

CHAPTER I

INTRODUCTION

1.1 Background

The recent global warming is caused by the increased use of carbon dioxide (CO₂), greenhouse gas emissions and excessive pollution (Husnaini & Tjahjadi, 2021). The World Meteorological Agency said that 2023 was recorded as the hottest year in the history of instrumental observations, the global average temperature anomaly reaching 1.40 degrees Celsius above pre-industrial times. The ASEAN region is also experiencing a change in the earth's climate, which has recently experienced an increase in the earth's temperature that has been felt in the last decade (Fahrudin & A'yun, 2024). Mitigation efforts in key sectors, including the energy sector in ASEAN, are very important, due to the high carbon footprint in the sector with the increasing energy demand in ASEAN and the country's dependence on fossil fuel energy, on par with the carbon-intensive growth in ASEAN. The amount of carbon dioxide (CO₂) emissions in the ASEAN region is presented in the following figure 1.1

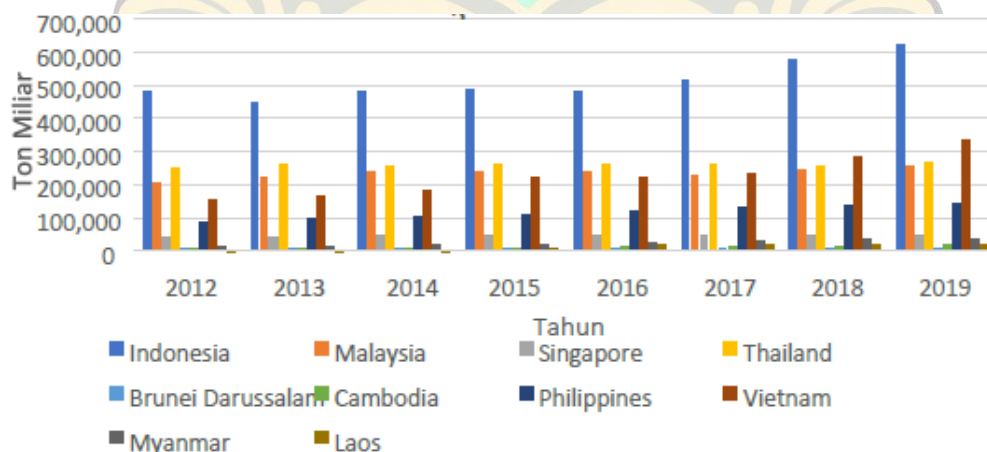


Figure 1.1 CO₂ Emission Data in Southeast Asian Countries in 2012-2019 (Fahrudin & A'yun, 2024)

From figure 1.1 Carbon dioxide (CO₂) emissions of countries in ASEAN explain that Indonesia occupies the top position in producing carbon dioxide (CO₂) emission gas from year to year has increased quite high. According to data from the World Bank in 2019, the country that produces 619,840 hundred tons of emissions is Indonesia, which means that with this figure Indonesia is the country with the highest CO₂ emission gas of the countries in the ASEAN region. Thailand is the second country that produces the highest CO₂ emissions with a value of 267,090 hundred tons in 2019, which means that from 2012 to 2019 CO₂ emissions continue to increase every year. Meanwhile, Malaysia has a value that reaches 205,801 to 253,270 thousand tons from 2012 to 2019. Then Brunei Darussalam is a country with a low emission level of 6,900 tons in 2019. The high level of CO₂ emissions in several ASEAN member countries shows that the factors driving emissions are still being implemented. One of the factors that is thought to increase CO₂ emissions is the increase in the use of fossil energy. In research Fasikha & Yuliadi, (2018) The main cause of pollution and deteriorating air quality is the energy sector.

Indonesia's dependence on fossil energy, especially coal, is still very high. According to the Ministry of Energy and Mineral Resources (EMR), around 60-70% of electricity generation in Indonesia in 2023 will still come from coal. This causes high carbon emissions and increases the environmental burden, especially in the midst of an increasingly severe global warming trend. However, Indonesia has shown its commitment to make an energy transition to renewable energy through a *net zero emission* program targeted to be achieved by 2060. Several strategic measures such as increasing the use of renewable energy (e.g., solar and wind) as well as the B35 biodiesel program have begun to be implemented.

However, major challenges such as high investment, dependence on imported technology, and bureaucracy still hinder the acceleration of the transition.

With increasing awareness of environmental impacts, companies in various sectors including energy are now encouraged to innovate in an environmentally friendly way. Climate change due to the increase in the concentration of greenhouse gases in the atmosphere caused by the burning of fossil fuels, deforestation and unsustainable industrial practices has prompted an increase in the demand of companies to develop sustainability technologies and innovations to reduce the impact of global warming. Green innovation can be a strategic solution to face this challenge, because it offers a more environmentally friendly approach to industrial activities. Green innovation helps reduce the negative impact of industrial activities on the environment such as air pollution, air pollution, water pollution and industrial waste (Liao, Zhang & Wang, 2019). This most relevant for the energy sector in ASEAN, including Indonesia, which is still very dependent on fossil fuels. With innovations that support energy-saving technologies, pollution prevention and waste management, companies can improve their environmental efficiency.

Green innovation not only contributes to environmental sustainability but also improves the competitiveness of the company. Research Chen et al., (2018) shows that companies that implement green innovation can improve their reputation, attract consumers who care about the environment and meet increasingly stringent government regulations. This provides a competitive advantage for companies, especially in the energy sector which faces pressure from various parties, including investors and consumers to be more environmentally responsible. Green innovation also contributes to the achievement of global

sustainability goals such as the Sustainable Development Goals (SDGs). As one of the steps to reduce carbon emissions, this innovation supports the energy transition to renewable energy which is Indonesia's commitment through the net zero emission program by 2060. Therefore, the implementation of green innovation is not only morally responsible, but also a strategic need to create a more sustainable future.

Green innovation is seen as a manifestation of the theory of legitimacy, which requires companies to act in accordance with societal values and norms (Husnaini & Tjahjadi, 2021). Pressure from various parties forces companies to care about and take responsibility for the environmental conditions in which they operate, as well as encourage them to take strategic risks, such as investing in green innovation. The company realizes that consumers are more interested in eco-friendly products, even though the price is higher (Tan & Zhu, 2022). Green innovation is an important tool to ensure long-term sustainability (Usman, Javed & Yin, 2020).

The main goal of green innovation is to reduce the negative impact of industrial activities on the environment (Liao et al., 2019). This green innovation is divided into an environmental pillar score and an environmental innovation score (Makpotche, Bouslah & M'Zali, 2024). These include innovations in energy-saving technologies, pollution prevention, waste recycling, eco-friendly product design, and environmental management (Zhang, Rong & Ji, 2019). Thus, the company leverages innovation to achieve environmental efficiency while improving financial performance. According to Chen, Yi, Zhang & Li (2018), Green innovation has a positive impact on the competitiveness of companies. Companies that implement

green innovation can reduce production waste, improve reputation and ultimately strengthen competitiveness amid consumer pressure and government regulations. Therefore, successful green innovation supports companies in strengthening core competencies and enhancing their green image.

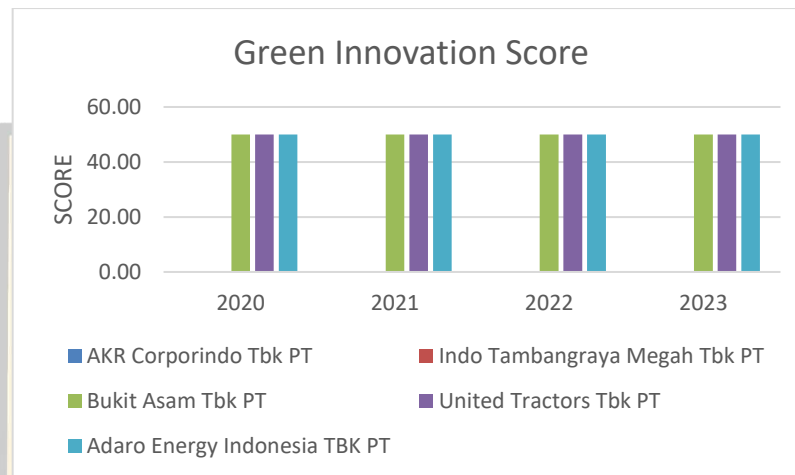


Figure 1.2 Green Innovation on Companies Energy Sector in Indonesia

Companies are increasingly required to focus on green innovation because it is more environmentally friendly and can be a solution to overcome pollution (Chen et al., 2018). This demand has made several companies start to disclose their green innovations, as seen in figure 1.2 which shows that Indonesian companies in the energy sector such as Bukit Asam Tbk, United Tractors Tbk and Adaro Energi Indonesia Tbk show green innovation disclosures worth 50%. Meanwhile, the companies AKR Corporindo Tbk and Indo Tambangraya Megah Tbk still have a green innovation value of 0. This data shows that there is a gap in the disclosure of green innovation in the energy sector, so it is necessary to know the factors that can affect this disclosure.

However, in realizing green innovation, companies not only need technological support and resources, but also a conducive social and governance

environment (Mohy-ud-Din, 2024). The corporate social pillar based on refinitiv reflects the company's commitment to social aspects such as labor welfare, respect for human rights, community involvement and product responsibility. This pillar plays an important role in creating an inclusive work environment, fostering innovation and meeting stakeholder expectations. In the research Syafri et al. (2021) which shows that a skilled and diverse workforce contributes significantly to the development of green innovation. Data from Refinitiv also supports that one of the components of the corporate social pillar, namely the workforce, may affect the disclosure of green innovation. In Figure 1.3, which shows that energy companies with high workforce scores such as Bukit Asam Tbk have a workforce disclosure score of 93.27 tend to have better green innovation disclosure, which is 50 compared to companies with low workforce scores such as Indo Tambangraya Megah Tbk. This confirms that effective workforce management, as one of the important components of the social pillar, may play an important role in driving green innovation. The company's social pillars provide the foundation to support the adoption of green technologies and promote sustainability.

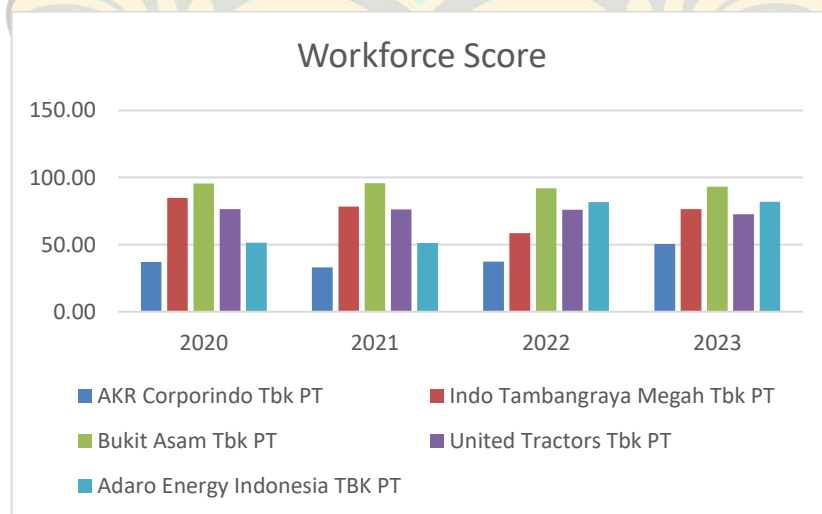


Figure 1.3 Workforce on Companies Energy Sector in Indonesia

The corporate governance pillar reflects the quality of corporate governance in ensuring transparency, accountability and sustainability. These pillars based on refinitiv include management, shareholder participation and CSR strategies designed to support ethical and strategic decision-making. The CSR strategy component in good corporate governance creates an environment that supports innovation, including green innovation. Research Makpotche et al. (2024) shows that companies with integrated CSR strategies are able to invest better in green technology than companies that only focus on short-term profits. Refinitiv data also supports this finding, in Figure 1.4 shows that companies in the energy sector that have a high CSR strategy score such as Bukit Asam Tbk with a CSR strategy disclosure score of 89.66 tend to have better green innovation disclosure of 50 compared to companies with low CSR Strategy scores such as AKR Corporindo Tbk. This confirms that effective CSR strategy management, As one of the important components of the Governance pillar, it may play an important role in driving green innovation. The corporate governance pillar provides the foundation to support the adoption of green technologies and promote sustainability.



Figure 1.4 CSR Strategy on Companies Energy Sector in Indonesia

In this study, researchers grouped social companies based on refinitive sources, using 10 key indicators of ESG scores to find out more deeply the influence of each component of the social and governance pillars on green innovation. The company's social pillar is used as an independent variable that covers four main categories: workforce, human rights, community and product responsibility. Dessler (2016) Defines workforce which refers to the entire group of workers in an organization or company involved in achieving company goals. Refinitiv defines workforce scores based on a company's effectiveness in job satisfaction, a healthy and safe workplace, maintaining diversity and equality of opportunity, and development opportunities for its workforce. Syafri, Prabowo & Ashari, (2021) found that organizations that have skilled employees are more likely to develop and implement green innovation effectively.

In the Universal Declaration of Human Rights (DUHAM) adopted by the United Nations General Assembly in 1948, human rights are defined as fundamental rights that are possessed by every individual from birth, regardless of race, color, sex, language, religion, political views, national origin or other social status. These rights are inalienable rights, which everyone has only because they are human and aim to guarantee dignity, freedom and equality. Refinitiv defines a human rights score based on a company's effectiveness in respecting basic human rights conventions. Bai, Hsu & Lin (2019) observed that companies operating in countries with strong commitments to human rights are more likely to undertake green innovations in response to environmental regulations and consumer demands. The right to a healthy environment is one of the main motivators for companies to adopt environmentally friendly technologies.

Companies and communities can create shared value through mutually beneficial interactions. Porter & Mark (2011) Calling the community a group that has a common interest that can be strengthened through responsible business activities. Refinitiv defines community scores based on a company's commitment to being a good citizen, protecting public health and respecting business ethics. Badruzzuhad & Firmansyah (2023) shows that the community can play a role in the formation of green innovation areas through collaboration between research centers, educational institutions and communities. Communities can also contribute to raising environmental awareness and facilitating green innovation.

According to White, Stoughton & Feng. (1999), product responsibility refers to the concept where manufacturers and suppliers take ownership of the environmental and societal impacts of their products throughout their entire life cycle, from design and production to usage and eventual disposal. This involves ensuring that products are designed and produced in ways that minimize harm and maximize beneficial reuse, recycling, or proper disposal. Refinitiv define product responsibility scores based on a company's capacity to produce quality goods and services integrating the customer's health and safety, integrity and data privacy. Lozano & Collazzo (2022) find the integration of product responsibility into CSR strategies encourages businesses to invest in green innovations. Companies that actively promote their commitment to sustainability through responsible practices can improve their public image and attract investors, thereby enhancing profitability

In this study, researchers group corporate governance based on sources from refinitiv, using 10 key indicators of ESG scores. The pillars of corporate governance are used as independent variables, which include three main categories:

management, shareholders and CSR strategy. Lina (2024) Explain management as the process of planning, organizing, directing and controlling resources, including human, financial and material to achieve organizational goals effectively and efficiently. Refinitiv breaks down management into two categories, namely structure and compensation which include aspects of independence, diversity and commitment. Makpotche et al. (2024) found that good corporate governance practices, such as non-duality of CEOs, the establishment of ESG committees and gender diversity in board, correlated with better environmental performance.

Shareholders are the owners of the company who have certain rights and responsibilities. Good corporate governance should provide space for shareholders to contribute effectively to corporate governance, while still applying high standards of conduct without being involved in the company's day-to-day operations (Amore & Bennedsen, 2016). When shareholders are not involved, agency issues can arise if the interests of the company's agents or representatives conflict with the interests of the shareholders. According to Amore & Bennedsen (2016), Shareholders often delegate their authority and responsibilities to the directors, who are then responsible for the company's strategy and operations. This puts the board and management in an accountable position to shareholders. Research by Makpotche et al. (2024) shows that shareholders have a significant influence on the disclosure of green innovation. Liu & Lyu (2022) states that companies with high environmental responsibility are valued by investors.

The next category is CSR strategies that are closely related to environmental performance. Social and environmental responsibility is an external factor that companies consider in running their business to support sustainability. The

application of corporate social responsibility has been regulated in law number 40 of 2007 concerning limited liability companies, where article 74 paragraph 1 states that "companies that carry out their business in and/or related to natural resources are obliged to carry out social and environmental responsibilities". According to Fraderick, CSR is that the company must take full responsibility for the consequences caused to the community and the environment in which the company is located. In the research Makpotche et al. (2024) It was found that CSR strategy has a significant influence on green innovation.

Green innovation in companies involves processes, products, or strategies that aim to reduce environmental impact while creating economic value. In this context, the components of the social pillars (workforce, human rights, community, and product responsibility) and governance (management, shareholder, and CSR strategy) were chosen because of their important role in supporting environmentally friendly innovation. The social component creates an environment conducive to innovation through improved workforce well-being, human rights protection, community engagement, and product responsibility, all of which can encourage companies to adopt green solutions (Hossain et al., 2021). Meanwhile, good governance through strategic management, shareholder engagement, and CSR strategies ensure the company has a structure that supports sustainability. Thus, social and governance aspects act as drivers, while green innovation measured through the environmental innovation score reflects the results of these influences (Khan et al., 2022). This approach avoids duplication with environmental pillar components, while highlighting the relationship between non-environmental aspects and green innovation, especially in the context of companies in ASEAN.

The literature shows that there are internal and external factors that affect the company's green innovation. Internal factors include government regulations, pressure from stakeholders (D. Zhang et al., 2019), Market Competition (Chen et al., 2018), and the availability of financial resources (Amore & Bennedsen, 2016). Internal factors include characteristics of the board of directors such as gender diversity (Liao et al., 2019), Geographical diversity (Usman et al., 2020) and institutional investor involvement on the board (Amore & Bennedsen, 2016). Most of this research was only conducted on companies in China and the main challenge faced was the problem of endogeneity. In this context, Amore & Bennedsen (2016) leverage corporate governance changes and green innovations related to anti-expropriation laws in the U.S. in the late 1980s as an exogenous shock to the threat of hostile expropriation (external governance) to address endogenousness. Using a sample of U.S. companies, they found that companies with weaker governance generated fewer green patents than companies with better governance. However, their study only covers the period 1976-1995 and the shocks used in their research date back to the late 1980s, while environmental issues have become more urgent in recent years. For example, green innovation experienced significant growth after 2015 (Takalo, Tooranloo & Parizi, 2021). Therefore, it is important to examine the relationship between internal governance mechanisms and green innovation using different approaches.

Research conducted Xu, Liu & Shang (2021) Regarding the contribution of ESG ratings to corporate innovation in developing countries, it was found that ESG ratings with high financial investment increased corporate innovation. Tan & Zhu (2022) found that environmental awareness managers strengthen the relationship

between ESG awareness and green innovation in developing countries. Moreover Liu & Lyu (2022) stated that the institutional environment greatly influences the company's ESG contribution to green innovation in companies listed on the China Stock Exchange. However, there is still no attention to the interests of stakeholders.

The COVID-19 pandemic, which was first detected in Wuhan, China, in December 2019, has triggered major changes in various aspects of global life. The transmission of this virus quickly spread around the world, and in March 2020, the World Health Organization (WHO) officially declared COVID-19 a pandemic. The economic impact of this pandemic is significant; Many countries experienced a sharp decline in economic activity due to the implementation of restrictive measures such as lockdowns and social distancing. According to a study, COVID-19 has led to a decline in companies' financial performance across various sectors, with reports showing that many companies have experienced drastic declines in revenue and profits (Ramadhan, Rani & Wahyuni, 2023). In addition, data from Indonesia's Central Statistics Agency (BPS) showed a contraction in economic growth from the fourth quarter of 2019 to the first quarter of 2020, where household consumption decreased from 2.71% to 1.56%, reflecting the direct impact of the pandemic on the economy. So researcher is interested in researching the influence of the corporate social and governance pillar on green innovation after the announcement of Covid-19, namely from 2020 to 2023.

Green innovation has emerged as a crucial strategic issue for businesses in response to global environmental challenges, regulatory pressures, and growing consumer awareness of sustainability. Studies, such as Irwanto & Alhazami (2023), have shown that implementing green innovation enhances competitive advantage

by improving resource efficiency and reducing environmental impacts. Additionally, Effendy (2024) found that green innovation significantly influences financial performance and environmental sustainability, particularly in the tourism sector. Despite the growing body of research highlighting its benefits, there remains a gap in understanding the specific factors influencing green innovation across different industries and contexts. By focusing on green innovation as the dependent variable, this study aims to explore its relationship with social and governance performance, thereby contributing to the development of sustainable business strategies.

Although several previous literature has identified the relationship between corporate governance and green innovation, there have not been many studies that explore how corporate social pillars affect green innovation, especially in Southeast Asian public companies and explore after Covid-19 announced. So the author is interested in researching "The Influence Of Corporate Social And Governance Pillars On Green Innovation In Southeast Asian Energy Sector Public Companies"

1.2 Research Questions

From the background presented, the author formulates the research problem as follows :

- 1) Does workforce affect green innovation in Southeast Asian energy sector public companies?
- 2) Does human right affect green innovation in Southeast Asian energy sector public companies?

- 3) Does community affect green innovation in Southeast Asian energy sector public companies?
- 4) Does product responsibility affect green innovation in Southeast Asian energy sector public companies?
- 5) Does management have an effect on green innovation in Southeast Asian energy sector public companies?
- 6) Does shareholders have an effect on green innovation in Southeast Asian energy sector public companies?
- 7) Does CSR strategy affect green innovation in Southeast Asian energy sector public companies?

1.3 Research Objectives

From the formulation of the problem, the objectives of this study are as follows :

- 1) Knowing the influence of workforce on green innovation in Southeast Asian energy sector public companies
- 2) Knowing the influence of human right on green innovation in Southeast Asian energy sector public companies
- 3) Knowing the influence of community on green innovation in Southeast Asian energy sector public companies
- 4) Knowing the influence of product responsibility on green innovation in Southeast Asian energy sector public companies
- 5) Knowing the influence of management on green innovation in Southeast Asian energy sector public companies

- 6) Knowing the influence of shareholders on green innovation in Southeast Asian energy sector public companies
- 7) Knowing the influence of the CSR strategy on green innovation in Southeast Asian energy sector public companies

1.4 Contributions of the Research

This research is expected to be able to share contributions to the community and parties involved with this research. Among these parties are:

- 1) For investors

The research is expected to provide important insights into how social and governance pillars affect green innovation, which can help investors make more informed investment decisions by identifying potential risks and opportunities in sustainability-focused companies. By understanding the influence of social and governance factors on the success and risks of green innovation, investors can better manage their portfolios, as well as assess the long-term value of companies based on their commitment to social and governance practices and their impact on green innovation.

- 2) For academics

This research is expected to be able to enrich the literature by clarifying the relationship between social pillars, governance, and green innovation, as well as providing a foundation for further research in the field of sustainability and innovation management. The findings of this study also contribute to the development of theories related to the influence of social pillars and governance on green innovation, as well as expanding existing

models. In addition, the multidisciplinary approach applied encourages the integration of social aspects, governance, and green innovation, thereby enriching academic understanding in a broader context.

3) For companies

This research is expected to be able to provide guidance for companies in developing sustainable business strategies by integrating social pillars and governance into their green innovation efforts, as well as demonstrating a commitment to sustainability and social responsibility that can improve the company's image in the eyes of customers, investors, and stakeholders. In addition, the research helps companies understand how good social and governance practices can facilitate and accelerate the green innovation process, as well as improve the effectiveness and impact of their sustainability initiatives.

1.5 Scope of Research

To further focus on the problems to be discussed, the author will provide research limitations so that the goals and objectives of this research can be achieved. There are several variables that will be discussed by the author, namely the corporate social pillars consisting of workforce (X1), human rights (X2), community (X3) and product responsibility (X4) as well as the pillars of corporate governance consisting of management (X5), shareholders (X6) and CSR strategy (X7). The characteristics of the company as a control variable will be measured by the age of the company, the size of the company and the company's ability to

generate profits, and green innovation (Y) as a dependent variable. This study uses public companies in Southeast Asian energy sector in the 2020-2023 period.

1.6 Research systematics

The systematics of writing this research are as follows :

CHAPTER I INTRODUCTION

This section will explain the background, formulation of problems related to the topic, research objectives, research benefits, research scope and writing system.

CHAPTER II LITERATURE REVIEW

This section describes the basic theories and concepts related to the research problem, the results of previous research, and the guidelines for hypothesis development.

CHAPTER III RESEARCH METHODOLOGY

This section covers research design, research population and samples, data collection methods and sources, operational definitions and measurement of research variables, data analysis methods and hypothesis testing methods.

CHAPTER IV RESEARCH RESULTS AND DISCUSSION

This section describes the results of hypothesis testing and interprets the findings of the research obtained.

CHAPTER V CLOSING

This section contains the conclusions of the research that has been carried out, the limitations of the research and the suggestions that are used for further research.

