Measuring Scotland's Global Impact in the National Performance Framework

John Davis and Graham Long,
Newcastle University

Scotland's International Development Alliance

Newcastle University

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Introduction

This paper addresses the question of how to measure Scotland's global impacts on sustainable development. The Scottish Government's National Outcomes highlight the ambition for Scotland to "make a positive contribution internationally". We investigate how this ambition could be measured, so as to enable an assessment of whether Scotland really is "taking a holistic "do no harm" approach to sustainable development" in line with the government's stated intention[1]. This is especially important in the context of the forthcoming Wellbeing and Sustainable Development Bill for Scotland, where accurately understanding Scotland's impacts not just "here and now" but "elsewhere and in the future" will be critical to applying the legislation in practice.

The paper focuses on Scotland's 'spillover' effects - the ways in which activity in Scotland affects sustainable development beyond its borders. These global impacts are an important aspect of Scotland's claim to advance sustainable development. We begin by evaluating how this area is currently measured in Scotland's National Performance Framework, then present and summarise relevant research on approaches to measurement, and finally suggest some directions for improvement. This paper cannot undertake a comprehensive analysis of Scotland's impact on the world. Such an exercise lies beyond the scope of this project, even were the methodological issues and challenges, identified in the second section, to be wholly addressed. The aim here is narrower, focused around two pillars: what Scotland's National Performance Framework currently measures, and the recent research on transboundary impacts in response to the Sustainable Development Goals. The paper aims to bring these together to inform a re-evaluation of what could and should be measured.[2]

Scotland's National Performance Framework (NPF) came into being in 2007 as a tool to inform evidence-based policy making aimed at improving the wellbeing of everyone living in Scotland.[3] Since the introduction of the UN's Sustainable Development Goals in 2015, the NPF has taken on additional significance, now also being seen as "Scotland's way to localise the SDGs".[4] The NPF currently includes 11 "national outcomes", one of which concerns "international" impacts and aims to ensure that Scotland is "open, connected and make[s] a positive contribution internationally". Progress towards this outcome is tracked using six "national indicators", with the outcomes subject to review every 5 years. The next review is due to begin, at the latest, by June 2023.[5]

Scotland committed to the Sustainable Development Goals in 2015,[6] and the UN encourages all countries to develop "ambitious national responses" to the SDGs that address all the goals and targets in their relevance for both domestic and global contexts.[7] The SDGs provide an important frame for this paper in three ways. First, the SDGs set targets for domestic activity to achieve the goals in areas that address global impacts: notably on sustainable consumption and production (goals 12 and 9) climate change (goal 12) and ecosystem protection (goals 14 and 15). However, the SDGs are less explicit on targets and metrics that focus on the *transboundary* and *extraterritorial* character of higher income countries' impacts. Second, the SDGs also contain a set of targets, and attached metrics, identifying particular ambitions and actions for high income countries' contributions to global achievement of the goals across a range of dimensions. These can be grouped into

[1] Scottish Government | Global Citizenship: Scotland's International Development Strategy - Our Priorities
[2] Scotland is also affected *by* positive and negative spillovers from other countries, but these impacts lie beyond the scope of this paper.
[3] Scottish Community Safety Network | Briefing Paper: National Performance Framework
[4] Scottish Government | The National Performance Framework: Sustainable Development Goals
[5] Scottish Government Blog | National Performance Framework: Fifteen Years of National Outcomes - What's Next for Scotland's National Performance Framework?
[6] Scottish Government | The National Performance Framework: Sustainable Development Goals
[7] UN Dept of Economic and Social Affairs | Transforming Our World: The 2030 Agenda for Sustainable Development para 78 (see also para 74)

four broad areas - (1) the nature and orientation of development assistance, (2) global governance and regulation, (3) global cooperation and partnership, and (4) technology transfer.[8]

Third, despite the lack of explicit targets for impacts beyond borders, the SDGs are presented as globally interlinked and indivisible, to be realised through policy coherence that recognises the impact of action or inaction not just "here and now" but "in the future" and "elsewhere". This has invigorated research around the interconnection between national policy, production and consumption and global social, economic, environmental and governance outcomes. Recognising these global dimensions makes an important difference to how we view progress towards the SDGs, especially for high income countries. Though the UK ranks 11th place overall in terms of its achievement of SDG outcomes[9], it ranks at the very bottom - 152nd out of 163 countries – in an assessment of its transboundary spillover effects.[10]

In response to this research need, the Sustainable Development Solutions Network (SDSN – a UN body promoting integrated approaches to education, policy analysis, research and global cooperation in order to fulfil both the SDGs and Paris Agreement on Climate Change) and others have made progress in developing methodologies for how to identify and measure the "spillover" effects of one country on another, and how these might be tracked.[11] This research is discussed in section 2 below. Though definitions of spillovers differ in important ways, this paper takes, as a starting point, the SDSN definition that an international spillover effect is an instance where one country's actions generate benefits or impose costs on the sustainable development of another country, focusing on areas where these costs are not fully captured in market prices.[12]

This paper has three sections. In the first section, we outline and assess the current metrics for Scotland's' international impact in Scotland's National Performance Framework. In the second, we discuss the current state of data science and practice around measuring international impacts and spillovers. In the third, we draw on the state of this science to recommend areas for focus and improvement in Scottish indicators.

Section 1: Assessing spillovers in Scotland's National Performance Framework

As noted above, the NPF currently provides six indicators for tracking Scotland's global impact. Of these indicators four are in operation and two remain in development ("Trust in public organisations" and "Scotland's international networks"). The first of the four currently being reported is "A positive experience for people coming to live in Scotland"[13]. This is drawn from the Scottish Households Survey (SHS)[14] where immigrants are asked how far they feel a sense of belonging to their immediate

[8] See, e.g. G.Long et al (2019) The SDGs and Scotland: A Discussion Paper and Initial Analysis pp.73-76.
[9] Sustainable Development Report 2022: Overall Rankings
[10] Sustainable Development Report 2022: Spillover Rankings
[11] See, e,g. Sustainable Development Report 2022: Spillover Rankings and select any country to see progress in relation to 12 indicators.
[12] Drawing on UNSDSN | Spillover Effects Research
[13] Scottish Government | National Performance Framework - A Positive Experience for People Coming to Live in Scotland
[14] An annual survey inaugurated in 1999. Run on behalf of the Scottish Government by Ipsos MORI, it uses face-to-face at-home interviewing to collect the views of a random sample of around 10,500 volunteer participants. Note that in 2020, due to the pandemic, telephone interviews of only 3,000 participants were carried out. See Scottish Government | Scottish Household Survey and Scottish Government | Scottish Household Survey: Publications

neighbourhood. The NPF, second, also assesses "Scotland's Reputation"[15] by using the annual Anholt-Ipsos Nation Brands IndexSM (NBISM)[16] which measures how Scotland is viewed by people overseas. A third indicator relating to "Scotland's Population"[17] reports how many of Scotland's 32 council areas saw their population fall in the previous year.

Finally, there is a measure of "Scotland's contribution of development support to other nations"[18]. This takes the form of a bespoke index drawn from nine further statistics:

- Scotland's connectedness to ODA recipient countries (yet to be included)
- Asylum seekers settled in Scotland per 100,000 population
- Higher Education Students from DAC Least Developed Countries / Total Non-EU Students
- Percentage of total waste treated in Scotland
- Value of the Low Carbon and Renewable Energy Economy (LCREE) in Scotland
- Value of Agricultural subsidies
- Percentage of international development funding targeting vulnerable groups
- Value of R&D contracts in Higher Education Institutions (HEIs) in partnership with ODA-eligible nations
- Value of goods imported from ODA countries

This index goes "beyond aid", encompassing issues relating to climate, trade and migration flows. However, it addresses spillovers only in limited and indirect ways, as we discuss below.

Tracking Scotland's impacts across the wider NPF

Importantly, assessing Scotland's global contribution – even in the current NPF – goes beyond the indicators directly attached to Scotland's aim to be "open, connected and make a positive contribution internationally". Indicators attached to the other ten national outcomes also address important aspects of Scotland's global impact.

For example, under the **economy** outcome, figures are provided for Scottish exports, Gross Expenditure on Research and Development (GERD) as a percentage of GDP[19], greenhouse gas emissions, and the overall size of Scotland's carbon footprint. Data related to the quantity and quality of habitats[20] in Scotland - as a contribution to global biodiversity - is also provided.

The **"environment"** outcome also includes indicators that speak to Scotland's contribution to, and impact on, a global scale. For instance, figures are provided for the proportion of energy produced from renewable sources, the state of biodiversity[21], the condition of protected nature sites, and the quality of Scotland's seas as well as the sustainability of fish stocks. A further indicator concerns total waste generated by Scottish households.

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[15] Scottish Government | National Performance Framework - Scotland's Reputation
[16] A total of 20,000 individuals across 20 countries complete an online survey asking about their perceptions of the exports, immigration and investment, governance, culture, people and tourism of 50 countries.
[17] Scottish Government | National Performance Framework - Scotland's Population
[18] Scottish Government | National Performance Framework - Contribution of Development Support to Other Nations
[19] This is a different measure to that included in the bespoke index used to measure Scotland's international development contribution.
[20] Taken from Natural Capital Asset Index
[21] Via an index combining the abundance of marine species - based on seabird counts - as well as measures of the quantity and geographic spread of terrestrial species.

Migrants are identified - e.g., in the SDGs - as a group at risk of vulnerability and marginalisation.[22] There are two indicators under the "international outcome" addressing the experience of migrants to Scotland, and the number of Asylum Seekers settled in Scotland. But further disaggregation by migrant status across a range of indicators including under **"education"** and **"poverty"** - just as disaggregation is currently available by 'gender' and 'ethnicity', say - would allow a greater spotlight on the life chances and experiences of migrants in Scotland. It would also allow intersecting aspects of disadvantage - for example, poverty, migration status, and gender identity - to be better addressed. The SDGs also have a global indicator on migrant remittances (10.c.1),[23] and consideration might be given to how this could be tracked in Scotland.

Thus, whilst it is both necessary and important to improve the indicators that currently constitute the "international" outcome, a comprehensive approach must take account of Scotland's international impact generated across all of the Outcomes.

Initial Problems and absences from the indicator set

Even taken as a whole, the NPF faces serious challenges as a gauge of Scotland's impact on global sustainable development. The indicators within the "international" section are imperfect as measures of the overall outcome - it is not clear, for example, what "population size" indicates about Scotland internationally, nor how important it is how people from 20 countries perceive Scotland.[24] The indicator set also could do a better job of tracking the challenges for migrants to Scotland through improved disaggregation of existing data, and new data around migration – e.g. on remittances, sectors and skills, or on modern slavery. However, the most serious sets of gaps and challenges remain around metrics addressing Scotland's spillovers. Beyond carbon footprint, there is no sustained coverage of the effects of Scotland's consumption and production on the global environment, no consideration of social and economic impacts on other countries involved in production of goods consumed in Scotland, and no consideration of the global impacts of Scotland's main industries.[25]

Section 2: Defining and measuring spillovers

Developing methodologies and indicators for tracking spillover effects is a focus for current research. Some of this work identifies spillovers in particular contexts or at industry scale - for example, EU textile supply chains[26] and particular crops such as soy.[27] But more general projects aim to establish metrics for spillovers at national[28] or subnational level.[29] Bringing

[22] See, e.g. SDG targets 8.7; 8.8, 10.7, 10.c.
[23] United Nations | SDG Indicator List
[24] A metric taken from the Anholt-Ipsos Nation Brands IndexSM (NBISM) and used to indicate progress under the "Scotland's Reputation" outcome. It might be – given what we say below about the difficulties of assessing political spillovers – that a replacement indicator could be developed around the global impact of Scotland's global political voice.
[25] This paper leaves aside the important and complex questions around Scotland's historic impacts, how the consequences of these should be assessed, and what they might mean for Scotland's current global responsibilities.
[26] A.Malik, et al. (2021) International spillover effects in the EU's textile supply chains: A global SDG assessment, Journal of Environmental Management; See also Eurostat - Data Explorer (emissions of GHG from final use, by product)
[27] H.Hoff, et al. (2019) International Spillovers in SDG Implementation: The Case of Soy from Argentina, Stockholm Environment Institute
[28] G.Schmidt-Traub, H.Hoff, M.Bernlohr (2019) SDSN Policy Brief - International Spillovers and the SDGs: Measuring How a Country's Progress Towards the SDGs is Affected by Actions in Other Countries see, for a country case of Indonesia, C.Brandi The Changing Landscape of Sustainability Standards in Indonesia: Potentials and Pitfalls of Making Global Value Chains More Sustainable pp.133-144 in A.Negi, J.A.Perez-Pineda, J Blankenbach (eds) (2020) Sustainability Standards and Global Governance: Experiences of Emerging Economies
[29] R.E.Engström, et al. (2021) Succeeding at home and abroad: accounting for the international spillovers of cities' SDG actions, npj Urban Sustainability 1

this research activity together is the work of SDSN[30] - in particular the methodology developed for the Spillover Index in the annual SDG index report,[31] and for the Global Commons Stewardship Index.[32]

SDSN proposes a typology of spillovers around four categories[33]: ***Environmental*** e.g. direct cross-border pollution (acid rain, river pollution) or environmental harm suffered by a country producing a product where that product is consumed overseas. ***Socio-economic*** spillovers largely relating to working practices and value chains that could be positive - through the introduction of higher safety standards - or negative e.g. exploitative labour practices. ***Financial and governmental*** spillovers address the way that the international investment policies and practices of one state can help or hinder the pursuit of the SDGs in other countries - e.g. via unfair tax competition, secretive banking practices and money laundering are all charged with fuelling a "race to the bottom" between sovereign states. international development finance could, conversely, be "one of the most important positive spillovers"[34]. The ***security*** **category** includes peacekeeping and conflict prevention as potential positive spillovers, whilst international organised crime and the arms trade provide examples of negative spillovers.

Spillover data for the UK

Work exists identifying indicators and datapoints for *UK-level* spillovers, and we present this data below. There are three important reasons to highlight this data:

First, Scotland's spillovers are incorporated in these UK wide figures. So, indirect though this is, these are currently the only metrics available that capture Scotland's spillovers, even as part of a larger whole. Of course, how useful these data are will depend on how, and to what extent, the spillovers generated by Scotland reflect, or differ from, the overall UK picture.

Second, whether these data look positive or negative - bearing in mind the question of how distinctive Scotland is in the context of the UK - is a useful indication of the urgency of developing spillover data for Scotland as a whole. If the UK has no, or only positive spillovers, then there might be less need to worry that Scotland is somehow harming other countries in a way that undercuts the relevant National Outcome. But if the UK performance in terms of spillovers is poor, this sharpens the worry that Scotland, too, is having a negative global impact.

Third, presenting the data that is available shows what is currently possible in terms of country-level metrics - it indicates what Scotland might look to develop in terms of tracking its spillovers.

The Spillover Index that forms part of SDSN's SDG Index[35] presents a subset of 14 indicators intended to give insight into a nation's spillover impact. The UK's performance on these indicators in the 2022 edition of the SDG Index report is shown in Table 1:

[30] A.Malik, et al. (2021) Making Globalisation and Trade Work for People and Planet: International Spillovers Embodied in EU's Food Supply Chains, SDSN and Partners
[31] Sustainable Development Report 2022: Spillover Rankings
[32] Global Commons Stewardship Index 2021
[33] G.Schmidt-Traub, H.Hoff, M.Bernlohr (2019) SDSN Policy Brief - International Spillovers and the SDGs: Measuring How a Country's Progress Towards the SDGs is Affected by Actions in Other Countries
[34] G.Schmidt-Traub, H.Hoff, M.Bernlohr (2019) SDSN Policy Brief - International Spillovers and the SDGs: Measuring How a Country's Progress Towards the SDGs is Affected by Actions in Other Countries p.4.
[35] SDSN | SDG Index - Spillover Scores: World Map

Indicator	Progress	Trend
Environmental and social impacts embodied in trade		
Exports of hazardous pesticides		- -
Scarce water consumption embodied in imports		- -
Fatal work-related accidents embodied in imports		OT
SO2 emissions embodied in imports		- -
Nitrogen emissions embodied in imports		DE
Exports of plastic waste		- -
CO2 emissions embodied in imports		OT
Marine biodiversity threats embodied in imports		- -
Terrestrial and freshwater biodiversity threats embodied in imports		- -
Economy and Finance		
International concessional public finance, incl. ODA[36]		DE
Corporate Tax Haven Score		- -
Financial Secrecy Score		- -
Shifted profits of multinationals		- -
Security		
Exports of major conventional weapons		- -

KEY:

Progress							
	SDG Achieved		Challenges Remain		Significant Challenges Remain		Major Challenges Remain

Trend

[36] For high-income and all OECD DAC countries only.

OT	On Track/Maintaining Achievement	MI	Moderately Improving	ST	Stagnating	DE	Decreasing

Table 1: Based on information from Sustainable Development Report 2022 | UK Country Profile: Indicators

This placed the UK 152nd out of 163 nations as regards spillover effects (compared with an 11th place overall ranking for progress towards the SDGs).

The Global Commons Stewardship Index (GCSI)[37] offers 11 indicators that focus on spillover impacts across six different sub-categories of environmental spillovers. The UK's performance on these indicators in the 2021 GCSI Report are provided in Table 2:

Indicator	Score	Trajectory
Aerosol		
Sulphur Dioxide (SO2) emissions		Insufficient progress
Emissions of various Nitrous Oxides (NOx)		Insufficient progress
Black Carbon emissions		Insufficient progress
Greenhouse Gas Emissions		
GHG emissions		Insufficient progress
Terrestrial Biodiversity Loss		
Land-use biodiversity loss		Insufficient progress
Freshwater biodiversity threats		No data
Marine Biodiversity Loss		
Marine biodiversity threats		No data
Nutrient Cycles		
Nitrogen Surplus		Wrong direction
Phosphorus fertilizer		Wrong direction
Water Cycle		
Scarce water consumption		Insufficient progress

[37] SDSN and Partners | Global Commons Stewardship Report 2021: Safeguarding the Shared Resources of the Planet

Water stress of crops		Insufficient progress

Key:

Score	Impacts on the Global Commons
95-100	None or limited
90-95	Low
80-90	Medium-low
70-80	Medium-high
50-70	High
30-50	Very High
0-30	Extreme

Trajectory	Meaning
2050	Projected to meet 2050 Threshold
2030	Projected to meet only 2030 Threshold
Insufficient progress	Insufficient progress towards thresholds
Wrong direction	Trajectory headed in wrong direction

Table 2: Based on UK Country Profile at SDSN and Partners | Global Commons Stewardship Report 2021: Safeguarding the Shared Resources of the Planet pp.267-8

The 2021 GCSI Report includes results for 100 entities (99 countries and the European Union). When considering only the impact of spillovers (in absolute terms) the UK was deemed to have an "extreme" impact placing them in the worst performing group alongside only seven other countries out of the hundred.[38]

Clearly, neither report shows the UK to be performing well in terms of spillovers. This sharpens the case for dedicated Scottish measurement to better understand Scotland's contribution to this negative picture at UK level. With the UK as a whole performing so poorly, Scotland would have to be very distinctive within the UK to plausibly maintain a "positive contribution" - or even "doing no harm" - in these respects. These reports, it should be noted, are strongly focused on environmental spillovers – in the case of the GCSI, reflecting the intent of the index; and in the Spillover Index, because of data/methodology limitations. These limitations are something we address in the discussion of methodological issues below.

[38] SDSN and Partners | Global Commons Stewardship Report 2021: Safeguarding the Shared Resources of the Planet p.4,Table 4 - Spillover Column.

The challenges of measuring spillovers

Issues of data and methodology are key problems in spillover work. SDSN identify three broad categories of data collection methods that might be used to quantify international trade-related spillover effects - "multi-regional input-output", "life cycle assessment" and "material-flow analyses".[39]

First, *Multi-Regional Input-Output* (MRIO) approaches use a combination of international input/output tables (four such prominent global databases are regularly updated and open access), trade statistics for sectors or products, and so-called satellite accounts that record environmental and socio-economic impacts. The results are said to comprehensively map the global picture but are perhaps best suited to capturing aggregate effects rather than tracing interactions between particular countries' production and consumption.

Second, *Life Cycle Assessments* (LCA) aim to describe the environmental (and sometimes socio-economic) impact of a product or service across its entire lifespan. This often requires a large amount of data which companies may not always be willing to provide. There is also the issue (shared with Material Flow Analyses - see below) of having to decide a cut-off point that provides a well-defined life cycle, the so-called "truncation problem". This makes the information less comprehensive than MRIO. Such methods can provide the specificity that MRIO can lack. SDSN suggest that LCA may not readily lend itself to capturing SDG spillovers. Nevertheless, the UN's Life Cycle Initiative - aimed at achieving comprehensive Life Cycle Sustainability Assessment (LCSA) - is cited as an approach with the potential to work well in the SDG context.

Finally, *Material Flow Analyses* (MFA) aim to track the flow of materials through national and international supply chains. This data can be combined with that for inputs which do not flow along the supply chain, such as land use. Again, the thoroughness of the approach is undermined by the truncation problem. There is also the chance of double counting and of re-exports complicating the picture.

At present it seems much of the data necessary to accurately measure spillover effects is not systematically compiled, perhaps reflecting practical difficulties with its collection. SDSN[40] draws particular attention to relatively weak systems of national accounting (SNA), especially in low- and middle-income countries; perhaps partially explaining why these countries are underrepresented in spillover research.[41] Furthermore, the input-output databases mentioned above vary according to global coverage and level of detail. The data that is available for use in the performance metrics, in both the Spillover Index and GCSI, are only available as 'time-lagged': for instance, many of the statistics in the 2021 GCSI Report date from between 2015 and 2019. Hence, not only data availability, but the availability of up-*to-date* data is a challenge. A number of researchers are measuring spillovers using hybrid approaches in an attempt to mitigate the shortcomings and challenges of individual techniques.

The challenges of measuring socio-economic spillovers

[39] G.Schmidt-Traub, H.Hoff, M.Bernlohr (2019) SDSN Policy Brief - International Spillovers and the SDGs: Measuring How a Country's Progress Towards the SDGs is Affected by Actions in Other Countries
[40] G.Schmidt-Traub, H.Hoff, M.Bernlohr (2019) SDSN Policy Brief - International Spillovers and the SDGs: Measuring How a Country's Progress Towards the SDGs is Affected by Actions in Other Countries
[41] Tian et al (2018) Trends and features of embodied flows associated with international trade based on bibliometric analysis, Resources, Conservation and Recycling

There is an especial gap in data around socio-economic spillovers, reflected in the presence of only one such spillover – on accidents at work – in the SDSN index. In large part, this is due to methodological difficulties facing such work. A 2019 OECD report summarising the 'state of the art' in measurements of such impacts offers the following assessment:

> *"Understanding the full picture of economic activity in today's interconnected and global markets is complex... the picture becomes exponentially more complex when social and environmental dimensions of sustainability that relate to economic activity are considered. The challenges include*
> *1) datasets that can trace economic activity from one end of the supply chain to the other are few;*
> *2) environmental or social datasets that are truly global are even fewer; and*
> *3) a consistent way to trace and attribute social and environmental impacts in global supply chains that has not yet been developed."*[42]

Country practice around measurement of global impacts is currently very limited. The OECD report highlights a number of countries that have taken steps to incorporate transboundary indicators into their national statistics, notably Belgium, Netherlands, and New Zealand.[43] However, as summarised by table 5.1 of that report , there are no candidate national indicators for socio-economic impacts of production and consumption. The SDG Voluntary National Reviews of high-income countries yield a similar picture. Finland's 2020 Voluntary National Review, for example, notes "comprehensive assessment of spillovers is not possible due to lack of adequate data", and no socio-economic indicators are mentioned, though environmental spillovers are addressed to a degree.[44]

There is limited global data available for particular sectors and issues. For example, the International Labour Organization provides a range of global data for the prevalence of modern slavery.[45] However, these global estimates are not currently available at the level of end-consuming countries: the ILO work is not well-placed to link the countries where forced labour *occurs*, with the countries in which the products of that forced labour might be *consumed*. A number of other methodological challenges are present:

- Attribution of responsibility and impact is vital yet complex. Diverse country contexts (for example, relevant legislation) at different stages in global supply chains; regulatory efforts that are recognised as shared global responsibilities; and the actions of private sector actors, often multi- or transnational in nature, all add methodological complexity. The issues matter for accurate data on spillovers, and for wider efforts to assess Scotland's role as "positive" or "negative".

- Scotland's limited competences within the framework of devolution matter for questions of responsibilities, and measurements around key metrics. For example, foreign policy, aspects of international development, taxation regimes and trade policy, and control of overseas territories and crown dependencies (especially important in the context of illicit flows and tax avoidance) are matters reserved for the UK parliament. Available metrics tracking

[42] OECD and Joint Research Centre - European Commission | Understanding the Spillovers and Transboundary Impacts of Public Policies: Implementing the 2030 Agenda for More Resilient Societies pp.112-113
[43] OECD and Joint Research Centre - European Commission | Understanding the Spillovers and Transboundary Impacts of Public Policies: Implementing the 2030 Agenda for More Resilient Societies p.94
[44] Voluntary National Review 2020 FINLAND: Report on the Implementation of the 2030 Agenda for Sustainable Development pp.142-143
[45] ILO, Walk Free and International Organization for Migration | Global Estimates of Modern Slavery: Forced Labour and Forced Marriage

particular spillovers – e.g. contribution to peacekeeping; overseas aid; tax haven score - are difficult to apply in this context.[46]

- All spillover research faces the methodological challenge that the definition is embedded in debates around the nature of economics. SDSN's definition of 'spillover' references impacts not reflected in 'market prices', but it is not clear how far socio-economic impacts – for example fair wage levels - *are* priced in (let alone environmental and governance impacts), and a persistent complaint against global economics is that transfers are mispriced at different stages of supply chains.[47] The 'market price' issue is a specific version of a wider problem about how the baseline or point of comparison for an assessment of Scotland's contribution should be determined.

- 'Knock-on' socio-economic effects of other kinds of spillovers is another area of complexity – for example, health impacts of environmental damage, socio-economic consequences of investment or lack of investment in countries or sectors, or socio-economic consequences of political policies. Each of these kinds of spillovers, again, face their own issues of metrics and definitions, and a similar analysis of the state of the research, and challenges, could be undertaken for each.

It should be noted that efforts to identify data and methods for calculating high-income country impacts overseas run parallel to two other tracks of research. The *first* addresses indicators for the 'circular economy'. In a certain sense, concepts of a circular economy are not sensitive to whether impacts are "here" or "elsewhere". However, achievement of a circular economy seems, by definition, to minimise or eliminate environmental spillovers. It might be, then, that the kinds of indicators adopted to track movement towards a circular economy would also, to an extent, track the absence of spillover effects. For example, indicators around sustainable procurement or the contribution of recycled materials to raw material demand [48] might also indirectly measure the relative absence of environmental spillovers, though not necessarily disaggregating impacts at home and elsewhere. The circular economy concept is receiving attention from the Scottish Government. A consultation regarding a proposed Circular Economy Bill has just finished receiving submissions.[49] Furthermore, a Ministerial post (not within Cabinet) has been established that, amongst other things, has responsibility for the circular economy.[50]

Second, whilst the focus for the NPF is on Scotland's spillovers and impacts elsewhere, the data that makes these impacts visible might actually be best found in the metrics and data collated in 'spillover-recipient' countries, where Scotland's impacts are felt. There might be scope to develop such data in partnership with countries that receive positive or negative impacts from Scotland.

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[46] In respect of overseas aid, whilst data on the Scottish Government's own international development funding is readily available, the contribution of Scotland through the UK Government's aid budget is more difficult to establish.
[47] B.Muchhala (2018) The Right to Development and Illicit Financial Flows: Realizing the Sustainable Development Goals and Financing for Development
[48] For further possibilities see M.Saidani, et al. (2019) A Taxonomy of Circular Economy Indicators, Journal of Cleaner Production
[49] Scottish Government | Delivering Scotland's Circular Economy - Proposed Circular Economy Bill: Consultation
[50] Scottish Government | Minister for Green Skills, Circular Economy and Biodiversity

The more we demand accuracy and certainty from indicators, the greater the challenges for identifying and measuring appropriate metrics. It may be, in the context of the NPF where much of the other data is very high quality, or in light of the need to catalogue Scotland's impacts in a comprehensive, granular way through accurate evidence, that the ambition for the 'quality' of Scottish indicators of global impact should be the very highest. However, indicators can fulfil a range of wider purposes even where they are not as well-defined or accurate as might be hoped. They can prompt debate, recognise an issue, contribute to change of practice – and to further indicator development - despite a degree of uncertainty and even inaccuracy. Indicators can temporarily stand in for longer term solutions, and can be useful even where they are proxies or 'near neighbours'. The search for accurate data does not, and perhaps should not, become a barrier to taking action likely to improve a nation's spillover impact. Given the methodological challenges above, it might be that the debate around additional indicators of global impacts for the NPF should proceed in this larger frame – though we cannot take this question further here.

Section 3: Recommendations

Data presented in section 2 shows that the UK is performing poorly in terms of spillover effects, and it is perhaps plausible, as a starting assumption, that Scotland is also performing badly. However, there is little spillover data available that is specific to Scotland - neither SDSN index disaggregates the UK data across this range of indicators down to Scottish (or Welsh or Northern Irish) level, leaving Scotland's Environmental and Social, Economic/Financial, Political and Security spillovers obscured. To establish whether Scotland does make a positive global contribution to sustainable development, there is a pressing need to develop effective ways to better track this contribution.

In response, this section makes three key recommendations on ways forward for Scotland:

(1) Introduce an NPF indicator on Scotland's "material footprint" to better track the environmental footprint of Scotland's consumption and production, in line with existing UK practice and the SDGs.

(2) Identify entry points for addressing the data gap around social and economic impacts of Scotland's consumption and production:
   - identify particular industries, sectors and metrics where most work has been done, as entry points for measuring Scotland's impact in these areas;
   - Develop indicators for the NPF to allow tracking of fossil fuels and the arms trade as key sectors and industries where Scottish production clearly has a global impact.

(3) Develop a longer-term multi-stakeholder collaborative approach to apply existing spillover methodologies to Scotland.

1. A new indicator for the NPF - Scotland's 'material footprint'.

A country's material footprint, or raw material consumption (RMC)[51], measures the amount of raw materials - both from home and abroad - that go into producing the goods and services used by governments, charities and private households in one year.[52] By focussing on what a country consumes rather than produces, and by accounting for inputs drawn from anywhere in the world, this measure provides a useful estimate of the total use of raw materials by a society which, in turn, represents a significant part of their overall impact on the planet and its people.

The ONS has published material footprint statistics for the UK since 1990 with the most recent data covering 2019. It presents this information, and the methodology underpinning it, on their SDG data website addressing SDG target 12.2.[53] Material footprint statistics specific to Scotland, and covering the period 2011-18, have already been compiled by "Zero Waste Scotland" and their partners.[54] According to Zero Waste Scotland, in 2018 Scotland's Material Footprint (RMC) was 19.3 tonnes per capita[55], which can be compared with the 2018 ONS data for the UK as a whole, of 16.9 tonnes per capita[56] and an EU average of 14 tonnes per capita.[57]

As noted above, a measure of Scotland's carbon footprint is included in the NPF as part of the "Economy" outcome.[58] This provides some indication of Scotland's material impact, albeit not as comprehensively. The ONS has indicated that it will continue to publish material and carbon footprint statistics in the future. If this is the case and/or Zero Waste Scotland continues to collate comparable data with an acceptable level of rigour - perhaps through collaboration with the Scottish Government's statistical service – then inclusion of material footprint data in the NPF would be straightforward and would directly address a key gap in coverage of Scotland's spillovers.

2. Addressing the data gap around social and economic impacts of Scotland's consumption and production

(a) Entry points for work on socio-economic spillover indicators

As summarised above, measurement of socio-economic spillovers is complex, and potential indicators for Scotland are underdeveloped. Four potential entry points for addressing this agenda emerge from the preparatory research for this paper.

(i) Issues where analysis of global impacts are most advanced

As the above analysis set out, science around measurement of impacts is more advanced in some areas than others. Where methodologies and data exist at global, regional or UK level, generation of relevant data for Scotland might be closer. One example of this might be work on fatal accidents embodied in imports, as used in the SDSN dataset. Another might be ILO's

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[51] Formula for Material footprint (RMC) = Domestic Extraction + Imports (RME) – Exports (RME). RME stands for "Raw Material Equivalent" and is an estimate of the total raw materials needed to produce a finished product, as opposed to the total of raw material in a finished product.
[52] ONS | Dataset - Material Footprint in the UK: 1990 to 2019 see "Metadata"
[53] UK Government | SDG Data: Indicator 12.2.1
[54] Zero Waste Scotland | Material Flow Accounts: Understanding Scotland's Material Footprint
[55] Zero Waste Scotland | SMFA Model: Update with 2018 data p.8; Zero Waste Scotland also tells us that, "[a]cademics agree that a sustainable level of material use, which would still allow for a high quality of life, is about eight tonnes per person per year." See Zero Waste Scotland | Press Release - Scotland's Raw Material Consumption
[56] UK Government | SDG Data: Indicator 12.2.1
[57] Zero Waste Scotland | SMFA Model: Update with 2018 data Table 5, p.14. Average is "EU-28" (27 member states plus UK).
[58] Scottish Government | National Performance Framework: Carbon Footprint

global work on forced labour where a methodology for tracking forced labour embodied in imports might be developed. The USA maintains a list of goods with forced labour involved in global production.[59] It might be that a similar list for Scotland could be translated into a numerical indicator (e.g. the value of imports at risk of child and forced labour). Extending this further, a longer-term goal might be to track human rights risks embodied in Scotland's trade.[60]

(ii) Countries and industries with greater data availability

A different, complementary entry point would be to identify particular countries or industries that were most important in the Scottish context and develop indicators targeting those linkages in particular, drawing on the greater availability of data in particular countries' accounts and existing investigation into particular sectors. In terms of *countries*, if those most heavily involved in Scotland's global value chains were identified, and socio-economic indicators for those countries were tracked, perhaps such statistics could function as a proxy that indicated the challenges of Scotland's place in such chains. In terms of *industries*, the garment industry is often highlighted as a context where work has already been done by NGOs on social and economic impacts. Partly in response to this 'spotlighting', a number of Scotland's largest garment retailers already address human rights compliance in their supply chains, and this information might be aggregated to a Scotland-level picture, or provide a framework or basis for indicator development.[61]

(iii) Indicators of compliance

A parallel track of activity might be to adopt an indicator of Scottish private sector compliance with human rights norms, participation in global business-human rights initiatives, or corporate social responsibility reporting. Fair trade certification could potentially be one such source of a basis for measuring compliance,[62] or this might be incorporated into the Scottish Business Pledge.[63] In effect, such an approach would sidestep methodological complexities around spillovers by instead measuring compliance with selected norms, laws, certification schemes or guidelines.

(iv) The SDG framework

Selected SDG indicators also speak to these questions and it may be that methodological and data work around these would also inform work in Scotland. In addition to SDG indicator 8.8.1 on injuries at work, indicators on national labour rights (8.8.2) equal pay (8.5.1) sustainability reporting by companies (12.6.1) and sustainable public procurement (new indicator 12.7.1) might help to inform next steps.

(b) NPF indicators on fossil fuel exports and conventional arms trade

Though tracking the impacts of Scotland's consumption across borders faces serious challenges, the impacts of Scotland's *production* are perhaps easier to make progress on. Fossil fuels and the conventional arms trade are two areas of Scotland's production that are prominent in terms of their global environmental and political/security spillovers. Neither is currently

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[59] United States Department of Labor | 2022 List of Goods Produced by Child Labor or Forced Labor

[60] OECD and Joint Research Centre - European Commission | Understanding the Spillovers and Transboundary Impacts of Public Policies: Implementing the 2030 Agenda for More Resilient Societies , p.99, notes this as a potential indicator, but offers no further discussion of how distant it might be. UNDP | Human Rights Risks in Business Operations offers a typology of these risks that might be the basis for measurement.

[61] Our initial analysis of data around fast fashion, however, did not provide any straightforward socio-economic indicators for adoption in the NPF, though data is well developed on the environmental side.

[62] See Fairtrade Standards and World Fair Trade Organization | Our Fair Trade System. Oxfam's 'Behind the Barcodes 2022' Supermarket Scorecard might be considered another example of such an approach.

[63] Our Skillsforce | Scottish Business Pledge

measured in the NPF. Understood as exports from Scotland, neither is included in the material footprint calculation (see above). Nevertheless, they represent key aspects of Scotland's international contribution and bear directly on whether Scotland, as a "good global citizen" can be said to "do no harm" globally.

The Arms trade

The SDSN spillover work identifies conventional arms as a key area of security spillover effects. It is clear that both the UK, and Scotland specifically, play an active part in that conventional arms trade, but so far there is no systematic effort in Scotland to track this spillover.

The Campaign Against the Arms Trade (CAAT) suggests that the UK is the second biggest producer of arms in the world and has published the first in what is promised to be a series of reports into Scotland's involvement in the global trade.[64] Some 'snapshot' data, then, into particular "spillover effects" of arms manufactured in Scotland is available for some specific instances. CAAT Scotland's report "Made in Scotland" discusses Scottish spillovers in the conflict in Yemen. According to the report "[a]t least 16 arms companies operating in Scotland have applied for export licences to Saudi-led coalition members or worked directly with military forces since 2008".[65] The report also notes the involvement of Scottish Enterprise and the number of meetings conducted by Scottish Government ministers with arms companies. This particular example, in the context of public opinion strongly opposed to continued arms exports from Scotland to Saudi Arabia[66], demonstrates the need for transparency around such spillovers. Notwithstanding these insights from particular cases, regularly updated indicators populated with information about the *overall* size and reach of the trade from Scotland in particular, are - if such information exists at all in the public domain - very difficult to find.[67]

An indicator on this in Scotland's NPF would be an important way to track this spillover over time. Arms export need not always be regarded as a negative spillover - as is illustrated, perhaps, by the supply of weapons to Ukraine by Western governments. However, to judge whether this spillover is positive or negative requires greater transparency around not just the scale of conventional weapon exports, but also an account of which countries are traded with and why - so as to allow the Scottish public to assess the moral case for continuing, reducing or ceasing the trade altogether.

Fossil Fuel extraction and export

In 2018, 82.3% of Scotland's oil and gas was exported.[68] Acknowledgement within the NPF of Scotland's role in fossil fuel extraction and export would provide a truer picture of the global impact Scotland is having. To measure Scotland's fossil fuel exports - and perhaps fossil fuel extraction more widely - is not in itself to judge whether the spillover here is positive or negative. Instead, transparency enables the Scottish people to discuss this vital issue. On the one hand, these exports can be viewed as a positive international contribution that, say, helps to meet global energy needs, contributes to global energy security and potentially creates a significant number of jobs outside Scotland. But, of course, in the context of climate change, the negative spillover embodied in the GHG emissions emitted by these exported non-renewables arguably undermines any such positive contribution.

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[64] CAAT Scotland | Made in Scotland: The Deadly Relationship Fuelling the Crisis in Yemen
[65] CAAT Scotland | Made in Scotland: The Deadly Relationship Fuelling the Crisis in Yemen p.2
[66] CAAT Scotland | Made in Scotland: The Deadly Relationship Fuelling the Crisis in Yemen p.2 – cites two polls suggesting support for continued sales is in the region 11 to 14%.
[67] The 'Made in Scotland' report estimates that the real value of UK arms licenced for export to the Saudi-led coalition since March 2015 is £16 billion, nearly three times the publicly available figure of £6.3bn.- see p.2
[68] Scottish Government | Annual Energy Statement: 2020

3. A collaborative research agenda for spillovers

Points (1) and (2) have aimed to reflect on some specific actions and agendas for the development and adoption of indicators. Beyond this there is a much broader spillover agenda, readily visible in the range of indicators – and the range of gaps - presented in the second section of the report. As noted, much of this data and methodological work is not yet done at the Scottish level. For progress to be made on the indicators suggested above, and for a more accurate picture of Scotland's global impact to therefore emerge, methodological challenges to conducting this work must be met, as well as challenges in sourcing and analysing relevant data.

Collective work between relevant stakeholders is the obvious - and perhaps only - means of doing so. The final recommendation, then, is to assemble a collaborative partnership and identify some key entry points into this spillover research agenda. The Scottish Statistical Service, NGOs, and universities could be important partners in this work. International initiatives such as the Wellbeing Economy Governments partnership (WEGo)[69] offer readymade forums for cross-border collaboration between like-minded governments on these issues. Cooperation with other actors in the UK (notably, the ONS) but also globally -with research teams already active around spillovers in OECD, EU and SDSN networks - would be another potentially fruitful way to explore what is possible for improved analysis of spillovers in the NPF.

[69] https://weall.org/wego

About Scotland's International Development Alliance

Scotland's International Development Alliance (the Alliance) is the membership body in Scotland for everyone committed to creating a fairer world, free from poverty, injustice and environmental threats. Our membership brings together a diverse range of over 200 international NGOs, companies, universities, charitable trusts, public sector bodies and individuals that operate in over 100 countries.

Scotland's International Development Alliance

Acknowledgements

This report was researched and published in partnership with Newcastle University.

Newcastle University

Website: www.intdevalliance.scot
Email: admin@intdevalliance.scot
Phone: +44 0131 281 0897
Socials: @intdevalliance

Scotland's International Development Alliance,
CBC House,
24 Canning Street,
Edinburgh,
EH3 8EG