The Governance Culture of Sustainability

An analysis of the influence of the National Governance Culture on Sustainability Performance

SBI Master Thesis

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ABSTRACT

The immediate need for sustainable development in increasing. The responsibility for addressing this need lies with countries, but because of the nature of the problem also non-state actors must act on this. Previous literature suggests that especially these non-state actors are influenced by the national background context of a country, which exists of political and socio-economic institutions also referred to as the National Governance Culture. A lot of research is conducted about the nature of this influence, as these institutions are not only believed to influence each other but also the sustainability performance of a country. However, this assumption has never been fully proven, as only parts of the relation or suggested relations were shown. Nevertheless, it is still commonly believed that more open and inclusive societies have a better sustainability performance. This research tries to uncover this relationship, by combining the elements of previous research. A qualitative analysis is performed to identify the important political and socio-economical institutions, and the indicators that measure the sustainability performance of a country. Then a quantitative analysis is performed based on data from publicly available databases, to create measurable variables. The influence of the Policy Culture (political institutions) and Socio-Economic Structure (socio-economic institutions) on Sustainability Performance is tested with multiple regression tests. The results of the research were in line with what the previous literature indicated, as the regression test based on data from 76 countries showed that especially having an open and inclusive Socio-Economic Structure had a positive influence on Sustainability Performance. However, the magnitude of this influence is unsure as the dependence on publicly available data was a main limiting factor for the robustness of the results. Even though there were some limitations, the phenomenon was still shown and further confirmed by this research. Showing that the influence of socio-economic institutions should be considered when striving for sustainable development. Furthermore, the research also brought up some interesting areas for research, as some indicators did have a surprising influence.

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1. INTRODUCTION

"We can now say with credibility that we have kept 1.5 degrees alive. But, its pulse is weak and it will only survive if we keep our promises and translate commitments into rapid action." **– Alok Sharma, president of the COP26**

The outcome of the COP26 in Glasgow once again showed that there is an increased and immediate need for sustainable development to diminish the impact of climate change. The responsibility for addressing this need for sustainable development is mainly on a national level, since the prevalent sustainability agreements, the Paris Agreement and the SDG framework revolve around voluntary nationally determined contributions (Clémençon, 2016; Forestier and Kim, 2020; Dubash, 2021). The importance of national contribution regarding sustainability is not a new concept, as Dernbach (1998) already addressed the importance of realizing sustainable development through actions on a national level. Examples of this are the Millennium Development Goals and the earlier Sustainable Development summits, which already mobilised countries to develop national strategies and commitments toward sustainable development (Sachs, 2012). The SDGs and the Paris Agreement, thus once again call for similar actions from states. However, due to their nature and the current magnitude of climate change, agreements call for more than contributions solely on a national level. Non-state actors also must contribute, as multi-level governance and multi-level action are needed to achieve the sustainability goals that are currently set (Stafford-Smith et al. 2017; Bäckstrand et al. 2017; Banerjee et al. 2020).

Non-state actors, such as corporate actors, consumers, civil society, and cities, however, do not function in isolation, as they are influenced by decisions and policies on a national level, which shape the institutional context in which they operate (Murtha and Lenway, 1994; Lockwood et al. 2017; Sandhu et al., 2018; Rosati and Faria, 2019; Dubash, 2021). Especially regarding the governance of sustainability transitions, the national context appears to be influential for not only state-level actions but also non-state-level actions, which also is the case for commitments toward SDG goals (Horn and Grugel, 2018; Rosati and Faria, 2019). Several contextual factors that have an influence are identified in the literature, for example, Ehnert et al. (2018) refer to the political regime as a national context that differs between countries and regions around the world, which influences the actions, and the efficiency of sustainability transitions of cities and countries. Wurster (2013), follows this view, but also acknowledges that the possible importance of socio-economic institutions in influencing a country's sustainability performance should not be overlooked. Furthermore, Sandhu et al. (2018) demonstrate this importance by showing that the legal system, economic freedom, and culture of a country, are influential background conditions for stimulating non-state actor commitment toward sustainable development. Political and socio-economic institutions thus seem to influence the sustainable development of countries, by shaping the background system in which the state and non-state level commitment takes place. What makes these factors especially interesting is that they also influence each other (Moran, 2006). For example, Persson (2002) shows the influence of political regimes on economic institutions. Whereas Buck and Sharim (2005) and Chang and Higashijima (2021) show the influence of market institutions and culture on the governance type and political regime of a country. This suggests that there is an interrelatedness between especially political institutions and socio-economic institutions and possibly also the sustainability performance of countries (Park et al., 2007).

Even though these institutional factors thus are important, they are often neglected or taken for granted, as shown by Daren Acemoglu and James A. Robinson in their book *"Why nations fail: The origins of power, prosperity and poverty".* In this book, Acemoglu and Robinson exemplify the need for countries to have open and inclusive political and economic institutions to accomplish continuous and prosperous development. This message is also relevant with regards to sustainable development, as sustainability increasingly is defined by the three pillars being Planet, People and Prosperity, instead of Planet, People and Profit. The United Nations (UN) also adopted this definition, and the replacement of profit for prosperity is caused by the notion that economic growth cannot be paired with truly sustainable development, as it is believed to be one of the main causes of environmental damage (Park et al. 2007, United Nations, 2015). Prosperity, on the other hand, relates to *"macro-economic institutions that are essential for creating fair and equitable development"*

(Vermeulen, 2018:15), and therefore it also considers the other pillars of sustainability. This thus indicates that countries with open and inclusive institutions should have a better sustainability performance compared to countries with closed and non-inclusive institutions, as they are more likely to enjoy the benefits of prosperity.

This research will follow this line of reasoning, as there is similar research that supports this way of thinking. In political science, several articles attempted to conduct research with a similar view, namely that democracies which are more inclusive and open than autocracies, perform better on sustainability aspects. However, a clear and decisive relationship has not yet been found. As either no significant relationship has been found (e.g., Bernauer and Bohmelt, 2013a) or only a relation between weak sustainability and democracy has been found (e.g., Ward, 2008). In other cases, it was found to not be the sole determinant (e.g., Kneuer, 2008; Wurster, 2013), in which the possible importance of socio-economic institutions has been indicated. Therefore, this research will go further than the political regime, by also identifying the underlying political and socio-economic institutions, as they show signs of interrelatedness (Moran, 2006). The combination of these institutions is referred to as the National Governance Culture of a country since they shape the institutional background context in which sustainability governance takes place. Furthermore, this research attempts to identify whether a relationship can be found between National Governance Cultures and sustainability performance since literature shows that the political and socio-economic institutions should determine the quality of a country's sustainability performance, however, is often not fully able to substantiate this. Nevertheless, there is the generally accepted expectation that countries with the most open and inclusive policy culture and socio-economic structure that are shaped by the institutions have better sustainability performance. This leads to the following research question:

How does the National Governance Culture of a country influence its Sustainability Performance?

To answer this research question, three sub-questions are set up to establish and define the relevant variables. These sub-questions are:

1. *What are institutions that define a country's policy culture?*
2. *What are institutions that define a country's socio-economic structure?*
3. *What are factors that measure a country's sustainability performance?*

The first part of this research is dedicated to answering these sub-questions, by performing qualitative literature research. Answering these questions creates the theoretical framework supporting the indicators and variables that are used in the quantitative analyses in the second part. These quantitative analyses are the ground on which the main research question is answered, which is based on the argument that the combination of political culture and socio-economic structure determines the quality of a country's sustainability performance. Where the theoretical framework serves as a base for building the variables and with that their indicators, quantitative data will is used to measure these variables, and to identify whether a statistically sound correlation can be found. The relevance of this research lies in this combined methodology. As other qualitative research only shows likely influences but is not able to fully substantiate them. Additionally, other quantitative research either does not consider both explanatory variables or in some cases only does this for a small number of countries. Thus, by combining these approaches, this research uses a more elaborate but comprehensive set of variables that goes more into depth than the other literature and it assesses more aspects than previous research. Essentially combining the elements of previous literature, and attempting to substantiate them on a larger scale, and with this attempting to uncover the nature of the relationship and its respective impact.

This research consists of five sections. The following section, the theoretical framework, shows the how the literature is used to eventually form the variables *Policy Culture, Socio-Economic Structure* and *Sustainability Performance.* The next section covers the methodology that is used for performing the quantitative analysis. It shows how the data is collected and reviewed, operationalized and how it eventually is used to answer the research question. The following section discusses the results of the analysed data, first by discussing results within individual variables, and then by performing the main analytical tests. After that the results, and the limitations that came with the chosen approach are discussed to accurately interpret the outcome, and the possibilities for further research. At last, the conclusion based on the results and the limitations is presented, also discussing the practical implications and general contribution of this research.

2. THEORETICAL FRAMEWORK

The first step in analysing the relation between national governance culture and a country's sustainability performance is defining the frameworks used for the relevant variables. This provides a base for indicator development, as the frameworks for the independent and dependent show important factors, conceptual categories, and impact categories that are relevant to measure. As mentioned in the introduction, this research aims to identify a relation between the political culture and socio-economic structure and a country's sustainability performance. That all while following the line of reasoning made in Why Nations Fail, that countries with more open and inclusive political and economic institutions achieve prosperity. Therefore, the main hypothesis of this research is that countries with an open and inclusive policy culture and an open and inclusive socio-economic structure will have better sustainability performance. Meaning that alterations in the policy culture and the socio-economic structure variables affect the sustainability performance of countries. The section stars with the discussing the literary framework that forms the base for the cause or explanatory variables Policy Culture and Socio-Economic Structure. Followed by the theoretical framework for the dependent variable Sustainability Performance .

2.1. POLICY CULTURE

As mentioned before, solely defining the political regime of a country will not give enough information to establish a correlation with sustainability performance. Therefore, in the framework, several factors that define the Political Culture of a country, and that also are relevant for determining its open and inclusiveness are identified. In some cases, also the relevance with regards to sustainability performance is considered, as this already suggests a relation. In this way, the concept embodies the political regime, but also important political and structural institutions that are identified in political science literature. The section is focused on identifying factors that can be placed in two categories, structural factors that regard the political regime of a country, and factors that regard the more cultural aspects of the political institutions. As one of the main criticisms of the use of the concept is that it should look further than the governmental system and focus on political and cultural institutions beyond the structural components (Lane, 1992; Formisano, 2001). Especially since literature such as Inglehart (1988) and Chilton (1988), already stressed the influence the social and cultural factors can have on the policy culture. Nevertheless, the concept of policy culture in this article deviates from the views of the abovementioned authors. The elements these authors include are not always focused on the open and inclusiveness of the political culture. They often tend to focus more on the nature of the political culture of a country, and less on the institutions that form this policy culture. Since this research regards the open and inclusiveness of institutions, this more institutional approach will be used to define the policy culture of a country.

2.1.1. Structural Factors

The structural factors, start with the most basic distinction of political regimes, where countries either fall in the category of democratic or autocratic. This, however, is a simplified distinction, as there are several variations possible within both regime classifications. Within the regime classifications there also is a major difference in how open and inclusive the regimes are. Therefore, 5 factors are identified which mainly regard the electoral process within countries all with different options for either democratic or autocratic countries which form the political regime and also can identify how open and inclusive the regime is. This is because the electoral system and process are important to consider when examining a political regime, as they also influence each other (Morse, 2012; Gandhi, 2015). The factors together make up relevant institutions that form and shape a political regime within a country. The identified factors that shape the Political Regime of a country are *Party-system, Electoral institutions, Electoral system, Authority and Legislative Assembly.*

2.1.1.1. Party System

The first factor that influences the political regime is the party system, which refers to the number of parties that can compete during the elections within a country. The party system has a large influence on the open and inclusiveness of the political regime, as a larger number of parties increases the freedom of choice. In democracies, one of the main aspects is that there should always be more than one competing political party in elections (Hoffmann, 2005; Cheibub et al., 2010; Dalton et al., 2011). This means that the party system within democracies can either be a two-party or multi-party system (Tsebelis, 1995; Diamond and Gunther, 2001; Dalton et al., 2011). In two-party systems, the freedom of choice is the most limited, as there are only two different political parties for the people to vote on. In such a system the distinction is often between left-wing and right-wing centred parties (Diamond and Gunther, 2001; Dalton et al., 2011). The main example of a two-party system is that of the United States, where the Americans can either vote for the more right-oriented republican party, or the more left-oriented democratic party (Sundquist, 2011). Multi-party systems are systems in which multiple, in this case, more than two political parties can be elected and voted on during elections (Tsebelis, 1995; Diamond and Gunther, 2001; Hoffmann, 2005; Dalton et al., 2011).

Autocracies on the other hand can have party systems without multiple parties, meaning that there is no freedom of choice for people to vote (Morse, 2012; Schedler, 2013; Lührmann et al., 2018). This is called a single-party system. However, this is not the only party system that can exist in autocracies. There also are autocracies in which there is perceived freedom of choice for the people to vote, as multiple parties can be elected (Morse, 2012; Schedler, 2013). This type of party system is referred to as a multi-party system, and even though it has similar aspects to the multi-party system within democracies, they are not, as they are heavily influenced by other political institutions (Morse, 2012). The main influential institutions are present in the next factor, the electoral institutions.

2.1.1.2. Electoral Institutions

The electoral institutions' factor refers to the rules and fairness of the elections. This also has a large effect on the open and inclusiveness of a political regime. For example, in democratic electoral systems, one of the main aspects is that there are at least free and fair elections, meaning that there are more open for the people to vote and influence the outcome (Howard and Roessler, 2006; Lührmann et al., 2018). Yet, elections in democratic countries do not always satisfy the rule of law and all liberal principles. The most common and widely accepted measurement for these distinctions are the institutional requisites of Dahl (Lührmann., 2018). Dahl (1971:8, 1998:85) identifies six requirements, for the electoral systems of countries, to distinguish democracies, these requirements are *elected officials, free and fair elections, freedom of expression, alternative sources of information, associational autonomy, and inclusive citizenship*. What this shows is that autocracies almost follow none of these principles, but democracies with solely free and fair elections, also do not always fulfil all requirements. Democracies with electoral systems that do not fulfil all requirements are regarded as electoral democracies, whereas democracies that do fulfil all the institutional requisites, fall in the category of liberal democracies (Dahl, 1971, 1998; Howard and Roessler, 2006; Lührmann et al., 2018).

In autocracies, as mentioned before, the electoral system also has a considerable influence on the party system (Landman, 2000; Morse, 2012). This is due to the several types of electoral systems that can exist in autocracies. The first type is the closed electoral system, which means that there are no elections present within a country (Howard and Roessler, 2006; Snyder, 2006; Lührmann et al., 2018). The other two possible electoral systems within autocracies are the electoral-hegemonic and the electoral-competitive systems (Snyder, 2006; Howard and Roessler, 2006; Schedler, 2013; von Soest and Grauvogel, 2017). These are only present in the multi-party systems as in these systems opposition parties are allowed to compete (Howard and Roessler, 2006). The difference between the two is to what degree the elections in a country are (un)fair. Electoral-hegemonic systems are the most unfair since in these systems the participation of the opposition is merely there for appearance (von Soest and Grauvogel, 2017). The ruling party in such a system is the sole party that can compete adequately, as the opposition is oppressed by state-owned media coverage, and is unable to organize electoral rallies or is even threatened with exile or threatened to a jail sentence (Howard and Roessler, 2006). These actions lead to a situation in which the ruling party wins with a large margin (Howard and Roessler, 2006; von Soest and Grauvogel, 2017). In electoral-competitive systems, the opposition can compete 'legitimately' and the elections, therefore, are somewhat more competitive. However, the ruling party still operates with a large advantage, as they often still use illiberal strategies such as fraud and oppression to influence the elections, which creates an *"uneven playing field between government and opposition"*(Lewitsky and Way, 2002:53; Howard and Roessler, 2006; von Soest and Grauvogel, 2017). Thus, showing that there are some differences in open and inclusiveness, but that autocracies rarely are open or inclusive with regards to the elections.

2.1.1.3. Electoral System

Since democracies enjoy the benefit of free and fair elections in contrast to autocracies where the winner is almost certain, it is also important how the winner of the elections is determined. This is where the next factor comes into play, the electoral system. There are three types of representative systems in place, which are *majoritarian, proportional,* and *mixed* systems. In majoritarian systems, the party that has the highest percentage, or the majority of votes wins the election, meaning there is a single winner with one seat in the legislature, also known as single-member-districts (SMD) (Landman, 2000; Colomer, 2001; Chang and Higashijima, 2021). The proportional system, however, does not have a single winner. In such a system there are multiple 'winners' who are rewarded with seats in the legislature proportional to the percentage of votes they received during the elections (Landman, 2000; Colomer, 2001)**.** The mixed system combines elements from both, in most cases, this creates a situation in which the representatives are chosen *"through majoritarian means and then add a 'top-up' list of parties"* (Landman, 2000:221). Concludingly this results in either mono-party executive governments or coalition governments. Where there is a difference in the open and inclusiveness, as the coalition governments allow for the influence of more parties, and thus essentially thus leads to more freedom in choice for the citizens, and overall creates more room for multiple opinions and thoughts.

2.1.1.4. Authority

The next factor is the Authority factor, which regards the persons or parties that after the elections have the final saying power with regards to policy decisions, the executive-legislative power (Landman, 2000). In democracies there are three types of systems that countries can have in place, *presidential, semi-presidential* and *parliamentary* (Landman, 2000; Colomer, 2001; Siaroff, 2003; Cheibub et al., 2010; Engesser and Franzetti, 2011). In presidential systems the power solely lies with the head of the government and state, 'the president', which is popularly elected for a fixed term which can only be broken by impeachment (Landman, 2000; Siaroff, 2003: Cheibub et al., 2010). Presidential systems also have a divide between the sources of democratic legitimacy and the legislature while parliamentary systems have prime ministers which do depend on a coalition or majority in the legislature, which is chosen during the election (Landman, 2000). Furthermore, in parliamentary systems the executive is not a single person but a collective, often the cabinet or the parliament (Siaroff, 2003; Cheibub et al., 2010). Another difference is that in parliamentary systems prime ministers can be discharged through voting of the legislature, additionally, the executive can dissolve the legislature to hold new elections (Landman, 2000; Siaroff, 2003; Cheibub et al., 2010). The third, semi-presidential or mixed system, combines elements of both the presidential and parliamentarian system and thus has lots of variations (Siaroff, 2003). However, elements that are most common in such a system are the combination of a popularly elected president as head of the state where the government can disassemble itself and the prime minister through a majority in the legislature (Landman, 2000; Cheibub et al., 2010). In these cases, the parliamentarian system is often seen as the most open, as these systems are more democratic, and thus it is least likely that the power lies with a sole leader.

Contrastingly, a main feature of autocracies is that there is always a single person or group that has all the power. What differs in these cases is the grounds on which the person or group exerts its power. Four different power systems are identified in the literature, which are *party, military, monarchy, and personal* regimes (Geddes et al., 2012, 2014). There are differences between this distinction in literature, but according to the argumentation presented in Roller (2013), this distinction best fits the aim of this research. The first regime, the party regime, appears to be like a presidential democratic regime, as it revolves around one dominant party ruling a country. Yet, there are major differences between both. One-party regimes in autocracies do not rule in the common interest of the people, and often also can suppress any opposition (Kailitz, 2013). Military regimes are not based on a form of elections but take place when a military officer takes the power and exerts 'military institutions', often as a result of a military coup (Kailitz, 2013; Geddes et al., 2014). The justification for this regime is often that only the military can save a country from the crisis it finds itself in (Kailitz, 2013). In a monarchy, the monarch rules a country based on the notion that he or she has God-given, historical, or natural rights because of his or her origin (Kailitz, 2013). This thus does not necessarily imply the monarch can rule because of religion but he or she can also be a descendent of a long-ruling royal family (Geddes et al. 2014). Whereas the other regimes had some moderate institutional justifications for exerting power, personal regimes lack this. Since in a personal regime all the power is in the hands of a single person, which can change political regimes to become a "*president for life*" (Kailitz, 2013:49; Geddes et al., 2014).

2.1.1.5. Legislative Assembly

The final factor with importance to the political structure is the legislative assembly as it's called in Rothstein (1996), it regards the presence of a second chamber, which is identified to be an important political institution, in democracies and autocracies (Tsebelis, 1995; Rothstein, 1996; Rogers, 2003; Baturo and Elgie, 2018a). Political systems with a second chamber are regarded as *bicameral*, as in these systems two legislatures must agree on a policy decision before it's implemented (Tsebelis, 1995; Rothstein, 1996). Whereas political systems with a single chamber, are regarded as *unicameral*, meaning that policy decisions only have to surpass a single legislature (Tsebelis, 1995; Rothstein, 1996). The presence of a second chamber thus allows more parties to give their opinion on decisions and plans and therefore inherently is more open. Overall, the presence of a legislative assembly has a considerable influence on the flow of decision-making within the governmental system of a country (Rogers, 2003). Even though bicameral systems often are associated with more democratic countries, they are also present in more autocratic countries. Furthermore, some trends show the number of bicameral systems within democracies is declining (Baturo and Elgie, 2018b).

2.1.2. Cultural Factors

In addition to the structural elements there also are the cultural elements of a Policy Culture which as mentioned briefly before, are not necessarily focused on the cultural nature of countries, but more on an institutional level, with regards to the open and inclusiveness of a country. The focus is therefore on how several important actors can play a part in the policy culture and the possibilities they get to express this culture. Three actors are identified that potentially can play an important role in the policy culture, while they also are especially relevant with regard to sustainability governance. The identified factors regard the role of *the Media, Civil Society,* and *the Public.*

2.1.2.1. Role of the Media

The first cultural factor regards the role of the media, which is important due to the mediazation of politics, which made journalism and the media overall an inherent institution of politics (Schudson, 2002). In addition to this, there is also literature that suggests and indicates that there is a correlation between the media system and the political system of countries. Engesser and Franzetti (2013) specifically show that based on a small scale, there is a positive correlation concerning the freedom dimension. A free role of the media entails the ability for the media to report on or about politics, but also the openness of parties to use it as means of communication to the public. Meaning that more free and open political systems are more likely to have media freedom, and vice versa. On the other hand, media, or the control over it, is also an important mechanism in the maintenance of more autocratic regimes (Acemoglu and Robinson, 2012; Evans and Ferguson, 2013). In addition to this link, Riti et al. (2021), also show that in countries with high freedom of the press, press freedom is a promising factor that can be used to reduce the further incidence of CO2 emissions. This also shows the relation between media freedom and sustainability performance. Concludingly, the media culture and media system, and especially the freedom of the system influence the political system and can also be relevant for sustainability performance, and thus it shows to be an important factor of a country's Policy Culture.

2.1.2.2. Role of Civil Society

Another influential factor is the freedom for the participation of civil society, as in political theory it is seen as *"the essential element in mobilizing opposition to authoritarian or totalitarian regimes*" (LaMay, 2004;11). With regards to sustainability governance, civil society participation can also be an important institution as Seyfang et al. (2010), identified civil society participation as a potential driver of sustainability transitions. Another argument that shows the importance of civil society influence is that increased civil society participation is often coupled with an increase in democracy and justice, which are important aspects to consider in a sustainable governance environment (Morse, 2012; Witter et al., 2015). This increased democracy and justice is a result of the increased openness of the governance environment in which decisions are made, as it allows for more non-governmental organisations to participate and influence decisions (Witter et al., 2015). In these governance environments, civil societies often represent parties of which their opinions otherwise would be excluded, meaning that the role of civil society is an important part with regards to the open and inclusiveness of political culture. It, therefore, is relevant within a country's Policy Culture to look at the degree to which civil society organisations are consulted or repressed and whether the government influences their ability to enter and exit.

2.1.2.3. Role of the Public

The last important actor that is identified is the public, this factor, therefore, regards the ability to participate in and influence political decisions. The public's role in politics and the public's political orientation is an important part of the political culture of a country (Inglehart, 1988; Chilton, 1988; Lane, 1992). Furthermore, political orientation also is linked to sustainable governance, as it is tied to climate change beliefs (Ziegler, 2017; Gregersen et al., 2020). However, the specific public orientation does not fit the aim of this research, since the focus is more on open and inclusiveness within the institutions, rather than the degree to which the public in a country has a more left or right-oriented political orientation. Therefore, the focus of this indicator regards the possibility for the public to participate in the political debate. It thus focuses on to what degree the public can openly enter political debates, and whether they can influence political decisions with their opinions. This is an important institutional feature of the Policy Culture of a country, especially concerning sustainability governance, as it is seen as an inherent part of sustainable development (Richardson and Razzaque, 2006; Geczi, 2007).

2.2. Socio-Economic Structure

As mentioned before, in the case of sustainability performance, not only economic but socio-economic institutions are identified as variables that likely influence a country's sustainability performance (Park et al. 2007; Kneuer, 2008; Wurster, 2013). Therefore, the second explanatory variable is regarding the Socio-Economic Structure of a country, which is shaped by those institutions. The main theme that arises from the literature concerning the socio-economic structure of countries is poverty and the social and economic aspects that can contribute to reducing poverty. This is perfectly aligned with the main school of thought behind this research, as it is built on the notion that inclusive and open institutions will foster prosperity in countries. The variable, therefore, is also built up with important economic institutions that are also mentioned in *"Why nations fail: The origins of power, prosperity and poverty"*.

Acemoglu and Robinson identify the following institutions as influential economic institutions regarding prosperity: *secure property rights, law and order, market and state support for markets, low/no barriers of entry in markets, uphold contracts and access to education for the majority*. In this variable, the main factors that concern these institutions are defined, and within those, not all the institutions of Acemoglu and Robinson are directly used. Some of the institutions are combined or slightly adjusted to better fit the socio-economic context. In total, the framework exists of the variable three conceptual categories that are identified in the literature and in some cases also databases. The first conceptual category regards the factors of rule and law of economies in countries, covering *property rights, the effectiveness of rule and law,* and *government integrity*. The second conceptual category then focuses on the freedom of the market, which includes the factors *freedom of trade* and *business freedom* of a country. The last conceptual category focuses on the factor of *access to education*. Although they are comparable to the economic institutions of Acemoglu and Robinson, their importance also is stressed in the literature regarding socio-economic institutions, thus showing that they are relevant to the framework for this variable.

2.2.1. Conceptual Category: Rule of Law

2.2.1.1. Property rights

The first factor is property rights, as the recognition of private property rights and lawful protection of them is seen as an institution vital to a country's economy, which is influenced by a country's culture (Tabellini, 2010). Secure property rights allow individuals in a country to have the confidence to invest and save money, without having to worry about being exploited (Miller et al., 2022a). Acemoglu and Robinson (2012) also address the importance of secure property rights, as one of the inclusive economic institutions that can influence the prosperity of a country. Furthermore, literature argues that secure property rights are also acknowledged to play an influential role as background institutions that influence the resources and growth of firms in a country (Claessens and Laeven, 2003; Evans and Ferguson, 2013; Sandhu et al., 2018; Jakšić and Jakšić, 2018). Property rights thus are institutions that can influence the economies of countries, and secure property rights are more likely to reduce the overall poverty of a country as they give the public and businesses more freedom to act without risks. This factor is influenced by several institutional aspects such as the respect for property rights, quality of the contracts and expropriation risks (Miller et al., 2022b).

2.2.1.2. Judicial Quality

The second factor of rule of law regards the judicial quality within a country. The quality is of importance as a lack of law and order, is seen as an extractive economic institution (Acemoglu and Robinson, 2012). The reasoning behind this is that a well-functioning legal framework protects all citizens and parties from unlawful actions (Miller et al., 2022a). Without the ability to rightfully protect the rights of citizens, the law-and-order system present in a country is not just and fair, and therefore often not inclusive for everyone. Showing that from a social perspective it also influences human rights, which further shows the importance of this variable (Kumar, 2006). The quality of the judicial system in a country according to Miller et al. (2022b) regards a combination of judicial interdependence, quality of the judicial process and the perceptions of the quality of public services and interdependence of civil service.

2.2.1.3. Government Integrity

The third factor encompasses the integrity of the government. Although not explicitly mentioned by Acemoglu and Robinson (2012), it is believed that countries with zero corruption will foster more prosperity, showing that the presence of corruption is likely to be a source of unstainable development (Aidt, 2009; Vermeulen, 2018). As corrupt activities from governments reduce the public trust and economic vitality in countries (Miller et al., 2022a). Furthermore, it is found to be a factor that for a large part is explained by a country's culture, and thus can be seen as a background institutional factor (Kumar, 2006; Boateng et al., 2021). Some aspects of government integrity already are covered in the Policy Culture variable, however, those heavily focus on the electoral process. Whereas the government integrity in this variable is focused on the integrity of the government regarding institutions and decision-making centred around economic activities and relations. Meaning that it is more focused on institutional aspects such as corruption and bribery risks, as identified in Miller et al. (2022b). For these reasons it thus is an important factor, included in the socio-economic structure variable.

2.2.2. Conceptual Category: Market Freedom

2.2.2.1. Freedom of Trade

The fourth factor, and thereby the first factor that regards the conceptual category of Market Freedom, is the freedom of trade. This factor is not explicitly mentioned by Acemoglu and Robinson (2012), however, it is still deemed to be of importance. This is due to the reason that a market with free and fair trade possibilities, often is more open and inclusive for citizens and companies. Furthermore, the ability to freely trade is seen as an institutional context that is expected to foster growth and reduce the overall poverty in a country (Falkinger and Grossmann, 2005; Evans and Ferguson, 2013; Jakšić and Jakšić, 2018). Similarly, Sandhu et al. (2018) show that countries with more economic and trade freedom are expected to foster companies with better financial and environmental performance. Showing the importance of this indicator within this research and for the socio-economic culture of countries. Aspects that influence this factor are for example trade regulations and restrictions in countries (Miller et al., 2022b). Where countries with fewer regulations and restrictions thus are regarded as more open and inclusive, as it allows important actors to have more freedom.

2.2.2.2. Business Freedom

The fifth factor, business freedom, constitutes the difficulty for businesses to access and enter markets. This thus does also include the barriers of entry within markets, which is mentioned by Acemoglu and Robinson (2012) as one of the important economic institutions regarding open and inclusiveness. The reason for this is that openly accessible markets are believed to be a contextual factor that leads to free and fair competition and the fostering of growth while reducing poverty in countries (Evans and Ferguson, 2013; Jakšić and Jakšić, 2018; Sandhu et al., 2018). Thus, showing the importance when regarding the socio-economic structure and sustainability performance. This factor however goes beyond the sole focus on the barriers of entry within markets, as Miller et al. (2022b) identified more aspects that are of importance when measuring the freedom for companies to enter the market. Examples of this are the business environment risk and the quality of other government-imposed regulations, meaning that it also covers elements from the markets and state support institutions as also identified by Acemoglu and Robinson (2012). Meaning that lower and fair barriers of entry with the inclusion of a supportive state are regarded as an element that is relevant for assessing the open and inclusiveness of the socio-economic structure of a country.

2.2.3. Education

2.2.3.1. Access to education

The last conceptual category consists solely of the sixth factor, which is access to education for the great majority, as mentioned in Acemoglu and Robinson (2012). The ability for people to have access to education is a social institutional aspect that is often considered to be important when striving for inclusive development (Aidt, 2009; Gupta et al., 2015; Gumede, 2018; Gregersen et al., 2020). This is also exemplified by the fact that it is covered in multiple SDG goals (Hope Sr, 2020). Access to education is of importance for this variable as it not only influences human development, but it also influences the labour market and thus the economy in countries (Gupta et al., 2015; Gumede, 2018). Meaning that it also influences the overall poverty of a country, one of the main themes surrounding the eventual variable. Countries that have more access to education are regarded to be more open and inclusive as this factor fosters an environment in which more people can develop themselves.

2.3. SUSTAINABILITY PERFORMANCE

Just as with the concept of sustainability, the three pillars Planet, People, and Prosperity also define sustainability performance. The base of the sustainability framework is centred around the SDGs, as especially their introduction increased the importance of country-level decisions as countries often seem to set SDG goals on a national level (Forestier and Kim, 2020; Fujimori et al., 2020; Dubash, 2021). Therefore, the framework ensures the inclusion of goals and indicators like those of the SDGs, but it also acknowledges the criticisms posed in Vermeulen (2018). Where Vermeulen argues that a large share of the SDG goals and indicators do not follow an input, throughput, output logic, and therefore for example have strategies as goals that do not measure actual performance. Vermeulen (2018), addressed this by developing a framework based on this logic, by incorporating LCA mid and endpoints from Huijbregts et al. (2016) in combination with SDGs into a single framework. However, due to the lifecycle/supply chain focus of the framework, it is not directly applicable to sustainability performance on a national level.

To create a variable that covers emissions and other sustainability performance measures on a national level, existing national sustainability measurement frameworks are reviewed and combined, to establish a framework that covers indicators deemed important in the existing frameworks. This, however, is a challenge due to the differences in the focus of the plethora of sustainability frameworks. At first, there is a differentiation between the focusses on different pillars, as not all frameworks and databases cover environmental, social and prosperity sustainability performance such as Vermeulen (2018) and the SDGs. Therefore, multiple databases are used and combined, which is for example also done in Xiao et al. (2018). This also strengthens the variable, as there often are criticisms posed on frameworks solely focussing on a single aspect. An example is the Human Development Index (HDI), which is criticized by Neumayer (2001) and Biggeri & Mazzo (2018) for it not including environmental or freedom aspects. While these aspects are covered in this variable because other databases do include those aspects, and therefore the framework for this variable aims at giving a complete overview of national sustainability performance regarding all pillars of sustainability.

A similar challenge is also present within the pillars themselves, as different environmental sustainability frameworks also have differences in their focus. An example of this is that within the SAFE 2013 model from Grigoroudis et al. (2013) there is a focus on the areas of Land, Water, Biodiversity and Air. Whereas, in the PROMOTHEE 2 model of Antanasijević et al. (2017), there is a focus on Climate Change and Energy, Sustainable Transport and Natural Resources. This is merely an example of the spectrum of focusses sustainability frameworks can have, and even though the focus of these frameworks differs, they frequently include similar elements. Therefore, in this variable, the framework of Vermeulen (2018) often is used as a guideline and is compared with frameworks and databases that are deemed useful and relevant for this research. To eventually create a variable that covers the most important and prevalent elements of sustainability frameworks, with a specific focus on actual performance measures, as the importance of this is stressed in Vermeulen (2018).

Another challenge is posed by focusing on emissions and other sustainability performance indicators within the national boundaries. As sustainability governance, and sustainability impact often crosses the borders of countries, with regards to sustainability performance and emissions, this often is a result of globalization (Malik & Lan, 2016). Meaning that richer countries often cause emissions in poorer countries, as they often outsource activities to such countries, because they are cheaper over there. This in a way leads to a phenomenon in which the riches get richer, while the poor get poorer in terms of sustainability performance. As the richer countries outsource their polluting activities to poorer countries, meaning their sustainability performance appears to be better, whereas the sustainability performance scores of the poorer countries become worse. While this is most commonly the case when regarding environmental sustainability performance, negative spillovers are also present when regarding human or prosperity sustainability performance. In contradiction to negative spillovers, countries can also cause positive spillovers outside of their national boundaries. Both types of spillovers per sustainability pillar are also accounted for, to create a more complete image of a country's actual sustainability performance.

The eventual variable thus exists of three pillars, with multiple impact categories and indicators on the national level, based on multiple databases and frameworks, with the addition of a spillover index. In this way, most of the challenges posed by defining sustainability performance are overcome. The choices that led to the eventual variable are discussed below.

2.3.1. Sustainability Pillar: Planet

The planet pillar of sustainability in this research covers the environmental sustainability performance of countries. Within literature and environmental sustainability frameworks, there is a difference in focus and indicator as mentioned. To overcome this challenge, as mentioned before, multiple frameworks are combined. An example of this methodology is Olafsson et al. (2014), who also combined elements that are present in multiple frameworks. This environmental sustainability performance framework is built up by integrating the framework of Vermeulen (2018) with elements identified in the literature and other sustainability performance frameworks. In the framework the impact categories of Vermeulen (2018) are integrated with some impact categories of the Environmental Performance Index (EPI) framework, the Sustainable Society Index (SSI) and with the Environmental Sustainability Index (ESI) of Olafsson et al. (2014). The reasoning behind this is that EPI focuses on measurable outcomes rather than policy outputs, which follow the input, throughput, outputs logic posed in Vermeulen (2018) (Saisana and Filippas, 2012; Wending, 2020). Furthermore, the ESI model from Olafsson et al. (2014) is used as it already combines important elements from several frameworks and thus is mainly used as a comparable guideline. These were not the only frameworks that were used and considered for the framework, as multiple frameworks were reviewed, however, these frameworks were deemed to be the most relevant.

In this literature and sustainability frameworks, several impact categories were frequently present, specifically in the abovementioned leading frameworks. Even though the main frameworks, Vermeulen (2018) and the EPI, differ in terms of main impact categories and their indicators. The Vermeulen framework has direct measurements for impact categories, an example of this is the impact category of Climate Change, which is indicated by the Global Warming Potential, and measured by the kilograms of CO2 equivalent that go into the air (Huijbregts et al., 2016). Whereas the impact category of Climate Change in the EPI framework is subdivided into several individual indicators, including the CO2, CH4, F-Gas and NO2 growth rates in countries (Wendling et al., 2020). Another example is the impact category Terrestrial Acidification from Vermeulen (2018), of which the main measurement unit is the kilograms of SO2 equivalent that go into the air (Huijbregts et al., 2016). While in the EPI the SO2 growth rate, is considered within the impact category of Pollution Emissions (Wendling et al., 2020). These examples demonstrate that even though categories appear the be (un)similar, they can include similar elements, or not at all. The focus of this variable is including the most prevalent impact categories and their measurements across the sustainability frameworks and literature. This eventually led to the inclusion of seven impact categories, which are *Climate Change, Energy Performance, Biodiversity, Land Use & Degradation, Air Quality & Pollution, Waste Management* and *Water Quality & Resources*. Table 1 shows how these impact categories related to the impact categories and SDGs that are mentioned in the literature and main frameworks that are reviewed. Only the impact category Nuisances from Vermeulen (2018) is completely not represented. This is for a reason that is also mentioned by Vermeulen, namely that this category is often neglected in (sustainability) impact measurements. Consequently, there was no data about this subject, hence, it is left out of this variable. The impact categories that form the base of the variable and are discussed below, showing the main elements of impact categories from the other sustainability frameworks that are used and elaborating on similarities shown in Table 1.

Table 1: Overview of the of the relevant environmental impact categories, the relating impact categories from the frameworks, and the relevant SDGs

IMPACT CATEGORIES	ELEMENTS FROM VERMEULEN	ELEMENTS FROM EPI	ELEMENTS FROM SSI	ELEMENTS FROM ESI	COVERED SDG
Climate Change	Climate Change	Climate Change	Greenhouse Gasses	Sub-Index of Energy Performance	13
Energy Performance	*Resource depletion (fossil fuels)*		Energy Use Renewable Energy Use	Energy Performance	7
Biodiversity		Biodiversity	Biodiversity	Biodiversity, Forests and Soil Degradation	14 & 15
Land Use and Degradation	Land Use and Degradation	Ecosystem Services & Sustainable Nitrogen Management	Organic Farming	Land Use Intensity, Agriculture and Fisheries	5 & 12
Air Quality and Human-Health Related Pollution	Human-Health Related Pollution	Air Quality		Air Quality	3 & 11 (13 & 15)
Waste Management	*Ecotoxicity Acidification*	Waste Management		Waste Management	11 & 12
Water Quality and Waste Management	Water Resource Depletion & Eutrophication	Sanitation Drinking Water & Water Resources	Renewable Water Sources & Sufficient to Drink	Water Quality and Pollution	6 & 14

2.3.1.1. Climate Change

The first impact category, Climate Change encompasses elements from all the three frameworks, as it regards the GHG emissions of countries. Climate Change is one of the main themes surrounding environmental sustainability performance, which is also shown by SDG13, which is solely focused on combatting climate change and its impacts (General Assembly UN, 2015). Several themes fit within this impact category, however, the most common theme in literature and the sustainability frameworks regards the CO2 emissions of countries. In the Vermeulen (2018) and the EPI framework, climate change has its own category named climate change, which both regard a selection of greenhouse gas emissions that are harmful to the environment. In the ESI framework, this impact category is placed as a sub-index of Energy Performance, however, this index also focuses on the CO2 emissions within a country. Furthermore, the subject of climate change and GHG emissions was present in all the reviewed frameworks including the SSI, and therefore deemed as a crucial impact category to be measured when looking at environmental sustainability performance.

2.3.1.2. Energy Performance

The second impact category is Energy Performance. This indicator is only clearly present in the ESI model, but it also is part of the SSI framework. Furthermore, it also includes elements of the Vermeulen (2018) framework, as it regards resource depletion, specifically regarding the use of fossil or renewable sources for energy. The EPI framework, however, does not focus on the energy concept when regarding environmental sustainability performance. Nevertheless, it is still deemed relevant due to two more reasons. The first is that literature argues that the use of renewable energy is important with regards to sustainable development, and thus sustainability performance (Dincer, 2000; Tajbakhsh and Samsi, 2019). Secondly, there is a whole SDG dedicated to energy, as SDG 7 focuses on affordable and clean energy for everyone (General Assembly UN, 2015). Showing that it is relevant to include in this variable.

2.3.1.3. Biodiversity

The third impact category regards Biodiversity within a country. Which is a common theme in environmental sustainability frameworks and models such as the EPI, SSI and ESI. In which all frameworks focus on aspects such as biome protection such as marine biomes, forest cover, and specie protection regarding living species (Saisana and Filippas, 2013; Olafsson et al., 2014; Wendling et al., 2020). Even though it is part of these three frameworks, nothing very similar is defined in the Vermeulen (2018) framework. Nevertheless, it is deemed important due to the recognition and importance it receives in the other frameworks and literature. Especially since biodiversity is also of importance in the SDGs, as SDG15: Life on Land has a large focus on maintaining biodiversity and protecting the ecosystems of the land which also includes protecting species, additionally, SDG14 also touches upon similar topics for marine ecosystems (General Assembly UN, 2015). It, therefore, is a relevant impact category to consider when considering environmental sustainability performance as maintaining and preserving them has a large benefit for the natural ecosystems and biodiversity in a country.

2.3.1.4. Land Use and Degradation

The fourth impact category is Land Use and Degradation. This impact category is present in all three of the abovementioned frameworks, but not in all it is specified in the same way. The Vermeulen (2018) framework, refers to specie loss by land use for example in the form of annual crops and forestry. These indicators are also present in the other frameworks, as the EPI framework covers this in the Ecosystem Services impact category and the ESI framework splits it into two impact categories. The SSI framework only focuses on the forest area aspect (Saisana and Filippas, 2013). Yet, these frameworks look at relatable indicators for this impact category, as the focus of all the frameworks concerning this impact category is on specific land loss, for example, forest/tree cover or grassland loss (Wendling et al., 2020). Additionally. the EPI, ESI and SSI frameworks also acknowledge the importance of agricultural practices, in the sense that they look at how sustainable and organic agriculture is within countries (Saisana and Filippas, 2013; Olafsson et al., 2014; Wendling et al., 2020). Both elements are also relevant concerning the SDGs, even though agriculture is not as explicitly mentioned. Nevertheless, it often influences the land use and degradation topics that are covered in SDG15, and more sustainable agricultural practices can also be seen as relevant concerning the main thought behind SDG12: Sustainable production and consumption (General Assembly UN, 2015). Therefore, these themes are deemed important for measuring environmental sustainability performance

2.3.1.5. Air Quality and Human-Health Related Pollution

The fifth impact category, air quality and pollution is mainly centred around the presence of hazardous gasses in the air. Especially those that are hazardous to humans and nature in when present in large amounts, such as PM 2.5 pollutant as high levels of exposure to this pollutant has negative effects on the human respiratory system (Xing et al., 2016; Huijbregts et al., 2016). This impact category is covered in all main frameworks except for the SSI, either as human-health-related pollution (Vermeulen (2018)) or in air quality impact categories (EPI, ESI). Within these categories, multiple hazardous gasses are covered, including PM 2.5, SO2, and household air pollution. Which all are hazardous to the environment and/or to human health, and thus negatively impact the air quality (Huijbregts et al., 2016; Wendling et al. 2020, WHO, 2021). These impact categories are also of importance for environmental sustainability performance when looking at the SDGs since they are covered in multiple goals. Explicitly these themes are mentioned in SDG3: Human Health and Well-being and SDG11:

Sustainable cities and communities. But they are also relevant for both SDG13 and SDG15 as they potentially are harmful to the atmosphere, environment and ecosystems (General Assembly UN, 2015).

2.3.1.6. Waste Management

The sixth impact category is waste management. This impact category is present in the EPI as well as the ESI framework. The SSI also touches upon the subject of waste however in another context, Vermeulen (2018), however, does not explicitly consider this subject, even though excess waste can harmful for the environment and soil quality, therefore it does has common grounds with ecotoxicity an acidification from this framework. This impact category in both frameworks encompasses two aspects of waste, the first being the total amount of waste that is produced in a country. The second, which might even be more important, is how the waste in a country is managed, and controlled, where the specific focus is on managing waste to limit the environmental harm it can cause (Wendling et al., 2020). It thus shows the importance when concerning the environmental sustainability performance of a country. Additionally, the concept of waste management is also present in the SDGs. The topic of waste and goals regarding sustainable waste management are covered within SDG11. Furthermore, waste and managing its environmental impact also is a large focus of SDG12, as it is a part of responsible consumption practices (General Assembly UN, 2015).

2.3.1.7. Water Quality and Resources

The seventh and last impact category regards the water quality and resources within a country which is broad. However, the elements of this impact category are present in all the frameworks, as they all mention the quality and resource aspects of water. The first aspect, water quality, in all frameworks encompasses the amount of water in a country that is either usable for sanitation or is available and usable as drinking water. This thus also means that it covers elements such as freshwater eutrophication of Vermeulen (2018). Furthermore, the second aspect, water resources mainly refers to the treatment of the water resource. This means the sheer amount of water consumption, but also the collection and primary treatment of wastewater. The reason for this is that treating wastewater can make it usable again, meaning that it also contributes to the relative amount of water available. In addition to the extensive coverage in sustainability frameworks, two SDGs are also completely focused on the topic of water. SDG6: Clean Water and Sanitation and SDG14 both focus on sustainably maintaining water resources. Where SDG6 has more of a viewpoint based on water resources available to humans, SDG14 has more of a focus on larger bodies of water and the sustainable management thereof, with the addition of the ecosystem focus as mentioned before (General Assembly UN, 2015). Due to the explicit importance of this impact category in sustainability frameworks, as well as in the SDGs, it will be considered in the environmental sustainability performance framework.

2.3.2. Sustainability Pillar: People

The people pillar of sustainability regards the social performance on the national level, and thus focuses more on the human aspects of sustainability. In contrast to the environmental sustainability performance, this variable will mostly be based on existing frameworks that fully or partially focus on social sustainability, and not that much on the Vermeulen (2018) framework. There are two reasons for this, the first one being the overlap of criteria that are considered in the people part of the Vermeulen (2018) and the criteria that are part of the prosperity pillar in this research, for example, employment. The second reason, which is closely linked to the first reason, is the supply chain focus of the Vermeulen (2018) framework, as frameworks with a national social sustainability performance perspective differ in focus. Whereas Vermeulen (2018) for example looks at labour rights and conditions, the other frameworks are more concerned with health aspects. As also shown in the environmental sustainability performance, this results in different impact categories all with different indicators. This does not necessarily mean that the framework of Vermeulen (2018) is not considered but in decisions regarding the inclusion of impact categories the reviewed sustainability frameworks are leading. The sustainability frameworks that were most influential in defining the variable, are the Human Development Index (HDI), the Sustainable Development Goals Index (SDGI) and the Sustainable Society Index (SSI). Other frameworks such as the Social Progress Index and the Happy Planet Index were also reviewed and considered, but in terms of comprehensiveness and data availability, the abovementioned three indices were deemed as a better fit. For social sustainability performance, there are common themes among the impact categories of the different frameworks. The main impact categories within the people pillar are *Health* and *Personal Development*, for which the frameworks and the SDGs all cover relevant elements, which are discussed below.

2.3.2.1. Health

The first impact category, health, covers the two main elements of nourishment and life expectancy. Among the abovementioned influential sustainability frameworks, the access to food, and thus the availability of nourishment for the people plays a large role. As the SSI looks at sufficient food access, the SDGI and SP look at the prevalence of undernourishment and the HDI looks at nutrition. All frameworks, however, have a shared element, namely, the percentage of people in a country that suffer from severe or moderate food shortage. The importance of this element is also mentioned in the literature regarding social sustainability, as Rogers et al. (2012) and McGuinn et al. (2020) regard access to food as a basic need for human well-being. Additionally, it also relates to the main theme of *SDG2: Zero Hunger*. The second important element regards life expectancy. In all the reviewed sustainability frameworks that focus on social aspects, life expectancy always came up as an indicator for the health category. The average life expectancy in a country often is a result of factors that are deemed important for human well-being and thus social sustainability. Such factors are the provision of basic needs, but also health security and proper protection from diseases (Rogers et al., 2012; McGuinn et al., 2020). Therefore, this element is in line with the main theme of *SDG3: Good Health & Well Being.* The presence of these elements in the frameworks, literature and the SDGs shows the relevance for measuring social sustainability.

2.3.2.2. Personal Development

The second impact category, personal development also concerns two main elements, which are education and literacy. Both elements are of relevance in *SDG4: Quality Education*, as they both regard the theme of education. The first element, education is present in all the reviewed social sustainability frameworks. Literature also substantiates the importance of education and knowledge in social sustainability (Rogers et al., 2012; McGuinn et al., 2020). Furthermore, the importance of access to education is already shown in the Socio-Economic Structure variable. Within the social sustainability frameworks, however, education is more focused on actual performance, as they often look at school enrolment ratios. This gives an insight into the percentage of the youth that goes to school. The other indicator, literacy, is less commonly mentioned within the frameworks, except for the SDGI and the SDGs. Nevertheless, literacy rates among the youth in countries are of importance since the variable regards the impact category of personal development. This also links back to the Vermeulen (2018) framework, which also has an indicator focused on t development and learning In this case, mostly in terms of knowledge, and with this focus being literate can be regarded as one of the most important resources for a person to develop itself. This view is supported by McGuinn et al. (2020) who argue that having resources for learning and self-development is important for social sustainability. Another argument that shows the relevance of the element is that the literacy aspect also contributes to the 'quality' part of SDG4, as it can be questioned whether education has a high quality when most of the students are illiterate. For these reasons, both show their importance concerning personal development and social sustainability.

2.3.3. Sustainability Pillar: Prosperity

The last pillar of the sustainability performance variable is prosperity. A lot of national-level background institutions that regard prosperity indicators from Vermeulen (2018) have already been accounted for in the explanatory socio-economic structure, such as fair competition and corruption. On the other hand, it is also argued that some of the indicators Vermeulen (2018) originally placed under the people pillar better fit in the prosperity pillar, for example, Gender and Ethnic Equality. After reviewing literature that was also used for the Socio-Economic Structure variable and the SDGs, it became apparent that the main themes that define prosperity are centred around the concepts of poverty and equality. This variable, therefore, covers elements of *SDG1: No Poverty, SDG5: Gender Equality, SDG8: Decent Work and Economic Growth* and *SDG10: Reduced Inequalities*. *SDG16: Peace, Justice and Strong Institutions* is left out of this variable even though it also covers elements that closely relate to prosperity practices, however, most elements of this SDG regard factors that are already accounted for in the explanatory variables e.g. rule of law and corruption, due to the institutional focus of the variable. Furthermore, Vermeulen (2018), also discusses the issue that elements of this SDG, such as weapon export and bribery often are not included in a company or product level sustainability assessment. In addition to Vermeulen (2018), the other sources for defining this variable are some of the same social sustainability frameworks as used in the People Pillar, the SDGI and the SSI, with the addition of the Heritage Index of Economic Freedom, which is also used for the Socio-Economic Structure variable. Elements that regard the main themes of prosperity, however, often are placed under social or sometimes economical sustainability performance. To prevent overlap with criteria used in the people pillar, the focus of the prosperity performance is more on systemic measures, compared to the social pillar focus on measures more on a personal level. As a result of this, the variable of prosperity performance exists of two impact categories which are working conditions and equality. They together cover the most important parts of the relevant SDGs, Vermeulen (2018) and the sustainability frameworks. In total, five main elements are identified, which are described below within their respective impact category.

2.3.3.1. Working conditions

The first impact category is called working conditions, and its main elements are more on the economic aspects of prosperity that concern labour in a country. In the Vermeulen (2018) framework several indicators are relevant for this impact category, such as remuneration & wages, contracts, employment and employment benefits. In the other sustainability frameworks, the focus is mostly on the poverty aspect regarding wages and employment statistics. The first important element, therefore, regards income, the SDGI and the HDI index cover this by looking at the poverty headcount ratio of income (UNDP, 2020; Sachs et al., 2021). This shows whether the wages in a country are sufficient for providing the people with an income that is above the poverty baseline which in the SDGs is set at $1.25 a day (United Nations, n.d.). The second identified element is present in Vermeulen (2018), the SSI and SDGI framework, and regards employment within a country. The availability of work in a country is of importance when concerning the reduction of poverty as it allows people to earn a living. Additionally, it is also seen as an important aspect of human well-being and thus for the sustainability performance of a country (Rogers et al., 2012; McGuinn et al., 2020). At last, there is the element of labour conditions, which covers the aspects of the remaining indicators of the Vermeulen (2018) framework. As mentioned, these elements are more focussed on contract and employment benefits. Therefore, they often are not present within the more socially oriented sustainability frameworks. Nevertheless, they are deemed important, as fair contracts from a socio-economical perspective are also seen as relevant since Acemoglu and Robinson (2012) identified them to be influential institutions for creating prosperity. The Heritage database also focuses on the aspect in the indicator called labour freedom, which covers most of the important labour conditions which are mentioned in Vermeulen (2018). As the indicator looks at elements of the labour market and contract regulations regarding subjects such as minimum wages, laws inhibiting layoffs, regulations regarding work hours and labour force participation and paid annual leaves and more (Miller et al. 2022b).

Additionally, this impact category and the important themes within them, cover multiple elements of SDGs, in this case the elements of *SDG1: No Poverty* and *SDG8: Decent Work and Economic Growth,* further showing the importance when regarding sustainability performance.

2.3.3.2. Equality

The second impact category, regards equality, also one of the main elements in defining prosperity and prosperous development. Equality, however, is a term that can concern multiple areas. This is also exemplified by the term being in the title of two SDGs. The most forthcoming form of equality is gender equality, as it is the main form of equality that is discussed in the media, and it also has its own SDG, *SDG5: Gender Equality*. Furthermore, it is also recognized in the SDGI, SSI and Vermeulen (2018) frameworks. Gender Equality covers several elements, for example regarding job opportunities, health, and security, as women in often are not equal to men in these and more areas (United Nations, 2015). The element of gender equality, therefore, covers several areas in which women and men are not equal. The SDGI uses multiple indicators for this, where the indicators are split up per area. On the other hand, the SSI looks at the Global Gender Gap Index of the World Economic Forum (WEF). The index tracks the gender gap over the years on four dimensions Economic Participation and Opportunity, Educational Attainment, Health and Survival and Political empowerment, which are the same four dimensions mentioned in SDG5 (WEF, 2021; Sachs et al., 2021). Another element of inequality measure that is of importance for this impact category is income equality, which is more closely linked to the other important theme, poverty. This element is present in the SSI and SDGI frameworks and it focuses on the distribution of income between the people in a country (Saisana and Filippas, 2012; Sachs et al., 2021). This is also a focus within SDG10 since the income distribution is often heavily skewed between the rich and the poor. Showing, that it's important to address income distribution to increase overall equality and tackle poverty. At last, the Vermeulen (2018) framework also mentions ethnic equality as a measure of sustainability performance, and even though it is mentioned within SDG10, it rarely is included in other sustainability frameworks. At the time of writing this research, there were little to no indices or other frameworks that measure ethnic inequality. Therefore, it unfortunately is excluded from the variable.

2.3.4. Additional Sustainability Component: External Footprint

As mentioned at the beginning of this chapter, sustainability performance and especially the impact countries have, can also cross the geographical boundaries of a country. This means that to get a more complete image of a country's sustainability performance, this impact also has to be considered. Mainly because this impact is often negative, especially for the richer countries, that in the first instance seem to perform better on aspects compared to their actual performance. This impact beyond geographical borders is often referred to as externalities or spillovers. These spillovers, however, are hard to quantify and measure, and often are not explicitly mentioned in the sustainability frameworks. Nevertheless, the SDGI framework has a specific spillover index, in which they identify and asses negative as well as positive spillovers that countries produce (Sachs et al., 2021). This index divides these spillovers into three dimensions that have a connection with several SDGs as well as the variables used in this research, namely, the environmental & social aspects embodied in trade, economic and finance and security dimensions. Examples of spillovers that are assessed within this index are exports of hazardous pesticides, GHG emissions that are embodied in imports and exports, biodiversity threats caused by imports and exports and corporate tax haven scores (Sachs et al., 2021). Thus covering aspects of the Planet, People and Prosperity impacts, that countries have across their borders.

3. METHODOLOGY

This section focuses on how the research is conducted. Thus, showing the steps that are taken to answer the sub-questions, operationalize the theoretical model, and eventually answer the research question. The important methodological steps are discussed below, starting with the research design.

3.1. RESEARCH DESIGN

The research uses a combined approach of a qualitative literature review, and then quantitative analysis. This all to test the main hypothesis, that having an open and inclusive National Governance Culture has a positive influence on a country's sustainability performance. The qualitative literature review, of political, economic, sustainability literature and sustainability frameworks is performed to create a theoretical sound base for the indicators that eventually measure the variables for the quantitative analysis. The literature review is followed by an extensive database review, of publicly available databases. This was needed to acquire useful data of sufficient quality. These steps however did not follow each other, as there was a lot of interaction between creating the theoretical base and selecting the databases. The reason for this is that the relevant themes of the literature needed to be quantified, however, this was not always possible. Therefore, as also will be mentioned, the databases sometimes also formed the theoretical base for selecting indicators. After collecting the data from the different sources the quantitative analysis starts, which is performed in the statistical computing program R. The performed analyses eventually form the results based on which the research question is answered. Since the qualitative literature review already is discussed in the previous chapter, the rest of this chapter is focused on discussing the steps of the quantitative analysis more in-depth. Starting with the data collection.

3.2. DATA COLLECTION

As mentioned the first part of the quantitative analysis concerns the collection of the needed to measure the eventual indicators and the variables. Since a large amount of publicly available databases are reviewed, it needed to be done structurally, to eventually pick the databases that had the best quality and were most useful for supplying the data needed to answer the research question. Therefore, five criteria are set up to which the databases had to fulfil, which are shown below.

1) Metadata needs to be available;
2) There needs to be a link to the theory;
3) It must include a large N of countries preferably >120;
4) A time element is needed, preferably 2015 – 2020;
5) The source must be credible

These are all factors that ensure the data fits the research purpose and theoretical background. An example of how the databases were reviewed is presented in Table 2. The selection and the quality assessment of the databases are of importance, as in research there often are tensions between the availability of data and the quality of data (Vermeulen, 2018). Reviewing the databases helps with overcoming these tensions by assessing the quality of all the collected databases and selecting the databases that fit best with the theory and have the highest scientific quality. With this method, most of the common tensions which according to Vermeulen (2018) exist in sustainability indicator research, are tackled. This quality review step is not only performed for the sustainability performance indicator data, but also for the databases with indicators regarding the political culture and socio-economic structure. As it is believed that this will assure the best data quality for measuring the indicators of the variables.

During the process of data collection, it, however, became clear that not all specific criteria for collecting data would be able to be met. Data quality and availability especially of the indicators regarding sustainability performance were not good as expected. The databases at the beginning where all reviewed systematically while keeping in mind the criteria mentioned above. However, eventually, some of the criteria had to be scrapped. The criteria that were deemed most important during this process, were a large N and quality sources of the data. To fulfil these criteria in the best way possible, the time element was eventually scrapped. As the data availability was lacking, in terms of completeness e.g. in both years for the timeline. Furthermore, data also was not very up to date and therefore the time element would not provide the best quality of analysis, as comparing scores for 1 indicator that has data in only 2016 and 2018, whereas another has data from 2015 up until 2020, would give skewed and inaccurate results. Therefore, the choice has been made to leave out the time element. It, however, was still not possible to find data for all the indicators for a single year, as that would have led to much less data than currently is included. The eventual data collection, therefore, exists of data from different years, where the chosen benchmark year is 2018. This year is chosen as it was the most up-to-date year, which was still covered for most of the indicators. In the cases that the data from 2018 was not present, the closest year has been chosen, as will be discussed with the specific indicators.

The final database is formed by merging al the database that where eventually used into a single database. In total the final database used data that originated from 12 different sources. In the final database only the countries that were shared among all the databases are included, which led to a sample of 148 countries. A list of the included countries can be found in Appendix A. The specific databases that are used are discussed in the next section, as this is also relevant information for the specific indicators.

Table 2: Example of the review process

Database	Metadata Available?	Link with Theory	Number of Countries	Timeline	Source
V-Dem	Yes	Policy Culture	202	1789-2020	Gothenburg University
QoG	Yes	Policy Culture Socio-Economic structure	~211	1946-2020	Gothenburg University
Nelda	On request	Policy Culture Socio-Economic structure	>160	1945-2020	Yale University
CIA World Factbook	There is no metadata	Policy Culture Socio-Economic structure	263	None	CIA
EPI	Yes	Environmental sustainability	180	2010-2020	Yale and Colombia University
SDSN -SDG	Yes	All sustainability	165	2000-2021	Cambridge University
World Bank	Yes	Policy Culture Socio-Economic structure	Depends on indicators	Depends on indicators	World Bank
Fraser Institute of Economic Freedom	Yes	Socio-Economic structure Prosperity Sustainability	165	1970-2019	Fraser institute

3.3. DATA IDENTIFICATION AND OPERATIONALIZATION

This section is centred around showing how and why the collected data is chosen, how it is used to operationalize indicators based on this data and the important elements from the literature. The goal of the operationalization is to establish indicators for the countries to eventually measure the variables. The main goal of data operationalization in this research is to find the right balance between complexity and simplicity in the indicators and data that cover the variables. The concepts and variables used within this research are quite complex and quantifying them therefore is a very large task. Therefore, an attempt is made to quantify these indicators in such a way that they provide a lot of information while being present in databases of sufficient quality, without the variables becoming too complex and elaborative. Furthermore, this chapter also covers the normalization of the data, as it all needs to be on the same scale for the data to be useful for scoring and measuring the indicators and eventually the variables. The preferred scale is an interval scale from 0-1, which for example is also done by Xiao et al. (2018), who combined multiple databases by normalizing the data on a 0-1 scale. Overall, almost all the indicators were normalized with the same methods, except for the Political Regime indicator as is discussed below. However, at first, the data and indicators are discussed.

3.3.1. Independent Variable: Policy Culture

This research aims at showing and justifying that countries with open and inclusive institutions and thus inherently a more open and inclusive policy culture have better sustainability performance. As shown in Theory section 2.1, there are a lot of different levels and possibilities within these levels that specify the Policy Culture. Thus making it quite complex to reward a country with a single measure for this. In the first instance, the idea was to create a variable score based on operationalizing approximately 30 indicators from the V-Dem database, however, after attempting this for several indicators it became clear that this would lead to complex aggregations of the indicators, especially within the scoring of the different structural elements. The main complications were in capturing every indicator that potentially was important for determining the political structure of a country and then being able to operationalize it in such a way that it was useful. Another hindering factor for this method was that most of the indicators were on an ordinal scale, which made operationalisation even harder as converting them to a useful interval scale is methodically not a very strong method. Since ordinal scales do not have an even or specifically set 'distance' between the options, which would be created manually by transferring it to an interval scale. Therefore, this method was eventually discarded, as it is believed to not have captured the most robust and methodically sound operationalization of the policy culture variable.

This eventually led to the variable being described and operationalized by three indices also from the V-Dem Varieties of Democracy database. Which is a database made by a team from Gothenburg University that is focused on conceptualizing and measuring the degree of democracy in countries worldwide (Lührmann et al. 2018; Coppedge et al., 2022). They do this by providing a dataset that goes beyond simply focussing on elections, and acknowledges and embraces the complexity of democracy as a system of rule (Coppedge et al., 2022). This way of conceptualizing democracy fits very well with the conceptualization of policy culture that is used in this research, as it is aimed at going beyond simple concepts and focusing on institutions that shape the system. In addition to this, it was the most frequently updated database compared to the other reviewed databases that were mentioned before. The database was last updated in 2021, and thus includes data from at the time preferred timeline of 2015-2021, whereas for example the QOG only includes data up until 2018 for a lot of indicators (Coppedge et al., 2022; Charron et al., 2021). Another strong and important quality of this database is that they have theoretical substantiation for the indicators they included in their extensive database. Showing that they also used some elements from example the Nelda database. At last, the database has three indices that cover the needed elements for this variable.

The political structure element is described by the index "*Regimes of the world – the RoW measure with categories for ambiguous cases*" of the V-Dem database (Coppedge et al., 2022). Which is an aggregated index based on 18 indicators, that categorizes countries on an ordinal scale with ten scores, from 0 to 9, based on the political regime that best describes the country's situation. What must be noted, is that almost all of the 18 indicators that are used in this index, were in the first instance also considered among the 30 indicators that were part of the original variable. The categories from the aggregated index vary from 0, which is a closed autocracy, to 9, being a liberal democracy. This distinction fits the research very well, as the aspects that belong to a closed autocracy, such as not having any elections for the chief executive of the legislature, are the least open and inclusive form of a political regime. On the other hand, liberal democracies can be regarded as the most open and inclusive forms of regimes as they enjoy the benefits of free and fair multiparty elections, whilst fulfilling Dahl's institutional prerequisites and benefitting from more liberal aspects (Lührmann et al., 2018; Coppedge et al., 2022). Meaning that the index provides a quite accurate conceptualization of how open and inclusive the political structures of countries are. Especially, because the distinction is in line with the literature that is used for the theoretical framework, as elements that are regarded as more open and inclusive in these articles, also are regarded as more open and inclusive in the V-Dem composite index. A simple example of this is that Tsebelis (1995) states that democratic multi-party systems are the most open and inclusive, whereas autocratic single-party systems are regarded as the least inclusive and open. The same way of reasoning is also used in this V-Dem indicator (Coppedge et al., 2022). For these reasons, the composite index is operationalized by converting the ordinal V-Dem scale into an interval scale. Even though it is argued that from a methodological point of view the conversion from an ordinal to interval scale is not the strongest method. The inclusion of ambiguous cases in this conceptualization causes the steps between the different categories to be relatively even, as instead of going from an Electoral Autocracy to an Electoral Democracy it adds extra in between transitions such as from an '*Electoral Autocracy upper bound*' to an '*Electoral Democracy lower bound*'. Meaning that each following category enjoys slightly more open and inclusiveness than the category before, for which the arguments for determining the category remain in line with the literature that backs up the indicators. This allowed for a more robust transformation towards an interval scale from 0-1, based on how open and inclusive the political regime of a country is, with liberal democracies scoring a 1 and closed autocracies scoring a 0.

The other 3 indicators, which are identified to be of importance for the policy culture also will be operationalized by aggregated indices from the V-Dem database. The first index is the "*Diagonal accountability index*" which is built up from 14 indicators from the original V-Dem database and provides countries with a score on a 0-1 interval scale (Lührmann et al., 2020; Coppedge et al. 2022). Which mostly revolve around the role of the media and civil society organizations (CSOs) and also a slight focus on the role of citizens, more specifically on how these actors can hold the government accountable for their actions. This is captured by four main criteria which are media freedom, civil society characteristics, freedom of expression (also for citizens in media for example), and at last the degree to which citizens are engaged in politics (Coppedge et al., 2022). The definitions of these four themes are mostly obvious, except for the civil society characteristics. This concept in the V-Dem database encompasses several aspects of the role CSOs can play within governance, mainly regarding the freedom civil societies have. Not only does it consider how easily and voluntarily CSOs can be joined and/or established, but it also looks at the degree to which they can be independent of the government (Coppedge et al., 2022). The combination of indicators used in this index fits well with the main themes of the policy culture elements, as they regard the freedom of the Media, the role and freedom of civil society and public participation. It especially covers all the indicators that in the first instance were considered for the freedom of the media and the role of civil society.

This index, however, lacked some of the elements of public participation, which is why the variable is complemented by another index from the V-Dem database, namely the "*Vertical accountability index*". This index is built up of 18 indicators from the V-Dem database, that scores countries on a 0-1 interval scale, based on the power that citizens possess to hold the government accountable (Lührmann et al., 2020; Coppedge et al., 2022). Where the focus specifically is on how freely citizens can formally participate in public parties, by for example being able to freely set up political parties but also how easily they can participate in elections and to what degree(s) these actions happen in a certain country (Coppedge et al., 2022). There is some overlap with the "*Diagonal accountability Index*" however, it does complement this index with information that is relevant to the policy culture, and therefore it is chosen to be the third indicator.

This overlap in indicators that are used in the V-Dem indices is not only present between these two indexes but in all three of the indices. This perfectly depicts the struggle and complexity of composing indicators that determine the open and inclusiveness of a country's Policy Culture. As mentioned in the Theory, the different levels and institutions of a Political Regime and Policy Culture are highly interconnected. An example of this is that a country with multi-party elections simply has a more open and inclusive Political Regime, and additionally it for example also more likely to benefit from public participation and the role of CSOs as more parties compete in an election indirectly also leads to more citizens or CSOs being able to participate in elections (Coppedge et al., 2022). Meaning that some indicators are relevant to all the indicators. What is good to consider is that this indicator does not measure any performance, as it is a classification measure of which countries are classified based on how open and inclusive they are. Therefore, it is argued that even though there might be an overlap between indicators used in the indices from the V-Dem database, they still are very useful for this variable as they are only used to classify the countries. A complete overview of the indicator and the data used for them is presented in Table 3 below.

Table 3: Overview of the indicators and data used for Policy Culture

Indicator	Database	Data Used	Source
Political Regime	V-Dem Varieties of Democracy database	"Regimes of the world – the RoW measure with categories for ambiguous cases" Index	Lührmann et al. (2018) Coppedge et al. (2022)
Civil Society and Media Freedom	V-Dem Varieties of Democracy database	Diagonal accountability index	Lührmann et al. (2020) Coppedge et al. (2022)
Public Participation	V-Dem Varieties of Democracy database	Vertical accountability index	Lührmann et al. (2020) Coppedge et al. (2022)

3.3.2. Independent Variable: Socio-Economic Structure

Just as with the first explanatory variable, the second explanatory variable Socio-Economic Structure is also scored on a 0-1 score, where a higher score represents more open and inclusiveness. Theory section 2.2 already clearly mentions six important factors that are of importance for measuring the open and inclusiveness of the socio-economic structure of a country. Due to the feedback loops in the process this research followed e.g. indicators that were found in the literature were validated by databases and the other way around, the identified indicators from the theory all have direct indicators. Meaning that the score for the open and inclusiveness of the Socio-Economic Structure is measured by six indicators as well.

The main database used to measure the socio-economic structure variable is the *"Heritage Index of Economic Freedom"* by the Heritage Foundation. There are two main reasons for this. The first one is that the way of thinking behind this database is very much in line with this research. A lot of theoretical aspects that arose from relevant literature, especially also from Acemoglu and Robinson (2012) are covered in this database. As they both look at economic institutions that lead to more openness and thus freedom, therefore, there was a theoretical fit between the database and the literature concerning the variable. The second more practical reason is that it is one of the few databases that attempts to quantify and measure economic freedoms in countries. Other databases such as Fraser and the World Bank do not necessarily focus on the freedom aspect and focus on performance, and thus look at factual numbers centred around trading for example. Other qualities of the database are the theoretical substantiation of their chosen indicators and the availability of data, as the database covers data within the preferred timeline, and includes 177 countries (Miller et al. 2022a). The other database that is used is the HDI, as it covers the indicator regarding the conceptual category of education. This is because the HDI is one of the only databases that also approaches the educational aspect of sustainability more contextually, rather than in a performance manner which other databases such as the SSI and V-Dem look at. In addition to this theoretical fit, the database also covers data from 189 countries, within a large proportion of the preferred timeframe, as it includes data up to 2019 (UNDP, 2020).

The indicators that originate from the Heritage database correspond directly with the important factors mentioned in the theory, meaning that there are three indicators regarding the conceptual category of the Rule of Law. The first indicator is *Property Rights,* it appraises a country's legal framework based on to what extent individuals have secure property rights, by looking at the risk of expropriation, the respect for intellectual property rights, and the quality of contract enforcement, law enforcement and the property rights themselves (Miller et al., 2022b). The second indicator that is used from the database is Judicial Effectiveness*,* which in this research is referred to as *Judicial Quality.* This indicator measures the effectiveness of the judicial legal systems, by assessing the judicial independence, the quality of the judicial process and the perceptions of the quality of the public services and the interdependence of the civil service (Miller et al., 2022b). The third, and last indicator of the Rule of Law, is *Government Integrity,* which evaluates the degree of systemic government corruption in a country. It is measured by the perceptions of corruption, the risk of bribery, and the control of corruption within a country (Miller et al., 2022b). Not only the indicators for the Rule of Law concept category are retrieved from the Heritage database, but also the indicators for the concept category of Freedom of the Market are retrieved from this database. For this conceptual category, two indicators are used, the first one being *Trade Freedom.* This indicator measures not only the trade-weighted average tariff rate but also looks at non-tariff trade barriers, such as quantity, regulatory or customs restrictions or government interventions (Miller et al., 2022b). The second indicator is *Business Freedom*, which focuses more on the ease for businesses to operate efficiently within a country. Factors that are considered are mainly legal framework factors, such as the business environment risk, regulatory quality and women's economic inclusion, but also a more practical factor, namely access to electricity (Miller et al., 2022b). All these indicators are directly retrieved from this database. This was possible, as the indicators in this database were ranked based on freedom, meaning that countries that scored the highest on these indicators were the most open and inclusive, as they allow for the most freedom for citizens and businesses within their country.

The only identified indicator within this variable that does not originate from the Heritage database is *Access to Education*. This indicator also was harder to quantify as it is focused on a contextual concept, whereas education often is coupled to performance or raw numbers such as enrolment rates. As mentioned, the HDI database has an indicator for education, which will be used to quantify access to education. The indicator is called *Access to Education,* and it measures the expected years of schooling for the youth assuming the institutional patterns of the past years remain the same (UNDP, 2020). It, therefore, focuses more on how the institutional context of the country influences the chances for children to go to school, which was deemed to most fitting approach to quantify this indicator. An overall overview of the indicators and their data sources is presented in Table..

Table 4: Overview of the indicators and data used for Socio-Economic Structure

Indicator	Database	Data Used	Source
Property Rights	Heritage Index of Economic Freedom	Rule and Law – Property Rights	Miller et al. (2022a)
Judicial Quality	Heritage Index of Economic Freedom	Rule and Law – Judicial Effectiveness	Miller et al. (2022a)
Government Integrity	Heritage Index of Economic Freedom	Rule and Law – Government Integrity	Miller et al. (2022a)
Trade Freedom	Heritage Index of Economic Freedom	Trade Freedom	Miller et al. (2022a)
Business Freedom	Heritage Index of Economic Freedom	Business Freedom -	Miller et al. (2022a)
Access to Education	Human Development Index	Expected years of Schooling	UNDP (2020)

3.3.3. Dependent variable: Sustainability Performance

The last variable that is operationalized so it can be scored on a 0-1 scale, is the dependent variable Sustainability Performance. Just as in the theory, the variable is divided into the pillars of Planet, People and Prosperity. These pillars will form the three main components of the variable, all with their own indicators. The External Footprint is regarded as an additional component. What is most important for the actual indicators is that they focus on measuring performance, as the critics of Vermeulen (2018) argue that this often lacks in sustainability performance measurements, with the main example being the SDGs. Nevertheless, it still is important that the indicators follow the main goals of the SDGs since they increased the importance of nation-level sustainable development (Forestier and Kim, 2020; Fujimori et al., 2020; Dubash, 2021). While in the Theory section the impact categories and the important elements and themes within them are only coupled to the main SDGs, a link to more specific subgoals is made within this section to give a concrete overview of which goals the indicators relate to. Furthermore, just as with the Socio-Economic Structure variable, the feedback loop process of forming the indicators for these sub-variables and the theoretical base for them influenced this variable a lot. Mainly because the theoretical base on which most of the indicators are chosen, is by comparing and combining existing sustainability frameworks. Therefore, most indicators are directly retrieved from databases of which the theoretical source indicated their importance. Eventually, the indicators for the sub-variables are combined creating a single score per sub-variable, which accordingly are combined into a single variable score for Sustainability Performance. The indicators per sub-variable are discussed below.

3.3.3.1. Variable Component: Environmental Sustainability Performance

The first variable component is defined by sixteen indicators and therefore is the most complex variable. This, however, is not a coincidence as environmental sustainability is largely centred around solving climate change issues, which is a very complex and interconnected problem. The indicators are discussed per relevant impact category as identified in the Theory section 2.3.1. An overview of the data used, and relevant SDGs is present in Table 5 at the end of the chapter.

For the first impact category from the theory section, Climate Change, there is a single indicator, which regards GHG emissions. The data for this indicator is retrieved from the Climate Watch database. This data source is chosen as the Climate Watch database is managed by the World Resources Institute, which is an international institute that has an NDC partnership, meaning that it tracks and helps with accelerating and implementing NDCs all around the world (World Resources Institute, n.d. ; NDC, n.d.). Furthermore, this data is also used in other large databases, such as the World bank. Therefore, the database is deemed a trustworthy and useful source for achieving GHG emission data, especially since the CAIT database that is used focuses on comparability, and bases its data on several other sources (Climate Watch, n.d.). Additionally, it also included data on a plethora of countries. The impact category of Climate Change is measured somewhat different in the frameworks as the ESI only solely looks at a single GHG emissions indicator, whereas in the EPI the focus is on all GHG emissions separately. In Vermeulen (2018) the GHG emissions are combined by measuring climate change in the global warming potential (GWP), which is expressed in the CO2-eq released in the air (Huijbregts et al., 2016). This, however, measures essentially the same as the EPI framework, as it combines all the GHG into a single comparable measurement. The actual indicator that will be used from this database is the *tonnes of CO2eq- emissions per capita* in a country because this is a comparable measure that captures the elements of all the databases. The Climate Watch indicator quantifies the Kyoto GHG emissions, which are CH4, N20 and F-gas emissions, meaning it covers the separated emissions from the EPI framework (Climate Watch, n.d.). With regards to the SDGs, this sole indicator is also fitting, as GHG emissions are the cause of the main issues that are to be tackled by the SDG13 sub-targets. Moreover, the indicator directly matches with the SDG13 sub-target 13.2.2, which focuses on the total GHG emissions per year (United Nations, n.d.). This essentially covers the main elements of SDG 13, as the other indicators have more strategy output.

The second impact category, Energy Performance, is also measured by a single indicator that assesses the energy consumption in countries. The indicator is retrieved from the International Energy Agency (IEA) database which is an intergovernmental institute with a focus on carbon and energy targets, as also present in the Paris agreement and SDG framework (IEA, n.d.). This database is used in the SSI framework, and is a source used for World bank data on energy performance, therefore, it is seen as a good source of data for this indicator. The specific indicator that is retrieved from the IEA database is the *% of modern renewable energy consumption of the total energy consumption.* This indicator is relevant as literature and the sustainability frameworks focus on the importance of increasing the use of renewable energy (Dincer, 2000; Tajbakhsh and Samsi, 2019). The choice has been made to focus on modern renewables instead of renewable energy, as it excludes traditional uses of biomass which contributes to air pollution and related health issues (IEA, 2022). Additionally, SDG7 itself and sub-target 7.1 also empathically mention modern energy, which thus does not necessarily refer to traditional energy use (United Nations, n.d.). The chosen indicator, therefore, covers the main message of the energy-related SDG. Especially, since it is covered in SDG sub-target 7.2.1 and as it also is of importance for the other sub-targets, including the ones that have more of a strategy outcome (United Nations, n.d.).

The third impact category, Biodiversity, is the first one that is not measured by a single indicator, as it is measured by three indicators, These indicators are all retrieved from the database of the EPI framework. This data is chosen as the EPI and the SSI framework both use the same data for measuring biodiversity, also data on this subject was hard to find from other sources due to the complexity of the indicators. Besides that, the EPI database includes data on 180 countries and is relatively up to date (Wendling et al., 2020). Both the EPI and SSI both use six indicators to measure biodiversity, however, the choice is made to only include three of these indicators in this research. The reasons for this are that for a lot of the indicators data quantity was lacking, and in this way, the three mentioned aspects of biodiversity as identified in the literature, biome protection, marine protected areas, and species protection are all covered with a single indicator. The first indicator, *Terrestrial Biome Protection,* looks at the proportion of each biome in a country that lies in a protected area, where rare biomes in a country have a higher weight (Wendling et al., 2020). The second indicator, *Marine Protected Areas,* is calculated by the percentage of Exclusive Economic Zone areas, that lies within marine protected areas, as this protects marine ecosystems from unsustainable practices and human intervention (Wendling et al., 2020). The last indicator is the *Species Protection Index,* which calculates how well the terrestrial protected areas in a country overlap with the ranges of its plant, vertebrate and invertebrate species (Wendling et al., 2020). In this way, the three elements are all covered, and there are no double indicators for either. As mentioned before, this impact category, and therefore these indicators cover elements from two SDGs, SDG14 and 15. The biome protection and specie protection indicators are mainly in line with SDG 15. As terrestrial biome protection covers elements from sub-targets 15.1, most specifically 15.1.2 and 15.4, which all are centred around the protection of different ecosystems around within countries. The focus on specie protection mainly corresponds with sub-target 15.5 which is focused on the degradation of natural habitats, biodiversity loss, and extinction of species (United Nations, n.d.). This covers the most important sub-targets of SDG15, as there also are a lot of strategy outcome targets within the SDG, The marine protected areas indicator even though it is in line with the main way of thinking behind SDG15 better fits with the goals and targets of SDG14, which is completely focused on oceans, seas and marine resources. This indicator covers almost all sub-targets of SDG14, as they all touch upon unsustainable practices and ecosystem prevention in marine areas, however, some are more explicit than others, for example, sub-target 14.5.1 (United Nations, n.d.). The combination of these indicators thus covers important elements of biodiversity from the theory and SDG (sub)targets.

The fourth impact category is land use & degradation, which is measured by a total of 4 indicators. Just as the impact category biodiversity, all these indicators are retrieved from the EPI framework database. This is for similar reasons, as data needed for these indicators was hard to find, due to their complexity. Of the four indicators that are retrieved from this database three regard land loss of a certain type that is a result of land use, being *Tree cover loss, Grassland loss* and *Wetland loss*. Tree cover loss is measured by the average annual loss in forest area over the past five years, divided by the total extent of forest area in the year 2000 (Wendling et al., 2020). Grassland loss is by the average annual loss in grassland area over the past five years, divided by the total extent of grassland area in the year 1992 (Wendling et al., 2020). At last, Wetland loss is measured by the average annual loss in grassland area over the past five years, divided by the total extent of wetland area in the year 1992 (Wendling et al., 2020). Therefore, they together cover the land use and cropland element of this indicator. The last indicator covers the agriculture part that also is present in this impact category, which is the *Sustainable Nitrogen Management Index,* which looks at the balance between the efficient application of nitrogen fertilizer with maximum crop yields as a measure of the environmental performance of agricultural production (Wendling et al., 2020). Unfortunately, data on this subject was only available up until 2015, however, it still was deemed important to cover this aspect of the impact category. With regards to the SDGs, the land loss indicators have significant relevance for SDG15, as the sub-targets 15.1, 15.2 and 15.3, all cover the subject of combatting degradation or recovering the loss of forests, grassland and or wetland (United Nations, n.d.). As mentioned before, the agricultural aspect of this impact category is not explicitly mentioned in the same SDG. It, however, is relevant concerning SDG12, as it is focused on sustainable consumption and production patterns (United Nations, n.d.). The sustainable nitrogen management index measures how sustainably crops are grown and produced, and therefore follows the main goal of SDG (Wendling et al., 2020). Meaning that all indicators have their relevance concerning environmental sustainability performance.

The fifth impact category, Air quality and Human-health related pollution is measured by three indicators that are all retrieved from the same source the Global Health Data Exchange (GHDX, 2022). This database is maintained by the Institute for Health Metrics and Evaluation, which is a health research centre based at the University of Washington in Seattle (GHDX, 2020). This source is chosen as it is also the source that is used for the EPI database, the World Bank, and more, additionally, the database is very comprehensive and includes a lot of countries. The three indicators that are retrieved from this database are the *ambient particulate matter, ambient Ozone* and *Household air pollution concentration* in the air, measured in micrograms per cubic meter, of which the mean values are used. These three indicators are chosen because they cover the relevant indicators used in Vermeulen (2018) and the EPI framework, as also shown in the theory. Furthermore, these gasses are also covered in the SDG3 sub-target 3.9.1 and SDG11 sub-target 11.6, which regard the mortality rates and annual levels of household and ambient air pollution (United Nations, n.d.). As mentioned another SDG for which these indicators hold relevance is SDG13, as protecting the atmosphere is one of the related subjects, and within this subject protecting the atmosphere from air pollution is also one of the themes discussed, nevertheless, there are no specific sub-targets that cover it (United Nations, n.d.). A similar story is present in SDG15, even though the indicators are relevant, as their presence can harm ecosystems, they do not have specific indicators. What this, however, does show, is that the indicators have relevance for a lot of SDGs and thus they specifically are relevant for measuring this variable.

The sixth impact category from the theory is waste management, which is measured by a single indicator that focuses on the sustainability of a country's waste management practices. The indicator is retrieved from the EPI database, which uses a measure called controlled solid waste*,* as this was the indicator used in the EPI and ESI framework (Olafsson et al., 2014; Wendling et al., 2020). In this research, the indicator is named *Sustainable Waste Management,* the indicator looks at the percentage of waste that is collected and treated in a manner that controls environmental risk, e.g. through recycling, composting, anaerobic digestion, incineration or disposed of in a sanitary landfill (Wendling et al., 2020). The data behind this is based on the World Bank's '*What a Waste 2.0 report'* and on data from Wiedinmeyer et al. (2014), which helped to determine the sustainability of waste control methods. Due to how this indicator is set up in the EPI framework, it has similarities with SDGs and SDG sub-targets. The indicator is especially relevant concerning SDG12, as sustainably controlling waste is also a large part of consumption and production patterns. This is shown by the fact that SDG12 sub-targets 12.4 and 12.5 aim at decreasing the environmental harm caused by the waste that is produced and aim at increasing the sustainable management of waste, for example through recycling (United Nations, n.d.). Another SDG that covers the environmental impact of waste in a similar way, is SDG11, in particular sub-target 11.6, which has a focus on decreasing the environmental impact of waste in cities specifically (United Nations, n.d.). As a result of the indicator's fit with the SDG goals, and the importance of waste control concerning environmental sustainability performance, it is part of the variable.

The seventh and thus last impact category, Water Quality and Resources, exists of three indicators which are retrieved from two different sources. The first two indicators are retrieved from the Aquastat database, which is the global information system of the food and agriculture organization of the United Nations (FAO, 2018). This source is chosen because the database is managed by the UN, and therefore includes indicators that are relevant or even directly relate to SDGs. Furthermore, it also had data on a lot of countries. The other indicator is retrieved from the SDGindex (SDGI), which is a fitting database due to its focus on tracking SDG performance, and thus its link with the actual SDGs, it also covers a lot of countries (Sachs et al., 2021). The indicators retrieved from Aquastat, regard the level of *water stress* in a country, which is measured by the freshwater withdrawal as a proportion of the available freshwater resources, and the proportion of a country's population that has access to *safe water* (FAO, 2018). These indicators are directly mentioned in the SDG6 sub-targets 6.1.1, 6.3.2 and 6.4.2, but also influence the other sub-targets (United Nations, n.d.) The indicator retrieved from the SDGI is the *clean water* score, which is a goal of the composed Ocean Health index, that refers to the degree to which national marine waters are contaminated by chemicals, eutrophication, human pathogens, and trash (Sachs et al., 2021). As this indicator is more focussed on the larger bodies of water, e.g. oceans it does not relate to SDG6, it however does directly correlate to SDG sub-target 14.1.1 (United Nations, n.d.). Furthermore, it is also relevant for other sub-targets, as maintaining a less polluted and more clean ocean is also beneficial for the ecosystems and sustainable practices. In addition to covering SDG goals, the choice of these indicators also covers a lot of elements identified in all the literature frameworks that were used in the theory, making them very fitting for this variable.

Table 5: Overview of relevant SDGs and the data used for Environmental Sustainability Performance

Indicator	Database	Data Used	SDG-Coverage	Source
GHG emissions	Climate Watch – CAIT database	tCO2-eq emissions per capita	**SDG 13: Climate Action** Sub-Target 13.2.2: Total greenhouse gas emissions per year	Climate Watch (n.d.)
Energy Performance	IEA – SDG7 Database	% of modern renewable energy consumption of the total energy consumption	**SDG 7: Affordable and Clean Energy** Sub-Target 7.1: By 2030, ensure universal access to affordable, reliable and modern energy services Sub-Target 7.2.1: Renewable energy share in the total final energy consumption	IEA (2018)
Terrestrial Biome Protection	EPI	Terrestrial Biome Protection:	**SDG 15: Life on Land** Sub-Target 15.1: By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements Sub-Target 15.4: By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development	Wendling et al. (2020)
Marine Protected Areas	EPI	Marine Protected Areas	**SDG 14: Life below water** Sub-Target 14.2.1: Number of countries using ecosystem-based approaches to managing marine areas Sub-Target 14.5.1: Coverage of protected areas in relation to marine areas	Wendling et al. (2020)
Specie Protection Index	EPI	Specie Protection Index	**SDG 15: Life on Land** Sub-Target 15.5: Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species	Wendling et al. (2020)

Tree Cover Loss	EPI	Tree cover loss	**SDG 15: Life on Land** Sub-Target 15.1: By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements Sub-Target 15.2: By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	Wendling et al. (2020)
Grassland Loss	EPI	Grassland loss	**SDG 15: Life on Land** Sub-target 15.1: By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements Sub-Target 15.3: By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world	Wendling et al. (2020)
Wetland Loss	EPI	Wetland loss	**SDG 15: Life on Land** Sub-target 15.1: By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements Sub-Target 15.3: By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world	Wendling et al. (2020)
Sustainable Agriculture	EPI	Sustainable Nitrogen Management Index	**SDG 12: Responsible Consumption and Production** Sub-Target 12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment	Wendling et al. (2020)
Ambient particulate matter pollution	GHDX	PM pollution is micrograms per cubic meter	**SDG3: Good Health and Well-Being** Sub-Target 3.9.1: Mortality rate attributed to household and ambient air pollution **SDG11: Sustainable Cities and Communities** Sub-Target 11.6.2: Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)	GHDX (2022)
Ambient Ozone Pollution	GHDX	Ozone pollution in parts per billion	**SDG3: Good Health and Well-Being** Sub-Target 3.9.1: Mortality rate attributed to household and ambient air pollution	GHDX (2022)

Household air pollution	GHDX	Household air pollution from solid fuel in micrograms per cubic meter	**SDG3: Good Health and Well-Being** Sub-Target 3.9.1: Mortality rate attributed to household and ambient air pollution	GHDX (2022)
Sustainable Waste Management	EPI	controlled solid waste	**SDG 12: Responsible Consumption and Production** Sub-Target 12.4: By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment Sub-Target 12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse **SDG11: Sustainable Cities and Communities** Sub-Target 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	Wendling et al. (2020)
Water stress	FAO - Aquastat	% of Water Stress	**SDG6: Clean Water and Sanitation** Sub-Target 6.4.2: By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity	FAO (2018)
Access to safe water	FAO-Aquastat	% of total population with access to safe drinking water (JMP)	**SDG6: Clean Water and Sanitation** Sub-Target 6.1.1: Proportion of population using safely managed drinking water services Sub-Target 6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	FAO (2018)
Clean water score	SDGI	Clean Water Score	**SDG 14: Life below water** Sub-Target 14.1: By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution Sub-Target 14.2: By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans Sub-Target 14.3: Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels	Sachs et al. (2021)

3.3.3.2. Variable Component: Social Sustainability Performance

The second variable component consists of four indicators, that directly correspond with the four indicators mentioned within the theory . Starting with the two indicators that regard the impact category of health which are the prevalence of undernourishment and healthy life expectancy. The data for these indicators is retrieved from two different sources, an overview of the indicator, the data and the relevant SDGs is shown in Table . Data for the indicator prevalence of undernourishment is retrieved from the World Bank database. The concept was identified in multiple sustainability frameworks (e.g. SSI), which all retrieved their data from this source. Furthermore, the World Bank retrieves this data from the Food and Agriculture Organization of the UN (The World Bank, n.d.). Therefore, it was deemed a credible source for this data, additionally retrieving the data from this source, meant that the data was raw, and not already adjusted or ranked by the sustainability frameworks themselves. The data for healthy life expectancy is retrieved from the World Health Organization database (WHO). This source is chosen since the indicator itself is a concept made by the WHO, and therefore it was the most trustworthy and complete source (WHO, n.d.). Additionally, the source covered a lot of countries with an N much larger than 120. The only downside of this data source is that the specific year of 2018 is not present in the database, therefore data on 2019 is used, as it was the closed year available to 2018.

As mentioned, the first indicator that is used is the *prevalence of undernourishment,* measured in the percentage of the population that is undernourished (The World Bank, n.d.). This indicator is chosen as it directly correlates with the main theme of SDG2, zero hunger, and it also is one of the direct sub-goals, namely SDG subgoal 2.1.1 (United Nations, n.d.). It is chosen to be the sole indicator for this aspect of social sustainability, as it covers the main cause and effect of the other aspects. For example, stunting and malnutrition, are two other issues regarding hunger that are covered within the sub-target SDG2.2 (United Nations, n.d.). Undernourishment is often one of the direct sources of these issues (Reinhardt and Fanzo, 2014). Therefore, it is deemed as a fitting representation of *SDG2: Zero Hunger*. The second indicator in the impact category of Health is *Healthy Life Expectancy*. This specific indicator is chosen as the measure of the WHO is a completely fitting indicator to measure performance regarding SDG3. The specific measure namely measures the "*Average number of years that a person can expect to live in "full health" by taking into account years lived in less than full health due to disease and/or injury*"(WHO, n.d.). It thus includes overall life expectancy, which is measured in sub-target 3.1, the influence and mortality rates of deceases as covered in sub-target 3.3, 3.4, 3.8 and 3.9., and the influences of injury covered in sub-target 3.6 (United Nations, n.d.). Showing that this indicator on its own covers almost all elements of the relevant SDG.

For the impact category of Personal Development, there are also two indicators, which are education enrolment and youth literacy. These indicators both are retrieved from the SDGI database. For both indicators, this was one of the only sources available, as the only other credible data source for this indicator was UNESCO. However, both databases had a lot of missing values specifically in the case of youth literacy. Eventually, the SDGI was chosen as had it more and more consistent data available. The data scarcity was quite an issue as the data on specifically European OECD countries, such as the Scandinavian countries, but also the USA, Canada and Australia was not present, meaning that these countries would also not be considered in the final analysis. However, since for most of these countries, this was the only missing indicator, the choice was made to fill in the missing data. Therefore, assumptions are made based on scarcely available literacy rate data, and the average youth literacy rate average from the respective geographical continents based on scarcely available UNESCO data retrieved from the World Bank database (The World Bank, n.d.b, n.d.c). Since the countries[1] that were missing almost all are among the OECD countries, which are the most developed countries, the missing values for youth literacy rates were assumed to be 99%.

The choice of this database resulted in the indicators being *primary education enrolment measured in* net primary enrolment rate (%), and *youth literacy rate* measured in the literacy rate (% of population aged 15 to 24) (Sachs et al., 2021). As these indicators are deemed to cover the base message of SDG 4, even though there are only two indicators. Both indicators have a strong correspondence with SDG4 sub-indicators 4.1.1, 4.1.2,

[1] Australia, Austria, Canada, Denmark, Finland, France, Germany, Iceland, Ireland, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Slovakia, Sweden, Switzerland, United Kingdom, United States of America

and 4.6, as they focus on increasing school enrolment and literacy within countries (United Nations, n.d.). Because, as mentioned in the theory section 3.3.3.2., these aspects attribute citizens, especially the youth, with primary skills needed to be able to develop themselves. Although these indicators might seem a little basic or easy, they still are not fulfilled very well in countries, hence, they still are part of the SDGs. The further sub-indicators of SDG4 overall go a little deeper into the quality of education aspect, e.g. technical skill development or knowledge of sustainable development (United Nations, n.d.). These indicators, however, are way harder to measure as no clear indicators could be found in databases. Additionally, these indicators or goals could never be fulfilled without the base indicators that were chosen for this sub-variable being fulfilled well.

Table 6: Overview of relevant SDGs and the data used for Social Sustainability Performance

Indicators	Database	Data Used	SDG-Coverage	Source
Prevalence of Undernourishment	The World bank - FAO	Prevalence of undernourishment (% of population)	**SDG 2: Zero Hunger** Sub-Target 2.1.1.: Prevalence of Undernourishment	The World Bank, (n.d.a)
Healthy Life Expectancy	WHO	Healthy life expectancy (HALE) at birth	**SDG 3: Good Health and Well-Being**	WHO (n.d.)
Education Enrolment	SDGI	Net primary enrolment rate (%)	**SDG 4: Quality Education** Sub-Target 4.1.1.: Proportion of children and young people (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex Sub-Target 4.1.2.: Completion rate (primary education, lower secondary education, upper secondary education)	Sachs et al. (2021)
Literacy	SDGI Own assumption	Literacy rate (% of population aged 15 to 24)	**SDG 4: Quality Education** Sub-Target 4.1.1.: Proportion of children and young people (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex Sub-Target: 4.6.1.: Proportion of population in a given age group achieving at least a fixed level of proficiency in functional (a) literacy and (b) numeracy skills, by sex	Sachs et al. (2021) Educated guess based on UNESCO

3.3.3.3. Variable Component: Prosperity Sustainability Performance

The third variable component is built up of 5 indicators, which are retrieved from various databases as a similar method compared to the people sustainability performance is used. Similarly in this case the databases and frameworks played a large role in defining and setting up the indicators for the variable. Therefore, the indicators often directly correlate with the database and frameworks they originate from. This is a result of the process of selecting databases, as they as mentioned before are chosen because they were reviewed and considered to be of good quality and useful for this research. The indicators used for this sub-variable are discussed per the relevant (impact) category that was present in the literature, an overview of the relevant SDGs and data used for these indicators is presented in Table 7. Starting with the category poverty, for which two indicators are used. The first indicator regards income versus a set poverty ratio and is directly retrieved from one of the main sustainability frameworks used to identify these important categories, namely the SDGI, which also is used as a database for indicators of social and environmental sustainability performance. The other indicator regards income distribution within a country. For this especially multiple sources were reviewed, for example, the Standardized World Income Inequality Database (SWIID), however this database there often was only data present up until 2016, and thus was not useful. Eventually, the data for this indicator is retrieved from the HDI, which also is a sustainability framework that influenced multiple indicators, which did have for enough countries and in the preferred timeline.

The actual indicators that came out of this are the *poverty headcount ratio of income* and the *GINI index score* of countries. For the poverty headcount, the ratio is set at $1.90/day of purchasing power as this ratio is used in a specific indicator of the SDGI (Sachs et al., 2021). This ratio already is higher than sub-target 1.1 of SDG1, which sets the poverty headcount ratio at $1.25 a day (United Nations, n.d.). It, therefore, also is in line with sub-target 1.2., which focuses on national poverty lines that often are higher, and forms a base for the completion of other SDG1 sub-targets (United Nations, n.d.). This is complemented by the addition of the GINI index indicator from the HDI, which measures how equally income is distributed within a country (UNDP, 2020). It therefore also relates to the abovementioned SDG sub-targets but also includes the equality parts mentioned in SDG1 target 1.4, which regards equal rights to have economic resources, especially for the poor and vulnerable, and SDG10 sub-targets 10.1.1 and 10.2.1 which concern the increase of income for the bottom percentage of the population (United Nations, n.d.). These indicators together, therefore, measure several important aspects of poverty based on income within a country.

The category of equality is measured by a single indicator, *gender equality*, however, it can also be argued that income distribution partly falls under this category, as it covers some of the elements mentioned in SDG10 (General Assembly UN, 2015). The data for this single indicator is retrieved from the World Economic Forum (WEF), as they have a measurement that covers the main aspects of the relevant SDG while being up to date and covering a lot of countries (World Economic Forum, 2021). There are two reasons for equality only being measured by a single indicator. The first one is that the chosen indicator from the WEF is an index that tracks the gender gap over the years on four dimensions Economic Participation and Opportunity, Educational Attainment, Health and Survival and Political empowerment (World Economic Forum, 2021). With these four dimensions the indicator covers elements from all the sub-targets of SDG6, and therefore it is deemed a fitting measurement for gender equality (United Nations, n.d.). The second reason, is less positive, as another relevant aspect identified in the literature, e.g. Vermeulen (2018), ethnic equality was not measured in any database, not even in the World Inequality Database. This is also a criticism of the existing databases, as it is an element that should be covered based on literature and because it is a part of SDG10 sub-target 10.2 (United Nations, n.d.). Nevertheless, data could not be retrieved to measure this concept and therefore, unfortunately, it is not included in this sub-variable.

The last category identified in the literature, working conditions, is measured by two indicators, which both originate from different sources that are used for other indicators. The two indicators that measure this category are *Labour Freedom* and *Employment* within a country. The data for Labour Freedom is retrieved from the Heritage database, which also provided data for a large part of the Socio-Economic Structure variable. This specific indicator is chosen as it covers a large part of the theoretical base for this indicator, as it also originates partly from this database. It also includes a lot of important labour market and contract regulations that are mentioned in Vermeulen (2018), which include the subjects minimum wages, laws inhibiting layoffs, regulations regarding work hours and labour force participation and paid annual leaves and more (Miller et al., 2022b). Furthermore, it is also in line with several sub-targets of SDG8, as it covers elements of the sub-target 8.3, 8.5, and 8.8, which all cover an element that regards fair and equal working conditions that can be caused by the elements covered in this indicator (United Nations, n.d.). The employment indicator from the SDGI is measured by the unemployment rate in percentage of the total labour force from ages over 15 years (Sachs et al., 2021). Employment, or unemployment, is one of the most obvious measurements regarding SDG8, as it shows the percentage of the population that works in a country. The indicator is not explicitly mentioned in an SDG sub-target, however, the fulfilment of the SDG8 sub-targets leads to an increase in employment rates. Hence, it is an indicator that reflects decent working conditions. The data for this indicator is retrieved from the SDGI database, but within this database, there were some missing values, especially for a large proportion of European and some non-European OECD countries such as Australia, Japan and the USA. Therefore the choice is made to fill this data, as for most of these countries it was one of the few scores missing, and it was believed that this information needed to be available for these countries. The remaining data is retrieved from the CIA World Factbook, which is an extensive database of the US government that provides a lot of information on the demographics of 266 countries and therefore is deemed the best secondary source of data (CIA, n.d.). Unfortunately, even in this source, there was no data available for 2018, but in these cases the closest year is chosen. The CIA database, however, makes a critical note of this data. Namely that the data present on this indicator specific regards officially communicated rates, but that unofficial rates in countries might deviate from this, mainly in a negative way. Overcoming this issue unfortunately does not fit the scope of the research as it’s aimed at using mundane and publicly available databases. Nevertheless, it is good to keep in mind will using and interpreting the data.

Table 7: Overview of relevant SDGs and the data used for Prosperity Sustainability Performance

Indicators	Database	Data Used	SDG-Coverage	Source
Poverty Wage	SDGI	Poverty headcount ratio at $1.90/day (%)	**SDG 1: No Poverty** Sub-Target 1.1: By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day Sub-Target 1.2: By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions	Sachs et al. 2021
Income Inequality	HDI	Gini Index	**SDG 1: No Poverty** Sub-Target 1.2: By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions **SDG10: Reduced Inequalities** Sub-Target 10.1: By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average Sub-Target 10.2: Proportion of people living below 50 per cent of median income, by sex, age and persons with disabilities	UNDP, 2020
Gender Equality	WEF	Global Gender Gap Index	**SDG 5: Gender Equality**	WEF, (2021) Achieved from: http://reports.weforum.org/global-gender-gap-report-2021/dataexplorer (now unavailable)
Labour Freedom	Heritage Index of Economic Freedom	Labor Freedom	**SDG 8: Decent Work and Economic Growth** Sub-Target 8.5: Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services Sub-Target 8.8: Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment	Miller et al. (2020a)
Employment ratio's	SDGI CIA World Factbook	Unemployment rate (% of total labor force, ages 15+)	**SDG 8: Decent Work and Economic Growth** Sub-Target 8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value Sub-Target 8.6: By 2020, substantially reduce the proportion of youth not in employment, education or training	Sachs et al. (2021) CIA, (n.d.)

3.3.3.4. Additional Variable Component: External Footprint

The data used for the sustainability spillovers will be directly retrieved from the spillover index of the SDGI. The SDGI and the corresponding database are deemed fitting as it is one of the few databases that actually asses these spillovers, and quantify an index for them. Furthermore, the sustainability impact framework of the SDGI also already is used for indicators in the People and Prosperity pillar, where it provides useful data within the preferred time frame and it includes a large number of countries. These qualities of the database are also applicable to the SDGI spillover index and therefore it is chosen as the data source for measuring the sustainability impact of countries surpassing their geographical borders. As mentioned in the Theory section, the spillover index of the SDGI focuses on three dimensions in which countries can have an external footprint, either negatively or positively. The identified dimensions within this index are *environmental and social impacts embodied into trade, economy and finance,* and *security* (Sachs et al., 2021). With these dimensions, the SDGI spillover index addresses the external footprint of a country's environmental and prosperity performance, which are covered by the impacts embodied in trade, and the economy and finance dimensions. However, it also adds an element that is more or less neglected in the sustainability performance variables, SDG16: Peace Justice and Strong Institutions, which as explained is also a cause of many elements being included in the explanatory variables. However, by including this spillover index element one of the identified issues by Vermeulen (2018) is partly tackled as the external spillover that is considered in this dimension is the export of major conventional weapons (Sachs et al., 2021). Meaning that a performance based measurement of SDG16 now also is included, as tackling the export of weapons corresponds with sub-target 16.4.2 (United Nations, n.d.). The inclusion of the external impacts will thus add more SDG elements that are covered, and additionally also gives a more accurate image of the actual impact countries cause. Therefore, it will be considered as an additional variable of Sustainability Performance.

3.3.4. Normalization Method

As mentioned, to compare all the indicator results with each other, they all must be on the same scale. The preferred scale for this is a 0-1 scale, which means that a lot of the indicator scores are normalized to fit this scale. Some indicators originally already used this scale, and in these cases, they are not normalized. Two normalization methods are used for this since all indicators except for the Political Regime were on a numeric scale, methodology section discusses how this scale is transformed to also be numerical. The first method that is used is min-max normalization of which the formula is present below. This method transforms the highest score into the value 1 and transforms the lowest score into the value 0. All other scores are then transformed into a value in between this range, proportionally to their original score. In the cases of indicators for the independent variables, this means that the most open and inclusive scores receive a score of 1 whereas the least open and inclusive score receives a 0. In the case of the dependent Sustainability Performance variable this means the best performer scores a 1, and the worst performer a score of 0. The other method that is used is essentially an inverted form of this method. It is only used for indicators of the Sustainability Performance components in which a lower score is regarded as better performance. For example, the total amount of GHG emissions, or water stress levels, in which more emissions or more water stress is regarded as a worse performance. The equation used for this normalization method is presented below. An overview of all the normalization methods used per indicator is shown in Table 8.

$$\text{(Min -Max)} = \quad Xnorm = \frac{X - Xmin}{Xmax - Xmin}$$

$$\text{(Inverted Min -Max)} = \quad Xnorm = \frac{Xmax - X}{Xmax - Xmin}$$

Table 8: Normalization method used per indicator

Indicator	Original Scale	Normalization Method	Indicator	Original Scale	Normalization Method
Political Regime	Categorical transformed to interval	Special	**PM pollution**	Interval	Inverted Min-Max
CSO and Media Freedom	Interval: 0-1, the higher the more open and inclusive	None	**Ozone Pollution**	Interval	Inverted Min-Max
Public Participation	Interval: 0-1, the higher the more open and inclusive	None	**House Hold Pollution**	Interval	Inverted Min-Max
Property rights	Interval: 0-100	Min-Max	**Waste Management**	Ratio	Inverted Min-Max
Juridical Quality	Interval: 0-100	Min-Max	**Water Stress**	Ratio	Inverted Min-Max
Government Integrity	Interval: 0-100	Min-Max	**Safe Water**	Ratio	Min-Max
Trade Freedom	Interval: 0-100	Min-Max	**Clean Water**	Ratio	Min-Max
Business Freedom	Interval: 0-100	Min-Max	**Prevalence of Undernourishment**	Ratio	Inverted Min-Max
Access to education	Interval	Min-Max	**Life Expectancy**	Interval	Min-Max
GHG emissions	Interval	Inverted Min-Max	**Primary Education Enrolment**	Interval	Min-Max
Modern Renewables	Ratio	Min-Max	**Youth Literacy**	Ratio	Min-Max
Terrestrial Biome Protection	Ratio	Min-Max	**Poverty Wage**	Ratio	Inverted Min-Max
Marine Protected Areas	Ratio	Min-Max	**Income Inequality**	Ratio	None
Species Protection Index	Ratio	Min-Max	**Gender Equality**	Interval	None
Tree Cover Loss	Ratio	Min-Max	**Labour Freedom**	Interval: 0-100	Min-Max
Grassland Loss	Ratio	Min-Max	**Employment**	Ratio	Inverted Min-Max
Wetland Loss	Ratio	Min-Max	**External Footprint**	Interval: 0-1	Min-Max
Sustainable Agriculture	Ratio	Inverted Min-Max			

3.4. DATA ANALYSIS

Within the last phase, phase 4 the data analysis will be performed, which will be carried out in the statistical computing program R. To test the hypothesis and eventually answer the research question several statistical tests will be performed. The hypothesis revolves around three variables, of which policy culture and socio-economic structure are explanatory whereas sustainability performance is the dependent variable. Meaning that it is expected that a higher score for the explanatory variables will lead to a higher score in the dependent variable, showing a linear relation. Therefore, the most fitting analysis is a multiple OLS regression test, of which the simplest form is presented in the equation below (Darlington and Hayes, 2016). Where the Y, in this case, refers to the dependent variable of a country, b0 represents the regression constant, X1 and X2 stand for the explanatory variables and b1 and b2 are the weights of the variables. This analysis will show the relative effect the explanatory variables have on the outcome variable.

$$\mathrm{Y} = \mathrm{b0} + \mathrm{b1X1} + \mathrm{b2X2}$$

Before the final regression tests, are performed, several other analysis steps are taken, the R script that is used for all these steps and the analyses can be found in Appendix B. At first, all the results of the individual variables, and variable components in the case of sustainability performance, are discussed. The first analysis step that is taken per indicator is analysing the data distribution of the indicators that measure the variable, this includes analysing the mean scores, standard deviation and histograms of the indicators. This step is taken as it provides information on what indicators score best and worst, and it also is a set-up for the next step, internal correlation. Internal correlation of the indicators is tested to assess how the indicators within a variable interact with each other. Internal correlation can however be tested with various tests, depending on how the data in variables is distributed. If the indicators all are normally distributed a Pearson test is most fitting, however, when there are non-normally distributed variables a Spearman test is more fitting. This is where the histograms help, as they already roughly show if the data is normally distributed, or not, to confirm this assumption based on the histograms a Shapiro-Wilkinson test is performed to check the normality. Based on the results of the Shapiro-Wilkinson test, the appropriate correlation test is performed. The reason that internal relation is tested, is because it provides a lot of information on the relationships between the indicators in a variable, and can also show the directionality of a variable. In the cases of the independent variables, it also is an assessment of literature, as the indicators chosen for these variables are based on their contribution to either an open and inclusive Policy Culture or an open and inclusive Socio-Economic structure. This does not necessarily hold for the Sustainability Performance variable components, as they are performance-based and are not expected to all be in the same direction, as performing well in a certain impact category does not necessarily mean that a country performs well in another impact category. It, however, is used to show the indicators relate to each other, which also gives interesting insights. The internal correlation statistics also are useful to consider for the last step, aggregation, which focuses on how the final variable score is calculated based on the indicator scores within the variable. To determine how the variables will be aggregated, exploratory factor analyses are performed to assess whether the variables can be explained by a single factor, or by more. This is determined by the specific contribution of the individual indicators, the significance of the analysis, and in the case of multiple factors, whether the indicators can be grouped (Kaiser, 1974). In the cases where a factor analysis shows that the variable can fittingly be described by a single factor, an equal weighting additive aggregation method is used, except in the specific case of the External Footprint which is discussed later. In sustainability performance indicator development this method is most used, as it has the benefits of simplicity, transparency and replicability (Gan et al. 2017). This method will also be used for the non-sustainability performance indicators, as it is assessed that these benefits are transferable to other indexes as well. These methods however also have drawbacks, due to the simplicity they may lack insights into relationships and can lead to mutually preferentially independence (Gan et al. 2017). These drawbacks however are somewhat counteracted by the insights retrieved through the internal correlation results, and by several extra regression tests that will vary in aggregation, as will be discussed in the next paragraph.

After the final aggregation of the variables, the regression tests are performed. The results of the regression tests will provide the answer to the research question. As the final model calculates the sustainability performance of countries, based on their policy culture and their socio-economic structure. This however is only the main model that is tested. In addition to this model several single and multiple linear regression tests are carried out, to get more insights into how specific parts of the variables contribute to one another. For example, single linear regression tests that calculate sustainability performance based on a single independent variable. Furthermore, regression tests in which is varied with the aggregation will also be performed, by for example only calculating environmental sustainability performance based on the independent variables. This contributes to creating extra depth in the insights retrieved from the results, as well as contributing to the robustness of the results.

3.5. RESEARCH QUALITY

To ensure that the research and the results is used to answer the research question, the research quality is of great importance. Bryman (2012) identifies two main indicators for ensuring quality in quantitative research being validity and reliability. Frambach et al. (2013) also add objectivity to this list. Validity is divided into internal and external validity. Internal validity is centred around the subject of causality between variables (Bryman, 2012). To ensure internal validity, several correlation tests and sensitivity tests are performed, for example by also measuring the correlation between the individual explanatory variables and the dependent variable, and by combining the explanatory variables into a single variable. External validity regards the generalizability of the results (Bryman, 2012). This will be addressed by using a large sample of data, to cover a wide variety of countries. Also the impact of the sample is considered in the final results. The reliability of research concerns the repeatability of the results and research when replicated (Bryman, 2012). External reliability is addressed through being transparent on the choices made, providing an overview of which data specifically is used, and by providing an R-script that shows how the different tests are performed. To ensure internal validity, internal consistency will be pursued by being consistent and transparent in arguing and placing indicators in categories, based on the argumentation that forms the base of this research. The last point objectivity regards the biases which are included in the research (Frambach et al., 2013). In this research there will be attempts to avoid personal biases, this will be addressed by basing all decisions on theoretical literature, meaning that choices will be made in check with existing literature or data that supports the choices.

4. RESULTS

This section is completely centred around discussing the results and scores of the indicators, the variables, and the regressions tests. First, the results of and within the different variables are discussed per variable. After, that the results of the final analyses are discussed.

4.1. INDEPENDENT VARIABLE 1: POLICY CULTURE

The first independent variable, *Policy Culture* is composed of three individual indicators, as explained in the Methodology chapter. In the final database, data on these indicators is present for all the countries, meaning that the results are based on data from 148 countries, and thus that the results cover a population of 7.355.870.836 based on 2018 statistics, from the SDGI (Sachs et al., 2021). Therefore, the statistics and results encompass around 97 percent of the world population in 2018, which was approximately 7.600.000.000 according to the World Bank (n.d.d).

The first interesting point is that the mean scores of all the variables are relatively high, especially for the indicators *Civil Society and Media Freedom* and *Public Participation*, as shown in Table 9. Which implies that on average countries all around the world are more democratic societies, in which Civil Society and the Media are accepted as independent organizations. Along with this, it suggests that citizens are also able to influence the government and can hold the government accountable for their actions, these results thus also show that on average in most countries citizens also have forms of political power. By being able to hold the government accountable, and by being able to join and influence the political debate, either by setting up or joining a political party or by giving their opinions.

Table 9: Individual mean scores and standard deviation of the Policy Culture indicators

Indicator	Mean Score (0-1)	Standard Deviation
Political Regime	0.573	0.303
Civil Society and Media Freedom	0.722	0.253
Public Participation	0.747	0.202

The most interesting about these mean scores is the *Political Regime* mean score, as this score barely represents the lower bound of electoral democracies. In terms of open and inclusiveness, this average is not nearly as high as the other variable averages. For this reason, it is interesting to further investigate this variable. Figure 1 shows the political regime division in 2018, which is in line with the lower average result, as it shows that the most common political regime in 2018 was the Electoral Autocracy, followed by Electoral and Liberal Democracies. What this also shows is that the divide between Autocratic countries and Democratic Countries is only slightly in favour of democracies.

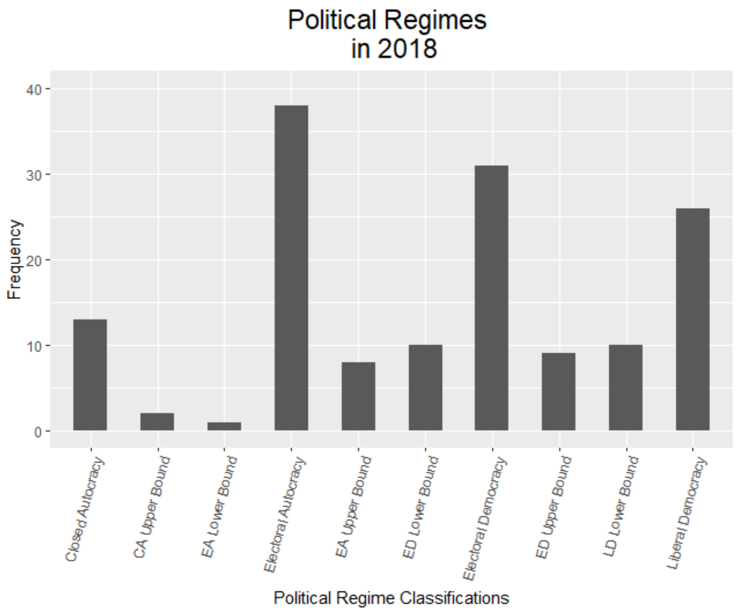


Figure 1: Political Regime division

Nevertheless, there is also something counterintuitive about these results as the correlation between the indicators is very high. Table 10 shows the output of Spearman correlation tests for the three indicators. The Spearman correlation test is chosen over the Pearson correlation test as the histograms for each of the indicators showed that there was a non-normal distribution in the scores. This is also confirmed by the Shapiro-Wilkinson tests, as all the p-values were < 0.05. What the table shows is that each indicator has a very strong positive correlation with the other, as $r_s > 0.90$ for all the cases, which also are statistically significant. This means that a more open and inclusive political regime has a strong positive effect on the freedom of civil society and media and the freedom for the public to influence government decisions, and vice versa. This result is also following the theoretical base of this research. Therefore, it was expected that the average political regime would be more on the open and inclusive side than the results show it is.

Table 10: Internal correlation statistics Policy Culture

		Political Regime	**Civil Society and Media Freedom**	**Public Participation**
Political Regime	Spearman Correlation r_s	**X**		
	Sig. (2-tailed)			
	N			
Civil Society and Media Freedom	Spearman Correlation r_s	**0.91**	**X**	
	Sig. (2-tailed)	.000		
	N	148		
Public Participation	Spearman Correlation r_s	**0.93**	**0.90**	**X**
	Sig. (2-tailed)	.000	.000	
	N	148	148	

Nevertheless, this justifies building up the final variable by combining the scores of the three indicators all with the same weight, for two reasons. The first one is, that combining the cultural elements, *Civil Society and Media Freedom* and *Public Participation* led to unrealistic scores, for example, Russia would score high, whereas this is not a realistic result. Secondly, a factor analysis could only be performed with a single factor, therefore indicating that one is fitting enough. This eventually means that the equation for determining the open and inclusiveness of the Policy Culture is:

$$Policy\ Culture = \frac{(\text{Political Regime} + \ \text{Civil Society and Media Freedom} + \ \text{Public Participation})}{3}$$

By combining the indicator scores into a single variable score, the global average score is 0.68. Which is still a high score, indicating that on average the *Policy Culture* is quite open and inclusive. The geographical distribution of the *Policy Culture* scores however is not evenly distributed, as shown in Figure 2.

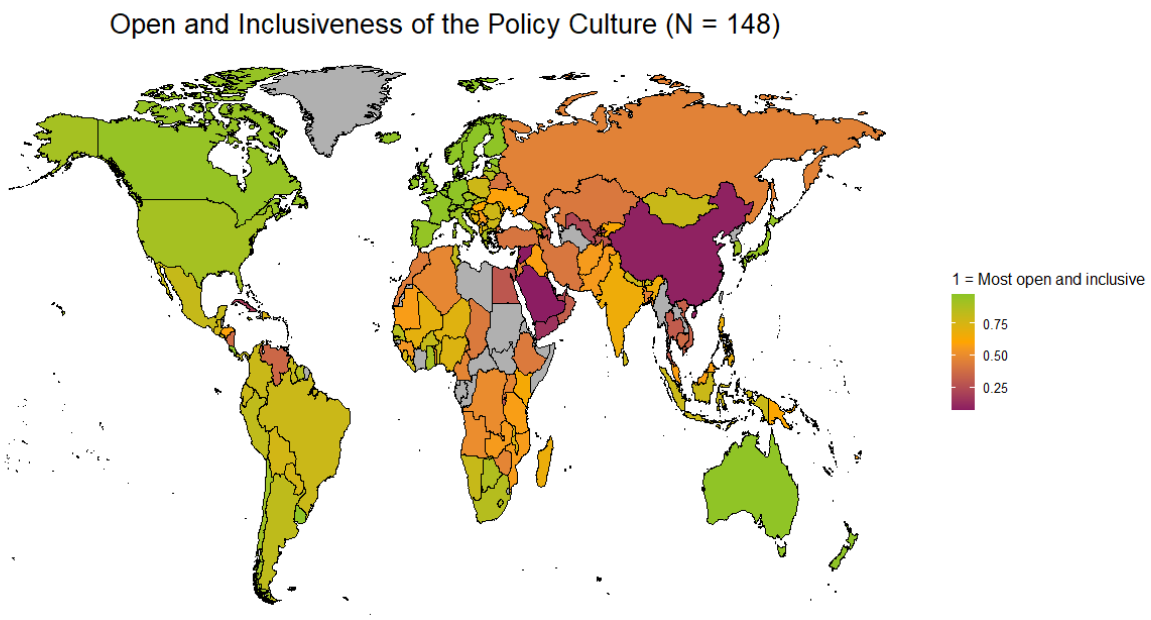


Figure 2: World map of the Policy Culture scores (midpoint = 0.6)

The figure clearly shows that more Western countries e.g. in Europe, North and Latin America and Australia score high on the open and inclusiveness of their Policy Culture. Whereas African, Asian and Arabic countries score relatively low on the open and inclusiveness. This observation is also clearly substantiated by the best and worst performers of this variable. As Table 11 shows, the top 10 performers list is dominated by European countries who all have a very high score on open and inclusiveness. On the other hand, the worst performers on open and inclusiveness all with a very low score, are Arabic and Asian countries.

Table 11: Top 10 and bottom 10 performers on the open and inclusiveness of the Policy Culture

Best Performers	Score (0-1)	Worst Performers	Score (0-1)
1. Sweden	0.972	139. Burundi	0.263
2. Denmark	0.971	140. United Arab Emirates	0.227
3. Estonia	0.971	141. Uzbekistan	0.223
4. Norway	0.969	142. Bahrain	0.183
5. Portugal	0.969	143. Cuba	0.179
6. Uruguay	0.968	144. Yemen	0.141
7. Costa Rica	0.968	145. Qatar	0.099
8. Finland	0.967	146. China	0.086
9. New Zealand	0.966	147. Saudi Arabia	0.072
10. Luxembourg	0.966	148. Syria	0.069

What is interesting about the division in country scores is that for the top performers the difference in scores is minimal. The top 10, all have an almost perfect score on open and inclusiveness, the worst performers score very low, meaning that they are not open and inclusive at all. But even with these extreme variations and the lower-than-expected average of the political regimes, there still is a very high correlation between the variables. This also explains the high average scores of the indicators and the high average score on the eventual variable. Therefore, indicating that it is a fitting measure, and thus is relevant to use in the eventual analysis

4.2. Independent Variable 2: Socio-Economic Structure

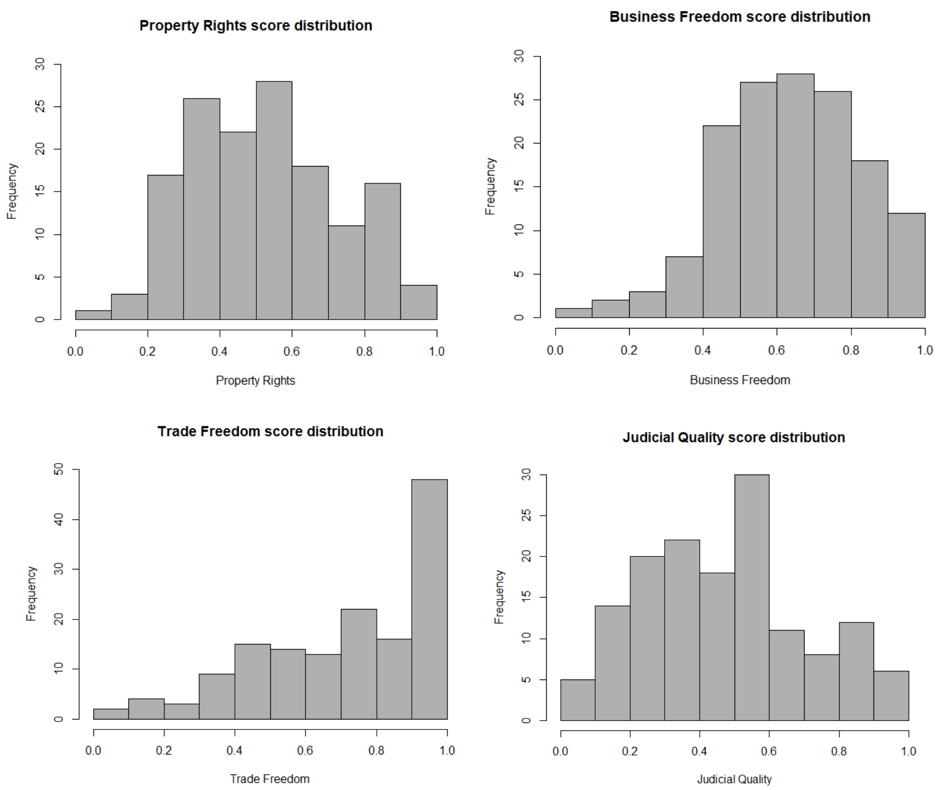
The second independent variable consists of the six indicators. The final database for this variable covers 146 countries and with that covers a population of 7.288.938.549, meaning that approximately 96% of the world population is covered in this variable (Sachs et al., 2021; The World Bank, n.d.d.).

The mean scores and standard deviation of the individual indicators are presented in Table 12 below. There is a significant difference in mean scores among the variables, for example, the average score for Trade Freedom is relatively high at 0.701, whereas the average score on Government Integrity is relatively low at 0.411. Furthermore, the averages also show that the indicators that are relevant for the freedom of the market institutions, Business and Trade Freedom, overall are the most open and inclusive in countries. The next highest average is Property Rights, showing that overall the more economic-oriented institutions in countries are more open compared to the social aspects of this variable.

Table 12: Individual mean scores and standard deviation of Socio-Economic Structure indicators

Indicator	Mean Score (0-1)	Standard Deviation
Property Rights	0.529	0.208
Business Freedom	0.636	0.190
Trade Freedom	0.701	0.237
Judicial Quality	0.469	0.235
Government Integrity	0.411	0.221
Access to Education	0.466	0.186

The standard deviation within the variables is quite low, as only a few of the standard deviations is slightly higher than half the value of the mean score. However, the spread of the data is still interesting to assess to check whether the variables are normally distributed. Figure 3 below shows a histogram of each indicator that shows the score distribution.



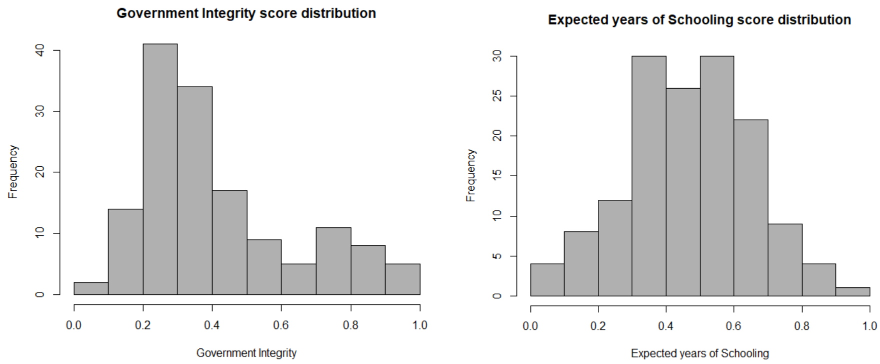


Figure 3: Score distribution histograms of the Socio-Economic Structure indicators

The histograms clearly show that the variables Trade Freedom and Government integrity are non-normally distributed. The other indicators however are closer to a normal distribution. To confirm these observations a Shapiro-Wilkinson test is performed per variable. The results of these tests showed that there is a clear normal distribution in the variables Business Freedom (0.09) and Access to education (0.84), as both of their p-values exceed 0.05. The p-value of Property rights is barely 0.05, so it can also be seen as normally distributed. Even though there are normally distributed indicators, there also are non-normally distributed indicators. Meaning that the correlation test that is performed is a Spearman correlation. The results of this test are presented in Table 13 below.

Table 13.: Internal correlation statistics Socio-Economic Structure

		Property Rights	Business Freedom	Trade Freedom	Judicial Quality	Gov. Integrity	Access to Education
Property Rights	Spearman Correlation r_s	**X**					
	Sig. (2-tailed)						
	N						
Business Freedom	Spearman Correlation r_s	**0.77**	**X**				
	Sig. (2-tailed)	.000					
	N	146					
Trade Freedom	Spearman Correlation r_s	**0.71**	**0.61**	**X**			
	Sig. (2-tailed)	.000	.000				
	N	146	146				
Judicial Quality	Spearman Correlation r_s	**0.86**	**0.69**	**0.61**	**X**		
	Sig. (2-tailed)	.000	.000	.000			
	N	146	146	146			
Government Integrity	Spearman Correlation r_s	**0.87**	**0.73**	**0.61**	**0.87**	**X**	
	Sig. (2-tailed)	.000	.000	.000	.000		
	N	146	146	146	146		
Access to Education	Spearman Correlation r_s	**0.75**	**0.74**	**0.64**	**0.69**	**0.70**	**X**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	146	146	146	146	146	

The table shows that the correlation values between the indicators are quite high, as the lowest correlation value of 0.61 is the correlation between Trade Freedom variables and the Business Freedom, Judicial Quality and Government Integrity variables. Furthermore, the highest correlation value of 0.87 is between Property Rights and Government Integrity. This indicates that all the indicators have a strong to a very strong positive effect on each other, especially since all the correlations are significant. This means that it confirms the assumption that these open and inclusive institutions contribute to a more open and inclusive socio-economic structure in countries, which is in line with the assumptions made based on the theory used in this research.

The final variable is built up by combining the six variables, all with equal weighting. This is because a factor analysis showed that explaining this variable with one total factor is the best fit. All the indicators, in this case, have a contribution of > 0.679 and the SS loading is far higher than 1, with a value of 4.725. Furthermore, the hypothesis that this variable can be explained by a single variable is statistically significant with a p-value of .000. It is also tested whether the variable could be explained by two factors, even though it also met the first two criteria of contribution values and the SS loading, the hypothesis was not significant with a p-value of 0.295 (Appendix C). Therefore, the choice is made to use the equal weighting, leading to the open and inclusiveness of the Socio-Economic Structure being described by the following equation:

$$Socio - Economic\ Structure = \frac{\text{Property Rights} + \text{Business Freedom} + \text{Trade Freedom} + \text{Judicial Quality} + \text{Government Integrity} + \text{Access to Education}}{6}$$

The overall average score for the aggregated variable is 0.54, meaning that globally most countries do not necessarily have the most open and inclusive Socio-Economic Structure. This is also shown in Figure 4, as it shows that few countries are coloured green, only parts of Europe, North America and Oceania. Whereas the other continents have a relatively poor performance, especially Africa.

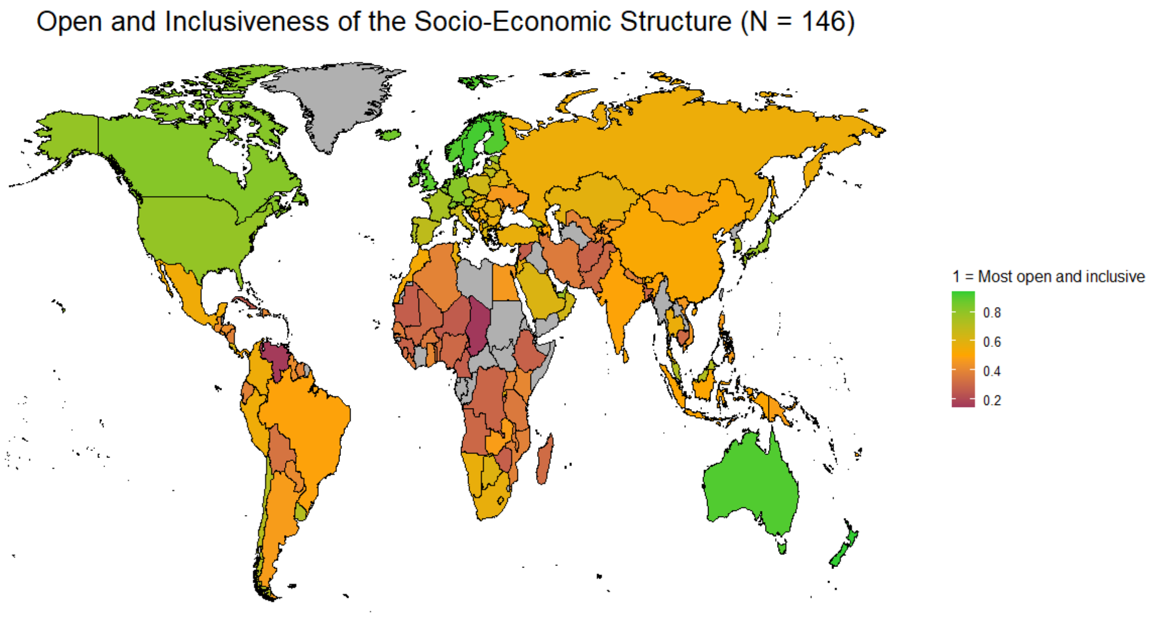


Figure 4: World map of the Socio-Economic Structure scores (midpoint = 0.5)

This geographical difference in scores is also shown in Table 14, which shows the top 10 best and worst performers. The best performers are predominantly European countries, nevertheless, the best scoring countries, are New Zealand and Singapore. Of the 10 worst performers African countries make up the largest share, however, also two middle Eastern countries and Cuba and Venezuela are included. Furthermore, it is interesting to see the large gap between the highest and lowest score. The top performers score very high, whereas the lowest-scoring countries score very low. Showing that there is a large divide in open and inclusiveness all around the world. It is especially interesting, since the standard deviation of the scores is not necessarily high, with it being 0.185. Thus showing that these 'top' and 'bottom' performers are outliers compared to the total sample of countries that is included.

Table 14: Top 10 and bottom 10 performers on the open and inclusiveness of the Socio-Economic Structure

Best Performers	Score (0-1)	Worst Performers	Score (0-1)
1. New Zealand	0.936	137. Afghanistan	0.280
2. Singapore	0.921	138. Ethiopia	0.278
3. Sweden	0.920	139. Zimbabwe	0.273
4. Australia	0.906	140. Cameroon	0.267
5. Norway	0.904	141. Mauritania	0.266
6. Finland	0.903	142. Syria	0.263
7. The United Kingdom	0.893	143. Niger	0.257
8. Denmark	0.890	144. Cuba	0.249
9. Iceland	0.860	145. Venezuela	0.152
10. Ireland	0.850	146. Chad	0.141

Overall the results of this variable showed that they confirm the expected result, namely that the chosen indicators together create an image of the open and inclusiveness of a country's Socio-Economic Structure, as the data has a unified relation. Even though there is a large score distribution, with several high- and low-performing countries. Furthermore, the factor analyses also showed that the variable can be described by a combination of these indicators, making this variable very useful and interesting to use in the final analyses.

4.3. DEPENDENT VARIABLE: SUSTAINABILITY PERFORMANCE

As mentioned in the Theoretical section, the dependent variable consists of three variable components, which are referred to as the pillars of sustainability, with an additional component in the form of the external footprint. At first, results for these individual components will be discussed, starting with Environmental Sustainability before the aggregated dependent variable will be discussed.

4.3.1. Dependent Variable Component 1: Environmental Sustainability Performance

The first and largest component of the Sustainability Performance variable is Environmental Performance, which is measured by 16 variables. As a result of this large amount of variables the final database on this component only covers 83 countries with complete data. Nevertheless, it still covers a population of 6.139.019.064 which is approximately 81% of the world population which is very impressive when considering the number of countries included (Sachs et al., 2021; The World Bank, n.d.d.)

Table 15: Individual mean scores and standard deviation of Environmental Sustainability Performance indicators

Indicator	Mean Score (0-1)	Standard Deviation
GHG Emissions (GHG)	0.822	0.147
Modern Renewables (MODREN)	0.229	0.186
National Biome Protection (BIOME)	0.734	0.285
Marine Protected Areas (MARINE)	0.369	0.417
Species Protection Index (SPECIES)	0.767	0.229
Cropland Loss (CROP)	0.823	0.168
Grassland Loss (GRASS)	0.987	0.024
Wetland Loss (WETL)	0.941	0.093
Sustainable Agriculture (AGRI)	0.531	0.212
Particular Matter Air Pollution (PM)	0.745	0.232
Ozone Air Pollution (OZ)	0.500	0.169
Household Air Pollution (HH)	0.733	0.338
Sustainable Waste Management (SWM)	0.514	0.363
Water Stress (WATSTR)	0.994	0.008
Safe Water (SAFEW)	0.845	0.222
Clean Water (CLEANW)	0.461	0.203

Table 15 shows the average scores and standard deviation of all the indicators, and with this some interesting results. At first, there is the indicator Modern Renewables, which on average has a very low score of only 0.229, meaning that a lot of countries on average do not use a large percentage of modern renewable energy compared to their total energy use. For this indicator, only a few countries score very well, with Iceland leading all countries followed by the Scandinavian countries, and surprisingly Liberia and Uruguay. On the worst performing end, there also are a few countries that score an absolute 0. Among these countries are Bahrain, Kuwait, Oman, Qatar, and Saudi Arabia which all are located in the Middle East. This result is not surprising as these countries are known for their dependence on oil and fossil fuels. Another interesting indicator that has a quite low average is Marine Protected Areas, with a mean score of 0.369. What is most pressing about this indicator is its standard deviation, which is higher than the mean itself, thus indicating that there is a lot of difference in the score distribution. The histogram of this indicator, as depicted in Figure 5, shows that within this indicator the highest peaks are either countries that score very low or very high, with relatively few scores in the middle.

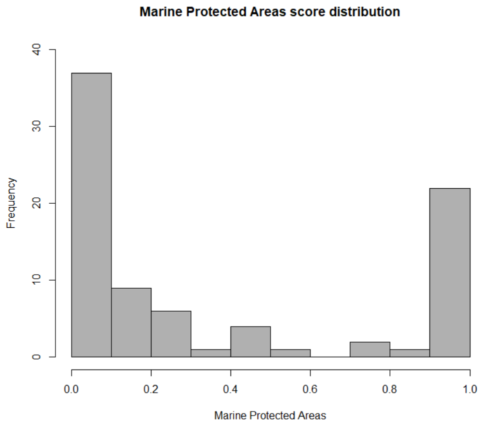


Figure 5: Score distribution histograms of the Marine Protected Areas indicator

In contrast to the high standard deviation, the indicators Water Stress and Grassland Loss both have extremely low standard deviations and very high average scores with an average of around 0.990. This however is explainable, as this is a result of the max-min normalization and a few outliers scores. In the case of Water Stress, the scores are heavily influenced because once again the Middle Eastern countries perform extremely bad on this indicator. For example, Kuwait has a water stress percentage of over 3800%, followed by the United Arabic Emirates and Saudi Arabia which have a water stress percentage of over 1000. Meaning that in these countries way too much freshwater is withdrawn with respect to their renewable water sources. In the case of Grassland Loss, Malaysia is by far the worst performer compared to all other countries. With the chosen normalization method these scores heavily influence the ratings of other countries, as compared to those extremely low scores most countries perform well. Nevertheless, these scores are not excluded from the calculation, as this research is comparative, and it thus is of relevance to also include this data. Nevertheless, it is important to consider this when looking at the scores, as this does not necessarily mean that on average countries score very high on these indicators.

For all the other indicators, the score distribution also is assessed by computing the histograms and performing the Shapiro-Wilkinson test, to determine whether the score distribution is normal. Most indicators, just as the ones discussed before however, do not have a normal distribution as their Shapiro-Wilkinson p-value often was far below 0.05. Two indicators do have a normal distribution, which are the Clean Water and Sustainable Agriculture indicators. Their Shapiro-Wilkinson values are much larger than 0.05, and their histograms which are presented in Figure 6, also show signs of normal distribution. Even though these two indicators are normally distributed, most of the indicators is not, meaning that the correlation between the indicators is tested with the Spearman test.

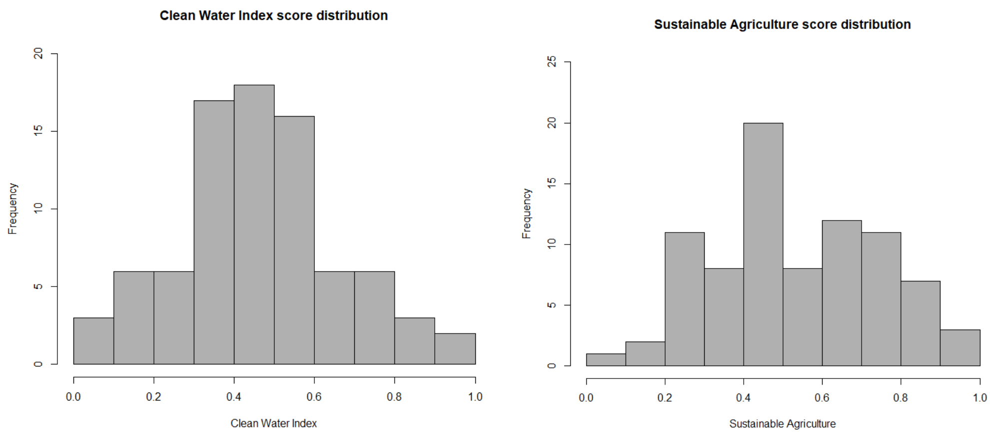


Figure 6: Score distribution histograms of the Clean Water Index and Sustainable Agriculture indicators

The internal correlation test results of this variable are presented in Table 16. The results of the Spearman test deviate quite a lot from the other variables, not only are there a lot more results, but the results also are not as unambiguous as they are for the independent variables. There is no clear direction in which the indicators correlate with each other, as there are strong positive but also strong negative relations between the indicators. Additionally, a lot of the correlations are not significant (the significance scores in italic). Nevertheless, there are a lot of interesting results and relationships that can be retrieved from the data. The first regards the indicator GHG emissions, which often is seen as one of the prevalent issues when looking at environmental sustainability performance. What is shown in the table is that the indicator overall mainly has a negative correlation with other indicators, only two of the relationships are very minimally positive, however, those relationships are not significant. The indicator on the other hand has a lot of relatively strong negative correlations that are significant. Examples of this are the strong negative correlation with Particular Matter and Household Fuel pollution, and the strong negative correlation with Sustainable Waste Management and access to Safe Drinking Water. Meaning that countries that have low GHG emissions often do not score well on these other indicators, and vice versa. Based on the data this relationship can be explained, as most of the countries that perform relatively well on GHG emissions per capita are poor and mostly African countries, that also perform poorly on the abovementioned related indicators. This is also what was to be expected based on the environmental issues that are existing in those countries.

In contrast to the GHG indicator which mostly has negative correlations with other indicators, the Particular Matter indicator (PM) has a lot of positive correlations that also are significant. Overall it has a relatively strong positive correlation with eight other indicators, and the only significant negative correlation it has is with the GHG indicator. The strongest positive correlations this indicator has are with Sustainable Waste Management (0.69) and with access to Safe Drinking Water (0.71). Meaning that countries with low Particular Matter Pollution often also manage their waste in a (more) sustainable way, and often have safe drinking water accessible for a large part of their population. It is quite interesting to see that similar indicators come up in this discussion too, as it does show that there is somewhat of a cluster of indicators that do have a positive correlation with each other. These clusters exist of the indicators that belong to the impact categories of Air Quality and Human-Health related pollution (PM, HH, OZ), Waste Management, and Water Quality and Resources excluding the water stress indicator, with the addition of the Marine Protected Areas indicator that also significant and strong positive correlation with these indicators. Between these indicators there also is the strongest correlation, which is between Sustainable Waste Management and Access to Safe Drinking Water (0.82). This also is quite a logical relationship, as countries that handle their waste in an unsustainable way often dump it, and then it either directly or indirectly influences the quality of the drinking water. Therefore, countries that perform well in one of those indicators, are also more likely to perform well in the other.

What this also shows is that the highest correlations are not between indicators that belong in the same impact category of environmental sustainability performance. The highlighted squares in Table .. show the correlation statistics between the indicators that are grouped in an impact category. It shows that two impact categories have a relatively strong positive correlation with each other, but also two in which this is not the case. In the impact category Biodiversity (Biome, Marine, Species) there is a medium to a strong positive correlation between all the indicators, just as in the Air Quality and Human-Health related pollution except for the insignificant relation between Ozone and Household gas air pollution. The other two impact categories with multiple indicators however do not have this strong correlation. Especially within the Land Use and Degradation impact category (Crop, Grass, Wetl, Agri) there is merely one significant relation which is not very influential.

Table 16: Internal correlation statistics Environmental Sustainability Indicator

	N = 83	GHG	MODREN	BIOME	MARINE	SPECIES	CROP	GRASS	WETL	AGRI	PM	OZ	HH	SWM	WATSTR	SAFEW	CLEANW
GHG	Spearman Cor. r_s	x															
	Sig. (2-tailed)																
MODREN	Spearman Cor. r_s	-0.06	x														
	Sig. (2-tailed)	.579															
BIOME	Spearman Cor. r_s	-0.09	0.19	x													
	Sig. (2-tailed)	.428	.085														
MARINE	Spearman Cor. r_s	-0.36	0.26	0.36	x												
	Sig. (2-tailed)	.001	.020	.001													
SPECIES	Spearman Cor. r_s	-0.31	0.27	0.69	0.51	x											
	Sig. (2-tailed)	.005	.013	.000	.000												
CROP	Spearman Cor. r_s	-0.14	-0.14	0.11	-0.05	-0.04	x										
	Sig. (2-tailed)	.200	.211	.306	.633	.695											
GRASS	Spearman Cor. r_s	-0.21	0.00	-0.15	0.38	0.03	0.07	x									
	Sig. (2-tailed)	.061	.973	.165	.000	.786	.509										
WETL	Spearman Cor. r_s	0.11	-0.08	-0.15	-0.15	-0.20	-0.08	0.26	x								
	Sig. (2-tailed)	.302	.475	.182	.175	.068	.495	.016									
AGRI	Spearman Cor. r_s	-0.35	0.12	0.02	0.32	0.35	-0.06	0.15	-0.11	x							
	Sig. (2-tailed)	.001	.295	.885	.003	.001	.561	.186	.311								
PM	Spearman Cor. r_s	-0.55	0.49	0.29	0.63	0.53	-0.07	0.30	-0.14	0.37	x						
	Sig. (2-tailed)	.000	.000	.008	.000	.000	.535	.006	.195	.001							
OZ	Spearman Cor. r_s	-0.25	0.44	0.06	0.32	0.14	-0.14	0.16	0.02	0.04	0.52	x					
	Sig. (2-tailed)	.022	.000	.603	.004	.193	.193	.139	.853	.749	.000						
HH	Spearman Cor. r_s	-0.63	0.00	0.10	0.52	0.34	0.22	0.47	-0.14	0.34	0.61	0.11	x				
	Sig. (2-tailed)	.000	.992	.355	.000	.002	.045	.000	.220	.002	.000	.330					
SWM	Spearman Cor. r_s	-0.55	0.17	0.24	0.68	0.46	0.12	0.39	-0.19	0.38	0.69	0.11	0.79	x			
	Sig. (2-tailed)	.000	.295	.026	.000	.000	.561	.000	.078	.000	.000	.315	.000				
WATSTR	Spearman Cor. r_s	0.08	0.45	0.10	-0.15	0.13	-0.22	-0.14	0.15	-0.04	0.07	0.39	-0.37	-0.28	x		
	Sig. (2-tailed)	.493	.000	.350	.165	.259	.042	.219	.166	.692	.512	.000	.001	.010			
SAFEW	Spearman Cor. r_s	-0.56	0.27	0.20	0.55	0.42	0.20	0.36	-0.18	0.42	0.71	0.08	0.77	0.82	-0.27	x	
	Sig.(2-tailed)	.000	.012	.075	.000	.000	.069	.001	.111	.000	.000	.489	.000	.000	.013		
CLEANW	Spearman Cor. r_s	-0.48	0.31	-0.02	0.34	0.11	0.18	0.22	0.16	0.11	0.49	0.57	0.35	0.28	0.21	0.27	x
	Sig. (2-tailed)	.000	.005	.852	.002	.323	.099	.041	.161	.335	.000	.000	.001	.012	0.54	0.13	

Overall, this does not necessarily mean that the indicators do not fit within the variable, but that based on this data it can be stated that performing well within a certain impact category does not necessarily mean that a country does well in another impact category except for the positive cases mentioned above. What this also means is that there probably are few countries that perform well on all the indicators. This is not necessarily a surprising result, as environmental sustainability regards a lot of different areas, and often also comes with trade-offs (Kanter et al., 2018). Furthermore, countries often have a specific area or focus in which they perform very well, whereas other goals are lacking, this is also displayed very well in for example SDGI reports.

Due to the complexity and the high number of indicators this variable component has, factor analyses have been performed to assess whether indicators can be grouped, to reduce the number of indicators. A logical grouping would for example be based on the identified impact categories from the theory to which each indicator belongs, however, as shown from the internal correlation this does not necessarily work as they do not all correlate with each other. The actual factor analyses unfortunately did also not produce any clear division of the indicators. The results showed that splitting the up until 3-factor groupings is statistically significant, however, this did not produce any logical grouping of indicators (Appendix C). Furthermore, in these situations, all the indicators regarding Land Use and Degradation actually should be excluded as none of their factor loadings exceed a load of < 0.4 (Kaiser, 1974). Therefore, the choice is made to leave out the indicator grouping of the factor analysis and keep all the 16 indicators from the theory. Meaning that they all individually contribute to a country's Environmental Sustainability performance. Leading to the following equation:

$$Environmental\ Sustainability\ Performance = \frac{(\mathrm{GHG + Modren + Biome + Marine + Species + Crop + Grass + Wetl + Agri + PM + OZ + HH + SWM + Watstr + Safew + Cleanw})}{16}$$

With this aggregation used for the total score of the variable, the average score for Environmental Sustainability Performance is 0.687, which still is relatively high. This may however be influenced by the geographical representation of countries that is present in the data. As shown in Figure 7, African, Middle Eastern, and Asian countries are not included in the data due to missing values for one or more of the indicators. However, these countries notoriously are known to not perform well on several aspects of this indicator, for example, shown by the individual Water Stress indicator.

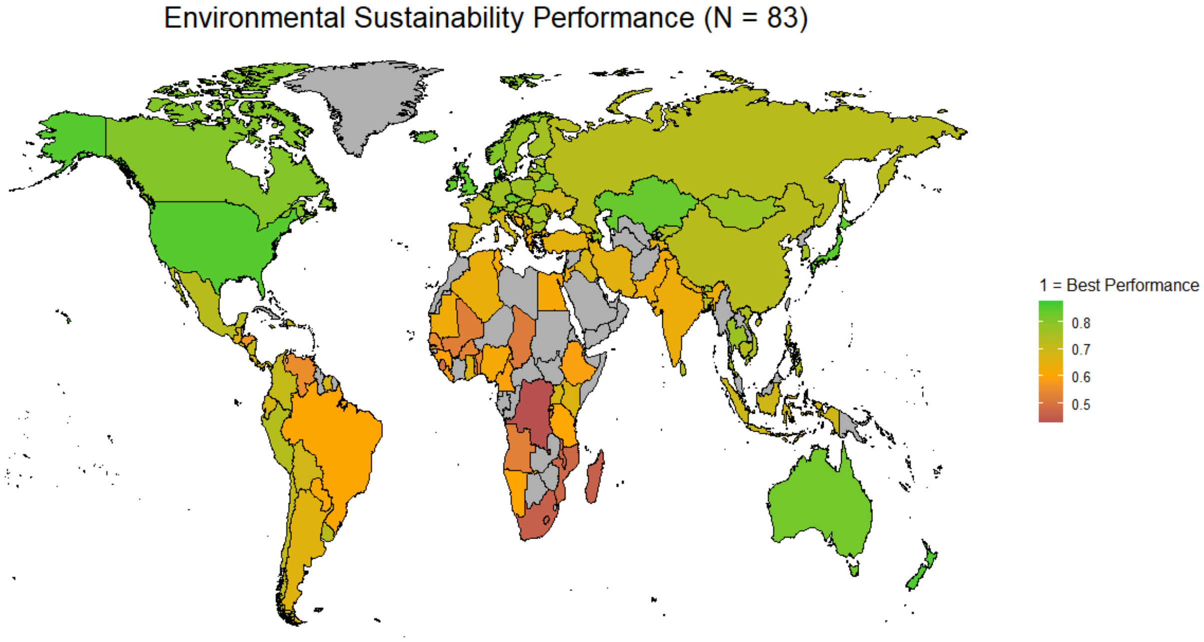


Figure 7: World Map of the Environmental Sustainability Performance scores (midpoint = 0.6)

Even though these poorer countries might not be represented as well as in the independent variables, they still are present within this indicator. Table 17 also substantiates this as these countries make up a large part of the 10 worst performers, as these are predominantly African and Asian countries. The main continent group of countries that is missing however is the Middle Eastern countries. In contrast with the worst performers, the top 10 best performers are mainly European countries, except for New Zealand. What is interesting about the scores, is that there are almost no 'extreme' scores, as the lowest score is only 0.488 and the highest score is only 0.868. Meaning that all scores are within a boundary of 0.200 of the mean score. This relatively low spread is also shown by the standard deviation of the variable score being relatively low at 0.113. It is however expected that with the inclusion of more countries in the final data of this variable this would be altered with especially more low scores.

Table 17: Top 10 and bottom 10 performers on Environmental Sustainability Performance

Best Performers	Score (0-1)	Worst Performers	Score (0-1)
1. Sweden	0.868	74. Togo	0.525
2. Denmark	0.853	75. China	0.522
3. New Zealand	0.853	76. Nigeria	0.522
4. United Kingdom	0.850	77. Liberia	0.519
5. Latvia	0.849	78. Guinea	0.517
6. Finland	0.842	79. Cameroon	0.507
7. Lithuania	0.842	80. Sierra Leone	0.490
8. Romania	0.840	81. Mauritania	0.489
9. Norway	0.837	82. India	0.489
10. France	0.836	83. Bangladesh	0.488

Regardless of the data within this variable being a bit lacklustre in some areas, e.g. the amount of countries, outliers in indicators and the geographical representation, the data still shows results that make sense and it covers a substantial percentage of the world population. Therefore, these indicators together are included as a component of the variable, especially as they also capture the complexity of the subject, whilst still showing logical results.

4.3.2. Dependent Variable Component 2: Social Sustainability Performance

The second component Social Sustainability Performance is described by a combination of 4 indicators, as described in the theory the indicators regard two main themes, health and personal development. In the final database, the 4 indicators that cover social sustainability have data on 127 countries, with a combined population of 5.414.161.257, which means that the results cover 71% of the world population in 2018 (Sachs et al., 2021; The World Bank, n.d.d).

Table 18: Individual mean scores and standard deviation of Social Sustainability Performance indicators

Indicator	Mean Score (0-1)	Standard Deviation
Prevalence of Undernourishment	0.860	0.217
Healthy Life Expectancy	0.686	0.194
Youth Literacy	0.907	0.173
Primary Education Enrolment	0.872	0.180

On average the mean scores for each of the indicators are very high, as shown in Table 18, Only Healthy Life Expectancy has an average score that is below 0.860, and the highest score is the mean score of Youth Literacy, which is 0.907. This means that the scores of the indicators are very ‘top heavy’, with a lot fewer lower scores, which often also are much lower scores, as depicted by the score distribution in Figure 8. This can be approached from two perspectives, from a methodological perspective this can be explained by the normalization method that is chosen, the min-max normalization. As in this case, a lot of scores are close to the highest scores and thus score high and when there are remotely lower scores they immediately score low. However, in the cases of these specific indicators, this is also a quite realistic representation, as the relevant SDGs and SDG sub-indicators for these indicators are often mostly aimed at the poorest and least-developed countries. As the specific goals often are fulfilled way better in richer, more developed, and often also Western countries. When looking at the country sample that is used for this indicator, it is also shown that the more developed countries have a good representation in the data. In contrast, the lesser developed, in this case mainly African countries, are less represented, which will also be depicted in a figure later. This thus also explains the high average scores for these indicators.

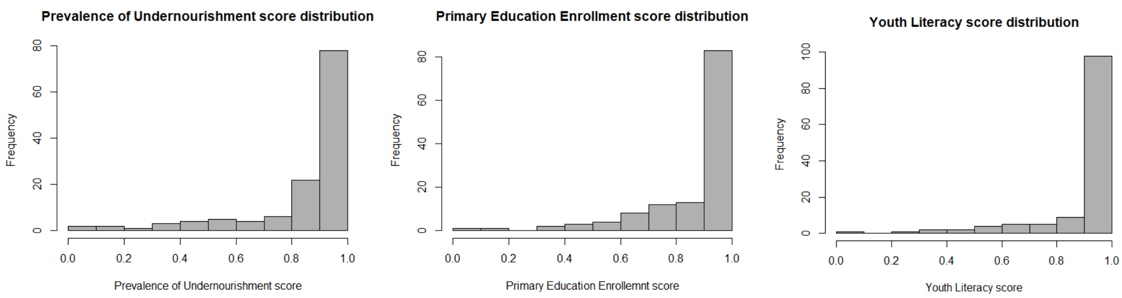


Figure 8: Score distribution histograms of the Social Sustainability Performance indicators

As a result of the score distribution indicating non-normality, with the addition of the Shapiro-Wilkinson test p-values for all indicators being < 0.05, the Spearman correlation method is chosen for testing the correlation between the indicators. The correlation results are shown in Table 19. These results show that the indicators almost all indicators have a strong positive correlation with each other. As most of the Spearman's rho values are in the range between 0.59 and 0.76, and strong effects are indicated by a value between 0.6 and 0.8. What is interesting about the correlation scores, is that the indicators that regard the theme of personal development; *Youth Literacy* and *Primary Education Enrolment,* have to lowest correlation with each other. Their Spearman’s rho value is 0.41, which only slightly indicates a moderately positive effect. From a theoretical perspective, it would make more sense for them to have a higher correlation with each other compared to their correlation with the other indicators, as they are part of the same SDG. Especially, as this assumption does hold for the indicators that regard the theme of health, as their value of 0.76 indicates a strong positive effect. Furthermore, the table also shows that all the correlation statistics are statistically significant.

Table 19:: Internal correlation statistics Environmental Sustainability Performance

		Prevalence of Undernourishment	Healthy Life Expectancy	Youth Literacy	Primary Education Enrolment
Prevalence of Undernourishment	Spearman Correlation r_s	**X**			
	Sig. (2-tailed)				
	N				
Healthy Life Expectancy	Spearman Correlation r_s	**0.76**	**X**		
	Sig. (2-tailed)	.000			
	N	127			
Youth Literacy	Spearman Correlation r_s	**0.67**	**0.63**	**X**	
	Sig. (2-tailed)	.000	.000		
	N	127	127		
Primary Education Enrolment	Spearman Correlation r_s	**0.61**	**0.59**	**0.41**	**X**
	Sig. (2-tailed)	.000	.000	.000	
	N	127	127	127	

The eventual variable score is built up by combining the four indicators, all with equal weighting. At first, the idea was to combine the scores of the main themes into a single score for health and personal development. However, for two reasons, an equal weighting method has been chosen, of which the first reason is the unexpected relatively low correlation between the health-related indicators. The second more important reason is the outcome of the factor analysis that is performed. Which showed that the combination of these indicators can be explained by a single factor, as all the indicators have a high contribution, namely >0.660 and the SS loading is higher than one which according to Kaiser's rule implicates that the factor is a good fit (Kaiser, 1974). Additionally, it is also argued that two factors are too much for explaining four indicators. This results in the equation below.

$$Social\ Sustainability\ performance = \frac{(\text{Prevalence of Undernourishment } + \text{ Healthy Life Expectancy} + \text{ Youth Literacy} + \text{Primary Education enrolment})}{4}$$

Figure 9 below shows the geographical distribution of the scores of the eventual variable. As already discussed with the mean scores of the individual indicators, the score in a lot of countries is quite high. In line with these observations, the mean score for Social Sustainability Performance also is high as it is 0.831.

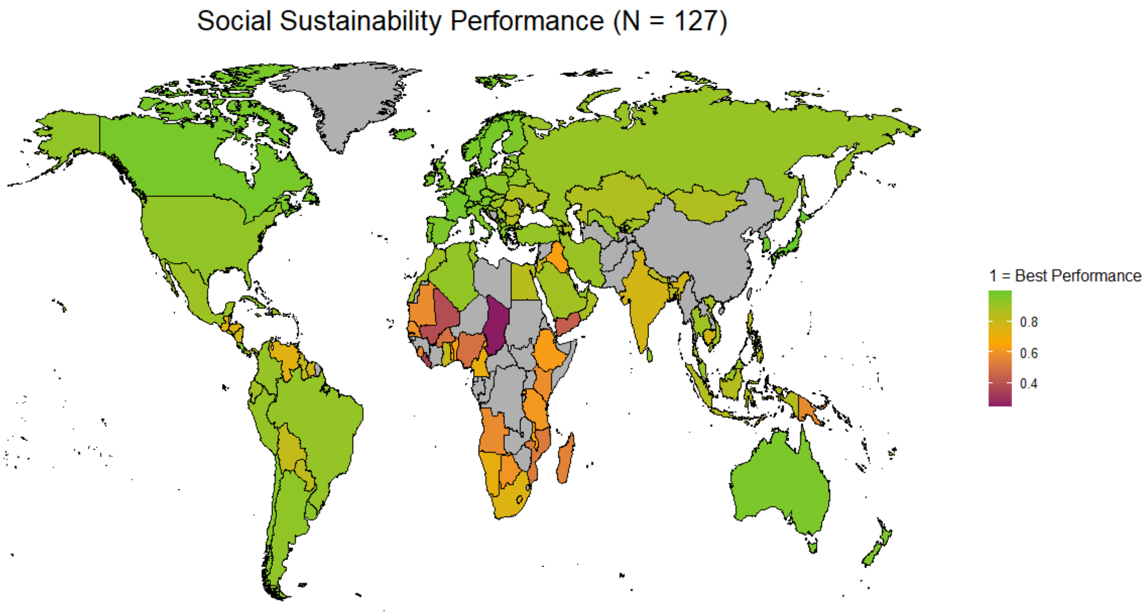


Figure 9: World Map of the Social Sustainability Performance scores (midpoint = 0.65)

The map also shows that especially Europe, and other more-developed countries e.g. Canada and Australia score very high on the variable. Whereas, African countries mainly score significantly lower. Table 20 provides an overview of the top and bottom of the performers on Social Sustainability Performance. It shows that the richer Asian countries Japan and South Korea, perform the best followed by European countries. Whereas, the worst performers are located in Africa, except for Yemen. What it also shows is that within the top 10 there only is a slight difference in scores as Japan only has a 0.024 point higher score than the number 10, Canada. However, for the worst performers, there is a much larger gap between scores. Especially Chad, has a very low score compared to the other, as the score of Nigeria already is more than double that of Chad.

Table 20: Top 10 and bottom 10 performers on Social Sustainability Performance

Best Performers	Score (0-1)	Worst Performers	Score (0-1)
1. Japan	0.996	118. Papua New Guinea	0.567
2. South Korea	0.985	119. Sierra Leone	0.559
3. Switzerland	0.983	120. Madagascar	0.543
4. Cyprus	0.982	121. Mozambique	0.516
5. France	0.979	122. Burkina Faso	0.496
6. Iceland	0.978	123. Nigeria	0.490
7. Sweden	0.977	124. Yemen	0.433
8. Norway	0.974	125. Mali	0.377
9. Malta	0.973	126. Liberia	0.344
10. Canada	0.972	127. Chad	0.243

Even though the average scores for the indicators and the variable are quite high, the results show that there still are countries that are countries with low scores. Since these low-scoring countries are located in Africa, the higher scores might have been influenced by the geographical spread within the data, as the map also shows quite some NAs in Africa. Nevertheless, this variable is still relevant to use for this research. As there still is a significant moderate to positive correlation between the indicators and the indicators can also be described by a single factor. Additionally, the low scores are almost all located in poorer and lesser developed countries, therefore, the data is in line with the theoretical assumptions and the aim of the SDGs relevant for this variable.

4.3.3. Dependent Variable Component 3: Prosperity Sustainability Performance

The third component Prosperity Sustainability Performance as mentioned before is described by a set of 5 indicators. The used for these indicators included a total of 125 countries, which together provide information on a population of 7.029.933.865, meaning this component covers approximately 93% of the world population (Sachs et al.,2021; The World Bank, n.d.d.).

Table 21: Individual mean scores and standard deviation of Prosperity Sustainability Performance indicators

Indicator	Mean Score (0-1)	Standard Deviation
Poverty Wage	0.867	0.240
Employment	0.753	0.183
GGG index	0.703	0.058
Income Inequality	0.576	0.128
Labour Freedom	0.543	0.186

Table 21 shows the average scores and standard deviation of the individual indicators used to measure the Prosperity Sustainability Performance. An interesting observation is that the average score of the Poverty Wage indicator is very high, while the poverty headcount ratio that is chosen ($1.90/day) already exceeds the poverty headcount ratio mentioned in the SDG sub-targets, as discussed earlier. Therefore, it brings up the discussion of whether especially the target of the SDGs is set high enough. Nevertheless, this does still mean that a lot of countries still have a part of the population that lives below the poverty line. Especially since the standard deviation is 0.240, this is not specifically very high, but it is the highest compared to the other indicators. This shows that there still are a lot of countries that do not perform well in this indicator. This is also depicted in Figure 10, which shows that there are around 90-95 countries that score well in this indicator, it however also means that the remaining countries do not perform well. Another interesting result is the very low standard deviation that is present within the GGG Index indicator, as it is only 0.058. An explanation for this can also be concluded from Figure xx as it shows that the score distribution for this indicator only scales between 0.55 and 0.90, which means that very low scores are not present in this indicator. This is a result of the indicator not being normalized as the index already was scaled from 0-1. What this also indicates is that in all countries within the database there is at least a certain level of gender equality.

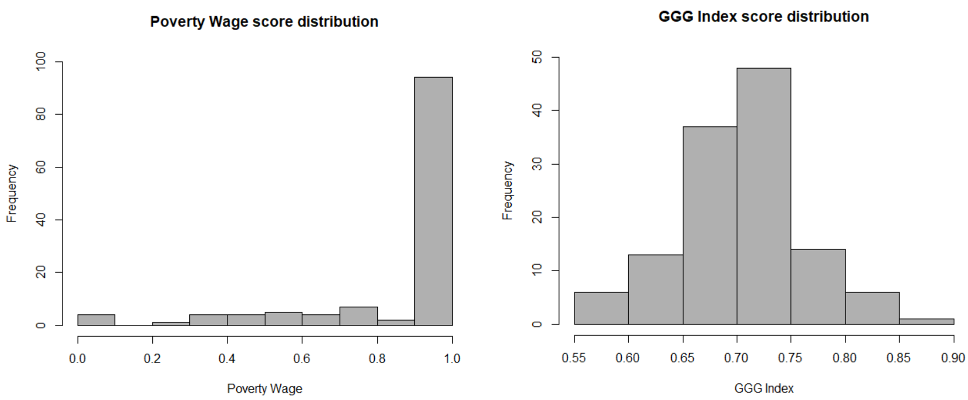


Figure 10: Score distribution histograms of the Poverty Wage and GGG Index indicators

Figure 11: Score distribution histograms of the Employment Ratio, Income Inequality and Labour Freedom indicators

The histograms in Figure 10 already show the score distribution of two of the indicators, the distribution of the other three indicators are shown in Figure 11, as they are used to check whether the data has a normal distribution. As also shown by both figures two indicators, GGG Index and Labour Freedom, show signs of a normal distribution. The Shapiro Wilkinson test is performed for all indicators to check whether they have such distribution, and for both indicators, the result shows that they have a normal distribution, as their p-values are 0.40 (GGG Index) and 0.81 (Labour Freedom). The other variables, as suggested by the histograms are non-normally distributed, which is also confirmed by the Shapiro Wilkinson test outcomes. Therefore, the internal correlation is tested with the Spearman test, of which the results are presented in Table 22.

Table 22: Internal correlation statistics Prosperity Sustainability Performance

		Poverty Wage	**Employment**	**Gender Equality**	**Income Equality**	**Labour Freedom**
Poverty Wage	Spearman Correlation r_s	**X**				
	Sig. (2-tailed)					
	N					
Employment	Spearman Correlation r_s	**-0.19**	**X**			
	Sig. (2-tailed)	.032				
	N	125				
Gender Equality	Spearman Correlation r_s	**0.28**	**0.03**	**X**		
	Sig. (2-tailed)	.001	*.781*			
	N	125	125			
Income Equality	Spearman Correlation r_s	**0.79**	**-0.14**	**0.40**	**X**	
	Sig. (2-tailed)	.000	*.116*	.000		
	N	125	125	125		
Labour Freedom	Spearman Correlation r_s	**0.27**	**0.01**	**0.25**	**0.30**	**X**
	Sig. (2-tailed)	.002	*.878*	.004	.001	
	N	125	125	125	125	

The results show that just as with environmental sustainability, there is no clear directionality in the data, in the sense that there is not a clear significant positive relation between the indicators. Additionally, there also are non-significant relations between the indicators. This, however, does not mean that there is no positive correlation, as the indicators Poverty Wage and Income Inequality do have a significant and very strong positive correlation with a value of 0.79. This positive correlation shows that based on this data it can be stated that countries that have a low percentage of their population living below the poverty headcount ratio, are more likely to have higher income equality, and vice versa. The relationship between these indicators is not surprising as they both regard income, furthermore the nature of the relationship is also quite logical, as in poorer countries income inequality is often higher. The strongest significant relationship after this is between Income Inequality and Gender Inequality, as they have a moderate positive correlation (0.40). This means that based on this sample it is the case that countries that have lower income inequality also are slightly more likely to have lower gender inequality and vice versa. Once again it is quite a logical relationship as both indicators regard the theme of inequality. Therefore, it is likely that reducing inequality in one indicator is more likely to reduce it in another, especially since the GGG Index also covers economic aspects of gender inequality, which is also the focus of overall income inequality. In addition to the significant positive correlations, the results also show one significant negative correlation, it however is quite weak (0.19). This relationship is between the Poverty Wage indicator and the Employment ratio indicator. Meaning that this data indicates that when one of the indicators increases the other decreases. This however seems quite illogical, as this essentially says that in countries in which more people have a job, it is more likely that more people live below the poverty wage headcount ratio. The indicator employment ratio, however, already has its flaws as mentioned in the methodology section 3.3.3.3. namely, that countries often report 'official ratings' which are often more positive than the 'unofficial ratings'. Meaning that this result might be biased by countries that overperform in their reported statistics. Therefore, this relationship is questionable, especially as no other significant relationships are found for this variable.

Taking these results into account, factor analyses are performed to investigate whether indicators can be combined into multiple factors to form this variable component. Results of the factor analyses showed that the variable component is unable to be build-up by two factors, as the SS loading of the second factor, in that case, is 0.759 and thus <1, additionally, it was also not significantly approachable. One factor on the other hand does fit the variable component, as the SS loading is >1 and it is significantly approachable with a p-value of 0.05. However, in this factor the indicator Employment ratio does not have a factor loading, meaning that it does not have a significant influence on the factor itself. Just as for some indicators in the Environmental Performance variable component, the choice is made still to include the indicators as a part of this variable. The reasoning for this is that the results of a factor analysis with only the four other indicators, showed insignificant results, whereas with the inclusion of the indicator the results are significant. Furthermore, the factor is largely explained by the indicators Poverty Wage and Income Inequality, as their factor loading are 0.737 and 0.997, which is quite logical due to their very strong positive correlation. This eventually leads to prosperity sustainability performance being described by the following equation.

$$Prosperity\ Sustainability\ Performance = \frac{(\text{Poverty Wage} + \text{Employment} + \text{GGG Index} + \text{Income Inequality} + \text{Labor Freedom})}{5}$$

With this aggregation of the final component score, the average score on Prosperity Sustainability Performance is 0.688. This average score is still quite high, however not necessarily compared to the other average scores of the other variables. This is not strange though, as except for the Employment ratio indicator the other indicators reinforce each other meaning that it is more likely to have a higher average. Figure 12 also shows this average quite well as the divide between green and more orange colours is even.

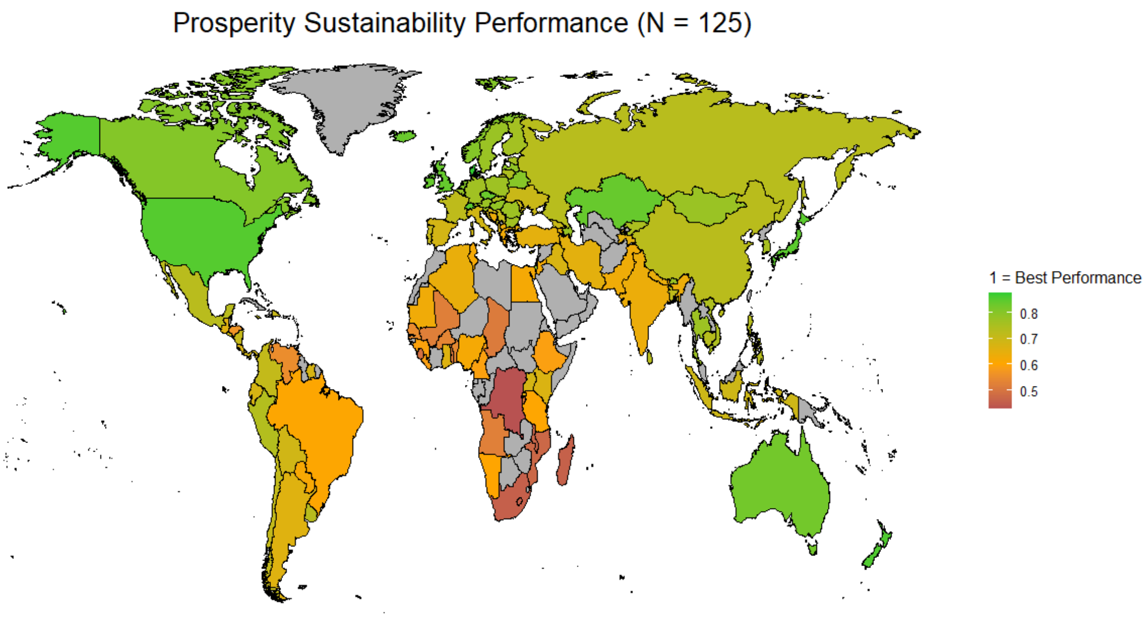


Figure 12: World Map of the Prosperity Sustainability Performance scores (midpoint = 0.60)

What Figure 12 also shows, is that there once again is a geographical difference in how well countries perform on this variable component. The figure shows that Europe, North America, Japan, Australia and New Zealand are once again the group of countries that are coloured green and thus overall perform the best. This is also confirmed by Table 23, as the top 10 performers are dominated by Europe and the other countries mentioned above. It, however, includes one unexpected country, Kazakhstan. On the other hand, the bottom 10 worst performers are dominated by African countries. Nevertheless, the African countries do not necessarily have very low scores, as the lowest score is 0.427, but the tenth lowest score already is 0.511. Thus showing that there already is a significant difference between the worst performers, whereas the top performers have less difference. Overall the scores are not very spread in the variable, as there are not necessarily very high and/or low scores, which is logical since the standard deviation for this variable is only 0.101.

Table 23: Top 10 and bottom 10 performers on Sustainability Performance

Best Performers	Score (0-1)	Worst Performers	Score (0-1)
1. Denmark	0.876	116. Chad	0.511
2. Singapore	0.863	117. Togo	0.510
3. New Zealand	0.858	118. Burundi	0.506
4. United Stations of America	0.854	119. Sierra Leone	0.490
5. Switzerland	0.850	120. Mozambique	0.472
6. Japan	0.848	121. Malawi	0.465
7. United Kingdom	0.840	122. Madagascar	0.458
8. Ireland	0.839	123. Lesotho	0.457
9. Kazakhstan	0.837	124. South Africa	0.456
10. Iceland	0.835	125. Democratic Republic of the Congo	0.427

Even though there are some issues as discussed above, the combination of these indicators still can describe this component as one factor. As even though Employment has a very limited influence, including it was the reason that the factor can be described by these indicators with statistical significance. Additionally, there also is a variance in scores for the final variable with no illogical results. Therefore, the variable with its indicators is still deemed useful in this research.

4.3.4. Dependent Variable Additional Component: External Footprint

The last component that is added to Sustainability Performance is the external footprint that is measured by a single indicator, the SDGI spill over index. The indicator data includes 146 countries covering a population of 7.317.430.939, which is approximately 96% of the world population (Sachs et al., 2021; The World Bank n.n.d).

Table 24: Individual mean score and standard deviation of the External Footprint

Indicator	Mean Score (0-1)	Standard Deviation
Spill over Index	0.847	0.175

Table 24 presents the average score of a country's external footprint, and since the mean is 0.847, it shows that most countries do not have a very large external footprint. The standard deviation also is not very high, which confirms this even further. However, Table 25 below shows that there are some outliers on the lower performing end. It also shows that there is a low difference between the top performer scores, only a difference of 0.003 between the top 10. Whereas on the lower performing end there is a much larger gap between the performing scores, as the difference between France and Singapore is almost two times the standard deviation. Meaning showing that there are fewer bad-performing countries.

Table 25: Top 10 and bottom 10 performers on External Footprint

Best Performers	Score (0-1)	Worst Performers	Score (0-1)
1. Chad	0.998	137. France	0.556
2. Burundi	0.998	138. United Kingdom	0.541
3. Moldova	0.997	139. Mauritius	0.484
4. Ethiopia	0.997	140. The Netherlands	0.470
5. Pakistan	0.997	141. Kuwait	0.433
6. Mali	0.996	142. Switzerland	0.417
7. Cameroon	0.996	143. United Arab Emirates	0.388
8. Mozambique	0.995	144. Luxembourg	0.310
9. Sierra Leone	0.995	145. Guyana	0.300
10. Guinea	0.995	146. Singapore	0.206

The most interesting thing this table shows is the geographical split between the top and worst performers, which is also shown in Figure 13. The top performers in this variable namely are mostly poorer African countries, whereas the worst performers are richer countries, of which a large proportion is located in Europe. These results are compelling as a lot of the countries that perform well in this variable component are countries that often are among the top 10 or 20 of the worst performers in the other components of sustainability performance. On the other hand, the worst performers, especially the European countries often score well in the other components. It thus is quite an opposite image of the other components. Nevertheless, these results are as expected, based on what the literature says about the external footprint of countries. As especially, the richer and more developed countries often outsource polluting activities to mainly African countries, due to their cheaper labour. In addition to this countries such as Singapore and The Netherlands are very active in trade which also comes with external pollution for example. It thus also shows that a lot of countries do not necessarily report all the emissions that they cause, as they spill over index shows that not a single country has a 'perfect' score.

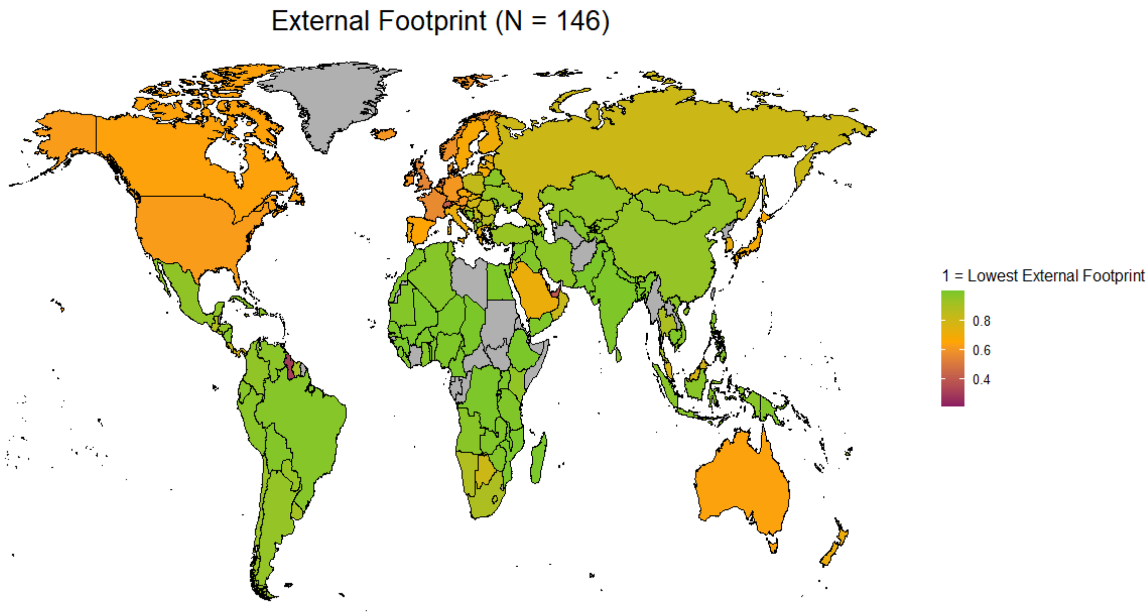


Figure 13: World Map of the External Footprint scores (midpoint = 0.65)

Since this additional component only exists of a single indicator, no correlation test or aggregated variable score is needed as it will just receive the score of the indicator. However, this does not mean it will hold the same value as the other variable components in the aggregated sustainability performance variable. This will be discussed in the next chapter.

4.4. Sustainability Performance: Final Aggregated Variable

Now that all the individual components of the Sustainability Performance variable are discussed, the final aggregation of the variable will be discussed. This will start with the three components of Environmental, Social and Prosperity sustainability performance as these are the main pillars of sustainability. In the first instance, the External Footprint is left out of the aggregation as it is an additional component that regards and influences all three of the pillars, however, it does not form a pillar on its own.

The final aggregation of the variable also uses the additive aggregation method, as also used for the individual components as mentioned in the Methodology section 3.4. There only is one difference, the final variable will not be aggregated with equal weighting as is the case for the independent variables and the components of the dependent variable. For the final variable, the individual components of Social and Prosperity sustainability performance will be combined. The reason for this is an argument made in Vermeulen (2018), namely that in the broader aspect these components both regard the People dimension, as they both cover elements and indicators that regard social and societal aspects of sustainability. Vermeulen in his article also refers to the *"Twin SD-agenda of integral ecological and societal fairness into that of planet and of people and prosperity"*(Vermeulen, 2018:15), arguing that the People and Planet aspects should be regarded as equally important. Since the framework of Vermeulen (2018) was of great importance for the developed framework, and for the whole research, this line of argumentation is also used in the final variable. Furthermore, this also leads to a more balanced indicator division, as environmental sustainability is defined by a lot more indicators than the other two components. This means that the final aggregation of the dependent variable Sustainability Performance is defined by the following equation.

$$Sustainability\ Performance = \frac{(Planet\ (Environmental) + People\ \left(\frac{Social + Prosperity}{2}\right))}{2}$$

The database on all the combined sustainability components includes data on 76 countries, meaning that for those all the sustainability indicators are present. Even though this number of countries is much smaller than for the other variables, the data still covers a population of 4.430.200.946, and thus at least covers 58% of the world population (Sachs et al., 2021; The World Bank, n.d.d). Figure 14 shows the score division around the world, and with that also the eventual countries included in the analysis.

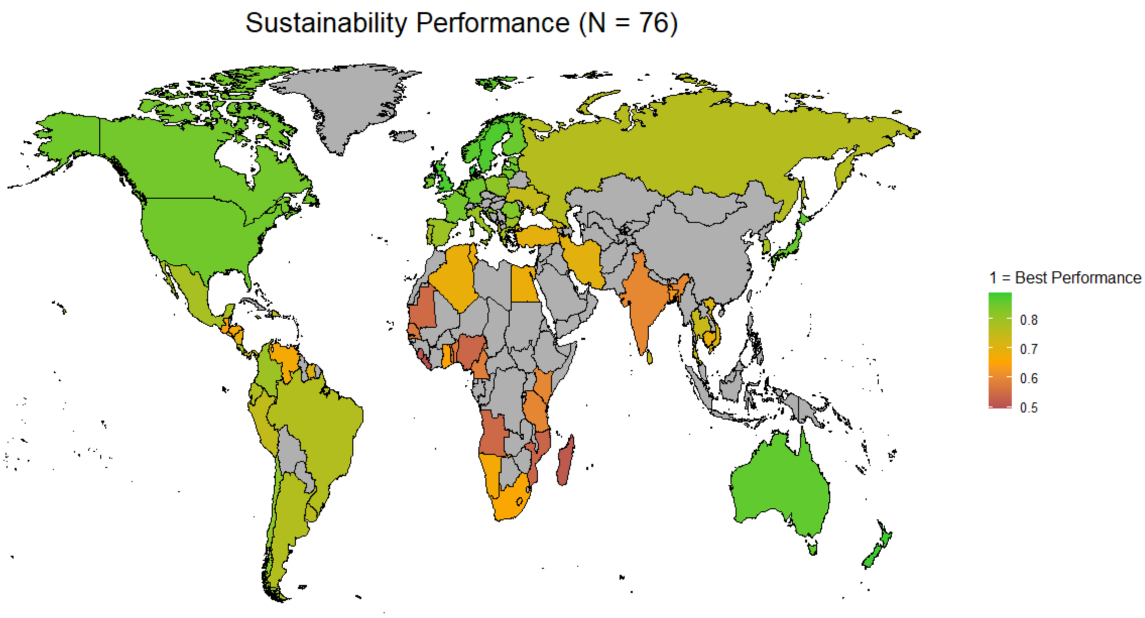


Figure 14: World Map of the Sustainability Performance scores (midpoint = 0.65)

The average score for the variable is 0.703, which just like the average scores of the individual components is quite high. One of the most likely causes for this is the eventual sample of countries that are included in the final data for this variable. As Figure 14 shows, countries that are missing in this final sample are mainly located in Africa, Asia, and the Middle East, and the scores of the individual components already showed that often countries in these regions did not necessarily perform well in the components. The same can be said for the final variable, as Table 26 shows that once again the top 10 performers are very similar, European countries, with the inclusions of Australia, New Zealand and Japan. Whereas the bottom 10 performers are solely African countries, showing that a selection of them luckily still are included in the final variable.

Table 26: Top 10 and bottom 10 performers on Sustainability Performance

Best Performers	Score (0-1)	Worst Performers	Score (0-1)
1. Denmark	0.887	67. Benin	0.570
2. New Zealand	0.881	68. Senegal	0.569
3. The United Kingdom	0.875	69. Togo	0.559
4. Sweden	0.872	70. Mauritania	0.545
5. Norway	0.863	71. Angola	0.542
6. Australia	0.859	72. Nigeria	0.538
7. Japan	0.855	73. Mozambique	0.535
8. Latvia	0.853	74. Madagascar	0.513
9. Finland	0.852	75. Sierra Leone	0.512
10. Germany	0.846	76. Liberia	0.493

There however was a component in which the image is completely turned around, namely the external footprint, that still is not a part of the variable yet. It however is hard to determine what value to give to this extra component. As already briefly touched upon before, it is bold to just add it or multiply it with the sustainability performance without giving it a substantiated value. Especially since the SDGI argues that they also use the indicators that provide the stand-alone index, within their SDGI indicator scores (Sachs et al., 2021). Meaning that in those cases the external footprint can be double counted. It, therefore, becomes clear that it is risky to let the external footprint hold the same value as sustainability performance even though it does touch upon elements of all the individual components and more. It however does give interesting results. Either multiplying the external footprint value with sustainability performance, of adding it equal weighting completely turns around the top and bottom performers. Table 27 provides a brief overview of top and bottom performers, based on three differentiation addition scenarios. Scenario 1 is the same value multiplication, in which the value of the external footprint is multiplied with the sustainability performance score. Scenario two is an equal weighting addition scenario in which Sustainability Performance and the External Footprint scores are added with similar weight. The last scenario, Scenario 3 is also an equal weighting scenario, however, in this scenario, it receives the same as the people and planet components. The equations for the different scenarios are shown below.

$$\text{Scenario 1} - \text{Adjusted Sustainability Performance} = \text{Sustainability Performance} * \text{External Footprint}$$

$$\text{Scenario 2} - \text{Adjusted Sustainability Performance} = \frac{(\text{Sustainability Performance} + \text{External Footprint})}{2}$$

$$\text{Scenario 3} - \text{Adjusted Sustainability Performance} = \frac{(\text{Sustainability Performance} + \frac{\text{External Footprint}}{3})}{2}$$

Table 27: Top and Bottom 5 performers per adjusted Sustainability Performance scenario

Scenario 1		**Scenario 2**		**Scenario 3**	
Top 5	**Bottom 5**	**Top 5**	**Bottom 5**	**Top 5**	**Bottom 5**
1. Colombia	72. Ireland	1. Colombia	72. Spain	1. Chile	72. Mozambique
2. Chile	73. Liberia	2. Chile	73. Ireland	2. New Zealand	73. Angola
3. Brazil	74. The United Kingdom	3. Brazil	74. The United Kingdom	3. Colombia	74. Madagascar
4. Ecuador	75. France	4. Ecuador	75. France	4. Romania	75. Sierra Leone
5. Mexico	76. The Netherlands	5. Mexico	76. The Netherlands	5. Croatia	76. Liberia

The table shows that incorporating the External Footprint in all the scenarios influences the total scores of sustainability performance. Especially, in scenarios 1 and 2 there are huge shifts as countries that in the first instance performed relatively well, now are among the worst performers, and the top performers are now all Middle and South American countries. Whereas scenario 3 is a more ‘familiar’ image in which the bottom performers are African countries, however, there are still South American countries in the top 5. It is also interesting how the mean score values around the scenarios, as in scenario 2 the overall mean score increases to 0.791, which is quite unrealistic when adding a factor that should decrease scores. In the other scenarios the mean score does decrease, in scenario 1 it becomes 0.609 where and in scenario 3 it even lowers to 0.507. From a logical point of view scenario, 3 is the most fitting, but almost all scenarios have their questionable aspects. Therefore it is quite hard to determine what is the best way to incorporate this component into the final variable, especially since there is no clear documentation on what value the indicator should hold according to the SDGI. It however is still good to take the impact into account when considering Sustainability Performance.

4.5. LINEAR REGRESSION

Now that all the variables are defined, and their results are discussed the final analyses are performed. As mentioned before, these are linear regression analyses that show the relationships between the two independent variables Policy Culture and Socio-Economic Structure, and the dependent variable Sustainability performance. The analyses cover all countries that had no missing values for all indicators, meaning they cover 76 countries that together represent 58% of the world population. At first, the internal correlation between the variables is tested with the Spearman test as none of the variables has a normal distribution. Table 28 shows that there is a strong positive correlation between all variables, the lowest score being 0.70. Showing that having a more open Policy Culture and/or Socio-Economic Structure also increases a country's Sustainability Performance, and vice versa.

Table 28 : Internal correlation statistics between the final variables

		Policy Culture	**Socio-Economic Structure**	**Sustainability Performance**
Policy Culture	Spearman Correlation r_s	**x**		
	Sig. (2-tailed)			
	N			
Socio-Economic Structure	Spearman Correlation r_s	**0.80**	**x**	
	Sig. (2-tailed)	.000		
	N	76		
Sustainability Performance	Spearman Correlation r_s	**0.70**	**0.88**	**x**
	Sig. (2-tailed)	.000	.000	
	N	76	76	

After that linear regression models are run, to specifically uncover the influence of the independent variables on the dependent variable. In the first instance, simple regression tests are run in which the individual independent variables are tested against the dependent variable, starting with Policy Culture.

The first single linear regression that is run is calculated to predict Sustainability Performance based on the Policy Culture variable. Table 29 shows the results of this test. It shows that when only considering these two variables, Policy Culture is significantly able to explain 30% of the variance in the dependent variable of Sustainability Performance as the adjusted R-square value is 0.3038. This on its own is not necessarily a high percentage, however, this only is one of the independent variables. It also shows that an increase in the Policy Culture score, leads to an increase in Sustainability Performance with an effect size of 0.29803, indicating that a more open and inclusive Policy Culture leads to better Sustainability Performance.

Table 29 : Single linear regression results Policy Culture and Sustainability Performance

	Estimate (β)	Std. Error	t-value	Pr(>|t|)
(Intercept)	0.50444	0.04024	12.536	< 2e-16 ***
Policy Culture	0.29803	0.05131	5.808	1.48e-07 ***

Residual standard error: 0.08957 on 74 degrees of freedom

Multiple R-squared: 0.3131, Adjusted R-squared: 0.3038

F-statistic: 33.73 on 1 and 74 DF, p-value: 1.482e-07

The second single linear regression test that is run, predicts Sustainability Performance based on the Socio-Economic Structure variable. The results of this test are presented in Table 30. It shows that on its own the Socio-Economic Structure variable can significantly explain 71% of the variance in the dependent variable since the adjusted R-square value is 0.7145. In contrast to the Policy Culture variable, this variable does explain a lot more, as 71% percent of the variance is quite a high number. Furthermore, it also shows that an increase in the Socio-Economic Structure score leads to an increase in Sustainability Performance. This thus also indicates that a more open and inclusive socio-economic structure in a country leads to a better sustainability performance.

Table 30 : Single linear regression results Socio-Economic Structure and Sustainability Performance

	Estimate (β)	Std. Error	t-value	Pr(>|t|)
(Intercept)	0.47249	0.01989	23.75	< 2e-16 ***
Socio-Economic Structure	0.46020	0.03350	13.74	< 2e-16 ***

Residual standard error: 0.05736 on 74 degrees of freedom

Multiple R-squared: 0.7183, Adjusted R-squared: 0.7145

F-statistic: 188.7 on 1 and 74 DF, p-value: < 2.2e-16

Now that both the single regression test are presented, the multiple regression test including both of the independent variables is run. This test is calculated to predict Sustainability Performance based on Policy Culture and Socio-Economic Structure, and is presented in Table 31 below. In the first instance, it looks like a significant regression is found as the p-value is <2.2e-16, in which both indicators combined predict 71% of the Sustainability Performance variable, due to the adjusted R-square value being 0.7148. However, there are some issues with this interpretation. When looking at the results, Policy Culture, now has a negative effect , compared to the positive effect it had in the single linear regression. Furthermore, the Socio-Economic structure now has a higher estimate value of 0.49562, compared to 0.46020 in the single linear regression. It however is highly illogical that when combining Policy Culture now suddenly has a negative effect on Sustainability Performance, and that Socio-Economic Structure now has a stronger effect. These abnormalities suggest that there is multicollinearity between the two dependent variables, meaning that there is some overlap in what both independent variables measure. Since the correlation matrix in Table… already showed that both independent variables have a strong positive correlation with each other (a value of 0.8), it can be stated that the presence of multicollinearity between the independent variables is likely. This does influence the quality of the results of the multiple linear regression. Nevertheless, this is not necessarily a large issue for this research, as it is not necessarily aimed at measuring the contribution of the individual indicators, and the VIF factors are not higher than 5, meaning that the multicollinearity is not deemed to be completely problematic. The multicollinearity could be solved by eliminating the impact of one of the variables, which in this case clearly would be Policy Culture, as Socio-Economic has a much larger estimate value and on its own also was able to explain 71% of the variance of Sustainability Performance.

Table 31 : Multiple linear regression results Policy Culture, Socio-Economic Structure and Sustainability Performance

	Estimate (β)	Std. Error	t-value	Pr(>|t|)
(Intercept)	0.48957	0.02579	18.980	< 2e-16 ***
Policy Culture	-0.04870	0.04686	-1.039	0.302
Socio-Economic Structure	0.49562	0.04777	10.375	5.18e-16 ***

Residual standard error: 0.05733 on 73 degrees of freedom

Multiple R-squared: 0.7224, Adjusted R-squared: 0.7148

F-statistic: 95 on 2 and 73 DF, p-value: < 2.2e-16

Even though the specific outcome of the multiple linear regression test thus might not be as robust, the results and implications that come out of the analyses are still very valuable. As the greater picture that is drawn by these results is still very much in line with the assumptions and the theoretical base that this research was trying to show. The results for example clearly show that Socio-Economic Structure is explaining a large part of Sustainability Performance, and positively influences it. What in this case means is that an increase in the open and inclusiveness of a country's Socio-Economic Structure, also leads to an increased Sustainability Performance and that 71% of the variance in the Sustainability Performance can be explained by this. This confirms the theory posed by Acemoglu and Robinson in *Why Nations Fail.* The same can be said for the open and inclusiveness of Policy Culture, however, to a much smaller degree. The multicollinearity discovered between the Policy Culture and Socio-Economic Structure variable, despite not being beneficial to the regression test results however also is an interesting result. As multiple sources (e.g. Persson, 2002; Buck and Sharim, 2005; Moran, 2006; Park et al., 2007; and Chang and Highashima (2021)) suggested that political and socio-economic institutions in the way that they are defined in this research, also influence each other by forming the institutional context of a country. Therefore, this result further confirms these statements.

Now that the multiple regression test of the main model is run, the multiple regression that includes the external footprint in the dependent variable is run to see how this influences the results. The external footprint is added to the dependent variable through the aggregation method of Scenario 3, as described in section 4.4, with the notion that even though it might be the most realistic aggregation method that was suggested, it is not necessarily the most fitting or perfect method. Nevertheless, it is interesting to show how it influences the outcomes, to get an overall image of what the influence of this variable component is. The results of the test are shown in Table 32.

Table 32 : Multiple linear regression results Policy Culture, Socio-Economic Structure and adjusted Sustainability Performance

	Estimate (β)	Std. Error	t-value	Pr(>|t|)
(Intercept)	0.39366	0.01333	29.542	< 2e-16 ***
Policy Culture	-0.04678	0.02421	-1.933	0.0572
Socio-Economic Structure	0.19181	0.02468	7.772	3.77e-11 ***

Residual standard error: 0.02962 on 73 degrees of freedom

Multiple R-squared: 0.5436, Adjusted R-squared: 0.5311

F-statistic: 43.48 on 2 and 73 DF, p-value: 3.678e-13

The External Footprint clearly influences the outcome of the multiple regression test. The main influence is that the independent variables now describe almost 20% less of the variance in Sustainability Performance as the adjusted R-square value now is 0.5311. This influence of the addition mostly impacts the Socio-Economic Structure variable, as its effect size is more than halved, whereas in the normal model it was 0.49562 it now only is 0.19181. The effect size of the Policy Culture variable, however, remains quite similar, it even becomes slightly less negative. This once again shows that Socio-Economic Structure is the main describing variable of the Sustainability Performance variable. It however needs to be stressed that this test merely is performed as an indication, as it was too complex to determine the specific value of the External Footprint component. Nevertheless, it still shows that considering not only the internal but also the external footprint of a country's sustainability performance most likely is not beneficial for the predictive value of the independent variables. This indicates that the current sustainability frameworks do not completely represent a fair image, as especially the well-performing countries, are hit the hardest by the inclusion, and thus give a more positive image of how well most countries perform on sustainability performance. Furthermore, this also shows that the actual influence of the independent variables might be lower than shown in the other models.

Now that the main models of the research are run and the main results of the research are presented, it is also interesting to go more into depth in this specific relation, to investigate what indicators contributed the most to this relationship. To investigate this, several new regression tests are run. In these tests, either the independent or independent variable(s) are disaggregated. In the first instance, three regression tests are run in which the dependent variables are disaggregated and thus split up into their respective indicators. The first results that are presented in Table 33, are of the single regression test between the split up variable Policy Culture and the dependent variable Sustainability Performance. This model thus calculates how the individual indicators of Policy Culture predict Sustainability Performance.

Table 33: Single linear regression results disaggregated Policy Culture and Sustainability Performance

	Estimate (β)	Std. Error	t-value	Pr(>|t|)
(Intercept)	0.53804	0.06159	8.736	6.48e-13 ***
Political Regime	0.33503	0.07249	4.622	1.63e-05 ***
CS and Media Freedom	-0.36319	0.08567	-4.239	6.56e-05 ***
Public Participation	0.31534	0.14347	2.198	0.0312 *

Residual standard error: 0.07505 on 72 degrees of freedom

Multiple R-squared: 0.5307, Adjusted R-squared: 0.5112

F-statistic: 27.15 on 3 and 72 DF, p-value: 7.469e-12

The results of this single regression test are very interesting, especially when comparing it to the results of the regression test with the aggregated Policy Culture variable. The first noteworthy difference is that the model now explains 51% of the variance, which is more than a 20 percent increase. The table, however, shows a lot more, as the effect size shows that the indicators Political Regime and Public Participation, both positively contribute to Sustainability Performance. What this entails is that countries with a more democratic regime, and/or with the freedom for the public to participate and hold the government accountable for political decisions have a better sustainability performance. On the other hand, the Civil Society and Media Freedom indicator has a negative effect size. Meaning that an increase in this indicator negatively affects the Sustainability Performance of a country. This seems counterintuitive as all the indicators had a very strong positive correlation with each other. Additionally, this result also opposes arguments that were made for its inclusion. Nevertheless, the effect is strong and significant based on the results of the test, it, however, does seem to be influenced by multicollinearity, however, the VIF factor value of the indicator is lower than 5, thus meaning it is not in the problematic range. An explanation for this can be the sample of countries included, as the mean score of the final sample is 0.793 compared to 0.722, meaning that it might be biased by low-performing countries with a relatively high score for this indicator. This, however, merely is speculation.

In the second single linear regression test that is performed, the independent variable Socio-Economic Structure is disaggregated. Meaning that this test calculates Sustainability based on the individual indicators that form the Socio-Economic Structure. The results of this model are shown in Table 34.

Table 34 : Single linear regression results disaggregated Socio-Economic Structure and Sustainability Performance

	Estimate (β)	Std. Error	t-value	Pr(>|t|)
(Intercept)	0.40927	0.02293	17.845	< 2e-16 ***
Property Rights	0.18351	0.06930	2.648	0.01003 *
Business Freedom	0.02331	0.04979	0.468	0.64120
Trade Freedom	0.10489	0.03117	3.365	0.00125 **
Judicial Effectiveness	-0.07098	0.05516	-1.287	0.20248
Government Integrity	-0.04836	0.05646	-0.857	0.39468
Access to Education	0.35800	0.04595	7.791	4.82e-11 ***

Residual standard error: 0.04469 on 69 degrees of freedom

Multiple R-squared: 0.8406, Adjusted R-squared: 0.8267

F-statistic: 60.63 on 6 and 69 DF, p-value: < 2.2e-16

The results of this regression test confirm the observation that is also made in the main model, namely that especially the Socio-Economic Structure variable is the main determinant of Sustainability Performance. This is shown by the fact, that when the variable is disaggregated it explains approximately 83% of the variance within the Sustainability Performance variable, which is higher compared to the values of the models with aggregated variables. Table.. also clearly shows that some indicators have a higher contribution than others. The main contributor to sustainability performance based on the effect size is the Access to Education indicator, which is chosen to measure the access to education for the great majority concept of Acemoglu and Robinson (2012). It is quite logical that specifically, this indicator has the largest influence on the Sustainability Performance variable, as this conceptual institution is directly linked to SDG4: Quality Education (United Nations, n.d.). Since the SDGs were also of great importance for the establishment of the dependent variable, it was to be expected that this specific indicator had the largest influence. Even though this indicator had the largest influence, it is not the only indicator that has a significant influence, as Property Rights and Trade Freedom also have a significant positive influence. The other indicators unfortunately only have a very small and insignificant influence. Hence, this indicates that countries with a Socio-Economic Structure that fosters, open and long access to education, secure property rights and freedom of trade are more likely to perform better on sustainability performance.

The following regression test is a multiple regression test, in which the individual indicators of both the independent variables are used thus combining both previous tests. This covers the final model of this research, but with all the loose indicators instead of the aggregated variables. The results are shown in Table 35.

Table 35 : Single linear regression results disaggregated Socio-Economic Structure and Sustainability Performance

	Estimate (β)	Std. Error	t-value	Pr(>|t|)
(Intercept)	0.45268	0.03835	11.804	< 2e-16 ***
Political Regime	0.11638	0.06023	1.932	0.057639 .
CS and Media Freedom	-0.11507	0.05612	-2.050	0.044315 *
Public Participation	-0.02573	0.09174	-0.280	0.779996
Property Rights	0.21453	0.07331	2.926	0.004701 **
Business Freedom	0.05112	0.05080	1.006	0.317917
Trade Freedom	0.10763	0.03105	3.466	0.000934 ***
Judicial Effectiveness	-0.09274	0.05487	-1.690	0.095674
Government Integrity	-0.08665	0.05940	1.459	0.149370
Access to Education	0.31912	0.04770	6.690	5.75e-09 ***

Residual standard error: 0.04368 on 66 degrees of freedom

Multiple R-squared: 0.8543, Adjusted R-squared: 0.8344

F-statistic: 43 on 9 and 66 DF, p-value: < 2.2e-16

Once again the results show that with the disaggregated independent variables the test explains a large proportion of the variance of the dependent variable, in this case also 83%. A similarity between these models and the main models of the research is that in these cases the adjusted R square value also does not change a lot compared to the one in the model with only the Socio-Economic Structure variable. In both cases the change in the value is <1%, thus showing that Socio-Economic Structure explains most of Sustainability Performance. The overall results also do not differ a lot from the previous disaggregated Socio-Economic Structure model, as Access to Education still has the most influential and significant effect on Sustainability Performance. It is also followed by the Property Rights indicator, of which the effect became stronger, more positive, and even more significant in the combined model. The effect of Trade Freedom did not change much, meaning it still has a positive and significant influence on Sustainability Performance. On the other hand, there is more change in the indicators that regard the Policy Culture variable. The negative effect of CS and Media Freedom is still present and significant, however, its effect size is much lower in this model, -0.115 compared to -0.363, meaning that its effect is decreased due to the other indicators. The other indicators of the Policy Culture are also influenced by this model, as the significant positive effect of the Political Regime and Public Participation indicators is diminished. The Political Regime indicator still has a positive effect, however, it also has a much lower effect size and it is only just insignificant. On the other hand, the effect of the Public Participation indicator is severely lowered, as in this model it has a very minimal negative effect, it however is far from significant and therefore not very useful for creating insights. What this all means is that the effect of the Socio-Economic Structure variable overtakes the effect of the Political Regime just as in the main model showing that there likely is multicollinearity. Furthermore, it concludes the same things as the previous model, that access to education, secure property rights and trade freedom overall are beneficial for sustainability performance whereas civil society and media freedom are not beneficial.

The second variation of regression tests regards a single linear regression test, in which instead of the independent variables being disaggregated, they are combined into a single independent variable. In the first instance, this was the main idea of the research, as the aggregated independent in this variable is the National Governance Culture, however, in the research, it was chosen to split it into two variables as they cover different aspects. Combining the indicators also is a possible solution to the likely multicollinearity problem that is present in the main model. The results of this regression test are presented in Table 36.

Table 36 : Single linear regression results aggregated National Governance Culture and Sustainability Performance

	Estimate (β)	Std. Error	t-value	Pr(>|t|)
(Intercept)	0.43979	0.03011	14.60	< 2e-16 ***
National Governance Culture	0.44079	0.04400	10.02	2.05e-15 ***

Residual standard error: 0.07041 on 74 degrees of freedom

Multiple R-squared: 0.5756, Adjusted R-squared: 0.5698

F-statistic: 100.3 on 1 and 74 DF, p-value: 2.047e-15

The results show that aggregating the two variables into a single independent variable gives a similar image to that of the results of the main model. The National Governance Culture variable has a positive and significant effect on the Sustainability Performance variable, as shown by the effect size. Furthermore, this model on its own is still able to explain approximately 57% of the total variance in the Sustainability Performance variable. This, however, is lower than the main model, and the abovementioned disaggregated independent variable models. Nevertheless, it still indicates that having a more open and inclusive National Governance Culture leads to better Sustainability Performance, and it can explain more than half of the variable scores with this.

In the third set of regression tests that are performed not the independent, but the dependent variable is disaggregated. To investigate the specific effect of the independent variables on specifically the planet or people dimension of sustainability performance. The first regression test regards the multiple linear regression between the independent variables and only the people dimension of sustainability performance. The results of this test are presented in Table 37.

Table 37 : Multiple linear regression results Policy Culture, Socio-Economic Structure and People Sustainability Performance

	Estimate (β)	Std. Error	t-value	Pr(>|t|)
(Intercept)	0.56087	0.03031	18.502	< 2e-16 ***
Policy Culture	-0.14729	0.05507	-2.675	0.00923 **
Socio-Economic Structure	0.56543	0.05614	10.072	1.88e-15 ***

Residual standard error: 0.06737 on 73 degrees of freedom

Multiple R-squared: 0.6617, Adjusted R-squared: 0.6525

F-statistic: 71.41 on 2 and 73 DF, p-value: < 2.2e-16

The results of this test, show that the variables explain 65% of the variance in People Sustainability Performance. Once again it shows that the Socio-Economic Structure variable has the largest influence on the dependent variable, in this case, People Sustainability Performance. What is noteworthy is that the indicator now has the largest effect size compared to all other models that are tested, meaning that overall it has the most positive influence on this part of the dependent variable. This makes sense as the People Sustainability Performance variable concerns the main aspects of Social and Prosperity performance, and specifically, the positive relationship between the institutions that form the socio-economic structure and between prosperity shaped the main message of Acemoglu and Robinson. The results, therefore, seem to be in line with the literature that was used for the base of the research. Nevertheless, the effect of the Policy Culture does counteract this message, as its effect size is negative and significant, thus showing that a more open and inclusive Policy Culture is not beneficial for the People Sustainability Performance variable. This is a quite strange observation, it however is also influenced by the same underlying issue of the beforementioned model(s), namely the CS and Media Freedom indicator having a negative influence that overwrites the influence of the other indicators.

The last regression test that is run includes the independent variables and Environmental Sustainability performance as the dependent variable. The model thus calculates how Policy Culture and Socio-Economic Structure explain Environmental Sustainability Performance. The results of this multiple linear regression are presented in Table 38.

Table 38 : Multiple linear regression results Policy Culture, Socio-Economic Structure and Environmental Sustainability Performance

	Estimate (β)	Std. Error	t-value	Pr(>|t|)
(Intercept)	0.41826	0.03014	13.877	< 2e-16 ***
Policy Culture	0.04988	0.05475	0.911	0.365
Socio-Economic Structure	0.42580	0.05582	7.628	7.02e-11 ***

Residual standard error: 0.06699 on 73 degrees of freedom

Multiple R-squared: 0.6578, Adjusted R-squared: 0.6484

F-statistic: 70.16 on 2 and 73 DF, p-value: < 2.2e-16

The results show that just as in the other model in which sustainability performance is disaggregated, the independent variables explain 65% of the variance, in this case for Environmental Sustainability Performance. Furthermore, it also shows that the Socio-Economic structure variable still has the largest positive effect on the dependent variable, which also is significant. Indicating that also a more open and inclusive Socio-Economic Structure has a positive effect on Environmental Sustainability Performance. In this model, however, the effect of Policy Culture is very small, and also not significant, indicating that the nature of the relation with Sustainability Performance is unclear, however, it likely has a neglectable influence compared to the Socio-economic Structure. Thus showing that the dependent variable still mainly is explained by the Socio-Economic Structure of a country.

5. DISCUSSION

The results showed that when broadly speaking the main results of the performed tests are in line with what the research attempted to prove, based on the literature that this research was based on. First, by showing that when tested individually, both independent variables had a significant positive relation with Sustainability Performance. It however goes further than that, since the multiple regression test showed that there likely is multicollinearity between the political and socio-economic institutions that were used to define both variables. This confirms the arguments made by Persson (2002), Moran (2006) and Park et al. (2007), which also suggested that this interrelatedness was in place. In addition to this, it also confirms the arguments made by Acemoglu and Robinson (2012). The highest possible effect size is that of the Socio-Economic Structure variable and the People component of Sustainability Performance. This shows that also on a larger scale countries that have open and inclusive institutions as identified by Acemoglu and Robinson, are more prosperous, and also perform better on social sustainability. This also confirms the argument made by Wurster (2013) which acknowledged the possible influence of socio-economic institutions in the context of Sustainability Performance. Furthermore, when combining both independent variables into a single independent 'National Governance Culture' there is still a positive relationship between this variable and Sustainability Performance. Meaning that the data in this sample shows that more open and inclusive democratic societies overall perform better on Sustainability Performance and that this variable explains 65% of the Sustainability Performance in a country. However, going deeper into this relationship showed more interesting results.

The results namely showed that the effect of the Socio-Economic Structure always overruled the effect of the Policy Culture variable. This is shown by the fact that in the model with both variables the main institutions that contributed to better Sustainability Performance are access to education, secure property rights, and trade freedom as those were the only indicators with a significant effect. In contrast to this, however, is the indicator of civil society and media freedom, which in the individual as well as in the complete models had a significant and negative effect on the Sustainability Performance of a country. Indicating that countries with more freedom for civil society and media to play a role in politics and governance, perform worse on Sustainability Performance. As mentioned, this observation is quite unexpected from a theoretical perspective. The result namely opposes arguments made in literature (e.g. arguments made in Seyfang et al., 2010, Morse (2012), Witter, (2015) and Riti et al. (2021)), as one of the reasons that the role of both of these actors is included is that this literature stated that more influence from both is beneficial with regards to Sustainability Performance. There is already touched upon a possible explanation that lies in the data itself. But it was deemed unlikely that the issues in the data altered the robustness of the model in such a way that the effect of the indicator will be completely inverted. Particularly, because there are some arguments made in the literature that shine another light on this finding. As Bernauer et al. (2013b) showed that there is a phenomenon called the democracy-civil society paradox. In their article, Bernauer et al. (2013b) show that civil society in the form of environmental NGOs, can have a positive impact on international sustainability governance, however, this impact is likely to decrease or even diminish at higher levels of democracy. Sénit (2020), further adds to this paradox by showing that the influence of civil society often happens in situations where only the elite privileged actors can participate. Especially with this link to elitism, an argument made by Frantzeski et al. (2016), that civil society can also have negative influence for example through lobbying, becomes more relevant as in a lot of countries the elite might not support sustainability. This shows that more freedom of civil society in specific might not be the solution to increase the sustainability of governance. LaMay (2004), further argues that in such instances civil society and media are heavily coupled and are used together by these 'elite' actors. It suggests that the focus needs to be on the quality of the civil society, in the sense that not only the elite should be able to influence the decisions, but rather an equal representation of actors. On behalf of media freedom, there also might be a more practical example that can explain the negative relation. The current nitrogen debate in The Netherlands is an example of this, as the farmers use protests and media to gain momentum for their opposition to stricter nitrogen policies. This also shows that more freedom in media does also not necessarily always benefit decisions in favour of sustainability. Implicating that even though the negative relationship between Civil Society and Media Freedom was unexpected, the result should not immediately be discarded. The true nature of this relationship, therefore, shows to be an interesting subject for further research.

The results of this research however are also subject to some discussion, as this research is completely dependent on the data that is used, and with that also the countries that are included in the eventual main model and regression tests. As shown, the final model includes data on 76 countries of the total 148 countries that are shared among all the databases used, accounting for 58% of the world population at that moment. This shows the first sensitive point of this research, namely that for almost half of the countries, there was no data of sufficient quality available for at least one of the 35 indicators used. Additionally, some of the indicators already had to be supplemented with data from secondary sources, or with data from other years, to be able to even get this sample. The struggle of finding data that was accurate and of sufficient quality came as a surprise, as in the first instance the idea was to also create a timeline including data on multiple years, however, due to the lack of availability of data, especially for the sustainability performance indicators, this idea was discarded. This was caused by two main issues present in most of the databases. The first one is that for a lot of indicators data was not up to date. For example at the time of this research global data on greenhouse gas emissions was only findable up to 2018, meaning that all the major databases, including the one that is used, the IEA, were about four years behind on statistics. Another example is that of the Sustainable Agriculture indicator, from which the data is retrieved from the EPI database, as it only included data up until 2015. The surprising thing about this is that databases such as the EPI publish reports on a yearly base, however, the 2021 edition thus still uses data from years before. This was not the only issue as there also was a lack of consistent data availability, meaning that data was not always present for each year, e.g. data for one country being available in 2014 and 2018, whereas another country only had data for 2015 and 2017. Therefore, it was impossible to create a consistent timeframe of data availability, and thus the choice was made to take 2018 as a benchmark year. Yet, it still was impossible to get data for all the indicators in this specific year, as in some cases it was simply not available. Even in the cases where data was available, the quality of it can be questionable, as already discussed in the specific instance of employment ratios. This research, therefore, shows one of the main issues with tracking sustainability performance, namely that for a lot of indicators and a lot of countries data on indicators is simply not available in publicly available databases, which also includes governmental sources such as the UN.

As briefly mentioned, not only the time aspect was a problem, but also getting indicator data for all the 148 countries was an issue leading to the current sample of 76 countries. When looking at the specific amount of countries covered in all the individual variables, it is clear that once again this issue was mainly present in the Sustainability Performance components as the decline in the included number of countries starts there. What also became clear is that for most of these indicators data from a specific set of countries was not present, eventually leaving out mostly data on African, Middle Eastern and Asian countries in the final sample. Whereas, these countries often also did not have an open and inclusive Policy Culture and Socio-Economic structure, and therefore possibly leaving out interesting results, as the sample includes a larger proportion of the higher scoring countries. What this also means is that the final model and results likely are biased, as for a large proportion it is based on the western and or more developed countries that are included within the final sample. To evaluate the possible bias issue, scores of countries that are not present in the final sample and that have a low score on Policy Culture and Socio-Economic were checked. Not all Sustainability Performance scores are checked, only those that were shown to be the most influential based on the performed factor analyses. Eventually, 11 countries were picked based on low scores and their geographical location, the sample includes 4 African countries, 4 Middle Eastern countries and 3 Asian countries. The countries and their scores on several Sustainability Performance data are shown in Table 39 and 40.

Table 39 : Environmental Sustainability Performance data non-open missing countries

Country	GHG	PM	HH	SWM	Safe Water	MPA	% below mean
Afghanistan	0.934	**0.390**	**0.350**	**0.011**	**0.255**	-	*80*
Chad	**0.818**	**0.308**	**0.030**	**0.020**	**0.180**	-	*100*
China	**0.773**	**0.436**	**0.615**	**0.452**	0.925	**0.016**	*83*
Democratic Republic of the Congo	**0.781**	**0.601**	**0.054**	**0.030**	**0.207**	-	*100*
Ethiopia	0.956	**0.635**	**0.027**	**0.010**	**0.288**	-	*80*
Indonesia	0.830	0.825	**0.642**	0.516	**0.790**	**0.280**	*50*
Saudi Arabia	**0.477**	**0.273**	0.991	0.914	0.950	**0.207**	*50*
Syria	0.932	**0.667**	0.999	**0.200**	**0.835**	**0.024**	*67*
United Arab Emirates	**0.241**	**0.507**	1.000	0.679	0.993	1.000	*33*
Yemen	0.988	**0.489**	0.736	**0.249**	**0.248**	**0.025**	*67*
Zimbabwe	**0.778**	0.787	**0.298**	**0.091**	**0.615**	-	*80*
% below mean	*55*	*82*	*64*	*73*	*73*	*84*	

Table 40: People Sustainability Performance data non-open missing countries

Country	Prevalence of Undernourishment	Healthy Life Expectancy	Poverty Wage	Income Inequality	% below mean
Afghanistan	**0.513**	**0.324**	-	-	*100*
Chad	**0.350**	**0.261**	**0.467**	**0.297**	*100*
China	1.000	0.813	0.997	**0.551**	*25*
Democratic Republic of the Congo	**0.117**	**0.331**	**0.065**	**0.256**	*100*
Ethiopia	**0.723**	**0.525**	**0.536**	**0.398**	*100*
Indonesia	0.909	**0.622**	0.954	**0.568**	*50*
Saudi Arabia	0.970	**0.662**	-	-	*50*
Syria	-	**0.625**	-	-	*100*
United Arab Emirates	0.979	0.729	0.997	-	*0*
Yemen	**0.000**	**0.444**	-	**0.325**	*100*
Zimbabwe	-	**0.298**	-	**0.373**	*100*
% below mean	*56*	*82*	*50*	*100*	

What these tables show is that for a large part the non-open countries in terms of Policy Culture and Socioeconomic structure also do not score well on the influential Sustainability Performance indicators. All countries, except for the United Arab Emirates score below the mean score for at least 50% of the indicators. The African countries Chad and The Democratic Republic of the Congo even score below the mean score for all the indicators. Furthermore, within all the indicators more than 50% of the scores of these countries are also below the mean score. What this indicates is, that as expected based on the main results, the non-open countries overall do not perform well on Sustainability Performance. Even in the case of the United Arab Emirates, which in this sample is the odd one out, it is known that they for example do not perform well on the Energy Performance and Water Stress indicators. Therefore, these tables show that even in the hypothetical case in which these countries are included it is likely that the main direction of the results would not be completely altered, especially as this sample already covers 27% of the world population on its own. Nevertheless, this still does not mean that any bias in the data and results should not be considered, it only shows that it is likely that it did not heavily alter the results and even that the inclusion of these countries might even strengthen the results.

Besides the limitations caused by the data and its availability, there also are limitations within the methodology behind forming the variables and indicators, which can also be seen as the complexity versus simplicity debate. This namely played a large role in the establishment of the variables and eventually also their scores. It was deemed impossible to define and measure every aspect that influenced either the independent or dependent variable components. An example of this is the original approach that was mentioned for defining the Policy Culture, as the approach switched from defining it with 26 individual indicators to defining it with three existing indices that covered a large part of these indicators. This approach made it more simple whilst still covering the important information on almost all the aspects that determine a Policy Culture according to the different literary sources. The same goes for the Socio-Economic Structure, which is mainly based on the institutions of Acemoglu and Robinson that were shown to foster prosperity and were also present in the relevant literature. The most challenging indicator, however, was Sustainability Performance, as due to its complexity, it regards a wide variety of indicators. What added to this complexity is the different focus of the range of available frameworks. Therefore, the final variable does not capture all the possible indicators that measure an aspect of Sustainability Performance, however, it also is not very simple as also a sole framework or database could have been used for all the indicators. Furthermore, by combining the common themes and indicators that were present in multiple frameworks and coupling them with clear SDG goals. The final variable exists of indicators that cover the main idea and message of the accompanied SDGs, and therefore it finds a balance between not being overly simple and not being too complex. Particularly, because finding indicators that have common grounds among multiple frameworks also shows their respective importance. A critical note, however, is that not in all cases the chosen indicators were strict enough, as overall the sustainability indicators had relatively high scores, which might give too much of a possible view of how well countries are performing. Nevertheless, this can also be seen as a criticism of the SDG framework itself, as often there were no clear targets set within them. The area in which the simplicity is present is the aggregation and weighting methods, as eventually almost all variables were aggregated with an additive and equal weighting method. But, just as shown in the debate around the External Footprint indicator, this is not necessarily the best method. Just as Gan et al. (2017) stated, this method has the benefits of simplicity, transparency, and replicability, but its drawbacks are that it can overlook insights into relationships and lead to mutually preferentially independence. The overlooking of insights is partly tackled in this research by also focussing on internal correlation and aggregation variation in the final regression test, however, it is not completely ruled out.

Overall, these sensitive points of the research show that the quality of the outcome can be disputed, especially from a statistical perspective. The qualitative part of reviewing literature and based on this building own variables fitted the research and also strengthened the research, as compared to other articles it takes into account three substantiated variables. Especially in the case of sustainability performance, it went beyond the focus of other research by taking into all three pillars, and specific performance measures coupled to the main sustainable development framework, the SDGs. However, the quantitative part is where the most disputable points arise. Basing the research on publicly available data proved to be challenging, and had a negative influence on the eventual sample and, thus the results. Even though the influence might be limited, it still cannot be ruled out, meaning that the predictive values of the variables might vary. Also, the influence of possible multicollinearity could alter these results. This shows that the results of the regression analysis might not be completely accurate. The quality of the results needs to be considered when interpreting the results, however, this research was not necessarily aimed at specifically showing the statistical correlation with perfect models. Therefore, it is still deemed that the main message that is shown by the results still has value.

Taking all of this into account, the research also shows improvement points for further similar research. Regarding the data availability and overall sample, however, it is hard to advise on how this research could be performed better. Simply because the researcher is so reliant on this publicly available data, of which the same lacking data often was also used in multiple sources. Therefore, follow-up research might not benefit from using the publicly available data but needs more specific and accurate data from countries themselves or other non-publicly available and more extensive databases to further enhance the research concerning the data used. As this might also address the data bias issue. With regards to the limitations of the variables and indicators used, there is less clear advice, as complexity and simplicity both have their benefits. However, specifically in the case of Sustainability Performance, the advice would be to embrace the complexity of the concept rather than the simplicity. Because oversimplifying sustainability performance, can lead to results that give a skewed image. This was also the case for some of the indicator scores in this research, since the mean scores for a lot of the Sustainability Components were relatively high, while this does not completely and accurately reflect on how well countries were performing at that moment. This also opens more research opportunities, namely further researching how Sustainability Performance should be aggregated as this was the main area of simplicity in the research. The focus could be on which themes or indicators hold more respective weight to others. A good example of this is exemplified by the case of the External Footprint, as this showed that the aggregation method has a lot of influence on the eventual scores of the variable. The last interesting point of research concerns the influence of civil society and media freedom. Particularly, as in literature, it is often argued that it is beneficial concerning sustainability performance, whereas the results and other literary insights showed that it might not be. The relation might thus not be as undisputed as some literature makes it appear to be.

6. CONCLUSION

This research aimed at identifying and uncovering how the National Governance Culture of a country influences its Sustainability Performance. Based on the quantitative analysis of data on 76 countries, covering 58% of the world population, it can be stated that this research shows that having an open and inclusive National Governance Culture leads to better Sustainability Performance. Even though the results are not completely robust, in the general sense they all show this phenomenon. Particularly the socio-economic institutions of access to education, secure property rights and trade freedom have a positive relationship with the Sustainability Performance of a country. Consequently, the positive influence of the Socio-Economic Structure of a country is stronger than that of the Policy Culture. Specifically, freedom of civil society and media showed to have a negative relation with the Sustainability Performance of a country. However, the National Governance Culture does not explain all of a country's Sustainability Performance, meaning that it is not the sole determinant.

Even though the methodology behind this research had its limitations, as discussed in the previous chapter, this research combined elements of several previous types of research and confirms the assumptions and the results of previous literature on a larger scale. Especially since the complexity that is behind this research was not avoided but in most cases embraced to a degree that fitted the scope of the research. Overall the research was able to prove the main assumption it was based on, as the link between more open and inclusive societies and better sustainability performance is often assumed, however, not tested while considering both the political and social institutions, complete sustainability performance, or on a large quantitative scale. The general message of the research thus fitted the expected result. There, however, also were some unexpected results, regarding the role of the Policy Culture. Based on the literature behind the variables it was expected that all the institutions forming the variable have a positive relation with Sustainability Performance, which was not the case in all the tested models. Furthermore, it was also interesting to see that the External Footprint, even though not properly integrated into the variable and tested models, clearly and negatively influenced the general relation between the independent and dependent variables. This shows that the focus on sustainability performance, even though it is often based between national boundaries, should be expanded to get an accurate image of a country's sustainability performance. The chosen method also showed the risk of depending on publicly available data sources, as the process of achieving data with sufficient quality and availability appeared to be a lot harder than expected. This showed that conclusions drawn in other research, especially regarding Sustainability Performance, should also be approached and interpreted more carefully. As the quality and availability of data from mundane and publicly available databases showed to be a limiting factor in this research.

The previous section already briefly touched upon some areas of improvement and opportunities for further research. These areas and opportunities, however, also result in more practical applications. The first one is already elaborated on a lot, namely, the data availability and quality. There however needs to be an improvement in this area to properly monitor and assess the Sustainability Performance of a country, as currently, even global organizations such as the United Nations suffer from this issue. There are two main directions in which this can be solved. Either the countries that contribute to the SDGs must take more responsibility or be obliged to be more accurate and extensive in supplying their data. Or global organizations such as the United Nations must set up an organization or agency that solely is concerned with this data, specifically with gathering it and measuring it. As otherwise, it will always remain challenging to get an accurate measure of how well countries are performing, and therefore, proper sustainable development might be achieved. The second implication is linked to the main conclusion of this research, as it showed that having an open and inclusive National Governance Culture is beneficial for a country's Sustainability Performance. Specifically, having an open and inclusive Socio-Economic Structure had a positive influence, therefore, the advice for countries that want actual sustainable development should also consider the influence of these institutions. They should specifically improve on the increasing access to education, secure property and freedom of trade, as these were the most influential institutions. Nevertheless, this alone unfortunately is not enough.

The overall contribution of this research is that in a general sense it confirms a phenomenon that is generally accepted, but, never fully proven. It combines findings and assumptions made in previous research, namely the influences of the political and socio-economic institutions within a country on its sustainability performance. While also including the important performance measures of all the pillars of sustainability performance exists of. Even with this more complex approach, the research shows that the assumptions made in the literature can be confirmed to a certain degree, as the general conclusion is in line with what was expected. Furthermore, it also opened up new opportunities for research and practical implications that can help with further understanding of how the institutional context of a country influences its sustainability performance, and by doing so it hopefully contributes to addressing the immediate need for sustainable development.

7. References

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APPENDIX A: COUNTRIES INCLUDED IN THE FINAL SAMPLE

Afghanistan
Albania
Algeria
Angola
Argentina
Armenia
Australia
Austria
Azerbaijan
Bahrain
Bangladesh
Barbados
Belarus
Belgium
Benin
Bhutan
Bolivia
Bosnia and Herzegovina
Botswana
Brazil
Bulgaria
Burkina Faso
Burundi
Cambodia
Cameroon
Canada
Chad
Chile
China
Colombia
Costa Rica
Croatia
Cuba
Cyprus
Czech Republic
Democratic Republic of the Congo
Denmark
Dominican Republic
Ecuador
Egypt
El Salvador
Estonia
Ethiopia
Fiji
Finland
France
Georgia
Germany
Ghana
Greece
Guatemala
Guinea
Guyana
Honduras
Hungary
Iceland
India
Indonesia
Iran
Iraq
Ireland
Israel
Italy
Jamaica
Japan
Jordan
Kazakhstan
Kenya
Kuwait
Kyrgyzstan
Latvia
Lebanon
Lesotho
Liberia
Lithuania
Luxembourg
Madagascar
Malawi
Malaysia
Maldives
Mali
Malta
Mauritania
Mauritius
Mexico
Moldova
Mongolia
Montenegro
Morocco
Mozambique
Namibia
Nepal
Netherlands
New Zealand
Nicaragua
Niger
Nigeria
North Macedonia
Norway
Oman
Pakistan
Panama
Papua New Guinea
Paraguay
Peru
Philippines
Poland
Portugal
Qatar
Romania
Russia
Rwanda
Saudi Arabia
Senegal
Serbia
Sierra Leone
Singapore
Slovakia
Slovenia
South Africa
South Korea
Spain
Sri Lanka
Suriname
Sweden
Switzerland
Syria
Tajikistan
Tanzania
Thailand
Timor-Leste
Togo
Trinidad and Tobago
Tunisia
Turkey
Uganda
UK
Ukraine
United Arab Emirates
Uruguay
USA
Uzbekistan
Vanuatu
Venezuela
Vietnam
Yemen
Zambia
Zimbabwe

APPENDIX B: BASIC FORMULAS USED IN R

*The official script can be requested

Mean values and Standard Deviation

mean(dataframe$indicator) → Gives the mean value of an indicator

sd(dataframe$indicator) → Gives the standard deviation of an indicator

Histograms and Shapiro-Wilkinson test

shapiro.test(dataframe$indicator) → Gives the Shapiro-Wilkinson test outcome

hist(dataframe$indicator, freq=TRUE) → Creates a histogram with frequencies

Internal Correlation Statistics

round(cor(dataframe of a variable, method = "spearman"), 2) → Gives a correlation table rounded to two decimals

round(cor_pmat(dataframe of a variable, method = "spearman", alternative = "two.sided", conf.level = 0.95), 3) → Gives the P-values rounded to three decimals

Factor analysis

factanal(dataframe of a variable, factors = N) → Creates a factor analysis, in which N represents the number of factors that tries to describe the variable

Regression Analysis

lm(Dependent variable ~ Independent variable + Independent variable+ `Public Participation`, data = dataframe) → Gives a linear regression output, the variables can be adjusted

vif(linear regression model) → Checking the VIF values for multicollinearity

Political Regime Distribution

- ➔ Assigning regime groups to certain values

```
polregplottable2$polregplot[polregplottable2$polregplot == 1] <- "Closed Autocracy"

polregplottable2$polregplot[polregplottable2$polregplot == 2] <- "CA Upper Bound"

polregplottable2$polregplot[polregplottable2$polregplot == 3] <- "EA Lower Bound"

polregplottable2$polregplot[polregplottable2$polregplot == 4] <- "Electoral Autocracy"

polregplottable2$polregplot[polregplottable2$polregplot == 5] <- "EA Upper Bound"

polregplottable2$polregplot[polregplottable2$polregplot == 6] <- "ED Lower Bound"

polregplottable2$polregplot[polregplottable2$polregplot == 7] <- "Electoral Democracy"

polregplottable2$polregplot[polregplottable2$polregplot == 8] <- "ED Upper Bound"

polregplottable2$polregplot[polregplottable2$polregplot == 9] <- "LD Lower Bound"

polregplottable2$polregplot[polregplottable2$polregplot == 10] <- "Liberal Democracy"
```

- ➔ Making a factor of them for the plot

```
plotorder <- factor(polregplottable2$polregplot, level = c('Closed Autocracy', 'CA Upper Bound', 'EA Lower Bound',
'Electoral Autocracy', 'EA Upper Bound',  'ED Lower Bound', 'Electoral Democracy', 'ED Upper Bound', 'LD Lower Bound',
'Liberal Democracy'))
```

- ➔ Making a plot with the frequency

```
plot <- ggplot(polregplottable2, aes(x= plotorder, y= Freq))
```

World Maps

- ➔ Merging with the world data for longitude and latitude

```
mapdata <- left_join(WorldData, variabledata, by = "region")
```

- ➔ Creating a basic map

```
map1 <- ggplot(mapdata, aes(x = long, y = lat, group = group)) +
 geom_polygon(aes(fill = variable), col = "black")
```

- ➔ Creating a map with title and colours

```
map2 <- map1 + scale_fill_gradient2(name = "name of the scale", high = "Limegreen", mid = "Orange1", low = "maroon4", midpoint = N, na.value = "grey69")+
 theme(axis.text.x = element_blank(),
     axis.text.y = element_blank(),
     axis.ticks = element_blank(),
     axis.title.y = element_blank(),
     axis.title.x = element_blank(),
     rect = element_blank())+
 ggtitle("Title")+
 theme(plot.title = element_text(hjust = 0.5, vjust = -0.5)) +
 theme(plot.title = element_text(size = 20)) +
 theme(legend.title = element_text(size = 12)) +
 theme(legend.text = element_text(size = 10))
```

- ➔ Creating a map with title and colours

APPENDIX C: FACTOR ANALYSIS RESULTS

SOCIO-ECONOMIC STRUCTURE

```
Loadings:
            Factor1
Propr_norm  0.960
Busf_norm   0.795
Tradef_norm 0.679
Judeff_norm 0.915
Govint_norm 0.916
Yscho_norm  0.764

               Factor1
SS loadings      4.275
Proportion Var   0.713

Test of the hypothesis that 1 factor is sufficient.
The chi square statistic is 32.29 on 9 degrees of freedom.
The p-value is 0.000177

Loadings:
            Factor1 Factor2
Propr_norm  0.723   0.623
Busf_norm   0.488   0.667
Tradef_norm 0.335   0.668
Judeff_norm 0.801   0.472
Govint_norm 0.825   0.450
Yscho_norm  0.425   0.701

               Factor1 Factor2
SS loadings      2.376   2.198
Proportion Var   0.396   0.366
Cumulative Var   0.396   0.762

Test of the hypothesis that 2 factors are sufficient.
The chi square statistic is 4.92 on 4 degrees of freedom.
The p-value is 0.295
```

ENVIRONMENTAL SUSTAINABILITY PERFORMANCE

```
Loadings:
               Factor1
GHG_norm       -0.529
ModRen_norm     0.198
PM_norm         0.739
OZ_norm         0.326
HH_norm         0.866
Watstress_norm
Safewat_norm    0.762
Cleanwat_norm   0.480
MSW_norm        0.864
TCL_norm        0.218
GRL_norm        0.247
WTL_norm       -0.102
SNM_norm        0.389
TBN_norm        0.267
MPA_norm        0.678
SPI_norm        0.373

               Factor1
SS loadings      4.219
Proportion Var   0.264

Test of the hypothesis that 1 factor is sufficient.
The chi square statistic is 347.79 on 104 degrees of freedom.
The p-value is 4.91e-28

Loadings:
               Factor1 Factor2
GHG_norm       -0.399  -0.389
ModRen_norm     0.474
PM_norm         0.767   0.415
OZ_norm         0.832  -0.104
HH_norm         0.316   0.884
Watstress_norm  0.601  -0.431
Safewat_norm    0.191   0.802
Cleanwat_norm   0.588   0.233
MSW_norm        0.366   0.747
TCL_norm       -0.105   0.352
GRL_norm        0.234   0.169
WTL_norm               -0.135
SNM_norm        0.188   0.298
TBN_norm        0.312
MPA_norm        0.438   0.461
SPI_norm        0.373   0.151

               Factor1 Factor2
SS loadings      3.173   3.064
Proportion Var   0.198   0.192
Cumulative Var   0.198   0.390

Test of the hypothesis that 2 factors are sufficient.
The chi square statistic is 216.5 on 89 degrees of freedom.
The p-value is 1.26e-12
```

```
Loadings:
               Factor1 Factor2 Factor3
GHG_norm       -0.500  -0.295        
ModRen_norm             0.440        
PM_norm         0.593   0.560   0.287
OZ_norm         0.168   0.888        
HH_norm         0.960                
Watstress_norm -0.239   0.668   0.109
Safewat_norm    0.802           0.163
Cleanwat_norm   0.433   0.536        
MSW_norm        0.777           0.300
TCL_norm        0.314  -0.180        
GRL_norm        0.260   0.199  -0.101
WTL_norm                0.129  -0.248
SNM_norm        0.320                
TBN_norm                0.160   0.838
MPA_norm        0.503   0.208   0.417
SPI_norm        0.119   0.178   0.848

               Factor1 Factor2 Factor3
SS loadings      3.588   2.320   1.900
Proportion Var   0.224   0.145   0.119
Cumulative Var   0.224   0.369   0.488

Test of the hypothesis that 3 factors are sufficient.
The chi square statistic is 122.95 on 75 degrees of freedom.
The p-value is 0.000404
```

SOCIAL SUSTAINABILITY PERFORMANCE

```
Loadings:
            Factor1
PrevUn_norm 0.696  
HALE_norm   0.818  
LIT_norm    0.870  
PrimE_norm  0.660  

               Factor1
SS loadings      2.346
Proportion Var   0.586

Test of the hypothesis that 1 factor is sufficient.
The chi square statistic is 16.68 on 2 degrees of freedom.
The p-value is 0.000239
```

PROSPERITY SUSTAINABILITY PERFORMANCE

```
Loadings:
                  Factor1
PovWage_norm       0.737
Unemployment_norm
GGG Index          0.400
Ineq ajd income    0.997
LF_norm            0.289

               Factor1
SS loadings      1.782
Proportion Var   0.356

Test of the hypothesis that 1 factor is sufficient.
The chi square statistic is 11.12 on 5 degrees of freedom.
The p-value is 0.049

Loadings:
                  Factor1 Factor2
PovWage_norm       0.638   0.767
Unemployment_norm         -0.283
GGG Index          0.534  -0.109
Ineq ajd income    0.815   0.280
LF_norm            0.368

               Factor1 Factor2
SS loadings      1.497   0.759
Proportion Var   0.299   0.152
Cumulative Var   0.299   0.451

Test of the hypothesis that 2 factors are sufficient.
The chi square statistic is 1.25 on 1 degree of freedom.
The p-value is 0.264
```