

The prioritisation of Sustainable Consumption and Production in the United Nation's Voluntary National Reviews

*A quantitative and qualitative analysis on Sustainable Development Goal 12's targets,
Means of Implementation and reported challenges*

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Abstract

In 2015 the Sustainable Development Goals (SDGs) were shared with the world. They can be seen as the most ambitious global goal-setting initiative to date. The 17 SDGs attempt to integrate social, economic and environmental components to solve society's largest challenges. One of the central Goals is SDG 12: Ensure Sustainable Consumption and Production patterns. Alongside the SDGs came the introduction of a new global governance review tool; the Voluntary National Reviews (VNRs). Their aim is to facilitate the sharing of experiences, successes, challenges and opportunities in order to accelerate the implementation of the 2030 Agenda.

This thesis tests how the VNRs can be used to study how countries prioritise SDG 12's components through a novel methodology. The SCP-Goal is chosen because it lacks high-quality indicators and it has seen limited implementation success so far. However, SDG 12 is seen as an 'enabler' for the implementation of other SDGs, making it a crucial Goal to monitor quantitatively and qualitatively. The prioritisation of SDG 12 is measured through the availability of a (1) policy or (2) a baseline in a country's VNR. The prioritisation patterns are compounded with frequently reported challenges, which aim to provide context to the patterns. In order to find commonalities and differences in the results, all VNRs are categorised through Gross National Income. Furthermore, Small-Island Developing States and Low-Population Countries are evaluated separately as well.

Recent theoretical contributions have shown that SDG 12 is formulated based on Ecological Modernisation (EM) theory. Therefore, an EM framework is used to explain prioritisation patterns and frequently found challenges. This allowed for the possibility to identify potential weaknesses in the way in which countries around the world prioritise SDG 12. From all this, contributions to the existing theory on Sustainable Consumption and Production and SDG 12 can be made.

Foreword

Before the start of this Master's Thesis content, I would like to express some words of gratitude. I am grateful for the continued supervision of Frank Biermann and Melanie van Driel. Furthermore, I want to thank my family and others for their support. Lastly, I am glad to have had the opportunity to acquire knowledge from professionals on the scientific method and critical thinking at the University of Utrecht.

List of abbreviations

SD – Sustainable Development

SDGs – Sustainable Development Goals

VNRs – Voluntary National Reviews

SCP – Sustainable Consumption and Production

SC – Sustainable Consumption

SP – Sustainable Production

wSC – weak Sustainable Consumption

sSC – strong Sustainable Consumption

UN – United Nations

SIDS – Small-Island Developing States

LPCs – Low Population Countries

EM – Ecological Modernisation

GNI – Gross National Income

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1. Introduction

1.1 The Great Acceleration

Steffen et al. (2015) (re)termed the period from the 1950's onwards 'The Great Acceleration'. Technological developments and economic activity accelerated at unprecedented rates. The world became faster, more advanced, more crowded, more complicated and in some way more interesting. But what have all the 'more's' done to humanity's *mores*? Society's development came with the slow realisation that greater deeds have greater consequences. The growing interconnectedness of economies presented governments with a set of interconnected, transboundary problems. The pandemic and climate change can metaphorically be seen as questions to humanity. What are the effects of the processes that form the configuration of the world today? And which direction do we as a species turn to for solutions?

1.2 The Sustainable Development Goals

The economic and technological developments were accompanied by social and institutional developments. The United Nations were created with an aim to maintain international peace after the Second World War. Over time, it has become an international institution involved in nearly all aspects of the international community. It has recognised the effects of human interactions and the challenges they pose to our place in the world. As such, it has also produced multiple sets of guidelines for the international community. With the end of the Millennium Development Goals (MDGs) in 2015, the introduction of the Sustainable Development Goals (SDGs) began. The SDGs consist out of 17 goals and 169 targets, each equipped with one or more indicators (United Nations, n.d.). They adopted a 'global target, national action' (GTNA) approach, which means that the targets were determined globally, but their achievement is a national enterprise (Amos and Lydgate, 2019). They have incorporated the three pillars of Sustainable Development (SD) in their formulation, meaning that there are equally important and interconnected social, economic and environmental Goals. Due to the size and aim to integrate SD's pillars, the SDGs are seen as the most ambitious set of internationally agreed goals to date (Biermann, Kanie and Kim, 2017). As such, the SDGs attempt to capture the effects of the processes that form the configuration of the world today in an international context. The Goals are to be reached by 2030, and the year 2020 marked the beginning of the 'Decade of Action'. This term emphasises the end of the preparative, awareness-raising phase of the SDGs and implies that more action is needed to reach the goals (Mallow, Toman & van 't Land, 2020).

1.2.1 SDG 12: Ensuring Sustainable Consumption and Production Patterns

One of the central Goals of the SDGs concerns Sustainable Consumption and Production (SCP) (Le Blanc, 2015; Slezák, 2018). The realisation of its set of targets and Means of Implementation (MoI) aim to create a system where economic growth can be 'decoupled' from ecological deterioration and resource depletion (UN, n.d.1). The strive for the integration of economic growth with ecological conservation hints at the UN not choosing between more or less. Instead, one of its key SCP's key objectives is 'Doing more with less' (United Nations Environment Programme, n.d.), indicating a desired continuation of the Great Acceleration trend. The discourse of SDG 12 is based on Ecological Modernisation Theory (EMT) (Weber and Weber, 2020), which coined the term 'decoupling' decades ago (Andersen, 2002; Jänicke et al., 2000; Simonis, 1989). Criticism on EM that it neglects aggregate resource consumption by focussing on eco-efficiency measures (Buttel, 2000) have been central in its use for the formulation of SDG 12.

Despite SDG 12's perceived position as an enabler for the implementation of other Goals, the High Level Political Forum (HLPF) (2018) noted that SDG 12 is the 'least resourced' of all SDGs. Fragmented action and information-gaps in the overall governance structures have led to limited implementation successes (One Planet Network, n.d.). In addition, SDG 12 has long consisted out of many Tier 3 indicators, meaning that there is no globally agreed upon framework on how the progress of the indicator is measured (Gasper, Shah & Tankha, 2019). So, even if substantial progress is made, there is probably a lack of appropriate data to present and evaluate it.

To keep track of the SDGs' implementation, the UN introduced the Voluntary National Reviews (VNRs). They are meant to stimulate countries to report on the progress, challenges and opportunities they face which could enable learning and cooperation possibilities between countries (Fukuda-Parr et

al., 2018). The discrepancy between the perceived importance and the level of implementation for SDG 12 make the VNRs an interesting tool to study.

1.3 The Voluntary National Reviews

The VNRs are a global goal-setting tool intended to ‘*facilitate the sharing of experiences, including successes, challenges and lessons learned, with a view to accelerating the implementation of the 2030 Agenda.*’ (UN, n.d.2). They are presented yearly at the HLPF which is a forum where countries come together to inform each other on the progress (or non-progress) they are making in the implementation of the SDGs (UN, n.d.2). As the name indicates, VNRs are published on a voluntary basis. While guidelines exist for their content, they are intended to allow for flexibility so adaptation to national circumstances can be guaranteed (VNR Handbook, 2021). The flexibility causes a lack of standardised content which limits the possibility to compare the implementation progress countries report to make (Sebestyén, Domokos and Abonyi, 2020). However, VNRs can be used for research into ‘the treatment of, and priority given to, specific issues in the national implementation of Agenda 2030 and the SDGs.’ (Fukuda-Parr et al., 2018).

1.4 Knowledge gap and research objectives

SDG 12 has seen limited implementation success due to fragmented action, information gaps and a lack of quality indicators. However, it is widely perceived as an enabler for the successful implementation of other SDGs. In light of the Decade of Action, research is needed to characterise how countries take action on SDG 12, what challenges they encounter and where information gaps exist. The aim of the VNRs to share experiences and challenges potentially facilitate the chance to uncover such patterns. As such, the documents can be used to satisfy the need for the monitoring of the SDGs through broad qualitative analysis, instead of solely through the indicator framework (Fukuda-Parr and McNeill, 2019). The VNRs offer a centralised database of countries that have volunteered to report on the SDGs. With Fukuda-Parr et al.’s (2018) statement in mind, this thesis aims to use all VNRs containing SDG 12 reporting from 2016-2020 to reveal the way in which countries *prioritise* SDG 12’s components. The priority is measured quantitatively through the occurrence of reporting on a policy and/ or baseline for SDG 12’s components. These results are supplemented by the analysis of frequently reported challenges, aiming to explain the way in which countries prioritise reporting on SDG 12 in their VNRs. Together, they can potentially contribute to fill in some of the aforementioned knowledge gaps around the implementation of SDG 12 on a large scale. The above have led to the creation of the following research questions.

1.4.1 Research questions

The main research question takes the EM formulation in mind, using it as the theory through which the patterns can be explained. Therefore, the research question is”

How are UN-countries prioritising SDG 12’s components and reporting challenges in the Voluntary National Reviews (2016-2020), and how can the patterns be explained from an Ecological Modernisation perspective?

The following sub-questions were created to come to a conclusive answer on the main research question:

1. Which countries report on SDG 12 in their Voluntary National Reviews?
2. How do the relevant countries prioritise SDG 12’s targets and Means of Implementation?
3. What are the commonalities and differences in the prioritisation and frequently reported challenges across groups of countries reporting on SDG 12 in their VNRs?
4. To what extent do the prioritisation patterns and reported challenges of countries further emphasise SDG 12’s Ecological Modernisation characteristics?

1.5 Societal and scientific relevance

The *societal relevance* of this study lies with the obligation governments have made to implement the Sustainable Development Goals. The challenges facing our globalised society have to be addressed at all levels of the system, but governments have an additional responsibility for the welfare of their citizens. The introduction of the VNRs as an open-access review mechanism can strengthen the accountability towards citizens and create transparency that can reveal opportunities for external actors (Fukuda-Parr et al., 2018; Vijge et al., 2020). Therefore, it is necessary that their use is tested to be able to hold governments accountable for their actions.

In addition, many of the problems associated with SDG 12 are transboundary (Bertelsmann Stiftung SDSN, 2018). As such, a broad analysis on how other countries are prioritising action on SDG 12 is of major importance for citizens around the world.

The *scientific relevance* of this study is in the first place connected to the Global Goals Project, led by Prof. Dr. Frank Biermann. The researchers of this five-year study programme study the evolution, effectiveness and future prospects of ‘global governance through goals’ as a steering mechanism in world politics (Global Goals, n.d.). It operates under the assumption that aspirational goals (i.e. the SDGs) bring little in terms of normative specificity, compliance mechanisms or regime formation. Nonetheless, the project aims to answer how global governance through goals can be effective, and under which conditions (Global Goals, n.d.1). Seeing as the VNRs are a new global-goals tool, this study contributes scientifically in terms of how the VNRs can be used to study prioritisation patterns for SDG implementation.

Secondly, to my knowledge this thesis is the first study that evaluates a broad range of (English) VNRs on SDG 12 in particular. Kim and Forestier (2020) used the VNRs to show how governments ‘cherry-pick’ (i.e. prioritise) SDGs in VNR reporting. However, no study has been done yet that attempts to reveal prioritisation patterns of components within a single Goal on a worldwide scale.

1.6 Thesis outline

The rest of this thesis is structured as follows. First, the relevant theoretical debate is set out in chapter 2. Chapter 3 thoroughly explains the novel methodology used in this thesis, and directly touches upon its pre-evaluation limitations. Chapter 4 presents the results, categorising them in groups as explained in chapter 3. This chapter offers the building blocks to answer sub-questions 1-3. Chapter 5 analyses the findings and links them to the theory while keeping the first three sub-questions in mind. Special attention is given to how the results align with Ecological Modernisation Theory (SQ 4). The discussion in chapter 6 first presents the major (post-evaluation) limitations of this thesis. Then, it discerns the relevant findings that contribute to, or deviate from, the existing theoretical debate. Based on these, research recommendations are made that can tackle remaining knowledge gaps or offer new lines of inquiry. Finally, chapter 7 attempts to give conclusive answers on the sub-questions, and ultimately the main research question.

2. Theory

This theory chapter is set out as follows. To set the stage, a brief description of Sustainable Development (SD), Global governance and how the SDGs relate to it is presented. Next, an elaboration on the role of the Voluntary National Reviews (VNRs) and how they can be used in research follows. This section is compounded with some theory on prioritisation in SDG research. From there onwards, an in-depth evaluation of existing literature regarding SCP is given. It distinguishes Sustainable Consumption (SC) and Sustainable Production (SP) and shows how it is used by the United Nations in the SDGs today. The latter is accompanied by a table that presents all of SDG 12's targets and indicators.

The last part of this chapter presents Ecological Modernisation theory (EM). It serves as a framework in which the results of this thesis are discussed, and from which potential shortcomings and recommendations can be derived. This section also incorporates characteristics of the Degrowth movement, as a counter-idea on the EM framework. The aim is to use an alternative (contrasting) approach to put EM into perspective.

To conclude, the used country classification is elaborated upon since an aim of this thesis is to differentiate the results across groups.

The conceptual framework of Figure 1 visually portrays how the theories and concepts relate to one another.

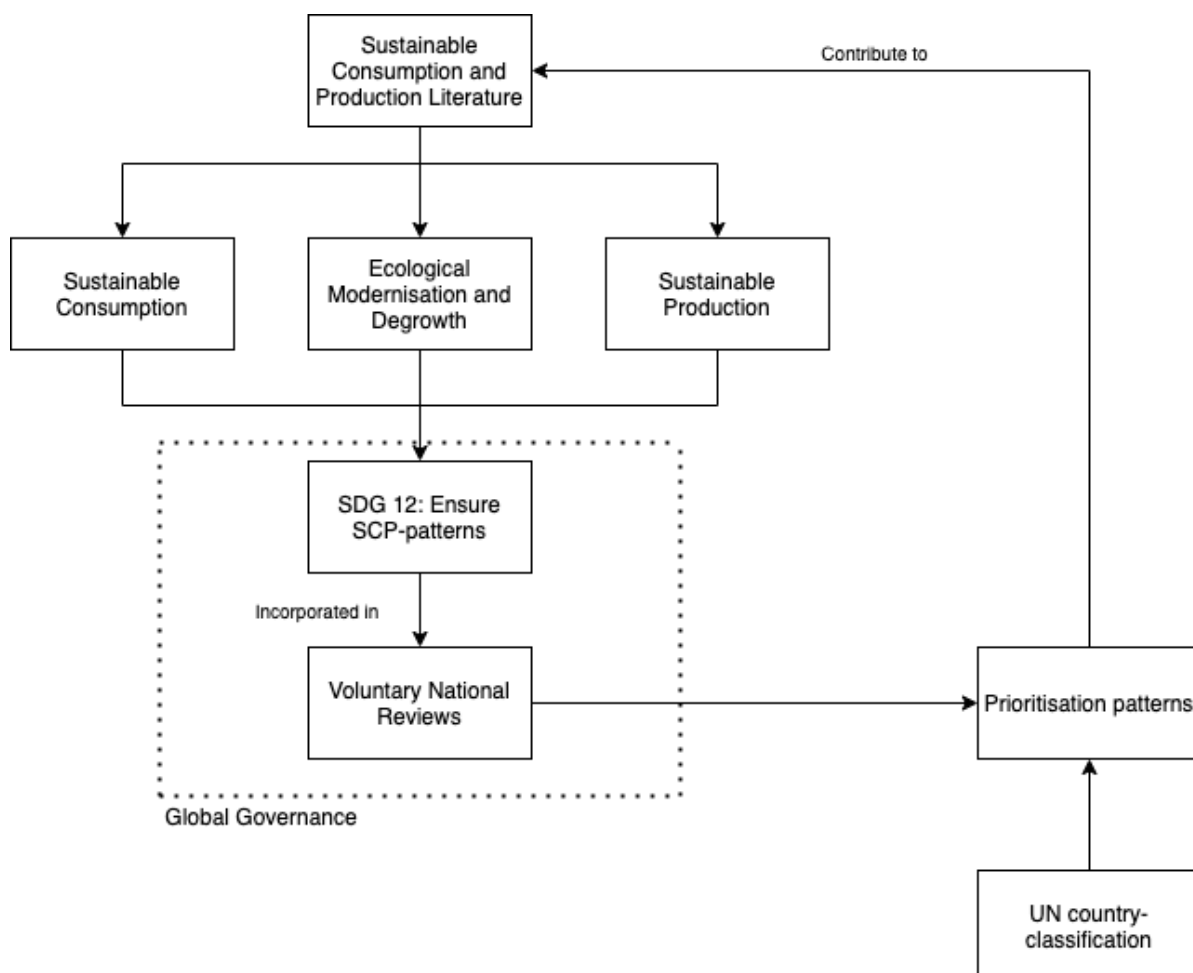


Figure 1 the conceptual framework visually presents how the used theories and concepts relate to each other.

2.1 Sustainable Development

The term Sustainable Development (SD) entered the international discourse at the 1972 Stockholm UN Conference on the Human Environment (Sustainable Development Commission, n.d.). SD derived from a global awareness of environmental problems, and intergenerational and north-south inequality concerns (Mol, 1996; Dryzek, 1997). It gained popularity due to the central role it had in the Brundtland Report (i.e. *Our Common Future*) in 1987, which introduced the now classic SD-definition: ‘*development which meets the needs of the present without compromising the ability of future generations to meet their own needs*’ (Brundtland, 1987). Finally, in 1992 at the Rio Summit, SD was recognised by the world leaders as one of the major societal challenges of our time (SD Commission, n.d.).

Essentially, SD is an anthropocentric approach (Langhelle, 2000) which is generally perceived as the dominant global discourse of ecological concern (Dryzek, 1997). The SD concept is built on three pillars (i.e. social, economic and environmental), and has two key elements:

- (1) The concept of *needs* (social justice), aimed particularly at a basic living standard for all people around the world; and
- (2) Imposed *limitations* by the current state of technology and social organisation on the environment’s ability to meet present and future needs (WCED, 1987, p.43; Langhelle, 2000).

‘Meeting future needs’ implies that generations can only pursue development interest as long as they do not affect the ability of future generations to meet their basic needs, which can be seen as the sustainability constraint of development (Malnes, 1990, p. 3). The perceived cause for ‘unsustainability’ is therefore poverty, which makes economic growth the precondition for environmentally sound development (World Commission on Environment and Development, 1987, p. 69).

This brief outline of the SD concept is how it is understood in the context of the SDG 12 (*Ensuring SCP patterns*) that is at the centre of this thesis. The Goal is considered to be an essential requirement for SD as it plays a crucial role in its emphasis on (basic) needs and limitations imposed by technology and social organisation (Wang, Ghadimi, Lim and Tseng, 2019). That is, the way in which societies produce and consume goods have a substantial impact on its (sustainable) development.

But what are the SDGs and how do they relate to Global Governance?

2.2 Global Governance and the SDGs

The SDGs are essentially a product of global governance, which was broadly defined by Finkelstein (1995) as: ‘... governing, without sovereign authority, relationships that transcend national frontiers. Global governance is doing internationally what governments do at home.’ The transboundary nature of many environmental problems has therefore been a driving force for the realisation that global governance structures are needed (Young, 1997 p.2). As such, global governance can be seen as a political response to create a problem-solving capacity for the consequences of globalisation (Biermann and Pattberg, 2012 p.4).

One approach to create this capacity within global governance is goal-setting. Global goals are defined as ‘internationally agreed non-legally binding policy objectives that are time-bound, measurable and aspirational in nature’ (Vijge et al., 2020). Consequently, four key characteristics to global governance through goal setting are identified in the literature, namely that they (1) are non-binding, (2) have weak institutional arrangements (i.e. not supported by treaty organizations), (3) are highly inclusive for all members of society and are (4) broadly framed (which facilitates much freedom for national interpretation) (Vijge et al., 2020; Biermann, Kanie & Kim, 2017). These characteristics are the underlying structure of the SDGs, which have made some critical scholars pessimistic about their capacity to make a change.

The SDGs have been mainly applauded for its strive to integrate social and economic development with environmental sustainability (i.e. the three pillars of SD). In fact, this feature has made it the most ambitious global governance programme as of yet (Biermann et al., 2017). However, the integration of these pillars in the formulation of the targets seems to be susceptible to trade-offs. Bhattacharya, Khan & Salma (2014) show that for SDG 12 specifically. The

formulation of targets reveals a primary focus on the environmental and economic pillar of SD, which makes the social / behavioural pillar underexposed. This ‘biased’ formulation might have consequences to understand how countries prioritise targets within SDG 12, and what challenges they encounter.

An additional potential influence is the use of Targets, Indicators and Means of Implementation (MoI), that serve to translate the three pillars of SD into conceptualised and measurable terms (UN, n.d.). This goal-setting approach may influence national governments to prioritise certain SDGs (Fukuda-Parr and McNeill, 2019). However, there is no existing literature available that it might also lead to prioritisation within one specific goal.

The quantitative format of the SDGs has been a basis for criticism, as over-reliance on quantitative measures can distort reality (Fukuda-Parr and McNeill, 2019). Or as Goodhart’s Law states: ‘When a measure becomes a target, it ceases to be a good measure’ (Hoskin, 1996; Newton, 2011). Such targets are merely a proxy of an underlying concept, and are therefore unable to present a comprehensive picture of a problem (or how it is solved) (Hall and Jaffe, 2012). Therefore, the research community suggests a cooperative approach of qualitative analysis and quantitative data collection to evaluate the progress in a certain country (Hicks et al., 2015).

So, the SDGs are the latest product of global governance, and are possibly the most comprehensive set of goals till this day. They attempt to integrate the three pillars of SD, although this seems to lead to trade-offs for at least SDG 12 specifically. The system of targets and indicators asks for a quantitative and qualitative analysis to monitor SDG-progress. The Voluntary National Reviews (VNRs) were designed to fill this gap.

2.3 The Voluntary National Reviews (VNRs)

In the past, global governance products have lacked formal policy evaluation mechanisms (Scholte, 2004). Therefore, the introduction of the VNRs is a development that intends to keep track of how countries are progressing towards the 2030 Agenda and what challenges they encounter from a national perspective (UN, n.d.2). The VNRs’ aim is ‘to facilitate the sharing of experiences, including successes, challenges and lessons learned, with a view to accelerating the implementation of the 2030 Agenda.’ (UN, n.d.2). Measurement is crucial for all stakeholders in global governance as it can contribute to decision making (Pinter, Kok and Almassy, 2017).

According to the latest VNR-guidelines update, countries are encouraged to report on all targets and all 17 SDGs. However, they may also reflect more in-depth on a selection of targets and Goals, seen as a national priority (United Nations, 2021). In addition, the review process should ‘discuss how means of implementation are mobilised, what difficulties are being encountered, and what additional resources are needed to implement the 2030 Agenda’. Relevant components to report on are financing, data needs, technology, partnerships and capacity development (United Nations, 2021).

While guidelines for the content of a VNR have been published and updated yearly by the UN Secretary General, they have proven to be insufficient to facilitate standardised content within the VNRs (Sebestyén et al., 2020). Therefore, there is limited potential to compare progress reported in the VNRs across countries (Fukuda-Parr et al., 2018; Sarwar and Nicolai, 2018). Thus, the VNRs cannot be conceptualised as an accountability mechanism between states. Instead, they aim to strengthen the accountability towards citizens and create transparency that can reveal opportunities for external actors (Fukuda-Parr et al., 2018; Vijge et al., 2020). It can therefore be seen as a framework for certain common elements (through the created guidelines), while allowing for flexibility that enable countries to adapt the reporting to their own context (High Level Political Forum, 2020).

What a VNR is useful for is a systematic and comparative overview of VNR reports can give insight into ‘the treatment of, and priority given to, specific issues in the national implementation of Agenda 2030 and the SDGs.’ (Fukuda-Parr et al., 2018). Prioritisation in the context of the SDGs has previously been conceptualised as ‘strategic ordering of the goals according to their relative perceived importance’ (Kim, Kotze, van Asselt, Vijge & Biermann, 2020). Forestier and Kim (2020) used ‘prioritisation’ in this context to analyse VNRs. In their study, a Goal was prioritised by a country when they explicitly

referred to it in their VNR as such. As a result, they showed that countries ‘cherry-pick’ (i.e. prioritise) certain SDGs.

There are multiple causes for prioritisation. They can potentially be used in this thesis to explain patterns. Broadly speaking, Van Zanten and Van Tulder (2018) argue that prioritisation is affected by a country’s context. More specifically, some explanations for cherry-picking are an insufficient governance capacity (Elder, Bengtsson & Akenji, 2016), a lack of appropriate knowledge (Weitz, Persson, Nillsson & Tenggren, 2015) and a pre-existing development agenda (Horn and Grugel, 2018). On an economic scale, Donovan et al. (2017) state that the regulatory or standards frameworks (directing firms) affect prioritisation, just as the culture of stakeholders (Chapman and Shigetomi, 2018). Identifying the causes for prioritisation might be too specific for this study, but they can still help make sense of broad data patterns in combination with qualitative information.

In the context of the SDGs, the broad set of goals might inherently lead to prioritisation (Forestier and Kim, 2020). As a consequence, a risk of trade-offs which could affect policy coherence is bound to occur (Bowen et al., 2017). However, the question remains how such statements relate to the analysis of a single SDG on a broad scale.

So, VNRs have been used for input in studying prioritisation between SDGs. It has, however, not yet been used to uncover prioritisation within a specific SDG. In addition, the lack of standardisation in the VNR guidelines make them inadequate for cross-country comparison based on their reported progress. However, it might be possible to compare the way in which countries prioritise targets and identify broad patterns in reported implementation challenges.

In order to understand how countries can prioritise targets of SCP in SDG 12, a broad understanding of what constitutes SCP is necessary. SCP has a long history and many underlying concepts that serve as a framework in which the results of this thesis can be placed.

2.4 Sustainable Consumption & Production

2.4.1 Setting the stage

Ideas and research in the 1970’s and early 1980’s set the stage for discussions concerning the relationship of economic growth (i.e. development) and environmental degradation (Wang, Ghadimi, Lim and Tseng, 2019).

Dominant products on one side of those ideas were the Club of Rome’s ‘Limits to growth’ (1972), Daly’s ‘Steady State Economy’ (1973) and Georgescu-Roegen’s ‘Degrowth’ (1979). The core thought in each of these theories revolves around the notion that unlimited economic growth through consumption is not possible in a finite world, and will inevitably lead to environmental, economic and social collapse. While these ideas were the first to question the unsustainable rates of resource extraction and pollution, they failed to be adopted by the mainstream (Martínez-Alier et al., 2010).

Instead, the industrial lobby shifted the narrative on SCP towards eco-efficiency and Ecological Modernisation (EM). EM’s central goal is to create cleaner modes of production through technological innovation, which would ultimately open up the possibility for unlimited and clean economic growth (Gasper et al., 2019; Amos and Lydgate, 2019).

Both streams have their view on SCP, but before that can be explained it is necessary to know what *Sustainable Consumption* (SC) and *Sustainable Production* (SP) constitute independently in the literature.

2.4.2 SC and SP in SCP

The formal introduction of the SCP-concept was in 1992, at the World Summit on Sustainable Development (WSSD) (Cohen and Muñoz, 2016). From then to this day, the most used definition for SCP in an international institutional context has been ‘the use of services and related products, which respond to basic needs and bring better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of further generations.’ (Norwegian Ministry of Environment, 1994). In this definition, there is a strong similarity visible with the SD-definition in chapter 2.1 (e.g. the concepts of needs and future generations). Furthermore, UNEP has adopted the 1994 definition for SCP, emphasising that SCP is about ‘doing more with less’, where ‘more’ relates to goods and services and ‘less’ to resource use, environmental degradation and waste as pollution (UNEP, n.d.). The use of

this definition on the international stage indicates how SCP is approached. However, the literature offers specifications in the term SCP that might be of importance for this thesis.

For example, Wang et al. (2019) argue that there is a different meaning for SCP in developed and developing economies. They note that cultural diversity, the stage of economic growth and political procedures can influence the debate on SCP patterns in different ways. These factors align with causes for prioritisation (i.e. contextual conditions etc.). These sources combined indicate that the level of development of a country has to be incorporated in order to differentiate the prioritisation results in this thesis, as SCP itself might have a different meaning.

But what are these differences? Wang et al. (2019) elaborates that developing the economy is often a top priority in developing economies, making sustainability a subaltern objective. Governments generally focus more on meeting the essential needs of the citizens, at the cost of environmental considerations (Clark, 2007; Fang, Côte and Qin., 2007). In contrast, developed countries' emphasis of SCP lies with limiting the excessive and wasteful resource use, caused by relatively extreme consumption patterns (Wang et al., 2019). In broad terms, this distinction is considered to be true. However, deviation from such a pattern has to be considered at all times. In addition, the goal of SDG 12 is to integrate the notions of economic growth and ecological protection. Potentially, that challenges the credibility of Wang et al.'s (2019) distinction.

That being said, developing economies can prioritise economic growth over environmental concerns. On the 'other side', developed economies aim to maintain their consumption and production patterns while limiting resource use. The distinction is valuable when attempting to explain why certain countries might prioritise specific targets.

Another distinction in the literature is between SC and SP, as is done by Barber (2007, p. 500-502). He describes Sustainable Consumption (SC) as 'raising awareness and changing consumer behaviour, values and motivations', which aligns closely with target 12.8 (see table 1). Sustainable Production (SP) concerns 'not only the volume and types of goods and services produced, but the process of making them, the natural resources extracted to make them, and the waste and pollution resulting from the extraction, production, and affiliated process resulting in a particular good'. Waste and natural resource extraction align with target 12.2 – 12.5 as presented in table 1 later at the end of this subsection. However, no overlap is found with the volume and types of goods and services while in any target or MoI of SDG 12 (see table 1).

While the definition of SP is quite elaborate, the SC definition remains rather vague. Lorek and Fuchs (2013) have distinguished between both weak Sustainable Consumption (wSC) and strong Sustainable Consumption (sSC) policy approaches. The wSC policy approach's premise is that SC can be achieved through improved energy efficiency resulting from technological innovations. These are then adopted by consumers through the diffusion mechanism of the capitalist free market. In this view, the assumption is made that the supply and demand interplay leads to sustainable consumption choices. However, WSC does not consider the volume or types of goods and services consumed (Lorek and Fuchs, 2013).

In contrast, sSC policy explicitly emphasises the need for structural changes in the levels of overall resource consumption. In addition, it still recognises the importance of eco-efficiency (wSC) measures. Furthermore, the social component in sSC is crucial as it aims to improve non-materialistic human well-being and restructure the way time is used (Lorek and Fuchs, 2013; Maniates, 2009). While sSC seems to align more with the integration-intention (i.e. social, economic and environmental) of the SDGs, it is not found in the formulation of SDG 12. The conceptualisations of wSC and sSC show strong similarities with EM and Degrowth discussed at the beginning of this chapter. There is clearly a distinction between how different forms of SC can be approached.

In sum, the literature on SCP has a long and extensive history. First, it is clear that different approaches are used to conceptualise SCP. Second, it can potentially have a different meaning in developed and developing countries. Lastly, there are differences in the conceptualisation and governance approaches of SC. The formulation of SDG 12 in table 1 presents the exact formulation of SCP in the global governance context, set out in 8 goals and 3 Means of Implementation (MoI).

SCP Targets & indicators	SDG 12 target & indicator(s) description
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T 12.1	Implement the 10-Year Framework of Programmes (10-YFP) on Sustainable Consumption and Production Patterns, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries
12.1.1	Number of countries with SCP national action plans or SCP mainstreamed as priority or a target into national policies
T 12.2	By 2030, achieve the sustainable management and efficient use of natural resources
12.2.1	Material Footprint (MF), MF per capita, and MF per GDP
12.2.2	Domestic material consumption (DMC), DMC per capita, and DMC per GDP
T 12.3	By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses
12.3.1	Global Food loss index
T 12.4	By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks
12.4.1	Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement
12.4.2	Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment
T 12.5	By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse (3 R's)
12.5.1	National recycling rate, tons of materials recycled
T 12.6	Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle
12.6.1	Number of companies publishing sustainability reports
T 12.7	Promote public procurement practices that are sustainable, in accordance with national policies and priorities
12.7.1	Number of countries implementing sustainable public procurement policies and action plans
T 12.8	By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature
12.8.1	Extent to which (i) global citizenship education and (ii) education for sustainable development (including climate change education) are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
MoI 12. a	Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production
12.a.1	Amount of support to developing countries on research and development for SCP and environmentally sound technologies
MoI 12. b	Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products
12.b.1	Number of sustainable tourism strategies or policies and implemented action plans with agreed monitoring and evaluation tools
MoI 12. c	Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances
12.c.1	Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities

Table 1 SDG 12's targets, indicators and Means of Implementation (MoI) (UN, n.d.1)

2.4.3 SCP and SDG 12

Judging from table 1, the content of the Goal is diverse. Its targets and MoI place emphasis topics ranging from resource efficiency to sustainable tourism and food waste. It shows close similarities with what Barber (2007) termed SP (except for the ‘volume and types of goods’), and what Lorek and Fuchs (2013) call wSC. But how does the UN conceptualise SCP exactly?

UNEP uses the Norwegian 1994 definition of SCP which is still translated into the formulation of SDG 12 in table 1. More research led to the identification of three main objectives related to (1) decoupling environmental degradation from economic growth (i.e. doing more with less), (2) applying life cycle thinking (i.e. resource efficiency and reuse of products and services) and (3) seizing opportunities for developing countries and ‘leap-frogging’ (UNEP, n.d.). The latter refers to bypassing the inefficient and polluting phases of development through technological ‘leaps’. Notably, an emphasis is placed on Sustainable Public Procurement (or target 12.7). Its definition basically refers to the aim that public organisations procure their goods, services, ‘works’ and utilities in an economically feasible way, without harming the environment and while improving the economy. More importantly, UNEP (n.d.) states that government can lead by example through SPP and deliver key policy objectives and send ‘strong market signals’.

Weber and Weber (2020), Gasper et al. (2019) and others have argued that the formulation of the Goal aligns strongly with Ecological Modernisation theory principles. EM has been characterised as the dominant international environmental discourse (Amos and Lydgate, 2019). Therefore, it is necessary to get a clear understanding of EM components as it might explain the prioritisation and challenge patterns in this thesis. To contrast EM, Degrowth principles are incorporated in the next section. It is used as a counter-idea of EM, with the aim of showing an alternative and contrasting approach for SCP. Furthermore, it allows for the incorporation of valid criticism on the EM approach. Ideally the theory can also be used to explain frequently reported challenges by VNRs for example. However, Latouche (2003) emphasises that degrowth is not a concept or real theory, since it does not correspond with an existing system. Instead, it is better characterised as a social, environmental movement and an emergent concept in academic circles (Martinez-Allier, 2010). Therefore, it cannot be expected that VNRs make direct references to its characteristics.

2.5 Ecological Modernisation and Degrowth

2.5.1 Origins and central premises

Ecological Modernisation (EM) is an environmental policy approach that formed in the 1980’s as a critical response to the radical demodernisation and deindustrialisation movements of the 1970’s (Buttel, 2000; Mol and Spaargaren, 2000). Such movements (like Degrowth) emphasised institutional and behavioural traits as the main causes for the environmental crisis (Mol, Sonnenfeld, Spaargaren, 2020 p.7). Therefore, Degrowth advocates for ‘the creation of a new social and also economic system that operates within the biophysical limits of the planet.’ (D’Alisa et al., 2015). EM’s definition presents a contrasting view as ‘the discourse that recognizes the structural character of the environmental problematique, but nonetheless assumes that existing political, economic and social institutions can internalize the care for the environment’ (Hajer, 1995 p.25). So, EM suggests that environmental problems can be solved through the current institutional arrangements that form most Western societies (i.e. capitalism), while Degrowth proposes the creation of a new socioeconomic system.

2.5.2 Capitalism

EM perceives capitalism as highly flexible and considers environmental concerns as a major trigger for flexibility. Such a trigger is able to transform free market capitalism so that it does not obstruct, but increasingly contributes to, the integration of environmental concerns into the daily functioning of existing institutions and societal actors such as the state, business and consumers (Mol, Sonnenfeld, Spaargaren, 2020). So, despite the recognition that environmental issues stem from modernisation and industrialisation, EM proponents argue that their solutions are to be found in more modernisation and “super-industrialisation” (Buttel, 2000; Mol, 1995). Therefore, EM’s main hypothesis is that economic growth and ecological conservation can be integrated to (re)form a model of development which deals with environmental problems (Gibbs, 2000). Moreover, EM considers environmental protection a potential asset to economic growth instead of a burden upon the economy (Weale, 1992 p.75).

Degrowth proponents argue that capitalism fails to solve environmental issues. Therefore, the movement strives for both an economic and cultural shift for developed societies especially (Kallis, 2011). Therefore, the central premise of degrowth can be seen as a reaction to the EM-paradigm. It argues that the efforts to develop problem-solving technologies and more efficient processes of production have failed to decouple economic growth from environmental degradation (Robra and Heikkurinen, 2019). It perceives unlimited growth as impossible on a finite planet, and states that economic growth should not be considered a prerequisite for increasing human well-being (Latouche 2009; Robra and Heikkurinen, 2019). Instead, the suggested strategy to realise an ecologically sustainable world is to reduce economic activity to a level that is considered to be within the ‘safe operating space’ of the planet (Demaria et al., 2013).

2.5.2 Characteristics and implementation

Mol and Sonnenfeld (2000) have identified three broad theoretical phases of EM, showing the transition of its core characteristics. The first phase placed a firm emphasis on the role of technological innovation, strived for the least possible state interference and had faith in market solutions (Huber, 1991). The second phase lessened the emphasis on technological innovation, the attitude towards the state and the faith in the market. It was complemented by the recognition that long-term environmental protection requires international socioeconomic and cultural changes (Hajer, 1995; Fudge and Rowe, 2001). Fudge and Rowe (2001) argue that this second phase laid the basis for the Brundtland Report in 1987. The latest and third phase has incorporated the role of consumption and ‘global processes’ in the international context. The SDGs might be the exemplification of this latest phase judging from the incorporation of the consumer-oriented on awareness-raising (12.8). However, it has to be emphasised that these phases are theoretical. Therefore, they do not necessarily overlap with how it is used in practice or in a global governance context. That being said, Mol & Sonnenfeld (2000) go on to state that the third stage conceptualises environmental problems as ‘challenges for (preventative) social, technical and economic reform’ in which market dynamics and economic agents are considered more important than before. In addition, the role of the state has changed towards the more decentralised and consensual styles of governance. Also, intergenerational responsibility towards the protection of the environment is incorporated (Fudge & Rowe, 2001). Politically speaking, actors are expected to build different coalitions to make environmental protection politically feasible in EM. Furthermore, consumers have to be steered into ‘the right direction’ (i.e. environmentally responsible direction) for their consumption-choices (Buttel, 2000; Fisher and Freudenburg, 2001).

The third phase of EM seems to align closely with SD, as it has incorporated intergenerational responsibility. Also, the connection of environmental problems with economic (and technical) and social components is made, similar to the three pillars of SD. The way in which consumption is discussed fits the decentralised and consensual character of governance, where consumers have to be steered towards environmentally responsible consumption.

Over the past two decades, EM has become a prominent policy strategy in environmental governance (Jänicke, 2020). Its main successes have been in eco-efficiency: the use of renewable energy in the power sector, waste recycling and consumer oriented measures such as eco-labelling (Dyllick and Hockerts, 2002; Jänicke, 2020). Consequent (politically popular) economic benefits such as additional employment, reduced production costs and innovation have contributed to widespread implementation of EM-strategies (Mol, Sonnenfeld, Spaargaren, 2020).

Due to the fact that Degrowth is not a theory (but a ‘movement’), proposals on how Degrowth is realised remain fragmented and diverse. In addition, its implementation is non-existent on a system scale. The main focus of academia has been on proposals for large-scale institutional and policy reforms (Kallis, 2011). Redistribution of time and resources, the importance of public services and re-localisation of economic activities have been central in these discussions (Martinez-Alier, 2010; Kallis, 2011). The only ‘tangible’ products of EM are several suggested concrete policies. The most prominent ones concern a basic income, a reduction of working hours, de-productivity to increase the demand for labour, salary caps, taxation of environmentally damaging activities and more employment in sectors where human interaction is central (e.g. healthcare and education) (Kallis, 2011; Victor, 2010; Latouche, 2009; Raventós, 2007). Central in these policy suggestions is that the matter/energy throughput of societies

and human organisations must reduce. This specification implies (1) a reduction of consumption and production processes and (2) more responsible economic activity (Heikkurinen, 2018). So Degrowth does not aim to stop producing or consuming. Instead, it aims to redefine what are to be considered (human) needs and intend to use resources accordingly, as opposed to using them for ‘ever-increasing human wants’ (Bonnedahl and Heikkurinen, 2019; Cosme, Santos and O’Neill 2017).

Degrowth specifically focusses on developed societies as they are associated with relatively high material and energy footprints. Degrowth proponents argue that those (countries/ societies) that exceed their allowable ecological footprint, are obliged to decrease them. This would allow ‘Southern’, or less-developed, countries to increase their material consumption, seeing as they generally have a low ecological impact relative to their bio-capacity (Ridoux, 2006; Georgescu – Roegen, 1975). In such developed societies, societal changes as proposed by Degrowth require different roles and responsibilities predominantly of state and business actors (Lorek and Fuchs, 2013). Both will have to deviate from the dominant political and societal worldview, where economic growth in a system of capitalism is the goal.

While changes for economic actors and consumers have been explained above, the role of the state remains largely understudied in degrowth literature (D’Alisa and Kallis, 2020). Yet, an overall consensus can be found in that the current scale of the state is too big. It is seen as inherently connected to the techno-economic, capitalist system and thus to the strive for growth (D’Alisa and Kallis, 2020). In addition, Deriu (2012) argued that the embeddedness of nation states in the globalised economic-political system have led to a loss of power to international organisations such as the World Bank and International Monetary Fund.

So, the characteristics of both streams are highly contrasting. Agreements can be found in the goal, but not in the proposed approach. For example, EM and Degrowth agree on the need to reduce the matter/energy throughput of societies. However, EM proposes eco-efficiency, while Degrowth advocates for an overall reduction of consumption and production.

Such structural differences are at the basis of critical arguments towards either stream.

2.5.3 EM- and Degrowth criticism

Due to its widespread use and political popularity, EM has received considerably more criticism than Degrowth. In fact, seeing as Degrowth is not a theory, and has not been implemented on a systemic scale, specific criticism on the implementation processes is hardly possible.

The first important EM-criticism are the so-called rebound effects. The *direct* rebound effect challenges the premise that a decrease in resource use or fewer emissions per unit of production (i.e. eco-efficiency) leads to an overall decline in used resources. Instead, the capitalist market mechanisms cause the price of products to fall, which increases the demand for production and in turn the efficiency-gains become irrelevant. The *indirect* rebound effect states that a reduction in costs enables customers to use their funds for consumption or production activities (Robra & Heikkurinen, 2019).

Secondly, EM does not provide an alternative to existing environmentally harmful industries, but it merely adds cleaner technology to it (Jänicke, 2020). This could cause problem displacement (across space and time) instead of solving environmental problems (Weale, 1992, p.76). Jänicke (2020) calls this a ‘de-location of ‘dirty industries’’. He states that industrialised countries displace the early stages of the production line (possibly based on heavy industry), while the final production stays in developed countries. The latter may be relatively clean.

The third critique is closely related to this, as the ecological effectiveness of EM is selective (i.e. related to a specific set of environmental problems (Mol, 1996; Jänicke, 2020)) and restricted to market-based solutions (Machin, 2019). The emphasis on (1) resource-efficiency and (2) pollution control causes a neglect for broader concerns such as aggregate resource consumption and its environmental impacts (Buttel, 2000). Furthermore, improvements in technology and efficiency do not counter the impacts of growing economies or rapid population growth. Therefore, the strive for growth and neglect of ecological limits to the human enterprise could weaken the SDGs capacity to contribute to sustainability (Robra and Heikkurinen, 2019).

Fourth, EM was initially considered to be ‘Eurocentric’ (Buttel, 2000). Scholars argue that the context of EM relates primarily to the experiences of western industrialised countries. As such, EM has no

connection to the global environmental problems or social justice (Christoff, 1996; Mol, 1996; Dryzek, 1997). However, adaptation to national contexts can make the EM-approach useful for *transitional, high performance* (economically) and *newly industrialising* countries on a global scale (Frijns, Phuong and Mol, 2000). Also, successes in certain industries in all parts of the world partly refute the Eurocentric critique, and add to the argument that EM strategies can be adapted to national circumstances. Nonetheless, mindfulness that adaptation to the national context is crucial, and awareness of EM's selective effectiveness to solve particular environmental problems, are required.

Lastly, Weber and Weber (2020) criticise what they call EM's 'stages-logic'. Societies can be categorised as being in a certain stage of development, which explains the occurrence of certain social and ecological complications. In their view, this logic of catch-up articulates the premise that further suffering and ecological degradation is necessary to realise economic growth (Weber and Weber, 2020; Akenji and Bengtsson, 2016), from which environmental conservation naturally follows.

Each of these criticisms can limit the extent to which SCP systems are created, especially when the state does not create the favourable policy conditions to counter them. They are a cause for concern as EM is generally considered to be a central component of environmental politics discourse and the SDGs (Hajer, 1996 p.248; Robra and Heikkurinen, 2019). Therefore, Jänicke (2020) states that EM needs an improved understanding of environmental policies beyond EM's selectiveness. In fact, he argues that a necessary addition to EM is a policy of structural change (e.g. phasing out fossil fuels) if SD is to be reached.

Degrowth's main criticism is that its ideas are unfeasible and as it has failed to implement actions (van den Bergh, 2011; Schwartzman, 2012). Furthermore, Degrowth lacks a clear definition which makes the aim of the movement too vague to formulate clear policy proposals (van den Bergh, 2011). Both of these critiques make it unclear what is understood by a Degrowth's aim for a 'smaller' state (D'Alisa and Kallis, 2020). The incompatibility of degrowth with the existing political climate could explain both of these criticisms (Lorek and Fuchs, 2013; D'Alisa, 2015). However, this does not clarify how a Degrowth-system should be implemented and what its consequences would be for all segments of society.

2.5.4 EM and SDG 12

With the above in mind, the EM characteristics in SDG 12 can be recognised. The UN formulated the goal of SCP in SDG 12: 'to decouple economic growth from environmental degradation' (UN, n.d.1). Furthermore, it aims to protect the environment and increase consumption through continuous technological innovation and transfer, instead of using regulation (UNEP, 2010; United Nations Statistics Division, 2018). This is substantiated by Gasper et al. (2019), who state that 'With the possible exception of measures to 'rationalize' inefficient fossil fuel subsidies (Target 12.c), there is no explicit acknowledgement of the need for regulatory changes to enforce sustainable practices and to restrict or prohibit unsustainable ones.'. Therefore, MoI 12.c might be an interesting component of SDG 12 in particular in this thesis.

In addition, a closer look at the targets, indicators and Means of Implementation (see Table 1) reveal that the main aim of Goal 12 is to achieve responsibility through efficiency measures (i.e., eco-efficiency) and that efficiency as a solution is present in several of the goals (Gasper et al., 2019; Robra and Heikkurinen, 2019). This is substantiated by Weber and Weber (2020) who show that the approach as set out in targets and MoIs in SDGs 12, 13, 14 and 15 aligns strongly with EM-theory; aiming for an integration of environmental and developmental (i.e. economic) objectives. The exceptions here are the notion that food waste should be reduced at a consumer level (12.3) and raising awareness (12.8) as a whole. Further, Gasper et al. (2019) argue that reduced waste generation (12.5) and rationalising fossil-fuel subsidies (12.c) can be considered as both production-and consumption oriented. However, they add that especially 12.5 can emphasise new business opportunities instead of changing consumer lifestyles. Still, the incorporation of such targets provide evidence for the use of the 'third phase' of EM in SDG 12's formulation, where consumption is incorporated into the theory. The question remains how countries adopt this framework. One thing is certain, the consumption discourse does not align with Degrowth ideas. The Goal contains no plea to reduce levels of consumption and production, or emphasis on unsustainable patterns of consumption. Instead, it focusses on eco-efficiency measures (Gasper et al., 2019; Weber and Weber, 2020).

Lastly, Akenji and Bengtsson (2014) notice that the SDG 12's (SCP) development paradigm is based on the catching-up rationale, similar to what Weber and Weber's (2020) termed EM's stages-logic. The use of country classification makes it possible to differentiate the findings of this project. Potentially, the prioritisation rates could reflect this stages-logic idea.

2.6 Groups of countries

Multiple sources in this theory section have emphasised potential different meanings of SCP for different sets of countries. Wang et al. (2019) mentioned differences between developed and developing countries. The VNR Handbook (UN, 2021) stated that countries can adapt VNRs to their national context. And Buttel (2000) and others criticised EM for being primarily relatable to (European / western) highly industrialised countries.

Taken together, it indicates that evaluating groups of countries might prove useful to enhance the potential to explain the found prioritisation patterns. In addition, the research questions in this thesis aim to reveal commonalities and differences between countries. Therefore, country distinctions from the UN itself are evaluated shortly. However, theory around the pros and cons of one classification above the other are neglected. Seeing as this thesis focusses on the UN's global-goal setting product, using UN-recognised income classifications seems appropriate.

The UN (2012) has classified countries level of development in terms of their Gross National Income (GNI) (per capita), in line with World Bank data. All countries evaluated in this thesis are categorised according to the classification of (1) high-income, (2) upper-middle income, (3) lower-middle income and (4) low-income. However, Small-Island Developing States (SIDS) are taken into consideration separately as they form a distinct group in the same UN (2012) classification document. Additional literature adds that SIDS are unique because of their small populations and special (but similar) social, economic and environmental challenges. In addition, they are largely dependent on the import of goods, tourism and fisheries which could be relevant for their prioritisation patterns (UN, n.d.3). Furthermore, the UN has specific 'UN Programmes of Action in Support of SIDS'. More specifically, they have launched an initiative to tackle (chemical) waste in 2019 (International Institute for Sustainable Development, 2019). The main causes for the focus on waste are the growing populations, rapid development and increasing amounts of imported goods (International Institute for Sustainable Development, 2019).

3. Methodology

The following chapter explains the methods and accompanying strategies to answer the research questions as stated in the introduction. It first elaborates on how the relevant VNRs are collected. Then the analysis procedure is explained, followed by how the collected data is processed. Thereafter, the strategy for the collection of the reported challenges is explained. Lastly, the novel method’s pre-evaluation limitations are elaborated upon.

3.1 Data collection strategy

The first step to prepare for analysis is to collect the VNRs that have explicitly reported on SDG 12. The UN’s Sustainable Development website has stored all 206 VNR documents published over the period 2016-2020. This includes countries that have published a VNR for the second or third time. The choice for the period 2016-2020 is simply based on the desire to make the analysis as comprehensive as possible. This requires exploring all available VNRs.

The initial strategy to gather the relevant documents is through the keyword search function on the UN’s website. The literature review and explorative reading of random VNRs clarified that countries use a variety of terms for ‘SCP’. Further exploration led to the creation of a set of seven keywords that are used synonymously for SCP presented in table 2. So, in order for a country to be incorporated into the analysis it has to include one of these seven terms.

A manual check of each VNR that turns up from the keyword-search ensures that the report either contains (1) a separate chapter on SDG 12; or (2) has SDG 12 incorporated into one of their priority-areas (or key-areas). The aforementioned non-uniformity of VNR content make this flexible approach necessary. The manual check ensures that only ‘relevant’ VNRs are included. This means that it has to report on SDG 12’s components or report challenges. Including one of the key words from table 2 is not enough.

Search terms for SCP country selection
1. Sustainable Consumption and Production
2. Sustainable Production and Consumption
3. Responsible Consumption and Production
4. Responsible Production and Consumption
5. SDG12
6. SDG 12
7. Goal 12

Table 2 Keywords used in UN's VNR database

Another aspect to consider is the language in which a VNR is published. This thesis only incorporates VNRs written in English for the comprehensive documents analysis. The initial screening of the VNR database has shown that there is a substantial amount of VNRs (54) that were published solely in French (27), Spanish (23), Arabic (3) and Russian (1). To circumvent total exclusion of VNRs outside of the linguistic capabilities of the researcher, they are all checked manually for the incorporation of a stand-alone SDG 12 chapter. For the French and Spanish documents, the keywords in table 3 are used. Due to the low frequency of solely Arabic and Russian VNRs, search terms in those languages are not deemed necessary.

French search terms	Spanish search terms
ODD	ODS
Objectif Developpement Durable	Objetivo de Desarrollo Sostenible
Objectif 12	Objetivo 12
Consommation et production responsable	Produccion y consumo responsable
Instaurer des modes de consommation et de production durables	Garantizar modalidades de consumo y produccion sostenibles

Table 3 French & Spanish SCP-keywords

To complete the data generation process, all available English VNRs that did not turn up after the use of the key words in table 2 are checked manually with the same keywords. This is done to prevent potential malfunctioning of the UN’s search engine, and ensure the highest reliability of the data gathering strategy.

3.2 The document analysis method

Document analysis is used as a method to systemically evaluate the VNR database. The analytic procedure for document analysis covers finding, selecting, appraising and synthesising data contained in the VNRs (Bowen, 2009). From this, major themes, categories and case-examples can be derived (Labuschagne, 2003). The categorisation in the case of this thesis is predetermined by SDG 12’s targets and MoI.

The goal of the document analysis is threefold. First, it is used to uncover how countries prioritise reporting on SDG 12’s components (i.e. its targets and MoI). ‘Prioritisation’ has a different conceptualisation in this thesis than how Kim and Forestier (2020) used it. In the first place, it depends on whether countries incorporate SDG 12 in their VNR. Secondly, a country has to report on at least one of SDG 12’s components in the form of (1) a policy or/ and (2) a numeric baseline (see detailed explanation in 3.2.1). This prioritisation-method is of the researcher’s own design and open for debate. This first strategy leads to quantitative results through a qualitative analysis.

Secondly, document analysis is used to categorise frequently reported challenges. The content of those challenges is used a contextual information to accompany the prioritisation results. As such, target specific challenges can be categorised. Both the prioritisation-and challenges’ data processing is done through the Excel-spreadsheet presented in figure 2. For the challenges, a separate field that do not fit any of SDG 12’s targets or MoI is added and referred as ‘target 12.d’. This addition has to ensure the incorporation of reported challenges outside of SDG 12’s selectiveness.

Thirdly, the document analysis can be used to test how the VNR instrument is used by countries in a global governance context. Hereby, the original purpose of the documents is taken into account, just as the context in which they were produced and their intended audience (Bowen, 2009). As such, the UN’s intended use of the VNRs is tested. Furthermore, this thesis aims to show which countries have published a VNR report on SDG 12, and which have not. A distinction is made between countries that have not published a VNR, the ones that have but chose to exclude reporting on SDG 12 and countries that will publish a VNR in 2021.

As stated in the theory section by Wang et al. (2019), developing and developed countries may have different conceptualisations concerning SCP. This could lead to differences in prioritisation patterns and types of reported challenges. Therefore, this thesis uses the UN’s (2012) Gross National Income (GNI) classification to distinguish countries’ prioritisations and challenges (see table 4). In the first place, this allows for an overview of the distribution of countries that report on SDG 12. Furthermore, the GNI-categorisation might reveal differences in prioritisation patterns and the nature of reported challenges. Furthermore, the theory on SIDS presented in chapter 2.6 has led to the decision to analyse SIDS separately as well, due to their unique economic social and environmental circumstances and small population size (UN, n.d.3). In line with the that, countries with a population smaller than 1 million inhabitants are evaluated separately as well.

GNI-classes	GNI per capita
HI	>\$12.276
UMI	\$3.976 - \$12.275
LMI	\$1.006 - \$3.975
LI	< \$1.005

Table 4 UN 2012 GNI categorisation

3.2.1 Analysis process: target prioritisation

The way in which target prioritisation is measured in this thesis requires an elaborate explanation, as it is a novel strategy and thus of the researcher’s own design. The previous section already stated that a distinction is made between a country having (1) policy and / or (2) a baseline on a target (or MoI). However, a thorough review on SDG 12’s indicators clarify that that not all targets and MoI can be tracked numerically in a domestic context, which makes the possibility of reporting on a baseline impossible. For example, indicator 12.7.1 for SPP reads as ‘the number of countries implementing sustainable public procurement policies and actions plans’ (table 1). Since the focus of this thesis is on country level, this indicator cannot be used to get meaningful data.

Because of this, the targets and MoI are split up in their analysis criteria. Targets 12.2 – 12.6 and 12.c can be tracked numerically and form a group called ‘T’ for ‘trackable’. Targets 12.7, 12.8 and 12.b cannot be monitored numerically and form a group called ‘NT’ for ‘not trackable’. The reader might notice the exclusion of target 12.1 and MoI 12.a, which is explained later.

The reason for using policies and/ or baselines as prioritisation is to circumvent vague (or ‘fuzzy’) (political) language, exemplified by the following example occurs. Country A reports on all targets and MoI, seemingly prioritising all of them. However, the language used only provides statements such as: ‘Resource efficiency improvements were made across all industries.’ or ‘Attention has been given to the improvement of recycling practices.’. While this might both be true, the reader of such a statement cannot know how the country in question has taken steps towards a component’s implementation. ‘Proof’ is required to find out whether a country truly prioritises a target.

Therefore, reporting on (1) policy (in development) and / or (2) a baseline is seen as providing some proof of prioritisation. An agreed-upon policy indicates a legal obligation and intent to realise a desired goal. In other words, they represent ideals of behaviour in a specific context (Aphale, Norman and Sensoy, 2012). Furthermore, the existence of a baseline suggests monitoring practices of indicators, and a desire to improve policy decision making based on evidence (i.e. data) (Baba and Hakem Zadeh, 2012). Therefore, it is assumed that the existence of one or both in national legislation increases the chance of a country prioritising the implementation of a target.

The following sections explain the evaluation process for both T- and NT targets. Table 5 and 6 present the way in which prioritisation is assessed.

T-targets: 12.2 – 12.6 & 12.c

Green is perceived as the ‘optimal’ outcome where both policies *and* baseline(s) are available in the VNR.

Yellow is a broad category. It is given when a VNR reports (1) existing policy *or* (2) a baseline, and (3) when policies are being developed but not implemented / accepted yet. The latter is included because it indicates an effort for prioritisation. Additionally, at the time of reading a VNR from 2018, chances are that a proposed policy is officially accepted today. Importantly, this does not include discourse such as ‘Policies will / have to be made...’, but rather ‘A new law on sustainability reporting for businesses is currently evaluated by ... and expected to be implemented in 2019.’

Red is used for a target that it is not mentioned at all in a VNR’s SDG 12 section, or the reporting does not align with the evaluation criteria.

Green	Policy exists for the target and progress is given in the form of a baseline (in %, absolute numbers, or annual differences).
Yellow	Policy exist or is in development for SDG 12’s component. A reported baseline without policy is also evaluated as ‘yellow’.
Red	The target is not mentioned at all within the SDG 12 section of a VNR, or is not reported on through a policy or baseline.

Table 5 levels of prioritisation for targets where numeric tracking is possible

NT-targets: 12.7, 12.8, 12.b

Green for the NT-targets simply means that policy, governments initiatives or requirements exists for the component in question.

Yellow is used for NT-targets when a policy is in development, an initiative is about to be launched or requirements are about to be set.

Red is given according to the same criteria as for the T-targets.

Green	Policy, requirements or initiatives have been implemented and is reported on in the VNR.
Yellow	Policies are in development for the target. This includes policies that are in development, but not officially implemented or accepted yet.

Red	The target is not mentioned at all within the SDG 12 section of a VNR, or is not reported on through a policy or baseline.
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Table 6 levels of prioritisation for targets where numeric tracking is not possible

3.2.2 Evaluation per target

While the above suffices as the general guidelines for this methodology, exact elaboration for each target and MoI is required. Most of SDG 12's indicators have long been categorised as Tier 3 indicators (Gasper et al., 2019). This means that an internationally agreed methodology for their measurement does (or did) not exist. While this might have changed over time, many VNRs have been published in the time span where this was the reality. In most cases, the indicators accompanying the targets did not fully reflect the way in which a target is formulated. With Goodhart's Law in mind (i.e. an indicator ceases to be a good measure once it becomes a target), the decision is made to use a broader range of evaluation criteria than only SDG 12's original indicators. Especially considering the status of SDG 12's indicators and implementation, the exclusion of potentially relevant information (i.e. data) that do not fit the indicators would be unfair to actions of countries. In many cases, countries report in line with the formulation of the target, but indicators do not exist for them. Yet, such reporting is still relevant for how countries prioritise SDG 12.

Table 7 presents (1) the original UN indicators, (2) the additions & adjustments that were made for the evaluation process and (3) the exact evaluation criteria for each of SDG 12's components. In general, the aim is to stay true to the way in which a target is formulated. Therefore, additions and adjustment had to be made in some cases. Table 7 is the result of an iterative process. Multiple rounds of evaluation were needed to come to additions and adjustments that seemed fitting to the formulation of SDG 12's components (see table 1) in the opinion of the researcher. This method is by no means perfect and open for debate.

12.2 T	<i>UN indicators</i>
	12.2.1 Material Footprint (MF), MF per capita, MF per GDP 12.2.2 Domestic Material Consumption (DMC), DMC per capita, DMC per GDP
	<i>Addition & Adjustment</i> <ul style="list-style-type: none"> (1) Addition: harvest quota-policies implemented are seen as resource-efficiency strategies (yellow) (2) Addition: for some countries, agricultural practices are the main economic occupation and thus seen as materials that deserve resource efficiency & management. Therefore, agricultural products and fresh water are considered resources for which resource efficiency policies can be made. (3) Adjustment: to prevent double-counting with target 12.5, recycling policy and data is not considered to be a resource-efficiency strategy. It is however recognised that recycling can improve resource-efficiency.
	<i>Criteria</i> Yellow = country is planning to implement/ has implemented resource efficiency policies, have harvest quota or present a baseline for indicator 12.2.1 or 12.2.2 Green = yellow + data on indicator 12.2.1 and / or 12.2.2
12.3 T	<i>UN indicator</i>
	12.3.1 Global Food Loss Index (GFLI)
	<i>Additions & adjustments</i> <ul style="list-style-type: none"> (1) Addition: data on the reduction of food waste along the production chain is considered to be relevant data and; (2) Addition: the creation of new and improved harvest storage facilities are considered relevant actions for a 'policy' or initiative (yellow)
	<i>Criteria</i> Yellow = policies implemented or planned to be implemented to reduce food waste (including the creation of new/ improved storage facilities) Green = yellow + when global food loss index, reduction numbers or baselines are given in any stage of the food production/ consumption-cycle

12.4 T	<p><i>UN indicators</i></p> <p>12.4.1 Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement</p> <p>12.4.2 Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment</p>
	<p><i>Addition & Adjustment</i></p> <p>(1) Addition: Signing an international treaty on chemical waste (such as the Rotterdam and Basel treaties) is considered to be equal to having policy on chemical waste. Of course, additional policies created by countries outside of those treaties are not excluded.</p>
	<p><i>Criteria</i></p> <p>Yellow = when 12.4.1 is followed, when a baseline is given without mentioning any agreements, or when a specific policy on chemical waste is included</p> <p>Green = yellow + 12.4.2 are followed (hazardous waste per capita, treated hazardous waste per treatment)</p>
12.5 T	<p><i>UN indicator</i></p> <p>12.5.1 National recycling rate, tons of material recycled</p>
	<p><i>Addition & Adjustment</i></p> <p>(1) Adjustment: The formulation of target 12.5 concerns the reduction of waste in general which makes an indicator on recycling alone too one-sided. Therefore, a baseline for the total municipal waste and municipal waste generated per capita are seen as relevant as they directly relate to waste generation.</p>
	<p><i>Criteria</i></p> <p>Yellow = policies are implemented/ prepared to increase prevention, reduction, recycling and reuse rate or when new recycling facilities are created</p> <p>Green = yellow + the national recycling rate, tons of material recycled in baseline or annual difference or (municipal) waste generated per capita</p>
12.6 T	<p><i>UN indicator</i></p> <p>12.6.1 Number of companies publishing sustainability reports</p>
	<p><i>Addition & Adjustment</i></p> <p>(1) Addition: Target 12.6 aims to “encourage companies to adopt sustainability practices”. However, indicator 12.6.1 focusses on sustainability reporting only. The concepts Corporate Social Responsibility (CSR) and Extended Producer Responsibility (EPR) policies are seen as relevant as they aim to improve a companies’ sustainability practices (Lioui and Sharma, 2012).</p>
	<p><i>Criteria</i></p> <p>Yellow = (upcoming) policy for increased sustainability reporting or/ and CSR & EPR obligations</p> <p>Green = yellow + number of companies publishing sustainability reports</p>
12.7 NT	<p><i>UN indicator</i></p> <p>12.7.1 Number of countries implementing sustainable public procurement policies and action plans</p>
	<p><i>Addition & Adjustment</i></p> <p>(1) Adjustment: The indicator of this target concerns a ‘number of countries’ while this thesis focusses on a country’s domestic situation. Therefore, this indicator cannot be used in the document analysis. This is what makes 12.7 a NT-target (Table 6).</p> <p>(2) Addition: when VNRs use synonyms for SSP such as ‘Green Public Procurement’ they are seen as relevant, even though they might emphasise the environmental/ economic pillar of SD more than the social.</p>
	<p><i>Criteria</i></p> <p>Yellow = country plans to implement sustainable public procurement policy / requirements</p>

	Green = country has implemented sustainable public procurement requirements or has instruments/ requirements in place to realise sustainable public procurement
12.8 NT	<i>UN indicator</i> 12.8.1 Extent to which (i) global citizenship education and (ii) education for SD (including climate change education) are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
	<i>Addition & Adjustment</i> (1) Adjustment: 12.8 is considered a NT-target because the indicator is formulated in vague terms. The ‘extent to which... are mainstreamed’ formulation does not clarify what is supposed to be measured, or when something is considered to be ‘mainstreamed’. (2) Addition: Only considering education as an awareness raising tool is too one-sided. Therefore, tax-incentives, government campaigns and eco-labelling are seen as awareness raising tools as well. (3) Note: The existence of Civil-Society awareness-initiatives is recognised and they are relevant for target 12.8. However, the analysis of this thesis focusses on government-action, therefore a VNR mentioning a CS-initiative without a government mentioning cooperation is not seen as relevant.
	<i>Criteria</i> Yellow = planning for education policies or policies for above mentioned possibilities Green = policies on SD education or government initiatives are implemented, eco-labels are used and promoted or tax-incentives to raise awareness are implemented.
12.b NT	<i>UN indicator</i> 12.b.1 Number of sustainable tourism strategies or policies and implemented action plans with agreed monitoring and evaluation tools
	<i>Addition & Adjustment</i> (1) Adjustment: Indicator 12.b.1 is simplified to follow the NT target rules (Table 6). Differentiation between one or more policies is not considered to be relevant additional information. In addition, it is highly susceptible to unreliable outcomes. Therefore, simplification to a NT-target is beneficial for the results.
	<i>Criteria</i> Yellow = sustainable tourism strategies, policies or action plans are being prepared Green = sustainable tourism strategies, policies or action plans are implemented
12.c T	<i>UN indicator</i> 12.c.1 Amount of fossil-fuel subsidies per unit of GDP (production and consumption) and as a proportion of total national expenditure on fossil fuels
	<i>Addition & Adjustment</i> (1) Adjustment / addition: the target formulation ‘rationalising inefficient of fossil fuel subsidies’ is considered vague language. Therefore, it is understood as (1) phasing out, (2) reducing or (3) not having fossil-fuel subsidies.
	<i>Criteria</i> Yellow = phasing out or reducing fossil fuel subsidy is planned or indicator 12.c.1 is known Green = phasing out or reducing fuel subsidy has taken place and indicator 12.c.1 is known, or a country explicitly states to not have any fossil-fuel subsidies.

Table 7 Evaluation criteria per target

3.2.3 Target 12.1 & 12.a

Table 7 does not present any evaluation criteria for target 12.1 and 12.a. For which the justification can be found in the following.

Target 12.1 is formulated as ‘Implement the 10-year framework of programmes on sustainable consumption and production, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries’ (UN, n.d.1). The 10-YFP has six programmes: (1) Sustainable Public Procurement, (2) Consumer Information for SCP, (3) Sustainable

Tourism, (4) Sustainable Lifestyles and Education, (5) Sustainable Buildings and Construction and (6) Sustainable Food Systems (United Nations Department of Economic and Social Affairs, 2014). The programmes have considerable overlap with SDG 12’s targets (see Table 1). This overlap would inevitably lead to double counting inside the methodology. Also, a country could, for example, have sustainable tourism policies without having a 10-YFP programme. However, it is considered as one of the six programmes of the 10-YFP. This would negatively influence the reliability of the evaluation of the targets, which has led to the decision to exclude the target from evaluation.

The formulation of MoI 12.a: ‘Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production’ (UN, n.d.1) is aimed at developed countries. The vague boundaries between what is considered developed or developing make it a challenge to identify which country should be evaluated along the lines of 12.a and which one would not. The choice for the use of GNI as a country-classification tool makes the inclusion of this Goal complicated and potentially unreliable. Therefore, it is excluded from analysis.

3.3 Data processing

All 108 English VNRs are evaluated in accordance with the criteria as presented in Table 7. Excel is used as a tool to create a spreadsheet in which the correct colour can be attributed. Figure 2 shows the way in which the spreadsheet is set up.

The column ‘Year’ (on the left) lists the year in which the VNR was published. The ‘Class (2012)’ (on the far right) determines which GNI-class the country in question belongs to. In case the UN (2012) source lacked data on a specific country, the World Bank’s (2010) GNI data was used as a supplement for the relevant GNI data.

Key word spreadsheet	Resources	Foodwaste	Chemical wa	Waste & rec	Reporting	Procurement	Awareness i	Tourism	Fossil fuel su	Class (2012 data)
VNR Countries	Year	Target 12.2	Target 12.3	Target 12.4	Target 12.5	Target 12.6	Target 12.7	Target 12.8	12.b	12.c
Albania										
Armenia										
Armenia *										
Australia										
Austria										
Bahamas										
Bahrain										
Bangladesh										

Figure 2 Excel data processing spreadsheet

The data processing structure as presented in Figure 2 allows for the identification of how VNRs prioritise SDG 12’s targets for all relevant countries. The end-result allows for the possibility to find commonalities and differences between countries in their prioritisations.

3.3.1 Data visualisation

Once the data is gathered, certain sections are visualised with the help of Geographical Information Systems (GIS). GIS allows for the creation of a world map that shows which country:

1. Has published a VNR in general;
2. Has published a VNR with a SDG 12 section;
3. Is expected to present a VNR in 2021 for the first time;
4. Has not published a VNR at all

The non-English VNRs are included in the map, which makes it representative for all nations. This map serves as an overview at the beginning of the results-chapter to get a general view of the relevant countries, and which countries are not participating in the VNR process.

The prioritisation results are visualised through graphs and are accompanied by relative prioritisation values to put the results into perspective.

3.4 Reported challenges

Aside from the goal to uncover which SDG 12 targets are prioritised by countries, this thesis aims to gain insight in frequently reported (implementation) challenges. The challenges are identified through a manual keyword search.

The keyword such as ‘challeng...’ is used to screen every relevant English VNR. By using ‘challeng’, both the keywords ‘*challenge(s)*’ and ‘*challenging*’ are included. A similar spreadsheet as presented in figure 2 is used to process the data. This means that challenges are listed per target. Further, this means that the GNI-classes are taken into consideration for the reported challenges as well. In addition, a column is added to list challenges in that do not fit any of the targets or MoI. The column for these challenges is referred to as ‘12.d’.

A challenge is only included when it describes a specific phenomenon, or when a cause is added that elaborates upon the challenge. This means that if country X simply states: ‘Waste is a challenge that needs to be addressed.’, it is not included. In contrast, statements such as ‘Waste *recycling* is a challenge...’ (a specific phenomenon) ‘Population growth contributes to the continuing increase of waste...’ (cause) are included as it provides contextual information on why a challenge exists, or what the specific challenge is.

The use of the reported challenges is twofold. First of all, they offer qualitative information that can contribute to the understanding of why countries prioritise certain targets above others. As such, the reported challenges are used as contextual information complementing prioritisation patterns. Therefore, the result chapter contains (where possible) quotations of challenges that might explain a pattern. This is by no means seen as hard evidence for a pattern, but merely intended as the provision of contextual information and integration of methodological strategies (quantitative and qualitative).

Secondly, frequently found challenges are collected per group (i.e. GNI classes, SIDS and LPCs) to reveal potential group-specific challenges. They are intended to be used as explanations for why a group prioritises reporting on certain targets. A group-specific challenge is considered to be frequent when at least three separate VNRs within the same group have reported a similar challenge.

Lastly, a separate chapter is dedicated to frequently occurring challenges across groups. The goal is to find challenges that occur in multiple groups at the same time. This is to circumvent the assumption that the level of income has a decisive role to play in the types of challenges that occur in a group. Here, the rule is that a challenge has to be mentioned in at least two separate groups, and that it occurs at least in three separate VNRs. Due to the interconnected nature of some targets, there might sometimes be overlap between to which target a challenge could fit. Therefore, a challenge can only be used for one target to prevent double counting. The target it belongs to is decided by means of individual judgement. In the results analysis, these boundaries are not considered for the waste targets as certain challenges can relate to all of them at the same time. Lastly, challenges that can relate specifically to EM and/ or Degrowth are evaluated. This concerns challenges related to technology & innovation, and consumption.

3.5 Pre-evaluation methodological limitations

The presented method has multiple limitations that have to be recognised.

- (1) The analysis in this thesis only covers the content as reported in a country’s respective VNR. The results can therefore not be perceived as fully representative for a country’s efforts to implement SDG 12’s targets (i.e. existing policies might not be mentioned). However, a country can be held responsible for the way in which they publish the content contained in this formal review mechanism of the UN. That being said, this thesis recognises the likelihood that countries create their own SDG review / progress reports. This complicates the possibility to make judgements about an individual country’s efforts based on a VNR. Therefore, comments are mostly limited to broad prioritisation patterns. A prioritisation-analysis of an individual country’s VNR is not reliable.
- (2) The emphasis on policies and data points towards a dominant focus on governmental action. However, it should be recognised that both Civil Society (CS), Non-Governmental Organisations (NGOs) and market actors can play a significant role in the creation of SCP patterns. Therefore, the results of this thesis can only apply to actions of a national government.
- (3) The lack of mandatory standardised guidelines for the construction of a VNR makes it challenging to compare the progress made across countries (Sarwar and Nicolai, 2018). Therefore, progress comparisons between VNRs are avoided.
- (4) SDG 12 is a central goal in in the SDGs. It has a central position in relation to the other SDGs (Le Blanc, 2015), which means that there might be overlap between Goal 12 and several others.

This thesis only focusses on the SDG 12 sections of a VNR, which could lead to overlooking potentially relevant information reported on in different Goals.

- (5) This thesis does not attempt to measure the effect or nature of reported policies. So, while the existence of policy can indicate prioritisation, it does not mean that the policy is effective at solving what it is designed for. Consequently, a group of countries that ‘scores’ well on the methodology presented above does not necessarily do well in tackling SDG 12. It can prioritise targets, but create policies with negative consequences. Or it can have no policy for a target, but have wonderful results through (for example) Civil Society initiatives. As such, the methodology is suitable to find out which targets are addressed, but not how (succesfull) they are addressed.
- (6) No distinction has been made between EU-policy and domestic policy for European countries reporting on SDG 12. So, if a country reports to adhere to EU-policy on Sustainable Public Procurement it is evaluated as green for 12.7. In the end, it turned out that such a situation has only occurred in a couple of cases. However, it does deserve a mention in the limitations of this methodology.

3.6 Proof of concept, reliability and validity

In order to improve the reliability and validity of the methodology, a ‘proof of concept’ test is performed in this section before the presentation of the results start. Key words of each of SDG 12’s components have been used in the VNRs of three countries (i.e. Brazil, Iraq and Pakistan) that have not reported on the Goal in a separate chapter or ‘Key-Area’. The goal is to show whether certain components are prioritised in reporting in other SDGs, without the presence of a SDG 12 section. This could put the absence of SDG 12’s components in perspective and test the reliability and validity of the method.

Both Brazil and Pakistan have reported on resource efficiency in other SDGs (14 & 15) along, resulting in a yellow prioritisation. Furthermore, the VNRs of all three countries have reported on awareness-raising. However, these also related to a range of topics outside of SCP. Lastly, Pakistan has reported on planned initiatives for waste management, resulting in a yellow value. The key-word searches for other targets have not resulted in any prioritisation following the scheme of table 7.

The integrative formulation of the SDGs inevitably leads to overlap, especially since SDG 12 is seen as an ‘enabler’ for the implementation of other targets. This is especially evident in resource efficiency, awareness raising and to a lesser extent for waste.

4. Result chapter

The results presented in this chapter are structured as follows. First, an introductory section aims to gain familiarity with the relevant VNRs used in this thesis. It presents an overview of which countries have published a VNR, when they did so and whether they publish in English. The location of the countries is presented in a geographical world map. To finalise the introductory section, all VNRs containing a SDG 12 section are classified according to the UN's GNI, SIDS and LPC classifications (2012). Also, the English and non-English VNRs are separated in line with the classification. From there onwards, the non-English VNRs are removed from the VNR sample. The introductory section allows for answering the first part of sub-question 1.

In the second section, the prioritisation results are presented. First an overview of all prioritisation results (from 108 VNRs) is given. Then, the same is done for all GNI-classes together and separately for the SIDS and LPCs. Secondly, the prioritisation results per group are presented in line with the evaluation scheme presented in the methodology. Each group is accompanied with potential frequently found challenges. The second section is finalised with a short synthesis on who prioritises what. The second section provides the building blocks to answer the second part of SQ 1 and SQ 2 in its entirety.

Thirdly, section three gives insight into the frequently found challenges across groups. It aims to reveal potential commonalities and differences between groups

Finally, this chapter ends with a summary of the most relevant results, which are then used as input for the result-analysis and discussion chapter. The third and final section of the result chapter make it possible to answer SQ 3.

4.1 Section 1: introduction

4.1.1 Published Voluntary National Reviews

A total of 206 VNRs have been published over the period 2016 – 2020. The first result of importance is that 139/206 (67%) VNRs have included a specific SDG 12 chapter in its VNRs, or have incorporated SDG 12 in 'priority-areas' (or 'key-areas'). Out of the 206 VNRs, 36 were second- and third timers. So, in total 170 countries published a VNR from 2016-2020. The 139 VNRs containing a SDG 12 section consisted out of 11 second- or third timers, resulting in a total of 128 countries (75%) that incorporated SDG 12 in its VNR. Figure 3 presents the distribution of VNR publication per year for the 139 SDG 12-VNRs.

However, figure 3 also shows that 31/139 VNRs that have reported on SDG 12 were not published in English. Of those, 20 are published in French and originate from African countries. Another 9 are published in Spanish and originate from South-American (5), Central-American (3) and European (Andorra) countries. The remaining two countries are Syria and Chad, which both published its VNR in Arabic (see table 8 for an overview). From Section 2 onwards, the non-English VNRs are left out of the sample, which leaves a sample size of 108 English VNRs on which the evaluation is performed. Lastly, it has to be mentioned that the United Kingdom has published a VNR collectively. However, the report has separated the content for Scotland, Wales, Northern Ireland and England. This thesis evaluates these countries separately, treating them as four autonomous units that make up the total of 108 VNR reports.

The remarkable rise from 2017 to 2018 in figure 3 can be explained by SDG 12 being one of the major themes of the UN's High Level Political Forum (HLPF) in 2018. It is also the year where the first non-English VNRs were published. After the surge in 2018, the amount of countries that reported on SDG 12 remains relatively high compared to 2016 and 2017. In addition, the number and share of non-English countries further increased while the number of

English VNRs decreased compared to 2018. This can simply be a result of which countries were requested / volunteered to publish a VNR in 2019 and 2020.

Regardless of further potential explanations for the rise in frequency, it is clear that the inclusion of SDG 12 in VNR reporting has increased overall from 2016 to 2020 in both English and non-English VNRs. A full list of all relevant VNR-countries can be found in Annex 1. But where are these ‘SDG 12-countries’ situated?

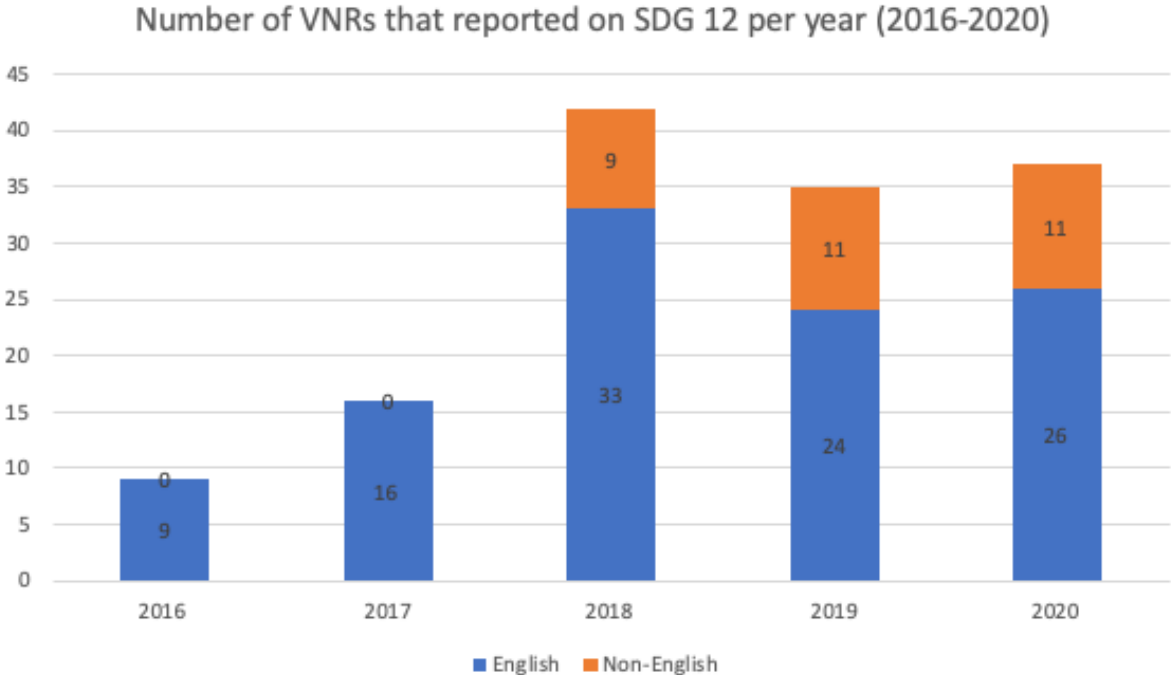


Figure 3 The number of English and non-English VNRs reporting on SDG 12 per year (2016-2020)

4.1.2 SDG 12 per region

Table 8 presents an overview of the total number of countries in a region, and the share of those countries that have reported on SDG 12. The countries are attributed to a region based on their geographical location, not their political affiliation. The classifications of the Europa-nu (n.d.) and Countries of the World (n.d.) have been used.

The American continents have the lowest proportion of countries that have reported on SDG 12. However, several are expected to present a VNR in 2021 which could contain SDG 12 reporting (see Annex 1 or the map in figure 5). A reason for the relatively lower proportion of countries reporting on SDG 12 in Australia & Oceania and North-America might be that a number of island-states are part of those continents. This is especially the case for the Australian sub-category, where the only large countries are Australia itself and New-Zealand. As such, the countries in the region Australia & Oceania that report on SDG 12 are predominantly made up of SIDS (75%).

The vast majority of Europe has reported on SDG 12, the exceptions being Belarus, Moldova, San Marino, Vatican City, Kosovo, Luxembourg and Monaco. Africa and Asia exist out of more countries than Europe, but have a lower SDG 12 reporting rate. South-America has a low number of countries publishing on SDG 12 (5), and only one of those published in English. This makes it the most under-represented continent in this thesis.

Region	Number of countries in the region	Total number of countries reporting on SDG 12	Proportion reporting on SDG 12 per region	Number of countries publishing on SDG 12 in English	Number of countries publishing on SDG 12 in other languages	Number of SIDS that reported on SDG 12	Proportion SIDS of SDG 12 reporting countries
Africa	54	31	57%	14	17	4	13%
Europe	47	40	85%	39	1	0	0%
Asia	50	34	68%	32	2	4	12%
North-America	23	9	39%	6	3	3	33.3%
Australia & Oceania	14	8	57%	8	0	6	75%
South-America	12	5	42%	1	4	0	0%

Table 8 The characteristics of regions based on information of Countries of the World (n.d.) and Europa-Nu (n.d.)

4.1.3 Income and language characteristics

Table 4 in the methodology presented the GNI-classification used in this thesis. Figure 4 presents the subsequent GNI-classification of the 128 countries that published the 139 VNRs on SDG 12. Distinctions are made in terms of whether the countries published their VNR in English or not. In addition, the number of SIDS and LPCs per GNI-class are also provided. Most countries that published in another language belong to the LMI-and LI classes. Without the non-English VNRs, a total of 101 countries reported on SDG 12 in English. Together, they are responsible for the 108 VNRs that are evaluated in this thesis.

The vast majority of English VNRs belong to the HI-class. If the distinction with SIDS and LPCs is set aside, 47/101 countries that published in English belong to the HI-class. Another 25 countries are from the UMI-class, while the LMI- and LI make up 18 and 11 countries. The unequal group distribution has to be taken into account when groups are compared in a later phase of this chapter.

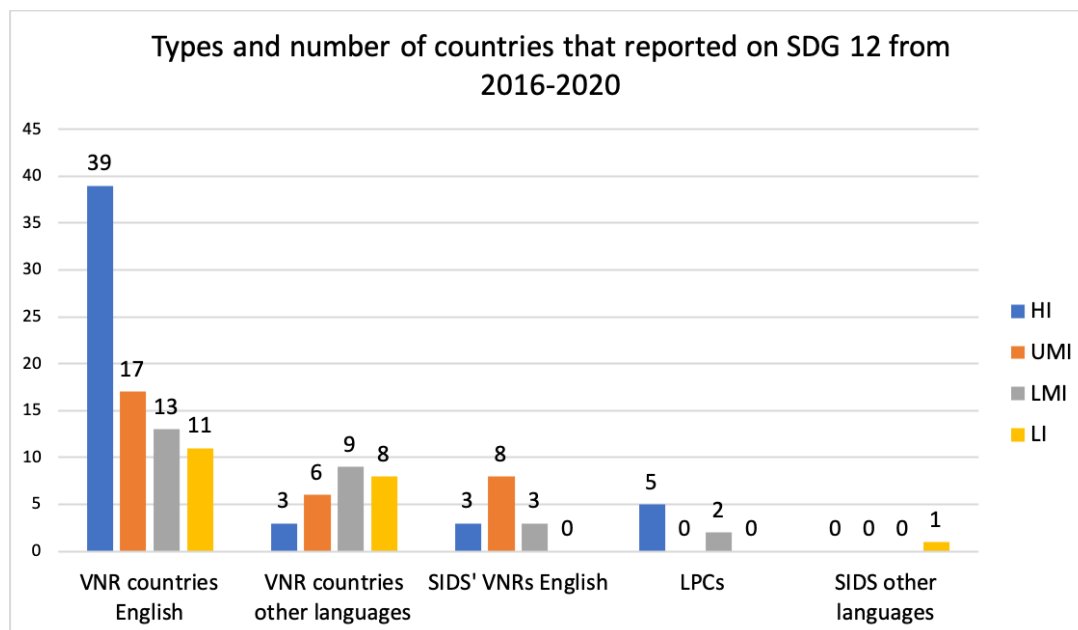


Figure 4 the GNI-categorisation of countries reporting on SDG 12 in all languages

Small-Island Developing States and Low Population Countries

The data compilation procedure has revealed a relatively large number of SIDS and LPCs. In total, 17 SIDS and 7 LPCs have published a VNR with a SDG 12 section. Nearly all have published the VNRs in English, except for 2/17 SIDS. Taken together, SIDS and LPCs make up +/- 17% of all 139 VNRs (disregarding language).

For the English VNRs, 15 out of the 108 relevant VNRs originate from SIDS. They represent +/- 14% of the evaluated VNRs. This group size brings them on par with the UMI, LMI and LI groups, making the SIDS fit for comparison. On top of that, there were another seven countries (6.5%) that have a population of less than 1 million inhabitants (that are not SIDS). Figure 4 shows the income characteristics of the SIDS and LPCs. Together, they make up 1/5th of the world's English VNRs that have reported on SDG 12. The mentioned unique economic, social and environmental characteristics of the islands support the choice to evaluate them separately. For an exact overview of the relevant SIDS and LPCs, see Annex 1.

Now that all countries have been classified, the question remains where they are located.

4.1.4 SDG 12 in the picture

The map in Figure 5 presents a visual overview of (1) countries that have not published a VNR, (2) countries that have published a VNR which reports on SDG 12, (3) countries that have published a VNR, but do not report on SDG 12 and (4) countries that will publish their first VNR in 2021. It allows for the possibility to place the percentages of table 8 into perspective.

The countries without reporting on SDG 12 that stand out most are the United States (No VNR), Brazil (VNR) and China (VNR). It is remarkable that three of the world's leading countries in terms of production and consumption do not have a VNR at all, or have chosen not to report on it explicitly. While Brazil does have an extensive report on other SDGs, China and the US have none available. However, China is registered on the UN's website as having presented their VNR on the HLPF in 2016 accompanied by a video recording. Yet, the link does not contain a document on which an analysis could be performed. A closer look at Brazil's (2017) VNR reveals that they chose to report on the challenges that fitted that year's HLPF-theme; 'Eradicating poverty and promoting prosperity in a changing world'. The associated SDGs with that theme were SDG 1, 2, 3, 5, 9, 14 and 17. Therefore, reporting on SDG 12 might not have been included. A reason for the absence of a VNR from the USA remains unclear based on the

empirical results. However, it would be worth researching as it is the country with the world's largest economy, and it has not announced to present a VNR in 2021.

The South-American continent consists of multiple countries that have a VNR, but have chosen not to report on SDG 12. The same goes for the eastern side of the Middle-East, where Iran has not published a VNR at all, and multiple surrounding countries have excluded SDG 12 from reporting. On the Arabic Peninsula, Yemen has not published a VNR. At the same time, most other countries (except for Iraq) have published a VNR with SDG 12 incorporated. Lastly, the south-western and eastern side of the African continent consist of some countries that have not reported on SDG 12. There are still other countries that have not published a VNR or not reported on SDG 12, but they are mostly islands not visible on this map (see Annex 1).

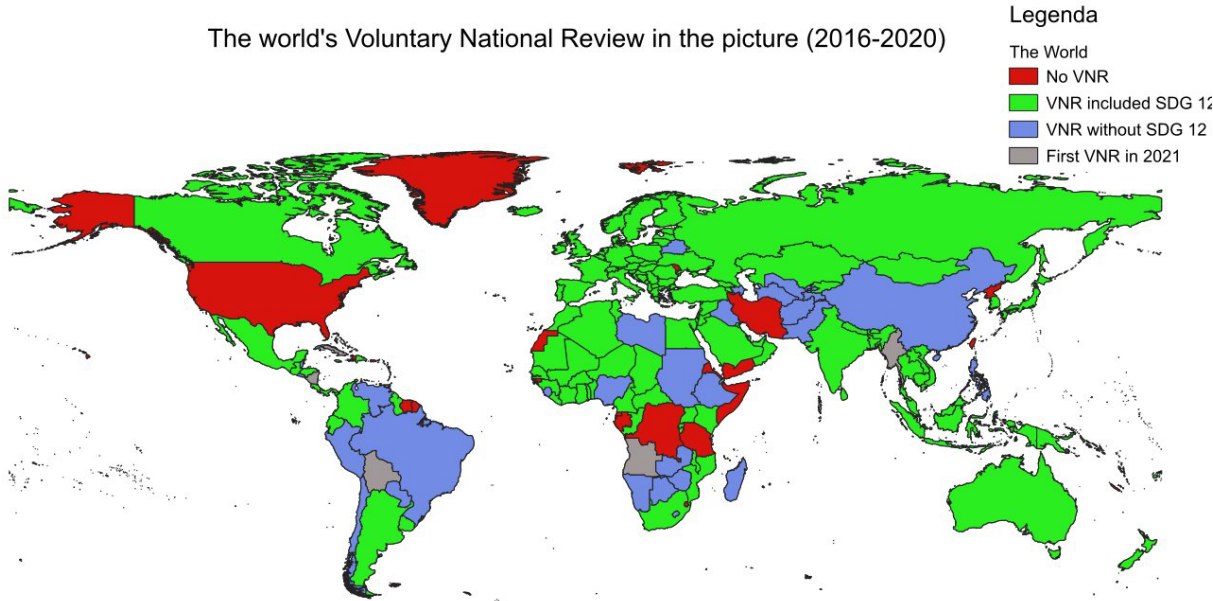


Figure 5 All 206 VNRs in the picture

Now that all necessary distinctions have been made, the non-English VNRs are excluded from the VNR sample from here on. This has obvious consequences for the comprehensiveness of the results, especially for the African and South-American continents (see table 8). Therefore, attempting to compare prioritisation between regions is neglected, as it would deliver unreliable results.

In the next section, the total of 108 English VNRs are evaluated in terms of their prioritisation and frequently found challenges. If the VNRs of SIDS (15) and LPCs (7) are subtracted, this leads to a sample of 86 VNRs.

4.2 Section 2: prioritisation

In this section, the prioritisation results are presented. First, an overview of all 108 VNRs is given. Then, the 86 VNRs (excluding SIDS and LPCs) are evaluated, followed by the individual evaluations of the SIDS and LPCs. After that, the detailed prioritisations and frequently found challenges per group are presented. Links to the theory are made in the result-analysis chapter (5). Therefore, this section only presents the ‘raw’ data.

4.2.1 Overall prioritisation total

Figure 6 presents the total prioritisation of SDG 12’s components for all 108 VNRs (including SIDS and LPCs). It shows the prioritisation of SDG 12’s components without differentiation between a policy or a baseline. The results are presented in both relative and absolute prioritisation values.

Overall, resource efficiency (12.2) and waste generation & recycling (12.5) practically share the most prioritised position. This means that at least 75% of the VNRs have reported on a policy and/ or baseline related to (1) the sustainable management and efficient use of natural resources and (2) the reduction of waste generation through prevention, reduction, recycling and reuse. The nearly equal prioritisation results for these targets might indicate a connection between the two targets.

Target 12.8 is the third overall most prioritised SDG 12 component with a relative prioritisation rate of 66%. Being a NT-target, this means that the majority of countries have reported on (upcoming) initiatives or policies directed at ‘ensuring that people everywhere have the relevant information and awareness for SD and lifestyles in harmony with nature’ (see table 1). In other words, most countries report on employing consumer-oriented strategies to raise awareness for SCP related topics.

Target 12.4 on the environmentally sound management of chemicals and all wastes throughout their life cycle is prioritised in reporting by 57% of the VNRs. The target seems to have overlap with target 12.5 judging from the way it is formulated (see table 1). However, the prioritisation rate is nearly 20% lower. This is even more so for the other waste component of SDG 12. Target 12.3 on halving global food waste across the entire supply chain (from consumers to producers) has a prioritisation rate of 48%, making it the least prioritised waste target. The differences in the prioritisation rates of the waste targets is a remarkable initial result. It indicates that policies or indicators are reported on less in the VNRs, resulting in lower overall prioritisation rates.

Target 12.7 on promoting sustainable public procurement practices in accordance with national policies and priorities has a relatively low prioritisation rate of 44%. Seeing as 12.7 is a NT-target, this means that 47 (out of 108) VNRs report on (upcoming) policies that incorporate SPP components. Reported adjustments to existing Public Procurement policies have been taken into account as well.

The target with the lowest prioritisation value (39%) is 12.6 on encouraging companies to adopt sustainable practices and integrate sustainability into their reporting cycle. The value means that 42 (out of 108) VNRs have reported on specific (upcoming) policies or requirements directed at influencing the workings of the business community. Alternatively, the value can represent a baseline on the number of companies publishing sustainability reports, in line with indicator 12.6.1.

The MoI on sustainable tourism (12.b) and the rationalisation of fossil-fuel subsidies (12.c) have the lowest prioritisation rates of all SDG 12 components. A simple assumption for the relatively low value of 12.b might come from the fact that not all countries have a large tourism sector, resulting in low reporting rates on (upcoming) sustainable tourism policies.

The extremely low prioritisation rate of 12.c does not have one single potential explanation. In the first place, it might be that many countries do not have fossil-fuel subsidies, resulting in non-reporting. Secondly, it is possible that information on fossil-fuel subsidies is incorporated

into other SDGs that relate more directly to energy (e.g. SDG 7). However, to check the latter possibility the key-word ‘subsid’ (in order to include ‘subsidy’, ‘subsidies’, ‘subsidized’ etc. all at once) has been used in all (108) relevant VNRs to test this explanation. No further reference towards fossil-fuel subsidies seem to have been made in the form of planning to phase-out, or the availability of a baseline or other relevant data.

An interesting observation is to see how resource efficiency is the most prioritised target, while a rationalisation of fossil-fuel subsidies is the lowest (12.c). It raises questions how these components relate to each other.

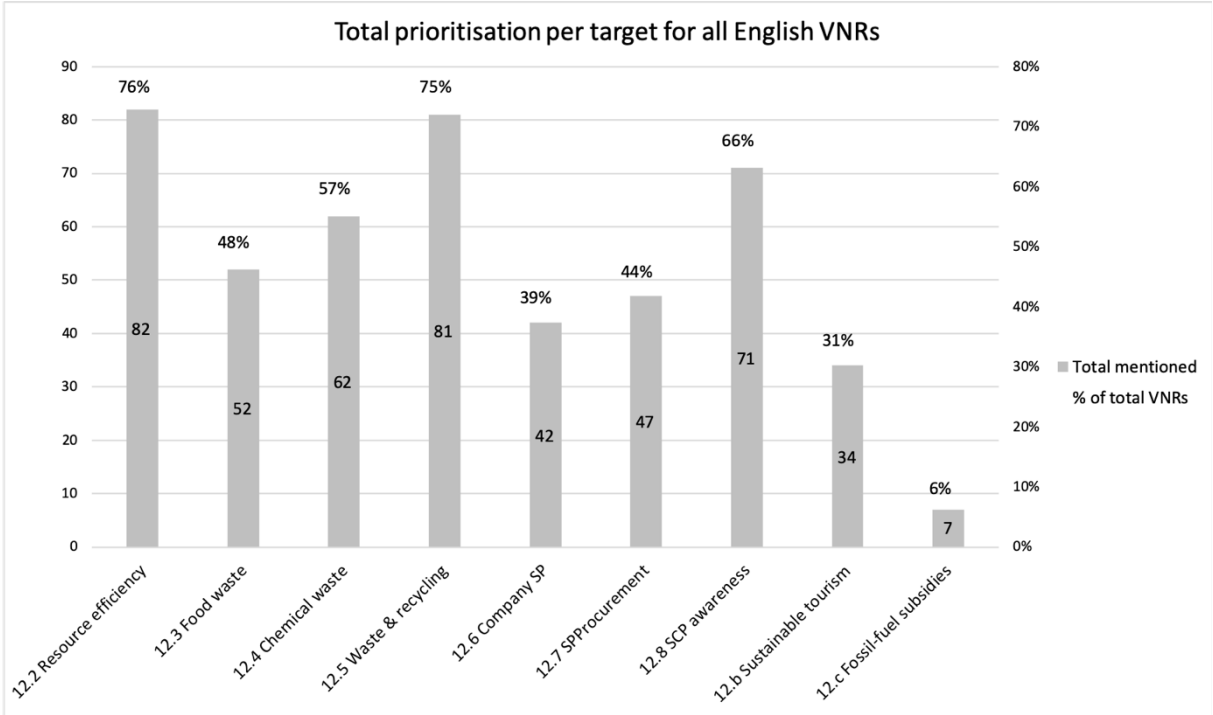


Figure 6 The overall prioritisation pattern of all 108 VNRs

Distinguishing the prioritisation values might offer more insight into the way in which countries report on SDG 12’s components in the VNRs. The following section starts with excluding SIDS and LPCs from the sample size used in this subsection.

4.2.2 Overall prioritisation for all groups

GNI-classes (excluding SIDS and LPCs)

Figure 7 presents the overall prioritisation of the 86 VNRs from all HI – LI countries that reported on a SDG 12 components. Similar to the figure 6, target 12.2 is the most highly prioritised. In fact, the relative value is 3% higher than before the exclusion of SIDS and LPCs. In contrast, the relative value of target 12.5 has gone down 3%, indicating that (one of) the excluded groups prioritise(s) target 12.5 more than 12.2.

The other waste targets (12.3 and 12.4) are barely affected by the exclusion of SIDS and LPCs. The food waste value has increased slightly (+2%), while the prioritisation rate of chemical waste has remained the same.

Target 12.8 remains the target with the third highest priority value. The prioritisation rate has increased with 4% compared to figure 6, indicating that SIDS and LPCs focus comparatively more on awareness-raising.

Both targets 12.6 and 12.7 remain the lowest prioritised across targets. However, both values have increased with 4% while compared to figure 6. Countries without a SIDS or LPC status tend to focus more on these targets than the ones that do.

For MoI 12.b, nearly a third of the absolute values are subtracted due to the exclusion of SIDS and LPCs. While this is a considerable amount, it does indicate that reporting on this MoI is not necessarily exclusive to SIDS.

Similar to the overview in figure 6, the lowest overall prioritisation lies MoI 12.c. However, if the absolute values are compared, it becomes clear the frequency has gone down with 1 prioritisation. Yet, 22 VNRs (20%) of the total were subtracted.

Some minor differences occurred when excluding SIDS and LPCs from the VNR sample. Some indications have already been presented towards how these groups might differ in their prioritisation rates. So, what do the overall prioritisations of SIDS and LPCs look like?

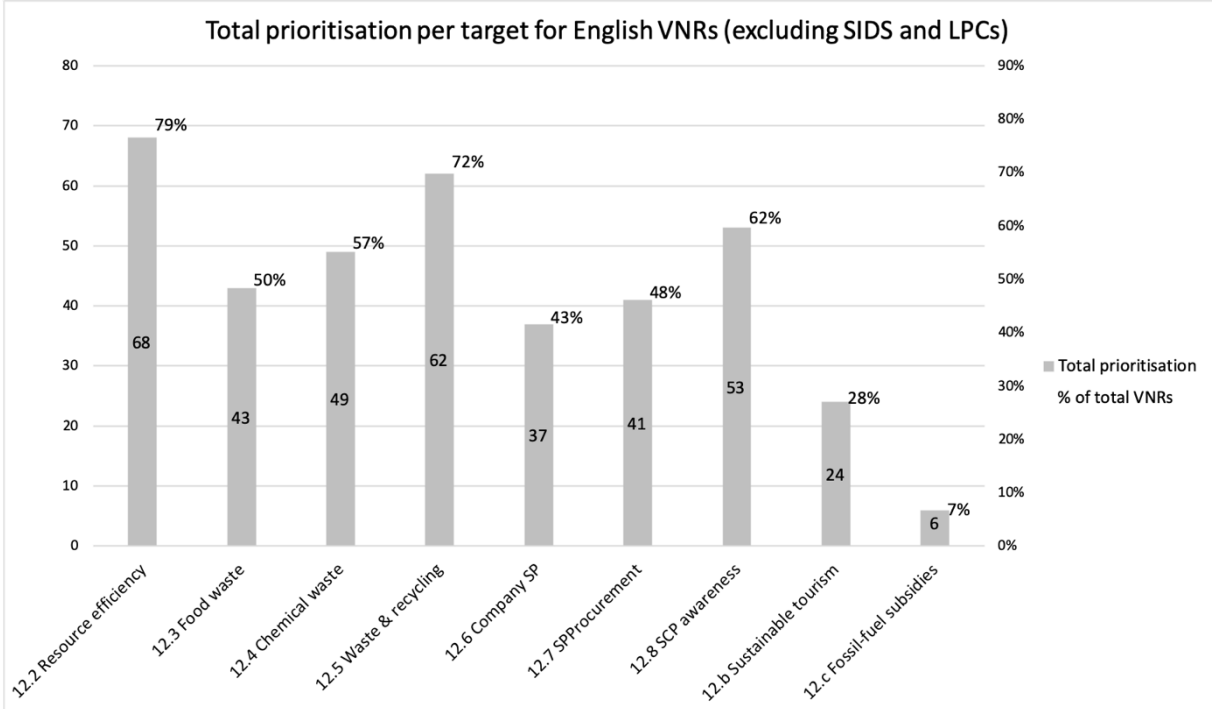


Figure 7 The overall prioritisation pattern of all VNRs (excluding SIDS and LPCs)

SIDS

Compared to figure 7, the overall prioritisation of SIDS presented in figure 8 shows notable differences with the collective GNI-classes prioritisation. The most prioritised targets on SIDS are target 12.5 and 12.8. In contrast with the previous findings, target 12.2 is fifth on the prioritisation list, with 47% of SIDS reporting on it in the form of a policy and/ or baseline.

Also, the targets on chemical-and food waste are more highly prioritised by VNRs from SIDS. The former has a prioritisation value of 67%, which is 10% higher than the average presented in figure 7. The relative prioritisation of food waste is not significantly higher than the average presented in figure 7.

The targets with the lowest prioritisation align with the general picture of figure 7 (12.6 & 12.7), although the relative values are much lower than the overall average. Potentially, differences in the economic structure of SIDS serve as an explanation for such a low prioritisation of target 12.6. The two countries that did report on company sustainability practices were Jamaica and Singapore.

For the MoI, the low prioritisation of 12.c aligns with the earlier perceived trend. The one SIDS that has reported on it is Cabo Verde, which stated to have stopped fossil-fuel subsidies since 2009. MoI 12.b on sustainable tourism could be perceived as rather surprising, seeing as many

SIDS have a higher dependence on tourism-based activities in their economies. Yet, the prioritisation value barely exceeds the value presented in figure 7.

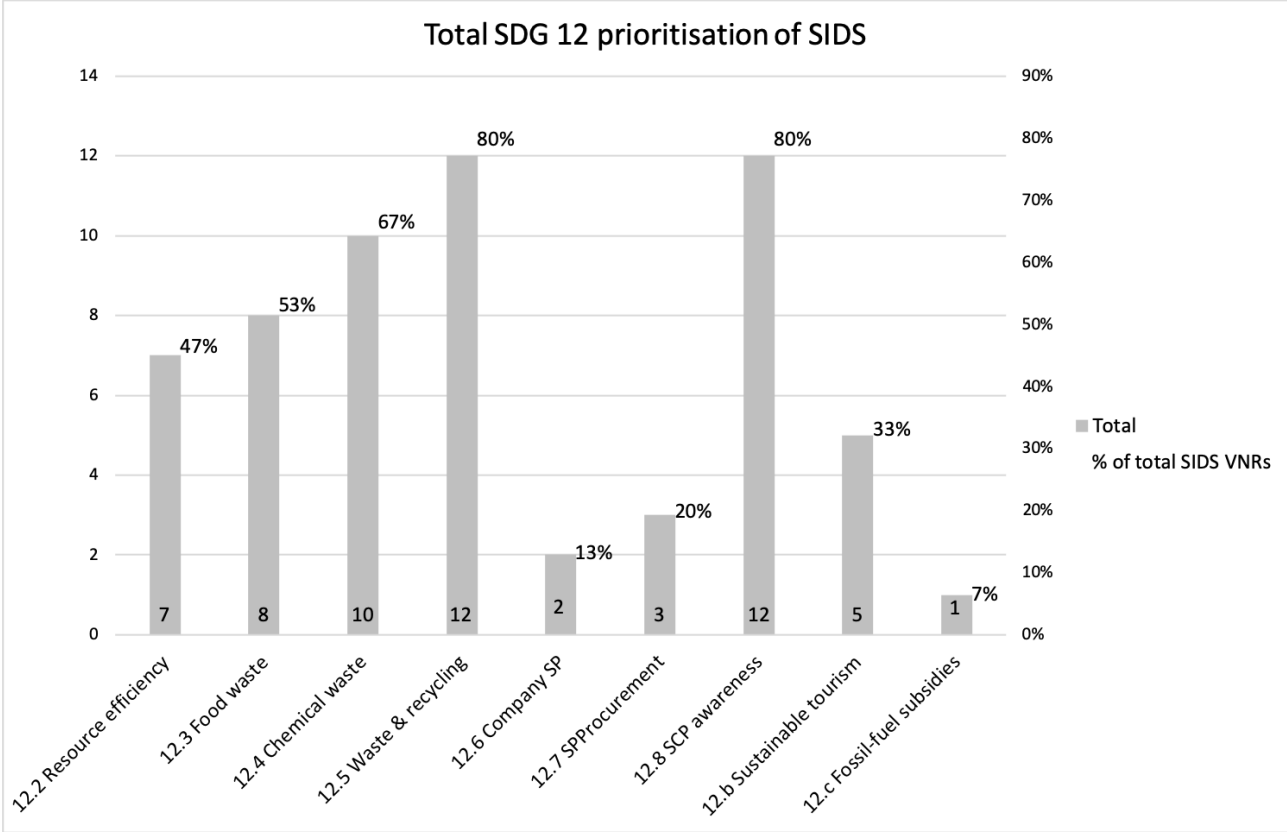


Figure 8 The overall prioritisation of SIDS

LPCs

The seven LPCs are Bhutan, Brunei Darussalam, Cyprus, Guyana (the only South-American VNR published in English), Liechtenstein, Malta and Montenegro (UN, 2012). Five of the seven LPCs are HI countries, while the other two are LMI.

The low frequency of LPCs make the prioritisation of this group less insightful. Especially because they do not share characteristics in the way SIDS do, except for their small populations. However, it does seem that the prioritisation of LPCs strongly aligns with that of the 86 countries presented in figure 7. All countries report on resource efficiency and waste generation & recycling. The other targets generally have a low prioritisation, except for 12.8 on raising awareness. Interestingly, 5/7 VNRs (71%) have reported on sustainable tourism (12.b). The prioritisation of this MoI is much lower in SIDS and the aggregate GNI-class groups. It could indicate that the majority of the LPCs have tourism-dependent economies. However, seeing as the group size is so small, no definitive conclusions can be made.

Also, the absence in food waste reporting (12.3) is remarkable as only Guyana has reported a baseline or policy on this topic in its VNR.

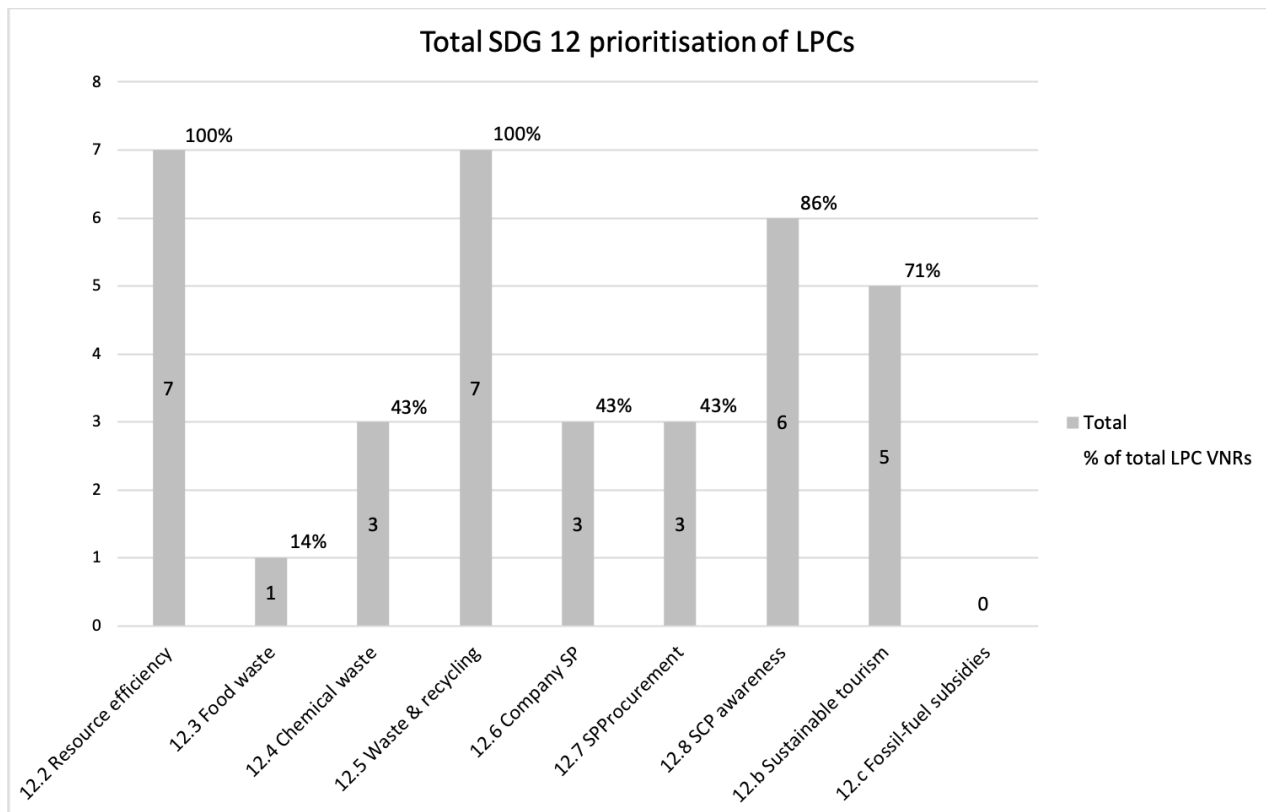


Figure 9 The overall prioritisation of LPCs

The overall prioritisation values of SIDS and LPCs showed some major differentiations. However, a proper comparison is only possible when the GNI-classes are evaluated individually as well. Therefore, the following section presents the detailed target prioritisation values (see evaluation scheme in table 7) for all groups. Furthermore, the frequently found challenges aim to give context to the prioritisation patterns of each group.

4.2.3 Detailed target prioritisation and frequently reported challenges per group

Each section is accompanied by a graph to present both the total prioritisation (similar to figure 6 & 7), and the detailed prioritisation (following the evaluation scheme). When discussed in the text, the absolute values of all figures are directly translated in relative percentages (comparative to the group size of a GNI-class). SDG 12's components are discussed according to the T-target and NT-target categorisation (see methodology). The graphs are created in such a way that the T-targets are shown on the left side (12.2-12.6 & 12.c), and the NT-targets on the right side (12.7, 12.8 & 12.b) with some space in between. Furthermore, each section is accompanied by the frequently reported challenges (3 or more), aiming to provide context to what is perceived as challenging per group.

Finally, all findings are summarised shortly in a synthesis section. This means that comparisons are made between groups based on their relative prioritisations. The section is accompanied by a table that includes all relative prioritisation values to be able to make those comparisons (i.e. relative to the VNR-size of the groups). The differences in group size have to be taken into consideration at all times, therefore the number of VNRs per group are incorporated in the title of the sections.

High-Income: 41 VNRs

T-targets (12.2-12.6 & 12.c)

The most highly prioritised targets in VNRs originating from the HI-class are target 12.2 and 12.5. This coincides with the results of the overall prioritisation presented in figure 7. Figure 10 allows for more insight into the way in which these targets are reported on. Target 12.2 has a high degree of yellow, meaning that either a policy or baseline is presented in the VNR. For target 12.5, the majority of reporting consisted of a policy and a baseline (green). This means that more VNRs contain reporting of created policies based in conjunction with existing data for target 12.5 (50%) than for 12.2 (22%), while they have more or less the same overall prioritisation.

Figure 7 showed that 50% of all VNRs (excluding SIDS & LPCs) report on food waste, which equals 43 VNRs. The majority of these are found in VNRs from HI-countries. Around 63% (26 VNRs) of the VNRs from this group include reporting on the topic. This is not only significantly higher than the average presented in figure 7, but also means that more than half of all food waste prioritisation values come from HI-countries' VNRs. In terms of the detailed evaluation, it is evident that the food waste target is mostly reported on through a policy or a baseline (yellow). This indicates that data availability on the target is low, or that reported data is not accompanied by reported policies. The absence of data in conjunction with policy remains even though any data along the food chain is seen as relevant for a green evaluation.

Target 12.4 (56%) and 12.6 (54%) are the T-targets with the lowest prioritisation rates. The former value is nearly equal to the average presented in figure 7. This means that more than half of the VNRs report on being part of an international multilateral environmental agreement on hazardous waste, or have data on the hazardous waste generated per capita. Remarkably, the number of VNRs reporting on those possibilities in conjunction is very low (<10%). The HI challenges section offers a potential explanation for this.

The latter value (12.6) is prioritised significantly more by HI-countries compared to the average value of figure 7 (43%). More precisely speaking, more than half of the VNRs from HI-countries reported on policies, EPR/ CSR obligations or the number of companies publishing sustainability reports (indicator 12.6.1). It seems that in general, HI-countries' governments are employing such strategies more often than other groups. However, within the HI-group itself, it is still the least prioritised T-target.

Similar to what has been perceived an evaluated earlier, MoI 12.c has a remarkably low prioritisation in reporting. The one green value in this case comes from England's (2019) VNR, stating that it does not have any fossil-fuel subsidies. The other is from New Zealand who states to be a member of the Fossil-Fuel Subsidy Reform (FFSR) organisation, operating both domestically and internationally. If others HI-countries are a member of such an organisation, it would be interesting to know why they have not incorporated that into their VNRs.

NT-targets (12.7, 12.8 & 12.b)

For the NT-targets, target 12.8 on awareness raising is most highly prioritised. About 68% of the VNRs report on having implemented a policy or initiative to raise awareness on sustainable lifestyles, or incorporation of SD into the education system. Comparatively speaking, this value is higher than the average presented in figure 7 (62%). As such, HI VNRs report on implementing strategies to change consumer behaviour more often than other GNI-classes. However, SIDS and LPCs prioritise target 12.8 more than HI-countries. The policies and/ or initiatives have already been implemented in almost all cases judging from the high number of green values. Yet, this also means that the 12 VNRs that did not report on awareness-raising activities also did not report on planning to implement them in the near future.

SPP (12.7) has seen a relatively low prioritisation in the VNRs (54%), which is still higher than the average presented in figure 7. About 73% of the VNRs that contained relevant SPP

information reported on having the requirements or policies already implemented (green). Another 17% reported to implement such requirements soon, or to adjust existing Public Procurement policies so that it aligns with sustainability principles. However, almost half of the VNRs did not report on its own procurement practices.

As far as sustainable tourism is concerned, around a quarter (10) of the HI VNRs contained reporting on this MoI. Of those, 90% mentioned having implemented sustainability consideration into policies or had created specific sustainable tourism plans.

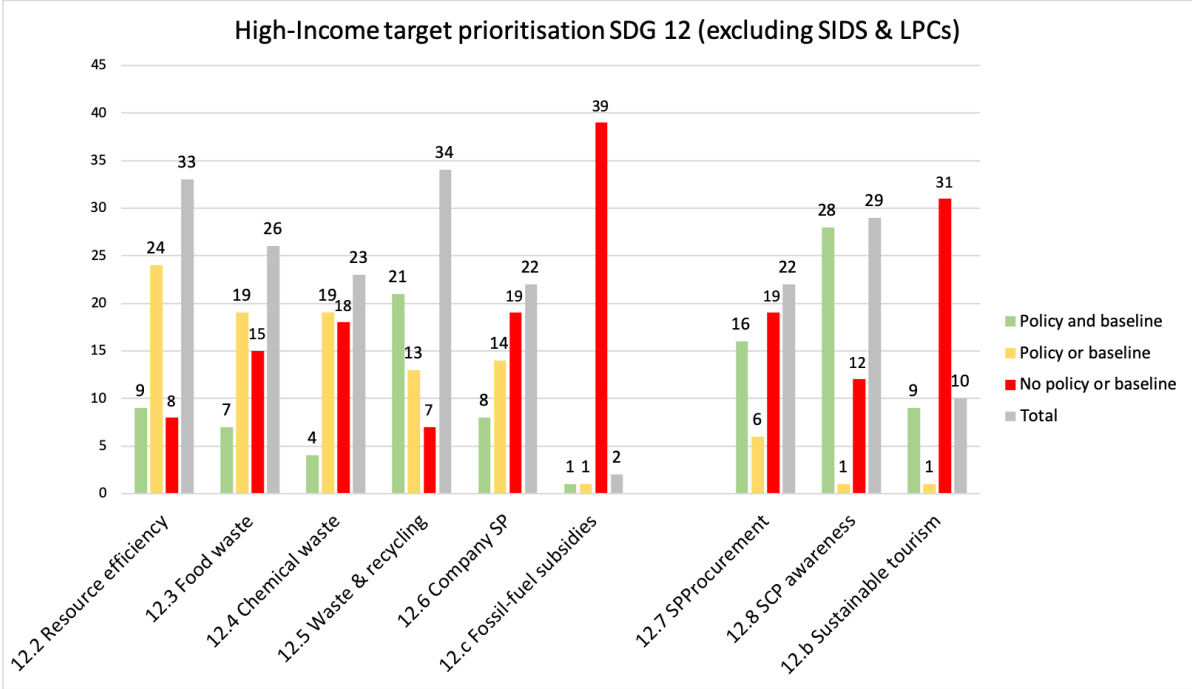


Figure 10 The detailed prioritisation of the High-Income class (UN, 2012)

So, the prioritisation of VNRs from HI-countries mostly aligns with the hierarchy as presented in figure 7. However, in most cases the value is a bit higher than the presented average. The number of times targets were reported on in the form of both a policy and a baseline (green) is low, except for target 12.5. The challenges presented in the following section attempt to provide context for the way in which HI-countries’ VNRs have prioritised reporting on SDG 12.

Frequently found challenges: HI

Out of the 41 VNRs in the HI category, 31 VNRs (+/- 76%) have reported at least one challenge related to a SDG 12 component. The number of reported challenges is generally very low. Yet, the targets with the most reported challenges are targets 12.2: resource efficiency and 12.5: waste generation & recycling. This means that the targets with the highest priority are also the cause for the most reported challenges for HI-countries. Still, less than half of the VNRs that reported on a target or MoI, has also reported a challenge.

Three countries have reported on similar challenge for target 12.2. They all concern maintaining economic productivity (or growth), while improving resource efficiency and taking into consideration ecological limits. For example, Latvia (2018) states that ‘Increasing productivity of the economy, including through the efficient and productive use of resources’ is a challenge. The same challenge has been reported by Estonia (2016). Israel’s (2019) reported challenge complements Latvia by stating that ‘One of the main challenges that industry faces is the need to be economically efficient and competitive while complying with environmental regulations and safeguarding the environment.’

These challenges imply difficulty around the UN's notion to decouple economic growth from environmental degradation, which is also one of the corner stones of SDG 12/ SCP. They raise questions around the types of resource-efficiency policies that are reported in VNRs, and how they relate to the overarching goal of 'decoupling'.

Other frequently found challenges concern the waste targets (12.3-12.5). Some of 12.5's challenges can relate to multiple waste targets (12.3 & 12.4) at the same time, because countries are making a statement that relates to waste a whole. HI VNRs report on (1) an increase in generated waste and (2) challenges around sorting waste.

For the former, reported causes vary from (urban) population growth (Kuwait, 2019; Saudi-Arabia, 2018; Australia, 2018) and the changing nature of waste, which also complicates recycling practices. Australia (2018) exemplifies the effect of the changes in waste in its VNR: *'The nature of waste has changed, with more complex goods now a significant component of landfill, making the process of recovery or recycling of components more challenging and resource-intensive... Electronic waste, which is growing three times faster than any other type of waste in Australia.'* Similar challenges have been reported by Finland, New Zealand and Slovakia without specifically mentioning e-waste. For example, New Zealand (2019) states *'The amount of waste disposed to levied landfills per capita rose by 20 percent in the three years between 2014 and 2017, and the upward trend is set to continue.'* This quote does not only imply an increase in waste, but also an inability to treat waste in an appropriate manner. Therefore, it seems that increases in waste generation relate directly to challenges around sorting and treating waste. The reported causes vary from a lack of appropriate facilities and technologies (Croatia, 2019; Qatar, 2018) and a lack of sorted waste disposal systems at the source (Latvia, 2018; Saudi-Arabia, 2018).

Apart for the implications these challenges might have for recycling, the issue of sorting waste might also contribute to the low data availability of food & chemical waste in the previous section. The municipal waste generated (12.5) is available in many cases, which is translated into a high number of green values. However, if waste separation is (increasingly) complicated, this might possibly result in lower data availability for the other waste types.

On a final note, it is remarkable that the most reported challenge on a target that aims to reduce waste generation, is an increase in waste. This could imply an inadequacy of the approach taken in some countries, especially in the ones which have reported on it.

For target 12.8 (awareness raising), the role of the consumer is a central topic in the reported challenges. Germany, Scotland, Slovakia, Slovenia and England all report challenges on the difficulty in changing consumer behaviour, applicable to a variety of SDG 12's topics. England (2019) reports that *'Changing consumer behaviours can be challenging... The right infrastructure can help to change society's mindset, as will appropriate enforcement measures that nudge people to 'do the right thing''*. Interestingly, Germany (2016) notes a misalignment of consumers' perceptions and actions: *'Two out of three Germans believe that the environment can only be protected in the long term if everyone's consumption is resource-efficient. There is, however, a discrepancy between many consumers' real-world behaviour and their environmental awareness. At present, German consumer behaviour does not take the Earth's carrying capacity into account to an adequate degree and requires critical discourse.'* These challenges are particularly interesting when they are presented together. England states to steer people to 'do the right thing', while Germany notes a discrepancy between the awareness people have and the decisions they take. The latter implicates that knowing what is 'right' does not necessarily lead to a change in behaviour. However, these findings are highly contextual and cannot be generalised for the entire HI-class.

In sum, for the HI-class the targets with the highest prioritisation also have the highest number of reported challenges. This further complicates the possibility to make statements on how the less prioritised targets are perceived, or why they are not prioritised.

Upper-Middle Income: 18 VNRs

T-targets (12.2-12.6 & 12.c)

The most highly prioritised targets in VNRs originating from the UMI-class are target 12.2 and 12.5 (both 78%). Similar to the HI-class, this coincides with the results of the overall prioritisation presented in figure 7. In terms of how the targets are evaluated, target 12.2 and 12.5 follow a similar pattern to the HI-class in the number of green and yellow evaluations. Namely, the occurrence of reporting on policy and a baseline (green) is high for targets 12.5 and low for 12.2.

Furthermore, target 12.4 deviates from the average-pattern (figure 7) as it is prioritised by 72% of the VNRs from UMI-countries (as opposed to 57%). Remarkably, the absolute number of green evaluations for target 12.4 is higher in the UMI-class (5) than in the HI-class (4) (while UMI's group size significantly smaller). This means that more VNRs in the UMI-class have reported on being part of an international multilateral environmental agreement on hazardous waste in conjunction with the presentation of data than in the HI-class.

The target on food waste has a significantly lower prioritisation (39%) in the UMI-class than the average presented in figure 7. However, the majority of the VNRs that did contain reporting on this topic included both a policy and a baseline in the rapport. Despite that, the target seems to get less attention in the UMI-class VNR reporting. In other words, less policies or data are reported around tackling food waste at any level of the supply chain.

Target 12.6 is also reported on in 39% of the cases, a little below average and a much lower than in the HI-class. So, VNRs from UMI-countries are less likely to report on policies that aim to encourage company sustainability practices or the number of companies publishing sustainability reports.

Lastly, MoI 12.c has not been reported on in any VNR from an UMI country.

NT-targets (12.7, 12.8 & 12.b)

For the NT-targets, the prioritisation of 12.8 is nearly equal to the average presented in figure 7 (61%). However, this makes awareness-raising less prioritised in VNR reporting than in countries from the HI-class (68%). A notable difference in the UMI-class is that relatively more VNRs report on planning to implement (yellow) policies and initiatives on awareness raising than in the HI-class.

The prioritisation of 12.7 on SPP (57%) is higher than the average. Most of the VNRs that reported on SPP have already implemented policies or requirements. Concerning MoI 12.b, a third of the VNRs (33%) have reported on having implemented sustainable tourism policies or requirements. However, none of the others have reported developing 12.b policies at the time.

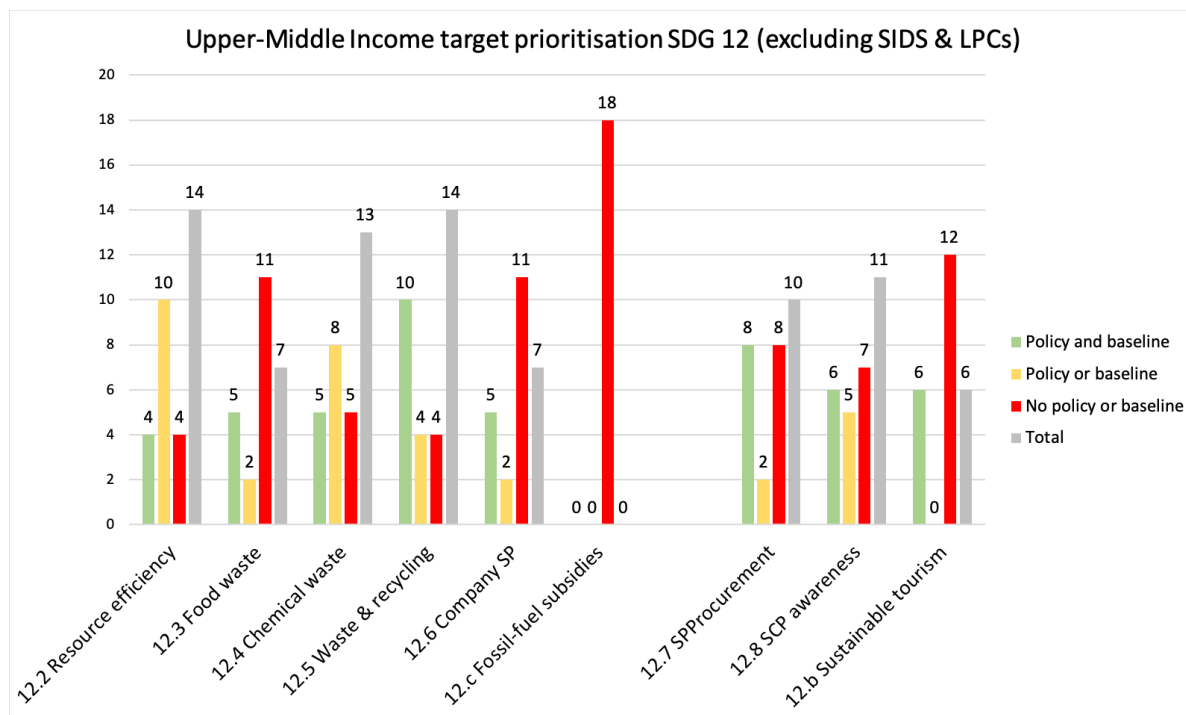


Figure 11 The detailed prioritisation of the Upper-Middle Income class (UN, 2012)

So, in terms of the most highly prioritised targets, the UMI-class values align with the average in figure 7. However, especially the targets on food waste and company sustainability practices have had less attention in reporting. At the same time, target 12.4 is almost as highly prioritised as targets 12.2 and 12.5, which deviates from the general picture. The emphasis on the two waste targets (12.4 and 12.5) make the lower prioritisation of the 12.3 (food waste) interesting.

Frequently found challenges: UMI

Out of the 18 VNRs in the UMI category, 11 (61%) have reported at least one challenge. However, in the UMI's case, the targets with the highest prioritisation values do not produce the most reported challenges (which is the case in the HI-class). The targets on food waste (12.3), waste and recycling (12.5) and 12.d (challenges that do not fit any target or MoI) are most reported on in UMI-countries' VNRs. Still, only a maximum of four countries has reported a challenge for either of these. Furthermore, the reported causes for the challenges vary across countries, making it irrelevant to comment on potential commonalities or structural differences for them.

However, there is consistency in a challenge reported in 12.d, as three VNRs report on data gathering complications. North-Macedonia (2020) states that *'Although the Government has a robust system to produce relevant environmental indicators, reporting environmental indicators in line with the SDG and other international standards remains a challenge.'* This indicates a misalignment of nationally available indicators and the indicators used by the SDGs. Such a challenge could also be an explanation for the generally low frequencies of reporting data (in conjunction with policy) in the VNRs across GNI-classes. Furthermore, South-Africa (2019) reports that *'The main limitation faced by South Africa in reporting progress in SDG12 targets is a general lack of data. For most targets, there are no accurate primary data to measure progress over time.'* This challenge relates more to the ability to monitor and accumulate data, further substantiated by Thailand's (2017) reported challenge: *'Increasing capacity of Thai agencies in monitoring material footprints and domestic material consumption will help address Thailand's challenge in implementing SDG12.'* Thailand's quote specifically relates to target 12.2, which has already shown a low number of green evaluations in the HI and UMI-classes.

In sum, data collection is the main reported challenge in VNRs of UMI countries. For the following sections, the question remains whether differences in prioritisation patterns and reported challenges continue to occur.

Lower-Middle Income: 14 VNRs

T-targets (12.2-12.6 & 12.c)

The most highly prioritised targets in VNRs originating from the LMI-class are target 12.2 (86%) and 12.5 (71%). While the relative values seem to differ a lot, the graph in figure 12 shows that this difference only consists of two VNRs. Yet, a relative decrease in prioritisation of target 12.5 is visible compared to the other classes. The pattern is that resource efficiency becomes more prioritised, while waste generation and recycling becomes less prioritised.

Furthermore, one major difference occurs in this class. The number of countries that are able to report on target 12.5 with policy and a baseline (green) has become less than the countries that cannot (yellow). In the previous GNI-classes, the green values outweighed the yellow values. This indicates that the data availability is lower or less policies exist around waste generation and recycling.

The lower-than-average and continued decreasing prioritisation of 12.3 (36%) and 12.4 (43%) indicate a decreasing emphasis on waste as a whole (12.3-12.5). However, similar to the UMI-class, the absolute number of VNRs reporting a baseline and policy (green) on food waste is relatively high compared to the HI-class. The consistency in this finding across these two classes might indicate a differing conceptualisation of food waste, leading to differing data types. For example, it could be that the UMI and LMI class are mainly concerned with post-harvest food losses (i.e. waste), while the HI-class has a focus on consumer food waste.

Together with 12.3 and 12.4, target 12.6 is also one of the lowest prioritised T-targets in the LMI class (43%). However, it is similar to the average presented in figure 7. Also, the availability of data (number of companies publishing sustainability reports) in combination with policy or CSR/EPR requirements is lower than the UMI-class.

Interestingly, the frequency of reporting on MoI 12.c is the highest in the LMI-class across groups. The yellow values are represented by Egypt and Sri Lanka, both of which had (old or vague) data available on indicator 12.c.1. The green value originates from Viet Nam, which stated to have phased out direct fossil-fuel subsidies, and is phasing out indirect ones as well.

NT-targets (12.7, 12.8 & 12.b)

For the NT-targets, the story around 12.8 is similar to that of the UMI-class. The relative value (57%) is a little lower than the average of figure 7 (62%). Yet, this difference is negligible due to the small group size. However, the majority of the VNRs that reported on target 12.8 have stated to implement awareness policies or initiatives in the near future. In the previous classes, most VNRs stated to have implemented them already.

The emphasis on SPP (12.7) is lower than average (43%) and that of the HI-and UMI classes. So far, it seems that the prioritisation of this target is going down alongside the decrease in GNI per capita.

Countries that did report on sustainable tourism (12.b) stated to have implemented policies or requirements. The remaining VNRs have not reported on the MoI.

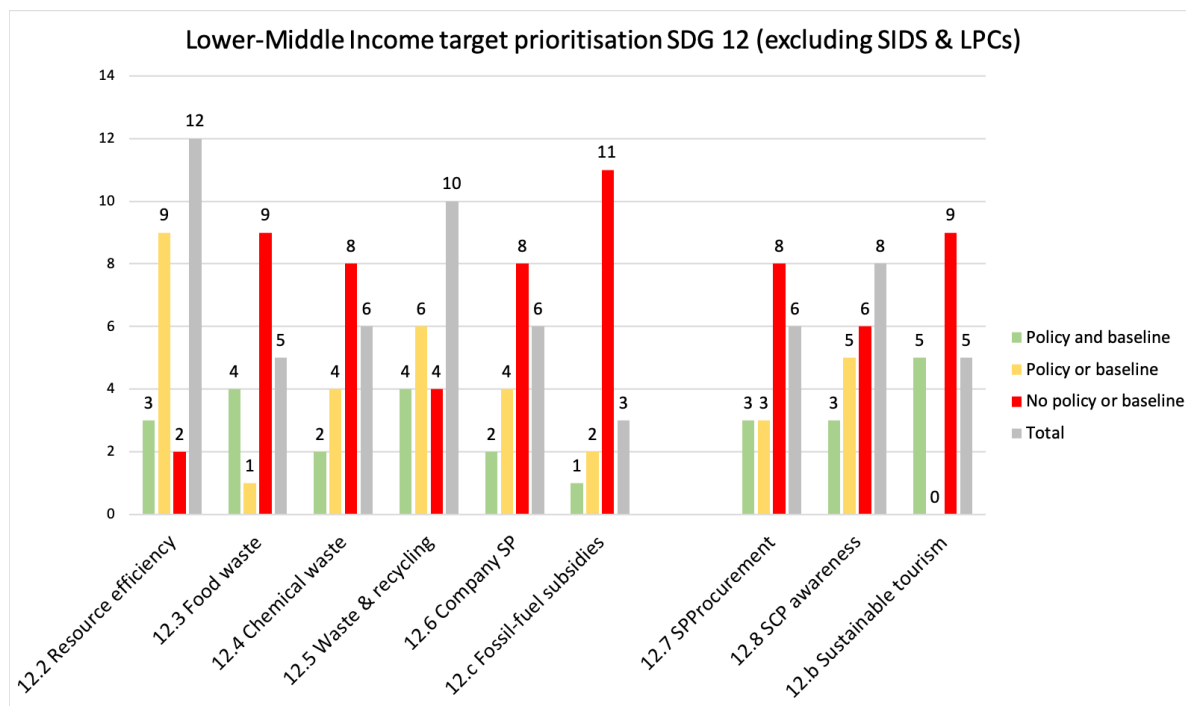


Figure 12 The detailed prioritisation of the Lower-Middle Income class (UN, 2012)

Frequently found challenges: LMI

Out of the 14 VNRs in the LMI category, 11 (~79%) have reported at least one challenge related to a target or MoI of SDG 12. Again, only target 12.d has shown consistency in the content of the reported challenges. However, it does produce two distinct challenges in this class despite the small group size. The first frequently reported challenge is similar to what has been found in the UMI-class. There are challenges around data availability and monitoring, reported on in four VNRs. In most cases, this relates to SDG 12 as a whole. Quotes of countries are not incorporated since their content does not present new information.

Secondly, four VNRs contain reporting on issues around inadequate, ineffective and non-existing regulation or policies for SDG 12. Causes range from inadequate regulation for particular targets (e.g. hazardous waste management) to the alignment of existing policy documents with SDG 12's components. Furthermore, Loa PDR (2018) emphasises the creation of new operational policies: *'The relative newness of sustainable consumption and production in Lao PDR means that policy and operational frameworks are inadequate.'* In general, fragmented institutional efforts and limited awareness of SCP as a concept are addressed causes of the challenges.

So, multiple challenges were reported by LMI VNRs. The combination of a lack of data and (subsequent) policies are the challenges mainly reported on. These challenges might indicate a potential explanation for the relatively lower absolute and relative prioritisation values of the LMI-class. An example is the lower data availability of target 12.5 compared to the HI-and UMI classes.

Low-Income: 13 VNRs

T-targets (12.2-12.6 & 12.c)

The most highly prioritised target in VNRs from the LI-class is target 12.2 (69%). Differences with previous classes are evident based on figure 13. First of all, the relative value of the most-prioritised target is notably lower than in previous classes (< 70%). Secondly, target 12.5 has lost its dominant prioritisation position completely. And third, none of the VNRs that reported on resource efficiency (12.2) did so with both a policy and baseline (green value).

The prioritisation of target 12.3 is similar to that of the LMI-class. However, a prioritisation of 38% (5 VNRs) implies that food waste is not considered in many VNRs of LI-countries. Still, 3/5 of the VNRs that did report on 12.3 were able to present both a policy and data on the topic. This further substantiates the previously made possibility that a different type of food waste is considered in these VNRs.

Target 12.4 is the second most highly prioritised T-target (54%) and close to the average of 57%. The LI-class is the first group that prioritises food- and chemical waste over waste generation and recycling (12.5).

Only two VNRs (15%) report on a number of companies publishing sustainability documents or policy directed at changing company behaviour. This makes it the least prioritised T-target, similar to the pattern seen in all other groups so far. As such, steering companies towards sustainable practices might be perceived as of low importance in the strategic ordering of SDG 12’s components.

MoI 12.c has only been reported on by Bangladesh, which included data on the amount spent on fossil-fuel subsidies. However, this was not accompanied by reporting on existing efforts to phase them out.

NT-targets (12.7, 12.8 & 12.b)

For the NT-targets, raising awareness (12.8) has the lowest prioritisation across GNI-groups (38%). The VNRs that did report on it, mostly mentioned implemented policies or initiatives.

Both SPP and sustainable tourism have a prioritisation of 23%. When it comes to SPP, the previously mentioned observation that the prioritisation decreases alongside GNI per capita has held up.

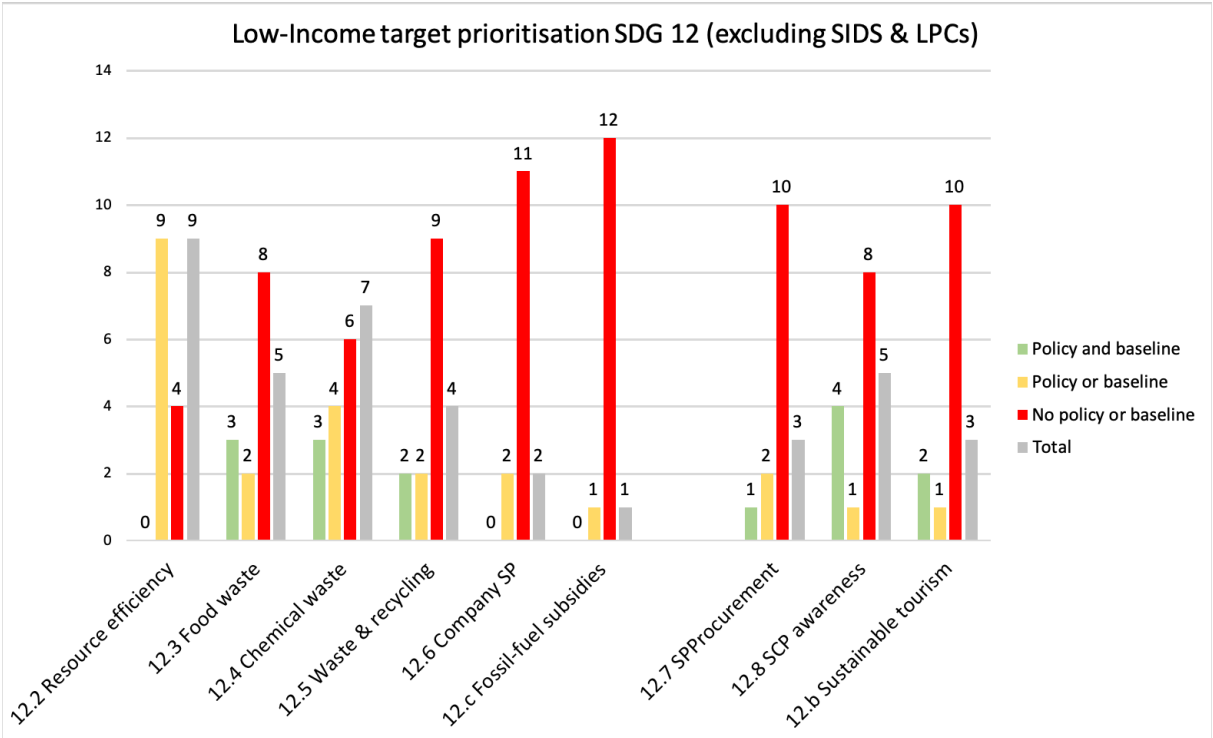


Figure 13 The detailed prioritisation of the Low-Income class (UN, 2012)

So, the prioritisation rates of SDG 12’s components are generally lower in VNRs from the LI-class than in other groups and does not align with figure 7. Still, the most prioritised target remains 12.2, which seems to be more or less consistent across groups. The high number of red values indicates a lack of reporting on both policies and data. Again, a critical note has to be placed on the relatively small group size.

Frequently found challenges: LI

Out of the 13 VNRs in the LI category, 10 (77%) have reported at least one challenge related to SDG 12. Overlap exists in the nature of the reported challenges for targets 12.4 and 12.d.

Three LI- VNRs share similar challenges on the management of chemical waste (12.4). Liberia (2020) states: ‘The assessment by the Ministry of Health (2009) revealed that the country lacks the resource capacity to empower regulatory bodies to monitor and ensure compliance in the healthcare waste management sectors.’. In addition, The Kyrgyz Republic (2020) stated: ‘The country, and the Central Asian region as a whole, lack the technological capabilities for the safe utilization of OPs and POPs.’ and that ‘Relevant regulations are not supported by implementation mechanisms.’. Finally, Cambodia

(2019) specifies its troubles towards mercury, stating that: *'The use of hazardous substances, especially mercury substances are not yet well managed in an environmentally sound manner and there is no specific government institution responsible for mercury management.'* These statements predominantly show that there is a lack of institutional capacity (both in funding, human resources and technology) to deal with chemical waste. The fact that multiple countries reported on similar challenges for target 12.4 might explain why chemical waste is prioritised relatively highly in LI VNR reporting.

Also, four VNRs report on similar data collection challenges as reported by the LMI-and UMI classes. This is substantiated by the high number of red values in figure 13. The data-issue is prevalent in group-specific challenges in 3 out of 4 GNI-classes.

Now that the GNI-classes have been evaluated, the remaining two groups (SIDS and LPCs) are evaluated in more detail.

SIDS: 15 VNRs

T-targets (12.2-12.6 & 12.c)

Figure 14 presents the detailed prioritisation of SIDS. The relative values of SIDS can be found in the text accompanying figure 8, and are therefore not repeated here.

SIDS generally seem to have a low degree of data availability in conjunction with policy, based on the overall absence of green values. Similar to the LI-class, reporting on target 12.2 is purely policy oriented, or only consists of a baseline without reporting on accompanying policies. For the waste targets (12.3-12.5), it is clear that food waste is prioritised least on SIDS and also has the lowest number of green values. For target 12.5, the municipal waste generation or national recycling rate (12.5) is known and combined with policy in at least five cases. However, the green values are still lower than the yellow ones, similar to the patterns found in the LMI- and LI classes. As seen in figure 8, nearly all SIDS neglect reporting on target 12.6 and MoI 12.c.

NT-targets (12.7, 12.8 & 12.b)

Since target 12.8 is the target with the shared highest prioritisation position for SIDS, the detailed prioritisation is extra interesting. Four SIDS have reported on planned awareness raising activities. This means that the majority (8) have already implemented awareness-raising activities of some kind. Of the five tourism prioritisations, four already have implemented policy or requirements and only Cabo Verde (2018) reported on implementing it in the future. In the case of SIDS, it is possible that the high prioritisation rate for raising awareness is closely related to the tourism industry. However, this thesis has not aimed to find out the potential relatedness of these targets in the SIDS-context. That being said, one could have expected a higher prioritisation on sustainable tourism in SIDS. It remains unclear why this is not the case.

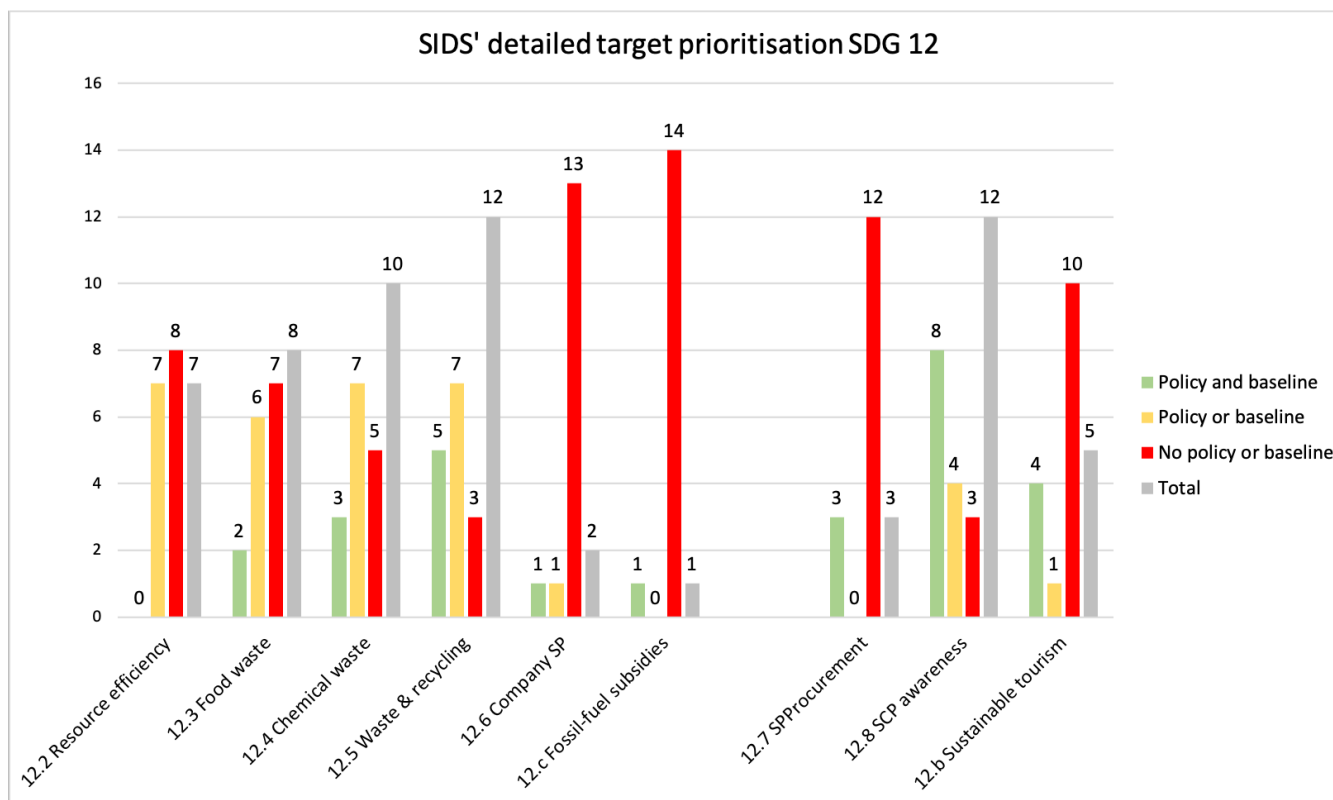


Figure 14 The detailed prioritisation of SIDS (UN, 2012)

Frequently found challenges: SIDS

Out of the 15 VNRs published by SIDS, 14 (93%) have reported at least one challenge related to SDG 12. Remarkably, 13/15 (87%) SIDS have reported on challenges related to target 12.5 on waste generation & recycling. No other group has come close to the frequency in which SIDS reported challenges on a single target. Again, some of these challenges can have overlap with the other waste targets.

Three SIDS mention the increase in waste generation (i.e. Singapore, Jamaica and Mauritius). The causes are similar to those stated by HI-countries. Singapore and Jamaica state: *'The amount of waste generated is expected to increase in tandem with population and economic growth.'* (Singapore, 2018) and *'Waste output is expected to increase to 1.5 kg/day per person subject to the influence of factors such as population increase, changes in consumption patterns, technological changes and economy modernization.'* (Jamaica, 2018). Both VNRs address increasing populations and economic growth as causes for the expected increase.

Complementary to such processes, VNRs from SIDS state a (1) scarcity of space, (2) a shortened lifespan of (new) landfills as waste streams grow (or absence of landfills) and (3) a lack of recycling facilities and/ or capacity.

Five challenges are reported specifically on recycling. They offer a variety of causes for the challenges around the topic. Both Mauritius (2019) and Samoa (2020) emphasise the lack of adequate facilities to recycle. Mauritius (2019) adds that a lack of legislation complements the lack of facilities issue. Micronesia (2020) addresses barriers around further upscaling of the recycling industry to a 'whole-of-country' transformation. The associated barriers are finding markets for recycled materials, and the high costs of exporting them due to its remote location. Palau (2019) also addresses complications in upscaling, as it states that *'Recycling needs to extend to a wider range of products. E-waste and junked cars are among priorities.'* Lastly, Singapore (2020) reports that their *'...manpower constraints limit the resources available for our waste management industry.'*, while they have achieved a recycling rate of 21% in 2017. So, while the recycling effort seems to be taken seriously in SIDS, challenges arise in the extent to which it can be realised on a large scale.

A last reported challenge with consistency that is mentioned by at least four SIDS is the lack of data, or inability to track it. This aligns with reporting of the UMI, LMI- and LI classes.

The last group to evaluate are the LPCs. After that, the results are summarised shortly in the synthesis section.

LPCs: 7 VNRs

T-targets (12.2-12.6 & 12.c)

All LPCs have reported on target 12.2 and 12.5. However, figure 15 shows that in both cases only one VNR reported on having both a policy and data available. For all other T-targets, none of the LPC’s VNRs reporting was fit to be evaluated ‘green’. So, the VNRs only contained a policy or a baseline. Comments on the relative prioritisation values can be found in the text accompanying figure 9.

NT-targets (12.7, 12.8 & 12.b)

Reporting on the implementation or development of awareness raising strategies is done by all LPCs except for Montenegro (2016). Furthermore, most of the LPCs have implemented sustainable tourism policies or requirements, and Montenegro was in the process of development at the time of their VNR publication (2016). Liechtenstein (2019) and Guyana (2019) did not report on 12.b.

Due to the small group size of LPCs, consistency in the reported challenges has not been found. However, the reported challenges are taken into account in a chapter 4.3.

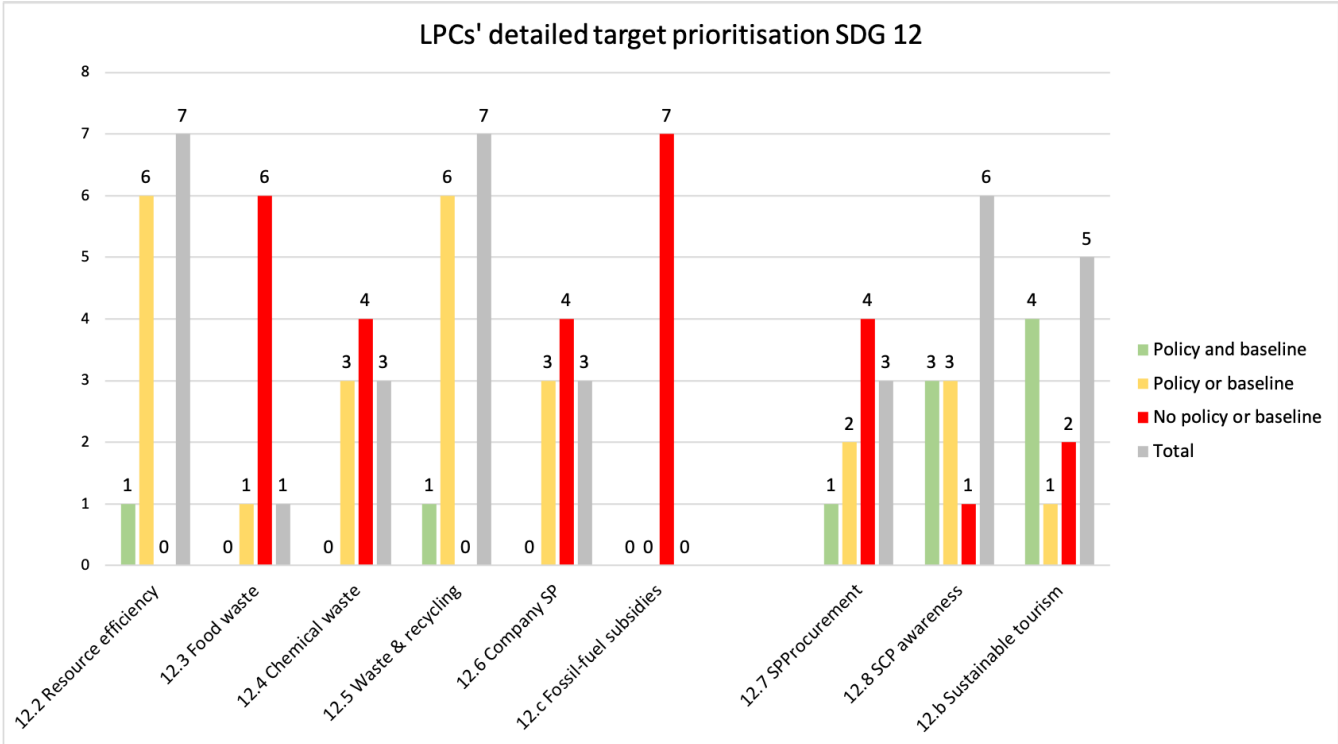


Figure 15 The detailed prioritisation of LPCs

4.2.4 Synthesis: who prioritises what?

This section shortly synthesises the results of all groups with the help of table 9. It presents an overview of all relative prioritisations for all groups, without differentiating between yellow or green values. The green and red boxes indicate whether more or less than 50% of the VNRs in a particular group has prioritised a SDG 12 component. This threshold is arbitrary, and simply serves to show how the majority in each group reports.

General implications

An interesting way of looking at table 9 is through the prioritisation range for SDG 12's targets (i.e. excluding MoI). The prioritisation range of the HI-class is 54%-83% (29%), meaning that the least prioritised target is still reported on in 54% of the cases. Two 'trends' are evident when the prioritisation range is considered for other groups. First, the maximum and minimum values decrease in general. Second, the prioritisation range increases alongside GNI per capita. The UMI-class' target-range is 39%-78% (39%), the LMI's is 36%-86% (50%) and the LI's is 15%-69% (54%). In concrete terms, VNRs from lower GNI-classes generally incorporate less reported policies and/ or baselines for SDG 12 than VNRs from higher GNI-classes. In prioritisation terms, it might be that lower-income classes are more susceptible to trade-offs than higher-income classes. However, that statement can only be made under the assumption that the VNRs are representative for a country's existing policies.

The frequently found challenges around data availability and a lack of effective regulation might substantiate the 'trade-offs claim'. From the UMI-class onwards, the most frequently found challenge is the unavailability of data. In addition, both the LMI-and LI classes report to have trouble around creating policies for SDG 12's targets. However, these challenges are equally likely to simply indicate that lower-income countries are less capable to report on an indicator-based global goal-setting initiative. For example, one of the reported challenges addressed a misalignment of nationally available indicators with SDG 12's indicators. This would also explain the differences in prioritisation, without making claims about their susceptibility to trade-offs.

In that line of reasoning, it is assumed that the prioritisation values are not reliable outcomes (i.e. VNRs are not representative for a country's existing policies or data). As such, it can be concluded that the comprehensiveness of VNR-content decreases alongside GNI per capita. Based on these differences, it can be argued that the formulation of SDG 12 and its indicator system aligns more with HI-countries than other income groups. In other terms, the formulation might align more with the capabilities present in HI-countries.

SDG 12's components	HI (41)	UMI (18)	LMI (14)	LI (13)	SIDS (15 VNRs)	LPCs (7 VNRs)
12.2 Resource efficiency	80%	78%	86%	69%	47%	100%
12.3 Food waste	63%	39%	36%	38%	53%	14%
12.4 Chemical waste	56%	72%	43%	54%	67%	43%
12.5 Waste & recycling	83%	78%	71%	31%	80%	100%
12.6 Company SP	54%	39%	43%	15%	13%	43%
12.7 SP Procurement	54%	56%	43%	23%	20%	43%
12.8 SCP awareness	71%	61%	57%	38%	80%	86%
12.b Sustainable tourism	24%	33%	36%	23%	33%	71%
12.c Fossil-fuel subsidies	5%	0%	21%	8%	7%	0%

Table 9 An overview of the overall relative prioritisation values of all groups (Red < 50% - Green >50%)

Prioritisation summarised

Overall, target 12.2 and 12.5 are the most highly prioritised targets. However, for the SIDS 12.2 is not highly prioritised (while 12.5 is), and for the LI-class 12.5 is not highly prioritised (while 12.2 is). The LMI-class also has a much lower prioritisation of target 12.5, although the difference with 12.2 equals only two VNRs.

Target 12.3 on food waste is mainly prioritised mainly by the HI-class and SIDS. Other groups (including the LPCs) have reported significantly less on a policy or baseline for 12.3. The result of the HI-class is the most significant due to its relatively large group size. A potential

explanation for the differences in prioritisation rates is a potentially different view on food waste. Section 3 in chapter 4.3 elaborates on this statement.

Target 12.4 on chemical waste is prioritised by the majority of the VNRs in most groups. The exceptions are the LMI-class and LPCs. The UMI-class and SIDS have a similar prioritisation value for this target. The fact that chemical waste is among the targets with the lowest priority in the HI-class is remarkable.

As mentioned, most groups prioritise target 12.5 highly. The reason why the LI-class doesn't is not yet clear. However, the reported challenges on data collection and the creation of effective policies might be applicable to this situation. For the HI-class, potential reasons for the high priority of 12.5 can be derived from the frequently found challenges. Both an increase in waste generation, the changing nature of waste and subsequent challenges around sorting waste are seen as problematic. Again, Section 3 gives more insight in the occurrence of such challenges in other groups as well.

Target 12.6 on company sustainability practices is the target with the lowest priority across groups. Only in the HI-class more than half of the VNRs report on policies, CSR/EPR obligations or the number of companies publishing sustainability reports. The LI-class and SIDS disregard this target most in their VNR reporting.

Target 12.7 on SPP follows target 12.6 as one of the least prioritised targets. However, both the HI- and UMI classes do report on SPP relatively frequently. Again, the LI-class and SIDS disregard this target most (but less than target 12.6).

The prioritisation of 12.8 decreases alongside income, meaning that (based on the VNR content) lower-income countries report on less policies and initiatives to raise SD/SCP awareness than higher income countries. However, within the lower GNI-classes themselves target 12.8 still has a relatively high prioritisation value. Furthermore, SIDS and LPCs prioritise target 12.8 highly. For SIDS specifically, it shares the most prioritised target position with 12.5. Possibly, most awareness initiatives or policies are aimed at waste.

MoI 12.b on sustainable tourism has a low prioritisation across groups, except for the LPCs. The reason for the disregard of sustainable tourism in SDG 12 reporting is unclear. However, a likely explanation is that a lot of countries do not have to create sustainable tourism policies because they have a small or non-existent tourism sector. Alternatively, tourism might be incorporated in reporting on other SDGs.

The overall disregard of MoI 12.c on the rationalisation of fossil-fuel subsidies across groups is remarkable. Especially combined with the shared high prioritisation of resource-efficiency across groups. This could indicate that phasing-out fossil-fuel subsidies is probably not used as a strategy to become more resource efficient (by driving up the price of such fuels for example). The possibility that reporting on fossil-fuel *subsidies* has been incorporated into other SDGs has been ruled out by the stated key-word search. In addition, the large absence of data on how much funds are going into fossil-fuel subsidies (directly or indirectly) remains surprising.

The following section discusses the remaining reported challenges that were found across all groups. Due to the smaller size of most groups (compared to the HI-class) it was less likely to find similar frequently reported challenges. An accumulation of reported challenges across groups tackles this limitation. Furthermore, it aims to circumvent the assumption that challenges are determined solely by the level of income. Lastly, it gives more in-depth insight in practical challenges around all components and serves as a set-up to connect all findings with Ecological Modernisation Theory.

4.3 Section 3: frequently found challenges across GNI-groups

The challenges discussed in this chapter occur in at least 2 two groups (including SIDS and LPCs) and are evaluated per SDG 12 component. Each component's evaluation begins with a list of countries that reported a related challenge, including the group it was categorised in.

Targets 12.6, 12.7 and MoI 12.c have barely been reported on as challenging. This finding is consistent with their generally low degree of prioritisation in VNR reporting across GNI-groups. Therefore, consistent challenges across groups for these components have been found only once for group 12.6.

Reported challenges regarding consumption and technology have been accumulated as both are relevant for the broader theoretical framework of this thesis. In addition, the VNR Handbook Guidelines (2021) explicitly stated to report on technology. Consumption challenges are combined with awareness challenges (12.8), as this is a consumption-related target (Gasper et al., 2019).

12.2 Resource efficiency

Two types of frequently occurring challenges have been found across groups for target 12.2. They concern additional decoupling challenges and production displacement.

Integrating economic growth with ecological conservation

Indonesia (LMI), Montenegro (LPC: HI), Kyrgyzstan (LI) & HI-class countries (see the frequently found challenges for HI-countries)

Integrating economic growth with ecological conservation has already been discussed in the HI-class' challenges section. However, three more countries from other groups have reported on this challenge. Indonesia (2019) states that economic growth often still drains the quality of the environment and natural resource reserves. Similarly, Kyrgyzstan (2020) states that environmental pollution and resource scarcity are the result of increasing consumption rates, despite the created regulations to counter this trend. Lastly, Montenegro (2016) reported that *'Countries have not positioned priorities for sustainable development as key elements of economic growth and development, but instead expect from sustainable development not to interfere with economic growth, while preservation of the environment is still not perceived as a precondition for a long-term sustainable economic growth and development.'* With this statement, Montenegro emphasises that it perceives a hierarchy of priorities instead of an attempt to find ways to integrate economic growth with the preservation of the environment.

Despite the additions of Indonesia and Kyrgyzstan, this particular challenge seems most prevalent in the VNRs of HI-countries. However, the absence of reported challenges does not mean that they do not exist.

Production displacement

Liechtenstein (LPC: HI), Sweden (HI), Switzerland (HI)

Three countries report challenges that nuance their positive domestic trend concerning emissions (per product), i.e. resource productivity. More specifically, they address production displacement. For example, Sweden (2017) states *'At the same time, emissions have continued to increase in other countries, among them countries from which Sweden imports goods and services. The greenhouse gas emissions that can be associated with Sweden's imports from other countries are today higher than its own emissions and are not following the domestic downward trend.'* Switzerland (2018) confirms the relevance of this challenge, adding that the unsustainable use of resources from abroad has a negative impact on people and the environment in other countries. Lastly, Liechtenstein (2019) specifically mentions that the positive domestic resource efficiency trend is (also) linked to the partial relocation of energy-intensive production abroad.

In the first place, these challenges emphasise the complexity of the global production and consumption system. Secondly, the challenges show that domestic resource-efficiency gains can be made without truly improving the resource-efficiency of the production process.

12.3 Food waste

Food waste has multiple types of challenges across groups. A first is associated closely to Green House Gas (GHG) emissions. The other two types of challenges relate to the claim made earlier in this chapter; that groups might have different conceptualisations of food waste.

GHG emissions

Australia (HI), United Arab Emirates (UAE) (HI), India (LMI)

Three countries specifically report on the impact of food waste on GHG emissions. When food waste ends up on the landfill, it starts to emit methane in its degradation process. Both the UAE (2018) and India (2020) specifically mention that methane as a greenhouse gas is at least 25 times more potent than carbon dioxide. If this problem is linked with the challenges of increased waste generation and waste separation (Frequently found challenges: HI), food waste becomes more problematic from a climate change perspective. On top of the GHG emissions, Australia (2018) also adds that food waste costs the economy an estimated 20 billion Australian Dollars per year. Lastly, wasting food also has implications for resource efficiency. This connection is substantiated by India's (2020) reported challenge that *'According to the FAO, up to 40 per cent of the food produced in India is wasted, virtually frittering away a lot of water, fertilizers, and other resources that go into producing food.'*

Post-harvest food waste

Turkey (UMI), Mexico (UMI), Armenia (LMI), Sri Lanka (LMI), Malawi (LI), Maldives (SIDS)

Six VNRs report on challenges around post-harvest food waste. In fact, three of them state to have measured food waste losses up to 40% for fruits and vegetables. A cause for this problem is addressed explicitly by 4/6 VNRs, namely the lack of appropriate storage facilities and transportation infrastructure. Armenia (2018) specifies the storage problem, stating that both outdated storage facilities and access to refrigerated storage are the main causes of food waste. The transportation problem is closely related to storing food appropriately. The causes of these challenges have direct links to the production process. Remarkably, none of the VNRs that report post-harvest challenges are HI-countries. This indicates a different conceptualisation of food waste across GNI-classes. Armenia (2018) explicitly states this difference: *'As an average low-income country, FLW (Food Loss Waste) in Armenia is much higher at the beginning of the supply chain (agricultural production stage) than at the end (in distribution or consumption steps).'*

Consumer food waste

Bulgaria (UMI), Spain (HI), Latvia (HI), Canada (Hi)

In contrast, three higher income countries report challenges that are directly related to food waste at the consumer level. The fact that Bulgaria from the UMI-class is included might indicate that within this class, both post-harvest and consumer food waste can be problematic depending on the context of the country.

Three countries report on food waste in the context of household-waste. In other words, the orientation of the challenge is directly related to food waste that households generate. Canada (2018) exemplifies this by stating that the largest challenge around food waste is a lack of awareness at the company- and consumer level. Of course, this finding does not mean to imply a complete absence of post-harvest food waste in HI-countries. It merely hints at a different conceptualisation of the food waste problem, and the fact that HI-countries might have chosen to not report on post-harvest losses in the challenges for 12.3 (whether they are there or not).

12.4 Chemical waste

Apart from the LI-class, many other countries from other groups have reported similar regulation challenges around chemical waste.

A lack of effective regulation

Qatar (HI), Mexico (UMI), Armenia (LMI), Sri Lanka (LMI), Viet Nam (LMI), Cambodia (LI), Kyrgyzstan (LI), Liberia (LI), Guyana (LPC: LMI), Montenegro (LPC: HI)

Ten VNRs across groups have reported challenges around a lack of (effective) regulations to transport and dispose hazardous materials and waste. Table 9 shows that the prioritisation of target 12.4 is relatively high (except for the LMI and LPC groups). The content of most of the challenges do not describe a complete lack of regulation. Rather, it focusses on the effectivity and comprehensiveness of existing regulations. In some cases, existing regulations need strengthening or expansion (to a particular hazardous substance or additional implementation mechanisms). In others, there is a need to create an integrated national plan to treat hazardous waste.

This challenge shows that countries from all groups have reported on chemical waste as an issue with environmental or health consequences. The lack of effective regulation might be closely related to a previously frequently found challenge in the HI-class, which addressed issues around the separation of waste. The next section adds additional dimensions to the waste issue across groups, which could be applied to chemical waste as well.

12.5 Waste generation & recycling

Waste generation and recycling have the highest number of reported challenges across groups, especially in terms of consistency and interconnectedness in the types of challenges. Due to the high number of reported challenges on this topic, a short summary is given. The causes of the challenges are generally relevant across groups. The number of reported challenges seem to align with the relative prioritisation values (i.e. low values generate a low number of challenges).

Waste treatment & recycling

- **Australia (HI), England (HI), Estonia (HI), Finland (HI), Israel (HI), Kuwait (HI), Latvia (HI), New-Zealand (HI), Qatar (HI), Saudi-Arabia (HI), Slovakia (HI)**
- **Kazakhstan (UMI), North-Macedonia (UMI), South-Africa (UMI)**
- **India (LMI), Mongolia (LMI), Ukraine (LMI)**
- **Kenya (LI), Kyrgyzstan (LI)**
- **Bahrain (SIDS: HI), Singapore (SIDS: HI), Jamaica (SIDS: UMI), Palau (SIDS: UMI), Papua New Guinea (SIDS: UMI), Mauritius (SIDS: UMI), Seychelles (SIDS: UMI), Samoa (SIDS: LMI)**
- **Guyana (LPC: LMI),**

The major pattern seems to be that waste generation is not slowing down, or is increasing due to (for example) population growth (reported on by seven VNRs). The consequence of population growth is increased aggregate consumption, even if the consumption per capita remains equal. The growing waste streams also cause the shortening of conventional waste disposal methods, such as landfills, especially on SIDS (or in smaller countries) as the issue is supplemented by scarce space (Mauritius, 2019; Seychelles, 2020). Some VNRs, such as India's (2020) emphasise the waste increase problem as an urban affair, as the share of people living in cities is estimated to *'surpass the halfway mark by 2050'* In addition, treating the general increase in waste has become increasingly complex because the nature of waste-streams is changing rapidly (England, 2019). Australia (2018) and Singapore (2018) for example, state that e-waste is the most rapidly growing waste-stream. E-waste requires more energy-intensive waste treatment processes to recycle or dispose of. The challenge concerning the changing nature of waste is reported on most by HI-countries.

Due to the increased complexity, and quantity of the waste stream, many countries are not able to recycle the waste. This inability is supplemented by the fact that many VNRs report challenges surrounding the separation of waste itself (at the source or at the landfill / treatment facility). For example, Croatia (2019) states that it needs additional equipment and new facilities for waste sorting, treatment and recycling. The effect of non-separation is reported by Kenya (2020), stating that waste and materials get contaminated. Therefore, this might make recycling or reuse as a strategy either more cost-intensive or technologically challenging. Many other lower-income countries such as Ukraine (2019), Kyrgyzstan (2020), Mongolia (2019), Guyana (2019) and multiple SIDS address the issues of a lack of facilities, waste separation and appropriate waste infrastructure. The consistency in the causes for these challenges across groups have not been found in other targets.

Even when there is not a reported lack of adequate recycling facilities, it is still a challenge to make sure that people know what to recycle and how (England, 2019). At the same time, many countries are well-intentioned with efforts to improve their recycling capacity but face challenges in terms of the cost-effectiveness of the practice itself. For example, Slovakia (2018) reports that the low fees for disposing

waste at a landfill are a limitation towards reaching its recycling goals. North-Macedonia (2020) adds that *'Due to a lack of cost-reflective tariffs for waste services, waste companies suffer from the lack of sufficient funds for maintenance, repair and new investments.'* These cost-related issues further obstruct the incentive to make recycling on a large scale a successful practice.

12.6 Company sustainability practices

The frequently found challenge across groups aligns with the prioritisation results. However, the challenges only apply to lower-income countries.

Lack of interest

Armenia (LMI), Kyrgyzstan (LI), Bhutan (LPC: LMI)

The only challenge that has been reported at least 3 times for target 12.6 is a general lack of interest from business in SCP (Armenia, 2018), a lack of incentives to stimulate sustainable production in the industry (Bhutan, 2018) and a complete absence of voluntary reporting on SD by companies (Kyrgyzstan, 2020).

In all cases, there was a lack of interest (or capability) within the lower income countries to incentivise or adopt company sustainability practices. While the frequency of reported challenges is very low for target 12.6, the character of the challenges could align with the low prioritisation of the target. However, it cannot be generalised across groups. Especially considering the HI-class has a prioritisation rate of 54% for target 12.6.

12.8 Raising awareness and other consumption challenges

The challenges on awareness raising relate exclusively to consumption. They are connected to some extent to challenges from target 12.2 (emission displacement), 12.3 (consumer food waste) and target 12.5 (stimulating recycling behaviour).

Consumption challenges

- **England (HI), Germany (HI), Iceland (HI), Slovakia (HI), Spain (HI)**
- **North-Macedonia (UMI)**
- **Armenia (LMI), India (LMI), Ukraine (LMI), Viet Nam (LMI),**
- **Fiji (SIDS: UMI), Jamaica (SIDS: UMI), Seychelles (SIDS: UMI)**

The aforementioned challenge of population growth and the increase in waste has an indirect linkage to consumption. Jamaica (2018) makes this link direct by stating that *'changes in consumption patterns, technological changes and economy modernisation'* are additional causes of the waste increase. Furthermore, the increase in foreign consumption patterns addressed by Sweden, Switzerland and Liechtenstein (12.2 Production displacement) are also already related to consumption.

Still, many other VNRs have mentioned consumption-challenges in general. Iceland (2019) is the only VNR that has reported *'decreasing consumption'* as a challenge in the SDG 12 section of its VNR. Germany (2016) did report that *'Two out of three Germans believe that the environment can only be protected in the long term if everyone's consumption is resource-efficient'* and goes on to mention that there is a discrepancy between consumers' consumption behaviour and their environmental awareness. However, it does not state that, as a result, the challenge of decreasing consumption should be taken up. Instead, the reported challenge is that *'It must become easier for consumers to opt for more sustainable products'*. A similar challenge is reported by Armenia (2018), stating that a lack of recognised labels is a key barrier to enabling consumer to make informed consumption choices.

England's (2019) reported challenge aligns with the latter two, as it states changing consumer behaviour can be challenging, but appropriate enforcement measures will help change consumer's behaviour to *'do the right thing'*. India (2020) and Fiji (2019) also report on challenges related to shaping *'sustainable habits'*, while Ukraine (2020) and North-Macedonia (2020) mention that a lack of efforts to promote SCP to the general public is the main challenge around consumption. Similarly, Viet Nam (2018) states that sustainable consumption has had little attention. It goes on to criticise the fact that sustainable consumption activities have been limited to awareness raising activities *'which remain fragmented with small-scale impacts'*.

Furthermore, four VNRs have reported a consumption challenge directly related to indicator 12.8.1 (see table 1), concerning education. Therefore, they reported on challenges related to the implementation of SCP (and SD as a whole) into curricula. This challenge is reported on across groups by Spain (2018), Slovakia (2018), Ukraine (2020) and Seychelles (2020).

Technology and innovation

The challenges below merge some of the earlier reported challenges from the perspective of technology and innovation. The types of challenges differ between higher- and lower income groups.

High-income technology challenges

England (HI), Italy (HI), Slovakia (HI), Slovenia (HI), Sweden (HI)

In HI-countries, the challenges related to technology are more centred around finding innovations to be able to transition to an energy- and resource efficient economy. As such, innovation is often posed as a solution and challenge at the same time. The challenge is to find innovations that are the solution to the reported challenge of ‘decoupling’ for example. At the same time, England (2019) states that *‘Despite advances in technology in recent decades, the average lifespan of many products is actually lower than it was 20 years ago. It will be challenging to extend the lives of products through repair, reuse and remanufacture.’* This indicates that advances in technology do not have to be beneficial in the context of the waste problem. Furthermore, the previously discussed challenges around waste separation and treatment facilities could be considered as technological challenges too.

Low-income technology challenges

Armenia (LMI), Egypt (LMI), Bangladesh (LI), Kyrgyzstan (LI), Papua New Guinea (SIDS: UMI)

Aside from the waste-and data collection challenges, other technological challenges have been reported by lower-income countries and SIDS.

The first notable challenge is only stated by lower income (LI & LMI) countries. Armenia (2018), Kyrgyzstan (2020) and Egypt (2018) emphasise that the lack of funding and the high initial costs of new technologies complicate the adoption of technology to improve SP, or to find innovative solutions. Moreover, Bangladesh (2020) states that the lack of appropriate technology is the main cause for resource inefficiency and unsustainable SCP patterns. Moreover, Papua New Guinea (2018) and Kyrgyzstan (2020) also report that the adoption of new technologies is hampered because of a lack of qualified personnel to properly use these novelties. This is an indication that even if there is technological capital available, appropriate human capital is needed to benefit from it. As such, these ‘lower-income challenges’ relate more to the absence, adoption and use of technology than to the challenge to find new innovations.

4.4 In sum

The results set out in this chapter have shown that groups of countries have different priorities, capabilities and challenges to work on its components within the SDG 12 framework. However, they also show that certain prioritisations and challenges exist across groups. Multiple commonalities and differences have been found, but it remains unclear how the findings relate to theory discussed in this thesis. Therefore, the following chapter aligns the results with the used theory. The emphasis lies on Ecological Modernisation Theory (SQ 4). The goal is to see how the prioritisation patterns and challenges can be explained, and how they might deliver new insights.

5. Result-analysis

This analysis in this chapter aims to compress the raw data presented in chapter 4. It consists of multiple layers of complexity. The prioritisation results are quantitative information that give insight into broad patterns across and within groups. The frequently reported challenges are qualitative information that can function as potential explanations for how countries prioritise SDG 12's components. The theory chapter offers the framework through which these findings are explained, with an emphasis on Ecological Modernisation Theory (i.e. EM's characteristics and criticism). Finally, the results and theory can be specified towards (and compared across) specific groups. Before the analysis starts, the VNR as a global governance tool is discussed shortly.

The end-result of this chapter serves as a set-up for the potential contributions to the theory (Chapter 6: Discussion) and answering the research questions (Chapter 7: Conclusion).

5.1 The VNRs as a tool from 2016-2020

The UN (n.d.2) describes that VNRs aim “to facilitate the sharing of experiences, including successes, challenges and lessons learned, with a view to accelerating the implementation of the 2030 Agenda.”. However, the non-obligatory character of VNR guidelines have caused a lack of standardisation in VNR content. Consequently, VNRs are not a suitable tool to compare SDG implementation progress across countries. However, VNRs can give insight into the treatment of, and priority given to, specific issues of the SDGs (Fukuda-Parr et al., 2018). In fact, the VNR handbook (2021) states that while countries are encouraged to report on all SDGs, they may also choose to report on a selection of national priority. The VNRs as a tool can be explained inside this theoretical context. The following presents two results of importance that relate to (1) which countries have not reported on SDG 12 (and why) and (2) the VNR's aim.

Major absentees that did publish a VNR without an SDG 12 section are found in South- and Central America (most notably Brazil), Africa, parts of the Middle-East and China. In addition, the United States of America (USA) did not publish a VNR at all. The absence of Brazil, China and the USA are important because they are (among) the largest producing and consuming countries in the world. If this finding is related to the theory, it is possible that China and Brazil have opted to reflect more in-depth on a selection of Goals and targets, seen as a national priority (UN, 2021). However, China's VNR was not available at the UN-website, making it impossible to know whether it has reported on SDG 12 or not. In contrast, Brazil's (2017) VNR is available. They stated to have created the VNR in line with the central theme of the 2017 HLPF: Eradicating poverty and promoting prosperity in a changing world. This theme did not include SDG 12, which can explain the absence of SDG 12 for Brazil and potentially other countries in 2016 and 2017 (see figure 3). In 2018, the reporting rate on SDG 12 (42 VNRs) surges which can similarly be explained by the incorporation of SDG 12 in the central theme of that year's HLPF (HLPF, 2018). However, after that the number of countries reporting on SDG 12 remained relatively consistent in 2019 (35) and 2020 (37). This indicates a change after 2018. Possibly, an alteration in the VNR guidelines was made, putting more emphasis on the incorporation of all SDGs independent of the theme. If that is the case, it might lead to the future incorporation of SDG 12 into the VNRs of the largest producing powers of the world. However, Brazil, China or the USA are among the 44 countries that committed to publish a VNR in 2021.

Aside from the HLPF-theme being an influence on how countries report on the SDGs in VNRs, prioritisation can also be influenced by contextual factors (Van Zanten & Van Tulder, 2018). More specifically, there could for example be a lack of appropriate knowledge to report on SDG 12's components (Weitz et al., 2015). This can be further substantiated by previous findings that SDG 12 originally had a large number of Tier 3 indicators, complicating reporting on the

Goal (Gasper et al., 2019). This complication has been evident in this thesis through both the low number of green prioritisation values, and the frequently reported challenges on the absence of data or incapability to collect it.

Also, the approach of goal-setting itself may influence national governments to prioritise certain SDGs (Fukuda-Parr and McNeill, 2019). While the authors direct this statement more towards the implementation of the Goals, it might also be true for VNR reporting. It could for example be that certain goals already align with a pre-existing development agenda, causing a country to prioritise reporting in line with that agenda (Horn and Grugel, 2018).

A second relevant result is that 31/139 relevant VNRs were not published in English. In the first place, this creates an already discussed bias in this study. More importantly, it does not align with the stated aim of the VNRs to facilitate the sharing of experiences, successes and challenges (UN, n.d.2). The variation of languages limits the potential of these documents to create the intended transparency and accountability to citizens (Fukuda-Parr and McNeill, 2019) on the worldwide of the implementation of the SDGs.

5.2 The prioritisation of SDG 12 explained

Weber and Weber (2020), Robra and Heikkurinen (2019) and Gasper et al. (2019) all stated to see close parallels between Ecological Modernisation Theory and the way in which SDG 12's components are formulated. Therefore, EM theory can be used to explain the prioritisation patterns of countries' VNRs. This section attempts to explain the broad prioritisation patterns, before going into more detail in chapter 5.3.

In the past, EM has received criticism on its 'Eurocentric' character (Buttel, 2000). Furthermore, its scope was said to relate predominantly to the experiences of (western) industrialised societies (Christoff, 1996; Mol, 1996; Dryzek, 1997). The disproportionately high frequency of HI-countries and the comparative dominance of European countries (85%, see table 8) reporting on SDG 12 might confirm this critique. Yet, it is equally likely that this indicates that European countries are 'taking the lead' in the implementation of SDG 12. In any case, many other countries from other continents have also reported on SDG 12. Above all this indicates the adoption of some EM strategies globally.

Therefore, the question becomes how HI-countries' prioritisation values compare to lower-income countries. Table 9 shows that the relative prioritisation rates decrease alongside the GNI per capita. In other words, higher-income countries were able to report on more data and policies in their VNRs than other groups on nearly all of SDG 12's components. At the same time, lower-income countries reported more frequently on (1) the absence of data, (2) a misalignment of the national indicators with those of SDG 12 and (3) a lack of (effective) regulation (especially for chemical waste, recycling and resource efficiency). Taken together, these results could confirm that EM is predominantly relatable to the experiences of higher-income societies (which are usually more industrialised). In prioritisation terms, countries from lower-income classes could be more likely to have a limited governance capacity (Elder et al., 2016) or lack of appropriate knowledge (Weitz et al., 2015) concerning the implementation of SDG 12 based on their VNRs. If these values are assumed to be true, then lower-income countries might be more susceptible to making trade-offs. However, studying policy coherence or trade-offs differences have not been an aim of this thesis.

Despite these potential capability differences between GNI-classes, the results have also shown that some of SDG 12's components are challenging for all groups. Interestingly, the challenges found across groups align with the most prioritised targets across groups. Put differently, SDG 12's components with the highest relative perceived importance also produce the most reported challenges.

The following sub-chapters are in-depth evaluations of how the findings relate to the theory, with an emphasis on the EM-approach. A set of themes is worked out that relate closely to the components of SDG 12. The themes are related to multiple characteristics of EM, such as its success-areas, the faith in market-based solutions (i.e. capitalism) (Machin, 2019), the position towards the role of the state, EM's selectiveness (Jänicke, 2020) and its existing criticisms. Furthermore, the different conceptualisations of SCP in developed and developing countries as described by Wang et al. (2019) are taken into

consideration. This distinction may prove helpful trying to explain why a group prioritises a topic differently than others for example. For clarity, Wang et al. (2019) state that developed countries' SCP-focus lies on limiting excessive and wasteful resource use caused by extreme consumption patterns. In contrast, developing countries prioritise economic growth over sustainability considerations, making the latter an inferior objective (Clark, 2007; Fang et al., 2007). When results are analysed in the text below, the term 'developed' is sometimes equated with 'higher-income'. It is recognised that these are not similar, but for the purpose of this result analysis they are used as such. Importantly, the narratives sketched below are not necessarily true for all countries. It is an attempt to use the qualitative information to make sense of the quantitative results, and link them to EM (and other) theory.

5.3 Resource efficiency and 'the wastes'

5.3.1 A link between resource efficiency and waste?

The overall-prioritisation results of both figure 6 and 7 indicate a potential connection between the two most highly prioritised targets: 12.2 on resource efficiency and targets 12.5 on waste generation and recycling. In the words of Kim et al. (2020), they are generally perceived as the components of SDG 12 with the highest relative importance in the evaluated VNRs. The potential connection between those targets is substantiated by one of UNEP's (n.d.) key objectives of SCP, namely 'applying life-cycle thinking' (i.e. resource efficiency and reuse of products and services). Furthermore, EM theory contributes to a possible connection. Buttel (2000) argued that EM places an emphasis on (1) resource efficiency and (2) pollution control (i.e. waste). Both targets are central to EM's core (i.e. eco-efficiency), and have been the areas in which EM has been successful in the past. Dyllick and Hockerts (2002) and Jänicke (2020) specifically mention that the use of renewable energy in the power sector and waste recycling have been central in those successes. In this case, the word 'success' translates itself into (politically) popular economic benefits such as additional employment, reduced production costs and innovation. Consequently, these benefits have contributed to the widespread implementation of EM strategies (Mol, Sonnenfeld, Spaargaren, 2020), which is represented in the most-prioritised targets in this thesis. So, based on the prioritisation results and the context of life-cycle thinking, one could argue that recycling and reuse are resource-efficiency strategies. But how does this relate to different prioritisation values across groups?

The aim of (EM's and SDG 12's) resource-efficiency is mainly centred around the continuation of economic/ productivity growth without depleting resources or harming the environment (UN, n.d.1; Gibbs, 2000). Based on that description, it is evident that recycling and reuse could play a crucial role in slowing the rate of the depletion of resources, and preventing waste from entering the environment. The description also seems to align closely with Wang et al. (2019)'s proposed conceptualisation of SCP in developed countries: to limit excessive and wasteful resource use. The possibility that recycling is mainly used as a strategy for resource-efficiency in higher-income (i.e. developed) countries can be supplemented by the decrease in 12.5's prioritisation rates visible from the LMI-class onwards (see table 9). Furthermore, if Wang et al. (2019)'s distinction also means that developing countries have a lesser need to limit excessive and wasteful resource use caused by extreme consumption, this could make recycling and reuse as a strategy less of a priority. Therefore, it might be that using recycling as a resource-efficiency strategy is predominantly a higher-income affair. However, it could also be that the capabilities of developing countries to use recycling as a resource-efficiency strategy might be inadequate due to (for example) a lack of appropriate knowledge (Weitz, 2015) or funds. If that is the case, it would still add to the argument that EM predominantly relates to the experiences of highly industrialised countries (Christoff, 1996; Mol, 1996; Dryzek, 1997).

5.3.2 Resource efficiency across groups

Potential linkages set aside, resource efficiency (12.2) was found to be the most consistent highly prioritised targets across groups (except for SIDS). So, target 12.2 and 12.5 can be mutually inclusive, but they don't have to be. This indicates that there are other reasons for prioritising resource efficiency highly (aside from the life-cycle argument), especially in lower-income countries. As stated, the contextual conditions of lower-income countries might simply make it less necessary to focus on recycling due to less extreme consumption patterns (Van Zanten and Van Tulder, 2018; Wang et al., 2019). Moreover, the SCP conceptualisation of developing countries states that they could prioritise

economic growth over sustainability concerns (Wang et al., 2019). The reported challenges of Sweden, Switzerland and Liechtenstein on the relocation of production processes, resulting in foreign emission increases and environmental harm, potentially align with this conceptualisation. The production processes alone would facilitate economic growth, and make a focus on resource-efficiency a priority. Especially considering the earlier stated economic benefits of reduced production costs that can result from resource-efficiency strategies (Mol, Sonnenfeld and Spaargaren, 2020). In prioritisation-terms, focussing on resource-efficiency would fit the pre-existing development agenda (Horn and Grugel, 2018). Weale (1992, p.76) has criticised EM that such displacements obstruct solving environmental problems. In this context, the consequences of production are displaced, while the aggregate resource consumption stays the same. As such, the countries reported that the domestic resource efficiency gains should not be overestimated.

Disregarding the differences between groups, the success of decoupling economic growth from resource depletion or environmental degradation is doubtful judging from the frequently found challenges. Realising this is found to be challenging across groups. This indicates that both developing and developed countries are susceptible to trade-offs between economic growth and sustainability considerations. The waste-targets further explain why this might be. However, first linkages between the waste targets (12.3-12.5) have to be revealed.

5.3.3 Prioritisation of ‘The wastes’

One could argue that (EM’s ‘other’ success area) ‘pollution control’ has a broader meaning than just waste generation and recycling (12.5). Indeed, both target 12.3 on food waste and target 12.4 on chemical waste are inherently connected to target 12.5. However, neither of these targets has been prioritised in reporting nearly as much (see figure 6 and 7). This could indicate that countries generally perceive either of these problems as less relevant to their context (i.e. of a lesser strategic relative importance (Kim et al., 2020)), they are complex to address, or they are less capable to report on them. In terms of the results of this thesis, the latter two explanations are more likely. Two frequently reported challenges across groups are indications for this. In the first place, many VNRs (especially HI-countries) noted that the changing nature of waste (e.g. more e-waste) complicates the possibility to recycle products. In addition (and as a consequence), waste separation at the source or at facilities is perceived as (increasingly) difficult. In multiple cases, these challenges are amplified by a generally observed increase in waste generation across groups. The cause for the observation is often stated to be population growth (leading to increased consumption). Now, how do these challenges relate to food- and chemical waste?

If waste is not separated, it is likely that all waste streams end up on the same landfill. This might have consequences for the ability to recycle, exemplified by Kenya (2020)’s reported challenge that a lack of waste separation leads to contaminated waste. Furthermore, it complicates the ability of countries to monitor the amounts of food- and chemical waste that are disposed of (especially from households). The prioritisation results substantiate this claim, as the number of green evaluations for either target (12.3 & 12.4) is low across groups. In other words, VNRs did not contain reporting on policies and a baseline in most cases. A lack of data complicates improving policy decision making based on evidence (Baba & Hakem Zadeh, 2012). In turn, the ideals of behaviour (e.g. SDG 12’s components) in a specific context are less likely to be realised through policies (Aphale, Norman and Sensoy, 2012). In other words, a lack of data on the generation and treatment of food-and chemical waste complicates the possibility to reach the targets set-out in SDG 12. The additional reported challenge across groups (except for the HI-class) that data collection is a major challenge only adds to the argument that waste is less likely to be separated (or the separation process is not tracked).

5.3.4 Waste and EM

So, SDG 12 is inherently an EM-framework (Weber and Weber, 2020) and the most prioritised targets align with the success areas of EM (Buttel, 2000; Jänicke, 2020). However, the prioritisation results and challenges indicate that VNRs limit themselves to target 12.2 and 12.5 in reporting, while other waste targets are more neglected. Therefore, EM’s selectiveness (i.e. related to a specific set of environmental problems) (Mol, 1996) becomes evident in the prioritisation results. From an EM perspective, the solution to the problem of waste separation is probably found in more modernisation (Buttel, 2000; Mol,

1995). And for that to happen, environmental protection has to become an asset to economic growth (Weale, 1992 p.72). In other words, market-based solutions have to create demand for waste separation and recycling in order to solve the challenges around for example perceived increases in waste and GHG emissions from food waste on landfills. However, for example Slovakia and North-Macedonia addressed that the insufficient fees for waste cause waste to end up on landfills, and prevent waste companies from being able to finance innovations to their treatment practices.

Furthermore, a supplementing frequently found challenge for chemical waste is a lack of (effective) regulation (aside from the lack of facilities to treat waste). Such regulatory challenges require intervention from forces outside of the market. In EM-terms, political actors are expected to build coalitions to make environmental protection feasible (Buttel, 2000; Fisher and Freudenburg, 2001). Occurrences of such strategies have been found in quotes from England (2019) for example, stating that consumers have to be 'nudged into doing the right thing' and they should be kept up-to-date with what to recycle and how. This further aligns with EM consumption-strategies where consumers have to be steered into 'the right direction' for their consumption choices and behaviour (Fisher & Freudenburg, 2001). However, exactly the inability to separate waste (due to inappropriate infrastructure), the lack of (recycling and) waste treatment facilities and perceived problems with the cost-effectiveness to treat waste properly indicate that such consumer-oriented strategies alone might not suffice. Food- and chemical waste are (theoretically) issues that would fit the strengths of EM, but it seems that such structural contextual factors limit the success of tackling these challenges in countries across groups. If trade-offs between economic growth and the potential consequences of all types of waste (12.3-12.5) are to be prevented, addressing them economically and politically might be necessary. In addition, seeing as the issues around recycling exist across groups, it also questions the current potential use as a resource-efficiency strategy discussed earlier.

Finally, the stages-logic (Weber and Weber, 2020), or catching-up rationale (Akenji and Bengtsson, 2016), of EM prescribes that improving a country's stage of development solves environmental and social issues. For the waste-issue, contrasting results have been found to this notion. The lack of appropriate facilities and separation is evident across groups. In fact, it is potentially reported on more in VNRs from HI-countries than in other groups. So even if a country is in the highest income class, it can still have similar problems around sorting and recycling waste as a country in the lowest income class. From that point of view, some waste issues are not solved by improving the level of development. However, for food waste, indications were found that certain challenges are more likely to be found in lower-income countries than in higher-income countries. Where lower-income countries experience food loss in the post-harvest phase, higher-income countries generally perceive challenges around limiting consumer food waste. In that sense, certain issues related closely to a lack of appropriate storage facilities for example (a technological challenge) seem solvable from an EM-perspective; by developing economically and technologically. However, this does not mean that all problems are solved completely alongside improving the level of development. It only indicates that the types of problems change, with a new set of consequences.

5.3.5 Waste across groups

Gaspar et al. (2019) stated that target 12.3 is partly consumer-oriented. The frequently reported challenges have shown that this might be true especially for HI-countries, while lower-income groups experience more production (i.e. post-harvest) related issues. Interestingly, the relative prioritisation rate for food waste is highest in the HI-class. This could indicate that food waste policy or data is more likely to be consumption-oriented in this class.

However, the results have also shown that lower-income countries received relatively more 'green' evaluations than HI VNRs. In other words, they were able to present food waste data and policy in conjunction more often than HI VNRs. So, while the prioritisation of consumer-oriented food waste might be higher in terms of policies, it might be harder to present data in conjunction with it in the VNRs. The challenges around waste separation could substantiate this statement. It might be complicated to track the proportion of household food waste if waste is not properly separated.

The prioritisation results have shown that chemical waste is prioritised most by the UMI-and SIDS groups. Specific explanations for why VNRs from UMI have the highest relative prioritisation across groups for 12.4 cannot be given. However, from EM's stages-logic perspective (Weber and Weber, 2020; Akenji and Bengtsson, 2016), it is possible that the level of development of these groups cause

the relatively higher prioritisation. It might for example be that both of these issues create more direct environmental or health problems than waste generation and recycling, creating an urgency in prioritising these targets. As a result, creating policies and gathering data on the issues with the most direct effect would be preferable. In turn, EM's stages-logic might explain the comparatively lower prioritisation of 12.4 in the HI-class. The countries in that group might possess a higher level of development to deal with certain environmental issues, causing a relative perceived importance. SIDS' relatively high prioritisation of target 12.4 and 12.5 can be explained by the specific initiatives to tackle chemical waste and waste management (UN, n.d.3). Furthermore, the growing populations, rapid development and increasing amounts of imported goods (IISD, 2019) explain the prioritisation on these targets. Lastly, this also explains the high number of challenges on recycling in particular. Despite these initiatives, SIDS still report many waste separation and treatment challenges.

Lastly, differences in prioritising target 12.5 are summarised broadly. In prioritisation terms, the lower prioritisation of recycling in the LMI- and LI classes seems to stem from a lack of appropriate knowledge (Weitz et al., 2015) and/ or an insufficient governance capacity (i.e. funding) (Elder et al., 2016) more than a pre-existing development agenda (Horn and Grugel, 2018). Also, waste recycling might be less relevant in developing countries because the extreme consumption levels do not exist as in developed countries (Wang et al., 2019). Still, an initially successful area of EM (Jänicke, 2020) is the target with the highest number of reported challenges in VNRs across groups. Therefore, the aim to protect the environment and increase consumption through continuous technological innovation and transfer, instead of using regulation (UNEP, 2010; UNSD, 2018) could be insufficient in the waste-area today. If recycling continues to be perceived from a EM-frame, it has to be made more attractive in an economic sense. Waste should become the trigger for capitalism's high flexibility, which transforms the market in order to integrate the associated environmental concerns into the daily functioning of institutions, business, the state and consumers (Mol, Sonnenfeld, Spaargaren, 2020).

5.3.6 In sum

A general weakness of EM's emphasis on resource-efficiency and pollution control is the neglect for aggregate consumption patterns (Buttel, 2000). Outcomes for this neglect have been shown by the reported increased waste streams and challenges around waste separation. The UN (2020) statement to increase economic growth, combined with the challenges around decoupling economic growth from resource depletion and waste might further confirm the neglect for aggregate consumption patterns. Furthermore, they might be indications for alignment with EM's direct rebound-effect as described by Robra and Heikkurinen (2019). The rebound-effect challenges EM's premise that a decrease in resource use or fewer emissions per unit of production (i.e. eco-efficiency) leads to an overall decline in used resources. The 'rebound' is that efficiency gains could trigger capitalist market mechanisms that cause the price of products to fall, which increases the demand for production. In turn, this could make the efficiency-gains irrelevant (Robra and Heikkurinen, 2019). Direct evidence for this effect has not been found. However, the issues around waste and resource-efficiency do indicate that potential efficiency gains have not led to an overall decline in resources.

The direct rebound effect implies that consumers play an important role in the effect of eco-efficiency. The role of consumption has been discussed in the result chapter, and mainly focusses on awareness-raising strategies. But do these strategies confirm the indication that EM might neglect aggregate resource consumption patterns?

5.4 Consumption: awareness-raising and others?

The formulation of SDG 12's targets does not include any mention to reduce overall (production and) consumption patterns (Gasper et al. 2019). The only targets that have clear consumer-oriented aspects are 12.3 and 12.8. Mol and Sonnenfeld (2000) argued that the third phase of EM incorporated the role of consumption and global processes in the international context. The existence of SDG 12 with the incorporation of the consumption targets indicate an alignment with that phase.

The relatively high prioritisation of reporting on awareness-raising strategies is evidence of governments taking action to steer consumers into 'the right direction' for their consumption choices (Buttel, 2000; Fisher & Freudenburg, 2001). The emphasis in most reported challenges for target 12.8 lies with difficulties around changing consumer behaviour. England's (2019) reported challenge that '*...changing*

consumer behaviour can be challenging, but appropriate enforcement measures will help change consumer's behaviour to 'do the right thing' indicate a strong alignment with EM consumption strategies. However, the relative prioritisation results in table 9 show that the use of this strategy decreases alongside GNI per capita. This could indicate that lower-income countries are less able to adopt these awareness-raising strategies. The reported challenges of lower-income countries indicated that there is a lack of initiatives or effect. This could indicate an insufficient governance capacity (Elder et al., 2016), but the evidence is highly susceptible to the context of these individual countries. Alternatively, if economic growth is the main priority in developing countries (Wang et al., 2019), neglecting the types of goods that consumers buy is more likely to occur. In turn, this could lead to less initiatives or policies aimed at consumer values. The focus of developing country governments tends to lie more with the essential needs of citizens, at the cost of environmental considerations (Wang et al., 2019). Again, the lower relative perceived importance of target 12.8 in lower-income countries can also be explained by the less extreme consumption patterns (lowering the urgency for such policies). The high prioritisation of SIDS is likely to be connected to the waste problem and tourism industry, and are linked to the initiatives employed by the UN (n.d.3).

So, the results have presented no reason to doubt that the vast majority of VNRs reports on SC in line with the wSC (i.e. eco-efficiency) (Lorek and Fuchs, 2013) and SC (i.e. awareness and consumer values) (Barber, 2007) conceptualisations presented in the theory. Eco-efficiency and technological innovation have to produce conditions that trigger capitalism's flexibility and produce market-based solutions. The tool to change consumer behaviour comes exclusively from awareness-raising approaches. Possibly, the long successful strategy of eco-labelling is used to influence consumer-choices as well (Dyllick and Hockerts, 2002; Jänicke, 2020). Even though the prioritisation rate of 12.8 decreases alongside GNI per capita, only Viet Nam (2018) has stated that awareness-raising itself has a limited and fragmented impact. The only VNR that has come close to making sSC (Lorek and Fuchs, 2013) references is Iceland (2019), stating that decreasing consumption itself is a challenge.

Combined with the analysis on waste, where for example increasing waste streams seem to appear across groups, it might be concluded that Buttel's (2000) criticism on EM that it neglects broader concerns for aggregate consumption patterns might be true. At the same time, this raises questions around the effectiveness of EM's SC strategies, even when the relative prioritisation values are high. However, the effectiveness of awareness-raising has not been measured in this thesis. Still, the question remains whether the reported challenges on changing consumer behaviour and creating sustainable habits can be solved. In an EM-paradigm, the integration of economic growth and environmental protection would have to be realised (Weale, 1992). So far, SC seems to be the responsibility of consumers entirely, with governments using soft strategies to steer people in 'the right direction'. This statement can be supplemented by the low prioritisation of target 12.6: creating company sustainability practices. The absence of reporting on policies, EPR / CSR requirements or company sustainability reports do not imply that governments place a similar emphasis on producers' responsibility as on consumers.

5.5 The low prioritisations

Jänicke (2020) claims that EM needs an improved understanding of environmental policies beyond its selectiveness (i.e. resource-efficiency and pollution control). However, the analysis in this thesis can where improvements are necessary within EM's own scope. The lowly-prioritised components concern target 12.6, 12.7, 12.b and 12.c. The general lack of VNRs reporting on these components, combined with a limited number of reported challenges complicate their analysis. Yet, EM's characteristics and other theory give the opportunity to explain the absence of some components.

5.5.1 Business

In prioritisation terms, target 12.6 (encourage company sustainability practices) seems to be of a generally low relative perceived importance based on VNR reporting (Kim et al., 2020). The absence of reported policies and data in VNRs potentially indicate a more 'laissez-faire' approach from the government towards business actors. Donovan et al. (2017) From an EM perspective, a reason for the absence of policies and data might be found in EM's faith in market-based solutions (Machin, 2019). Moreover, it might underline the confidence states have in the ability of capitalism to transform itself

and integrate environmental concerns into the daily functioning of businesses (Mol, Sonnenfeld, Spaargaren, 2020). In any case, the regulatory frameworks directing firms have not been reported on much across countries, but differentiation in the rates has been perceived.

Target 12.6's relative prioritisation rate is low across groups, but highest in the HI-class. In addition to the low values, barely any reported challenges have been found for the implementation of this target. Due to the lack of qualitative information, the most likely explanation for the low values is the 'faith in the market-based solutions' argument. What makes this interesting is that EM has long recognised that long-term environmental protection requires international socioeconomic and cultural changes (Hajer, 1995; Fudge and Rowe, 2001). Yet, these changes have not been translated in VNRs reporting on government policies or initiatives to encourage sustainable business practices from 2016-2020. It can be argued that resource-efficiency policies have consequences for business practices, however the content and potential connectedness of the reported policies have not been studied in this thesis.

The incorporation of target 12.6 in SDG 12 indicates an internationally recognised willingness to make changes to businesses, but the response in VNR reporting has been limited so far in terms of policies, data or challenges. The only frequently found challenges concerned a general lack of interest or initiatives from business and government for SCP. However, the low number of VNRs reporting on that make it equally likely to be a specific contextual condition than a pattern for certain GNI classes. Still, if it is assumed that Wang et al.'s (2019) SCP distinction is true (i.e. developing countries prioritise economic growth over sustainability). Then it could be assumed that especially companies in lower-income countries will have the weakest incentive to adopt sustainability practices. The prioritisation results do reflect this potentiality. However, these are equally likely to indicate a predominant alignment of an EM-framework with highly industrialised countries (Christoff, 1996; Mol, 1996; Dryzek, 1997). To get valid explanations for the differing values, case-studies will have to be performed.

5.5.2 Fossil-fuel subsidies

Jänicke (2020) exemplified his stated need for 'a policy of structural change' by mentioning phasing out fossil-fuels. Gasper et al. (2019) described MoI 12.c as the exception to the rule that SDG 12 has not explicitly acknowledged a need for regulatory changes to 'enforce sustainable practices and restrict or prohibit unsustainable ones'. From a political EM perspective, actors are expected to build different coalitions to make environmental protection politically feasible (Buttel, 2000; Fisher and Freudenburg, 2001). Yet, nearly all SDG 12 sections in English VNRs neglect the only regulatory-oriented component in the Goal. This indicates that shifting away from fossil-fuels subsidies is (not yet) a strategy for stimulating more SCP patterns, at least not based on VNR reporting. The non-prioritisation is not extremely surprising as UNEP (2010) has emphasised SCP's focus on technological innovation and its transfer, instead on regulation.

A nuance in this finding is that a possibility of fossil-fuel information being incorporated into other sections of VNR reporting exists. Furthermore, a selection of countries might not have fossil-fuel subsidies, making it potentially irrelevant to report on them. For the former option, the key-word 'subsid' (in order to include 'subsidy', 'subsidies', 'subsidized' etc. all at once) has been used in all relevant VNRs to test this possibility. No further reference towards fossil-fuel subsidies seem to have been made in the form of planning to phase-out, or the availability of a baseline or other relevant data.

A further interesting observation is to see how resource efficiency is the most prioritised target, while a rationalisation of fossil-fuel subsidies is the lowest (12.c). It indicates that the goal of more efficient use of resources is not likely to be connected to potential measures that would complicate the use of such resources (i.e. phasing out fossil-fuel subsidies). Therefore, Jänicke's (2020) criticism that the EM-approach adds cleaner technology to existing harmful industries, but does not provide alternatives for them could be underlined by the absence of prioritising the rationalisation fossil-fuel subsidies. The absence of reported regulations towards companies (12.6) might also align with this statement.

5.5.3 SPP and sustainable tourism

The SPP prioritisation rates are predominantly found in the HI- and UMI classes. Still, within these groups they are among the targets with the lowest prioritisation. Lower-income countries have scarcely reported on SPP. In addition, frequently reported challenges on the topic have not been found.

The only relation of SPP to the theory comes from the emphasis UNEP (n.d.) has placed on the topic on their SCP page. UNEP (n.d.) stated that governments SPP practices can be exemplary for other actors in society. However, the lack of reported policies or requirements for SPP across groups indicates that government do not yet lead by example in a convincing manner on a global scale. In UNEP's (n.d.) words, key policy objectives or strong market signals have not been identified in abundance based on the relatively low prioritisation rates. In practical terms, there might be challenges around procuring goods that are economically attractive and sustainable at the same time. Especially in lower-income groups, SIDS and LPCs it seems that SPP is of lower perceived importance.

The non-prioritisation of sustainable tourism might be explained by the fact that many countries do not have tourism-dependent economies. However, since SIDS can have tourism-dependent economies (UN, n.d.3), one could have expected higher prioritisation rates compared to other countries. It is possible that UN Programmes of Action for SIDS already take action on tourism separately from the SDGs, explaining its low prioritisation rates. If that is the case, it would be interesting to study why such programmes are not largely incorporated into reporting in the VNRs. The reason for the high prioritisation of sustainable tourism for LPCs cannot be explained from the theory. However, it could be tourism-dependent economies are a relevant explanation. Still, the group size of the LPC-class complicates making reliable statements.

5.6 Technology and data

Perhaps the most frequently found challenge is the lack of appropriate data to track progress on SDG 12's implementation. In addition, many VNRs were not able to present policies in conjunction with data based on the low frequency of green evaluations. A large proportion of SDG 12's targets have long been classified as Tier 3 indicators (Gasper et al., 2019), meaning that no internationally agreed methodology for the measurement exists. For that reason, the evaluation method in this thesis has not limited itself solely to the proposed SDG 12 indicators. Despite that, not many VNRs offered alternative sources of data to indicate progress on a target. Furthermore, if data is the evidence that can improve decision-making (Baba and Hakem Zadeh, 2012), then countries with better monitoring capabilities are more able to create more effective policies aimed at SDG 12's implementation. So, the absence of data and monitoring capabilities could create challenges around the creation of effective evidence-based policies. In addition, the ability to track data relates directly to how countries are able to report on SDG 12's progress in VNRs and other documents. The goal-setting approach could result in countries prioritising SDGs for which data is available (Fukuda-Parr and McNeill, 2019). If this is also true for a specific Goal's targets, this might explain the lower prioritisation rates of lower-income classes (as they also struggle more with data collection). However, even if that is the case, most of SDG 12's components' indicators were still barely reported on in conjunction with policy in the HI-class. Especially considering the relatively high data availability on target 12.5 resulted from the Municipal Waste Generated, not the national recycling rate (12.5.1). Therefore, there seems to be a general lack of data availability independent of income, even when a broader range of indicators is perceived as relevant outside of SDG 12's original indicators.

From an EM point of view, technology refers mostly to innovation leading to cleaner production while using less resources (i.e. 'doing more with less' (UNEP, n.d.)). The reported challenges have shown an indication that HI-countries' technology struggles are centred around finding innovations to transition towards a more resource-efficient economy. In contrast, developing countries struggle to fund, adopt and regulate appropriate technologies. No indications have been found that developing countries are 'leap-frogging' (UNEP, n.d.).

Also, the challenges have also shown that technology is a multi-dimensional problem. Waste can be used as an appropriate example based on the results. In the first place, funding for appropriate waste facilities for example is an economic issue. Secondly, educating people to successfully use the technology is social challenge. Third, effective regulation is needed (e.g. for chemical waste) to make sure technology is used and it delivers its intended effects. Fourth, favourable financial situations have to be created to update existing technology to be able to keep treating waste appropriately. As such, innovations alone are not enough to solve environmental problems or facilitate leap-frogging in developing countries.

EM's solutions to environmental problems are to be found in more modernisation or 'super-industrialisation' (Buttel, 2000; Mol, 1995; Spaargaren, 1996). At the same time, EM is central in the international environmental discourse (Amos and Lydgate, 2019; Gasper et al., 2019). However, the differences in technological challenges indicate a potential unequal ability of countries to adopt or create technologies (as solutions) in multiple dimensions. HI-countries seem more capable to use technologies, but still report to struggle with finding innovations to transitions to a resource-efficient economy and solve the waste problem.

5.7 The alternative: Degrowth

The fact that EM has contrasting ideas with Degrowth, and EM is at the basis of SDG 12's formulation, the chance was low to find Degrowth references in the VNRs. Except for Iceland's reported challenge to decrease consumption, there have been no direct references that can relate to Degrowth. However, there are some cases where shortcomings in the EM-approach have become evident. If EM needs to expand its understanding of environmental policies beyond its own selectiveness (Jänicke, 2020), Degrowth might offer insight in how these shortcomings can be addressed.

In essence, Degrowth and EM agree on the central aspect of SCP. Namely, that the matter/energy throughput of societies and human organisations must reduce (Heikkurinen, 2018). The core difference lies in the approach to reach this goal. Degrowth's take is that efforts to develop problem-solving technologies and more efficient processes of production have failed to decouple economic growth from environmental degradation (Robra & Heikkurinen, 2019). Multiple VNRs from the HI-class specifically have reported to find this decoupling challenging. In addition, three more HI-VNRs have stated to displace their production processes which does not solve the larger environmental problem (Weale, 1992). Furthermore, the previous section on technology have shown the multi-dimensional nature of how technology can work efficiently.

Based on the results of this thesis, the waste targets might expose a potential inability of EM to integrate environmental protection with economic growth. Challenges from multiple dimensions such as population growth, inadequate market conditions, the changing nature of waste, treatment facilities and ineffective regulation all challenge the problem-solving potential of technology. Therefore, EM's main hypothesis that economic growth and ecological conservation can be integrated to deal with environmental problems (Gibbs, 2000) might be challenged most for waste. A Degrowth perspective that a reduction of consumption and more responsible economic activity could alleviate these issues (Heikkurinen, 2018). However, the economic growth narrative of EM does not align with such alternatives.

Therefore, the most important issue to tackle from an EM-perspective are the market conditions (i.e. appropriate waste fees). One of Degrowth's policy proposals is to tax environmentally damaging activities (Kallis, 2011; Victor, 2010). This could be one strategy of politicians within the EM-framework to try and build coalitions to make environmental protection feasible in economic terms (Buttel, 2000; Fisher and Freudenburg, 2001). However, EM currently focusses on employing consumer-strategies around raising awareness. While this can have significant impacts, it will not change the market characteristics of the recycling industry. In developed societies, Degrowth calls for different roles and responsibilities from states and business actors (Lorek and Fuchs, 2013). This aligns with the longstanding recognition of EM that international socioeconomic and cultural changes are necessary for environmental protection (Hajer, 1995; Fudge and Rowe, 2001). However, the low prioritisation of target 12.6 and 12.c do not indicate a willingness / success of creating policies to steer companies towards more sustainable behaviour or rationalise fossil-fuel subsidies. Unfortunately, Degrowth's call for different roles for states is not compounded by theory on how this is possible as the role of the state is largely understudied (D'Alisa and Kallis, 2020).

5.8 In sum

The prioritisation patterns have shown alignments with EM and SCP literature. However, countries challenges and prioritisation also align with weaknesses that are associated with the approach, and have become visible in the VNR reports. This raises questions about the dominant role EM has in the

international environmental governance context. The next chapter discusses the broader theoretical contributions the results of this thesis might have. It summarises the components of this the result analysis to come to such answers with the pre- and post limitations of this study in mind.

6. Discussion

The discussion is structured as follows. First the limitations of this thesis are discussed. They are followed by some generalisation, validity and reliability considerations. Then, attention is given to how this thesis contributes to the existing theoretical debate on VNRs, SDG 12 and EM. Based on the contributions and the remaining gaps, research recommendations are formulated.

6.1 Limitations

6.1.1 Theoretical limitations

The first limitation is related to the extensiveness of the used theories. At the beginning of this thesis, a choice had to be made between evaluating the VNRs more extensively or incorporating a large theory section on all SDG 12's components. In the end, the former option was chosen as it offered qualitative information to the prioritisation patterns in the form of reported challenges. In addition, it offered better opportunities to explore how the VNR as review tool is used by countries. However, this limited the ability to place the (qualitative and quantitative) findings into a broad theoretical framework on SDG 12's components. If the thesis was repeated, a short theoretical status quo on all of SDG 12's components could have been included to provide this theoretical context. However, the use of the EM-theory has partially circumvented the need for such a status-quo chapter.

6.1.2 Post-evaluation methodological limitations

Aside from the pre-evaluation limitations described in chapter 3.5, there are additional post-evaluation considerations. In hindsight, it would have been clearer if an additional category was added to the evaluation scheme for T-targets. In this thesis, a yellow evaluation was given when a VNR reported on a policy or a baseline. This decision limited the potential to discern specifically between whether a VNR reported a policy or a baseline. An additional category would allow for a more effective distinction. Consequently, implications on the way in which countries prioritise a target could have been more specific. The availability of data without an accompanying policy could indicate a lack of governance capacity more clearly for example.

Further, a lack of time resulted in the forced exclusion of non-English VNRs that reported on SDG 12. It would have benefitted the comprehensiveness of the results majorly if an additional 31 VNRs were included for analysis. As a result, the findings cannot be generalised for South-American countries. The African continent has been underrepresented as well, even though African countries were still represented to a moderate degree.

Furthermore, the UN (2012) classification also offered the possibility to categorise countries in (1) developed, (2) transitional and (3) developing economies. Additional categorisation would have been possible for the G7-economies and Least-Developed Countries (LDCs). The use of this classification could have circumvented the existence of the now disproportionately large HI-class. Within that group, a lot of differentiation would still have been possible seeing as the threshold for the class is set at around \$12.500 dollars per capita.

A major limitation for the qualitative context of this thesis was the limited frequency of reported challenges in the VNRs. Even though the used methodology aimed to look for consistency in reported challenges before making a claim, a higher frequency would have made the results more reliable and generalizable. However, the inclusion of the reported challenges has proven to be a valuable addition for an attempt to explain prioritisation patterns. They have served as a test towards the partial aim of the VNRs: to incorporate implementation-challenges. As such they have provided qualitative insight in implementation, and partially tested the VNRs as a review tool.

Lastly, the idea of using Degrowth as a contrasting theory has not been very successful. The expectation pre-evaluation was that the theory could prove to be useful if countries deviated from SDG 12's EM discourse. Looking back, this has not yielded the desired effect.

6.2 Generalisation, validity and reliability

The evaluation scheme of table 7 has assured consistency of measurement, i.e. the reliability of the results. During the evaluation process, multiple challenges have been encountered that challenged the

used evaluation scheme. Therefore, it has been subject to change throughout the first months of this thesis. Examples are distinguishing between T- and NT targets and the ‘Addition & adjustments’ boxes in table 7. The evaluation has been performed once in its entirety with the first draft of the evaluation scheme. After that ‘round’, adjustments were made and weaknesses were taken out. The second evaluation round showed minor differentiations in the evaluation outcome, but delivered much less problems during the process. In addition, the performed proof of concept test has added to the reliability of the results.

The methodological limitations stated above already gave insight into the validity of the methodology and the subsequent results. An additional evaluation category would have improved the distinction between a reported policy and reported baseline. In addition, the use of developed / developing countries (instead of GNI-classes) might have been beneficial towards the validity of the results in some cases. These two changes would have improved the accuracy of the methodology in two ways. First, the way in which a VNR prioritised a target would have been clearer. Secondly, the prioritisation of a group would have had more implications as the term ‘developed’ indicates more than just a GNI per capita measure.

If these validity improvements would be made, the generalisability of the results would improve for a group of countries with more distinct features that possibly apply better to the SCP context as a whole. Furthermore, the generalisability of the results would improve if VNR reports include more challenges with a clear cause.

So, the novelty of this thesis’ methodology and limited availability of existing VNR-research have led to some imperfections in how this thesis was performed. However, it has opened up a possibility for other researchers to study the way in which countries prioritise the implementation of the SDGs. The above considerations can help improve the approach of researchers in the future. In turn, the research community can use the VNRs as an accountability mechanism towards the state. The way in which governments report on the VNRs is their responsibility. Governments cannot be expected to present all activities that are going on, but if a certain government activity has a high priority, it should at least be included in the formal UN review mechanism of the SDGs.

6.3 Theoretical contributions

6.3.1 SCP and SDG 12

The first contribution to the theoretical debate on SDG 12 is that countries prioritise reporting on targets within one SDG in their VNRs. As such, Kim and Forestier’s (2020) finding that countries ‘cherry-pick’ SDGs in VNRs can be expanded. Conclusive answers as to why certain targets are prioritised cannot be given as they are bound to contextual conditions. However, the frequently found challenges across groups can be seen as indications that attempted to reveal structural implementation challenges independent of income.

The challenges and prioritisation rates indicated that both high-and low-income countries struggle with the waste issue (despite the generally high prioritisation of target 12.5). They also indicate that food-and chemical waste might not be incorporated in EM’s conceptualisation properly across groups. Based on the results on target 12.2 and 12.5, applying life cycle thinking (UNEP, n.d.) might be complicated to realise in multiple contexts, but for different reasons. Therefore, improved understanding of how all aspects of waste (12.3-12.5) can be incorporated into the EM-framework is necessary. More specifically, policies and (financial) incentives are required to help tackle increasing waste streams, facilitate effective waste separation (at source and facility), create favourable market conditions to make waste an asset to economic growth and find ways to decouple economic growth from resource depletion and pollution. There is no one-size-fits-all approach to do this. However, the generally low prioritisation rates to encourage sustainable business practices might indicate an avenue for governments to get business actors involved. At the same time, this could go against EM’s core value that has faith in market-based solutions.

Consequently, another contribution to the SCP/ SDG 12 theory partly aligns with Jänicke’s (2020) statement that EM needs an improved understanding of environmental policies beyond its own selectiveness. The word ‘partly’ is used because the waste issue does align with EM’s selectiveness (Buttel, 2000), but also needs improved understanding and attention. Therefore, expanding Jänicke’s

(2020) statement might be justified. If SDG 12 is inherently an EM-framework, then it is clear that governments need more understanding of (effective) policies outside *and within* EM's selectiveness. In the statement in question, Jänicke (2020) specifically referred to phasing-out fossil-fuel subsidies. While the 'rationalisation' of such subsidies have been included in SDG 12, they have been its most neglected component in VNR reporting. The least prioritised components could indicate in which SDG 12 areas improved understanding is needed most. However, from an EM-perspective, these are also the areas where the market is expected to do its work, without too much interference of the state. Still, based on the analysis of the VNRs it is clear that countries do not prioritise the rationalisation of fossil-fuel subsidies and the topic is not included in other parts of their VNRs either. Lastly, the role of consumption for SDG 12 is mostly addressed through awareness-raising and in the case of HI-countries potentially also through food waste. This confirms the neglect for sSC-and Degrowth conceptualisations of SC. Countries have not reported on the need to decrease consumption, the exception being Iceland (2019). As such, the VNRs do not go beyond EM's narrative, where economic growth and resource depletion can be decoupled. Reducing the matter/ energy throughput of a society continues to be approached from an eco-efficiency perspective. Some doubts around the ability to change consumer behaviour have been addressed, which could reaffirm the insufficiency of awareness-raising strategies to realise SC on an international systematic scale.

6.3.2 Global goal-setting & the VNRs

The SDGs are the most ambitious set of Goals used in a global governance context to date (Biermann et al., 2017). However, its emphasis on the use of indicators and targets might not be the best strategy in an international context. This study has shown that countries from all groups have a problem with providing relevant data in their VNRs. This raises questions around the use of indicators to measure progress. However, this is not to say that the use of quantitative information is useless. It is just a reminder that the world of data is complex and that Goodhart's Law states: 'once a measure becomes a target, it ceases to be a good measure' (Hoskin, 1996; Newton, 2011).

Nonetheless, the introduction of a review mechanism such as the VNRs is a positive addition to the global goal-setting context. Especially because it facilitates a large central database with SDG progress reports of countries from around the world. However, they can still be improved in terms of striving for uniformity in used languages and incorporation of all SDGs in each VNR. This would improve the chance to realise the aim to facilitate the sharing of experiences across countries (UN, n.d.).

Fukuda-Parr and McNeill (2019) argued that broad qualitative analysis of the SDGs is needed to monitor the progress of their implementation. The VNRs should aim to become that tool. However, for that to happen the previously mentioned emphasis on the indicator framework should shift towards a more qualitative emphasis. The availability of data is useful to substantiate statements, but the implementation challenges come from the qualitative information. Right now, qualitative analysis is only possible to a limited extent through the progress-sections in VNRs. In this thesis, the challenges have proven to be a useful qualitative information for the problems associated with the limited implementation of SDG 12. However, their overall availability was limited across groups and targets. As such, large scale incorporation of implementation challenges could make the VNRs a helpful central database for researchers, governments, business and civil society actors. The qualitative information can help circumvent potential lacks of data availability and valuable contextual information alongside indicators. In addition, an increased emphasis on qualitative information for each target would help countries lacking data with creating a meaningful VNR.

Lastly, it would be useful if countries reported on all targets and MoI in a VNR, even if there is no information available on them. This would improve the aim to give citizens accountability towards the state for the implementation of the SDGs. Also, unavailability of information itself could be a very useful result.

6.3.3 The prioritisation method

The novelty of this thesis' method and studying the VNRs require some comments that can be used for future prioritisation research in a global goal-setting context. As suggested by Fukuda-Parr & McNeill (2019), the VNRs are useful to study prioritisation patterns. The method used in this thesis differs from Forestier and Kim's (2020) approach, who operationalised the prioritisation of SDGs in a VNR as

'instances where a government makes explicit references to specific SDGs as prioritised in its VNR'. The aim of this study was not to compare prioritisation between Goals, but the prioritisation of a single Goal's components. The strong point of this method is that 'priority' equals the existence of a policy and/ or baseline. The weak points are that a government does not have to report the existence of a policy in a VNR, and that the absence of a baseline does not mean that countries are taking no action on a target. As such, this method does circumvent vague languages where possible, but is more dependent on the comprehensiveness and quality of a VNR than Kim and Forestier's (2020) prioritisation method. Another difference is that Forestier and Kim (2020) can rely on the responsibility governments take when they proclaim that a SDG is prioritised above others. The method in this thesis assumes that a country prioritises a target when they report that a policy for the target exists. As such, it neglects the importance the policy might have compared to other existing policies.

Nonetheless, the use of Forestier and Kim's (2020) method would not have been possible in the context of this study, as the reporting on individual components of SDG 12 would rarely have been detailed enough. Therefore, it had to be assumed that the existence of reporting on a certain component means that a country prioritises that target over others.

The method in this thesis can be used again, but the limitations set out in this thesis have to be taken into account and necessary changes have to be made.

6.4 Research recommendations

Based on the above, multiple research recommendations can be formulated. First of all, the effectiveness of the application of 'life-cycle thinking' has to be studied in relationship to the effectiveness of the recycling industry. The study would have to be differentiated across countries in different development stages. Differences in obstacles from a social (e.g. how does a consumer recycle properly?), economic (e.g. what are cost-effective strategies to stimulate the waste industry to recycle?) and environmental perspective (e.g. what are the effects of the changing nature of waste on environmental pollution?) could prove to be useful in the creation of more effective recycling policies and approaches.

Secondly, a comparative case study can be performed in which the VNRs and national SDG progress documents can be compared. For example, The Netherlands have published national SDG documents on a yearly basis and a single VNR in 2017. The content of each document can be compared systematically to identify similarities and discrepancies. As such, the way in which countries use VNR documents can be studied further, and their representativeness for implementation efforts can be compared.

Third, the Spanish and French VNRs that were excluded from this study should be analysed in a similar manner. With a representative data base, prioritisation patterns and frequently reported challenges can be categorised per region/ continent for SDG 12.

Fourth, the absence in reporting on the rationalisation of fossil-fuel subsidies deserves further attention. This need is supplemented by Jänicke's (2020) claim that EM needs improved understanding of environmental policies beyond its own selectiveness. Insight in the countries that have the highest fossil-fuel subsidies, the use of fossil-fuels in general and (for example) the bottom-up developments of industries that rely most on those subsidies could be interesting to study.

Lastly, the components of SDG 12 have to be studied for the USA, China and Brazil. These countries are among the largest producers and consumers of the world. The reasons for them not publishing a VNR on SDG 12, and their occupation with SCP in general should be studied. For example, the types of legislation that they implement on matters related to SCP are of major importance.

7. Conclusion

The conclusive chapter of this thesis answers the four sub-questions in separate sections with the considerations of the discussion in mind. Ultimately, a final section summarises these elaborations to answer the main research question:

How are UN-countries prioritising SDG 12's components and reporting challenges in the Voluntary National Reviews (2016-2020), and how can the patterns be explained from an Ecological Modernisation perspective?

7.1 Countries reporting on SDG 12

Nearly 70% (139/206) of all VNRs have incorporated a section dedicated to SDG 12. Table 8 shows that Europe has the highest share of countries that reported on SCP. Other regions in the world do so to a lesser extent. The document analysis used in this thesis had to limit its evaluation to the 108/139 VNRs that were published in English (coming from 101 countries). The 31 excluded non-English VNRs with a SDG 12 section mainly originated from African and South- and North American countries. Their exclusion has obvious consequences for the comprehensiveness of the results. Consequently, a recommendation has to be made to strive for the uniformity of language in VNR documents. This strive aligns with the intended aim of the reports to 'facilitate the sharing of experiences, including successes, challenges and lessons learned, with a view to accelerating the implementation of the 2030 Agenda.' (UN, n.d.2).

The used country classification strategy (UN, 2012) showed that around 38% of the relevant English VNRs came from High Income (HI) countries (excluding SIDS & LPCs). The number of VNRs reporting on SDG 12 decreased alongside GNI per capita. Taken together indicate that the incorporation of SDG 12 in a VNR is done most by European and/ or HI countries. This potentially aligns with Buttell's (2000) criticism on EM that it is Eurocentric, and relates primarily to the experiences of highly industrialised countries. A categorised list of all countries with a VNR on SDG 12 can be found in Annex 1.

7.2 The overall prioritisation of SDG 12

The overall prioritisation results of the VNRs have shown that the most prioritised targets on resource efficiency (12.2) and waste generation and recycling (12.5) align with EM's success areas of resource efficiency and pollution control. The additional relatively high prioritisation on raising consumer awareness (12.8) indicate that countries have generally adopted what Mol and Spaargaren (2000) called the 'third phase' of EM. The fact that the 'other' waste targets (12.3 and 12.4) have a lower priority in VNR reporting than 12.5 is remarkable. It potentially indicates that food-and chemical waste have a relatively lower perceived importance in terms of the existence of policies and/ or a higher unavailability of data. The targets with the lowest overall relative prioritisation concern encouraging company sustainability practices (12.6) and Sustainable Public Procurement (12.7). However, the MoI on sustainable tourism (12.b) and especially the rationalisation of fossil-fuel subsidies (12.c) have the lowest prioritisation rates of all of SDG 12's components.

7.3 Commonalities and differences across groups

When the overall prioritisation results are differentiated across groups, commonalities and differences in their patterns occur. The HI, UMI and LPC groups follow the overall prioritisation trend explained in the previous paragraph (or figure 6). However, the LMI, LI and SIDS prioritise SDG 12's components differently or less in general). In the first two groups (LMI and LI), resource efficiency (12.2) remains the most prioritised target, but the emphasis on waste generation and recycling (12.5) in reporting decreases. The same is true for the reporting on raising SCP awareness (12.8). For the LI-class, the target on chemical waste (12.4) has a higher priority in reporting than 12.5. The SIDS' pattern deviates in a contrasting manner. The emphasis on waste generation and recycling (12.5) and awareness-raising (12.8) share the most prioritised position. Yet, the emphasis on resource efficiency evident in other groups does not occur in VNRs from SIDS. Their high reliance on imported goods (UNEP, n.d.) possibly explains with the reduced emphasis on resource efficiency.

The focus of frequently found challenges across groups are mainly on waste (relating to 12.3-12.5), recycling and data availability. Indications have been found that higher-income countries experience different types of challenges than lower-income countries for the same targets (e.g. food waste and waste generation & recycling). However, the low frequency of reported challenges in VNRs challenge the generalisability of these indications. Yet, they have contributed the needed qualitative component to monitor the implementation of the SDGs (Fukuda-Parr and McNeill, 2019).

The differences in prioritisation patterns and reported challenges are potentially explained by the differing conceptualisations of SCP in developed and developing countries (Wang et al., 2019).

7.4 SDG 12 and Ecological Modernisation

Gaspar et al. (2019) and Weber & Weber (2020) concluded that the formulation of SDG 12 has strong similarities with EM theory. This thesis' strive was to show how countries prioritise the Goal's components, which components are neglected, how this aligns with EM theory and explain what this might mean.

The previous paragraphs have already contributed two potential alignments with theory from or aimed at Ecological Modernisation (i.e. its '*Eurocentricity*' and success areas). Today, the adoption of EM in other countries outside of Europe shows that EM primarily relates to highly industrialised countries, not just European ones. The relative prioritisation values might indicate an increased capability of higher-income countries to report on policies and/ or data than lower-income countries. This can be substantiated by challenges from lower-income VNRs where data availability and the lack of (effective) regulation were reported relatively frequently. However, the generally low frequency of green values indicates that data availability (in conjunction with policy) is generally low across groups. These claims have to be considered with the likelihood in mind that potentially relevant policies were not incorporated in VNR reporting.

The prioritisation patterns and challenges have also shown that food-and chemical waste are possibly not to be considered as part of EM's perceived success area of pollution control. The lower prioritisation rates indicate a generally lower perceived importance (Kim et al., 2020), an insufficient governance capacity (Elder et al., 2016) or a lack of appropriate knowledge (Weitz et al., 2015). The reported challenges around waste separation and the lack of (appropriate) recycling facilities substantiate the potential inability of countries to deal with waste targets.

In turn, the nature of these challenges potentially indicates a discrepancy between higher-income countries' (and SIDS') prioritisation of target 12.5 and the ability to realise its implementation. In other words, the findings challenge the ability of countries to realise one of UNEP's (n.d.) SCP key objectives; to 'apply life cycle thinking'.

The fact that countries report on SC in the context of awareness-raising and what Lorek and Fuchs (2013) termed wSC is not surprising due to the relation between SDG 12 and EM. However, the decrease of 12.8's prioritisation alongside income is interesting. Lower-income countries prioritised this strategy to a lesser extent than higher-income countries. The lower perceived importance of this target might stem from the different conceptualisations of SCP in developed- and developing countries (Wang et al., 2019). At the same time, multiple HI-countries have reported challenges to change consumer behaviour, and steer people to 'do the right thing'. This raises questions on the extent to which the strategy is effective.

The low prioritisations of target 12.6 (encourage company sustainability practices) and MoI 12.c (rationalisation of fossil-fuel subsidies) can be explained from EM's faith in market-based solutions (Machin, 2019). In addition, this result aligns with the criticism of Jänicke (2020) that EM needs improved understanding of policies outside of its own selectiveness. However, especially the waste results indicate that EM also needs improved understanding of environmental policies within its own selectiveness. More specifically, the VNR results of countries indicate that improved understanding and mechanisms for 'the wastes' are necessary for the implementation of SDG 12.

Lastly, the multi-dimensional technology challenges indicate that solutions outside of the technological sphere might have to be evaluated. Some HI-countries report the need to find innovations to transition to a resource-efficient economy, while lower-income countries report the absence of, or inability to adopt, technologies.

7.5 In sum

Now that all sub-questions have been answered, the main research question can be answered. Countries from all continents have contributed VNRs with SDG 12 incorporated between 2016-2020, but not all of them were in English. The English VNRs have generally shown to prioritise resource efficiency (12.2), waste generation & recycling (12.5) and raising consumer awareness (12.8). However, the use of country classification has resulted in visible differentiations in these patterns. Lower-income countries prioritise reporting on SDG 12 slightly different, and to a lesser extent, than higher-income countries. The prioritisation results have affirmed an alignment with EM's success areas of resource-efficiency, waste generation and recycling and its emphasis on raising consumer awareness. In addition, the EM theory offered reasonable explanations for the lower prioritisation of other SDG 12 components. Yet, the differences across groups and the reported challenges for the waste targets and consumer awareness indicate where the EM-approach might be vulnerable. Therefore, EM needs reconsideration, and improved understanding both within and outside of its own selectiveness. This could lead to improved use of EM as an international environmental policy approach in the context of global governance through goal-setting.

Final thoughts

The following is a short elaboration on my view of SDG 12, SCP and the VNRs. It is not substantiated by empirical evidence, and not intended to be read as such. However, it can be seen as a product of the past 9 months.

The Great Acceleration was mentioned in the introduction of this thesis. The word ‘Great’ in this term is not intended to mean ‘good’, but rather ‘unprecedented’. Technology and economic growth have brought humanity many great (good and unprecedented) things. Therefore, a complete demonization of capitalism and technological progress is misplaced in my opinion. What the VNRs have showed me is that there is an international effort (of which the effectivity is unknown) to change the impact our globalised society has on the world. I think technological progress and capitalism have a place in that effort. Trade and the creation of new ‘tools’ are the mechanisms humans have used to build society from Sumer (4000 BC) to ‘the Global Village’ of today. For me, they symbolise a way in which the realisation of Sustainable Production can be approached.

However, in Sumer humans did not have to think about their mores on a planetary scale. Much of their behaviour had a direct impact on their habitat. Today, it takes effort and willingness to think about what the consequences of your consumption behaviour are on the habitat of people far away. Therefore, raising awareness on this subject is a necessary SC approach. However, humans are not rational beings and are subject to cognitive dissonance. In simpler terms, we are good at believing something and behaving contrary to that belief. Sustainable Development should not be a test of a human’s psychological weaknesses, but an enhancement of its strengths.

One of its weaknesses is the concept of ‘needs’. Jared Diamond (1996) once turned the phrase ‘Necessity is the mother of innovation’ around to ‘Innovation is the mother of necessity’. This phrase has stuck with me for the entirety of my thesis, because I think it symbolises the weakness of the EM approach for SC. In my view, it is time for national governments to take the bolder steps. Our strength (i.e. the power of innovation) should be steered towards social and environmental solutions (necessity). But for that to happen, market actors need strong incentives from political actors. If the faith in the market is strong, then it should be trusted with creative ways to deal with restrictions, and produce innovative solutions in the social, environmental *and* technical spheres. The pandemic continues to show us how connected our world is. Restrictions to limit health risks are made on a global scale, and are similar in their nature. Despite the hardships the pandemic has brought, I see the fact that combined global efforts are possible as something hopeful for the future.

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Annex 1

The first seven columns are the relevant VNRs used in this thesis. The non-English column lists the countries that have reported on SDG 12 in a different language. The 'No VNR' column lists all the remaining countries in the world that have not published a VNR yet.

High Income coun	Upper Middle	Lower Middle	Low Incom	SIDS	LPCs	Non-English	No VNR
Australia	Albania	Armenia	Bangladesh	The Bahama	Bhutan	HI-countries	American Samoa
Austria	Bosnia & Herz	Armenia *	Cambodia	Bahrain	Brunei Daru	Andorra	Anguilla
Belgium	Bulgaria	Egypt	Kenya	Cabo Verde	Cyprus	Oman	Antarctica
Canada	Costa Rica	Georgia	Kenya*	Dominican R	Guyana	Uruguay *	Aruba
Croatia	Hungary	Ghana	Kyrgyz Rep	Fiji	Liechtenstein	UMI	Baker Island
Czech Republic	Jordan	India	Liberia	Jamaica (3 n	Malta	Algeria	Barbados
Denmark	Kazakhstan	Indonesia	Malawi	Maldives	Montenegro	Argentina *	Bermuda
Estonia	Lebanon	Laos	Mozambique	Mauritius		Colombia *	Bouvet Island
Estonia *	Malaysia	Mongolia	Nepal	Micronesia		Ecuador	British Indian Ocean Territory
Finland	Mexico	Nigeria	Rwanda	Palau		Ecuador *	British Virgin Islands
France	North Macedon	Sri Lanka	Togo	Papua New Guinea		Panama *	Cayman Islands
Germany	Romania	State of Palestin	Uganda	Samoa		Tunisia	Christmas Island
Greece	Russian Federa	Ukraine	Uganda *	Seychelles		LMI	Cocos (Keeling) Islands
Iceland	Serbia	Viet Nam		Singapore		Cameroon	Cook Islands
Ireland	South Africa			Vanuatu		Congo, Republic	Dominica
Israel	Thailand					Congo *	Equatorial Guinea
Italy	Turkey					Cote d'Ivoire	Eritrea
Japan	Turkey *					Guatemala *	Falkland Islands (Islas Malvinas)
Kuwait						Honduras *	Faroe Islands
Latvia						Mauritania	French Guiana
Lithuania						Morocco *	French Polynesia
Netherlands						Senegal	French Southern & Antarctic Lands
New Zealand						Syrian Arab Rep	Gabon
Norway						LI	Gibraltar
Northern Ireland						Benin *	Glorioso Islands
Poland						Benin **	Greenland
Portugal						Burkina Faso	Grenada
Qatar						Burundi	Guadeloupe
Republic of Korea						Central African R	Guam
Saudi Arabia						Chad	Guernsey
Scotland						Guinea	Guinea-Bissau
Slovakia						Mali	Haiti
Slovenia						Niger	Heard Island & McDonald Islands
Slovenia*						Niger *	Howland Island
Spain						Non-English SII	Iran
Sweden						Comoros	Jan Mayen
Switzerland							Jarvis Island
Switzerland *							Jersey
United Arab Emirates							Johnston Atoll
United Kingdom							Juan De Nova Island
Wales							Macau
							Man, Isle of
							Martinique
							Mayotte
							Midway Islands
							Moldova
							Montserrat
							Netherlands Antilles
							New Caledonia
							Niue
							Norfolk Island
							North Korea
							Northern Mariana Islands
							Paracel Islands
							Pitcairn Islands

							Puerto Rico	
							Reunion	
							Sao Tome and Principe	
							Somalia	
							South Georgia and the South Sandwich	
							Spraty Islands	
							St. Helena	
							St. Kitts and Nevis	
							St. Pierre and Miquelon	
							Suriname	
							Svalbard	
							Swaziland	
							Taiwan	
							Tanzania, United Republic of	
							Tokelau	
							Turks and Caicos Islands	
							Tuvalu	
							United States	
							Virgin Islands	
							Wake Island	
							Wallis and Futuna	
							Western Sahara	
							Yemen	
							Zaire	