenario are the financial constraints the SMEs operating in rural and urban areas are often denied access to financing, necessary for their survival. If this sector gets strong then it can be major contributor in the economic development of a country due their relative size, activity, and job creation potential, but for all this to happen it is important that new policies should be formulated which would fulfil the requirement for relevant latest solutions for funding the SMEs in a world integrated economy.

Overall Finance Demand by MSMEs

1. As per International Finance Corporation (2018) the addressable credit gap is Rs. 25.8 trillion.
2. As per UK Sinha Committee Report (2019), RBI constituted Committee, the overall credit gap is 20-25 trillion.

Financing is important for SMEs to set up and diversify their operations and the end result of which would be development of innovative products. Although India has a wide and well-knit financial system, which consists of banks and non banking financial institutions, venture capital firms and many more, it needs to bridge this huge credit gap in order to make SMEs adopt the latest methods and technologies into their operations.

Once the production capacity of SMEs is taken care of and marketing help is also provided, all these initiatives would result in pushing the demand which will pull SMEs out from the crisis. All these financial institutions which are created for the purpose of financial inclusion cater to the financial needs of the SMEs to help them grow and diversify. After the strict governmental regulation, the SMEs are facing the pressure to adopt environmentally friendly production methods which would not be possible without proper financial help. To achieve this aim of green regulations, the green finance initiatives have been introduced with regards to SMEs which is a market-based lending or investing program that takes into consideration the environmental impact to drive business decisions. Energy sector in India contributes approximately seventy percent to the greenhouse gases followed by the agriculture sector which contributes approximately twenty percent to the greenhouse gases. Applying energy-efficient technology and best operating practices has the dual advantage of lowering SMEs' operating expenses and increasing their competitiveness. It would also contribute to lowering the emissions intensity of the Indian industrial sector, which is a declared goal of India's Nationally Determined Contribution (INDC) under the Paris Agreement. India's SMEs will play a crucial role in managing the energy transition.

1.5 Background of Green Finance

The largest emitters at the world level are China, India and Japan who need financial diversification particularly into GF. The total cost of environmental change results in disastrous situations like heat waves, flooding, scarcity of water, cyclones, Tsunami and other related hazards that could be contained by transforming the economic and financial system. In the absence of these mitigating actions, the global temperature could rise which will affect the world economy as which could reduce by almost 18% in the next 30 years (Swiss Re, 2021). The United Nations Environment Programme (UNEP) predicts that if we continue to do business as usual it will cause global temperature rise over 3 degree centigrade which in turn cripple economies, disrupt the trades and push people towards poverty. The combined effect of this will be declining agricultural productivity, rise in the sea level and health expenditures. Global warming would cause India 3% of GDP per year. Climate change is disrupting the environment and economy around the world. India has a commitment to achieve net zero emissions by 2070 but achieving these objectives is a huge challenge. The banking sector in India can play a prominent role in achieving its climate goals through green financing.

It is seen that the lending institutions in India are more interested in providing funds to the fossil fuel projects which creates pollution and harm the environment rather than financing the green projects due to the reason that the funding to the green projects requires more formalities and also offers lower rate of return especially in the developing countries. If any

developing country wants to or wishes to attain the 17 sustainable development goals then it is earnestly required that they should promote and incentivize the green projects and practices that would provide environmental benefits to the country, this can be achieved through promotion of policies and instruments such as green bonds, green central banking, carbon market instruments, financial technologies, green funds to name a few, all these instruments are collectively known as "green finance". Green finance is a revolutionary concept which has combined the business world with environmentally friendly behaviour facilitating the growth of green finance initiatives. Green finance initiatives take into consideration many stakeholders such as individual businesses, investors and financial lenders for the promotion of GF in various corporations and the SMEs. Green finance concentrating on the green economic activities for SMEs financing. It can be studied into two parts:

1. Financing for green growth and
2. Financing for protection of environment

The former is involved with indirect finance, such as the establishment of a green fund and a green loan. The second portion, on the other hand, is largely concerned with reducing environmentally destructive activities.

1.5.1 Development of Green Finance

The early 1990s saw a tremendous awareness in the area of green finance and most of the banks, financial institutions and government organisations have started focusing on the green finance which uses the sustainable development model to find a remedy to the environment related challenges. In May 1992, many banks, including Deutsche Bank, the Royal Bank of Canada, and other significant European banks, joined together to reaffirm their commitment to environmental and sustainable development activities, forming the Banking Initiative (UNEP, 1992). The United Nations Environment Program (UNEP) has previously said publicly that sustainable development must be the top priority of banks; only then will banks be able to contribute significantly to sustainable development. Since then, the banking industry has made every effort to contribute to long-term growth. The Equator Principles (EP) were established in 2003 to ensure that financial institutions only support projects that are both socially responsible and environmentally sustainable. The EP acts as a baseline for banks to use when making lending choices concerning environmental and social risks, such as approving or rejecting projects that do not fulfil the standards related to environmental and social aspects. Among the notable green finance principles and programmes are the UN Global Compact and the UN Principles for Responsible Investment. The UNGC includes 10 optional principles on labour, human rights, the environment, and anti-corruption. GF may be utilised as a method by various states to discover answers to developing environmental problems, as the world's primary environmental

challenges, such as water, land, and air pollution, are the result of industrialised countries' economic prosperity. To address such mounting environmental concerns, governments have implemented a programme known as the Green Credit Policy, which ensures that the economy thrives in a healthy and ecologically beneficial manner. Some nations, such as China, have constituted a Green Finance Study Group (GFSG), with UNEP serving as the secretariat. The emerging economies have backed interaction with non-G20 developing nations to identify environmental challenges and provide answers and assistance to better grasp green financing ideas. China has legally accepted green finance as part of its economic plan, while Japan has also pushed green investments (Schumacher et al., 2020). India is the fifth most vulnerable nation affected by change in climate as 3 to 4% of its GDP is at risk annually. India has decided to reduce its carbon emissions up to 33% of 2005 level but for this goal to achieve it needs huge investment of 2.5 trillion dollars by 2030. (MoEEF, 2015) but India is mobilising only 25% of this target (CPI, 2020). In India the Indian Renewable Energy Development Agency IREDA and its Ministry of Renewable Energy (MNRE) have progressed in the direction of issuance of green bonds with international assistance. The policy makers should ensure that the investment climate should not only support but favour green SMEs.

The development of green finance incorporates five main factors listed as below:

1. The establishment of green finance initiatives and its awareness among individuals.
2. Infrastructure building for green finance.
3. To strengthen the functioning of the green financial institutions.
4. Promoting green investors.
5. Global greenhouse gases regulation.

1.5.2 Green Finance Concept

Although GF is not properly universally defined, several studies describe it as financial aid for green growth that aims to reduce greenhouse gas (GHG) and pollutant emissions. Green growth refers to the integration of the economy and the environment. Green finance is the funding of industrial and commercial improvements that primarily aim to reduce GHG (Greenhouse Gas) emissions and other types of pollution. Many scholars think that green development presents a significant answer to three important challenges confronting the world today: climate change, energy restrictions, and the financial crisis. Green financing includes significant improvements in environmental well-being sectors such as air and water pollution, river infringement, incorrect disposal of industrial medical waste, deforestation, and loss of biodiversity. Therefore, green financing should be environmentally beneficial and help to reduce poverty by creating more jobs. One of the many forms of green financing is investing in initiatives supported

by the Clean Development Mechanism. The SMEs should adopt and incorporate the following techniques into their operations in order to effectively use green finance. The following are some of these strategies:

1. A favourable policy climate for encouraging green investment.
2. Increased governmental and private investment.
3. Identifying and promoting relevant green financing projects.
4. Identifying the concerns, obstacles, and facilitators in green finance methods.
5. Identifying the roles of various organisations that might assist promote green finance.

Green initiatives require green financing to be completed. The following projects require green financing:

1. Renewable energy initiatives, such as solar power-based projects.
2. Use of compressed natural gas (CNG) or liquefied petroleum gas (LPG) to replace fossil fuels
3. Biofuels generated from rice husk, sugarcane bagasse, molasses waste, recycling of various waste such as jute waste, sericulture waste, paper waste, coconut fibre, textile, garment waste, and so on.
4. Rainwater gathering through agricultural ponds, soil conservation, roofs, and other projects
5. Green housing and microfinance, renewable energy, waste management, environmentally friendly materials, and so forth.

Green financing means the financial arrangements for ecologically friendly initiatives that focus on reducing the negative consequences of climate change. This includes the use of renewable energy sources such as solar, biogas, wind, and clean transportation; efficient disposal and energy conversion; green building; waste management, and so on. Green bonds, carbon market instruments, and the development of green banks and green funds may all have an essential role to play in the adoption of green projects. GF refers to instruments such as green buildings, green bonds, and green funds, among others. Green financing will be critical to long-term economic success in the future. Economic progress at the expense of the environment has resulted in degradation of the environment, which has resulted in an imbalance in natural resources and pollution, both of which are adverse to long-term economic growth. As a result of these difficulties, governments all over the world are increasingly focusing on the usage of environmentally friendly modern technology. The benefits of employing green financing are a powerful drive for implementing ecologically friendly initiatives. GF results in the best allocation of resources, which helps to long-term sustainable development, however to achieve this, focused green finance policies must be implemented.

The increased amount of carbon-intensive activities is one of the key causes of climate change. Banks and other lending organisations release toxic substances into the environment. However, banks are

intrinsically linked to those activities which have affected the natural environment because of their unplanned lending policies to SMEs and other businesses (Gray & Bebbington, 2001). So banks should be responsible while lending the loan to the business operations. Business operations that are unfriendly to the environment should be provided loans only after assurance about their activities of not causing any environmental damage or their activities will meet environmental standards. As a result, it is critical that banks exercise greater caution when funding any industrial activity and guarantee that the loan issued would aid in the improvement of environmentally friendly company practices. So, in the current context, the most essential notion for academics and corporations is sustainable development. As a result, the notion of green finance is critical for SMEs.

Green finance concept is a subpart of the broader concept of sustainability finance. It considers those instruments and methods that minimise the ecological impact of investment decisions. Although it can be one of the best tools to attain sustainability, it has its own challenges also in the following concern areas.

They are as follows:

1. Urgent need to finance priority projects of sustainable development ,and
2. Need to incorporate those factors in financial decisions which improves sustainable development.

To make SMEs incorporate environment saving methods in their operations its necessary to mobilise required capital. Steps including reforms in the areas of environmental regulations, subsidies related reforms and suitable pricing are needed in the financial system to make it more effective for the SMEs. A sound financial system regulates risk as well as aids in the mobilisation of capital and serves as a conduit between those with extra cash and those in need of it. Therefore, Green Finance(GF) promotes eco-friendly investments in the areas of goods and services by promoting public policies that encourage environment conservation and help in mitigating the damage caused by the environment and also includes those components that specifically deal with green investments, like Green Climate Fund. Thus, the effectiveness of banking network and capital markets to mobilise and allocate the capital for GF to the industrial sector particularly to SME sector will be required.

1.6 Green Finance Initiatives (GFIs)

GF term is mainly used for financial investments for those projects that enhance or support sustainable development or environmental sustainability or for those efforts which synergize combat environmental degradation and climate change. GF is needed to finance or fund green investment/sustainable development initiatives which can be termed as green finance initiatives. Green finance increases the financial flows from public, private and not for profit sectors towards the areas which promote sustainable development. Green means any investment in pollution control

or precaution system, energy efficiency, sustainable use of water land, waste management, clean transportation system etc are some of the areas which are eligible for green finance globally. Initiatives that promote the availability i.e. various channels of distribution, equitable conditions; affordability i.e. easy terms and conditions, quality services; accessibility and awareness regarding green finance and promote the SMEs to adopt these initiatives may be termed as Green Finance Initiatives (GFIs) The sources of green finance could be internal (money that comes from within the business like retained earnings, owner capital etc.) or external (money that comes from outside the business like government, financial institutions). Green finance initiatives are a relatively new term in India as compared to European countries. The European countries are much ahead in accomplishments of the green finance objectives. Countries such as Malmö have achieved hundred percent fulfillments of the objectives. Now the concept of green finance initiatives is gaining currency and it is a widely used term in India and other developing countries. These initiatives are helpful in minimising the environmental hazards and the market sees them favourably.

Green finance is critical to the green industrial ecosystem and economy's efforts to safeguard the environment. Banks will be required to establish a dedicated green banking unit in the future to design, evaluate, and oversee the bank's green banking concerns. While financing a new project or providing working money to existing businesses, financial institutions must be accountable enough to make sure that environmental damage is taken into account. Banks should prioritise financing environmentally friendly business activity. Green loan schemes are low-interest financing options offered by commercial banks and financial organisations to encourage investment in energy-efficient projects. Solar energy, biogas, Effluent Treatment Plants (ETPs), and other related fields should be financed by banks. The following are the goals of the green financing bank:

1. The green banks will develop a strategy for funding green initiatives.
2. Raising awareness of green financing among management and technical workers.
3. To share information about green initiatives, project profiles, and associated expenses, among other things.
4. Developing awareness initiatives for aspiring and aspiring entrepreneurs.
5. Identifying projects that are eligible for green financing, facilitating project preparation, and considering end-to-end solutions.
6. Proceeds are transferred to the entrepreneur, who earns C-credit by sponsoring green projects.

Various governments are working together to form an independent Green Investment Bank (GIB), whose primary goal will be to give loans to

green companies. In addition to raising their own standards, green banks will also have an impact on other companies' socially responsible behaviour in order to promote sustainable banking practices. In water-strapped and drought-prone locations, banks can also fund the cultivation of water-resistant and drought-resistant crops utilizing surface water rather than underground water. Green building projects can also be financed by banks. Because green finance items are of high quality, the vast majority of buyers opt for them, ensuring that both producers and sellers are delighted with them. Due to the relatively high level of environmental consciousness and the government's cooperation for environmental sustainability, there is a growing market for eco-friendly products and services. The general public now has a better grasp of green financial concerns thanks to increased media coverage, worldwide environmental initiatives, and outreach programmes. Employees in green factories receive satisfied pay, bonuses, and working conditions, resulting in efficient and healthy workers who provide maximum market output. Due to their dependability and reliability, consumers increasingly place a high value on green financial products and are willing to pay a premium for them. Because they feel the products produced through green financing are of high quality, external stakeholders are ready to establish links and collaborations with GF providers.

In the retail banking industry, a few popular green products in terms of green finance are:

Energy –Efficient Mortgages

One of the most popular categories of green finance products is a greenhouse mortgage. Energy-Efficient Mortgages (EEMs), commonly referred to as greenhouse mortgages, provide clients who purchase brand-new homes that are energy-efficient or invest in green alternatives a noticeably lower interest rate. By incorporating energy-saving equipment into a new house or refinancing an existing one, borrowers may use an energy-efficient mortgage to reduce their utility costs. Banks should promote green mortgages by paying the costs associated with converting a property to green electricity in order to make this a more desirable option for a financial institution.

Green Credit Cards

The Green Credit Cards are the first worldwide project to leverage credit card infrastructure to offer a variety of financial incentives for environmentally responsible behaviour. Green credit cards are another recent project that is quickly gaining traction with users. The advantages and benefits of having green credit cards are numerous and difficult to quantify. In most developed countries, banks provide consumers who purchase green products and services with emissions offset programmes, incentives, and cheap borrowing rates. Some banks donate cardholder incentives to SMEs dedicated to environmental improvement, allowing cardholders to redeem these credits for "green" items. When people buy

eco-friendly products, take public transportation, conduct paperless transactions, and use less power, water, and gas, they can earn points that can be turned into cash or contributed to environmental funds. Discounts on green services and the purchase of recyclable parts are also available with the Green Credit Card. The Green Credit Card encourages people to live a low-carbon lifestyle and to be environmentally conscious.

1.6.1 Green Finance Initiatives promotes Green Economy

The report entitled "Towards Green Economy - Pathways to Sustainable Development and Poverty Eradication " provides a solid base for making policy in the domain of the green economy. As per UNEP the green economy means government and private investment towards a resource-efficient, low carbon and socially inclusive economy that contributes to the preservation the biodiversity and ecosystem services. (UNEP, 2011) In other words, a Green economy improves the quality of life for everyone while remaining within the planet's ecological constraints. Renewable energy, energy efficiency, clean technology, sophisticated waste management systems, low-carbon transportation, sustainable agro forestry, and many more industries related to environmental conservation are included in the green economy. The countries face a big difficulty in determining how to quantify the green economy. The green finance initiatives at the national level focuses on the systemic transitions that require green financing within the real economy, some of the examples of such initiatives are energy efficient retrofitting of buildings, and the decarbonization of road transport which can considerably transform the efforts of developing countries towards achievement of green initiatives. International organizations, such as the EU , WB , IMF and OECD, etc have promoted green projects to tackle the problem of the "brown economy" which is dependent on the use of fossil fuels, environmental pollution for their production processes resulting in resource depletion and climate change. GF is becoming more valuable due to the scale of the challenge of financing sustainable development. Governments ratified three important accords in 2015 that outlined their future vision: a new set of seventeen SDGs, the Paris Climate Agreement, and the 'finance for development' package. GF is critical to implementing these agreements, and it is critical to transform them into practical initiatives that are appropriate for each country.

1.6.2 SMEs and Green Finance Initiatives (GFIs)

Financial institutions play a critical role in the promotion and implementation of green financing projects. Because it is evident that the notion of green financing aspires for a greener, cleaner, and more environmentally sustainable future, it is critical for emerging countries like India to properly implement GFIs in order to gain the greatest benefits. Many studies have been conducted in order to better comprehend India's ambitions. Green Finance is a crucial step against the fight for climate change and meeting the environmental objectives. The SMEs rely heavily

on the GFIs as they face the most problems due to their traditional methods of production which contributes to the environmental pollution. Increased financial flows from banks, NBFIs, and other lending institutions are the goal of green financing. Initiatives in green finance assist in better managing social and environmental risks, and they take advantage of possibilities that result in high returns and environmental benefits as well as increased responsibility. The Reserve Bank of India (RBI) includes the small scale renewable energy industry within its priority sector financing programme in 2015 as part of its green efforts. By doing this, it hopes to strengthen its projects as more SMEs and large enterprises use renewable energy in the future. The nodal organisation for targeted loan programmes for boosting clean production and energy-efficient technologies in SMEs is the Small Industrial Development Bank of India (SIDBI). As per "Asia's Green Revolution: A Look At SME Finance", a financing research in innovative technological solutions and finding the ways to finance technology transfer to small and medium enterprises still a challenge. Climate change mitigation requires multifaceted cooperation and actions led by green finance. Greater provision of green finance particularly for the small and medium enterprises sector could bring new dimensions to the potential growth of the economy. The SMEs which are till now ignoring the importance of green finance will have to face different types of risks including financial instability.

One of the core agenda of SIDBI's vision is sustainable development of small and medium enterprises. SIDBI is not only providing green finance to this sector but also promoting the awareness regarding this concept through various schemes. SIDBI has focused lending programs that promote investment in energy efficiency and clean methods of production and processes. It is also collaborating with the International Agencies like JICA and AFD.

SIDBI acts as a window for financing highly innovative and climate mitigation projects. It has also launched a green finance scheme which will focus on green projects in line with the national agenda. SMEs usually have access to banking sector finance in addition to informal finance. But still they are largely dependent on personal sources and informal sources of finance as there are obstacles in accessing finance despite having a good financial system in India.

To reduce the risk from climate change, SME must have a high level of financial resilience. The ability of SMEs to access capital will determine their ability to promote green growth and address the climate catastrophe. Even while the government has focused on enhancing the macroeconomic circumstances for small and medium-sized businesses through a variety of arrangements, such as public subsidies, concessions, guarantees, etc., financial diversification and access to capital are still insufficient. There is a need for banks to increase and diversify their financial sources, particularly "green financing." Corrective actions are

needed to safeguard the environment in light of the growing concern over environmental deterioration. To review the technology that SMEs are utilising, and adoption of appropriate technologies to maximise energy conservation is the need of the hour. The identification of major threats to the SMEs, in the context of energy conservation, policy initiatives for SMEs would be based on the concepts of Reuse, Reduce (waste), and Recycle as thrust areas of various activities. Financial authorities need to use a variety of strategies to deal with environmental concerns for SMEs that need to realign themselves with a green emphasis. This will open the door for creative environmental policies that may be summed up as the four Ps of inclusive green finance: provision, promotion, protection, and prevention. These 4Ps policies are all focused on allocating funds for climate action. Government should make more efforts to provide technical and financial services to the SMEs to invest in cleaner production. SIDBI is playing a pivotal role in this area and also helping India achieve its National Determined Contribution (NDC) to encourage the adoption of green business practices by the industrial sector, especially the SME sector. The government can be instrumental in creating a financial infrastructure for the coordination, production, and sharing of data regarding SMEs' creditworthiness in order to financially support them. Institutions for credit guarantees can provide necessary help helpful in this government initiative. This would to a great extent solve the problems of SMEs in India which are facing serious financing difficulties. Enhancing SMEs' access to finance through better coordination with the financial institutions would strengthen the financial infrastructure for better coordination regarding the creditworthiness of SMEs, and introduction of new types of financing schemes such as leasing, factoring, venture capital and microfinance for the SMEs.

1.6.3 Green finance initiatives and India

There are several agreements that require best practices to be used globally in order to combat climate change. It also needs considerable government assistance in terms of policy formulation. Government policy should prioritise the development of a circular economy that resolves harmful emissions. In recent years, the government has developed a number of flagship programmes aimed at raising awareness of GFIs and encouraging their financing globally. These initiatives encourage the corporates to consider these aspects in the financial and non-financial environmental considerations.

The discovery of opportunities that encourage sustainable initiatives and aid in the receipt of a favourable return and environmental advantages (UNEP), as well as the management of social and environmental hazards, all contribute to the creation of GFIs. One such attempt is the Sustainable Stock Exchange, which allows member nations to create company price indexes that measure stock performance while also

incorporating Environmental, Social, and Governance (ESG) principles into finance. The National Stock Exchange (NSE) and the Bombay Stock Exchange (BSE) are both involved in this project, which aims to assist individuals in making educated decisions about their investments in the respective firms. The legal framework requires financial and non-financial corporations to disclose information concerning sustainability, exposure to Environmental, Social, and Governance risks, and actions connected to Corporate Social Responsibilities (CSR). This legislative framework intends to decarbonize the energy industry and requires that commercial banks to distribute at least 5% of their loans to green technology, promoting green financing. As a result, India has enacted many policy measures in the recent decade to promote green financing. India acknowledged the need for green finance in 2007. Following that, The Reserve Bank of India created guidelines to incentivize banks to support sustainability objectives and published a notification on "Corporate Social Responsibility, Sustainable Development, and Non-Financial Reporting, emphasizing the importance of global sustainability." The National Action Plan on Climate Change (NAPCC) was launched in 2008 to describe the policy framework for reducing the effects of change in climate. The Climate Change Finance Unit (CCFU), established in 2011 to manage the many authorities and institutions responsible for delivering green finance in India. The Securities and Exchange Board of India (SEBI) mandated sustainability disclosure standards in 2012, as well as the publication of annual corporate responsibility reports by the top 100 listed businesses based on market capitalisation. SEBI established rules for green bond issuance and disclosures in May 2017. Along with this, the Ministry of Corporate Affairs introduced a significant provision in the Companies Act, 2013, by making it mandatory to report the progress on CSR. A Corporate Governance Committee was established in 2017 with the suggestion that the board of directors convene once a year to discuss strategy, budgeting, risk management, board evaluation and ESG issues. These incentives were in line with India's commitment under the Paris Agreement to cut greenhouse gas emissions from non-fossil sources by 35% by 2030. Therefore, the relevance of research on the green finance initiatives to leverage SMEs competitiveness such as innovation and management becomes crucial. Small renewable energy projects were included in the RBI's priority sector financing plan in 2015. Now, Indian banks have implemented internal policies to limit their lending to carbon-intensive businesses and to adopt a green finance credit approach that encourages carbon-intensive firms to rethink their business models in order to transition to greener production techniques. As SMEs play an important role in several emerging markets; therefore, the importance of research on the green finance initiatives to leverage SMEs competitiveness such as innovation and management becomes crucial.

Furthermore, in 2015, the Government of India sponsored and launched a two-phase Faster Adoption and Manufacturing of Hybrid and Electric Cars (FAME) programme to improve financial flow and infrastructure development in order to boost the manufacturing and sale of green vehicles. When compared to existing conventional automobiles as part of GFIs, such green vehicles benefit from reduced GST imposition, lower interest rates, and a longer payback window. The government has established the Production Linked Incentive (PLI) Scheme to encourage the production of high-efficiency in the field of non-conventional energy. As of September 2019, the government established a target of 450 GW of renewable energy by 2030. The RBI is also extremely diligent in putting safeguards in place to encourage green financing activities. It is raising customer knowledge about various areas of green finance through its awareness initiatives, as well as concentrating on the creation and promotion of green bond markets and boosting enterprises' green finance operations. The ambiguous definition of green activities, IPR and technology transfer issues from advanced countries, disclosure and assessment of environmental risk, and "green washing" of environmental compliance are some of the issues highlighted by the RBI in its report 'Trend and Progress of Banking in India (2018-19)' that impede proper implementation of GFIs. As a result, this research underlines the critical importance of developing a green finance framework that supports the green finance ecosystem and raises awareness of it. To promote GFIs, the Indian Renewable Energy Development Entity (IREDA), a government-backed agency tasked with encouraging clean energy projects. In May 2016, IREDA has announced intentions to establish India's first Green bank. There are also some other organisations, such as Infrastructure Finance Corporation Limited (IIFCL), that are committed to offering a "credit enhancement plan" for funding ecologically sustainable infrastructure projects. As a result, it can be inferred that the notion of Green financing would be a game changer for growing economies such as India. IREDA, Power Finance Corporation Ltd., Rural Electrification Corporation Limited or REC Ltd., and Indian Railway Finance Corporation are some of the organisations that issue green bonds in India. In addition, the World Bank has from time to time issued green bonds to fund various initiatives in India. However, the idea of GF is still in its nascent stage in India, since green bonds account for only 0.7% of all bonds issued in India since 2018, while bank lending accounts for only 7.9% of total outstanding bank credit to various sectors as of 2020. Thus, green money is required to limit environmental damage.

As the small and medium enterprises (SMEs) have been given high priority status in India since the outset, and support methods have been developed to help these businesses thrive and become important contributors to GDP. Thus, they need urgent attention when it comes to the adoption of Green Finance initiatives for India in general and the state of

Haryana in particular. For many years, despite numerous protective and policy measures, SMEs have remained small, technologically backward, ecologically unpleasant, and competitively weak. Thus, green growth is indispensable for building a green economy and in this the SMEs can play a pivotal role which would ensure the balance in the activities and between economy, society and environment.

1.6.4 Enhancing SMEs access to Green Finance Initiatives

SMEs need to revisit and reconsider their policies on water efficiency, carbon emissions, green supply chains and environmentally friendly/green manufacturing. They need every kind of support to convert their operation into green operations. In India, the most significant impediment to SMEs' growth and development is a lack of access to capital. The reasons for this include a combination of high lending risks and market limits. A mismatch between SMEs' requirements and the availability of financial sector services can be attributed to both the supply and demand sides of the financial services sector, resulting in limited access to funding for SMEs. In developing countries, small businesses account for 80% of all jobs. The difficulties in obtaining green funding are compounded by the difficulties in obtaining SME financing. SME engagement requires a variety of factors, including an enabling environment, understanding and awareness of SME climate finance options, and specialized financial solutions. Appropriate solutions exist to address the issues, but the challenge is putting them together into usable systems. There are three basic methods to improving the general business climate for SMEs and improving the SMEs evaluation. To begin, there is a need to reduce the information gap between financial institutions and small private businesses. Second, specific financial institutions to be developed and new creative facilities may be established to better address the green financing needs of SMEs and to help start-up firms. These measures should be taken in addition to promoting standardised bookkeeping and accounting procedures. Private sector engagement is possible through comprehensive finance schemes and sector transformation projects. To improve SMEs' access to capital, they must address both their demand and supply aspects. On the demand side, SMEs should better organize their business documents in order to be more eligible for bank loans. There are other approaches to appraising loan applicants on the supply side. Large banks may rely on credit scores provided by credit rating agencies, whereas smaller banks may choose relationship banking with their corporate clients in order to gather more precise data for better monitoring.

1.6.4.1 Role of SIDBI

It is a dedicated agency to provide short term and long term finance to MSMEs. SIDBI has helped in the creation of economic and ecological wealth by promoting energy efficiency and sustainable and green finance. It focuses on lending schemes which promote investments in the

areas of clean and energy efficient production and technologies, and reduction in the emission of greenhouse gases. It acts as a window which finances the high impact technologically innovative and climate change control projects. It has set a dedicated window to enhance the resilience of MSMEs sector to combat and adopt climate change strategies with the aim of Greening these enterprises in the line of India's Glasgow Summit commitments. SIDBI is an accredited agency of GCF i.e. Green Climate Fund. It also channels funds for providing green investment and also renders project management support to the other institutions engaged in climate change mission. Technology Information Forecasting and Assessment Council (TIFAC)-SIDBI aims at providing concessional loan up to Rs.200 lakh per project at very low interest rates to the MSMEs or Startups for innovative technology projects. The streamlined 4E scheme i.e. End to end Energy Efficiency Scheme in collaboration with the World Bank to support more energy efficient projects also solar projects with dispensation of credit in lesser time period and at lower interest rates. SIDBI is also supporting Energy Service Companies (ESCO) through supporting them financially and also providing risk sharing facility which helped in energy savings and reduction in annual emission of CO₂ to a considerable extent. It has also launched a Green Financing scheme to help green projects in the SME sector in line with national targets. It has a dedicated window to finance high impact innovative and climate change projects and to enhance the resilience of the SME sector to climate change and adopt preventive measures to facilitate greening of the SMEs in India. SIDBI has made a number of steps to encourage SME loans for green and energy-efficient technologies. SIDBI promoted the following lending schemes in the areas of clean production and energy-efficient technologies. SIDBI is assigned as the accredited agency by the Government of India for implementing various government subsidy schemes, namely, CLCSS (Credit linked Capital Subsidy scheme), TUFS (Technology Upgradation Fund Scheme), FPTUFS (Food Processing Industry Technology Upgradation Fund Scheme) and TEQUP (Technology Upgradation), SCLCSS (Special Credit Linked Capital Subsidy Scheme) **Aggarwal A. et al (2013)**

Financing for Energy Efficiency

SIDBI is taking a number of steps to encourage SME loans for technology and manufacturing methods that conserve energy. In accordance with bilateral funding from Germany and JICA (Japan International Cooperation Agency), SIDBI has developed schemes focusing on clean and efficient technology or production processes Concessional funding to encourage investment in green technologies was combined with the launch of cluster-specific information distribution based approach.

Green Financing

Under the Japan International Cooperation Agency (JICA) scheme, SIDBI financially assisted more than 2000 SMEs. The total support amounting to more than Rs. 800 crores was provided. Some these successful initiatives of SIDBI are as under:

Electronic Waste Recycling Facility

SIDBI aided Bangalore-based E- Parisara Pvt. Ltd. with an electronic trash recycling initiative. The facility is designed to handle garbage from Bangalore's IT, Telecom, and Electronic industries. The project's benefits include assisting more than 100 SMEs in becoming compliant with environmental audits, lowering waste treatment costs, and reusing and recycling treated materials. The Electronic Waste Recycling Facility has made a significant contribution to the recycling of waste in Bangalore. The similar methodology should be emulated by other Indian states that are dealing with the same trash disposal and recycling issues.

Common Effluent Treatment Plant

To develop Treatment Storage and Disposal Facilities (TSDF) in Surat (Gujrat), the textile dyeing and printing plants in and around Surat (Gujrat) have received support to assist SMEs in efficient disposal of waste. Due to this around 300 enterprises have been able to comply with pollution control regulations.

Furthering Green Growth with Developmental Support

SIDBI's SMEs Financing and Development Project is implementing a number of efforts to help SMEs become more competitive. Credit support to more than 2000 SMEs scattered across major cluster centres around the country and offering both financial and non-financial services. The global standard of conduct of the Environment and Social Risk Assessment Framework (E&S) has been embraced by SMEs Projects in their appraisal process.

Energy Efficiency Initiative in collaboration with BEE.

SIDBI and the Bureau for Energy Efficiency (BEE) have signed a Memorandum of Understanding (MoU) to create an energy-efficient technology shelf for 25 MSME clusters, as well as to raise awareness also the willingness and ability of regional business development services to promote and adopt energy-efficient solutions.. This will be subsidized monetarily in order to stimulate the adoption of energy-efficient technology and long-term solutions.

The Ministry of MSME, GOI has implemented various schemes for SMEs which provides financial and non-financial support to them to enhance their sustainability in the form of promoting green growth. Some of these schemes are:

1. PMEGP(Prime Minister's Employment Generation Programme)
2. CGTMSE(Credit Guarantee Scheme for Micro & Small Enterprises)
3. IC (International Cooperation)

4. CLCS (Credit Linked Capital Subsidy Component)
5. SFURTI(Scheme of Fund for Regeneration of Traditional Industries)
6. ASPIRE (A Scheme for Promotion of Innovation, Rural Industries and Entrepreneurship)
7. ZED Certification
8. Lean manufacturing competitiveness of MSMEs
9. Digital MSMEs
10. Entrepreneurial and Managerial Development of SMEs through Incubators
11. Awareness on Intellectual Property Rights (IPR)
12. Coir Industry Technology Upgradation Scheme

The ability of SMEs to adapt to the effects of climate change is largely dependent on removing the obstacles that GFI adoption creates, such as market access, information access, inadequate awareness of climate risks, assessment, and appropriate legislation. India is a frontrunner in the adoption of green initiatives and the promotion of these initiatives across various states needs active participation from the state governments also. The states such as Haryana have been actively adopting the green initiatives for financing for the firms in general and SMEs in particular. The continuous efforts by the state government would help in the adoption of GFIs. The adoption of green finance initiatives should be the priority areas of the government policy formulation which should be adopted on a war footing.

SMEs are crucial to economic progress, employment development, innovation, and social cohesion. They are also a major source of sustainable development innovation. The financial needs of SMEs should be given more consideration in order to speed the sustainability transition. Green and sustainable financing that provides environmental advantages is the need of the hour to address this potential. Sustainable finance is a critical component of achieving SDGs and the Paris Climate Agreement. The rapid rise of the green bond market demonstrates the rising number of policy choices for mobilizing private financing for green projects. Governments are also paying more attention to the funding needs of SMEs in order to promote economic growth and financial inclusion.

The agendas for SME financing and green finance have typically run in parallel. Well-tested approaches for improving SME financing provide vital insights into how small businesses' long-term financial needs might be met more effectively. Sustainable finance offers new ways to mobilise money that can make a significant contribution to SME financing in general. There are two primary points to the green and sustainable finance agenda for SMEs:

First, providing finance for traditional SMEs to boost their long-term viability. Second, granting funds to SMEs that are focusing on growing green goods and services, dubbed "green innovators."

The development of the industry depends on SMEs having timely access to sufficient finance at a reasonable cost. In contrast to the overall supply of finance from formal sources, which is INR 14.5 trillion, the total satisfied demand for external credit in India is anticipated to be INR 37 trillion. The credit gap in this industry is thus expected to be in the neighbourhood of INR 20–25 trillion. Access to money is first on the list, with 31% of SMEs citing it as a barrier, access to markets (28%), zeroing in on the business (23%), and owning and acquiring land (23%). (18 percent). Only one in every fifteen micro-entrepreneurs has access to formal credit to start a new business.

As from the above discussion it is clear that SMEs contribution to the mitigation of climate change cannot be ignored, however, the majority of nations are currently managing this issue with little comprehension. The following are the key reasons why inclusive green financing policies for SMEs may not be implemented:

1. Lack of clear data on climate change impact on SMEs.
2. Lack of coordination between different climate change authorities and agencies.
3. Low level of understanding on how to work in this area by policymakers.
4. A lack of robust data
5. There is a risk of incomplete integration of environmental performance.
6. There are limited sustainable financing products
7. There is a lack of diversity in financial institutions.
8. There is a lack of awareness among SMEs about green/sustainability investments.

1.7 SMEs Development in Northern India, Particularly in the State of Haryana

India is made up of 28 states and eight union territories (UTs). There are states and union territories which have advanced industrially, while others have advanced agriculturally. Because of their climates and geographical locations, different states have different advantages. The west and south of India, for example, are industrial belts, whilst the east and north of the country feature agrarian landscapes. After 1991, the employment situation in the country became more complicated, and the agriculture sector's contribution to national GDP decreased dramatically, despite the fact that it remains the country's largest employer. The industrial sector's employment has been relatively stable. On the other hand, while the services sector's share of employment has been declining in recent years, it is now extremely productive and capable of providing job possibilities. The importance of SMEs in creating jobs cannot be overstated, and the government's support for them has been vital in their success.

In descending order, the top 10 states with the fastest-growing businesses are Delhi, Punjab, Rajasthan, Haryana, Gujarat, Andhra Pradesh, West Bengal, Maharashtra, Uttar Pradesh, and Tamil Nadu. These states' SMEs grew at a faster rate than the rest of the country, with a CAGR of more than 15%. The top three states are all in northern India, which is important to note. SMEs in the northern states benefit from being adjacent to a sizable market and the rapidly expanding metropolitan area of Delhi NCR. As per MSME Directorate Haryana, there are 2,16, 115 MSMEs, including 1,69,407 micro enterprises, 44,543 small enterprises and 2,165 medium enterprises categories. Faridabad tops the list with 32,033 MSME units. Gurugram at number second with 31,029 units , Panipat at number three with 21,117 units followed by 15,711 units in Karnal and 12,205 units in Sonipat (Goel, M. M. ,2014)

Table 1.3 Haryana Economic Survey 2022 Electricity Consumed Sectorwise (in percentage)

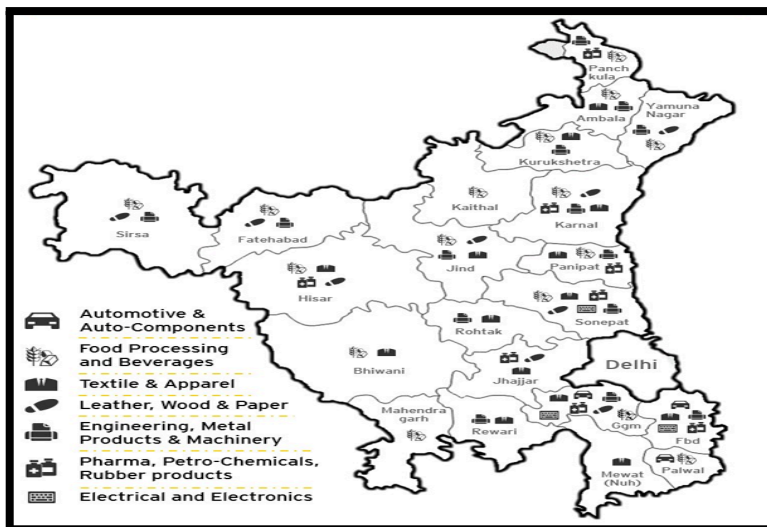
Sector	2020-21
Industrial	30.29
Domestic	28.69
Agriculture	24.11
Commercial	0.09
Public service	0.03
Railways	0.001
Misc.	0.040

It can be seen that the share of industrial sector in energy consumption is highest in Haryana.As per RBI Bulletin 2021 share of non-conventional energy finance is low in Haryana (around 5%) as compared to national average of 7.9% and in comparison to its neighboring states Punjab (more than 16%), Delhi NCR (more than 7%) and in UP (7% approximately) which could be reduced by adopting green finance initiatives. They also profit from an increasing population in northern India, which is driving demand for SMEs' diverse products and services. Over the last five decades, this sector has been the engine of socioeconomic growth in the rising Indian economy. It generates the second-largest amount of employment after agriculture, and hence makes a significant contribution to socioeconomic growth. The MSME Development Act of 2006 also provides a framework for the registration of manufacturing and service organisations and aims to ease their development and improve their competitiveness. The MSME Development Act of 2006 establishes a regulatory framework for SMEs to grow and compete more effectively. It establishes a framework for addressing issues such as investment ceilings and industry coverage. The Act authorises the Central Government to implement policies and provide

guidelines to help SMEs develop and improve their competitiveness, but the State Government bears main responsibility.

The government of Haryana has encouraged SMEs in the state as economic catalysts, with an emphasis on boosting SMEs firms, job creation along with inclusive growth. The Haryana Enterprise Promotion Policy 2015 establishes a transformative course for Haryana's industrial growth as a consequence, focusing strategic interventions on SMEs. Textile apparel, scientific instruments, plywood, metal, light engineering, footwear, and dairy and food processing are among the state's priority industries. The biggest MSME industries in Haryana include automobile, food & beverages, textiles, engineering, and metals, with over 2,00,000 SMEs, total investment surpassing Rs.20,000 crore, and job creation exceeding 10 lakh people. Panipat, Faridabad, and Gurugram are home to the majority of SMEs, along with a substantial number of traditional micro and small businesses in Ambala, Panchkula, Karnal, Rohtak, and Kaithal. Despite the fact that the Small Business Act of 2015 establishes a legislative framework and tax incentives for SMEs, still the sector continues to face challenges due to inadequate market access, funds, technology, and infrastructure facilities etc. National-level industrial initiatives like the Delhi-Mumbai Industrial Corridor, the Amritsar-Kolkata Industrial Corridor, and the Kundli-Manesar-Palwal Corridor will be a significant issue if agglomeration advantages are to be achieved. The goal of the "Haryana MSME Policy-2019" is to enhance the competitiveness of SMEs throughout the state's priority industries by establishing modern infrastructure, supporting innovation, including balanced growth, and providing meaningful employment.

Therefore, if existing technology and financing are improved in green areas to achieve maximum output in obtaining green finance projects, it will promote the growth of agriculture and rural development dairy production, soil conservation, energy efficiency techniques, the use of renewable energy sources, and other activities have a significant potential to reduce greenhouse gas emissions.



Source: <https://msme.haryana.gov.in>

A holistic policy framework is being built out to fulfill the Haryana Enterprise Promotion Policy 2015 objectives. These policies are in line with significant national efforts such as Skill India, Make in India, Digital India, and Stand-up /Start-up India, as well as the Central and State Government's 'Ease of Doing Business' initiatives. Haryana is separated into four development blocks: A, B, C, and D, each with a different level of industrial development. There are no medium or large businesses in category D, but they are given the incentives for industrial development in order to improve the regional economy.

1.8 Scope of the Study

Due to inadequate policies, limited understanding, and financial and economic constraints, SMEs have limited access to climate funding. The appeal of investing in SMEs is limited by weak policies and financial infrastructure, as well as political instability. The main causes for low uptake include a lack of grassroots awareness or knowledge of existing opportunities. Green finance's relevance in enhancing environmental health cannot be overstated. Environmental Protection is about improving the environment's quality through time while also focusing on customer pleasure by understanding their demands. The present research studies the impact of Green Finance Initiatives at grassroots level i.e. the SMEs. The study area is taken in Haryana. The study tries to explore the GFIs adopted by the SMEs. This study helps in environmental conservation along with enhancing the efficiency of SMEs, This study will help in implementing GFIs through focused programs and policies for the SME sector. The research also

identifies some of the challenges in the implementation of GFIs that needed to be overcome. The recommendations will help the SMEs to formulate better strategies to attain sustainable development. This research purview tries to know about the various initiatives (public or private) related to sustainable growth of SMEs by preserving the environment and adopting green practices. It provides an opportunity to serve the environment and enhance efforts for funding these SMEs in the economy.

1.9 Conclusion:

The chapter highlighted the importance of green finance initiatives for the nation as well as the SME sector. From the review of previous studies related to the Green finance initiatives in India and the state of Haryana in particular it can be concluded that green finance is the way forward in the future and our SMEs can be an indispensable tool in the adoption of green finance. The Government of India has introduced many initiatives to further the achievement of their Green agenda which includes handling the challenges which comes in way of strengthening SMEs capacities in terms of managerial capability, awareness creation on economic values of innovative technologies and ways to achieve global quality standards so that the products produced in the SMEs are of global standards which can be exported to other countries and that would increase the foreign exchange thus contributing to the development of India. To achieve the green agenda of the government, the financial institutions would play a pivotal role for example, SIDBI has been collaborating with many international partners and proactively adopting international best standards in green financing. SIDBI's proactive leading role will act as a change agent in the promotion, financing and development of the SME sector and would help in fulfilling national and global goals with main focus on the three Ps which are People, Planet and Profit. The focus on 3Ps would speed up the green agenda of the government along with this making this world a better place to live in. This chapter presents the meaning and importance of SMEs, backgrounds and concept of GF. It then introduces the concept of Green Finance Initiatives (GFIs) and its relevance for the SME sector along with different green financing efforts by different agencies, institutions and the government. The study also elaborates on the need, significance and scope of the purpose of the thesis.

CHAPTER - 2

Review of Literature

The purpose of literature review is to understand the present study on the basis of studying the overview of the published academic contributions. The research papers were identified on the SMEs and green finance from reputed databases.

2.1 Introduction

India is considered to be the fifth most susceptible country to the negative consequences of climate change as 3 to 4% of its Gross Domestic Product is at risk annually. India has pledged to limit its carbon emissions up to 33% of 2005 level but for this goal to achieve it needs a huge investment of 2.5 trillion dollars by 2030. (MoEEF, 2015) but India is mobilising only 25% of this commitment (CPI, 2020). Though India has adopted various monetary and fiscal initiatives to deal with this issue, green investment at this large scale requires alignment of its financial system with green goals (UNEP, 2015). Additionally, there is a pressing need to emphasize the significance of green finance projects to the country's financial industry. India's financial industry is not entirely integrated with uniform actions to enhance green ending and investments (CPI, 2020).

Epstein & Buhovac (2014) opined that emerging countries should prioritize adopting sustainable green practices as there is much scope of green practices development in the emerging economies. Asia Pacific Climate Week, 2021 organised by United Nations Climate Change and partners concluded that SMEs in Southeast Asia form the backbone of these economies and have a very prominent role to play in tackling climate issues. The government has set various goals related to climate protection like reducing greenhouse gas emission before 2030 and achieving net zero emissions before 2050 to avoid the worst effect of climate change. Recognizing climate change and its threat, the SMEs are required to start taking actions immediately.

As per the report of the United Nations Climate Change (**UNFCCC, 2021**), SMEs can pave the way for green growth across economic sectors including manufacturing, agriculture, and energy sectors. Given the scale and pace of emission reduction needed, it is very significant that enterprises across the world immediately act to reduce emissions of greenhouse gases in their direct operations and also in their supply chains. If these issues are left unchecked the climate change can pose a very drastic effect on the business because of cash flows, resource availability, demand, supply chains etc. and this will act as a material challenge to these vulnerable

enterprises' systems. It is in the interest of companies itself to mitigate the climate risks that affect their competitiveness and profitability.

Chopra et al. (2005) opined that to tackle these issues, these enterprises need green growth/sustainable growth and there comes the need of green investment and several other green efforts that may all be included in green finance.

2.2 An insight into Green Finance

Zenklusen, 2005; Back et al., (2008); Geddes, Schmidt, and Steffen (2018); Ziolo et al.(2019); Dikau & Volz(2020)The banking sector has also understood the importance of green finance and sustainable banking as against the unpredicted economic issues in the future and the lenders now have become more environmentally conscious and have decided not to support those companies that are not environmentally sensitive, or they do not comply with the environmental protection norms. Traditional banks have now started adopting environment friendly products. The conventional banks have transformed their operations according to the changing roles imposed by green financial regulations.

ADB report Catalyzing Green Finance (2015) asserted that the entire financial system must be reoriented to support a green growth.

Chaudhary and Bhattacharya (2006) described green finance as "money related enterprises flowing into possible development undertakings and activities, natural goods, and structures that enable the development of a more controllable economy." It includes, but is not limited to, climate funds.

Weber, Fenchel & Scholz (2008) studied environmental credit risk related management processes in European Banks. Environmental risk analysis is mainly integrated into the rating stage than all stages of the loan life cycle, particularly the monitoring phase. Because banks generally do not have a thorough grasp of the consequences of environmental hazards on their lending portfolio, according to the report

Niklas Hohne et al., (2012) GF can be separated into three distinct sections: green energy, adaptation to environmental change impacts, and environmental purposes. GF is defined as those financial investments in sustainable viable projects that help promote the development of a sustainable economy. It also encompasses a range of environmental targets such as reducing industrial pollution, improving sanitation, and protecting biodiversity, as well as reducing cash flows in those projects that increase the greenhouse gas emissions (GHGs). GF is concerned with long-term investment as well as environmental sustainability.

Hohne et al (2012) studied "green money" as financial investment going into programs and efforts for sustainable development, environmental goods, and the regulations which promote sustainable economy.

Verma et al. (2012) reviewed the existing literature on green finance and explored the future scope and asserts that some problems

impede the development of green investment products. Even while the market for green financial goods and services looks to be expanding in industrialised nations, it is still in its infancy and has no clear bounds. Financial institutions are essential to the development of a sustainable low-carbon economy, and financial institutions should utilise more environmental data for making loan and investment choices. Such decisions will boost the company's environmental branding and performance and provide long-term value to the companies. Businesses with a bigger carbon footprint will be perceived as riskier in the future, and banks in turn will avoid financing environmentally degrading industries in favour of financing new technology solutions that minimize carbon emissions.

Khandewal, (2013) studied the green banking practices of various banks such as IndusInd bank, ICICI Bank and Yes Bank and highlighted the concept and benefits offered by "green bank". The study provided valuable suggestions for green banking using online banking, waste management i.e., reduction in paper money, green banking in rural branches by adopting latest techniques such as green credit cards and green loans.

PWC (2013) Price Waterhouse Coopers Consultants stated GF as financial services and products offered to support environmentally friendly investments and encourage low-emission latest technology, projects and industries while taking environmental issues into consideration across the whole disposal related decision-making, risk management and ex-post monitoring.

Zadek and Flynn (2013); Xu (2013) used green investment interchangeably with green finance, green investment refers to the overall capital cost of moving towards a green economy that incorporates water conservation, cutting down GHG emissions, and investing in a socially responsible sustainable manner. Environmental funds, nature-linked securities, weather derivatives and ecological options are examples of market-oriented mechanisms that can regulate emissions. Green financing encourages the development of green products by offering low-interest loans to environmentally favourable projects while discouraging payments to polluting businesses.

Volz, Judith Bohnke, et al. (2014) Green finance encompasses all forms of loans or investments that aim to reduce environmental impact and improve environmental sustainability. Sustainable investing and banking are crucial components of green finance in order to achieve environmental sustainability criteria.

Lindenberg (2014) also claims that there is no globally agreed definition of GF since there has been no academic contribution to the subject, and the definitions provided by international organisations differ significantly from academic studies. The following definitions of green finance are proposed by Nannette Lindenberg (2014):

1. The financing of both governmental and private green investments, as well as the mitigation and compensation of environmental damage.
2. Finance aids for the implementation of public policy, such as funding to encourage initiatives that have a low environmental impact.

Bocken et al., (2013); D'Orazio and Valente (2019) the environment sustainability gained attention from the starting of 1960s, though, in the present time it invites a lot of discussions on environment preservation. So, the enterprises are now focusing on climate crises by concentrating on curbing pollution, managing waste and evolving innovative ideas. The availability of climate finance generates finance to mitigate the environmental crisis such as carbon emissions from industries for the benefit of nature.

Lindenberg (2014);Urban and Wojcik (2019) GF is the financial institution policies that support the green economy. Green finance's 'green' attribute encourages the allocation of financial resources in all sectors of the economy to focus on environmental protection, clean energy, social inclusion, and corporate governance.

Berensmann & Lindenberg (2016) Green-washing, or giving investors false information about green bonds, can result from a lack of information and the near absence of a clear definition of green financing.

Goel (2016) emerging economies have a huge potential to establish the green infrastructure required for green financing by considering barriers and increasing corporate citizen consciousness. Greater understanding of the present state of green finance will help in full analysis of policy aims, as well as ramifications for national governments and regulators, MNCs, the private financial sector players and data suppliers.

Wang & Zhi (2016) GF is a novel financial scheme aiming at environmental conservation and achieving resource sustainability. This review paper investigated the green finance status quo in the area of renewable energy and identified some inefficiency. If the market mechanism for green financing is sensible, green finance can direct the flow of capital, provide efficient risk management, and obtain better utilisation of environmental and social resources. The research also stated that effective policy regulation will eliminate the knowledge asymmetry problem and eliminate moral hazard. According to the research, the majority of green investment is financed by banks. In India, there are little research on green finance, and beyond theoretical areas, there is not much empirical evidence to describe green finance's underperformance. Green finance concept is also related with the green products along with their functioning. Green finance is defined as funding for environmentally friendly growth and development that aids in tackling hazardous emissions and compounds that deplete the ozone layer.

OECD (2017)The goal of green finance is to "achieve economic development while lowering pollution and greenhouse gas emissions,

eliminating wasting, and enhancing efficiency in the use of natural resources."

Hoshen, M. S. et.al, (2017) opined that green financing refers to activities, programmes, and products that promote sustainable development, as well as policies that incentivize financial investment to promote a more sustainable economy. The investment climate survey of the World Bank states that having access to finance can reduce the major threats of climate change and improve the performance of these enterprises.

Schafer (2018); Liu et al. (2019); L.He et al. (2019) Green finance's importance has risen dramatically in recent time, and it is gradually becoming more apparent as a fundamental idea in encouraging sustainable development and growth of financial markets. With this in mind, the G20 2016 formed the Green Finance Study Group (GFSG), which is co-chaired by the UK and has UNEP as its secretariat. GF reached the pinnacle of importance at the G-20 nations' eleventh meeting in Hangzhou, China in 2016 where it was discussed extensively. GF, according to the International Finance Corporation (IFC), is described as investment options that support social inclusion, the environment, and financial prosperity. China's central bank has also initiated adoption and implementation of policies to promote GF in the country.

Green finance has the following components, according to the various definitions presented.

1. The funding of governmental and private green investments in the following areas is referred to as green finance:
 - Environmentally friendly goods and services, such those related to water management or biodiversity, landscape conservation.
 - Environmental and climate harm prevention, such as energy efficiency or dams.
2. The funding of governmental policies that make environmental and environmental-damage mitigation programs easier to implement, such as renewable energy tariffs.
3. Green financial systems, like Green Climate Fund, green investment tools like specialized green funds and green bonds, along with their corresponding institutional, economic and legal frameworks.

The term green finance is defined differently by many authors, practitioners and researchers, but the most common definition of green finance is given by previous researches as promotion of green finance lending with the aim to protect the Planet earth. GF puts focus on the ecological environment benefits and puts emphasis on the environmental protection by the rapid pollution of industries. The area of GF requires further understanding and research as to how to reduce the risk with the use of GF, improving the financing support mechanism with the development of the renewable energy (RE) industry. RE is a key topic for green financing .

2.3 India and Green finance

R. Gandhi, deputy governor of RBI, 2016 "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

Yıldırım, S. et.al., (2020) highlighted that Sustainable development focuses on creating a balance between socioeconomic and environmental factors for creating a conducive ecosystem in which both humanity and the natural environment live in coordination without disturbing each other.

When it comes to sustainable development as a means of conducting business, India has always led the way. With the Kyoto Protocol, the concerns related to climate change received increased attention. The Companies Act, 2013, also mandates that large corporations must give at least 2% of their annual net profits to Corporate Social Responsibility (CSR), a provision of the legislative framework that India accepted in August 2002. Biological adaptation, security of a wide range of plants, agroforestry, conservation, and preservation of the character of the land, air, water, innovation-related contributions and rural improvement ventures are further CSR activities.

Jain, S., (2020) suggested that India needs to develop a detailed strategy and an integrated policy approach to align its financial system with its long term needs while considering environmental risks. The National Action Plan on Climate Change (NAPCC) was created in 2008 with the intention of creating a comprehensive framework for policies that will lessen the effects of climate change. The National Voluntary Requirements for Responsible Financing, introduced in 2015 by the Indian Banking Association, are one example of a policy that includes broad green lending guidelines. These initiatives are driven by the industry, not the central bank. The recommendations comprise eight fundamental concepts, such as incorporating E&S risk management into corporate operations, reducing the environmental impact in operations, generating environment friendly goods, services, and investments, and promoting inclusive human and social prosperity by involving stakeholders, preserving a commitment to human rights, along with disclosure. With the intention of creating a comprehensive policy framework, the National Action Plan on Climate Change (NAPCC) was created in 2008. In response to a UNEP investigation, SIDBI published National Voluntary Guidelines for Responsible Finance for Indian financial institutions. The guidelines' main goal is to support banks in their efforts to incorporate environmental, social, and corporate governance (ESG) considerations into their lending and investing decisions. This is anticipated to advance responsible lending and environmental due diligence.

Rajput, Kaur et al.,(2013) Indian banks are positively reacting to environmental changes by taking proactive steps concerning green banking. According to the survey, just a few banks in India are implementing green financing activities that have an impact on the environment. The reaction to

global environmental measures is slow. There isn't a single Indian signatory to the UN Environment Programme Finance Initiative. The study indicated that the primary deficiencies in India's green financing sector are environmental awareness and conscience, as well as Carbon Disclosure Projects, which demand public disclosure of emissions in India. Despite the fact that the disclosure initiative is operational in India, the response has been quite low. The current management structure, according to the study, needs to be integrated with environmental and sustainability challenges.

Yadav and Pathak (2013) used a case study technique to investigate private and public bank Green Banking initiatives for environmental sustainability. According to the survey, Indian banks recognize the importance of adopting beneficial environmental actions. As per the study, With the exception of ICICI banks, the banks in the public sector have taken more measures than those in the private sector. Only ICICI Bank has adopted green finance efforts as a sustainable strategy in the private sector.

Nath et.al (2014) the study focused on the RBI's green rating criteria, the World Bank's environmental and social principles, and the bank's initiative in adopting green practices. Green Coin Rating is a phrase used to describe the Green Rating Standard. Carbon emissions and the amount of recycling activities are used to evaluate bank. The global bank's guidelines include measures to lessen environmental effect, its necessary to properly implement annual reporting, Environmental Impact Assessments and the adoption of sustainable practices. According to the survey, if Indian banks want to build a name in green financing, they must be good corporate citizens.

Sudhalakshmi and Chinnadorai, (2014) banks must incorporate their green aspects into their lending principles. Every tiny step made now will contribute to a better future global environment. As a result, Green Banking needs to be promoted at the policy level in India. In terms of green finance, Indian banks are still lagging behind Western countries.

McKinsey & Co, (2016) India's green manufacturing industry is only getting started. If manufacturing were to reach its full potential, it might contribute 25 to 30 percent of the Gross domestic product and provide sixty million to ninety million new jobs to the economy by 2025.

Soundarrajan, P., & Vivek, N., (2016) The prospects, constraints, and recent trends in green financing in India are discussed in this theoretical article. The article discusses rising India's green finance potential, problems, and recent trends. Green finance is essential for low carbon green growth as it promotes and combines financial, environmental, and economic growth. However, there are regulatory gaps, less awareness, and roles of various banks in GF, including SIDBI and MSMEs. To maximise energy saving, these banks concentrate on reorienting and implementing alternative technologies for production and process. A financing programme known as

"green finance" takes environmental factors into account when determining risk or uses green or environmental incentives for risk assessment. Lack of a clear government policy, lack of awareness, and access to capital were the main issues identified. This theoretical paper also discusses the current GF trends, Challenges and opportunities.

OECD (2018) issue paper titled "SMEs-Key drivers green and inclusive growth" As per this empirical review paper robust analysis of greening SMEs, especially in developing countries, is still limited. Future research should focus on the effect of greening SMEs on sustainable growth. SMEs are unaware about the environment, complex environment norms, unsupportive legislations and support organisations, impact and potential benefits of going green. The synergies between greening and improved business performance of SMEs present themselves in two primary ways. Firstly, SMEs can enter into growing market demand for green products and thus it increases market share and helps in capturing new markets. Secondly, SMEs can generate efficiency gains from going green and reduced costs. The research also highlighted that resource efficiency measures in manufacturing enterprises in India may lead to cost savings of 60.8 billion /Year. Lower middle income countries have financing gap to SMEs 76% of the potential demand

Reddy, A. S., (2018) India has very ambitious national targets for renewable energy such as 175 GW related to renewable energy (from solar wind and other renewable sources) by 2022. India not only needs plentiful green finance but that too at a cheaper rate to transit to a clean energy economy. The GF system is needed to increase financial flows from different types of financial institutions banking, micro-credit, and insurance sectors including public, private and not-for-profit sectors.

E.Ferrara, (2019) opined that Green finance and green Project evaluation is mainly on medium long term green projects i.e. the projects which have environmental and climate objectives. This research mainly analysed the financial instruments used, necessary eligibility criteria, required certification and the sectors in which these projects operate.

2.4 Green Finance Initiatives

Green Finance Initiatives are those initiatives that fund green investments/projects. These initiatives help SMEs in adopting green practices by promoting the availability, affordability, and awareness of green finance.

Geels (2004); Barbier, (2010) environmental consciousness increased in 2008–2009, which sparked discussions about environmentalism and the conceptualization of the "green economy". The majority of nations have embraced the 2030 Agenda for Sustainable Development and its seventeen SDGs to address global environmental issues. The SDGs cover a wide range of goals, from a focus on eradicating global poverty and promoting economic growth to a focus on concerns

related to climate change, social protection, universal access to education and health care, and social protection. These objectives aim to solve issues related to economy, society, and environment. These objectives place special emphasis on the need for a greener economy and on environmentally friendly manufacturing and consumption practices. Acknowledging scientific principles is necessary to formulate strategies that will assist to lessen the harmful effects of environmental and climate change.

Unruh (2000) contented that undertaking sustainable green practices is beneficial in the long run, still most of the countries are not adopting and taking its fullest benefits.

Sahoo and Nayak (2007), Government efforts should also be made to encourage green finance initiatives, as banks in India have not given green initiatives enough weight, and legislative measures are needed to support green banking in India. The equator principle are still not adopted by any Indian banks, according to the study, and no single bank has signed the UNEP financial initiative statement.

Kandavel, D (2013) discussed the concept of “green bank” and benefits offered by it while studying the green banking practices of various banks and suggested measures for heightening green banking through online banking, reduction of paper money, waste management, clean and hygienic environment, and extension of green banking to rural branches through green credit cards and green loans. .

Jha & Bhome (2013) studied empirically the actions taken to go green, as also the general public's and bank workers' knowledge of green banking. The research investigated the banking and non-banking financial institutions contribution to GF in Bangladesh and also tried to find out future prospects and challenges. The study is based on secondary data analysis and revealed that though the percentage of green financing is increasing in total loan disbursement but still below the standards set by the Central Bank of Bangladesh.

Pathak et.al (2014) The article “Green Finance: How to Benefit in the Indian Economy” has stressed green growth using green finance's goods and services, including corporate financing, green leasing of technology, green securitization, carbon finance, and carbon insurance. Due to inadequate technology expertise and suitable financial solutions, Small and medium enterprises are disregarded. Additionally, he advises that training and energy efficiency loan models be used to implement sustainable measures for the SME sector.

Dhingra & Shekhar (2015) SMEs can receive assistance for their investments in energy-efficient technology through the loan guarantee programme, the government established as part of its incentive package. By providing SMEs with access to financing to adopt widely available and

affordable energy-efficient solutions, they might use the proceeds to execute technological improvements, such as replacing energy inefficiency.

Acosta, L. A., & Suresh, S. (2016) It is a case study on India prepared for GIZ (German Development Institute), to produce empirical facts that policy makers can use to develop green growth policies, titled "a study of solar energy and inclusive green growth in India" the study area of the research were Delhi, Pune, Bangalore . Purposive and chain referral sampling were used for collecting data. It highlighted the financial support for solar energy related policy for MSMEs and financial help through NABARD, National Housing Bank(NHB), Solar energy Corporation of India (SECI) and IREDA's loan schemes. It also mentioned skill-based activities connecting solar with rural population along with good governance system in the SMEs. It also discussed the OPEX MODEL of solar (Build-own-operate), competitive market system and improving governance system in the MSMEs. It concluded that there is a positive impact of the government policies on conclusive green growth of MSMEs

Zahid K. Jadoon (2017) discussed the significance of credit and green practices in developing countries and focused on some of the major points such as:

- To identify whether different economic requirements of the various sectors of economy are being fulfilled by credit by financial institutions.
- The timely bank credits result in the fulfillment of the financial needs of the SMEs, and which subsequently results in the economic progression of the country.
- The availability of credit by the financial institutions for the farmers to increases agricultural productivity which would subsequently results in the development of the agriculture sector.

RK Ranjan & R Kushwaha (2017) Bank credit assists the goods production on a large scale leading to the technological improvements at lesser costs to provide advantage to the underfinanced. And also, the adoption of green practices will create a positive public image, which would increase the brand loyalty for the green products.

OECD (2017) Tax benefits and subsidies from Government entities serve as an attractive opportunity to adopt GFIs.

SEBI (2017) Green initiative projects that are environmentally sustainable includes energy generation from renewable resources, such as solar, biogas, and wind, as well as cleaner transportation that lowers carbon emissions, green building and waste management, and so on. Climate change adaptation, water and waste management, conservation of biodiversity and judicious land usage are also included in the Green Debt Securities. To meet the financial requirements for these green initiatives, green bonds, carbon market instruments like carbon taxes, and contemporary financial institutions like green banks and green funds are all being developed. Green financing refers to the sum of all of these projects.

Rashid, M. H. U., & Uddin, M. M.,(2018)This study seeks to determine the roles played by banks and nonbank financial institutions in Bangladesh's total economy through the analysis of secondary data. It also aims to highlight the difficulties and opportunities faced by banks and other financial institutions (FIs) when it comes to green finance. This analysis demonstrates that, despite increasing trends in green financing, the level of total loans disbursed remains below Bangladesh Bank's benchmark. It also highlighted the provision of various government related policies and schemes helps small and medium enterprises to grow and prosper in the market. But whether this intervention and provisions by the government are supporting these small and medium enterprises is the question of research.

Dikau and Volz (2018) However, increased distribution of green funds for the development of environmentally sustainable initiatives requires a right incentive structure. Surplus funds from traditional companies are invested in green and environmentally friendly industries. As a result, substantial funds are allocated to encourage long-term, sustainable growth. In 2010, Banks in developing nations with a larger percentage of green projects in their loan portfolio are excluded from having extra reserves under a policy known as differentiated reserve requirements for banks, which was introduced in Lebanon and other developing nations.

Retallack, S. al, (2018) The goal of this research is to provide an overview of the best practices for implementing intelligent public programmes that address the primary energy efficiency concerns and make use of private funding required for large-scale implementation. It is based on an analysis of 10 case studies, conversations with experts, and reviews of previous initiatives. According to the report, there is a need for robust policy frameworks that will support the investment industry with the appropriate economic and regulatory forces.

Rajhans, Mrugakshi, (2018)The secondary research with main objectives to analyse the green finance initiatives taken by the Indian government and to find out recent trends, future scope, challenges, and opportunities of green finance in India. This study finally concluded that the Indian government should set a clear green investment strategy and green finance regulations and policies should be clear and transparent to attract the investors. Impact of government financial Initiatives on the development of MSMEs in Pune district 2018, the main objective of the thesis is to study the impact of govt. financial schemes on MSMEs and identify the problems. A study of 500 MSMEs in Pune District was conducted with the help of a questionnaire. Almost 34% respondents were not aware of the schemes and approximately 68% of the respondents have not taken advantage of any scheme.

Siegel, R. et al (2019)The research objective was to identify and analyse information about Green- lean problems, challenges, success factors, tools and approaches, sustainability-related elements, frameworks,

and advantages etc. in manufacturing SMEs, through a systematic review and a systematic model on implementation determinants was also presented. The research found that SMEs managers initiate steps for adopting sustainability measures.

Charles, G., & Philip, B. (2020) Moreover, to generate enough demand and commitment, it is imperative to engage in activities like awareness-raising, technical support, competence building & equipping, pipeline development, and de-risking.

Dalia D'Amato et al., (2020) The circular economy idea is becoming more popular among businesses than the linear economy because of the SDGs set forward by the UN 2030. Resource management that is more effective is favoured in a circular economy. This study offered guidance to stakeholders and SMEs on how to manage the transformation to circular economy for managing of SMEs' long-term growth and viability.

He, Z., Liu, Z. et al., (2020) The researcher selected 2013-2019 data and constructed a distributed lag model to analyse the role of green finance and financial technology in the construction of smart cities. The seven green finance indicators considered in the paper are green credit, green bonds, green insurance, green development funds, green investments, green stocks, and carbon finance. Four parameters were considered in the construction of city Index i.e., smart economy, smart society, smart technology and smart environment. The paper used the linear transfer function (LTF) method and rational distributed lag model (RDL) method to choose the method. The researcher observed that innovation of financial system in terms of adoption of technology, development of methods of objective assessment and improves risk compensation system, development of innovative financial products and financing methods and focusing on internet financial technology innovation is the key.

A. Shankar, T. Avni (2020) The stimulus package proposed by the government can be utilised to finance investments in the MSME sector for increasing competitiveness through uptake of energy efficiency technologies. There are over 700,000 registered manufacturing units in India. The expected annual savings would be '15,000 crores' if energy intensive facilities could save an average of 15% through energy efficient technology and better practices. The green stimulus would speed up India's environmental change in addition to aiding in economic recovery. It would also continue to provide more impetus when the epidemic is over.

The adoption of energy-efficient technologies (EETs) is hampered by the following factors:

1. Not having enough knowledge, i.e., awareness of certain technology solutions, including both new technologies and appropriate operating procedures.
2. Lack of competent employees and time for small businesses to learn and use new technology;

3. The scarcity of adoption-related local services and support.

The state has assured bank loans to SMEs as part of the stimulus package. This enables SMEs to invest in energy efficiency using bank funding. SMEs can use this financing to modernise their operations and invest in energy-efficient and renewable energy technology.

Kaur, R. (2020) While examining the reasons for its uneven performance and offering some corrective methods need to further strengthen in India, the study report also assessed several energy conservation programmes implemented by BEE to provide energy efficiency measures to big and small industrial units. It has been recognized that in order to conduct energy-efficient programmes in the industrial sector consistently, there is a need to acknowledge the necessity of technology transfer, specified energy consumption requirements, funding methods, and capacity building. There is a need to maintain and increase efforts in that direction.

2.5 Green Finance Initiatives promotes Green Growth/sustainable growth and Green Economy

Alfredsson & Wijkman, (2014) Environmental economists David W. Pearce and Kerry R. Turner initially used the phrase "circular economy" in 1990 to describe an economic system that makes it easier to transmit money to people who are starting environmental activities. A circular economy enhances society's socioeconomic well-being while preserving the environment.

European Economic Area(2014) The notion of a green economy states that green measures don't always limit economic growth; rather, they bring up fresh opportunities for growth, such as the following:

1. Changes in the production system because the production systems are the major sources of pollution.
2. Innovating new technologies to counter the menace of non-green activities.
3. Opening of new markets for green consumption.
4. The usage of green finance brings confidence in the organisations due to the contribution in the social responsibility, and
5. Lastly, stability.

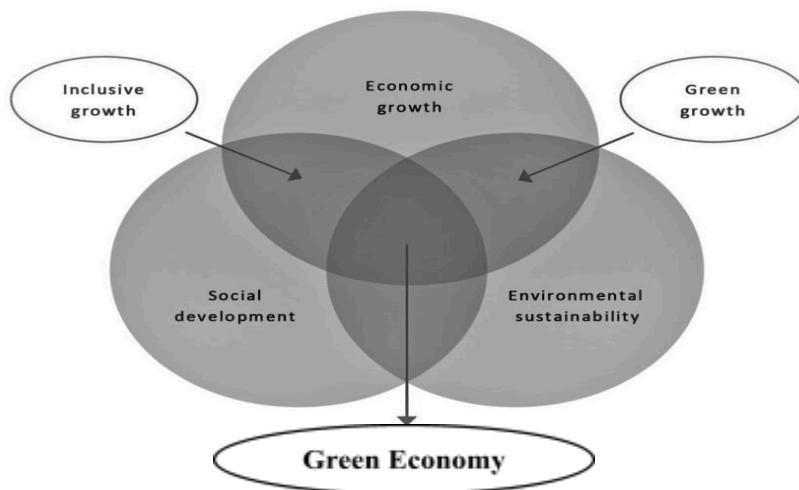
As per UNEP, green economy ensures that three components, namely the economy, society, and environment, are in balance. The environmental component functions as a stimulus for economic reform and social welfare along with green growth in a green economy. Since "Green growth" is closely related with "green economy" therefore it is difficult to achieve "Green growth" without paying due attention to the "green economy"

Blumberga, A., & Kizane, I. (2017), as per this study investigates the relationship between green finance initiatives and sustainable development among SMEs in Europe. It examines how SMEs' access to

green finance options, such as green bonds and crowd funding platforms, influences their adoption of sustainable practices, resource efficiency, and long-term growth.

Farghly, B., et.al (2018) This research seeks to measure the perception of MSME managers regarding multi-dimensional sustainable business growth in Egypt. The purpose of the study is to evaluate how effectively MSMEs' sustainable growth aligns with the three performance indicators of triple bottom line (TBL) sustainability (financial, social, and environmental). Data were gathered using structured and semi-structured questionnaires and interviews with Egyptian MSMEs' managers, employees and entrepreneurs in order to examine the effects of revised microfinance programmes offered by Egyptian banks. The research hypotheses were determined using structural equation modelling (SEM) for the purpose of data analysis. With the highest statistical significance, microfinance initiatives explained 22.1% of the variation in financial sustainable growth. The impact on social sustainability ranks second, with microfinance contributing to the explanation of 19.6% of the variation in that growth. Additionally, with regard to acceptability and knowledge, microfinance elements have a considerable impact on environmental sustainability (42.5%).

Figure 2.1 Green Economy and Green Growth relationships



Source: Green Growth -Economic Growth Partnership 2012. (Atebije, T. N., & Razak, T. S)

The aforementioned approach is progressively acknowledged as a sustainable development model, demonstrating that a green economy is an

essential economic strategy to fulfil United Nations SDGs rather than a replacement for sustainable development.

2.6 SMEs and Green Finance Initiatives

Noh (2010) emphasised that Small and medium enterprises also need green growth for their sustainable development. Green growth means green economic growth in a balanced way which improves the manufacturing ability continuously and focus on lessening the environmental pollution by implementing the green knowledge and technologies and expanding the energy and resources.

The following areas have been considered as critical indicators of green growth progress:

1. Productivity, as well as environmental and resource-related improvements.
2. Natural resources and their proper management.
3. Environmentally related quality of life.
4. Green growth's governing principles, available economic prospects, and social setting.
5. Appropriate management of the economy as a whole.

There are studies like **Richard Duncan (2011)** pointing out that bank credit plays a significant role in achieving economic growth in his work "The Dollar Crisis", stated that the "Credit growth drives the economic growth of a country". The lender's credit help to establish and diversify the business, so the availability of credits promotes enterprises maintain a reasonable scale of business. International Finance Corporation and World Bank survey highlighted that credit availability is the main criteria for SMEs in starting and doing business. Also, the Global Entrepreneurship Monitor (GEM) found that availability of credit for these enterprises either in the form of equity or debt is one of the key factors in the development of this sector GEM Global Report 2010.

Klapper, Leaven & Rajan(2006) stated that the credit granted by the banks can be used to enhance informal activities alongwith effectiveness by resources replacement resulting in reviving of economic activity

Mason and Harrison (1993), Bruns and Fletcher, (2008) also, among these the banking institutions, mainly the commercial banks are the major source of financing.

Ghatak, (2010) pointed that the schemes of the government have the potential to reduce small-scale lending costs while also improving the data and information available on borrowers. They allow small businesses to obtain formal financing and improve loan terms. Such programs help small businesses acquire financing for operating capital, investment, and/or leasing at reasonable rates by causing minimum damage to the environment. The scheme helps SMEs in increasing their market appeal and expanding their economic activities." Credit guarantee programs' flaws

can be overcome with proper design and participation from the private sector. The government should provide more assistance to SMEs in the form of government procurement programs, credit and performance ratings, lending to priority industries, and marketing support.

Ayyagari et.al.(2010) SMEs need finance for startup, expansion, modernization, new technology adoption etc. This finance can be managed internally or externally. Internal sources of finance can be anything other than bank financing, owner's savings, moneylender financing and retained earnings and opposed to it basic sources of external finance generally come from banks, financial Institutions, venture capital and the government.

Bouri et al. (2011) added that enhancing the access to financial sources to the sector in the developing countries could promote the economic situations through GDP growth and prosper the innovative activities and sustainability of the firms.

Harvey, Oum and Narjoko (2011), Chakrabarty, D. K. (2013) Green banking has two aspects, according to the RBI. First, the method by which banking activities are carried out, for which the central bank gives guidance on electronic and paperless banking; and second, the issue of the criteria used to pick loans, for which the RBI does not publish any particular rules or regulations.

Rouf & Kazi Abdur (2012) The purpose of this paper "Green microfinance is promoting green enterprise development" was to examine micro credit and renewable energy related programs for their green growth. The paper presents a contrasting comparison of Grameen bank and credit system of Bangladesh with Alternate saving credit program of Canada and also studies its impact on local economies and environment development of Toronto. The findings of this paper are positive to the sustainable (environment) development. Green Micro Finance and green micro business development are underserved areas, and less thought is given to this subject by the government and non-government organisations in their planning, policies, and programs.

Driga & Dura (2014) opined that as the main source of credit for the national economy, banks are important for any contemporary economy. Thus, the majority of research established and emphasised the significance of credit for economies and came to the conclusion that bank lending contributes to economic strength and growth. The significance of GF and the green economy has grown in the current context when environmental concerns overshadow economic ones. An easy access to finance not only leads to prosperity of SMEs but helps them undertake innovative activities.

Tsokaet.al., (2014) reviewed and suggested how certain modifications in SMEs can transform the entire operations of the company towards the green economy. Based on the secondary data the study suggested a conceptual framework which can be used by the organisations

to implement the green financial practices which would subsequently result in the creation of the circular economy.

Timsina (2014) studied those enterprises seeking credit for investment in plants and machinery. To address environmental concerns, bio - diversity losses, waste disposal issues, water management issues, and major social and economic challenges, several researchers have put forth a variety of models. So, access to external finance is a very challenging task for small and medium enterprises.

Blumberga, A., & Kizane, I. (2017), This study investigates the relationship between green finance initiatives and sustainable development among SMEs in Europe. It examines how SMEs' access to green finance options, such as green bonds and crowd funding platforms, influences their adoption of sustainable practices, resource efficiency, and long-term growth.

Chang and Slaubaugh (2017), Depken and Zeman (2018), Verma, T. L., & Nema, D. K. (2019) contented that the potential of SMEs in attaining sustainability through different policies by the MSME Ministry in fostering business- related waste management, lean manufacturing, loan assistance, coordination, and awareness campaigns for MSMEs owners. The author emphasises how effective government measures can help and develop SMEs. As a result, Indian banks should be more cautious in promoting green project financing.

As per the research by **Agarwal, S., & Sharma, S. (2018)** which focuses on the relationship between green finance and the environmental performance of renewable energy firms in India. It explores how green financing mechanisms, such as venture capital investments and carbon credits, influence firms' adoption of renewable energy technologies, reduction of greenhouse gas emissions, and overall environmental sustainability.

Soundarrajan and Vivek (2018) stated there are typically three major sources of finance: domestic, international and private sector finance. As opposed to global public finance, which includes funding from multilateral development banks and international organisations, domestic public finance refers to funding that is provided directly by a government. Internal and overseas funding sources make up the private sector's financing.

Yacob, et.al (2018) This study is the first to examine the framework for green efforts for manufacturing SMEs. No framework that might direct researchers of this substantial impact on the environment industry has been developed so far. The results showed a connection between waste management, energy management and water conservation with environmental sustainability. According to mediation analysis, the relation between green initiatives and environmental sustainability is totally mediated by owners' and managers' intentions toward being green. The use

of green technologies does not affect the environmental sustainability of manufacturing SMEs, according to the moderation analysis.

Aboelimged, M. (2018), this paper explores the relationship between technological, organizational, and environmental drivers and sustainable manufacturing practices (SMP) within 238 small and medium enterprises (SMEs) in Egypt. The study adopts a natural-resource-based view (NRBV) and examines how these drivers influence SMP and its impact on competitive capabilities. The model is empirically validated using survey data and structural equation modeling. The findings reveal that environmental pressures, management support, and employee engagement positively influence SMP. Surprisingly, technology infrastructure, technology competence, and environmental regulations do not significantly affect SMP. However, SMP is found to have a positive and significant impact on the competitive capabilities of Egyptian SMEs. The study emphasizes the role of the institutional context in promoting pro-environmental behavior among SMEs and suggests future research directions for SMP.

Koirala, S. (2019) revealed that individual carbon footprints of SMEs are small but collectively they contribute more than 70% of total industrial pollution in Europe. Using secondary data analysis this study tries to reveal the tradeoffs and synergies about the ability of SMEs to show green and inclusive growth through eco-innovation and adoption of green measures.

Mura, M., Longo, M., & Zanni, S. (2020) study on circular economy and SMEs suggested that the circular economy should be used in the SMEs for effective implementation of the green practices, the concept of circular economy enforces the implementation of a systematic approach towards the value creation of a company.

Wahab, N. A. A. et al (2020), this research investigates the relationship between green technology adoption and the financial performance of manufacturing SMEs in Malaysia. It explores how the adoption of green technologies, such as renewable energy systems and energy-efficient processes, affects SMEs' productivity, cost efficiency, and competitiveness.

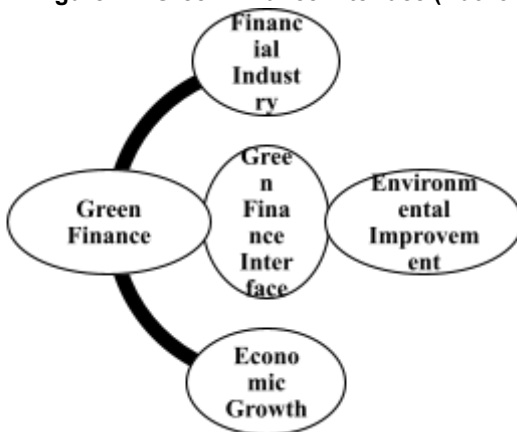
Tang et al (2020), In this particular study, the primary objective was to examine the impact of financial literacy, innovativeness, and environmental sustainability on the sustainability of small and medium-sized enterprises (SMEs). The researchers collected data from 300 small business firms in China and utilized structural equation modeling (SEM) to test their hypotheses. The results indicated that both financial literacy and innovativeness significantly influenced the sustainability of SMEs. Furthermore, social inclusion was found to have a significant effect on both SMEs' sustainability and their performance. The findings suggested that incorporating sustainability models into their operations and enhancing financial knowledge are essential for SMEs to maintain their sustainability.

Xu, H. et al (2020), previous research has yielded conflicting findings regarding the impact of green finance on enterprise green performance. To address this issue, through a meta-analysis of existing 30 empirical studies, this research provides evidence of a significant effect of green finance on enterprise green performance. It highlights the moderating role of firm type and region, emphasizes the varying impacts of different green finance indicators, and underscores the stronger influence of green finance on environmental performance compared to other dimensions of green performance. The study concluded that that GFIs are particularly effective in improving environmental outcomes within enterprises.

So, in context of SMEs, there have been numerous perspectives on sustainable green practices / GFIs and their results, including the utilization of green technologies to gain a competitive edge, perceiving environmental regulations as a catalyst for innovation, enhancing competitive positioning, and reducing operating costs, carbon emissions, and delivery time in supply chain distribution networks. Green initiatives encompass a range of activities aimed at reducing waste generation, minimizing the by-products of waste, decreasing energy consumption, conserving water, optimizing material usage, improving occupational health and safety, and enhancing overall workplace safety (Lin and Huang, 2012) (Yacob et.al 2018)

The literature reviewed presents a relationship between green finance, green investment towards accomplishment of the green economy goal through SMEs which can be represented with the help of a diagram as given below:

Figure 2.2 Green Finance Interface (Author)



2.7 Barriers and Challenges

Sarkis, (2001) green financing is the basic step to achieve the goal of green growth. GF initiatives help in achieving objectives of such growth. It connects the financial industry, economic growth, and environmental improvement. But due to limitations in size, small and medium enterprises face big challenges when it comes to green their businesses as SMEs lack confidence and support to invest in innovative environmentally friendly technologies. In the long term, adopting sustainable green practices is advantageous, still most of the countries are not adopting and taking its fullest benefits.

Unruh (2000) hypothesized that current institutions and regulations should be changed to support the aim of environmental preservation.

Subramanian and Pillai (1994) analyse the performance of Kerala's small businesses compared with that of small businesses in other important states and with the national average. They asserted that severe financial and marketing issues as well as low capacity utilisation are the key causes of Kerala's small enterprises' subpar performance. This might be made better by adopting green strategies which would result in reaping economies of large scale.

The major study by **Chattopadhyay (1995)** investigates the causes and solutions of industrial sickness in India. They discovered that unhealthy industrial units have poor management, antiquated technology, a decline in demand, and labour issues. The statistical techniques employed, such as financial ratios and multiple regressions, highlighted the fact that financial institutions are unable to adequately finance SMEs and that stringent enforcement of government legislation is necessary to change the situation.

P. Trott (2002); Bala Subrahmanya (2004) According to a review of the literature, SMEs have a tremendous opportunity for development if they accept innovation in the form of new markets and technology. Study underlined how small-scale enterprises are impacted by local and global events. According to the research, small firms have suffered greatly in terms of unit growth, employment, production, and exports. The study finds that the legislative changes have given the small-scale enterprises industry additional possibilities and markets. To make India's small industries competitive internationally, attention should be moved to the development of financial infrastructure and technology.

Kumar et al., (2009) Emphasised the importance and challenges of SMEs in the growth of any economy. This report discusses major issues which SMEs face in the area of marketing and the other environmental issues along with other critical issues such as licence raj tax systems etc. A number of challenges have stymied the expansion of SMEs. Micro businesses have faced a plethora of challenges. The challenges that

small businesses face include the need to compete with large and medium industries, which are more numerous and have more qualified entrepreneurs, superior and abundant raw materials, advanced and sophisticated equipment, and the ongoing development of cutting-edge technologies than the former. SMEs are vastly outperformed by large-scale enterprises due to their undeveloped manufacturing techniques, constrained financial resources, untrained, inexperienced, and naive business owners, and the non-standard character of their goods. It is quite difficult for SMEs to compete with big businesses in terms of cost and product quality. If these labour-intensive companies that create jobs had to close, it would be devastating for the Indian economy. The existence of SMEs is in peril unless the government encourages, subsidises, and equips them with the newest technology.

Ghatak (2010) Studied that due to the higher administrative expenses of small-scale lending, as well as the perceived high risk and the absence of security or collateral, banks are reluctant to extend credit to small enterprises. Credit guarantee schemes reduce moneylenders' risk and are primarily a response to small businesses' lack of assurance." SME recovery and growth can be aided through technology transfers (such as green technology) and networking.

Babajide and Abiola (2011);Afeef (2011) found few funding constraints for micro finance firms in context with microfinance institutions. Small and medium-sized businesses (SMEs) have limited access to low-cost, high-quality financing. These have been identified as important roadblocks to their ability to contribute to economic progress.

Gunasekaran et al (2011) Suggested that technology can provide competitive advantage and sustainability in the global market.

Morakar (2012) Small-Scale Industries have to face challenges as a result of deregulation and de-reservation policies, which have boosted competitiveness in the SME sector. Apart from these the labour force in SMEs have undergone tremendous change due to globalisation and started giving due importance to those employees who have higher skill set. There is a widespread belief in industry and governmental organisations that SMEs lack the skilled labour needed to meet the demand for their products. As a result, if the labour is skilled, SMEs have a lot of openings for skilled workers." According to the study, the government can take a variety of measures to improve SMEs in India like increased productivity, technology up gradation, increased availability of credit and cost-effectiveness, promotion skill development, marketing assistance, and modernization, infrastructure facility upgrades, tax and incentive-related matters, and suitable institutional framework development.

SMEs are mostly unaware of the environmental impacts of their activities and show signs of lower adoption rates for environmental practices

(Fleiter et al., 2012; Johnson and Schaltegger, 2016; Boakye et al., 2020).

Mwaniki and Moffat Karo (2012), most of the SMEs finance their operations via personal savings, loans from banks, governments, and non-governmental organisations. The study's conclusions indicate that marketing is the biggest barrier to a company's success. According to the survey, the bureaucratic mindset in registration offices, high cost of compliance and tax burdens impede SME growth.

Singh et al. (2012) examined the variables that contributed to the small-scale industry's growth in India, concentrating on the legal changes that have offered it new opportunities. The number of Small scale Industries (SSI) units, production, and employment all show significant growth in the SSI business. The research suggested the need for technology development and the construction of financial infrastructure to increase SSI and meet the growth target. They mentioned technology, vast financial needs, and cutting-edge marketing strategies, are just a few of the challenges.

AnjuSingla and Parul Grover (2012), the opportunity to maximise and augment the lending of green loans for the SMEs is a crucial component for their growth and sustainability because when financing large firms, the risk is concentrated among a small number of units, whereas when lending the same amount to the SMEs, the risk is distributed across a large number of units. A sound infrastructure for SMEs would make it easier for them to access and utilise funding, giving them an equitable chance to compete and survive in the age of globalisation.

Lama's (2013) SMEs have established themselves as a major driver of GDP growth and industrial output in India. SMEs must increase their production, raise the quality of their work, innovate, and cut costs. Government policies and cutting-edge methods should help SMEs become more competent and appealing.

Laforet S. (2013), Navickas V et al. (2013) opined that a nation's environment or favourable helping circumstances have a role in the growth of its innovation culture. Therefore, the acceptance of innovation as a component of green financing efforts depends on a system that fosters the ideas that result in the creation of high-quality technical advances, or "green innovations," in Lithuanian businesses. This paper throws light on socially responsible innovation and findings suggest that socially responsible initiatives promote business innovations and competitiveness. As a result, it can be said that innovations operate as a catalyst, maximising the performance of innovative businesses in comparison to those that do not.

Kamunge, Njeru, and Tirimba (2014) the two most important factors affecting the performance of Limuru firms are availability to finance

and management and administrative expertise. Supportive government regulations and policies, infrastructure facility and availability of relevant market information are the other key variables which positively impact the SMEs performance.

Sharma, Gopal et al. (2014) conducted a study to determine the extent of consumer knowledge of India's green banking activities. According to the findings, there is a low degree of awareness about green finance initiatives, and even those who use internet banking are unfamiliar with the notion. According to the research, most people associate green banking with online bill payment and cash deposit systems, environmental bonds, green CDs, net banking, solar-powered ATMs, and green loans. The study found that most customers are unaware of green banking or green finance due to a lack of education and technological problems.

Popp et.al.(2011); Nesta et al. (2014); Ringel et al. (2016), numerous research on renewable energy investigate a wide range of issues, such as increasing investment in renewable energy, how environmental regulations affect innovation, and the impact of legislation in renewable energy related investments.

UNEP Inquiry - FICCI (2015) report on the design of a sustainable financial system for India-2015 that there should be no legal restrictions on long-term investments in the pension and insurance sectors. Investors may seek to direct money into green initiatives in India, according to reports. However, in order to mobilise local and foreign capital, it needs credibility as well as legislative and regulatory initiatives.

Sharma, MPN, and Lodhi (2015), the situation of green financing in India as well as barriers to green investments were researched. In addition to a unified public awareness, drastic changes in technology, skills, legislation, and economic structures are required.

Jaimin R. Vasa (2016) conducted a comparison of the contributions of SMEs in China and India. The study came to the conclusion that while there were much more SMEs in India after 2017–18 as a result of the incorporation of numerous already-existing small industries into the SME category, their status in India was still seen to be subordinate to that of SMEs in China. The research emphasised that the government should allow selected SMEs with good operating performance to enter the bond market for financing.

Hussain et al., (2016) Georgeson, L (2017) the study suggested some frameworks for identifying economy-society-environment interactions, which would improve assessment for the green economy. Identifying and measuring the shortcomings in green practices implementation would go a long way toward improving measurement.

Chandak (2016) identified that the lack of understanding of finance schemes and experience affects the first-generation entrepreneurs in the development of SMEs. Banks consider SMEs as risky projects as their increasing NPA is also one of the main causes for credit crunch. The major hindrances to access to finance are lack of collateral, no past experience, risky project, poor financial statement, lack of infrastructure etc., in Nagpur city. The study concluded that the effect of macro environment factors has a positive impact on performance of SMEs whereas the infrastructure was not found to be significantly impacting SMEs performance. **Margaret Mutiria (2017)** banking institutions should make an effort to offer SMEs specialised bank loan options that also include training in proper finance skills for project planning, business finance management, and loan repayment.

Mazzucato and Semieniuk (2017) in order to fulfil global energy demand until 2040, the International Energy Agency (2016) estimates that \$44 trillion in additional investments are required, \$9 trillion of which must be made in renewable energy. Therefore, increasing investments in renewable energy is essential for attaining climate-resilient growth and low-carbon transformation and fiscal measures to incentivize private sector participation are critical in this process. As a result, a government strategy supporting a low-carbon energy transmission includes soliciting private investment in renewable energy as one of its key objectives .

Biswas, T., Sharma, S, & Ganeshan, K. 2018 A study on “Factors influencing the uptake of Energy Efficiency Initiatives by Indian MSMEs” - Council on Energy ,Environment and Water. In the study primary data collected from one district each from 10 states including Haryana Punjab industrial clusters. MSMEs operate on a smaller scale than large businesses and have a lower financial base; as a result, they frequently lack access to affordable finance and easily available new technology. Instead, they go for low-cost and inefficient solutions. Using descriptive analysis the findings were:

1. 80% enterprises never participated in workshops, even those who attended shown poor satisfaction level
2. Only 45% enterprises were aware of EETs (Energy Efficient Technologies) relevant to their sector
3. Energy monitoring – 50% using energy bills, 20% process level monitoring, 88% enterprises recording energy consumption data

But a surprising finding was that access to formal finance does not influence the decisions to invest in EETs.

Lehman et.al., (2018) As per the study the role of private investors does not offer strong incentives to promote the investments in adopting contemporary technologies which would speed up the pace of technological

development. The more advanced new technologies may compete with the established ones, but they may be used to achieve effective outcomes. The new and advanced technologies will facilitate the adoption of green practices which will provide a competitive advantage to the organisations. Since they frequently favour fossil-fuel based technology.

Bonosree, B 2018, the primary objective of the research "A study on the sustainability of micro small and medium enterprises in Kamrup and Kamrup metro district of Assam " to study the impact of entrepreneurial related factors in developing sustainable enterprises. A sample of 100 MSMEs were taken from districts of Kamrup and Kamrup metro using judgmental sampling technique. The tools and techniques used for analysis are based upon proportion and percentage analysis. Likert scale, correlation analysis, measurement of central tendency and dispersion. The Impact analysis and rank analysis tools were also used. Respondents were asked to rate the impact of selected factors.

Singh and Thakar (2018) though SMEs are required in every economy but their impact on the environment cannot be ignored. This review paper extensively reviewed more than 90 papers on green manufacturing. This paper showed some critical success factors for GM adoption like regulations related to environment protection, competitive green strategy, top management commitment, awareness, employees' involvement. It also identified some major drivers in this green manufacturing process like demand from employee side, health, safety and environment concern, innovation, profits, market trends, competitors policies etc. this study also highlighted that its proper implementation has failed due to lack of proper guidance and incentives and its awareness. The SMEs in India have many primary issues and challenges which are very critical barriers in the growth of SMEs. Some of the top most barriers can be stated as finance related constraints, lack of quality, lack of marketing support, lack of innovation and research and many more. SMEs also search out for new innovations which would help in the implementation of green finance initiatives and in turn provides employment, help earn revenue for the firm and in turn help in the economic growth of the nation and also better lifestyle by offering quality products or services. Through companies' mail survey and interviews this study tries to examine the outcomes of organisational innovation in SMEs. it finds that innovation improves the productivity and market, but its impact is not found on retention of employees and operational efficiency.

World Bank (2019) report, the lack of easy access to money with sufficient amounts and low interest rates is one of the biggest obstacles to the adoption of energy efficiency technology. This problem is further exacerbated by the fact that investments in efficiency do not result in

increased revenue. Financial institutions frequently do not consider them to be "bankable" because of this.

M. Hammad (2019) A thesis on "Studies on Sustainability in Supply Chains of SMEs in India". The study was based on sustainable practices, sustainability performance indicators and parameters of supply chain management. Also determine the implementation priority. It is a primary study and researchers used multiple regression modeling and factor analysis. It was concluded that technology issues related to cost and regulatory requirements negatively affect the sustainability performance. Whereas training education, availability of funds, commitments from management contribute positive to sustainable practices. Study area of the research was Delhi NCR.

E. Ferrara (2019) The focus of this thesis "Green finance and green Project evaluation" is mainly on medium long term green projects i.e. the projects which have environmental and climate objectives. This research mainly analysed the financial instruments used, necessary eligibility criteria, required certification and the sectors in which these projects operate.

Ryszawska, B. (2019) stated that the SMEs require innovative business models and a new CSR concept called CSR 2.0 for the prevention of environmental degradation.

R Prasanna et.al, (2019) found that the most important prerequisite for successful technology adoption is the availability of a skilled workforce.

Dalia D'Amato et al., (2020), the circular economy is becoming more popular among businesses than the linear economy because of the Sustainable Development Goals set forward by the UN 2030. Resource management is favoured in a circular economy. For the management of SMEs' long-term viability and growth, this research offered insights to stakeholders and SMEs on how to go forward with the transition to a circular economy.

In thesis, **Baig (2020)** conducted a comprehensive investigation on the obstacles encountered by MSMEs in obtaining financial assistance to ensure their sustainability. The researcher employed a convenience sampling method to collect primary data from a randomly selected sample of 750 MSMEs. Through the utilization of descriptive analysis, factor analysis, and linear regression analysis, the study revealed several challenges that significantly affect the sustainability of MSMEs. These challenges include intricate procedures, limited availability and affordability of finance, as well as a lack of awareness regarding financing schemes.

Soderholm, P (2020) conducted a study which focused on five main challenges related to environmental risks. These five main challenges if taken care of would help in bringing and accepting radical changes

towards the adoption of green practices. These changes are not just incremental sustainable, but these changes are disruptive which would transform the entire operations of the organisations, these are the main challenges which are going to change the entire operations of the organisations. The first two challenges deal with different types of structural tasks needed and barriers to overcome that to implement technology change and rest of the challenges focus on the role and responsibilities of key actors (government authorities, private firms, research institutes, individuals, etc.) in the transition process. The future would require handling of these challenges which would revolve around green capitalism and the steps which would be used in the designing of appropriate policy mixes and strategies and finally accepting these green challenges has to be dealt with keeping in mind the distributional concerns which is an important component in the green implementation process. Prior research also suggests that access to finance is one of the triggering issues for providing a conducive economic environment for small and medium enterprises.

Ngondjeb, D. Y. (2020), businesses should take use of the possibilities and difficulties in terms of entrepreneurship, innovation, access to financing, demand for eco-friendly goods and services, social inclusion, and equity in order to embrace green practises. SMEs must develop their businesses in a sustainable way despite the problems with the climate and the environment.

Cerminara, et al., (2020) emphasised that for the economic growth of the companies, generation of wastes has to be minimised since the generation of wastes which are created in the production processes acts as a barrier in the implementation of Green practices due to this reason the companies especially the SMEs have started focusing on the waste management process at all stages of the production process, which will result to zero waste production in the SMEs production process.

Das, M. and Rangarajan, K. (2020), have built a model using a sample size of 200 SMEs. By examining aspects including collaborative synergy and government policy efforts, the report seeks to determine a link between sustainability performance and business success for SMEs in emerging economies. The study found that both of these factors have a positive impact on sustainable long term performance and growth.

Nagender K.S. et.al, (2021) the objective of the study was to highlight the scope, prerequisites, and impediments when SMEs transit from linear to circular economies (CE). A survey based on a semi structured interview questionnaire on representatives of SMEs. The major prospects identified were 3R (reduce, reuse, recycle) and CE leads to competitive advantage and achieving sustainable goals. The major challenges in implementation are related with lack of awareness, financial challenge, weak management vision among others. The findings suggested some

prerequisites for transitioning to green or circular economy are strong management will, technology up-gradation, innovation, training and motivation of employees and appropriate guidelines

Wasan, P., Kumar, A., and Luthra (2021) This article explores techniques for developing green financing in Indian SMEs as well as the obstacles and hurdles to its implementation. This paper employs a two-phase technique to offer a thorough literature review, which is supported by the Delphi method to identify the main obstacles to GF adoption and suggest potential solutions. The solution strategies are ranked using global weights as input, and the best worst approach is employed to rank the obstacles using their relative weights. According to the research, the biggest obstacles to GF adoption are those that are connected to legislation, the economy, and expertise. The article's recommendations for encouraging the use of green finance include clear green policies and risk assessment frameworks as its two most significant promotional tactics; low-cost refinancing and securitization markets for eco-friendly goods and innovations, improved credit mechanisms for eco-friendly developers, and a fusion of directed and incentivized finance, public and private finance, financial markets and technology are all examples of green policies and frameworks.

Sharma, N. K. (2021) identified a number of obstacles to the adoption of green practices, including lack of knowledge, obstacles related to finances, poor management of SMEs with regard to the adoption of the Circular Economy, and many others that will be covered in more detail in the study. Some of the most frequent obstacles to the implementation of green practices were untrained staff and a lack of knowledge. One of the main concerns for creating a Circular Economy is the consumer's acceptance of green money. Strong "management will," innovation, technology advancement, staff training, and motivation are key areas that have been identified for the successful implementation of green practices.

Ramesh, J., et.al., (2021) this review paper explores the sustainable energy strategies (SES), it included the initiation of various practices and policies that reduce energy demand through energy efficiency measures along with the role of technological capabilities. It also examines the factors influencing SES and barriers to energy efficiency that are believed to enhance productivity and sustainability in MSMEs.

Fernandes,C. et.al, (2021) Research article provides insight about green growth by adopting sustainable technology. Innovation, entrepreneurship, government agencies and consumers have a positive impact on economic growth and a more sustainable society. The paper highlighted the concept of green growth which started in the early 1970s and concluded that government policy, collaboration in technological development has a positive impact in mitigating climate change.

Ahmed, (2021) examined internal factors e.g., training and development and external factors like government policies and access to finance as major factors influencing sustainable growth in SMEs.

According to **Dadhich, Purohit, and Bhasker (2021)** green technology has garnered significant attention in micro, small, and medium industries. This study collected first-hand data through a questionnaire answered by 150 SMEs in Rajasthan. The study aimed to develop a conceptual framework and test four hypotheses using AMOS after conducting exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The findings revealed that energy, water, waste management methods, and sustainable green practices had a statistically significant and positive association with the operational performance of the industries.

According to **Ghadimi, O'Neill, Wang, and Sutherland (2021)**, data for this study were collected through a questionnaire survey from professionals in Irish manufacturing SMEs. The experts' opinions were analyzed using interpretive structural modeling (ISM) and cross-impact matrix multiplication applied to classification (MICMAC) to identify the mutual influences among nine enablers. The findings indicate that, from the perspective of Irish SMEs, strong green supply chain relations are an outcome of successfully implementing green manufacturing (GM) practices, rather than a driver of other enablers. Additionally, the study reveals that GM practices in SMEs lead to lower manufacturing costs.

In the study by **Wang, Z., Peng, M. Y. P., Anser, M. K., & Chen, Z. (2023)**, the impact of green finance and renewable energy on energy efficiency in E-7 economies, including India, was analyzed. The researchers specifically examined the nonlinear and asymmetric effects of green finance and renewable energy on energy efficiency. The data used in the analysis spanned the period from 1985 to 2017. The study revealed that the main obstacle to achieving green energy efficiency in these economies is the insufficient investment from both the private and governmental sectors in the energy industry. This lack of investment hampers progress in improving access to power, enhancing energy security, and promoting environmentally sustainable economic growth. The findings highlight the potential for renewable energy and energy efficiency deployment in E-7 countries, but also underline their vulnerability. The paper emphasizes the need to address the limitations in green financing and renewable energy policies to fully unlock the funding potential for energy efficiency in E-7 countries. By addressing these barriers, it is believed that greater progress can be made in realizing the goals of energy efficiency and promoting sustainable energy practices in these economies.

The major challenge facing developing economies, according to the literature reviewed, is that they are still unable to integrate green

financing, which would allow them to balance the demands of social and economic development while taking environmental effect into account while making economically feasible loan decisions. This will necessitate financial system integration as well as long-term development. Raising market intermediaries' and stakeholders' understanding of environmental risk can help achieve this. By finding and establishing marketable green financial goods and services, as well as by coming up with a creative financial solution to meet the demands of green initiatives. The appropriate concentration on economic development and environmental preservation may cause delays in the completion of these integrations, but they will go a long way toward integrating the Indian financial system with a sustainable goal. To increase the bank's engagement in green financing, macro circumstances will need to improve. Along with this, some of the issues that need to be addressed by stakeholders include the fact that sanctions and regulatory requirements should be in line with environmental and social criteria. Second, to boost economic development and the effectiveness of green financing policies, there should be synergy between state agencies, and third, coordination within the policy framework is required to strengthen the bank's participation in green credit.

Although a lot of green initiatives have been introduced by the government but due to lackadaisical approach of the SMEs the complete benefits are yet to be exploited by them. The government's policy framework is thought to be crucial for enhancing green lending by financial institutions and green credit by banks. A green economy would be created as a consequence of the government's good policy development, which would encourage green finance.

Table 2.1 Major issues and challenges chalked out through literature review

Challenge	
Green technology Adoption	Kumar et al., (2009),Goel (2002) Bala Subrahmanya (2004), Singh et al. (2012),), Kaur et al., (2018) and Gupta and Barua (2018) Pathak et.al (2014), Lehman et.al (2018) Gupta and Barua (2018)R Prasanna et.al, (2019), Ngondjeb, D. Y. (2020)
Innovative practices	Lama (2013), Laforet S.(2013),Nesta et al. (2014),anMurray, Skene& Haynes (2015) Navickas V et.al., (2013), Ullah et al., ((2021)
Government Policy Support	Kumar et al., (2009), Popp et.al.(2011), Kaur et al., (2018) and

	Gupta and Barua (2018), Lama (2013), Kamunge et al (2014), Ringel et al.(2016), Margaret Mutiria (2017), Gupta and Barua (2018), Ullah et al., ((2021)
Issues related with skilled labour	Morakar (2012), R Prasanna et.al, (2019),Junia A. Purwandaniand Gilbert Michaud,(2021) OECD (2018)
Financial issues like Government schemes and policies related with credit guarantee programs, technology up gradation, subsidies etc	Goel (2002), Ghatak (2010), Morakar (2012), Chandak (2016) Jha and Bhome (2013). Pathak et.al (2014), Chandak (2016), Verma, T. L., &Nema, D. K. (2019) Shankar, A, &Avni T. (2020).
Modernization and modifications	Morakar (2012),Tsoka et.al (2014) Ullah et al., ((2021)
Tax incentives	Mwaniki, Moffat Karo (2012) Morakar (2012), Kaur et al., (2018) and Gupta and Barua (2018)
Marketing assistance	Subramanian and Pillai (1994)an Kumar et al., (2009) Sanchita (2010) Morakar (2012) Mo aMwaniki, Moffat Karo (2012)
Aspects related with Green funds/loan access, availability, and affordability to SMEs	Ganguly (1988), Balu (1991),SSubramanian and Pillai (1994), Bala Subrahmanya (2004) Sanchita (2010),Babajide and Abiola (2011), AnjuSingla & Parul Grover (2012), Kamugne et al (2014), Chandak (2016) Singh et al. (2012) AJitendra Kumar (2016)A Acosta, L. A., & Suresh, S. (2016), Zahid K. Jadoon (2017), Margaret Mutiria (2017) Zahid K. Jadoon (2017) nNgondjeb, D. Y. (2020)
Infrastructural facility	Kamugne et al (2014)
Access to Bond market to SMEs	Jaimin R. Vasu (2016), Ngondjeb, D. Y. (2020)
Awareness related aspects	Bahl (2012) , Sharma, Gopal et al. (2014), Chandak (2016),Gupta and Barua (2018)Verma, T. L., &Nema, D.

	K. (2019), Kaur et al., (2018) and Gupta and Barua (2018)
Exclusive loan products for SMEs	Margaret Mutiria (2017)
Issues related with green products and services demand	Gupta and Barua (2018) Ngondjeb, D. Y. (2020)
Waste management issues	Verma, T. L., & Nema, D. K. (2019), Ullah et al., ((2021). Cerminara, et al., (2020)
Cost of adoption of GFI	Kaur et al., (2018) and Gupta and Barua (2018) Wu (2017), Gupta and Barua, (2018)

We can identify after literature review that technology, Innovation, accessibility, availability, affordability of funds, awareness about these initiatives, government policies and schemes, waste management have been the main challenge which needed to be focused.

2.8 Research Gap

This study intends to facilitate structured discussion amongst stakeholders, especially those who are focused on establishing and expanding green financing projects and on how to boost SMEs' involvement in protecting the environment. H. Creech et al. (2014) highlighted that future research should focus on the role of national and local policy level environmental governance like policies, awareness level and participation of SMEs. According to the research by Wang and Zhi (2016) in India, there are few research on green finance, and beyond theoretical issues, there is little empirical evidence to explain green finance's underperformance. Although we have studies focusing on green finance, more research is required with regards to the adoption of green finance initiatives in SMEs. Much research on SMEs is there but what is less analysed is the role that these enterprises are playing in a green and sustainable economy. El-Kassar and Singh (2019), Yang et al. (2017), and Zhan et al. (2019) have conducted the majority of the study on the performance of green economy practices in the context of large organisations. The majority of environmental research has primarily focused on larger organizations (Redmond et al., 2008; Yacob et.al: 2018; Leonidou et al., 2017; Courrent et al., 2018; Boakye et al., 2020; Dey et al., 2020). Presently we have many studies on sustainable performance and financial performance of corporate but not SMEs. (Tang et al. 2020). According to Epstein and Buhovac (2014), developing nations should place a high priority in implementing sustainable green initiatives since they have a great demand and need for them. It is argued in one of the studies by Mansouri et al. (2015) that there are less multi-objective sorts

of study on subjects like sustainable green initiatives than there are single-objective studies. Likewise, many researchers recommend that instead of single aims, researchers should concentrate more on multi-objective studies. (Hwang et.al,2012; Govindan et al. 2015). However, earlier studies have controversial findings regarding the impact of GFIs on the enterprise green performance that too vary according to the region and firm type. So future research should focus on Future research should focus on effect of greening SMEs on sustainable growth (i.e. positive or negative).(Xu H. et al.2020) Robust analysis of greening SMEs, especially in developing countries, is still limited and researchers are suspicious about the adoption of green initiatives by SMEs and its impact in terms of their sustainable growth. (OECD, 2018). This research tries to fill this gap by focusing on the following issues:

1. Are any green finance initiatives available to SMEs?
2. Are they adopting these initiatives?
3. Does its adoption result in their sustainable growth?
4. Are there any challenges in adoption of these initiatives?
5. Are SMEs awareness of these initiatives?

Based on literature review it was found that most of the studies in India are on green banking, green marketing, green instruments etc. out of which maximum research focuses on the banking sector specifically. When it is in context with SMEs then those are restricted to CSR, sustainable supply chain, energy efficiency etc. Additionally, while previous research has explored various aspects of green initiatives and environmental sustainability, there was a lack of focus on the Indian, particularly Haryana SMEs. This study fills the gap by conducting one of the such research works in Haryana state that specifically investigates the implementation of environmental sustainability within the SMEs. There are comparatively less researches which comprehensively cover the various issues and challenges related with GFIs in context with SMEs in India. This study aims to address this issue. This research also offers suggestions for improving SMEs' ability to access green financing programmes. The goal is to make SMEs more competitive, which will improve revenue, profits, employment, and environmental protection.

So the theoretical frame work of thesis can be summed up as:

For a considerable duration, the MSME sector in India has played a crucial role as a prominent driver of the economy. These enterprises, despite having limited financial and intellectual resources, consistently take initiatives and strive to maintain smooth industrial operations. Their primary objective is to meet market demands while minimizing operational costs. However, over the past decade, global markets have experienced significant growth. In order for MSMEs to sustain their competitiveness on a global

scale, they require assistance in terms of intellectual expertise, technology, and financial support.

India's Nationally Determined Contribution (NDC) document highlights the launch of the Zero Effect, Zero Defect (ZED) initiative and the Make in India campaign in 2015. The ZED initiative aims to assess and rate approximately one million medium and small enterprises based on quality control and certification criteria. These criteria include parameters such as energy efficiency, resource efficiency, pollution control, utilization of renewable energy, and waste management. (msme.gov.in)

Chen et al. (2017) mentioned that SMEs are responsible for at least 70% of the industrial wastewater discharge. According to the Leading Practices Report for Haryana MSMEs in 2021, the majority of MSMEs rely on outdated technology, leading to higher operational costs in manufacturing. While manpower and raw material costs are beyond their control, MSMEs can focus on optimizing energy and utility costs. By adopting energy-efficient technology and best practices, they can improve resource efficiency and achieve cost optimization. Small and medium-sized enterprises (SMEs) are often constrained by limited financial resources (Khan et al., 2018). Cost reductions related to greening initiatives in small and medium-sized enterprises (SMEs) primarily stem from improved efficiency, improved product design, waste management and energy efficiency resulting in decreased resource inputs for the same level of output. These cost-saving measures can be achieved through various avenues, applicable to SMEs in both developed and developing contexts (OECD, 2018).

The MSME sector faces several barriers that hinder its progress, as mentioned in Gupta and Singh (2020) and TERI (2012). These barriers include inadequate capacity of MSME units, limited access to clean technologies, absence of local service providers, and gaps in traditional finance delivery mechanisms. These challenges have a detrimental impact on the sector's growth and development. These enterprises typically face challenges in investing in eco-friendly initiatives due to these financial limitations. Therefore, it is crucial for SMEs to have access to financial resources that can support their innovation efforts. Laforet (2011) highlighted that financial resources play a fundamental role in driving innovation in small enterprises. The ability of SMEs to adopt and leverage advanced technologies is contingent upon their access to funds, as it allows them to sustain and maintain innovative practices. Consequently, the availability of finances is of utmost importance for facilitating sustainable green innovation within SMEs. If a company has access to affordable, usable financial services that meet its financial needs, it has good access to finance. (Tang et al., 2020)

So, in order to achieve sustainable growth SMEs need to adopt GFIs. But there are different theories/views related with their implementation of environment improvement measures. According to previous studies (Epstein et al., 2017; Gian et al., 2019; Wang and Zhang, 2020; Wang W. et al., 2020; Zhan, 2020), the concept of business sustainability has gained significance, particularly in terms of environmental sustainability and social responsibilities. Business sustainability is typically influenced by three fundamental elements: environmental, economic, and social dimensions.

In 1994, Walley and Whitehead presented a neoclassical theory suggesting that environmental regulations impose additional costs on firms. They argued that pollution control measures increase production costs, implementing environmental performance improvements/ GFIs would reduce marginal net profit. According to this theory, green finance would have a negative impact on a firm's green performance. (Luo, C et al. 2017; He, L. et al. 2019)

However, in recent years, scholars have increasingly questioned the validity of the neoclassical theory. Alternative theories, such as the natural resource-based view (integrates environmental factors and suggests that organizations can leverage their resources to address environmental challenges and stakeholder theory (firms can meet the environmental demands of stakeholders, enhance organizational efficiency, and adapt to changes in the external environment) have gained prominence. In this context, green finance is seen as having a positive influence on a firm's green performance. (Hart, S.L. 2011; Xu H. et al.2020)

According to the Leading Practice Report for Haryana MSMEs in 2021, implementing energy-efficiency programs can lead to significant savings of 10% to 30% in energy costs over a three-year timeframe, as cited by the International Atomic Energy Agency (IAEA). Moreover, there exists substantial potential for indirect savings such as reduced maintenance costs, material expenses, and waste generation. These savings ultimately contribute to enhancing the competitiveness of an establishment or industrial sector.

Numerous researchers have arrived at similar conclusions. For example, Deng and Lu (2017) demonstrated that green finance policies can enhance the environmental performance of food firms, while Zhou et al. (2020) found that green finance has a significant positive impact on both the environment and the economy.

According to Bai et al. (2018), research revealed that green subsidies have a positive impact on enhancing the green efficiency and decomposition of enterprises. However, contrasting findings have been reported by other researchers. Wang et al. (2019) conducted a study and concluded that there is no significant positive relationship between environmental performance and corporate green financing. Additionally,

Pekovic et al. (2018) discovered that there exists an optimal level of environmental investment for enterprises. Inadequate or excessive environmental efforts can have a negative effect on enterprise performance. Ghadimi . P. et al (2021) the study reveals that GM practices in SMEs lead to lower manufacturing costs.

In summary, the neoclassical theory's assertion that green finance has a negative influence on enterprise green performance has been challenged by alternative theories such as the natural resource-based view and stakeholder theory. Many studies have supported the notion that green finance related initiatives have a positive impact on green enterprise performance. So our study also tries to find out the impact of GFIs on the sustainable growth of SMEs positive and negative?

Consequently, this study has chosen energy management, water conservation, and waste management, green technology adoption as the focus areas for research question development and testing in relation to green finance initiatives as identified by Yacob et.al, (2019). Along with that two more variables affordability and availability of GFIs are also included as identified by Basant, F. et al, (2018) as analyzing these initiatives is very crucial to know the implementation of GFIs in SMEs. Apart from that awareness level and challenges faced by SMEs in implementing GFIs are also taken into consideration as identified after thorough literature review and consultation with experts. By focusing on energy management, water conservation, and waste management, green technology adoption, affordability, availability as the key areas of GFIs along with awareness level and challenges faced by SMEs, this study adds to the body of knowledge.

This study evaluates 57 items on likert 5 point scale referred from published sources and consultation with experts in the field. (See table 3.2 and 3.3)

CHAPTER - 3

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology explains the process used to conduct the study. It functions as a type of blueprint that instructs the researcher on how to conduct the study. It is described as a systematic process to solve a problem. Research methodology can be described as a systematic approach to solving research problems (Kothari, 1990). In essence, literature reviews are a helpful hand that demonstrates the types of tools that can be utilised in what circumstances to conduct research regarding the study design and the methodologies employed in carrying out the research activity. The research methodologies that are derived from literature reviews are numerous. In other words, the research methodology is the particular approach taken to locate, select, organise, and analyse data relevant to a subject. The methodology section of a research study gives the reader the chance to judge the study's overall validity and dependability. The methodology section provides an explanation of the data collection and analysis process. A research technique is a methodical approach to carry out research. Sociologists use a number of qualitative and quantitative research techniques, such as participant observation, experiments, survey research, and secondary data. The majority of studies employ quantitative techniques with the goal of classifying characteristics, counting them, and building statistical models to test hypothesis and explain findings. Quantitative research is useful for examining implementation-related concerns. The goal of qualitative approaches is to provide a thorough, in-depth account of observations, including the conditions and context of happenings. This study has been done by the researcher in order to find out various things which are as follows:-

1. To find out green finance initiatives available to SMEs.
2. To examine whether there is proper implementation of green initiatives in small and medium enterprises.
3. To know the awareness level of SMEs regarding green finance initiatives.
4. To know the challenges faced by SMEs in proper implementation of green finance initiatives.

3.2 Title of the study

The title of the present study is “An Assessment of the Impact of Green Finance on Indian Initiatives at the Grassroots Level”

3.3 Research Objectives

1. To study the green finance initiatives for SMEs.

2. To examine implementation of green finance initiatives in SMEs.
3. To study the awareness level of SMEs regarding green finance initiatives.
4. To study the key grassroots level challenges in effective implementation of green finance initiatives.

3.4 Research Questions

Question 1: What green finance initiatives / policies are available to SMEs?

Question 2: What is the relationship between different green finance initiatives like energy management, waste management, water conservation, green technology adoption, availability, affordability and sustainable growth?

Question 3: What is the level of awareness regarding green finance initiatives in SMEs?

Question 4: Whether there are some challenges in the proper implementation of green finance initiatives?

3.5 Research Design

The research design is the strategy of the framework of research techniques and methods to be decided to integrate the different components of the research. In the study extensive literature review was followed by development of conceptual framework.

Population of the study

Population for this study is the SMEs in Haryana. The Leading Practice Report for Haryana MSMEs in 2021 highlights the remarkable economic growth the state has experienced since 2013-14. Throughout these four years, Haryana's growth has consistently outpaced the national average across its primary, secondary, and tertiary sectors. Notably, the manufacturing sector has played a crucial role, contributing around 18% to the state's Gross State Domestic Product (GSDP) and displaying steady growth at a Compound Annual Growth Rate (CAGR) of 7% over the past five years. This impressive performance has elevated Haryana to become one of the leading states in India, with its manufacturing sector now contributing close to the national average of 17-18% to the overall GSDP. Moreover, Haryana is now competing head-to-head with industrially advanced states like Gujarat (with a manufacturing GSDP contribution of 26-28%) and Maharashtra (with a contribution of 18-21%). Haryana state is the most favored destination for Industrial products. It is also a favoured home for auto majors and auto parts manufacturing. The state takes its pride as it is among the largest automobile hubs and is the manufacturer of two thirds of the passenger cars, 50% of the tractors and 60% of the motorcycles manufactured in the country. As the government is promoting carbon efficient technologies e.g. E- vehicles this state has great potential in the sustainable growth of the country. Haryana is emerged as IT hub and is at number three when it comes to software export. Gurugram ranks at number one in growth rate and technology infrastructure and second in

startup ecosystem. It is a major textile exporter whereas Panipat, Gurugram, Faridabad, Sonapat, Hisar are the robust textile destinations. (iebf. org.) Haryana's rank in ease of doing business has been 6 (2016) and 3 in (2018). Haryana is among the states which have successfully completed the ease of doing reforms which were mandated by Department of Expenditure. These reforms are significant indicators that the state has investment friendly business climate (PIB,2021). It means government is totally focused on benefitting the industrial sector by removing the hurdles in its proper functioning. Haryana is a state with 22 districts which are divided in four blocks according to industrial development (haryanaindustries.com.).

Block wise classification of Haryana Districts

Blocks	Classification Basis
A	Industrially developed areas
B	The 'intermediate development' areas
C	Industrially backward area
D	Most industrially backward areas

As this study is related with SMEs and Green Finance Initiatives adoption, we selected blocks A and B which are industrially developed and covers the following 14 districts

S.no.	Districts
1.	Ambala
2.	Faridabad
3.	Gurugram
4.	Jhajjar
5.	Panipat
6.	Rewari
7.	Sonepat
8.	Yamunanagar
9.	Hisar
10.	Rohtak
11.	Karnal
12.	Kurukshetra
13.	Palwal
14.	Panchkula

List of the SMEs in Haryana is mainly obtained from the office of Directorate of MSME, Haryana. Till now more than two lakh MSMEs are registered in Haryana on Udyam Registration portal of ministry of MSME. (As per Directorate of MSMEs in Haryana).

Sampling Method

The sampling method employed in this study consisted of purposive and convenience sampling, which are non-probability sampling techniques. Purposive sampling, also known as judgment or expert

sampling, involves selecting a representative sample based on expert knowledge of the population rather than using random selection methods. This approach allows researchers to choose participants who possess specific characteristics relevant to the study's objectives.

In this particular study, due to the COVID-19 lockdown restrictions, convenience sampling was utilized to reach the respondents. Convenience sampling involves selecting individuals who are readily available and accessible for participation. Despite not being representative of the entire population, convenience sampling was chosen for its practicality and cost-effectiveness in collecting primary data during the lockdown period.

Sample size

Determining an appropriate sample size is indeed a crucial aspect of research. The size of the sample should be optimal, neither too large nor too small, in order to achieve reliable and meaningful results. The determination of an adequate sample size depends on various factors, including the nature of the study and the type of analysis to be conducted. Different researchers have provided recommendations regarding minimum sample sizes. For instance, Comrey and Lee (1992) and Lam (2017) classified sample sizes of 50, 100, 200, 300, and 500 as very poor, poor, fair, good, and very good, respectively. A general rule of thumb suggests a minimum of 10 observations per variable. Kelloway (1998) and Marsh, Balla, and McDonald (1988) suggested a sample size of 200 for accurate goodness-of-fit measurements. Tabachnick and Fidell (2001) and Kline (2010) proposed a sample size of 100-200 cases or five cases per free parameter in the model as suitable. Loehlin and Beaujean (2016) recommended a sample size that is at least 50 more than eight times the number of variables in the model.

Considering Cochran's formula, for a large population with a 95% confidence level and a 5% margin of error, the sample size should be 385 or more. In your study, the sample size is approximately 10 times the number of cases/statements in the questionnaire, which aligns with the guidelines mentioned above.

Therefore, considering a target population of 500 respondents from SMEs operating in Haryana, which includes owners or officers, the chosen sample size appears reasonable.

Data Collection

This study is based on primary as well as secondary data. During survey, responses from 14 industrial districts of Haryana were encouraged instead of relying on few districts. Due to the type of the study, confidentiality and other reasons, it was a challenge to collect responses from the respondents.

The Research Instrument

Primary data for the research was gathered with a self-designed questionnaire to collect specific information. A questionnaire is a research

instrument used to collect responses from respondents about the topic for further analysis. It was created after thorough study of the existing literature. The research instrument was thoughtfully designed on the basis of existing scale and further, the developed scale contains questions from the earlier developed scale and the modified questions based on the existing studies and the thought of the researcher with consultation with experts. Finding the right quantifiable items for the questionnaire required months of preparation. During the questionnaire designing process experts from academics, Industry and officers of the government departments were also consulted and their expert views were taken into account (wording, content and level of understanding of respondents). Finally it contains 57 items (statements) in all on the basis of literature review and experts' advice. Pilot study was also done to check the correctness and completeness of the research instrument. Furthermore it validates the feasibility of the study. The respondents were directly approached. They were made aware about the purpose of research.

A self-designed questionnaire on a Likert scale of 1 to 5 was used to obtain all of the respondents' replies. 1 represents "strongly disagree," 2 "disagree," 3 "neutral," 4 "agree," and 5 "strongly agree." To provide an appropriate analytical guide to quantify the causal link, a five-point Likert scale was used. The questionnaire's design has mostly quantitative features.

Secondary Data

Secondary data refers to the data from already existing sources. It is from previously published sources. Secondary data helps in understanding the research problem and also guides the manner in which research should proceed. Secondary data for the study has been collected from sources like reputed research journals, government websites, magazines, books, various reports like reports of RBI, Niti Aayog, Ministry of MSME, All India MSME census etc. As the fourth and last MSME census was conducted long back in 2006-07, so it is less reliable now. Also the coverage of MSME sector is wider now (it now includes retail trade and many services). So the other reliable source for MSME data is the data bank of MSME Ministry and the Udyog Adhar Registration base. (rbi.org.in)

Data Collection Procedure

First of all a reliable list of addresses of SMEs was arranged through office of Haryana Industries department, offices of Directorate of MSMEs, Haryana, Renewable Energy Development Authority (HREDA), District Industries Centres and many more through personal contacts and referrals. Till now more than two lakh MSMEs are registered in Haryana on Udyam Registration portal of ministry of MSME (As per Directorate of MSMEs in Haryana). Collecting data during covid-19 was a challenge. As the starting of data collection period was influenced by lockdowns and restricted movement so researcher firstly relied on online google form

technique but the results were not satisfactory. Then researcher started collecting data telephonically and writing down the responses on excel sheet. Many cluster heads were also contacted and response was positive but it was also not fully beneficial as we could not collect many responses through this method. When lockdown and other restrictions were relaxed, personal data collection was also done. Respondents were hesitant when personally contacted due to the Coronavirus issue. Most of the time they were hesitant touching the questionnaire and talking comfortably. Some respondents even did not take the printed questionnaire. In those cases researchers asked the questions verbally and marked the answers in questionnaire. Some respondents found to be reluctant in their response as they were suspicious about the nature of study as it included the questions related to adoption of green measures in their organisation. Efforts were made to make them understand the nature of study and maintaining the confidentiality of data. It was very challenging and required more follow-ups and personal requests.

The completed responses were either gathered on the spot or the questionnaires were left with them to be collected at some later designated date. Most of the data collection by personal visits was done during the period of September-October – November-December 2021. Maximum data was collected from manufacturing SMEs considering the nature of the study.

3.6 Data Analysis Techniques

The data collected through the questionnaire was coded and tabulated in Microsoft Office Excel 2013. To analyse data, IBM SPSS (Statistical Package for Social Sciences) is used. SPSS Analytics is a mathematical data processing software package.

Table 3.1 Methodology/ Tools/ Instruments to be used

Objective	Instrument/ Tool/ sample design etc. to be used
1.To study the of green finance initiatives for SMEs	The research learning will be based on secondary data analysis.
2. To examine implementation of green finance initiatives in SMEs	The research learning will be based on primary data sources. Multiple Regression Analysis and descriptive statistics.
3. To study the awareness level of SMEs regarding green finance initiative.	Questionnaire Sources. Descriptive Statistics, Exploratory Factor Analysis(EFA), Confirmatory Factor analysis (CFA)
4. To study the key grassroots level challenges in effective implementation of green finance initiatives.	Using primary data sources. Descriptive statistics.

Table 3.2 Variables Defined

Name of variables/ constructs	Explanation
Waste management	Rapid industrialization has resulted in huge quantities of waste generation and these wastes are generally discharged in water bodies or dumped on land without its proper treatment which results in environmental health hazards. (Patricio et al.,2015; Winfrey and Tilley, 2016) This negatively impacts the sustainability of the SMEs. The main problem of waste management occurs due to unsustainable consumption pattern adopted in processes (Tchobanoglous, 2009). Joint efforts by SMEs and government bodies could be evolved for better management.
Energy management	As per Bureau of Energy Efficiency, GOI, Ministry of Power, every year, the SME sector uses the energy equivalent of around 50 million tonnes of oil, which is roughly 20–25% of the energy used by major businesses. Additionally, energy is frequently the single highest expenditure in the majority of SME's, which lowers the productivity of these businesses. Due to a number of constraints like lack of resources, expertise, rising fuel prices and other constraints, SMEs are not able to adopt energy efficiency technologies in their operations. (Rizzo and Fulford,2012) Dedicated green finance initiatives could help them achieve energy efficiency and enhance competitiveness.
Green technology adoption	Technology and quality management have now emerged as very important factors for enhancing the competitiveness of industries. Technology up gradation means use of efficient, energy saving, waste reducing, quality improving methods and processes, tools, plant and machinery by the industries. Large industries having sufficient information and funds can easily implement these strategies into their operations but SMEs having many constraints are unable to adopt these initiatives and remain uncompetitive. Use of green technology helps in energy and water savings, and it also reduces waste. (Rao & Hault, 2005, Yacob et al., 2019) and a good number of green

	finance initiatives could help SMEs overcome these constraints.
Water conservation	Kenny et al, (2009) analysed that water conservation is an important issue in the industries but they do not pay heed to water conservation in their routine processes and practices. SMEs generally ignore water conservation practices due to financial constraints. (Bay and Rasmussen, 2011) (Chang and Slaubaugh 2017, Depken and Zeman (2018)
Availability of GFIs	There should be sufficient schemes, channels of financing, training programs and service providers for adoption of available GFIs. (Unit 2015, Basant, F. et al, 2018)
Affordability GFIs	Adequacy and affordability of GF to promote investment in sustainable initiatives/practices/GFIs (Unit 2015, Basant, F. et al, 2018
Awareness of GFIs	There is a need to sensitise SMEs about environmental impact and its impact on their sustainability. Increasing education, training programs and awareness about green practices are prerequisites for SMEs to adopt green initiatives. SMEs are generally not much aware of financial benefits related with adoption of GFIs. Rao et al. (2009) Not much awareness about government schemes and benefits to adopt GFIs (OECD, 2017, Junia A. Purwandani and Gilbert Michaud, 2021)
Sustainable Growth of SMEs	Sustainable growth is a growth which promotes a more resource efficient, greener and competitive economy. (Yacob et al., 2019) elaborated that SMEs which are innovative and manage waste generation and environment cost will gain competitive advantage. Adoption of green initiatives help SMEs attain sustainable growth. As per (Costello, 2008) adoption of GFIs provides SMEs with financial, operational and environmental benefits. GFI adoption also ensures training and skill enhancement in employees. (Lin & Huang, 2012; Sezen & Cankaya, 2013; Dubey et al., 2014; Loiseau et al.2016) Green economy related green practices are perceived as a

	pathway to green and sustainable growth. Businesses find new market opportunities (Rao et al.2009). Firms gain financial benefit, people benefits, commercial benefits (competitive advantage) and environmental benefits. (Junia A. Purwandani and Gilbert Michaud, 2021) (Chang and Slaubaugh 2017)
Challenges in Implementation of GFIs	Already explained after literature review in table 2.1 in chapter 2

Table 3.3 Constructs of the Questionnaire

S. No	Constructs	Scale Adoption	References
EE	Energy management:-	Likert Scale	
EE1	Organisation ensures activities minimise the energy used.	Methods for decision-making in survey questionnaires based on Likert scale, Barua, A. (2013)	Yacob et.al (2018)
EE2	Organisations' activities ensures minimum emissions to air	Same	Yacob et.al (2018)
EE3	Organisation set measurable targets to reduce energy usage	Same	Yacob et.al (2018)
EE4	Organisation applies effective strategies to improve energy management	Same	Yacob et.al (2018)
EE5	Organization regularly monitors energy consumption trends.	Same	Yacob et.al (2018)
WC	Water conservation:-	Likert Scale	
WC1	Organization promotes the water reuse in production processes	Same	Yacob et.al (2018)
WC2	Organization set measurable targets for reducing water usage	Same	Yacob et.al (2018)

WC3	Organization applies effective water conservation strategies.	Same	Yacob et.al (2018)
WC4	Organization monitors the water usage trends	Same	Yacob et.al (2018)
WC5	Organisation minimises the amount of effluent to water	Same	Yacob et.al (2018)
WM	Waste management-:	Likert Scale	
WM1	Organization ensures in minimizes waste from its activities	Same	Yacob et.al (2018)
WM2	Organization promotes the recycling of waste	Same	Yacob et.al (2018)
WM3	Organization set measurable waste reduction targets.	Same	Yacob et.al (2018)
WM4	Organization ensures the disposal of hazardous waste disposal by complying with all existing legislation standards	Same	Yacob et.al (2018)
WM5	Organization monitors on-site and off-site waste disposal	Same	Yacob et.al (2018) Tchobanoglou s (2009)
GTA	Green technology adoption-:	Likert Scale	
GTA1	Organization uses energy efficient technology	Same	Yacob et.al (2018)
GTA2	Organization controls carbon footprint by adopting latest technology	Same	Yacob et.al (2018)
GTA3	Organization is not fully benefitted by green technology financing schemes	Same	Yacob et.al (2018)
GTA4	Organization believes in technology up gradation and innovation for long term sustainability	Same	Compiled after literature review
GTA5	Organization adopts Zero Defect and Zero Effect policy to make environmentally friendly products.	Same	Compiled after literature review

Ava	Availability-:	Likert Scale	
Ava1	There are not sufficient programs and schemes targeting SMEs	Same	Compiled after literature review
Ava2	There are not varieties of channels for distribution of green finance in SMEs.	Same	Basant, F. et al(2018)
Ava3	There are not sufficient service providers/agents for availing GFIs	Same	Basant, F. et al(2018)
Ava4	There are not sufficient facilities/training programs for adopting GFIs	Same	Compiled after literature review
Aff	Affordability-:	Likert Scale	
Aff1	GFIs require huge investment.	Same	Compiled after literature review
Aff2	GFIs not available on easy terms and conditions	Same	Basant, F. et al (2018)
Aff3	Lots of paperwork and formalities involved in availing GFIs.	Same	Basant, F. et al (2018)
Aff4	There is no trade off between low interest rates and quality of services provided by GFIs.	Same	Basant, F. et al (2018)
Awa	Awareness-:	Likert Scale	
Awa1	Top level management has an understanding of GFIs policies and their implications.	Same	Basant, F. et al(2018)
Awa2	Government is not taking sufficient steps to raise awareness regarding GFIs. (workshops/ seminar)	Same	Compiled after literature review
Awa3	Organization is less aware of use of energy efficient methods.	Same	Compiled after literature review
Awa4	Organization is less aware of the term green finance.	Same	Compiled after literature review and

			expert consultation
Awa5	Environment protection improves SMEs long run sustainability	Same	Compiled after literature review
Awa6	There exists a trade-off between financial and social performance in GFIs applied by SMEs. .	Same	Basant, F. et al(2018)
Awa7	Organization is less aware of green technology adoption schemes.	Same	Compiled after literature review and expert consultation
Awa8	Green finance is a social investment by nature	Same	Basant, F. et al(2018)
Awa9	My company chooses its GFIs after a good study of all programs available.	Same	Basant, F. et al(2018)
Awa 10	Not much awareness about green finance schemes.	Same	Compiled after literature review Heather Creech et.al 2014
SG	Sustainable Growth-:	Likert Scale	
SG1	Adopting green practices helps in SMEs long term sustainability	Same	Basant, F. et l(2018)
SG2	Ensures compliance with Government's legislation	Same	Yacob et.al (2018)
SG3	Competitiveness in my company is based on capabilities like innovation, skills.	Same	Basant, F. et al(2018)
SG4	My company promotes investment in people like training and development programs for its employees.	Same	Basant, F. et al(2018)
SG5	Green Finance Initiatives reduces negative impacts on environment.	Same	Yacob et.al (2018)
SG6	Organization works on maximizing the efficient use of resources.	Same	Basant, F. et al(2018)

SG7	Pollution in my company is considered from both sides; production and consumption.	Same	Basant, F. et al(2018)
SG8	Adoption of GFIs improves financial performance	Same	Yacob et.al (2018)
SG9	Organization benefits from government's incentives	Same	Yacob et.al (2018)
SG10	Helpful to gain market opportunities	Same	Yacob et.al (2018)
	Challenges in implementation of GFIs	Likert Scale	
GP	Government Policies		
GP1	The environmental norms are complex	Same	Compiled after literature review
GP2	The regulatory regime is unsupportive	Same	Compiled after literature review
GP3	There are not much green finance policies/schemes for SMEs	Same	Compiled after literature review
CoA	Cost of adoption of GFIs		
CoA1	The availability and affordability of funds for adoption of GFIs is a challenge	Same	Compiled after literature review
CoA2	Additional costs for due diligence and certification	Same	Compiled after literature review
CoA3	Environmental compliance imposes financial burden on SMEs(skilled labour/ improved technology etc)	Same	Compiled after literature review
	Trained and skilled labor		
T&SL 1	GFI adoption requires skilled labour	Same	Heather Creech et.al 2014

T&SL 2	Skilled labour is not available on affordable terms and conditions to SMEs	Same	Compiled after literature review
T&SL 3	Providing training and skills to labour generates additional burden on SMEs	Same	Compiled after literature review

3.7 Descriptive Statistics used in the study

Mean

The mean is also called average which is the sum of a set of data divided by the number of data. The mean is the most commonly used effective tool of all position measures as it is easily understandable and has useful mathematical properties that enable it to be used in a variety of statistical contexts (Whitley & Ball, 2001). It has been used to calculate the average score of SMEs adoption of green finance initiatives.

Standard Deviation

It provides information on the dataset's variance from the mean. When the standard deviation is low, it means that the data are grouped around the mean, but when it's large, it means that the values are spread out over a broader range. It is an effective tool for gauging normal distribution.

Normality of Data

Normality of data can be understood as a specific type of statistical distribution called a normal distribution and sometimes it may be called the Gaussian distribution or bell-shaped curve. It is a symmetrical continuous distribution which is defined by the mean and standard deviation of the data. Normality tests are conducted to tests whether a dataset is distributed in a way consistent with a normal distribution. For the data analysis, the values of skewness and kurtosis are estimated to determine the normality of data with skewness and kurtosis is zero. Practically, obtaining a perfectly normal curve is difficult. As a result, for psychometric analysis, suitable skewness values should range from -2 to +2 (George & Mallery, 2010).

Confirmatory Factor Analysis (CFA)

Confirmatory factor analysis (CFA) is a form of factor analysis which is most of the times used in social research. It is a multivariate quantitative method to test the hypothesis whether a relationship exists between observed variables and their underlying latent construct. CFA is used to know the assessment of fit between observed data and a pre conceptualised model. (Grounded Model)

Model Fitness

To assess model fit, four statistics were taken into consideration. Fit describes how well a model can reproduce the results. Four fit indices—Root Mean Square Error of Approximation (RMSEA), Chi-square

(2), Comparative Fit Index (CFI) are used to assess the proposed model's fit in the CFA. The most fundamental fit metric is the χ^2 model fit, which is an absolute fit index that implies multivariate normality and is seen as being adaptable to sample size (Gerbing & Anderson, 1992). It assesses the null hypothesis that the covariance structure of the proposed model is identical to that of the observed covariance matrix. (Byrne, 2013) As the sample size grows and the number of degrees of freedom rises, so does the chi square value, which is dependent on the sample size. The relationship between the suggested model and the observed covariance matrix is measured by the Goodness of Fit Index (GFI). The sample size has an impact on this matrix. Root Mean Square Error of Approximation (RMSEA) Index is an absolute fit index, in that it assesses how far a hypothesized model is different from an observed covariance matrix. It is highly efficient when the sample size is large. A measure of incremental fit is called a Comparative Fit Index (CFI). The manifest covariance matrix's assessment of the studied model's performance in comparison to an alternative model is shown by the CFI (Chen, 2007). Higher numbers suggest a better match, and the CFI values range from 0 to 1.

Suggested model fitness estimates

The Goodness of Fit Indices	Recommended values when N >250
Absolute Model Fit	Significant P-values expected p-value >0.05
Chi-Square CMIN/DF	<3
The Goodness of Fit Index/GFI	>0.80
RMSEA	<0.70
Incremental Model Fit Adjusted Goodness of Fit (AGFI)	>0.80, is usually less than the value of GFI
Standardized Root Mean Residual (SRMR)	>0.80 or less
Normal Fit Index (NFI)	>0.90
CFI	>0.90

(Source: Hair, Black, Babin, Anderson & Tatham 2006; Kline, 2011)

3.8 Conclusion

The creation of the entire framework, from the research design to the location of data collection, has been explored under this chapter of research technique. This chapter has explained the research methodology, the hypothesis being framed, sampling procedure, pilot study, and data collection methods. It also discussed the survey questionnaire, its constructs, scaling and structure. Different statistical techniques such as factor analysis, CFA, and Goodness-of-fit measures were also discussed.

CHAPTER – 4

OBJECTIVE WISE ANALYSIS AND INTERPRETATION

4.1 Preliminary Analysis

The preliminary analysis was conducted in the form of measuring the data normality by using skewness and kurtosis, reliability analysis for measuring the consistency and lastly, the confirmatory factor analysis for the validity checking for the individual as well as constructs of the study.

4.1.1 Case Processing Summary

From table 4.1 (Case Processing Summary) it is evident that the value of valid N i.e., number of values present in the data set is 500 which is 100% of the total population which states that values of the entire population are present in the data set. Whereas the value of missing N i.e., number of values missing in the data set is 0 which is 0% of the total population which states that there are no missing values present in the data set and the data set is valid for further processing.

Table 4.1 Case Processing Summary

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
EE1	500	100.0%	0	0.0%	500	100.0%
EE2	500	100.0%	0	0.0%	500	100.0%
EE3	500	100.0%	0	0.0%	500	100.0%
EE4	500	100.0%	0	0.0%	500	100.0%
EE5	500	100.0%	0	0.0%	500	100.0%
WC1	500	100.0%	0	0.0%	500	100.0%
WC2	500	100.0%	0	0.0%	500	100.0%
WC3	500	100.0%	0	0.0%	500	100.0%
WC4	500	100.0%	0	0.0%	500	100.0%
WC5	500	100.0%	0	0.0%	500	100.0%
WM1	500	100.0%	0	0.0%	500	100.0%
WM2	500	100.0%	0	0.0%	500	100.0%
WM3	500	100.0%	0	0.0%	500	100.0%
WM4	500	100.0%	0	0.0%	500	100.0%
WM5	500	100.0%	0	0.0%	500	100.0%
GTA1	500	100.0%	0	0.0%	500	100.0%
GTA2	500	100.0%	0	0.0%	500	100.0%
GTA3	500	100.0%	0	0.0%	500	100.0%

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GTA4	500	100.0%	0	0.0%	500	100.0%
GTA5	500	100.0%	0	0.0%	500	100.0%
SG1	500	100.0%	0	0.0%	500	100.0%
SG2	500	100.0%	0	0.0%	500	100.0%
SG3	500	100.0%	0	0.0%	500	100.0%
SG4	500	100.0%	0	0.0%	500	100.0%
SG5	500	100.0%	0	0.0%	500	100.0%
SG6	500	100.0%	0	0.0%	500	100.0%
SG7	500	100.0%	0	0.0%	500	100.0%
SG8	500	100.0%	0	0.0%	500	100.0%
SG9	500	100.0%	0	0.0%	500	100.0%
SG10	500	100.0%	0	0.0%	500	100.0%
Ava1	500	100.0%	0	0.0%	500	100.0%
Ava2	500	100.0%	0	0.0%	500	100.0%
Ava3	500	100.0%	0	0.0%	500	100.0%
Ava4	500	100.0%	0	0.0%	500	100.0%
Aff1	500	100.0%	0	0.0%	500	100.0%
Aff2	500	100.0%	0	0.0%	500	100.0%
Aff3	500	100.0%	0	0.0%	500	100.0%
Aff4	500	100.0%	0	0.0%	500	100.0%
Awar1	500	100.0%	0	0.0%	500	100.0%
Awar2	500	100.0%	0	0.0%	500	100.0%
Awar3	500	100.0%	0	0.0%	500	100.0%
Awar4	500	100.0%	0	0.0%	500	100.0%
Awar5	500	100.0%	0	0.0%	500	100.0%
Awar6	500	100.0%	0	0.0%	500	100.0%
Awar7	500	100.0%	0	0.0%	500	100.0%
Awar8	500	100.0%	0	0.0%	500	100.0%
Awar9	500	100.0%	0	0.0%	500	100.0%
Awar10	500	100.0%	0	0.0%	500	100.0%
CHIM 1	500	100.0%	0	0.0%	500	100.0%
CHIM 2	500	100.0%	0	0.0%	500	100.0%
CHIM 3	500	100.0%	0	0.0%	500	100.0%
CHIM 4	500	100.0%	0	0.0%	500	100.0%
CHIM 5	500	100.0%	0	0.0%	500	100.0%
CHIM 6	500	100.0%	0	0.0%	500	100.0%
CHIM7	500	100.0%	0	0.0%	500	100.0%
CHIM 8	500	100.0%	0	0.0%	500	100.0%
CHIM 9	500	100.0%	0	0.0%	500	100.0%

4.1.2 Skewness and Kurtosis Measures

The basic task of various statistical analysis is to characterize the location and volatility of datasets. A detailed description of the data includes skewness and kurtosis. Skewness is a measure the regularity, more specifically the lack of regularity. Spreads or datasets are symmetric if the data look the same on the left and right sides of the center. Kurtosis is a measure of whether the data is stronger or weaker than the normal distribution. In other words, strong tails or outliers are more common in sharp datasets. Datasets with low kurtosis often have no outliers or a very minor hem. All symmetric data should have skewness that are quite near to zero since the skewness of the normal distribution is zero. Data that is distorted to the left is indicated by negative skewness values, and data that is distorted to the right is shown by positive skewness values. The acceptable value of skewness is in between -1.98 to +1.98 and for Kurtosis is also in between -1.98 to +1.98.

All the variables have the values of skewness and kurtosis in between the acceptable ranges of skewness and kurtosis. Hence it can be said that the data collected is neither skewed nor kurtotic in nature and is acceptable for further processing.

Table 4.2 Descriptive Statistics

Descriptive Statistics					
	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
EM1	500	-1.405	.109	1.533	.218
EM2	500	-1.205	.109	.800	.218
EM3	500	-1.415	.109	1.319	.218
EM4	500	-1.381	.109	1.253	.218
EM5	500	-1.515	.109	1.800	.218
WC1	500	-1.420	.109	1.331	.218
WC2	500	-1.460	.109	1.553	.218
WC3	500	-1.382	.109	1.099	.218
WC4	500	-1.494	.109	1.662	.218
WC5	500	-1.348	.109	1.224	.218
WM1	500	-1.339	.109	.893	.218
WM2	500	-1.355	.109	1.377	.218
WM3	500	-1.437	.109	1.708	.218
WM4	500	-1.341	.109	1.125	.218
WM5	500	-1.296	.109	.948	.218
GTA1	500	-1.304	.109	.901	.218
GTA2	500	-1.272	.109	.893	.218
GTA3	500	-1.371	.109	1.120	.218

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GTA4	500	-1.431	.109	1.496	.218
GTA5	500	-1.398	.109	1.255	.218
AVL1	500	-1.263	.109	.906	.218
AVL2	500	-1.422	.109	1.372	.218
AVL3	500	-1.510	.109	1.837	.218
AVL4	500	-1.393	.109	1.284	.218
AFF1	500	-1.465	.109	1.656	.218
AFF2	500	-1.422	.109	1.532	.218
AFF3	500	-1.457	.109	1.555	.218
AFF4	500	-1.334	.109	1.024	.218
AWAR1	500	-1.407	.109	1.384	.218
AWAR2	500	-1.371	.109	1.173	.218
AWAR3	500	-1.363	.109	1.282	.218
AWAR4	500	-1.422	.109	1.163	.218
AWAR5	500	-1.476	.109	1.743	.218
AWAR6	500	-1.384	.109	1.238	.218
AWAR7	500	-1.527	.109	1.763	.218
AWAR8	500	-1.414	.109	1.435	.218
AWAR9	500	-1.350	.109	1.167	.218
AWAR10	500	-1.332	.109	1.174	.218
SG1	500	-1.335	.109	.971	.218
SG2	500	-1.351	.109	1.021	.218
SG3	500	-1.411	.109	1.364	.218
SG4	500	-1.479	.109	1.751	.218
SG5	500	-1.396	.109	1.176	.218
SG6	500	-1.398	.109	1.278	.218
SG7	500	-1.410	.109	1.706	.218
SG8	500	-1.417	.109	1.388	.218
SG9	500	-1.341	.109	1.352	.218
SG10	500	-1.519	.109	1.727	.218
CHIM1	500	-1.376	.109	1.219	.218
CHIM2	500	-1.307	.109	.980	.218
CHIM3	500	-1.423	.109	1.531	.218
CHIM4	500	-1.415	.109	1.436	.218
CHIM5	500	-.525	.109	-.972	.218
CHIM6	500	-.518	.109	-1.198	.218
CHIM7	500	-.664	.109	-.774	.218
CHIM8	500	-.513	.109	-1.039	.218
CHIM9	500	-.652	.109	-.879	.218

4.1.3 Data Screening

After data collection, the following step is to look for missing values and outliers in the raw data and rectify them so that the multivariate analysis's presumptions are not broken. An observation that stands out from the rest of the data set is referred to as an outlier. An outlier is less likely to follow the same statistical distribution compared to the other data set findings. There were no data omissions discovered. The extreme outliers in the data set were identified using box plots for all variables. A visual depiction of data dispersion is a box plot. The lower quartile (Q1) and upper quartile (Q2) are shown along with the median (Q3). An outlier is any observation that deviates from this range (Walfish & Ball, 2006). There are no outliers present in variables and can be considered for further processing. Hence the box plot for variables shows that there are no outliers present in the data collected.

4.1.4 Reliability Analysis and Validity Analysis

Various types of reliability and validity may be used to determine the soundness of a psychometric scale. In present study, Cronbach's alpha, reliability as well as content and construct and other forms of reliability and validity were assessed for the scale used in this study. (Malhotra, Hall, Shaw & Crisp, 1996)

Reliability Analysis

Reliability analysis was conducted to evaluate the stability of a measurement tool and the internal consistency of its results (Kirk and Miller, 1986). In empirical research, Cronbach's alpha is widely used to assess the internal consistency of a scale (Cronbach, 1951; Henson, 2001). Cronbach's alpha measures the degree of accountability, specifically the accountability for the internal consistency or interdependence of items, scales, or tests, such as questionnaires. Internal consistency refers to a measurement where all aspects of a scale or test contribute positively to the same underlying construct. It is important to note that accountability pertains to the data itself, rather than the scale or the measurement.

Cronbach's alpha values range between 0 and 1. Values closer to 1.0 indicate higher internal consistency of the scale variables. A Cronbach's alpha value of 1.0 represents perfect dimensional consistency, while a value of 0.0 signifies no consistency among the dimensions. Unlike other reliability estimation techniques that require data from two different time points (e.g., pre-test reliability or test-retest reliability), Cronbach's alpha can be calculated using a single sample. It is generally considered respectable when Cronbach's alpha exceeds 0.70. However, some researchers have suggested lower acceptance thresholds for Cronbach's alpha, such as Nunnally (1978), who proposed that values as low as 0.50 can be acceptable for exploratory research. Hair et al. (2011) also argue that

although a value of 0.70 is commonly seen as respectable, values as low as 0.60 can be acceptable for exploratory research. In our study, all the obtained values fell within these acceptable ranges. The use of Cronbach's alpha is appropriate for the current study since the majority of responses were collected using a five-point scale.

Case Processing Summary			
		N	%
Cases	Valid	500	100.0
	Excluded ^a	0	.0
	Total	500	100.0

Case Processing summary shows that no variable was found missing while calculating the reliability of the data collected from field. Hence multiple imputation technique will not be applied to this study and data collected is ready for further study.

Energy management- Factor 1	
Reliability Statistics	
Cronbach's Alpha	N of Items
.747	5

Reliability statistics of factor energy management is 0.747 which is above the acceptable value of 0.5 if there are less than 10 items in the scale and 0.7 if there are more than 10 items in the scale (Nunnally, 1978 and Hinkin, 1998). Cronbach's alpha value 0.747 states that if same set of respondents are again given the same set of questionnaires at different time, then there are 74.7 % chances that they will give same responses.

Water conservation- Factor 2	
Reliability Statistics	
Cronbach's Alpha	N of Items
.736	5

Reliability statistics of factor water conservation is 0.736 which is above the acceptable value of 0.5 if there are less than 10 items in the scale and 0.7 if there are more than 10 items in the scale (Nunnally, 1978 and Hinkin, 1998). Under reliability statistics the Cronbach's alpha value 0.736 states that if same set of respondents are again given the same set of questionnaires at different time, then there are 73.6% chances that they will give same responses.

Waste management- Factor 3

Reliability Statistics	
Cronbach's Alpha	N of Items
.747	5

Reliability statistics of factor waste management is 0.747 which is above the acceptable value of 0.5 if there are less than 10 items in the scale and 0.7 if there are more than 10 items in the scale (Nunnally, 1978 and Hinkin, 1998). The Cronbach's alpha value 0.747 states that if same set of respondents are again given the same set of questionnaires at different time, then there are 74.7% chances that they will give the same responses.

Green technology adoption- Factor 4

Reliability Statistics	
Cronbach's Alpha	N of Items
.766	5

Reliability statistics of factor green technology adoption is 0.766 which is above the acceptable value of 0.5 if there are less than 10 items in the scale and 0.7 if there are more than 10 items in the scale (Nunnally, 1978 and Hinkin, 1998). The Cronbach's alphavalue 0.766 states that if same set of respondents are again given the same set of questionnaires at different time, then there are 76.6% chances that they will give same responses.

Availability- Factor 5

Reliability Statistics	
Cronbach's Alpha	N of Items
.726	4

Reliability statistics of factor Availability is 0.726 which is above the acceptable value of 0.5 if there are less than 10 items in the scale and 0.7 if there are more than 10 items in the scale (Nunnally, 1978 and Hinkin, 1998). Cronbach's alpha value 0.726 states that if the same set of respondents are again given the same set of questionnaires at different time, then there are 72.6% chances that they will give the same responses.

Affordability- Factor 6

Reliability Statistics	
Cronbach's Alpha	N of Items
.668	4

Reliability statistics of factor Affordability is 0.668 which is above the acceptable value of 0.5 if there are less than 10 items in the scale and 0.7 if

there are more than 10 items in the scale (Nunnally, 1978 and Hinkin, 1998). The Cronbach's alpha value 0.668 states that if same set of respondents are again given the same set of questionnaires at different time, then there are 66.8% chances that they will give same responses.

Awareness- Factor 7

Reliability Statistics	
Cronbach's Alpha	N of Items
.853	10

Reliability statistics of factor Awareness is 0.853 which is above the acceptable value of 0.5 if there are less than 10 items in the scale and 0.7 if there are more than 10 items in the scale (Nunnally, 1978 and Hinkin, 1998). The Cronbach's alpha value 0.853 states that if same set of respondents are again given the same set of questionnaires at different time, then there are 85.3% chances that they will give same responses.

Sustainable Growth- Factor 8

Reliability Statistics	
Cronbach's Alpha	N of Items
.848	10

Reliability statistics of factor sustainable growth is 0.848 which is above the acceptable value of 0.5 if there are less than 10 items in the scale and 0.7 if there are more than 10 items in the scale (Nunnally, 1978 and Hinkin, 1998). The Cronbach's alpha value 0.848 states that if the same set of respondents are again given the same set of questionnaires at different times, then there are 84.8% chances that they will give same responses.

Challenges in implementation of GFI- Factor 9

Reliability Statistics	
Cronbach's Alpha	N of Items
.668	9

Reliability statistics of factor challenges in implementation of is 0.668 which is above the acceptable value of 0.5 if there are less than 10 items in the scale and 0.7 if there are more than 10 items in the scale (Nunnally, 1978 and Hinkin, 1998). The Cronbach's alphavalue 0.668states that if same set of respondents are again given the same set of questionnaires at different time, then there are 66.8% chances that they will give same responses.

Overall individual Questions reliability

Reliability statistics of the questionnaire is 0.971 which is above the acceptable value of 0.7 (Nunnally,1978 and Hinkin,1998).

	Cronbach's Alpha
EM1	.964
EM2	.964
EM3	.964
EM4	.964
EM5	.964
WC1	.964
WC2	.964
WC3	.964
WC4	.964
WC5	.964
WM1	.964
WM2	.964
WM3	.964
WM4	.964
WM5	.964
GTA1	.964
GTA2	.964
GTA3	.964
GTA4	.964
GTA5	.964
AVL1	.964
AVL2	.964
AVL3	.964
AVL4	.964
AFF1	.964
AFF2	.964
AFF3	.964
AFF4	.964
AWAR1	.964
AWAR2	.964
AWAR3	.964
AWAR4	.964
AWAR5	.964
AWAR6	.964
AWAR7	.964
AWAR8	.964
AWAR9	.964

AWAR10	.964
SG1	.964
SG2	.964
SG3	.964
SG4	.964
SG5	.964
SG6	.964
SG7	.964
SG8	.964
SG9	.964
SG10	.964
CHIM1	.964
CHIM2	.964
CHIM3	.964
CHIM4	.964
CHIM 5	.965
CHIM6	.965
CHIM7	.965
CHIM8	.965
CHIM9	.965

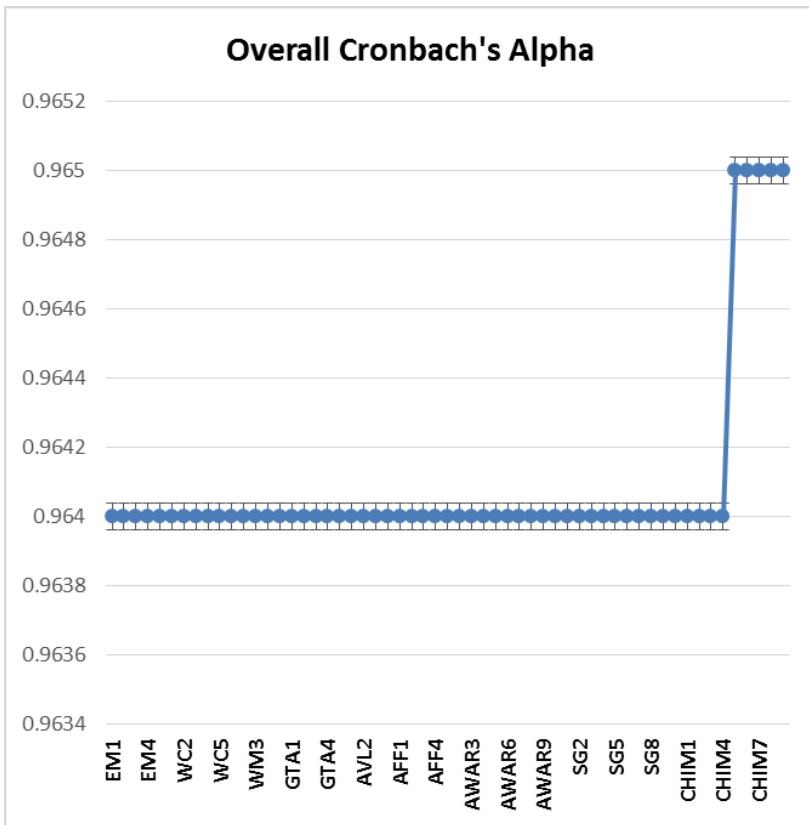


Figure 4.1 Overall Cronbach's Alpha

4.1.4 Validity Check

Validity refers to the extent to which a measuring instrument accurately reflects the true differences among individuals being measured. Various methods are employed to establish the validity of a measuring tool, including face validity, content validity, and construct validity (Carmines & Zeller, 1979).

Content Validity

Content validity assesses whether a measuring tool adequately covers the topic under investigation. It refers to the extent to which a measurement or assessment tool encompasses all the relevant and important aspects of the construct being measured. In the context of a

measurement model, content validity ensures that the items or indicators included accurately represent the construct of interest. To establish content validity, it is crucial to have a clear definition of the construct being measured and a thorough understanding of its underlying dimensions. This can be achieved through a comprehensive literature review, expert opinions, and input from relevant stakeholders. Once the construct is well-defined, a set of items or indicators is developed to capture its various dimensions. These items are then reviewed by experts in the field to ensure their relevance, comprehensiveness, and alignment with the construct. Pilot testing the measurement model with a representative sample of the target population further helps establish content validity. The data collected during the pilot test is analyzed to assess how well the items or indicators reflect the underlying construct. Overall, establishing content validity in a measurement model requires a systematic and rigorous approach that considers the construct, the items used, and the feedback from experts and stakeholders. In this study, a pilot study of the questionnaire was conducted to assess its reliability and validity.

Face Validity

Face validity relates to whether the statements and questions in a questionnaire are appropriate for the study at hand. To confirm face validity, experts from academic and industrial communities were consulted. Additionally, a pilot test was conducted to identify any flaws or discrepancies in the questionnaire. Based on the feedback received, necessary adjustments were made to improve the questionnaire's face validity.

Construct Validity

Construct validity refers to the extent to which a test accurately measures what it is intended to measure. It ensures that the test has been designed in a way that effectively validates its claims. Confirmatory factor analysis is typically used to evaluate if the observed measurement items represent the underlying latent components. Convergent and discriminant validity are key aspects of construct validity.

Convergent Validity

Convergent validity is a type of construct validity that examines whether two measures that are supposed to measure the same construct produce similar results. It involves comparing measurements obtained through different tools and assessing the degree of resemblance between them (Mello & Collins, 2001). Convergent validity is crucial in research as it provides evidence that a measure is indeed capturing the intended construct. It is often assessed by examining the correlation between two measures of the same construct. A high correlation indicates strong convergent validity, suggesting that the measures are effectively capturing

the construct. In our study, we assessed the convergent validity by analyzing the values of Average Variance Extracted (AVE) and Composite Reliability (CR). AVE values greater than 0.5 and CR values greater than 0.6 were observed, in line with previous studies (Hair et al., 2006, 2015; Fornell & Larcker, 1981).

By following these steps, we ensure that the measurement tools used in our study possess content validity, face validity, and convergent validity, which collectively contribute to establishing the overall validity of the study. (Table 4.3)

Discriminating Validity

It is only the opposite; it necessitates demonstrating a lack of or extremely low resemblance between various constructs. In contrast, the discriminating validity shows that two actions that are not intended to be applied together are unrelated. An exceptional structural validity requires both types of validity (Kinnear & Taylor, 1996). Discriminant validity is important in research because it helps to ensure that a measure is not influenced by other constructs that it is not intended to measure. It is often assessed by examining the correlation between a measure and measures of other constructs. A low correlation between the measure and measures of other constructs indicates that the measure has high discriminant validity. The statement "Average variance extracted is greater than squared inter-construct" refers to a criterion known as the Fornell-Larcker criterion for assessing discriminant validity in a structural equation model. The Fornell-Larcker criterion states that the average variance extracted (AVE) for each construct should be greater than the squared inter-construct correlation between that construct and any other construct in the model. AVE is a measure of the amount of variance in a construct that is accounted for by its indicators, while squared inter-construct correlation is a measure of the correlation between two constructs in the model. The Fornell-Larcker criterion is used to assess whether a construct is more strongly related to its indicators than to other constructs in the model, indicating that the construct is distinct from other constructs in the model and has discriminant validity.

Therefore, if the AVE is greater than the squared inter-construct correlation, it indicates that the construct has more variance accounted for by its indicators than shared variance with other constructs, providing evidence for discriminant validity. In our case the AVE for each construct EM (.55), WC (.56), WM (.52), GTA(.53), AVA(.50), AFF (.51) are greater than squared inter-construct correlation . (in bold) (Table 4.3)

Confirmatory factor analysis

Confirmatory Factor Analysis (CFA) is a statistical technique widely used to assess the reliability and validity of constructs in research studies (Hair et al., 2010). It examines the correspondence between observed

variables and underlying latent constructs. While Exploratory Factor Analysis (EFA) explores the number of factors required to describe the data, CFA goes a step further by specifying the number of factors and determining the relationships between observed variables and latent constructs (Brown, 2006).

CFA involves the validation of the measurement model by comparing the theoretical model with the actual data (Kline, 2016). To perform CFA, researchers need to define the individual concepts and their theoretical structures, ensuring that the items are conceptually aligned with the constructs (Marsh et al., 2004). The measurement model should include an adequate number of indicators for each construct, typically at least three (Hair et al., 2017). The factor loadings, representing the relationship between observed variables and latent constructs, are essential for assessing individual item validity (Byrne, 2016). Ideally, factor loadings should be substantial and statistically significant, typically exceeding a value of 0.7 (Hair et al., 2017).

The evaluation of the measurement model's validity involves examining various goodness-of-fit statistics. These statistics, such as the chi-square test, Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR), provide an indication of how well the data fit the theoretical model (Hu & Bentler, 1999; Kline, 2016). Lower values of chi-square, CFI, TLI, RMSEA, and SRMR indicate better model fit (Brown, 2006)

Table 4.3 Validity Analysis

Validity analysis								
Convergent validity			Discriminant validity					
Dimensions	Average variance extracted	Construct Reliability	Energy management (EM)	Water conservation (WC)	Waste management (WM)	Green technology adoption (GTA)	Availability (AVA)	Affordability (AFF)
			EM	0.55	0.68	1	.07	.02
WC	0.56	0.70	0.268	1	.14	.02	.01	.02
WM	0.52	0.63	0.158	0.379	1	.28	.06	.05
GTA	0.53	0.63	0.198	0.167	0.533	1	.02	.03
Availability	0.50	0.69	0.175	0.135	0.245	0.165	1	.03
Affordability	0.51	0.66	0.156	0.145	0.236	0.175	0.185	1

(Table 4.3) So, in the study, Constructs validity was analyzed with convergent and discriminant validity. Under the convergent validity the AVE (Average Variance Extracted) is required to be minimum 0.5 and construct reliability to be at minimum of at least 0.6. In our results of validity in the category of convergent, the AVE was found to be equal to be 50% and more than 50% (i.e. 0.5)

The results of construct reliability indicated that all the values were found to be more than 60% with maximum range of 70%.

Fornell and Larcker (1981) suggested where the square root of the AVE is bigger than the associated correlations, suggesting appropriate discriminant validity according to this criterion, every construct meets this requirement. Discriminant validity can be insured with the average variance extracted and a value more than 0.5 is considered as good. The discriminant validity was analyzed further by using Spearman correlation by using SPSS. At the initial level under the discriminant validity first of all the correlation was analyzed for all the constructs. After that, square of it was compared with AVE (calculated under convergent validity). For Discriminant to exist it is required that AVE should be more than Square of Correlation

values.(Fornell and Larcker, 1981). In order to prove the measurement model, it is very important to satisfy the conditions of reliability and validity.

Table 4.4 Standardized Estimates of Green Finance Initiative Variables

Standardized Estimate of Green Finance Initiative Variables			
EM5	<---	F1	.479
EM4	<---	F1	.540
EM3	<---	F1	.541
EM2	<---	F1	.573
EM1	<---	F1	.494
WC5	<---	F2	.625
WC4	<---	F2	.556
WC3	<---	F2	.585
WC2	<---	F2	.644
WC1	<---	F2	.586
WM5	<---	F3	.521
WM4	<---	F3	.555
WM3	<---	F3	.460
WM2	<---	F3	.503
WM1	<---	F3	.554
GTA5	<---	F4	.518
GTA4	<---	F4	.531
GTA3	<---	F4	.528
GTA2	<---	F4	.551
GTA1	<---	F4	.561
AFF4	<---	F5	.561
AFF3	<---	F5	.625
AFF2	<---	F5	.580
AFF1	<---	F5	.552
AVL4	<---	F6	.586
AVL3	<---	F6	.564
AVL2	<---	F6	.663
AVL1	<---	F6	.714

The table 4.4 presents the standardized estimates of the Green Finance Initiative variables, specifically the relationships between the latent factors (F1 to F6) and their corresponding observed variables (EM1 to EM5, WC1 to WC5, WM1 to WM5, GTA1 to GTA5, AFF1 to AFF4, AVL1 to AVL4). Standardized estimates represent the strength and direction of the relationships after taking into account the variability and scaling of the variables. These estimates are particularly useful for comparing the relative importance of different variables within each latent factor.

For example, looking at the first row, the standardized estimate for EM5 with F1 is 0.479. This indicates that EM5 has a positive relationship with F1, and its contribution to F1 is of moderate magnitude compared to the other observed variables within F1. Similarly, for the second row, the standardized estimate for EM4 with F1 is 0.540. This suggests that EM4 has a stronger positive relationship with F1 compared to EM5. By examining the standardized estimates, researchers can determine which observed variables have stronger or weaker relationships with their corresponding latent factors. Variables with higher standardized estimates have a greater impact on the latent factor they are associated with.

In summary, the standardized estimates in the table provide insights into the relative contributions of observed variables to their respective latent factors within the Green Finance Initiative.

The table 4.5 presents the covariances between the latent factors (F1 to F6) in the model. Covariances represent the degree of association or relationship between two latent factors. For each pair of latent factors, the table provides the estimated covariance, standard error (S.E.), critical ratio (C.R.), and p-value (P).

For example, looking at the first row, the covariance estimate between F1 and F2 is 0.184. This indicates a positive association between F1 and F2. A higher value suggests a stronger relationship between the two factors. Similarly, for the second row, the covariance estimate between F2 and F3 is 0.214. This suggests a positive association between F2 and F3, with a stronger relationship compared to the F1-F2 covariance.

The standard errors (S.E.) provide an estimate of the uncertainty or variability associated with each covariance estimate. The critical ratios (C.R.) represent the ratio of the covariance estimate to its standard error and are used to assess the statistical significance of the covariance. In this table, "****" denotes a statistically significant covariance at the conventional significance level (e.g., $p < 0.001$).

By examining the covariance estimates, researchers can understand the strength and direction of the relationships between the latent factors in the model. Positive covariances indicate positive associations, while negative covariances indicate negative associations.

Table 4.5 Covariance Estimates

Covariances						
			Estimate	S.E.	C.R.	P
F1	<-->	F2	.184	.032	5.817	***
F2	<-->	F3	.214	.033	6.487	***
F3	<-->	F4	.293	.030	9.922	***
F4	<-->	F6	.257	.036	7.087	***
F5	<-->	F6	.430	.049	8.701	***
F1	<-->	F3	.270	.029	9.246	***
F3	<-->	F5	.338	.041	8.177	***
F1	<-->	F4	.275	.029	9.489	***
F1	<-->	F6	.269	.037	7.337	***
F1	<-->	F5	.280	.038	7.396	***
F2	<-->	F4	.256	.038	6.812	***
F3	<-->	F6	.287	.038	7.627	***
F4	<-->	F5	.282	.038	7.422	***

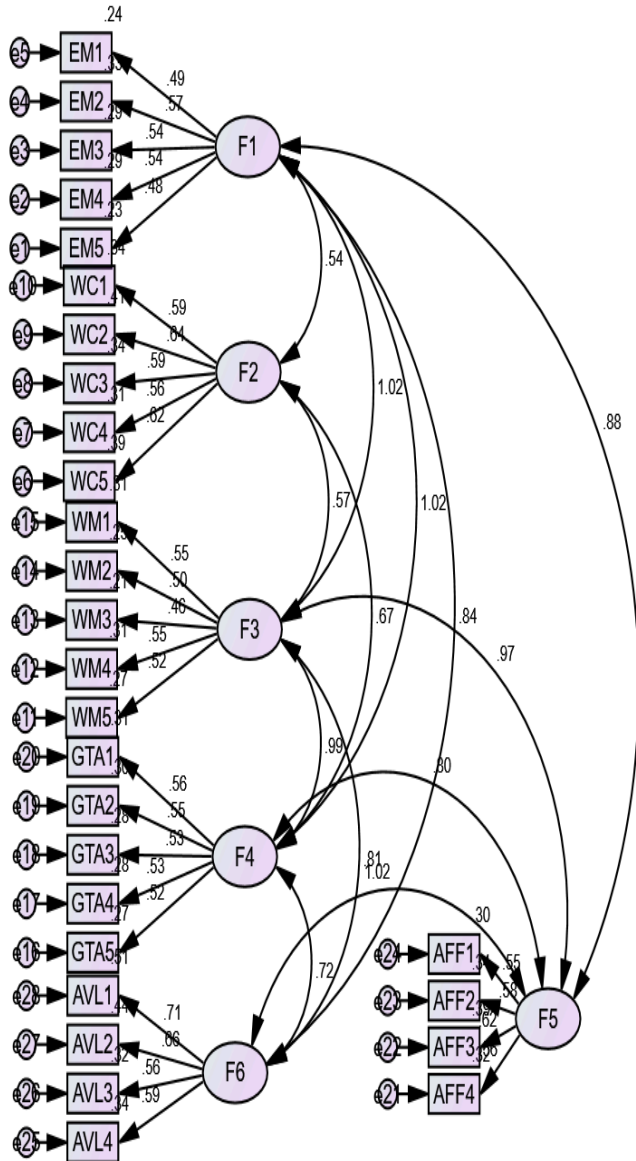


Figure 4.2 Measurement Model

For the overall validity of the questionnaire, the model fit indices were initially utilized, with multiple indicators in order to check the goodness of fit. The indicators for the goodness of fit indicated that model was a good fit model with CMIN/df to be within range (less than 3), GFI, NFI, CFI all were above .9 with RMSEA to be 0.013.

The Goodness of Fit Indices	Recommended values when N >250	Estimated Values	Interpretation
Chi-square/df (χ^2/df)	Between 1 and 3	2.99	Acceptable
The Goodness of Fit Index/GFI	>0.90	0.910	Acceptable
Root Mean Square Error Approximation (RMSEA)	<0.08	0.013	Acceptable
NFI (Normed Fit Index)	>0.90	0.902	Acceptable
CFI (Comparative Fit Index)	>0.90	0.915	Acceptable
RMR (Root mean square residual)	<0.05	0.011	Acceptable

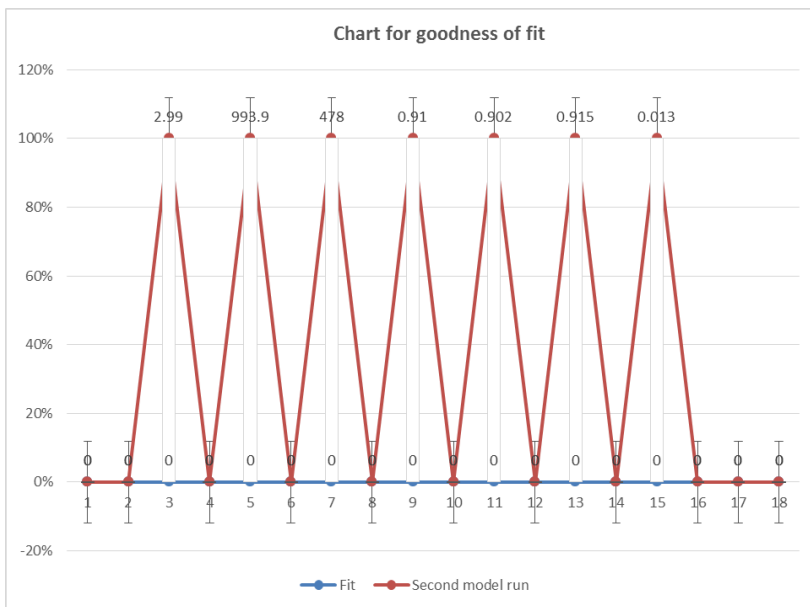


Figure 4.3 Goodness of Fit

4.2 Objective wise interpretation

Objective 1: To study green finance initiative for SMEs.

Green finance initiative financing schemes help green projects in the MSME sector in line with national targets. SMEs are benefited by green finance initiatives mainly through the medium of Government and financial institutions, most importantly SIDBI. It has a dedicated window to finance high impact innovative and climate change projects and to enhance the resilience of SME sector to climate change and adopt preventive measures to facilitate greening of the SMEs in India, SIDBI is assigned as the nodal agency for implementing various subsidy schemes of the government and has made a number of steps to encourage SME loans for green and energy-efficient technologies.

Table 4.6 Schemes implemented by Ministry of MSME & its organizations

Name of the scheme	Objective	Key benefits
CLCS (Credit Linked Capital Subsidy Component)	To make available technology up gradation in new or existing MSEs	-improved technology -subsidy up to 15% on credit up to 1.00 crore
IC (International Cooperation)	Enhance competency by attending international events to learn and explore new opportunities, new technologies, modernization, awareness of better manufacturing processes etc.	-reimbursement of fare for participating in the events\fairs\exhibitions . -reimbursement of holding seminars\conferences etc.
MSE-CDP(Micro & Small Enterprises Cluster Development Programme)	To support sustainable growth of MSEs and setting up of Common Facility Centre (for training, testing, waste effluent treatment, production processes, etc). Promoting green manufacturing technology for the clusters.	-Creation of common facility centres for enterprises. -financial assistance up to 90% of the project cost with conditions.
SFURTI(Scheme of Fund for Regeneration of Traditional Industries)	To help traditional industries to become competitive and sustainable.	-financial assistance up to 90% of the cost.

<p>ASPIRE(A Scheme for Promotion of Innovation, Rural Industries and Entrepreneurship)</p>	<p>To set up a network of incubation and technology centres to promote entrepreneurship\ innovation and to enhance the competitiveness of the MSME sector.</p>	<ul style="list-style-type: none"> • Maximum Rs. 1 cr. To Government agencies and maximum Rs. 50 Lakh to private agencies for procuring plant and machinery. -grants also given to new TBIs and existing TBIs plants and machinery
<p>ZED Certification</p>	<p>To enable and promote quality products having no defects and having no adverse effect on environment and promote energy efficiency and improved manufacturing processes. Supporting Make in India initiative.</p>	<p>-Reimbursement of fees for ZED certification and consultancy charges.</p>
<p>Lean manufacturing competitiveness of MSMEs</p>	<p>To adopt lean manufacturing techniques by reducing and recycling waste; Introducing innovative practices for improving overall competitiveness and productivity.</p>	<p>-Up to 80% assistance by GOI</p>
<p>Digital MSMEs</p>	<p>Promoting adoption of Information and Communication Technology (ICT)tools.</p>	<p>- to improve efficiency and competencies</p>

<p>Entrepreneurial and Managerial Development of SMEs through Incubators</p>	<p>To promote ventures that are based on emerging technology and innovation through ideas from professionals beyond the traditional activities of MSMEs.</p>	<ul style="list-style-type: none"> • Up to Rs. 15 Lakh for translating innovative ideas into commercial products. • Seed funding up to Rs. 100 Lakh for setting up new units.
<p>Awareness on Intellectual Property Rights (IPR)</p>	<p>To promote awareness about IPR among MSMEs To help protect ideas and business strategies and assist them in technology up gradation and competitiveness enhancement.</p>	<ul style="list-style-type: none"> -Reimbursement of Patent/Trademark/GI - Financial help for setting up an IP Facilitation Centre up to Rs. 1.00 cr. For period of 5 years
<p>Coir Industry Technology Upgradation Scheme</p>	<p>Help for procuring eligible plant & machinery for modernization, up gradation and/or establishing a new unit.</p>	<ul style="list-style-type: none"> - maximum financial assistance will be Rs.2.50 crores.

Source: Ministry of Micro, Small and medium Enterprises, GOI

These schemes are run on a national level and Haryana is also one of the state where SMEs are accessing these initiatives. Apart from that schemes mentioned in the Haryana Enterprise and Employment Policy, 2020 are:

Energy Conservation Scheme for MSMEs:

1. Aim: Encourage energy conservation practices.
2. Measures: Identify areas of excess energy consumption and implement effective means to reduce water usage.
3. Reimbursement: Up to 75% of energy audit cost, capped at INR two lakhs.
4. Subsidy: 50% subsidy on capital equipment required for energy conservation.

Water Conservation Scheme for MSMEs:

1. Aim: Promote water harvesting and conservation.
2. Measures: Measure water consumption and implement effective ways to reduce water usage.

3. Reimbursement: Up to 75% of water audit cost, with a maximum of Rs. one lakh.
4. Subsidy: 50% subsidy on capital equipment needed for water conservation.

Assistance for Waste Management Scheme for MSMEs:

1. Aim: Support the establishment of electronic waste management and e-waste recovery projects.
2. Financial Assistance: Up to 50% of the project cost, covering machinery & equipment up to Rs 50 Crore.

Assistance for Technology Acquisition for MSMEs:

1. Aim: Facilitate access to new technology for the MSME sector.
2. Purchase Assistance: Up to 75% reimbursement of technology purchase cost, capped at Rs. 50 lakh.
3. Eligibility: Technologies from premier National/International Institutes or Patented Technology from domestic/foreign companies.

These schemes have been introduced to promote sustainable practices, enhance resource efficiency, and foster technological advancement within the MSME sector in Haryana.

SIDBI's focused lending programs promote investment in energy efficiency and clean methods of production and processes. It is also collaborating with the International Agencies like JICA and AFD. SIDBI is an accredited agency of GCF i.e. Green Climate Fund. It also channelizes funds for providing green investment and also renders project management support to the other institutions engaged in climate change missions. Technology Information Forecasting and Assessment Council (TIFAC)-SIDBI aims at providing concessional loan up to Rs.200 lakh per project at very low interest rates to the MSMEs or Startups for innovative technology projects. The streamlined 4E scheme i.e. End to end Energy Efficiency Scheme in collaboration with the World Bank to support more energy efficient project also solar projects with dispensation of credit in lesser time periods and at lower interest rates. SIDBI is also supporting Energy Service Companies (ESCO) through supporting them financially and also providing risk sharing facilities which helped in energy savings and reduction in annual emission of CO₂ to a considerable extent. It has also launched a Green Financing scheme to help green projects in the SME sector in line with national targets. It has a dedicated window to finance high impact innovative and climate change projects and to enhance the resilience of the SME sector to climate change and adopt preventive measures to facilitate greening of the SMEs in India.

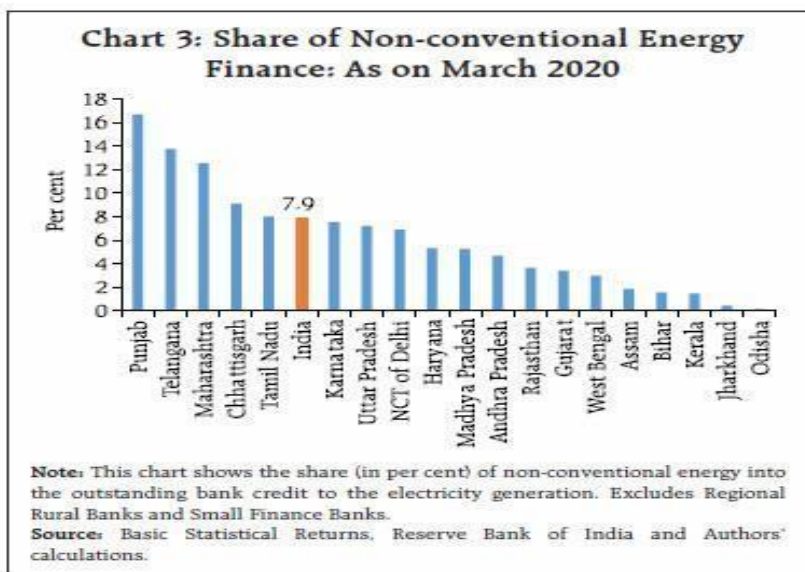
SIDBI and the Bureau for Energy Efficiency (BEE) have signed a Memorandum of Understanding (MoU) to establish an energy-efficient technology shelf for 25 MSME clusters, as well as to raise awareness also the willingness and ability of regional business development services to promote and adopt energy-efficient solutions.. This will be subsidised

monetarily in order to stimulate the adoption of energy-efficient technology and long-term solutions.

As already discussed in chapter one in 2015, the Government of India sponsored and launched a two-phase Faster Adoption and Manufacturing of Hybrid and Electric Cars (FAME) programme to improve financial flow and infrastructure development in order to boost the manufacturing and sale of green vehicles. When compared to existing conventional automobiles as part of GFIs, such green vehicles benefit from reduced GST imposition, lower interest rates, and a longer payback window. The government has established the Production Linked Incentive (PLI) Scheme to encourage the production of high-efficiency in the field of non-conventional energy.

In order to encourage the expansion of the "green economy" and to adhere to the ESG (Economic, Social, and Environmental) and SDG (Sustainable Development Goals) fundraising standards, the RBI has added "green" and "sustainable" to the list of "Priority Sector Lending" (PSL).

Figure 4.4 Share of Non-conventional Energy State-wise

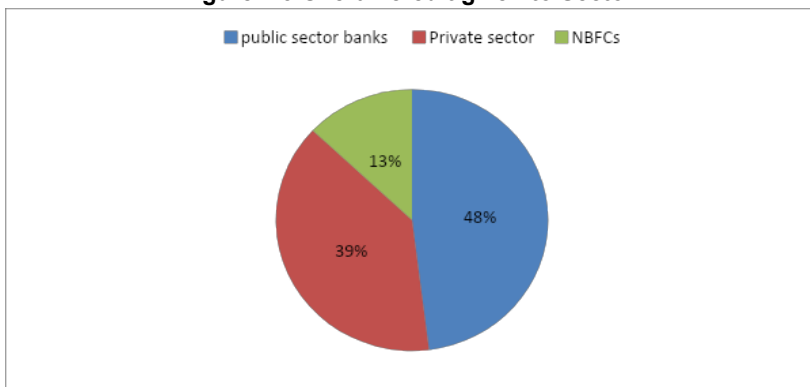


Source: RBI Bulletin 2021

The RBI added the small renewable energy industry to its Priority Sector Lending (PSL) programme in 2015 as a part of the green financing policy. The total outstanding bank credit for the non-conventional energy industry at the end of March 2020 made up 7.9% of the total outstanding bank credit for power generation (www.rbi.gov.in). RBI Bulletin 2021 share

of non-conventional energy finance is low in Haryana (around 5%) as compared to national average of 7.9% and in comparison to its neighbouring states Punjab (more than 16%), Delhi NCR (more than 7%) and in UP (7% approximately)which could be enhanced by adopting green finance initiatives.

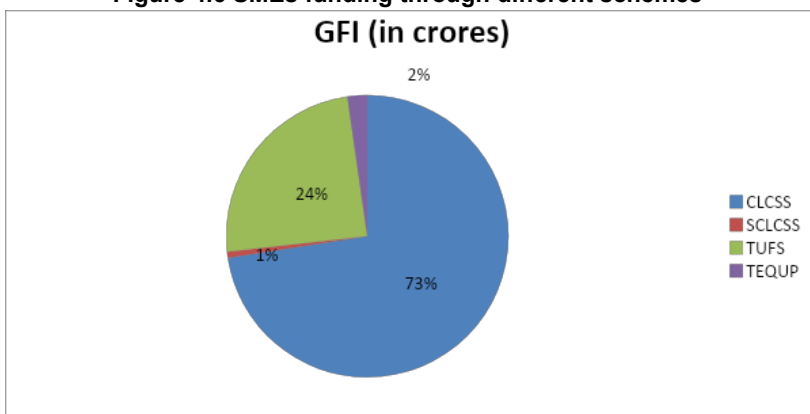
Figure 4.5 Overall credit given to Sector



Author compilation (SIDBI Annual Report 2021)

It can be seen that Public Sector banks are in a leading role when it comes to providing finance to SMEs. Public Sector banks are providing 48% finance as compared to 39% by Private sector banks. It may be due to the fact that these banks have good reach in all the areas of the country.

Figure 4.6 SMEs funding through different schemes



Source: SIDBI Annual Report 2021

Here CLCSS stands for Credit linked Capital Subsidy scheme, TUFS stands for Technology Upgradation Fund Scheme, and TEQUP stands for

Technology up gradation, SCLCSS stands for Special Credit Linked Capital Subsidy Scheme. These schemes are helping SMEs in accessing enhanced technology, advanced machineries and adopting methods and practices which govern improvement in efficiency and attaining sustainable growth. It could be seen that the TEQUP scheme has very low funding which could be improved.

Table 4.7 Funds sanctioned to SMEs

The table below shows the fund that has been sanctioned to SMEs:-

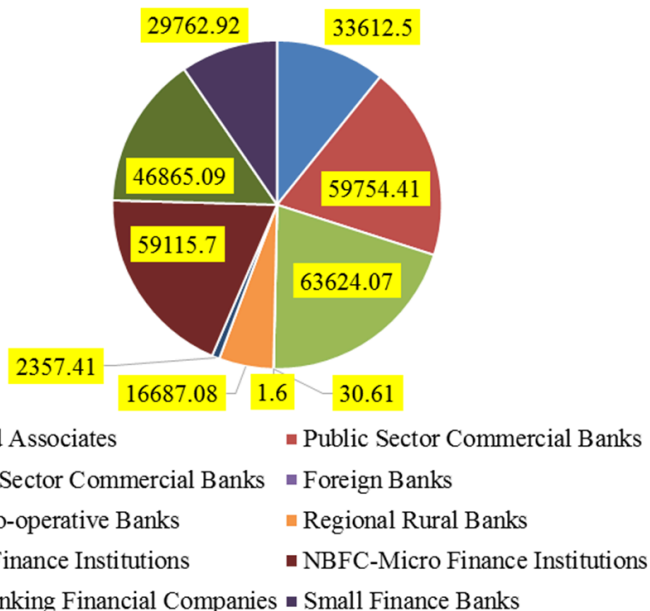
Bank wise Performance		Financial Year: 2021			
[Amount Rs. in Crore]					
S.No.	Bank Type Name	Bank Name	Total		
			No Of A/Cs	Sanction Amt	Disbursement Amt
1	SBI and Associates				
		Total	2737079	33825.92	33612.5
2	Public Sector Commercial Banks				
		Total	3927190	65409.04	59754.41
3	Private Sector Commercial Banks				
		Total	13277989	64006.64	63624.07
4	Foreign Banks				
		Total	569	30.61	30.61
5	State Co-operative Banks				
		Total	257	1.6	1.6
6	Regional Rural Banks				

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		Total	1508094	18046.89	16687.08
7	Micro Finance Institutions				
		Total	1879391	2357.41	2357.41
8	NBFC-Micro Finance Institutions				
		Total	22963995	61113.56	59115.7
9	Non-Banking Financial Companies				
		Total	5853690	47136.75	46865.09
10	Small Finance Banks				
		Total	7722064	29794.37	29762.92
		Grand Total	59870318	321722.79	311811.38

Author's compilation

source : mudra.org.in



Source : mudra.org.in

Figure 4.7 Funds Sanctioned to SMEs

Table 4.8 Budget Allocation and Expenditures Incurred on incentives to Sector

Year	Budget Allocation	Revised Budget Allocation (In Crores)	Expenditure (in Crores)
2017-18	150.00	67.20	66.98
2018-19	100.00	69.42	69.42
2019-20	100.00	100.00	99.99
2020-21	100.00	100.00	75.78
2021-22	100.00	-	22.59
Up to 22.10.2021			

Source: Industries and Commerce Department Haryana and Haryana Economic Survey 2021

According to Enterprise Promotion Policy -2015/Haryana Enterprises & Employment policy different incentives are provided to this sector in the Haryana state which includes Testing Equipment Assistance, Assistance for Environment Compliance, assistance for technology Acquisition and up gradation, Investment subsidy among others.

Objective 2: To examine implementation of green finance initiative in SMEs

R.Q.1 - Do Green Finance Initiatives (GFIs) have a significant impact on sustainable growth?

R.Q.1 (a): Does Energy Management have a significant impact on sustainable growth?

R.Q.1 (b): Does Waste Management have a significant impact on sustainable growth?

R.Q.1(c): Does Water Conservation have a significant impact on sustainable growth?

R.Q.1 (d): Does Green Technology Adoption have a significant impact on sustainable growth?

R.Q.1 (e): Does the Availability of green finance initiatives have a significant impact on sustainable growth?

R.Q.1 (f): Does the Affordability of green finance initiatives have a significant impact on sustainable growth?

In examination of the implementation for green finance initiatives in the small and medium enterprises, initially the descriptive statistics in the form of mean and standard deviation was measured on the total constructs by making all the indicators into one on the sample size of 500. The results indicated that sustainable growth is highly achieved in terms of implementation of green finance initiative with the total mean value of 40.63 and the standard deviation as 7.19907. Moreover, in line of the construct wise implementation analysis the energy management, water conservation, green technology adoption, availability and affordability indicated the mean value of approximately 20 and the standard deviation as 3.9. It indicates that the energy management, water conservation, waste management, green technology adoption, availability and affordability have good implementations of the Green Finance initiative in any small and medium enterprise. (See the descriptive table 4.9 below).

Table 4.9 Descriptive Statistics

Descriptive Statistics			
	Mean	Std. Deviation	N
Sustainable Growth	40.6380	7.19907	500
Energy management	20.2080	3.89295	500
Water conservation	20.3080	3.91558	500
Waste management	20.2100	3.90235	500
Green technology adoption	20.2180	4.05455	500
Availability	16.1760	3.30194	500
Affordability	16.2100	3.11983	500

The analysis aimed to determine whether the adoption/implementation of GFIs (Green Financial Initiatives) has an impact

on the sustainable growth of SMEs (Small and Medium Enterprises) using multiple regression analysis.

The model summary provided important insights into the relationship between the variables. The R-value, which represents the correlation between the dependent and independent variables, was found to be .911. This indicates a strong positive correlation of approximately 91.1% between the variables, suggesting a significant relationship.

Additionally, the R-squared value, which indicates the proportion of the dependent variable's variation explained by the independent variables, was determined to be .829. This means that approximately 82.9% (or approximately 83%) of the total variation in the dependent variable can be accounted for by the multiple independent variables. In other words, the independent variables have a substantial influence on explaining the changes in the dependent variable, which is sustainable growth.

Furthermore, the adjusted R-squared value in the model summary is used to generalize the results and account for the variation between the sample and the population. In this analysis, the adjusted R-squared value was estimated to be 82.7%. This suggests that the findings are likely to hold true for the wider population, providing confidence in the accuracy of the estimated value.

In conclusion, the results indicate a strong positive correlation between the variables and suggest that the adoption/implementation of GFIs has a significant impact on the sustainable growth of SMEs. The independent variables collectively explain a substantial portion of the variation in sustainable growth, and the findings can be generalized to the population with a high degree of confidence. (Table 4.10).

Table 4.10 Model Summary

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.911 ^a	.829	.827	2.99287	.829	399.033	6	493	.000
Predictors: (Constant);Affordability, Water conservation, Energy management, Availability, Green technology adoption, Waste management									
Dependent variable : Sustainable Growth									

The standard error of the estimate of regression is a quantitative measure that assesses the accuracy of predicting the dependent variable based on two or more independent variables in a regression model. It provides an estimate of the average distance between the observed values of the dependent variable and the predicted values from the regression equation. A lower standard error of the estimate indicates that the predicted values are closer to the actual observed values, suggesting a higher

accuracy of the regression model in predicting the dependent variable. Conversely, a higher standard error of the estimate indicates that there is more variability between the predicted and observed values, indicating a lower accuracy in predicting the dependent variable.

In summary, the standard error of the estimate of regression serves as a useful metric to evaluate the precision and reliability of the predictions made by a regression model, considering the collective influence of the independent variables on the dependent variable.

The Anova table was used as part of a multiple regression analysis to examine the relationship between affordability, water conservation, energy management, availability, green technology adoption, waste management, and sustainable growth. The analysis focused on interpreting the significance value (Sig value) and the F-ratio. In this study, a significance level of 95% or a 5% level of significance was used to draw conclusions. The results of the analysis showed that the P-value was determined to be .000, and the F-ratio was calculated as 399.033. These findings suggest that the model used in the study is a good fit. (Refer to the Anova table 4.11).

Table 4.11 Anova Table

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21445.534	6	3574.256	399.033	.000 ^b
	Residual	4415.944	493	8.957		
	Total	25861.478	499			
a. Dependent Variable: Sustainable Growth						
b. Predictors: (Constant), Affordability, Water conservation, Energy management, Availability, Green technology adoption, Waste management						

The coefficient table in the analysis aimed to measure the causal relationship between multiple independent variables and a dependent variable. It provides the results of the regression analysis, specifically focusing on the individual impact of each independent variable on the dependent variable.

In this analysis, standardized coefficients were used instead of unstandardized coefficients. Unstandardized coefficients are typically used to compare the same variables across different equations, while

standardized coefficients are used to compare variables within the same equation. Standardized coefficients allow for a more meaningful comparison of the relative importance of different independent variables. By examining the regression coefficients corresponding to each independent variable, it becomes possible to determine the direction and strength of the relationship between the independent variables and the dependent variable. The standardized coefficients, also known as beta weights, are expressed in standard units, providing a standardized measure of the independent variables' impact on the dependent variable. The advantage of using beta weights is that they allow for the comparison of variables that are measured in different units. This means that even if the independent variables are measured using different scales or units of measurement, the standardized coefficients provide a standardized and comparable measure of their relative importance in explaining the variation in the dependent variable.

Overall, the coefficient table and the use of standardized coefficients (beta weights) provide valuable information in understanding the significance and relative contribution of each independent variable in the regression model, facilitating the identification of the most influential variables in explaining the variation in the dependent variable. The standardized beta values in the table indicate the percentage change in the dependent variable associated with a unit change in the corresponding predictor variable.

In this analysis, the results indicate the following impacts on sustainable growth:

1. **Energy Management:** The standardized beta value is .099, indicating a 9.9% impact on sustainable growth. The p-value of 0.000 suggests that this impact is statistically significant, and there is a positive relationship between energy management and sustainable growth.
2. **Water Conservation:** The standardized beta value is .149, indicating a 14.9% impact on sustainable growth. The p-value of 0.000 suggests that this impact is statistically significant, and there is a positive relationship between water conservation and sustainable growth.
3. **Waste Management:** The standardized beta value is .286, indicating a 28.6% impact on sustainable growth. This suggests that waste management has a significant positive impact on sustainable growth, as indicated by the p-value.
4. **Green Technology Adoption:** The standardized beta value is .208, indicating a 20.8% impact on sustainable growth. The p-value of 0.000 suggests that this impact is statistically significant, and there is a positive relationship between green technology adoption and sustainable growth.
5. **Availability:** The standardized beta value is .110, indicating an 11% impact on sustainable growth. The p-value of 0.000 suggests that this

impact is statistically significant, and there is a positive relationship between availability and sustainable growth.

6. **Affordability:** The standardized beta value is .172, indicating a 17.2% impact on sustainable growth. The p-value of 0.000 suggests that this impact is statistically significant, and there is a positive relationship between affordability and sustainable growth.

Overall, these results suggest that all the independent variables (energy management, water conservation, waste management, green technology adoption, availability, and affordability) have significant positive impacts on sustainable growth, with varying magnitudes of influence. (Table 4.12).

Table 4.12 Coefficient table

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.963	.789		3.756	.000
	Energy management	.183	.064	.099	2.870	.004
	Water conservation	.275	.063	.149	4.371	.000
	Waste management	.527	.065	.286	8.049	.000
	Green technology adoption	.369	.062	.208	5.948	.000
	Availability	.239	.071	.110	3.363	.001
	Affordability	.397	.075	.172	5.284	.000
a. Dependent Variable: Sustainable Growth						

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Table 4.13 Correlation Table

Correlations		Sustainable Growth	Energy management	Water conservation	Waste management	Green technology adoption	Availability	Affordability
Pearson Correlation	Sustainable Growth	1.000	.792	.798	.841	.818	.773	.796
	Energy management	.792	1.000	.738	.759	.773	.737	.724
	Water conservation	.798	.738	1.000	.753	.764	.754	.690
	Waste management	.841	.759	.753	1.000	.755	.720	.770
	Green technology adoption	.818	.773	.764	.755	1.000	.722	.727
	Availability	.773	.737	.754	.720	.722	1.000	.712
	Affordability	.796	.724	.690	.770	.727	.712	1.000
Sig (1-tailed)	Sustainable Growth	.000	.000	.000	.000	.000	.000	.000
	Energy management	.000	.000	.000	.000	.000	.000	.000
	Water conservation	.000	.000	.000	.000	.000	.000	.000
	Waste management	.000	.000	.000	.000	.000	.000	.000
	Green technology adoption	.000	.000	.000	.000	.000	.000	.000
	Availability	.000	.000	.000	.000	.000	.000	.000
	Affordability	.000	.000	.000	.000	.000	.000	.000
N	Sustainable Growth	500	500	500	500	500	500	500
	Energy management	500	500	500	500	500	500	500
	Water conservation	500	500	500	500	500	500	500
	Waste management	500	500	500	500	500	500	500
	Green technology adoption	500	500	500	500	500	500	500
	Availability	500	500	500	500	500	500	500
	Affordability	500	500	500	500	500	500	500

(Table 4.13) The correlation table shows the Pearson correlation coefficients between Sustainable Growth and each independent variable. The table also provides the associated significance values (p-values) and the sample size (N). The correlation coefficient ranges from -1 to 1, where 1 represents a perfect positive correlation, 0 represents no correlation, and -1 represents a perfect negative correlation.

Sustainable Growth has a strong positive correlation with Energy management (0.792), Water conservation (0.798), Waste management (0.841), Green technology adoption (0.818), Availability (0.773), and Affordability (0.796). The correlation coefficients suggest that all the independent variables have positive relationships with Sustainable Growth, with Waste management showing the strongest correlation. The p-values indicate the statistical significance of the correlation coefficients. All the p-values are reported as "0.000," which means that the correlations are statistically significant at the chosen significance level (assuming a one-tailed test). The sample size for all variables is 500. A larger sample size generally increases the reliability and stability of the correlations.

In summary, the correlation table reveals that Sustainable Growth has strong positive correlations with all the independent variables. These

relationships are statistically significant, suggesting that these independent variables are important factors contributing to Sustainable Growth.

Objective 3: To study the awareness level of SMEs regarding green finance initiatives.

Exploratory factor analysis (EFA) is a data reduction technique used to uncover the underlying structure and relationships among observed variables. Its purpose is to identify the latent factors driving these relationships. By reducing the number of variables, EFA aims to extract a smaller number of factors that explain the common variance among them. EFA begins with a correlation matrix of the observed variables, which is then analyzed using eigenvalue decomposition to extract the factors. Researchers interpret these factors based on the loadings, which represent the correlations between each factor and the observed variables. It's important to note that EFA is exploratory and doesn't establish causal relationships. In this study, SPSS version 22 was used for data analysis.

Table 4.14 KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.928
Bartlett's Test of Sphericity	Approx. Chi-Square	1369.571
	Df	45
	Sig.	.000

To ensure the appropriateness of conducting factor analysis, two tests were performed: the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity. The KMO test assesses the strength of correlation between variables, with values ranging from 0 to 1. A KMO value closer to 1 indicates better suitability, while values below 0.5 are considered unacceptable. Values above 0.5 are generally acceptable, but higher values, such as 0.7 and above, are preferred. In this analysis, the KMO value was found to be 0.928, indicating excellent sampling adequacy.

Bartlett's test of sphericity examines the null hypothesis that the correlation matrix is an identity matrix, meaning that there are no relationships between variables. In factor analysis, we require inter-variable relationships for meaningful results. If the test is significant (with a p-value below 0.05), it suggests that the correlation matrix is not an identity matrix and factor analysis can be conducted. In this case, Bartlett's test yielded a highly significant result ($p < 0.05$), indicating the presence of significant relationships among the variables.

Therefore, based on the KMO value of 0.928 and the significant result of Bartlett's test, it is concluded that the data set exhibits strong correlation and is suitable for factor analysis. In exploratory factor analysis, the second step involves measuring the communalities, which represents the amount of variation or variance in each variable that can be accounted for by the factors. Initial communalities are estimates of the extent to which

each variable is influenced by the factors, and they are measured through principal components extraction, typically equal to 1 in correlation analysis.

Ideally, the total variance explained by the factors should be around 60%. In our case, the value obtained is close to 60%, indicating a satisfactory level of variance explained.

Moving on to the next step, the rotated component matrix plays a crucial role in exploratory factor analysis. It classifies the observed variables into related groups based on latent variables. This matrix, also known as loadings, provides estimates of the correlations between each variable and the estimated components.

In the current study, exploratory factor analysis was conducted, and the rotated component matrix was utilized to identify groups within the dataset consisting of a total of 500 responses. By examining the rotated component matrix, researchers can gain insights into the relationships among variables and identify meaningful groups arising from the data.

Table 4.15 Communalities

Communalities		
	Initial	Extraction
AWAR1	1.000	.809
AWAR2	1.000	.571
AWAR3	1.000	.571
AWAR4	1.000	.560
AWAR5	1.000	.778
AWAR6	1.000	.518
AWAR7	1.000	.480
AWAR8	1.000	.487
AWAR9	1.000	.569
AWAR10	1.000	.506
Traction Method: Principal Component Analysis.		

Table 4.16 Total Variance Explained

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.314	43.143	43.143	4.314	43.143	43.143	2.370	23.702	23.702
2	.773	7.734	50.877	.773	7.734	50.877	1.868	18.675	42.377
3	.762	7.620	58.497	.762	7.620	58.497	1.612	16.120	58.497
4	.734	7.340	65.837						
5	.614	6.144	71.981						
6	.603	6.032	78.013						
7	.594	5.940	83.952						
8	.551	5.505	89.457						
9	.539	5.391	94.848						
10	.515	5.152	100.000						

Extraction Method: Principal Component Analysis.

Table 4.17 Rotated Component Matrix

Rotated Component Matrix ^a						
	Component			2	3	
	1					
AWAR2	.716	Factor 1				
AWAR3	.701					
AWAR7	.655					
AWAR10	.612					
AWAR1			.881	Factor 2		
AWAR9			.584			
AWAR6			.537			
AWAR8					.405	Factor 3
AWAR5					.856	
AWAR4					.595	

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.
 a. Rotation converged in 5 iterations.

Table 4.18 Factor 1- lack of GFIs focused awareness programs

AWAR2	Government is not taking sufficient steps to raise awareness regarding green finance initiatives. (workshops/ seminar)
AWAR3	Organisation is less aware of use of energy efficient methods
AWAR7	Organisation is less aware of green technology adoption schemes.
AWAR10	Not much awareness about green finance schemes.

Table 4.19 Factor 2 -Understanding of SMEs regarding benefits from GFIs

AWAR1	Top level management has a understanding of GFI policies
AWAR9	The company chooses its GFIs after a good study of programs available
AWAR6	There exists a trade-off between financial and social performance in GFIs applied by SMEs

Table 4.20 Factor 3- Understanding regarding Green concept

AWAR8	Green finance is a social investment by nature
AWAR5	Environment protection improves SMEs long run sustainability
AWAR4	My organisation is less aware of the term green financing.

Descriptive Statistics of Awareness

The descriptive statistics indicate the awareness level of SMEs entrepreneurs regarding the green finance initiative on several indicators. In the measurement of the awareness level of the SMEs entrepreneurs regarding the green finance, it is indicated by the results that the company chooses its green finance initiatives i.e. the green practices to be adopted, after studying different programs available to them (mean 4.0800 and standard deviation 1.10998) as top level management of SMEs has a fairly good understanding of Green Finance Initiatives to be adopted, has responded by the SMEs officials with the mean value of 4.0900 and standard deviation of 1.077. Also the SMEs officials /owner feel that government do not take sufficient steps in raising the awareness regarding the green finance initiatives, in essence, the government do not organise sufficient workshops or seminars to make awareness regarding the green finance initiative available for the small and medium scale enterprises as indicated in the mean value you as 4.0380 with standard deviation of 1.132. Moreover, the SMEs are not much aware of the usage of energy efficient methods (mean and standard deviation as 4.06 and 1.09 respectively). The enterprises understand that green financing being a social investment in nature but they are not much familiar about the term green financing in general and also the schemes launched for them with regards to green finance initiatives. SMEs are aware that the environment protection improves their sustainability and there exists a trade off between financial and social performance in the long term. But there is a problem, the organisations are not well versed in terms of awareness regarding the schemes related with green technology adoption which is a very important factor. It was found that the overall problem that comes in the green finance initiatives is just the lack of awareness from the government side due to the less initiatives for awareness raising regarding green financing initiatives and practices just like seminars and workshops etc.

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Table 4.21 Descriptive Statistics of awareness
Descriptive Statistics of Awareness

	N	Minimum	Maximum	Mean	Std. Deviation
Top level management of my company has a good understanding of Green Finance Initiatives policies. AWAR1	500	1.00	5.00	4.0900	1.07714
Government is not taking sufficient steps to raise awareness regarding green finance initiatives.(GFI) (workshops/seminar)AWAR2	500	1.00	5.00	4.0380	1.13275
Organization is less aware of the use of energy efficient methods. AWAR3	500	1.00	5.00	4.0620	1.09020
My organization is less aware of the term green financing. AWAR4	500	1.00	5.00	4.0240	1.18585
Environment protection improve SMEs long run sustainability AWAR5	500	1.00	5.00	4.1320	1.05869
There exists a trade-off between financial and social performance in Green finance initiatives applied by SMEs. AWAR6	500	1.00	5.00	4.0640	1.12179
Organization is less aware of green technology adoption schemes. AWAR7	500	1.00	5.00	4.1080	1.10579
Green finance is a social investment by nature AWAR8	500	1.00	5.00	4.0560	1.10603
My company chooses its Green Finance Initiatives after a good study of all programs available.AWAR9	500	1.00	5.00	4.0800	1.10998
Not much awareness about green finance schemes.AWAR10	500	1.00	5.00	4.0380	1.09862

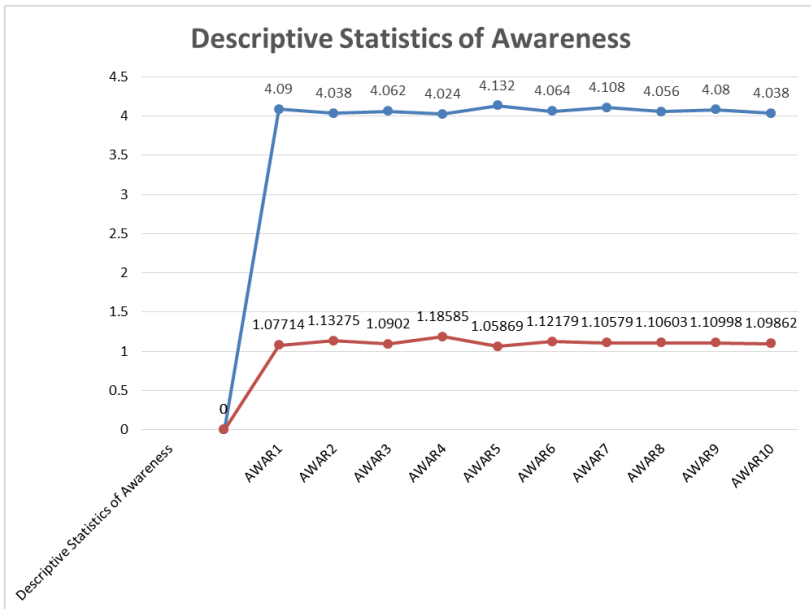


Figure 4.8 descriptive statistics of awareness

Objective 4: To study the key grassroots level challenges in effective implementation of green finance initiatives.

Table 4.22 Descriptive Statistics of Challenges

Descriptive Statistics					
Indicators	N	Minimum	Maximum	Mean	Std. Deviation
The environmental norms are complex the regulatory CHIM1	500	1.00	5.00	4.0980	1.10219
The regulatory Regime is unsupportive. CHIM2	500	1.00	5.00	3.9600	1.15111
There are not much green finance policies/ schemes for SMEs. CHIM3	500	1.00	5.00	4.0520	1.08612
The availability and affordability of GFIs is a challenge. CHIM4	500	1.00	5.00	4.0680	1.09443
Additional cost for due diligence and certification CHIM_5	500	1.00	5.00	3.5180	1.35105
Environmental compliance imposes financial burden on SMEs. CHIM6	500	1.00	5.00	3.4260	1.48895
Green finance initiative adoption required skilled labour. CHIM7	500	1.00	5.00	3.6340	1.33852
Skilled labour is not available on affordable terms and conditions to SMEs. CHIM8	500	1.00	5.00	3.4900	1.38916
Providing Training and skills to employees generates additional burden on SMEs CHIM9	500	1.00	5.00	3.5340	1.39741

CHAPTER - 5

FINDINGS, SUGGESTIONS AND CONCLUSIONS

This chapter highlights the findings of the study and discusses the results of previous studies. This chapter is divided into different sections. It describes the major findings and concludes the research findings. There is a discussion of the findings of the extent of green finance initiative within SMEs, to examine the implementation of green initiatives in small and medium enterprises, awareness level of SMEs and the major challenges in successful implementation of Green Finance Initiatives. Following this, the findings depict the relationship between water conservation, waste management, green technology adoption, availability, affordability and sustainable growth. In the final part of this chapter, conclusions are reached and finally, the recommendations for achieving environment sustainability using green finance initiatives, research limitations and scope of future research are addressed.

During the initial stage of data analysis, skewness and kurtosis were examined to assess the normality of the distribution. The findings of the study indicated that the data exhibited a normal distribution with minimal positive skewness. Skewness is a measure used to determine the degree of asymmetry in a distribution, reflecting any imbalance caused by outliers in the data.

Following the assessment of normality, the reliability of the measurement was evaluated. The results indicated that all Cronbach's alpha values were within the threshold limit, demonstrating good indices for the measurement indicators. Reliability analysis aims to ensure that a scale consistently represents the concept it intends to measure. In summary, the analysis confirmed the normal distribution of the data with minimal positive skewness. Furthermore, reliability analysis indicated good indices for the measurement indicators, as all Cronbach's alpha values fell within the acceptable threshold

5.1 Results Objective wise

Objective 1: To study green finance initiatives for SMEs.

The concept of green finance initiative schemes is helping small and medium scale enterprises to fulfill the national targets. These enterprises are taking benefits by adopting the green finance initiatives as a medium from the government and financial institutions prominently from SIDBI. It is creating a kind of window for channelizing the financing of innovative climate change projects to enhance the capabilities of SMEs to adapt to the changed requirements imposed by environmental concerns globally especially for green and energy efficient technologies. There are

several schemes implemented for SMEs. Moreover, there is a credit guarantee scheme for small scale enterprises which encourages the self-employment opportunities by providing the Collateral and guarantee free loans to the small scale industries units with the guarantee coverage of 75% - 85% in range. Additionally, there are other schemes such as credit linked capital subsidy component, International corporation, MSME cluster development programme, scheme for funds of regeneration of traditional industries, scheme for promotion of innovation rural industries and entrepreneurship, Lean manufacturing competitiveness for the small scale enterprises, entrepreneurial and management development of small scale enterprises through the incubation, awareness on intellectual property rights for the reimbursement of patents and trademarks in order to enhance the awareness among the small scale enterprises about the intellectual property rights. The basic purpose is to provide competency in the new opportunities for the modernization of manufacturing process which can support the sustainable growth of small scale enterprises which can create promotion of sustainable manufacturing technology for the clusters in order to provide help to the traditional Industries to become competitive and sustainable in terms of growth. In order to achieve sustainable growth several banks came forward for sanctioning of the loans to the SMEs. The SBI and its associate, public sector commercial banks, private sector commercial banks, foreign banks, state cooperative banks, regional rural banks, microfinance institutions, non-banking financial companies, micro finance institutions, small finance banks came forward for the creation of accounts to sanction and disbursement the amount of loan to the small scale industries for achieving sustainable growth which comes to Rs 59870318 as indicated in the reports of mudra.org.in. (Refer Table 4.1 in chapter 4).

As per secondary data it is analysed that:

1. There are many modes for the SMEs to avail the benefit of green finance initiatives. There are schemes launched by the central and state governments to enhance the green initiatives availability, affordability and awareness among the SMEs. (Table 4.6)
2. RBI is also pushing sustainable green finance practices by putting the renewable energy projects under priority sector lending. As per RBI Bulletin 2021 share of non conventional energy finance is low in Haryana (around 5%) which is low as compared to national average of 7.9% and in comparison to its neighbouring states Punjab, Delhi NCR and UP which could be enhanced by adopting green finance initiatives. (Figure 4.7)
3. Budget allocations and expenditure on incentives and schemes by the government shows that in 2020-21 and 2021-22 the expenditure on different incentives to SMEs was not spent fully. This may be due to the corona lockdown impact. (Table 4.8)

4. Maximum credit to these enterprises is provided by public sector banks (48%) followed by private sector(39%) banks and then NBFCs(13%). (Figure 4.8)
5. Maximum availed initiative among different initiatives/schemes is for CLCSS (Credit linked Capital Subsidy scheme) followed by TUFSS (Technology Upgradation Fund Scheme, and TEQUP stands for Technology up gradation), SCLCSS (Special Credit Linked Capital Subsidy Scheme). These schemes are helping SMEs in accessing enhanced technology, advanced machineries and adopting methods and practices which govern improvement in efficiency and attaining sustainable growth. (Figure 4.9)
6. In Lower middle income countries(world Bank) financing gap to SMEs is 76% of the potential demand as per OECD, 2018 issue paper titled "SMEs-Key drivers green and inclusive growth"

Objective 2: To examine implementation of green finance initiatives in SMEs.

A major challenge in policy for greening SMEs is to encourage implementation of green practices among SMEs. Their greening efforts should see some sustainable gains i.e. sustainable growth. Otherwise they tend to keep the environment at a low priority objective. **OECD (2018)**.

1. The results under the coefficients table stated that the Energy Management is having a 9.9% impact on Sustainable growth with standardized beta value as .099 with p value = 0.000, which indicates that there is a positive impact on Sustainable growth with a lesser percentage of approximately 10%. The results under the coefficients table stated that energy management is having a 9.9% impact on sustainable growth. The findings of this study suggest that energy management has the least significant effect on sustainable growth with approximately 10% approx. in totality. The reason behind this relative effect on the sustainable growth of small scale industries lies in the organisational activities in terms of energy management initiatives like the organization ensures that the activities of energy management minimize the amount of the energy used and it maximizes the use of renewable energy as the primary source of energy. Additionally, the organization has created the measures in terms of setting for the measurable targets so that the energy usage can be reduced to make it effective in terms of implementation, the organizations uses the effective strategies so that the energy management can be improved with regular monitoring of the energy consumption. So, all these measures in terms of Energy Management are having only 10% impact on the sustainable growth. **OECD (2018)** report also concluded that manufacturing companies in India could save approximately 60.8 billion rupees if they adopt energy efficiency measures i.e. it will ensure their sustainable growth. **Wahab, N. A. A., et al., (2020)**, also

concluded that energy-efficient processes, energy efficiency promotes sustainable growth of SMEs. Moreover Haryana Enterprise and Employment policy, 2020 notified "Energy Conservation Scheme" for MSMEs located anywhere in the state with the aim to encourage the practice of energy conservation by measuring areas of excess energy consumption and establishing technologically and economically effective means to cut down water consumption. Up to 75% cost of energy audit is reimbursed up to maximum of INR two lakhs. Also 50 % subsidy is provided on the cost of capital equipment required for energy conservation.

2. In addition to that the water conservation stated the standardised beta value as .149, which indicates that there is 14.9% impact on the sustainable growth out of water conservation which is significant with p value= 0.000. The findings suggest that water conservation has approximately 15% impact on sustainable growth. The reason behind that impact on sustainable growth lies in the organization's promotion, measurable targets and effective strategies, regular monitoring and minimization of effluents in water. Basically the organisations promotes the reuse of water in the production process and they set the measurable targets so that the water usage can be reduced and for the same there applies the effective strategies so that the conservation of the water can be improved, along with that these organisation they also monitor the trends in the water usage and as a result they able to minimise the amount of effluents in the water. So with all these managements for the water conservation has shown approximately 15% impact on the sustainable growth. Haryana Enterprise and Employment Policy, 2020 notified "Water Conservation Scheme" for MSMEs located anywhere in the state with the aim to encourage the practice of water harvesting and conservation , measuring the consumption and establishing technologically and economically effective means to cut down water consumption. Up to 75% of the water audit cost is reimbursed up to a maximum of Rs. one lakh. Apart from that 50 % subsidy is provided on the cost of capital equipment needed for water conservation.
3. In line of the findings and discussion there are other variables having significant impact on the sustainable growth of SMEs namely as- waste management is having 28.6 percent impact on Sustainable growth. The finding of the study indicated that in terms of waste management, organisations works in India so that we can ensure that there should be a minimum amount of waste from its activity. With the minimization of the waste from its activities SMEs go for recycling of the waste also. The Enterprises promotes the recycling of the waste by taking into account the measurable targets for the waste management in terms of reduction. Moreover in terms of the waste management all the

enterprises ensure the hazardous waste disposal by following the appropriate existing legislation standard and also enterprise monitors and records on-site and offsite waste disposal. The findings of the paper also generated the same results that water conservation, waste management and energy management are related to sustainability of SMEs **Yacob et. al, (2018)**. According to **Singh, Singh, and Sethi (2022)**, the study's findings reveal that implementing green practices or Green Firm Initiatives (GFIs) such as waste reduction, adoption of eco-friendly techniques, utilization of reusable resources, and the promotion of environmental awareness have a positive influence on enhancing business performance. Haryana Enterprise and employment policy, 2020 notified "Assistance for Waste Management Scheme" for MSMEs located anywhere in the state with the aim to financial assistance upto 50% of project cost covering machinery & equipment up to Rs 50 Crore to facilitate setting up of electronic waste management and e-waste recovery projects.

4. Further the green technology adoption is having 20.8% impact on Sustainable growth. For proximity 20% effect on Sustainable growth from the green technology adoption is because of the enterprise commitment of usage of the green/ energy efficient technologies. Enterprises use energy efficient technology because it controls the carbon footprints. These organizations benefit by adopting green technology financing schemes from the government. SMEs believe that adoption of the technology up gradation initiatives and innovation technologies schemes ensures long-term sustainability will create a kind of Sustainable growth. In addition to this organizations adopt Zero Defect and Zero Effect policy to make environment friendly products. But SMEs also believe that they are not fully benefited by green technology financial schemes. Haryana Enterprise and employment policy, 2020 notified "Assistance for Technology Acquisition" for MSMEs located anywhere in the state with the aim to make available new technology to the MSME sector. It involves purchase assistance for acquiring the latest technology. For this up to 75% (max. of Rs 50 lakh) reimbursement of purchase cost of technology from premier National/International Institutes/Patented Technology from domestic/foreign companies. In this study **Abolmaged, M. (2018)** surprisingly, the presence of technology infrastructure, technological competence, and adherence to environmental regulations does not exert a significant impact on the sustainability of Small and Medium-sized Enterprises (SMEs). Also study by **Yacob et.al, (2018)** indicated that green technology adoption does not significantly impact environmental sustainability
5. Results of this study suggest that there is 11% impact of availability on Sustainable growth of the Enterprise. There are multiple reasons for

the effect of availability on sustainable growth in the relative term. There are not sufficient programs which can target small and medium enterprises, where there is absence for the varieties of channels which can distribute green finance to the small and medium scale enterprises. Moreover, there is a lack of sufficient service providers for agents for availing green finance initiatives. That is why there is only an 11% effect on sustainable growth. OECD (2018) paper titled "SMEs-Key drivers green and inclusive growth" also concluded that lower middle income countries financing gap to SMEs 76% of the potential demand)

6. The affordability is having 17.2 % impact on the sustainable growth because the green finance initiative is requiring huge investment which is not available on easy terms and conditions, also there are lots of paperwork and the formalities involved in adopting implementing the green finance initiative and importantly, there is lack in the direction of quality services provided for implementing green finance initiative. **Blumberga and Kizane (2017)** found that the availability and affordability of Green Financing GFIs play a significant role in influencing the adoption of sustainable practices, resource efficiency, and long-term growth in Small and Medium-sized Enterprises (SMEs). Most of the studies agree that availability and affordability of GFIs promote sustainable growth of SMEs.
7. There are multiple ways by which the sustainable growth is achieved by the SMEs, namely as adopting green practices helps in SMEs long term sustainability, ensures compliance with Government's legislation, competitiveness based on capabilities like; skills and innovation and also promotes investment in people by supporting training and development programs for employees, GFIs work towards reduction of carbon emission, pollution control in production and consumption, promotes organizational financial performance and help obtaining government's incentives to organization. **Aboelimged, M. (2018)** the findings reveal that environmental pressures, management support, and employee engagement positively influence the adoption of Sustainable practices/GFIs.
Rouf, K. A. (2012) secondary research findings of green credit on sustainable growth confirmed a positive relationship between them. Finance features have significant impact on environmental sustainability in terms of its affordability, availability, acceptability and awareness of SMEs. **Basant et al., (2018)**
Our results show that there is a positive and significant impact of different GFIs on the sustainable growth of SMEs. If they adopt these measures it will encourage them to go green. All our research questions got positive findings.

Objective 3: To study the awareness level of SMEs regarding green finance initiatives.

On a five point likert scale from 1- strongly disagree to 5- strongly agree it was found that most of the answers cluster at 4 which shows agreement with regards to variables related to awareness. (C. R. Kothari)

The findings of the study indicated that the entrepreneurs who are engaged in the small scale enterprises are well aware about the initiative of green financing. It was measured by several indicators on which the entrepreneur has responded. It was found in the measurement of the awareness level of the SMEs entrepreneurs regarding the green finance that it is the social investment by nature and GF is one of a number of terms used to describe activities associated with the two-way interaction between the environment, finance and investment but SMEs are not much aware about this term.

It is further indicated by the findings that the Government is not taking sufficient steps to raise awareness regarding green finance initiatives in terms of conducting the workshops or seminars, though the government can take necessary steps for the SMEs like the “flagship schemes that focus at awareness building and promoting the funding of green initiatives. Such schemes encourage financial and non-financial institutions to embed environmental concerns into their financing patterns. Our findings are similar to the findings of **Creech et.al (2014)** which concluded lack of awareness due to insufficient research support like workshops, training etc.

The further findings of the study stated that the SMEs which are engaged in green finance initiatives are less aware of the usage of renewable energy though the development and use of renewable energy improves the energy security, environment, economy in different industries. The discussion for the awareness regarding the green finance initiative further explained that the entrepreneurs engaged in SMEs are well versed in terms of awareness about the green finance and they are also well aware that it increases the “level of financial flows to sustainable development priorities”. The findings of the descriptive statistics analysis indicated that SMEs are aware that the environment protection improves the SMEs long run sustainability. The entrepreneurs stated that though they are not much aware about the green financing specifically but still their top management has understanding about green finance initiatives related practices and policies and they adopt it after good study of available opportunities. They also believe that there is a tradeoff between financial and social performance when they adopt green finance practices and initiatives. But still they are not much aware about green finance schemes available may be due to the reason that government is not doing full efforts in promoting these initiatives available for SMEs. (**Tang et al., 2020, Singh, Singh, and Sethi, 2022**) awareness about GF effects SMEs sustainability.

Objective 4: To study the key grassroots level challenges in effective implementation of green finance initiatives.

The results of this study indicated the mean and standard deviation on an average of 4 on the 5-point scale which indicates that the situation is troublesome in terms of challenges. The complex environmental norms (Mean = 4.09, Standard Deviation = 1.102), the unsupportive regulatory Regime (Mean = 3.96, Standard Deviation = 1.15), not clear government policies of GF for green finance for SMEs (Mean = 4.05, Standard Deviation = 1.08), the high cost of adoption of GFIs (Mean = 4.06, Standard Deviation = 1.09), additional cost for due diligence and certification (Mean = 3.51, Standard Deviation = 1.35), environmental burden imposed financial burden on SMEs (Mean = 3.42, Standard Deviation = 1.48), GFIs adoption requires skilled laborer (Mean = 3.63, Standard Deviation = 1.33), which cost more to the SMEs (Mean = 3.49, Standard Deviation = 1.38), providing training and skills to employee creates additional cost (Mean = 3.53, Standard Deviation = 1.39)

1. In the measurement of the grass root level challenges in the effective implementation of the green finance initiatives, the findings of this study indicated that the environmental norms are very complex because the regulatory regime is unsupportive with the lack of clear cut government policies towards the GFIs for SMEs
2. Further there is a cost problem also as there is a requirement of additional cost for license and certification and there is an environmental compliance which impose the financial burden on small and medium scale enterprises. Also easy availability and affordability of funds is a challenge. **Majumdar (2019)** found that financial obstacles are critical to implementing green manufacturing, which was further agreed upon by **Singh et al. (2021)**. In the current study, it has been observed that insufficient government support and poor availability of funds are essential criteria that must be addressed.
3. Also there is a requirement of skilled labors in the green finance initiative adoption which again creates more cost to the small and medium Enterprises. Moreover, there is a requirement of providing training to make the employees skilled and there is the existence of additional cost in this regard. **Creech et.al (2014)** also identified the lack of skilled human capital (50% of SMEs) for greening of SMEs in a 4 years longitudinal study of over a thousands of SMEs in Asia, Latin America and Africa.
4. Skill gap, financial gap, awareness gap about environment impact , potential market benefits and unsupportive environment legislation were identified **OECD(2011)**, **OECD(2013)**, **OECD(2018)**, **OECD (2018)**, **GIZ (2012)**. Training education, availability of funds, commitments from management contribute positive to sustainable practices. **(M. Hammad, 2019)**

SMEs face a mess of challenges within the current landscape - which, if left unaddressed, create some risk to a high growth trajectory. The largest challenge during this space is access to the proper financing. However, adequate and timely funding is the lifeblood of SMEs and a key differentiating issue which will bring these SMEs to the massive leagues. Totally developed and modern infrastructure contributes to the expansion of the SME sector. Technology, which is the backbone of contemporary businesses, contributes to innovation and reduces costs. With the adoption of the latest technologies, SMEs could compete with their international counterparts. Therefore, policymakers ought to offer the right startup incubation and incentive support to SMEs.

5.2 Suggestions/Recommendations

1. The Study revealed that the Indian financial industry has not yet been completely supportive of any planned initiatives to increase green lending and investment. Therefore, there is an increasing need to educate its financial sector of the importance and advantages of green finance efforts in India's banking and SME sectors. Enterprises are required to integrate environment management related aspects in their organizational planning process.
2. Companies promote investment in people to support training and development programs for its employees and sensitise them about green initiatives adoption. Government should also organize training workshops to support SMEs in gaining knowledge about technological advancements and easy uptake of new energy efficient technology.
3. Green Finance Initiatives of the company that affects the environment positively. Enterprises need to adopt cleaner methods of production, lean manufacturing processes and energy efficiency on priority basis. Efforts should be made to phase out low-energy efficient equipment and obsolete technology and to promote adoption technology upgradation and use of high energy efficient technology.
4. SMEs believe that they are not fully benefited by green technology financial schemes. Government is required to make more efforts so that the affordable schemes targeting SMEs are available to them.
5. Budget allocations and expenditure on incentives and schemes by the government should be increased and fully utilised.
6. More efforts should be made to increase the accessibility and awareness of TEQUP initiative as it is directly related with environmental competitiveness of SMEs.
7. Government should ensure that SMEs meet certain environmental criteria before sourcing materials to keep the fundamentals of an organisation strong for achieving sustainable development. Presently the government procures at least 25% from MSMEs (msme.gov.in) but there is no green focus in this. If this procurement policy mandates the

adoption of green initiatives by these enterprises, this will incentivize them to shift to green concept and adoption of green technology.

8. Non conventional energy finance is low in Haryana as compared to national average and in comparison to its neighbouring states Punjab, Delhi NCR and UP which could be enhanced by adopting green finance initiatives. As most of the energy is used by the industrial sector, its very crucial for the state to improve financing in this sector.
9. As most of the financing to SMEs is coming from the public sector, efforts should be made to encourage and involve the private sector in this green transition.
10. The various challenges faced by SMEs stated that the regulatory regime is unsupportive and environmental norms and policies are complex. Government should come forward with attractive and cost efficient green finance programs with respect to lowering the cost of adoption (skilled labour) and ensure the environment norms should coincide with ease of doing business.
11. Respondents are becoming more aware, but view this change as a costly process. More incentives to these SMEs will act as key drivers in this change process. There is a need to generate more awareness and promote GFIs mainly related to energy efficiency and management by effective schemes related to renewable energy adoption.
12. Government should also ensure to improve the availability and affordability of GFIs.

5.3 Limitations of Research

1. Area Constraints:- In this research, Haryana is taken as a study area which is comparatively progressive states. Change in the area of study might change the results of the study.
2. Budget Constraints:- Limited funds also acted as a constraint to the researcher in case of primary research.
3. Time Constraints:- The whole study was done in a time span of two years. This time period was also impacted by the Corona pandemic over the world which posed a challenge in research. Change in time period may lead to deviation of results from actual results.
4. Type of enterprises: This study is based on small and medium enterprises. Study on large enterprises may have changed the results. Also in this study mainly manufacturing enterprises are taken into consideration hence does not properly reflect the green finance initiatives scenario in other sectors.
5. Sample Size Constraints:- In this study a sample size of 500 is taken from different districts of Haryana .Change in the sample size of the study might change the results.
6. Response from respondents: Some respondents found to be reluctant in their response as they were suspicious about the nature of study as

it included the questions related to adoption of green measures in their organization. Efforts were made to make them understand the nature of study and maintaining the confidentiality of data. It was very challenging and required more follow-ups and personal requests.

5.4 Future Scope of Research:-

1. The future researchers may investigate the green finance initiative concept taking into consideration different areas of study. The future researchers may investigate into the impact of the corona pandemic on green finance initiatives adoption.
2. The future research could be focused on green finance initiatives' impact and implementation in large industries or any particular type of industry like service, automobile, textile etc.
3. In future studies, it is recommended to complement the quantitative survey approach used in this research with qualitative methods such as interviews or case studies. This integration would allow for a more comprehensive exploration of the motivations, challenges, and barriers faced by manufacturing SMEs when adopting environmental sustainability practices.
4. Future researchers could explore the influence of the COVID-19 pandemic on the adoption of GFIs.

In future this study will help the organisations to develop such policies in accordance with governmental rules and regulations and would help companies to make favourable policies to sustain in the cut-throat competition in future. This study will also help the organisation in reframing their strategic and competitive policies in such a way that they would deduce measures to adopt green finance initiatives and make their business more sustainable. Tailored green financing programs and initiatives for SMEs in the sectors like waste management, energy efficiency, renewable etc will pave the way for green transition of SMEs. For effective adoption and green transition of the SMEs, participation of all the players i.e. private, public, policies, industrial support agencies etc. is must. Dedicated green financing programs for SMEs in the sectors like waste management, energy efficiency, renewable etc will pave the way for green transition of SMEs. Finally adequate assistance, awareness and sensitization are key factors for achieving success in proper implementation of green finance initiatives and policies.

The road to effective implementation of green initiatives lies in proper coordination among policy makers, the enterprises i.e. SMEs, service providers and last but not the least the financial institutions. It also provides areas for the Government to work upon to boost the greening of SMEs by promoting GFIs and paying attention towards challenges faced by these small and medium firms.

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