STRENGTHENING SCIENCE ADVICE IN THE UN GENERAL ASSEMBLY

FINAL THESIS REPORT

By UCL STEaPP MPA Students

Commissioned By

International Science Council

Department of Science, Technology, Engineering and Public Policy (STEaPP)
University College London

Authors

Benedikt Schmidt, MPA Health, Technology and Public Policy, 2023/24

benedikt.schmidt.23@ucl.ac.uk

Fatimah M. Al Otaibi, MPA Digital Technologies and Policy, 2023/24

fatimah.alotaibi.23@ucl.ac.uk

Leo Kwok Guo, MPA Climate, Sustainability, and Innovation Policy, 2023/24

leo.kwok.23@ucl.ac.uk

Olivia Macdonald, MPA Climate, Sustainability, and Innovation Policy, 2023/24

olivia.macdonald.23@ucl.ac.uk

Oule Wang, MPA Development, Technology and Innovation Policy, 2023/24

oule.wang.22@ucl.ac.uk

Ziyi Chen, MPA Development, Technology and Innovation Policy, 2023/24

ziyi.chen.22@ucl.ac.uk

Supervisors

Dr. Jean-Christophe Mauduit, Associate Professor of Science Diplomacy at UCL STEaPP

j.c.mauduit@ucl.ac.uk

Prof. Arthur Petersen, Professor of Science, Technology & Public Policy at UCL STEaPP

arthur.petersen@ucl.ac.uk

ISC Representatives

Anne-Sophie Stevance, Senior Science Officer, Head of Global Science Policy Unit

anne-sophie.stevance@council.science

Anda Popovici, Science Officer, Global Science Policy Unit

anda.popovici@council.science

Acknowledgements

We would like to express our profound gratitude to all the people and organisations[1] that have helped us complete this dissertation research. We appreciate everyone's help and contributions in making it happen.

We are grateful to our academic supervisors, Dr. Jean-Christophe Mauduit and Prof. Arthur Petersen. Their advice and knowledge have been crucial in determining the focus and scope of our research and aligning its methodology.

We would like to thank our esteemed project partner organisation, the International Science Council, and in particular their representatives Anne-Sophie Stevance, Anda Popovici, and Dr. Morgan Seag for helping facilitate this research. We appreciate their commitment to enhancing science advice at the global policymaking level.

We extend a big thank you to our interviewees for contributing their time, knowledge, experience, and insights, which were crucial for this study. We thank the general academic community for their contributions to the field of scientific policy advice. The body of existing literature provided a solid foundation for our study.

We thank the University College London Department of Science, Technology, Engineering, and Public Policy for granting us access to the tools, infrastructure, and assistance that have made this possible.

[1] Benedikt Schmidt thanks the Swiss Study Foundation for their crucial support.

Executive Summary

In the context of wicked 21st-century problems, policymakers increasingly ask for science advice (SA) to inform their decisions. The United Nations General Assembly (UNGA) with its 193 Member States is one of the most representative forums for multilateral negotiations covering the entirety of global issues. Surprisingly, there is no structured way of including scientific evidence into the process of policymaking at the United Nations General Assembly.

The International Science Council (ISC) is a global organisation of scientific organisations including international disciplinary unions and associations, and academies of science promoting the strengthening of SA mechanisms within the UNGA. For that purpose, they wish to analyse the needs of the UNGA for scientific advice, the lessons learned from past and current SA mechanisms and the steps required to establish a more permanent advisory mechanism. This study used primary data from interviews and secondary data retrieved through a rapid literature review to answer the following research questions:

1. What formal and informal mechanisms of evidence provision exist within the UNGA?
2. What issues prevail regarding those existing mechanisms?
3. What are the necessary steps for establishing more permanent and robust mechanisms of evidence provision within the UNGA?
4. What roles could the ISC play in such alternative mechanisms?

Regarding the current state of SA at the UNGA, the results suggest that there is no specific or standardised pathway or mechanism. Instead, there is a somewhat disjointed mix of several formal, informal, or ad-hoc pathways. There are few pathways that feed directly into the UNGA. The national science-policy interfaces and the UN specialised agencies are the main sources of evidence for Member States. The findings yielded a wide range of issues regarding the current state of SA at the UNGA. The main problems are:

- Absence of a clear mandate for science advice
- Resource and capacity constraints to deal with evidence in the permanent missions
- Missing links between existing channels
- Limited stakeholder inclusion
- Confusion about the handling of different types of knowledge
- Insufficient accountability and implementation

The interviews yielded broad consensus on needed reform regarding SA at the UNGA. An alternative UNGA SA arrangement should be institutionalised, formal, and centralised. The findings regarding features of effective and meaningful SA from the interviews align with the existing literature. Both highlight the importance of a clear mandate, strong communication, transparency, adaptability, transdisciplinary collaboration, and knowledge brokerage. Interviewee responses suggest that the ISC is well-posed to take a coordination role in knowledge brokerage at the UNGA. They highlighted its global network, independence, track record, personal relationships and convening power as key advantageous characteristics to leverage. The report presents recommendations to the UNGA about enhancing its SA arrangements and to the International Science Council about its involvement around the UNGA.

Table of Contents

List of abbreviations

Abbreviation	Full Name
CSTD	Commission on Science and Technology for Development
ECOSOC	Economic and Social Council
EIP	Evidence-informed Policy(making)
GA	General Assembly
GSDR	Global Sustainable Development Report
HLPF	High-Level Political Forum
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC	International Panel on Climate Change
ISC	International Science Council
KB	Knowledge Brokers/Brokerage
MG	Major Group
MGoS	Major Groups and other Stakeholders
MS	Member States
OPGA	Office of the President of the General Assembly
OWG	Open Working Group
PGA	President of the General Assembly
SA	Science Advice
SAM	Science Advice Mechanism
SDG	Sustainable Development Goals
SG	Secretary General
SPI	Science-Policy Interface
STC MG	Scientific and Technological Community Major Group
STI	Science, Technology & Innovation
TFM	Technology Facilitation Mechanism
UN	United Nations
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
UNGA	United Nations General Assembly
WHO	World Health Organisation
WMO	World Meteorological Organisation

List of Tables

List of Figures

1 Introduction

The 21st century presents a unique and pressing set of 'wicked problems' (Weber and Khademian, 2008), characterised by their interconnectedness, complexity, and lack of straightforward solutions. Issues like climate change, pandemics or food poverty blend scientific aspects with social challenges. In this context, policymakers increasingly seek scientific advice to inform their decisions (OECD, 2015; Capano and Malandrino, 2022). They use scientific evidence to make empirical generalisations, causal claims or predictions (Gundersen, 2024), helping to understand the dynamics of global challenges (Tyler, 2020).

Several drivers have solidified the development of evidence-informed policymaking (EIPM) nationally and internationally (Boswell, 2009; Head, 2013; Stone, 2019; Espey and Casarin, 2024). First, recent decades have seen growing calls for greater government accountability, pushing decisionmakers to bolster policies with evidence to ensure efficacy and value for money—particularly in sectors that require heavy spending like healthcare (O'Dwyer, 2003). Second, the COVID-19 pandemic highlighted the critical need for timely, science-informed decisions in managing public health crises (Angeli, Camporesi and Dal Fabbro, 2021; Bhatia, Allin and Di Ruggiero, 2023), prompting closer linkages between science and policy. Third, the United Nations 2030 Sustainable Development Goals (SDGs) have promoted science's role in the policy process, particularly by catalysing the use of citizen science to monitor and report SDG goal progress (Croese, Dominique and Raimundo, 2021; Fraisl et al., 2023).

In this dynamic landscape of global challenges, the United Nations (UN) stands as a paramount institution of international policymaking. Through its various bodies, including the General Assembly, Security Council, and Specialised Agencies, the UN facilitates dialogue and coordination among its 193 Member States. The UN develops voluntary policy frameworks with international targets (like the SDGs), legally-binding treaties, conventions, and norms, and promotes data sharing, stimulating the development of policies at the national level (United Nations, 2024f).

The use of science advice (SA) in the UN has increased in recent decades (National Research Council, 2002; Dumitriu, 2018; Espey, 2023) in response to the growing need for scientific evidence in policymaking. Indeed, reinforcing the 2030 Agenda for Sustainable Development, the Secretary-General's 'UN 2.0' agenda centres science and data in the renovation of the UN (UN Secretary-General, 2023a). This shift has spawned a diverse ecosystem of science-policy interfaces around the organisation (Kohler, 2022), aiming to provide sufficient evidence across its broad range of policy areas.

1.1 Science Advice at the United Nations General Assembly

The UN General Assembly (UNGA) is the UN's primary policymaking body, where MS convene to deliberate issues and adopt resolutions. Despite being the most diverse and representative forum for broad-spanning multilateral negotiations (United Nations, 2024b), the UNGA has modest representation of science. Instead, science is included through a mix of informal pathways, ad-hoc formats like scientific briefings, and a few mandated formal channels for specific areas, like

the High-Level Political Forum on Sustainable Development (Espey, 2023). An institutionalised approach to integrating evidence into UNGA deliberations is lacking (Espey, 2023).

1.2 The International Science Council

The International Science Council (ISC) is a non-governmental organisation representing more than 250 international scientific unions and associations (International Science Council, 2024a). Driven by its vision of science as a public good, the ISC promotes the integration of science into international policymaking (International Science Council, 2024b). The ISC serves as co-chair of the UN Scientific and Technological Community Major Group (STC MG, International Science Council, 2024c), working to promote policymakers' and society's understanding of science and technology's opportunities and limitations. Across its initiatives, the ISC supports the strengthening of science advice mechanisms within the UN (International Science Council, 2024b).

In 2021, the ISC mandated a Steering Group to strategise its engagement with the intergovernmental system and amplify the voice of science in global policymaking (Marton-Lefèvre, 2021). Following this advice, the ISC catalysed the establishment of the 'Group of Friends on Science for Action' (GoF), a coalition of UN MS advocating for a stronger role of scientific evidence in UNGA policymaking (International Science Council, 2023). The Steering Group recommended to analyse the needs of the UNGA for scientific advice, review past and current SA mechanisms, and outline the steps to establish a more permanent advisory mechanism. Therefore, the ISC commissioned this research, which aims to build on the rather scarce foundation of literature about SA at the UNGA from the perspectives of evidence suppliers and users.

1.3 Research Objectives

The aim of this research is threefold. First, we expand the limited knowledge base of evidence-informed policymaking at UNGA by mapping its current SA mechanisms. Second, we highlight the issues that arise from these current channels. Third, based on the lessons from existing mechanisms and respective issues, we propose alternative pathways for science advice provision at the UNGA that will facilitate closer integration of robust evidence into its policymaking processes. These aims translate into the following research questions:

1. What formal and informal mechanisms of evidence provision exist within the UNGA?
2. What issues prevail regarding those existing mechanisms?
3. What are the necessary steps for establishing more permanent and robust mechanisms of evidence provision within the UNGA?
4. What roles could the ISC play in such alternative mechanisms?

The report is structured as follows: The methodology is detailed in Section 2. The findings of the research are presented in Sections 3 – 7. Section 3 lays the theoretical foundation regarding the interaction of science and policy, Section 4 introduces UN bodies that are relevant to SA. Section 5 describes the current landscape of SA at the UNGA. Respective issues are presented in Section

6. Section 7 focuses on alternative UNGA SA arrangements and their associated challenges. The findings are discussed in Section 8, followed by actionable recommendations in Section 9.

2 Methodology

This research project used primary and secondary data to analyse SA at the UNGA. First, initial scoping was conducted to gauge the quantity and scope of relevant, available academic and grey literature to develop a coherent search strategy (Section 2.1). Second, a rapid literature review (RLR) identified academic and grey literature on SA pathways for the UNGA and practice of SA in general intergovernmental contexts (Section 2.2). Third, primary data was gathered through semi-structured interviews with topical experts and stakeholders and analysed using qualitative coding (Section 2.3). Fourth, the current UNGA SAMs were mapped, followed by a SWOT analysis of the UNGA SA system to structure the findings at a macro level (Section 2.4). Finally, alternative SA arrangements and recommendations were proposed. This research received ethics approval from the University College London (UCL) Department of Science, Technology, Engineering and Public Policy (STEaPP) Local Research Ethics Committee.

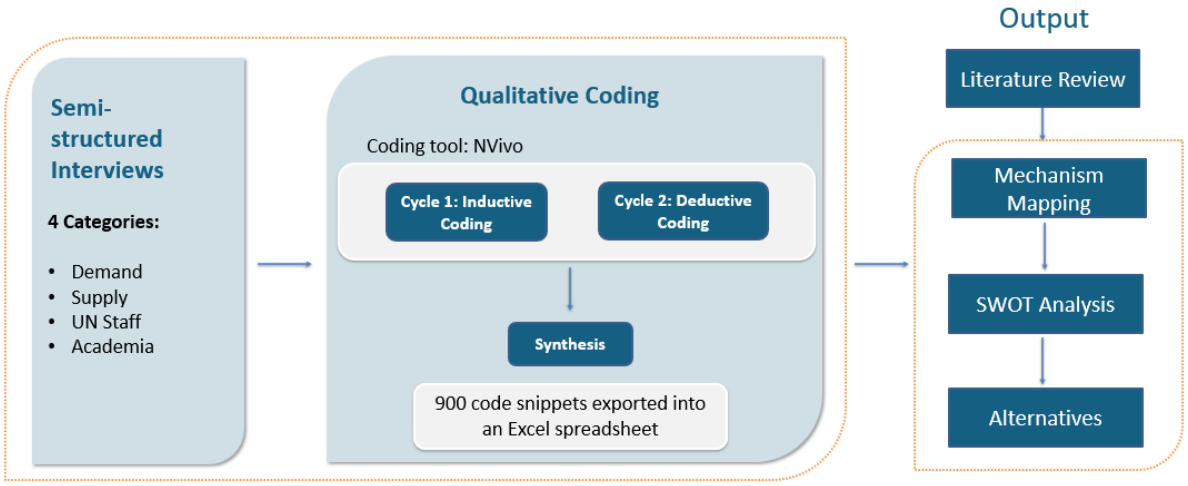

Figure 1: Overview of the methodological research structure. Primary and secondary data are integrated to map mechanisms, perform SWOT analysis and develop alternatives.

2.1 Initial Scoping

The initial scoping aimed at developing an understanding of the UN system, the current state of scientific policy advice in the UNGA and the UN, and to inform a search strategy. First, secondary data about the UN structure and SA channels in the UN system was collected from websites and reports. Second, two informal expert meetings were held. Third, a scoping review of the academic and grey literature was performed on Scopus and Policy Commons.

2.2 Rapid Literature Review

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA, Moher et al., 2009) technique was used to identify the core papers to include in the review (Appendix A). All

search results (around 3000) were screened by two researchers independently based on title/abstract, following specified inclusion and exclusion criteria to ensure consistency. Discrepancies were resolved through discussion. The final 62 articles underwent full-text analysis by one person. Search strategy details can be found in Appendix A.

2.3 Semi-structured Interviews

Semi-structured interviews were chosen for their flexibility, allowing for spontaneous exploration and further clarification for deeper understanding (Wilson, 2014). Sixteen interviews were conducted following a questionnaire (Appendix B). To capture a broad perspective, interviewees from four categories were recruited: demand-side (D), supply-side (S), UN staff (U) and academia (A). Each interviewee was assigned a unique code following NumberCategory (e.g., 1A for interviewee 1 in academia, 3S for supply-side, 7U for UN staff). Interviewees were identified through the ISC's network, academic papers, UN websites, and snowballing (interviewees recommending others). At least three team members attended each hour-long interview, with one person leading the interview and another summarising the content. All interviews were recorded and transcribed.

Table 1: Description of the four interviewee categories and interviewee codes.

Category	Description and Rationale	Codes
Demand	Representatives of the Permanent Missions of UN MS covering different geographies and levels of economic development to understand their needs	13D, 14D, 16D
Supply	Representatives of scientific organisations that engage in evidence provision for policy to understand their needs	3S, 8S, 9S, 11S, 12S
UN Staff	Staff members of UN or UNGA bodies to include their knowledge of processes and the interlinkage between different UN bodies	6U, 7U, 10U, 15U
Academia	Scholars to get a critical, academic perspective on SA	1A, 2A, 4A, 5A

Two cycles of qualitative data coding were conducting using the NVivo software to structure, reduce, and analyse the interview data, following *Coding qualitative data: A synthesis guiding the novice* (Skjott Linneberg and Korsgaard, 2019). In the first cycle, descriptive codes were inductively created from the data. In the second cycle, a predefined set of codes was used to categorise the first cycle's codes. To ensure intercoder reliability, a small sample of inductively coded passages was first deductively coded by several researchers independently then compared. Both cycles were reviewed by a second researcher. Ambiguities were resolved through discussion. The resulting 900 code snippets were exported into a spreadsheet for analysis.

2.4 SWOT Analysis

A SWOT analysis was performed to get a macro-level perspective of the UNGA SA system. Strengths, weaknesses, opportunities and threats (SWOT) analysis is a method of structured planning and evaluation of any process (Benzaghta et al., 2021), differentiating between internal (strengths, weaknesses) and external (opportunities, threats) elements. Internal factors currently hindering evidence integration were classified as weaknesses, while those supporting it were considered strengths. External aspects were categorised as threats/opportunities.

2.5 Limitations

Limited resources and time affected the depth and scope of the research, potentially impacting the thoroughness of the analysis. The literature review was limited to one academic platform (Scopus), as a quick scope revealed significant article overlap with PubMed and Web of Science. Search terms and parameters, limiting literature published from 2000 to March 2024, may have excluded relevant articles. To avoid biasing interviewees, interview questions were designed to minimise priming interviewees on specific concepts like SA. Despite measures to standardise coding, the subjective nature of qualitative analysis allows for varying interpretations that may influence results. The ISC was not involved in the design of the methodology. They provided a list of over 50 potential interviewees. The research team independently selected from this list and made additions considering geography, UNGA experience and contact availability. For some interviewees, the ISC facilitated initial contact. In the interview questions, only the ISC was mentioned as an example of a knowledge broker organisation (Appendix B).

3 Science and Policy

The growing prominence of evidence in policymaking has sparked debates about the evolving relationship between science and policy. This dynamic landscape highlights the importance of science advice mechanisms, which serve as critical links in the science-policy interface to facilitate evidence-informed policymaking. Varying definitions and conceptions in the literature reflect the multifaceted nature of science advice and its complexities.

To clarify these concepts and provide context for our report, the following section synthesises material from our literature review. Although specific information on science advice and evidence-informed policymaking at the UN General Assembly (UNGA) was scarce, the general literature offers a theoretical framework to establish a common language, enhance the coherence of our analysis, and facilitate the communication of our findings. These insights will guide the evaluation of existing mechanisms and inform evidence-based recommendations for reforming the UNGA.

3.1 Science Advice in the Science-Policy Interface

The expansion of EIPM has grown the **science-policy interface (SPI),** which represents the junction of the science and policymaking worlds. This dynamic intersection is where knowledge from evidence producers is exchanged to inform policymakers' decisions. The social processes connecting the two parties define the SPI (Van den Hove, 2007; Kettle, Trainor and Loring, 2017; Juhola *et al.*, 2024), including relationships between policymakers, scientific advisors, scientific communities, societal stakeholders, special interest and pressure groups, and the media (Gluckman and Wilsdon, 2016; Van Woensel, 2020b). The nature and flow of evidence depend on the actors involved and their relationships (Oliver and Faul, 2018), influencing access and quality of information (Soomai, MacDonald and Wells, 2013).

The linkages of the SPI facilitate the exchange of **science advice (SA)**, a term that carries many nuances. Because its processes and outputs are variable in form (dependent on its context, audience, and content), SA is best defined by its purpose: to provide robust evidence-based insights (often beyond conventional science) to inform decision-making processes (Gluckman *et al.*, 2022). While 'science' typically refers to evidence generated through rigorous scientific methods across natural and social sciences (Koetz, Farrell and Bridgewater, 2012), SA includes guidance from other experts beyond scientists to inform policymakers' contextual understanding of policy issues and solutions (Gundersen & Holst, 2022). Experts include non-scientific, yet specialised understanding of a given subject (Goldman, 2001; Grundmann, 2017), such as indigenous and local knowledge. While this evidence may not be derived from formalised scientific methods, they are still invaluable to and necessary within policy discussions (Gluckman et al., 2021).

According to the literature consensus, enhancing the credibility, legitimacy, and relevance of SA and its processes increases the SA's effectiveness and impact by ensuring that evidence is scientifically rigorous, inclusive, and directly applicable to policy needs (D. Cash *et al.*, 2003; Koetz, Farrell and Bridgewater, 2012). **Credibility** represents the scientific strength of the

technical evidence and its arguments (D. W. Cash *et al.*, 2003). Because not all evidence integral to policymaking can be yielded through scientific processes like peer review (like local and Indigenous knowledge), transparency of the processes and methodologies used to generate evidence (scientific or otherwise) is of key importance to support the credibility of all evidence presented in deliberations (Van Woensel, 2020a; De Donà and Linke, 2023). The **legitimacy** of SA stems from inclusive inputs and fair representation, fostering trust and acceptance among stakeholders, even if opinions differ (D. W. Cash *et al.*, 2003; Koetz, Farrell and Bridgewater, 2012; De Donà and Linke, 2023). Transparent, participatory processes further bolster legitimacy, while **relevance** hinges on SA's adaptability to evolving policy questions, enabling timely, actionable, and interdisciplinary insights that meet the demands of multiple policy areas (D. W. Cash *et al.*, 2003; MacDonald *et al.*, 2015; Stewart, 2023).

3.2 Science Advice Mechanisms and Coproduction

While SA can be provided informally, directly by individual experts and institutions, or on an ad-hoc basis, **science advice mechanisms (SAMs)** are institutional arrangements (structures, processes) through which SA can be generated and communicated to policymakers (Science Advice for Policy by European Academies, 2019). SAMs vary in structure, formality, and inclusivity, involving various actors from the SPI (Kenny et al., 2017), but they all strive to ensure that SA is produced, validated, and delivered systematically. A SAM's form reflects its cultural and constitutional setting (Gluckman & Wilsdon, 2016) and the varying ideas of how SA can best enrich the decision-making process in that context (Juhola et al., 2024). The design of a SAM determines its scientific and political orientation (Kenny et al., 2017). De Dòna and Linke (2023) compare ICES, IPCC, and IPBES, highlighting how their different approaches to balancing the interaction between science and policy affect the influence, inclusivity, and politicisation of evidence production.

SAM design choices influence the credibility, legitimacy, and relevance of SA and, thus, its impact. Combining the frameworks of Kenny et al. (2017) and Tyler (2020), we propose a new typology (Table 2) to build a fuller comparative schema of the variations of SAMs. The proposed typology helps identify the strengths and weaknesses of different SAM models. Understanding the structure and characteristics of SAMs is crucial for designing effective and contextually appropriate models for the UNGA.

Table 2: Typology of SAM traits, drawing from (Kenny et al.*, 2017) and (Tyler, 2020).*

Characteristic	Description
Target Audience	The intended audience influences the methods and format of SA to ensure effective communication: *executives* seek targeted scientific evidence for immediate decisions, while *legislatures* require broadly applicable information for cross-party debate (Kenny *et al.*, 2017).
Governing Structure	For example, a SAM may have 'an office of expert science advisors [...] or a committee of politicians with a staff or secretariat' as its governing body (Tyler, 2020), which serves as the primary point of contact between the SAM and policymakers and impacts the SAM's effectiveness (Hoffman et al., 2018).

Institutional location	Whether the SAM is located internally to the policymaking body or externally shapes the process of evidence formulation (Tyler, 2020). The UK's Parliamentary Office of Science and Technology (POST) is located within the legislature (Kenny et al., 2017). Closer proximity between science advisors and policymakers facilitates the transmission of advice but may risk the politicisation of the science (Kenny et al., 2017). Having the SAM external to the policymaking body but connected through a formal agreement (Tyler, 2020), like Switzerland's Foundation for Technology Assessment (TA-SWISS, Kenny et al., 2017), protects the integrity of the evidence yet might diminish policy relevance.
Mandate and Scope of Work	The scope of knowledge provision varies (Kenny et al., 2017). Outputs may be prescriptive (e.g., explicit policy recommendations); descriptive (e.g., policy option assessments or summaries of evidence); or a combination (Tyler, 2020; Wilsdon & Doubleday, 2015).
Research methods	Research question design may be overseen by a board of policymakers or chosen directly by policymakers (Kenny et al., 2017). Methods range from commissioning expert research to literature reviews, interviews, or participatory approaches. Notably, the use of grey evidence has increased due to its more accessible language (MacDonald et al., 2015).

Efforts to promote and integrate science advice into policymaking—through the SAMs or otherwise—are complicated by inherent differences between institutional logics and work processes (Koetz, Farrell and Bridgewater, 2012; De Donà and Linke, 2023). On the supply side, evidence production outputs are typically lengthy, technical reports resulting from extended research cycles (MacDonald *et al.*, 2015; Stone, 2019). On the demand side, policymakers work within much shorter political cycles and thus seek timely, accessible, and policy-relevant evidence (MacDonald *et al.*, 2015; Dunn, Bos and Brown, 2018; Directorate-General for Research and Innovation, European Commission, and Group of Chief Scientific Advisors, 2019; Espey and Casarin, 2024). These differences have led to communication barriers and constrain the fluid exchange of knowledge across the boundary, complicating the integration of evidence-based processes.

Knowledge brokers (KBs) are key facilitators within the SPI ecosystem by bridging the gap between the scientific community and policymakers (Gluckman, Bardsley and Kaiser, 2021; Sundqvist and Linke, 2024). Their role involves translating complex scientific findings into accessible, actionable insights tailored to policy contexts, ensuring that the advice is both understandable and applicable. The ISC exemplifies this role by, among other initiatives, connecting scientists with policymakers through various SPI committees. For example, its Scientific Committee on Antarctic Research directly contributes to international policymaking via the UNFCCC and IPCC (International Science Council, 2024d). KBs are expected to serve as 'honest brokers,' translating evidence unbiasedly by contextualising its limitations and implications while safeguarding the integrity of both the scientific and policy communities (Pielke, 2007).

KBs play a crucial role in the **coproduction of policy**, where evidence producers and policymakers collaborate across the policymaking cycle (Figure 2) (Dunn, Bos and Brown, 2018; Stewart, 2023). Coproduction can exist as a broader approach within the SPI or be

institutionalised within a SAM explicitly designed to foster science-policy collaboration. This approach values not only scientific evidence but also external stakeholder perspectives, enhancing the legitimacy of policies. However, this integration of the science and policy realms allows for a mutual influence, evoking the central challenge of balancing scientific robustness, relevance, and legitimacy. As Nelkin (1987) explains, 'ironically, the greater the utility of science in political affairs, the less it can maintain its image of objectivity that has been the very source of its political value.' While close interaction of scientists and policymakers may risk the politicisation of science, coproduction importantly enhances the legitimacy, relevance, and use of evidence in policymaking and yields policies that are evidence-based, inclusive, and attuned to societal priorities.

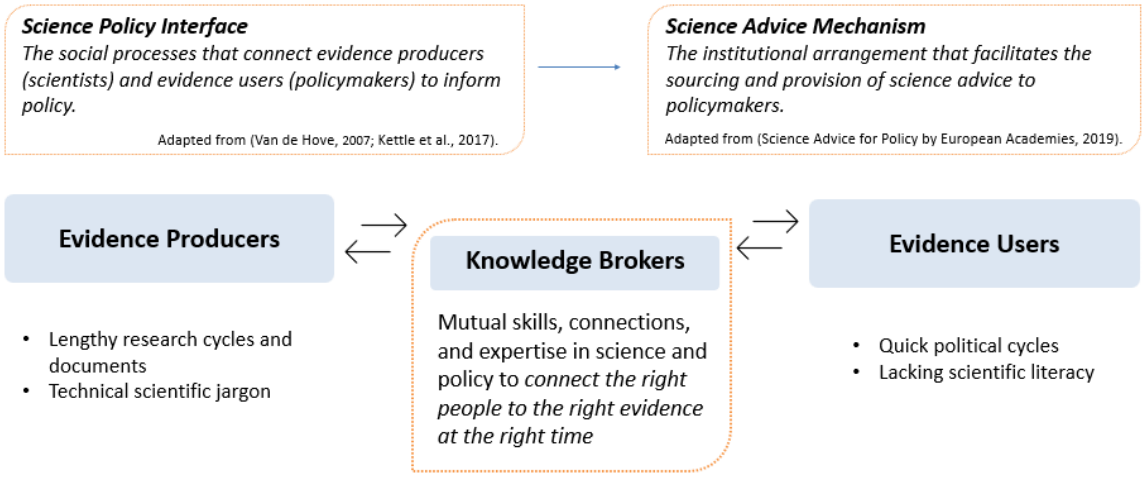

Figure 2: Evidence producers and policymakers collaborate across the policymaking cycle, engaging in co-production and facilitated by knowledge brokers.

3.3 The multilateral UN setting

Multilateral institutions face significant challenges in managing shared resources and a broad of range of interests and stakeholders (Betsill and Corell, 2007). Characterised by flat hierarchies, the resulting dynamics complicate consensus-building and collective action (Ostrom, 1990). In the UN's consensus-based approach, each Member State is granted an equal vote. While this approach is designed to ensure fairness, competing national interests and diverging priorities often hinder the achievement of concrete outcomes (Rietig, 2014).

In global policymaking, robust SA processes can help counterbalance the influence of powerful states and support impartial, evidence-based problem analysis (Rietig, 2014). However, unlike in national or regional settings, SA in multilateral settings like the UNGA must operate amidst complex challenges, including diverse national interests, resource disparities, conflicting views on the role of science in policymaking, and structural constraints (Rietig, 2014; Kohler, 2019; Gluckman, Bardsley and Kaiser, 2021; Espey, 2023). Achieving a geographic and disciplinary evidence balance alone is particularly challenging (the interacademy partnership, 2019), further complicating the effectiveness of SA mechanisms.

While multilateral processes aim to reconcile national interests, they can inadvertently undermine the efficacy of global SAMs (Kohler, 2019; Gluckman, Bardsley and Kaiser, 2021; Espey and Casarin, 2024). One key challenge is the lack of agreement on the credibility and legitimacy of SA. Perspectives on evidence validity and authority vary widely among MS, making consensus on its integration difficult to achieve (Van Woensel, 2021; Wiegleb and Bruns, 2023).

The implementation of global policy advice often happens on the national level. If national and global advisory processes highlight different priorities or lead to inconsistent recommendations, confusion arises, hindering implementation. Therefore, a certain degree of alignment between the perspectives and outlooks of national and global SAMs is crucial (OECD, 2015, 2018). Since global policy advice relies on national evidence inputs, well-developed national science advice systems significantly enhance the capacity to provide robust global policy advice (the interacademy partnership, 2019).

The UN's multilateral structure has faced growing criticism for its limitations in addressing complex global challenges (3S, 4A, 5A, 9S, 15U; Gleckman, 2018). This criticism has fueled calls for greater stakeholder involvement in policymaking, based on the idea that those directly affected by an issue are best positioned to determine solutions (Gleckman, 2018). Multi-stakeholder processes (MSPs) intend to address this need by engaging a diverse array of actors—including government agencies, NGOs, private sector representatives, and civil society—to collaboratively pursue common goals (Brouwer, 2016; Sahel, 2016). These processes can range from simple consultations to complex partnership networks, creating structured opportunities for external participation. By fostering inclusivity, legitimacy, and trust, MSPs enhance the credibility and effectiveness of global governance processes—crtical attributes for tackling complex global issues (Gluckman & Wilsdon, 2016).

3.4 Conclusion

Science advice is essential to effective global policymaking, particularly within multilateral institutions like the UNGA. The influence of science advice hinges on its credibility, legitimacy, and relevance, which are strengthened through inclusive science advice mechanisms, responsive science-policy interfaces, and knowledgeable brokers. Despite structural challenges and complexities of reconciling diverse national interests in multilateral settings, science advice mechanisms (SAMs) and multi-stakeholder processes (MSPs) offer viable pathways for embedding evidence-informed policymaking into the UN framework following a coproduction approach, enhancing inclusivity and legitimacy to enrich policy processes and outcomes.

In the next section, we will explore the structural and procedural aspects of the UN system that shape its approach to global policymaking. This analysis highlights how the UNGA's internal frameworks and decision-making processes impact its ability to leverage SA effectively—for better or for worse.

4 The UN System: Bodies Relevant for Science Advice

Drawing on initial scoping and interviews, this section provides context for science advice in the UN system. The UNGA is one of the six principal UN organs (Figure 3). With regards to SA and this report, three of them are most relevant: the UNGA, the Economic and Social Council (ECOSOC) and the UN Secretariat.

Figure 3: The six UN principal organs created from (United Nations, 2021).

4.1 The General Assembly

The UNGA is the UN's main policymaking organ and a unique forum for multilateral discussion of international issues (United Nations, 2024b). Each MS has an equal vote to adopt resolutions, mandate various UN bodies, approve the UN budget, elect the non-permanent members of the Security Council, and appoint the SG upon recommendation from the Security Council. The UNGA's work is organised in six main committees and various additional subsidiary bodies.

Based on a Western jurisprudence model designed in the 1940s (5A), the format of the UNGA is characterised by formal consensus voting procedures to manage the sovereignty of its 193 Member States (MS). While well-respected (10U), resolutions and mandates are therefore non-binding for MS (13D, 16D). National interests (3S, 5A, 15U) and geopolitics (10U) drive deliberations, with most MS organised in negotiation blocs, like the G77 (11S, 13D), to consolidate voting power. The main function of the UNGA is to make decisions on pre-prepared proposals through consensus-based resolutions, rather than engaging in investigations or in-depth discussions (13D, 14D). As a result, the UNGA is considered 'one of the least scientifically engaged UN bodies, probably by design, without space for scientific discussions' (14D).

Each yearly session is guided by an elected President of the General Assembly (PGA), who heads the Office of the PGA (OPGA). The PGA and their office influence the flow of evidence and knowledge in the UNGA. The PGA directs the discussions, accords the right to speak, poses questions, announces decisions, and oversees proceedings (6U, 7U, 13D; UN General Assembly,

2022). This role, while often seen as symbolic (6U, 14D), is crucial to 'maintain peace inside UNGA' (6U). The OPGA sets the UNGA agenda by collating perspectives from MS, coalitions, the UN secretariat, NGOs and academia through plenaries, meetings, commissions, working groups, and committees into a concise summary for MS (6U). The PGA also has scope in agenda-setting (as do the chairpersons of the committees), allowing them to focus on priority areas they announce before their election (6U). President of the 77th UNGA Session Csaba Kőrösi, for instance, sought to strengthen the role of science within the UNGA (9S, 13D, 15U).

4.2 The Economic and Social Council

The ECOSOC serves as the central coordination and implementation body of the UN and is the entry point for non-governmental actors (United Nations, 2024a). Civil society participates mainly through the Major Groups and Other Stakeholders (MGoS), organised along nine different themes (United Nations, 2024e). One of them is the Scientific and Technological Community Major Group (STC MG), co-chaired by the ISC. The MGoS participate in the High-Level Political Forum on Sustainable Development (HLPF), the central UN platform for the follow-up and review of the SDGs (United Nations, 2024d).

Key functional commissions relevant to SA, like the Commission on Science and Technology for Development (CSTD) and the Statistical Commission, are part of the ECOSOC reporting structure (United Nations, 2021). UN specialised agencies, like the World Health Organisation (WHO), operate autonomously and have their own governance structure but are connected to the ECOSOC (Aeschlimann, 2021). Figure 4 illustrates the key bodies related to SA that report to ECOSOC.

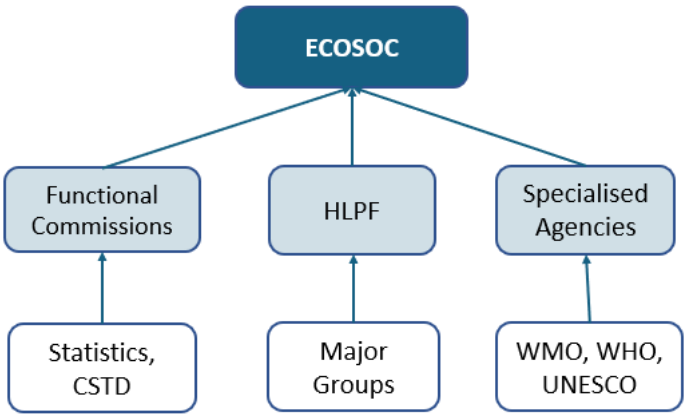

Figure 4: Reporting structure of the ECOSOC depicting selected bodies that are relevant to science advice with scientific staff. Created from (United Nations, 2024a) and (United Nations, 2021).

4.3 The UN Secretariat

Headed by the Secretary-General (SG), the UN Secretariat executes the daily business of the UN as mandated by the UNGA (United Nations, 2024i). The Secretariat staff possess extensive

process knowledge and influence the flow of evidence within the UNGA (10U). In 2013, former SG Ban Ki Moon established the first Scientific Advisory Board (UNSAB), tasked to provide the SG directly with SA for the SDGs (The World Academy of Sciences, 2016). SG Guterres established a new iteration of the board in 2023, consisting of eminent scientists and Chief Scientists from UN agencies (UN Secretary-General, 2023b; United Nations, 2024h). They are tasked with providing independent, robust, and actionable SA to the SG and his senior management. Several interviewees (2A, 4A, 10U) see the UNSAB mainly as an initiative specific to the SG.

The UN's institutional structure determines the flow of evidence and SA in its current process. Taking a closer look at these evidence flows helps to identify where institutional strengths can be best leveraged and where they need improvement to better support EIPM at the UNGA.

5 The Landscape of Science Advice at the UNGA

Based on initial scoping, interviews, and limited UNGA-specific literature, this section presents existing SAMs either directly or indirectly connected to the UNGA.

To uphold its original mandate of maintaining peace and security, the scope of the UN's work has broadened to encompass a growing spectrum of global challenges, increasing its reliance on data and evidence (3S). While the relevance of science at the UNGA has varied over time (5A) and from topic to topic (7U), it has increased over the last decade (5A, 8S, 14D). This change is reflected in the growing number of science-related resolutions, a broader institutional openness to diverse scientific perspectives (5A, 8S, 14D), and demonstrated in the Pact for the Future Zero Draft (United Nations, 2024g).

Nevertheless, SA has yet to occupy a central, foundational role in the UN's operations (1A, 5A). There is no specific structure for SA to the UNGA (1A) or the broader UN (7U). Instead, channels for SA are case-specific (2A, 3S, 7U) and shaped by the different institutional arrangements of UN entities (3S). The primary data reveals that UNGA employs both formal and informal SA channels. While formal channels—via UN agencies, for example—offer a structured approach to providing scientific input, informal channels through personal networks and side events provide flexibility and foster trust.

To systematically analyse the diverse landscape of SA at the UNGA, this study elaborated a four-tiered categorisation framework, covering the UN Ecosystem, Member States, Partnerships, and Ad-hoc Arrangements (Figure 5). This framework provides a structured understanding of the complex interplay of actors and mechanisms involved in shaping the UNGA SPI.

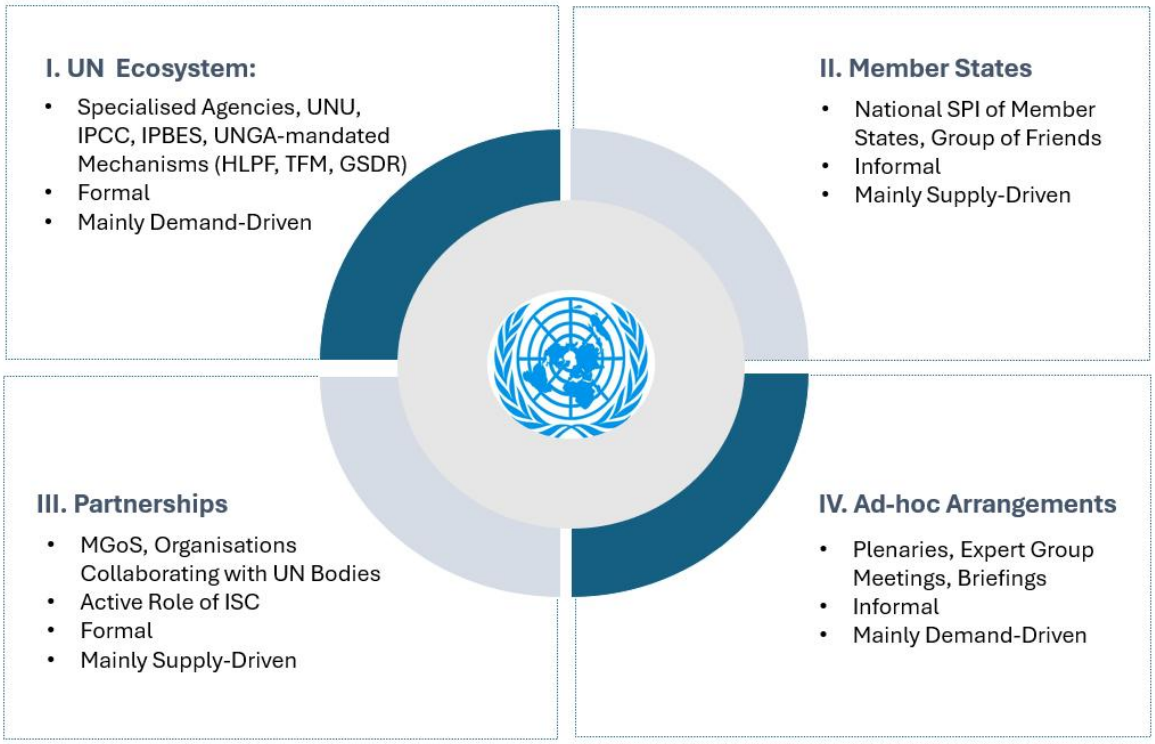

Figure 5: An overview of SAMs at the UNGA, derived from (Petersen, 2015; Tyler, 2020; Espey, 2023).

The literature distinguishes between two antipodal evidence flows in policymaking: supply- and demand-driven. The supply-driven model emphasises the 'push' of evidence by researchers to influence policymakers (Espey, 2023). In contrast, the demand-driven model emphasises the user-centered approach of evidence uptake where policymakers actively 'pull' evidence that matches their existing beliefs and the political context (Espey, 2023). In practice, a mix of both flows is common.

5.1 The UN Ecosystem

The UN ecosystem generates a wealth of policy-relevant knowledge. Several bodies and mechanisms belong to this category:

- **UN Specialised Agencies:** Mandated by the UNGA, specialised agencies conduct evidence synthesis and research on various topics relevant to the UN's mandate (Dumitriu, 2018; Espey and Casarin, 2024). They also fund programmes such as the UNDP or UNEP, which generate data for policy analysis. Knowledge outputs vary, including reports, policy briefs, assessments, and statistical data (Espey, 2024). Compared to academic research, agency evidence is more applied (1A, 5A) and policy-directed, informed by field experience, and used to support MS' positions (14D, 16D; Dumitriu, 2018; Espey, 2023).
- **The United Nations University (UNU):** Established in 1975 to bridge the gap between the international academic community and the UN system, the UNU is a network of 13 research institutes across 12 countries (United Nations University, 2024). Interestingly, only two interviewees (1A, 3S) mentioned UNU, but not as a relevant source of evidence.
- **Intergovernmental Scientific Bodies**: IPCC and IPBES are examples of intergovernmental platforms that inform political debates about climate change and biodiversity, respectively. Both rely on open-ended SA bodies appointed through member party nominations. Their evidence is often cited in UNGA resolutions and enjoys considerable credibility due to structured, government-negotiated, yet still independent procedures (1A, 9S, 12S, 13D, 14D).
- **UNGA-Mandated Mechanisms:**
    - **The Technology Facilitation Mechanism (TFM)** is the only mandated mechanism on STI for the SDGs (10U), established by the UNGA in the 2030 Sustainable Development Agenda. It fosters multi-stakeholder collaboration and partnerships via the sharing of information, experiences, best practices and policy advice among MS, civil society, the private sector, the scientific community, UN entities and other stakeholders (United Nations, 2024j). The TFM provides formal mandated input to the HLPF's SDG review and consists of four components: Interagency Task Team on STI for the SDGs (IATT), the STI-Forum, the 10-Member Group, and 2030 Connect. The 10-Member Group also provides SA to the UNGA (7U).

- **The Global Sustainable Development Report (GSDR)** is a mandated entry point for science into UNGA discussion related to sustainable development topics (United Nations, 2024c). Every four years, a new version of the GSDR is presented at the beginning of the HLPF. It is one of only two mandated reports to inform the decision-making process at the HLPF (11S).
- **The High-Level Political Forum on Sustainable Development (HLPF)** is the main forum to review progress on the SDGs (United Nations, 2024d). It takes place quadrennially under the auspices of the UNGA and yearly under the auspices of ECOSOC. The access for non-state actors during the two-day UNGA HLPF, however, is very limited compared to the one-week ECOSOC HLPF (11S). Processes linked to the HLPF, such as the STI Forum, the GSDR or the STC MG indirectly feed evidence to the UNGA.

- **The UN Secretariat:** The Secretariat informally offers scientific expertise upon request (10U). It officially produces custom reports and briefings for MS (14D). However, its primary role remains supporting the SG (6U) and implementing UNGA decisions.
- **The SG Science Advisory Board (UNSAB):** The UNSAB is indirectly linked to the UNGA in that it provides advice to the SG who reports to the UNGA. The UNSAB is not accessible to MS (14D).

5.2 Member States and National Science Advice Systems

The main channel of evidence flow into UNGA is through MS. They leverage their national science advisory systems to inform their positions and influence negotiations (S3, 13D, 16D) or reach out directly to scientists informally (10U). Networks and collaborations between MS can supplement national expertise. The EU countries, for instance, demonstrate a coordinated approach for voting as a political bloc and unify their efforts to provide cohesive evidence-based input into UNGA deliberations (14D).

'Groups of Friends' are a common form of coalition of MS in the UNGA to push certain positions (3S, 6U, 10U, 13D). They can either be very influential or simply serve to declare common intentions (16D). The Group of Friends on Science for Action (GoF) promotes a stronger role for science in decision-making (International Science Council, 2023). Established in 2023, it is currently co-chaired by India, South Africa, and Belgium (15U). France, Belize, and Switzerland have since joined (14D). UNESCO and the ISC form the GoF's secretariat (6U).

The principal goals of the GoF are to ensure that the UN and MS have access to actionable knowledge for EIPM and to promote MS commitment to apply that knowledge to meet the SDGs (United Nations Group of Friends on Science for Action, 2024). An anticipated long-term outcome of the GoF is to promote a more systematic use of science in UNGA deliberations and to discuss a general UNGA SAM (14D). Currently, the GoF is at an exploratory state, trying to raise awareness and stimulate the discussion around the use of science in the UNGA (5A, 14D). To advance their purpose, the GoF organises formal meetings where MS can participate at the levels of Permanent Representative or Mission expert (14D), as well as information sessions, side events during international forums (United Nations Group of Friends on Science for Action, 2024), and internal coordination meetings (6U).

5.3 Partnerships and Networks

Several channels internal or external to the UN link academia, civil society and business to the UN:

- **Major Groups and Other Stakeholders (MGoS):** MGoS represent civil society communities, including women, youth, indigenous peoples, businesses, and others (United Nations, 2024e). The Scientific and Technological Community (STC) Major Group is the only institutional representation of science in the UNGA (Espey, 2023). The MGoS play a key role in advocating for sustainable development and providing input into the UNGA's policymaking (2A, 7U), but are invited by the UNGA on a case-by-case basis (3S, 10U, 11S), reflecting a demand-driven approach.
- **Organisations with working relationships with UN bodies:** An example is the UN Sustainable Development Solutions Network (SDSN). Established in 2012 under the SG, the SDSN fosters collaboration between governments, the private sector, academia, and civil society to support independent monitoring and accountability, and the sharing of best practices and local solutions (SDSN, 2024). Despite its role, the SDSN lacks formal representation within the UNGA and the HLPF (Espey, 2023).
  Other scientific organisations like the InterAcademyPartnership (IAP) and the ISC also play important roles in facilitating the flow of evidence to the UNGA. The ISC is involved in several processes: it collaborates with UN bodies (8S, 11S) including agencies, the OPGA and the UN Secretariat; facilitates participation of scientists in UN processes and events to provide independent advice and represent science (7U, 8S, 11S; International Science Council, 2021); prepares UN formats like the HLPF (11S) or the STI Forum (11S); elaborates high-level briefs (8S); and organises regional fora (7U).

5.4 Ad-hoc Mechanisms and Informal Channels

The UNGA employs a variety of ad-hoc mechanisms to incorporate scientific evidence into its decision-making processes. These include informal plenaries and committee meetings with scientific experts (6U, S11), and expert group meetings that influence the UNGA agenda through inputs to the secretariat (10U). Interactive formats, such as briefings with diverse experts, have been employed by past PGAs as well (6U, 15U).

Informal channels, such as side events during the UNGA session, also contribute to evidence flow (5A, 8S, 13D). Interviewees emphasised that, while coffee breaks offer communication opportunities for scientists, these interactions often limit their role to advocates rather than advisors, with transparency and access determined by interpersonal relationships (5A, 11S, 13D).

Table 3 provides an overview of the SA mechanisms at the UNGA. The formality 'Type' distinguishes between evidence inputs formally requested by the UNGA and those gathered informally, without formalised structure. For example, though national SPI input is fed through formal hierarchies into the UNGA, the selected evidence is sourced from its respective national

evidence landscape informally, based on availability. The 'Approach' indicates whether the evidence is generated on-demand (reactive) or freely, either on a regular basis or spontaneously (proactive). The 'Driver' distinguishes between the supply and demand approaches described by Espey (2023). A demand-driven mechanism is initiated and managed by policymakers seeking actionable recommendations. A supply-driven mechanism reflects a push from evidence producers to showcase their research and input. Many of the mechanisms include both elements, but the table reflects the dominant driver.

Table 3: Summary of SA mechanism mapping at the UNGA level along the four-tiered categorisation framework.

Category	Mechanism	Type	Format of Advice	Approach	Driver
UN Ecosystem	Specialised UN Agencies (WHO, UNESCO etc.)	Formal	Reports, Practitioner Knowledge	Proactive	Demand
	HLPF	Formal	Statements, Expert-led Assessments Recommendations	Reactive	Demand
	TFM	Formal	Reports, Policy Briefs	Proactive	Demand
	GSDR	Formal	Reports	Proactive	Supply
	IPCC & IPBES	Formal	Expert-led Assessments Recommend actions	Proactive	Demand
	UNSAB	Informal/ Formal	Reports, Policy Notes, Consultation	Reactive/ Proactive	Demand/ Supply
	UN Secretariat	Informal	Internal Briefings, Policy Notes, Reports	Reactive	Demand
	UNU	Formal	Journal Publications, Events, Educational Curricula	Proactive	Supply
Member States	National SPIs of MS	Informal	National Reports, Policy Positions	Reactive	Supply
	GoF	Informal	Advocacy, discussions, forums	Reactive/Proactive	Demand
Partnerships & Networks	MGoS	Formal	Expert Presentations, Reports	Proactive	Supply
	SDSN	Informal	Reports	Proactive	Supply
	ISC	Formal	Briefs, Publications	Proactive	Supply
Ad-hoc Arrangements	Plenaries, Briefings, Expert Group Meetings	Informal	Reports, Policy Briefs,	Reactive	Demand

Despite the diversity and number of SA provision mechanisms at UNGA (Table 3), interviewees revealed a broad set of factors that hinder meaningful provision of SA to UNGA policymakers and create inequitable representation of different stakeholders in UNGA decision-making. While some of those factors indirectly influence SA at the UNGA, the majority is tightly linked to UNGA processes, institutional characteristics, and political dynamics.

6 Issues with the Current State of SA at UNGA

We acknowledge that the intergovernmental context, particularly within the UNGA, is unique and far more complex than academic or non-governmental settings. UNGA processes are characterised by a range of behind-the-scenes challenges, political intricacies, and multifaceted negotiations that do not lend themselves to simplistic fixes nor are done justly by simplistic criticisms. However, the following descriptions of issues within the UNGA reflect grievances raised by interviewees working directly within its context, making their concerns and complaints legitimate, nonetheless.

6.1 Fragmentation across the UN System

The UN system consist of over 30 separate organisations with their own mandates and governing bodies. This fragmentation of the UN system is the consequence of a series of intentional choices by Member States after WWII to uphold the independence of the UN organisations and constrain their range of activity (Gleckman, 2018). The resulting fragmented UN system approach to policy research poses challenges for effective SA at the UNGA level. Despite having liaison officers, the UN agencies often work in isolation and sometimes even in competition (6U, 12S, 13D; Dumitriu, 2018). Agencies interpret research mandates differently and operate with varying levels of funding and human resources, leading to inconsistencies in evidence availability and quality (Dumitriu, 2018). The different science-related formats within the UN system are also poorly connected. The creation of ad-hoc scientific advisory bodies, like the recent UNSAB, leads to an excess of uncoordinated efforts (9S). Different UN SAMs like the TFM and the GSDR lack formal links, preventing synergies (10U). Additionally, one-time science initiatives, like thematic days and forums, often lack long-term vision, monitoring, and evaluation (6U, 13D).

The supply-side, including intermediary organisations, academic actors and think-tanks, is also split into silos, hindering communication (6U, 10U). This division reflects the more fundamental insufficient integration of the social and natural sciences required to tackle global problems (1A, 3S, 12S). A unified platform to connect evidence suppliers is missing (6U).

6.2 Lack of Standardisation

The UNGA lacks a clear mandate for SA (9S) and a standardised system to formally connect evidence suppliers with MS (13D, 14D). Initiatives aimed at strengthening the science-policy dialogue, such as the SDSN and the GSDR, lack permanent mandates or formal representation in the UNGA (Espey and Casarin, 2024). The quadrennial format of the GSDR is not conducive to regular, interactive exchange between UNGA policymakers and the scientific community. Other SA channels, like the CSTD and the TFM, only have informal links to the UNGA (10U). The STI Forum feeds into the HLPF under the ECOSOC, hence lacking a direct link to the UNGA (Espey and Casarin, 2024). Furthermore, there is no consistent scientific validation mechanism to guide UNGA negotiations (6U, 9S, 15U).

Notably, there are also no standardised protocols for integrating different types of knowledge into decision-making. This gap highlights the ongoing debate regarding the relative significance of

different types of knowledge—such as indigenous, local, scientific, practical insights, and participatory research—in policymaking (Espey and Casarin, 2024).

6.3 Capacity Constraints

Many MS face severe capacity constraints in their Permanent Missions, limiting their ability to integrate evidence (6U, 8S, 14D, 15U, 16D). Missions must cope with the ever-expanding UN agenda and cover a plethora of topics in short timeframes (5A, 7U, 10U, 14D, 15U). To compensate for resource constraints, some resource-poor countries collaborate in coalitions, like the Caribbean Community (CARICOM, 13D). Still, even if strong national science capacities are available, there is often not enough time to get evidence (14D). The demanding UN agenda leaves little time for policymakers to engage with scientists (12S) or read policy papers (11S).

During the later stages of the policy cycle, the implementation of resolutions and the provision of implementation data are generally inadequate (11S, 15U, 16D). This issue arises mainly from two reasons. First, many countries lack the necessary human and financial resources for implementation, a situation worsened by the current UN liquidity crisis (16D). Second, there is a lack of MS accountability, due to political reasons and an absence of effective follow-up mechanisms (11S, 15U, 16D; Dumitriu, 2018). As one interviewee noted, 'some Member States will never accept the word of international accountability because they feel they are sovereign states' (11S). Without implementation, even the best SA becomes extraneous.

6.4 Inequities

Due to resource disparities, well-resourced countries dominate UNGA deliberations. They have technical representatives (14D) and science advisors in their delegations (7U). Because policymakers rely on their staff to understand scientific issues, lower-resourced countries struggle to properly engage in discussions about science and evidence (3S, 8S). Some even lack sufficient English language skills (16D). As a result, the principle of '[o]ne nation, one vote' does not equate to 'one nation, one scientific voice' under the current system (10U).

Scientific evidence from western contexts is overrepresented in the UN system (3S), raising a need to capture more evidence from Global South countries (6U). This imbalance mainly stems from gaps in national research funding and capacities (2A; Dumitriu, 2018; Espey & Casarin, 2024). The prioritisation of formal reports and English-language materials further disadvantages traditional knowledge and non-English sources (2A, 5A, 16D).

Moreover, the process for selecting experts for formal briefings lacks transparency and often relies on informal channels, raising further concerns about representativeness and inclusivity. This system tends to favour well-known experts (S8; Dumitriu, 2018). For example, if policymakers request evidence with short notice, it is unlikely that such evidence will be both comprehensive and representative (and hence legitimate). As one interviewee noted, 'even two weeks is an enormous undertaking for the scientific community, if you really want to be representative and inclusive' (8S).

6.5 Stakeholder Inclusion

There is a variety of multi-stakeholder processes (MSP) in the UN system, such as the HLPF under ECOSOC, the TFM or the informal stakeholder dialogue ahead of the SDG summits (United Nations, 2023). However, those lack institutional connection to the UNGA. While the HLPF under ECOSOC, for example, allows institutional participation of the MGoS, the UNGA has no such formal mechanism for their involvement (10U, 12S, 16D). Access to UNGA for non-governmental stakeholders, which is crucial for meaningful engagement (Espey, 2023), is very limited (5A, 8S, 10U, 11S). They mainly must engage through governmental channels to be heard (3S, 16D). For scientific engagements, the STC MG is the only institutional gate, framing science as a stakeholder group (Espey and Casarin, 2024). These institutional arrangements also reflect the missing consensus in the UNGA on the role of stakeholders in decision-making: wealthier countries generally support stakeholder engagement, while less wealthy countries often view it as biased (10U, 16D). Similarly, there is no consensus on whether science is a stakeholder. Correspondingly, the UNGA rules of procedure only allow for a case-by-case participation of stakeholders.

6.6 Systemic Obstacles to Knowledge Exchange

Several systemic factors hinder the exchange of knowledge between the demand and supply-sides. These challenges stem from both specific issues within the UNGA, such as procedural or capacity limitations, and from external factors.

UNGA processes are lengthy and complicated, hampering timely implementation of SA (13D), adaptation to evolving needs (16D) and expeditious decision-making on urgent issues (5A, 15U, 16D). Evidence providers wanting to engage with UNGA must liaise with MS well in advance to incorporate their input into negotiation statements (5A; Dumitriu, 2018). The reliance on relationships within the UNGA ecosystem in New York further complicates this process, making it challenging for external actors to engage (1A). Additionally, the lack of technical briefings for MS before formal deliberations and the limited speaking time during discussions for both evidence suppliers and policymakers restrict the use of evidence to support arguments (2A, 7U, 13D, 14D).

There is also a systemic lack of communication skills between demand and supply at the UNGA. Even the well-resourced Permanent Missions lack the expertise needed to interpret scientific and technical knowledge and its limitations, impeding meaningful engagement (8S, 11S, 14D). They often do not know how to articulate their evidence needs in questions (8S, 14D), which stunts their ability to request relevant SA. Similarly, evidence providers struggle to explain the practical relevance of their research (12S). While many scientists seem willing to provide expertise (9S, 10U, 5A), they should be 'bilingual' in both scientific and non-expert language (1A, 11S, 12S).

Moreover, academia does not incentivise public engagement of scientists (10U, 1A, 5A, 11S). Scientists are recognised for publishing in journals, rather than for their research's impact (10U). The focus on subject specialisation limits researchers' ability to connect across disciplines (12S). While publishing in high-impact journals can strengthen the status of scientists in the eyes of

politicians (11S), it does not necessarily encourage engagement within the UN. That said, strong science policy journals are lacking (10U), representing another challenge to policy-relevant research (1A). As a result, scientists rarely engage with the UN, often only doing so ad-hoc or during side-events, rather than as part of formal procedures (5A).

6.7 Political Interference

In a highly political environment like the UNGA, scientific evidence is often politicised. Most countries use it to support their positions, frequently prioritising economic and political influences over scientific ones (1A, 5A, 8S, 13D). For example, the responsibility for climate change negotiations moved from meteorology services to ministries for economy or finance (13D). A meaningful dialogue about evidence is seen to be absent (5A). The GSDR for example, originally developed as an 'assessment of assessments' (10U) to synthesise existing reports, was put under reinforced governmental oversight in 2015 to accommodate the significant political component of assessments. While this may make the report more appealing for UNGA discussions, it arguably weakens its original objective of providing a neutral assessment (10U).

Geopolitical divisions impede a shared understanding of the use of science and evidence in UNGA decision-making, hampering greater evidence integration (5A, 6U, 10U, 15U). Two staff (6U, 10U) claimed that many MS reject an elevation of science as a universal bridge over other political considerations. The geopolitical divide fosters mistrust in the validity of presented evidence at the UNGA (15U, 16D); the same proposal can be judged differently according to who presents it (11S). For example, proposals from Global North countries are often met with suspicion from Global South countries.

With rules of evidence engagement lacking (7U, 9S), the credibility of evidence sources varies among MS. National SPIs are usually the first choice for MS for SA (5A, 8S, 14D), but politically negotiated outputs like IPCC reports (13D) and evidence from UN specialised agencies (6U, 13D) are also well respected. Evidence from NGOs and universities seem to lag behind (13D). Inputs from practitioners and grey literature were preferred over academic inputs (6U). That said, indigenous knowledge has gained broader acceptance and representation across the UN over the last years (3S, 7U). Understanding the origins of evidence remains crucial (6U).

While some of the above-mentioned issues are inherent to the UNGA format and thus hard to change, others relate to procedural aspects amenable by modification. The next section explores ideas and opportunities from interviews on how to better arrange SA within the UNGA framework.

7 Alternative UNGA SA Arrangements

To address the issues described in Section 6, interviewees provided a range of insights and recommendations for what a UNGA SAM should be. Their responses offer a detailed vision of how such a mechanism could be effectively structured and implemented. Organising interviewees' responses by theme, we outline the key features and functionalities that interviewees believe are essential for a successful SAM, as well as their key insights into current UN and UNGA procedures.

7.1 Strengthening the UNGA SPI

The overall processes linking science and policy within UNGA procedures need strengthening (3S, 5A ; Dumitriu, 2018). To foster broader discussions necessary for meaningful change, science should be prioritised as a standing agenda item (8S, 15U). For example, routine morning discussions between the PGA and ambassadors could focus more on science and on addressing diverging views (15U). These meetings could include expert panel presentations on topical SA issues and mandatory reactive responses to encourage policymakers to more actively engage with SA (5A). Recruiting more officials with scientific backgrounds to assist the missions and delegations would help the demand-side articulate their evidence requests (7U, 13D, 9S; Dumitriu, 2018)—a necessary step to provide evidence suppliers with appreciated direction to ensure policy relevance of their research. Alternatively, researchers could provide explicit questions for policymakers to select and ask for subsequent investigation (8S). Also, from the supply-side, stronger science policy journals that investigate beyond the 'big picture' would be a welcomed academic resource for UN actors (10U). General guidelines about how to integrate evidence, its limitations and where to find it would facilitate access and usage (8S, 14D), promoting closer coordination and communication between the demand- and supply-sides.

The PGA could enhance the integration of scientific evidence into UNGA proceedings by implementing new procedures. Either ahead of or at the start of each UNGA session, the PGA should announce their annual theme, accompanied by key areas of scientific inquiry (5A). To complement, the PGA could hold a series of scientific panels that outline key research questions that align with the agenda (8S). The announcement of priority areas would incentivise evidence producers to engage with UNGA policymaking, providing up-to-date, robust evidence of exact relevance to the session's deliberations (1A, 8S). One interviewee (5A) also recommended that the PGA establish guidelines of engagement to ensure the integrity and transparency of the evidence presented. These guidelines would clarify the roles of various contributors, including knowledge brokers, practitioners, and community representatives. Each respective input should disclose the research methods undertaken to produce the output. Doing so would protect the respective value of different types of evidence and reflect greater transparency.

7.2 A UNGA Science Advice Mechanism

Interviewees across all categories agreed that there should be an institutionalised UNGA SAM to bolster its EIPM (4A, 5A, 8S, 10U, 14D). *Institutionalisation* entails creating a dedicated body with

a formal mandate and work program (10U), ensuring its operational stability and effectiveness in systematically integrating SA into UNGA policymaking processes.

The core remit of the SAM would be to provide equal access to comprehensive, credible, robust SA on any issue on demand (14D). Adhering to the ideal characteristics outlined in Table 4—particularly formalised procedures and central provision of SA—would enable the optimal usage of the SAM. Additional services suggested by interviewees included the management of a central science-based knowledge repository to provide general practical advice about SA and to monitor MS progress towards resolutions through cross-cutting indicators regarding sustainability (15U). While MS must organise these efforts, a division of the SAM could ensure transparency and congruence on processes. Another academic (2A) suggested that the SAM could also include a panel of experts to provide a quality validation service. This independent panel of experts could review the methodologies of presented reports to strengthen accountability. This measure of peer review could be used for specialised agencies' goal reports and/or MS' progress on SDG implementation, for example (2A).

Interviewees identified several characteristics an ideal institutionalised UNGA SAM would possess. Table 4 describes and organises them thematically and points out overlap with the general literature. Incorporating these traits into the design of an institutionalised SAM would support its functionality and impact on UNGA policymaking.

Table 4: Desirable Characteristics of an institutionalised UNGA SAM, based on interview and literature findings.

Characteristic	Description

Clear Mandate	• A clear mandate gives the SAM **institutional legitimacy** and backbone (3S), providing it the necessary political foundation and authority (Akhtar-Schuster *et al.*, 2016; De Donà, 2023). It should specify:
	  ○ **The purpose of the SA, its structure, and processes** (4A, 7U) to avoid institutional mismatch (4A).
	  ○ The advice **recipient**(s) (Oldham, 2006; Kenny *et al.*, 2017)
	  ○ Any **intermediary** organisations the SAM will interact with (5A)
	  ○ The required **financial and human resources** (6U, 16D), including for the evidence synthesis, the secretariat and for communication (Koetz *et al.*, 2008; Dumitriu, 2018; Science Advice for Policy by European Academies, 2018; Juhola *et al.*, 2024).
	  ○ **Procedural responsibilities** (Koetz *et al.*, 2008), separating advisory and regulatory functions (European Public Health Alliance, 2017).
	• **Formalised** procedures ensure the inclusivity and equity of operations (8S).

Co-production	• Strong **communication skills** are essential to foster **trust** between stakeholders (6U, 12S).

	• **Generalist facilitators** support interdisciplinary collaboration between scientists and help build a coherent scientific consensus to present to policymakers (12S). • A **strong immediate linkage** between the SAM and policymakers (4A) with **direct access, reporting lines, and regular feedback** between the advisors to the decisionmakers facilitates trust (Gluckman, 2015; Juhola et al., 2024; Kenny et al., 2017; Lomas, 2007, Directorate-General for Research and Innovation et al., 2017; Dumitriu, 2018; OECD, 2015; Oldham, 2006; Reillon, 2016). • A **follow-up** mechanism to ensure that policymakers make use of the evidence produced (11S, 16D), including implementation monitoring and support, and continued dialogue to enhance accountability (16D). • **Broad stakeholder inclusion**, including civil society (14D), MGoS, NGOs, academia (6U), and potentially private sector (3S) would enhance **evidence inclusivity** (8S) for more comprehensive consequent policy solutions (Lemos and Morehouse, 2005; Grainger, 2009; OECD, 2015; Carter, 2018; Gluckman, Bardsley and Kaiser, 2021; Sundqvist and Linke, 2024).
Transparency	• **Transparent** proceedings and decisions support trust within the SAM (3S, 6U, 9S). • **Publicly available** operations to promote trust (Gluckman, 2015; OECD, 2015; Directorate-General for Research and Innovation, European Commission, and Directorate-General for Translation, 2017; European Public Health Alliance, 2017; Van Woensel, 2020b).
Adaptability	• **Adaptability** to absorb new information (3S) and openness towards new scientific information and any demand-side changes. • Flexibility to process **short- and long-term requests** for evidence (Oldham, 2006).
Independence	• To be perceived as **neutral** (3S, 4A, 9S, 11S) and have MS policymakers' trust (6U), **advice providers should be independent,** perhaps even from the UN system itself (9S).
Effective Advice	• The advice output of the UNGA SAM should be **credible, relevant, and legitimate** (4A; De Donà & Linke, 2023; Heink et al., 2015; Koetz et al., 2012). • The request and provision of SA should be **centralised** to streamline evidence incorporation into deliberations and support EIPM at UNGA (10U). • **Transdisciplinary collaboration and research** (3S) and **diverse sources of knowledge** are key to cut across scientific fields and policy priority areas (3S; 2A; 4A; Gluckman et al., 2021; Koetz et al., 2008; National Research Council, 2002). • Evidence outputs should be **tailored** to the recipients (11S), in an **accessible format** (11S; Directorate-General for Research and Innovation et al., 2019; Espey & Casarin, 2024; MacDonald et al., 2015; Reillon, 2016).

	• Careful **timing** of evidence presentation is crucial (11S). Evidence suppliers need to take advantage of **windows of opportunity** (2A) and give **proactive advice** (4A; (Tyler, 2020) based on topical developments and the rhythm of the policymakers' agenda (Aula, 2023).
Knowledge Brokerage	• **Understanding both science and policy worlds, knowledge brokers** should be a part of the SAM as they can source and communicate the right evidence to the **right people at the right time in the right format** (2A, 4A, 5A, 8S, 11S; MacDonald et al., 2015). • Knowledge brokers **should not operate from advocacy** (2A; 4A; Gluckman, 2015; Juhola et al., 2024; Van Woensel, 2020) but as 'honest brokers' (Pielke, 2007).

Institutionalising a SAM at UNGA offers several benefits:

1. **Enhanced Dialogue**: An institutionalised mechanism would foster co-production, increasing dialogue between evidence suppliers and policymakers and aiding the development of cross-cutting themes (5A, 12S; Directorate-General for Research and Innovation et al., 2019; Gluckman et al., 2021).
2. **Encouraged Investment in SA**: In emphasising SA at UNGA, the establishment of an UNGA SAM would encourage MS to invest in their national SPIs, thereby reinforcing both national and UNGA mechanisms (5A).
3. **Equitable Access to Resources:** An institutional SAM may level the playing field by providing open access to robust evidence synthesis, helping to bridge gaps in national SPI capabilities and resources (14D; Avery et al., 2016; National Research Council, 2002).
4. **Increased Inclusivity and Transparency**: Institutionalisation and formality would better assure inclusivity, transparency and democratic processes enriching discussions and enhancing the forum's credibility and legitimacy (7U; 8S; Gluckman et al., 2021).
5. **Continuity and Consistency:** Institutionalising an UNGA SAM through a resolution would ensure continuity and consistency in evidence provision, protecting the mechanism's credibility and effectiveness, and fostering greater MS buy-in (10U; Gluckman et al., 2021; OECD, 2015; Oldham, 2006).

However, a few interviewees described challenges to institutionalising a SAM within the UNGA. One UN staff member (6U) emphasised that the most sustainable way for scientific input to reach UNGA deliberations is through MS, suggesting that a standalone SAM would be ineffective unless it is integrated through MS. Another interviewee (1A) highlighted that the size and decentralisation of the UN system makes a one-size-fits-all solution impractical. A SAM with decentralised components may be more manageable to integrate into the existing structure of the UN system (2A). Additionally, an interviewee (15U) pointed out the benefits of informality, advocating for informal discussions between scientists and policymakers to facilitate SA discussions without getting held back by formalities. Lastly, a supply-side interviewee (9S) cautioned that the SAM should maintain independence from the UN system.

7.2.1 SAM Structure

The governing arrangement of the SAM is critical in determining its effectiveness. In terms of the SAM's central administration, a well-resourced secretariat would help to solidify the SAM's effectiveness. Apart from administrative responsibilities, the secretariat brings knowledge of policy processes and would help establish a strong direct upstream link to policymakers (4A). The SG and the PGA should be directly involved with the SAM to facilitate its operations, legitimacy, and effectiveness (8S, 15U). The thematic session calls for evidence described in Section 7.1 would ensure that the outputs of the SAM directly align with the UNGA agenda (8S), solidifying its relevance. The SG's and PGA's oversight is crucial to balancing inclusivity and politics without compromising the scientific integrity of the SAM. Interviewees cited the IPCC as a best-practice model for balancing policymaker input with scientific rigor (see Box 1).

To support the integration of the SAM within the UN, the SG and PGA should *'create…horizontality…across different science advisory pathways'* (9S). Regular briefings between the SG, the UN agency Chief Scientists and the head of the SAM should be established to coordinate evidence supply across the UN system (9S). This horizontal approach aligns with the horizontal perspective some interviewees (4A, 9S, 10U) have suggested for UN reform, emphasising 'lateral networking'—an institutional network where multiple entities agree to share information and work collaboratively towards specific goals (9S, 10U).

Unlike a rigid hierarchical structure resistant to change, lateral networking would enhance the SAM's resiliency within the UN system. The PGA would establish the institutional links necessary to connect the SAM to existing bodies (10U), while the SG and their office would oversee the systemic congruence (9S). The IEA and World Bank are examples of networked relationships with the UN: they maintain independence but still provide legitimate, relevant material. Codifying these relationships ensures commitment, accountability, and stability, protecting the organisation from changes in leadership or priorities and securing it to existing bodies and processes (10U).

Box 1. Balanced, Structured and Politically Respected: The IPCC

Established by the WMO and the UNEP in 1988, the IPCC provides a comprehensive scientific perspective on climate change sand its consequences to the UNFCCC. The IPCC's final Assessment Report is delivered to the UNFCCC. IPCC members are nominated by participating governments. They determine the outline and approval of reports and the summaries for policymakers, reflecting a political influence. The report authors are researchers also nominated by their governments; however, they perform their synthesis work independently, ensuring a strong scientific basis. The reports are intended to be policy-relevant yet policy-neutral and not prescriptive.

Several Interviewees (1A, 9S, 12S, 13D) complimented the established structured collaboration and dialogue between scientists and policymakers within the IPCC, the independence of the evidence generators, the party-negotiated but still scientific consensus and the scientific character of its secretariat. It is also stated that 'there are some great

initiatives within the IPCC and others to try to get support to scientists from the global south to publish' (13D), which highlights the importance of balanced global power dynamics.

7.2.2 Establishment of a potential UNGA SAM

The establishment of any form of UNGA SAM would stem from an official resolution (8S). Likely, an institutionalised SAM would be built incrementally through multiple resolutions (10U). Establishing a body to reform the broader science and technology architecture through a single resolution has achieved only partial reform, as demonstrated by the TFM, GSDR, and HLPF (10U). These instances of reform did not transform the system to address broader issues like regional inequities. Another such 'tick-box exercise' should be avoided (13D). Once established through a resolution, it is essential to continue refining the SAM's operations and procedures. These should be tested across different stakeholder groups, including policymakers, scientists, and NGO representatives (10U), and in a major negotiation (6U).

Political buy-in of MS and the UN Secretariat is necessary to pass the founding resolution (4A, 6U). To garner sufficient support, it is essential to address the varied motivations behind why MS might favour such a mechanism at the UNGA. For G77 countries, one interviewee (5A) noted two primary incentives: aligning with international donor agendas to secure funding and addressing national capacity challenges in providing SA. In addition to other reasons, the interviewee speculated that many Global North countries might support the SA agenda to increase data monitoring and accountability oversight to ensure value for money. Several interviewees (3S, 7U, 13D) identified the GoF as a key player in facilitating information exchange among MS. Having the support of several ambassadors to help push through supportive proposals would further help to solidify the operations of the SAM (15U). Leveraging GoF's ability to raise awareness of existing evidence sources and link the evidentiary output of other UN agencies to the UNGA would help build support for and encourage the use of the SAM.

7.2.3 Enhancing Stakeholder Inclusion

Incorporating a broad range of stakeholders would support a wide-ranging input scope of the SAM. Stakeholders can contribute local perspectives, knowledge and capacities throughout the policymaking cycle, from agenda setting over evidence synthesis and policy formulation to implementation (National Research Council, 2002; Aricò, 2024; Espey and Casarin, 2024), except for the formal act of adopting a policy. The policy cycle perspective elucidates that stakeholder inclusion in UNGA policymaking comprises many stages far before and after a specific proposal is discussed at UNGA, such as evidence synthesis in specialised agencies or implementation with local authorities.

For example, partnerships with large networks like Future Earth and the SDSN already play an important informal role as entry points for information via national governments (10U). Including their memberships would not only expand the SAM's evidence base but also boost its legitimacy. Other interviewees recommended to involve business because of its relevance regarding

implementation and knowledge production (3S, 12S), actors from the fields of technology and innovation (10U) due to their tight interlinkages to science and Permanent Representatives (8S). Civil society actors also have a key role to play as a critical perspective on policy proposals (14D), oftentimes catching details that policymakers may inadvertently overlook. Considering diverse perspectives promotes more inclusive, well-informed policymaking.

The UNFCCC COP *dialogues*, for instance, are characterised by their multistakeholder nature (Aricò, 2024). Still, the corresponding bureau, which provides advice and is responsible for process management (UNFCCC, 2024), consists of MS representatives. An alternative would be to change the COP bureau to a multistakeholder bureau. The SDG negotiations represent a case of meaningful science dialogue and stakeholder inclusion (Espey, 2023).

Box 2. Inclusive Dialogue and Co-Production: The SDG Negotiations

The Sustainable Development Goals (SDGs) negotiations began in 2013 with the establishment of the Open Working Group (OWG)—an intergovernmental platform mandated to elaborate a universal set of SDGs (5A; Espey, 2023). The OWG supported a conducive environment for knowledge exchange by involving diverse Major Groups (Children and Youth, Indigenous Peoples, STC MG) in the process. Morning pre-sessions for scientific presentations allowed for direct discussion before official meetings, ensuring that scientific perspectives were integrated into policy discussions (7U). MGoS and specialised agencies were granted space for statements during meetings (7U). Informal exchanges allowed for more in-depth discussions and tailored SA (13D).

Recognising the complexity of sustainable development challenges, MS actively sought scientific input, enabling multiple consultation and feedback rounds that refined proposals based on emerging scientific findings. This iterative approach during the negotiations, supported by the political buy-in of MS, enhanced the policy relevance of scientific research and built trust between the scientific community and policymakers (7U).

While the SDGs represent a significant step forward, challenges remain. Horizontal integration of scientific advice across themes of topics was limited. For instance, while water, food, and energy security are interlinked, they were frequently addressed as separate issues during the negotiations. (9U, 11S)

7.3 The Potential of the ISC

Interviewees were asked about their perspective on the ISC as a knowledge broker for SA at the UNGA. Combined with existing literature, five crucial strengths of ISC were highlighted. Based on these strengths, several interviewees see the ISC as well-posed to take a leadership role in SA at the UNGA (5A, 7U, 9S, 12S, 14D). However, the interviews underscored four significant caveats about the ISC's engagement at the global intergovernmental system.

Table 5: Strengths and limitations of the ISC as a Knowledge Broker.

Strengths	Limitations
Global Network: This network is a resource for MS to recruit experts in an inclusive and representative manner regarding disciplines, gender and geography (2A, 6U, 8S, 7U, 9S, 12S, 14D ; Marton-Lefèvre, 2021). **Personal Relationships:** The ISC maintains personal relationships to evidence suppliers and users (Marton-Lefèvre, 2021), fostering trust. **Independence:** The ISC is independent from political actors (9S ; Marton-Lefèvre, 2021). **Achievement:** As a merger of the International Council for Science (ICSU) and the International Social Science Council (ISSC), the ISC can build on longstanding achievements regarding scientific collaboration on global issues (Marton-Lefèvre, 2021). **Convening Power:** Its broad membership, track record and role as coordinator of the STC MG at the UN foster a considerable convening power on the international science and policy stage (2A; Marton-Lefèvre, 2021).	**Political Limitations:** As a non-UN entity, the ISC could face legitimacy deficits perceived by MS (14D). It should be careful to not come across as an actor influencing the agenda at the UNGA to avoid push-back from MS (D14) and needs allies among the MS to advance its agenda (5A, 12S). UNESCO and UN specialised agencies could have reservations against the ISC being the main knowledge broker (9S). **Sharing Brokerage Role:** Given the abundance of intermediary organisations, it seems impossible to have a single dominant actor (5A, 12S). For political reasons, the UN cannot elevate the ISC above other non-governmental actors (8S). Still, too much competition reduces the effectiveness of knowledge brokers (8S; Oliver and Cairney, 2019). Thus, the brokerage function might be shared among a few actors. **Advocacy Connotation:** A perception of the ISC as an advocacy organisation could endanger its independence and trustworthiness (2A, 4A). **Visibility:** The ISC is not known to all MS (16D) nor across the whole scientific community (11S).

7.4 Challenges regarding the Change of UNGA SA Arrangements

Changing the current SA arrangements at the UNGA faces several challenges, ranging from consensus among MS over systemic challenges to resource requirements.

7.4.1 Consensus among Member States

To establish a UNGA SAM with a well-resourced secretariat, support from MS is required (4A, 5A). The MS that do support science in policymaking are those that already have had dialogue about it for the last few decades—mostly the Global North and a few Global South exceptions, like Singapore (5A). Other countries might have more urgent topics that require their attention. Showcasing the universal benefits of a UNGA SAM may bolster greater support from more MS. The awareness-raising activities of the GoF might help here, particularly since half of its members are Global South countries.

Due to the inherent political nature of the UNGA and its diversity, building consensus around the presented evidence with respect to political discussions is difficult (3S, 15U). Therefore, any institutionalisation should be towards '*a mandated way of agreeing on information*' (15U), speaking to an institutionalised process rather than a new body.

Another challenge is agreeing on measures of a potential new SAM's effectiveness (1A, 3S, 4A). A respective assessment of effectiveness would have to follow an agreed framework (4A). One example of such a framework looks at the whole SPI instead of a single mechanism and takes the interactions and conversations between demand- and supply-side as a measure of success (4A).

7.4.2 Systemic Challenges

The UN system has become very large over the years and as a result, the level of inertia to create change has become immense (9S). Indeed, one UN Staff interviewee (10U) expressed scepticism about the degree to which institutional change is possible. Rather, the focus should be on *feasible* change within the context of institutional inertia and current challenges preventing consensus. While some level of bureaucracy is needed in the UN system, the sluggishness of the system as it stands currently is not conducive to supporting the provision of SA (9S).

Political interference may stem from the demand-side since the uptake of SA is limited by how receptive a Permanent Mission and their capital are (8S). There may even be a difference between the two (8S), making universal support across demand, supply, and MS capitals a major obstacle.

It might be unrealistic to both network and institutionalise the new SAM within the structure of existing UN bodies due to vested interests and the support the various subsidiary bodies receive (10U). Current influential figures are more focused on short-term agendas rather than long-term structural reforms. They prefer to use their tenure and agendas for specific initiatives since the time available for implementing these agendas is often too short to initiate meaningful discussions and reforms.

These reservations apply to the PGA. Their power is restricted by several factors. First, their term is limited to one year, meaning a push for long-term issues is constrained (6U, 15U). Second, the PGA is elected by the MS, thus accountable to them and supposed to be neutral (6U, 14D). Third, the PGA depends on their personal credit with diplomats (15U). Fourth, the PGA's power is restricted by the resources of its office (6U). Finally, past UNGA resolutions constrain the PGA's scope of action (13D).

7.4.3 Required Resources

Securing the necessary funding is essential to the creation of a UNGA SAM (11S, 16D). The financial resources required to establish and run such a mechanism would be feasible — the cost of the formalised IPCC process is around USD 8 million a year (15U). The real issue instead is finding a champion to take the initiative and put up the money to set up the SAM. To strengthen the integrity of and trust in the SAM and reduce inherent bias, funding would ideally stem from the UN itself. However, since the budget from within the UN system is limited (1A, 16D), other

means may need to be explored. The IPCC funding model might be a suitable approach. Aside from contributions from its parent organisations WMO and UNEP, the IPCC is funded by voluntary contributions from its member governments at the UNFCCC (IPCC, 2024). The interviews did not reveal additional ideas.

Once established, the funding system should be appropriately aligned between the supply and demand sides to facilitate productive collaboration (3S). Ongoing adjustments to current funding bodies are striving to better support a transdisciplinary, global approach to science and SA (3S). However, donor-recipient funding dynamics (Huang *et al.*, 2024) should be taken into account insofar as to ensure that the SAM's processes are not politically compromised. Coordinating funding approaches across demand and supply serves to secure resources but must be done so carefully to protect the integrity of the SAM.

8 Discussion

Our findings reveal significant limitations within the current SA landscape at the UNGA, highlighting a persistent institutional mismatch that constrains the effective integration of SA into policymaking. Present SPI channels fail to adequately connect evidence producers with policymakers, reinforcing a divide between the two worlds of science and policy. This analysis—validated by alignment of our assessment of the UNGA SA landscape (Table 3) and interview data—illuminates critical gaps in the structure and processes governing SA at the UNGA. We found that most SA pathways are supply-driven, resulting in abundant evidence across the UNGA SPI (Section 5). However, insufficient engagement and uptake from the demand side hinders the integration of this evidence into decision-making. Interviewees identified two main factors contributing to the limited uptake of evidence in policymaking: a skills gap (e.g., scientific literacy and communication) and the absence of formal procedures requiring evidence consultation. External stakeholders, like MGoS, are present, but their input is restricted from meaningfully participating in UNGA deliberations, weakening the legitimacy of the policymaking process. Without stronger engagement protocols, the impact of SA remains constrained by these structural and procedural deficiencies.

Deficient uptake also stems from the absence of a centralised channel for suppliers to provide their evidence, leaving SA provision decentralised and reliant on informal channels. On paper, formal mechanisms like the TFM or UN specialised agencies dominate the UNGA SPI as the preferred source of evidence for MS after their national SPIs. However, they lack standardised entry into UNGA deliberations. This gap has led to a reliance on informal pathways, which interviewees highlighted offer more flexible, accessible, and directly relevant advice. Social networks and preexisting relationships, then, are the main drivers in evidence exchange at the UNGA SPI (Section 6.4), raising equality concerns since not all MS have access to such networks nor the capacity to build them. To address this imbalance, interviewees advocated for an institutionalised, centralised SAM to provide standardised and equitable access to scientific expertise across the UNGA.

Interviewees emphasized that KBs play a vital role in translating complex scientific findings into actionable insights for policymakers and sourcing appropriate evidence for deliberations. The ISC was identified as a central actor in this reform, given its global network, independence, and convening power. To gain credibility as an 'honest broker' (Table 5), the ISC must ensure the inclusivity of other KBs and respect for MS sovereignty, thereby fostering trust and effective engagement across diverse stakeholders. Leveraging KBs within a formalised SAM could streamline and enhance the quality and timeliness of evidence provision to MS representatives.

8.1 The Desire for Change

There is consensus on the need for reform of UNGA's current SA landscape. That several interviewees across categories identified the SDG negotiations (4A, 7U, 9S, 11S, 13D) as an instance of successful exchange between policymakers and evidence providers attests to a desire for change (see Box 2). The establishment of the Open Working Group during the negotiations marked the first time UNGA deliberations followed a new format that allowed for direct, meaningful dialogue about scientific inputs with the negotiators themselves—including

ambassadors and key aides. The approach facilitated substantive engagement with SA at a high level, demonstrating a successful model integrating science into policy discussions.

The issues identified in our findings echo concerns raised in previous reports, including a significant study published by *Proceedings of the National Academy of Sciences* (PNAS) in 2002, which highlighted similar obstacles in integrating science advice within the UN system. The persistence of these issues over two decades demonstrates both institutional inertia and a lack of accountability in addressing longstanding barriers to effective science-policy integration. Moreover, several interviewees expressed appreciation for the study to spotlight lagging progress in catalysing meaningful change. They said they see the report (and similar efforts) as a means to foster institutional introspection and system awareness, reduce fragmentation, and promote inter-organisational synergies (4A, 9S). This feedback from interviewees suggests a positive trend towards more informed, balanced policy decisions and reflects a deeper appreciation for the coproduction approach within the UN framework. If the UN and UNGA wish to maintain their relevance as the leading institutions for international policymaking and peace, the urgency of implementing meaningful reforms cannot be overstated. This report underscores the need for structural and procedural changes that will enable the UN to fulfil its mandate, adapting to the complexities of today's global challenges with robust, evidence-informed policymaking.

A critical question arises regarding the suitability of the UNGA as a venue for incorporating SA, given its political nature and multilateral processes. Unlike advisory bodies or technical committees, the UNGA is primarily a political forum where most MS approach discussions with predetermined policy positions. This routine raises concerns about the ability and openness to integrate scientific evidence, especially when such evidence may conflict with established national interests or political strategies. The prevalence of pre-established agendas among Member States means that SA often plays a secondary role, potentially being used selectively to support policy stances rather than inform or reshape them. This context challenges the notion of the UNGA as an effective forum for SA integration and raises the possibility that alternative, less politicised platforms might better facilitate impactful science-policy engagement at the global level.

8.2 Recommendations for Reform

Interviewees called for an institutionalised, formal, and centralised SAM to ensure equal access to scientific expertise for all MS. The current lack of a centralised SAM contributes to the inefficient distribution and inconsistent uptake of scientific evidence. A formalised SAM could streamline the provision of evidence, ensure equal access for all MS, and reduce the dependency on informal networks, which currently contribute to inequities among MS. Effective SA should have a clear mandate, strong communication, transparency, adaptability, and transdisciplinary collaboration (Table 4). Lessons from the IPCC's governance model—a respected balance of scientific independence with political oversight—underscore the potential effectiveness of a centralised, UNGA-oriented SAM.

Interviewees underscored the importance of designing networks and procedures that enhance coproduction between policymakers and scientists. Reforming from a horizontal perspective could better align policy design and scientific input (9S), reducing the departmental and disciplinary fragmentation that hinders science-policy coherence. Likewise, coproduction would

be bolstered by establishing rules of engagement to facilitate evidence exchange and dialogue. Currently, the discretionary use of available evidence by MS representatives allows for inconsistent inclusion of evidence in deliberations—an allowance stemming from missing evidence engagement obligations for demand-side actors. Creating guidelines for evidence and evidence engagement would integrate evidence consideration into demand-side routines.

Integrating interview data into our typology (Table 2), we elaborate on key SAM characteristics for the UNGA context. The SAM should align with the UNGA's deliberative format—akin to a legislature—and provide outputs suitable for use by all MS. This approach would equalise access to knowledge and evidence, levelling the playing field for all MS, regardless of their capacity or scientific capabilities. Given the UNGA's highly political nature, a SAM governed by a committee of politicians may be most effective. The IPCC, identified as a case of best practice, is also managed by a panel of elected policymakers that decide on consensus. This arrangement does not affect the scientific robustness of the organisation, which is highly respected across both science and policy communities. A political committee, similar to the IPCC, to oversee the SAM could solidify its legitimacy in UNGA while maintaining its scientific rigour.

Some interviewees also recommended that the SAM be located outside the UN system to avoid institutional inertia. While a UNGA SAM officialised under the UN would carry strong legitimacy, the SAM may then run the risk of ossifying like other UN agencies—becoming an entity that accepts funding but does not engage meaningfully and publishes reports in vain (14D). An internal body may also become entangled in UN system politics, compromising its scientific independence (9S). Conversely, an external SAM would need to be universally accepted and respected by MS as an authoritative source, providing independent scientific analysis (14D). Linking the SAM laterally within the UN system could help avoid the biases and rigidities that might undermine the integrity and relevance of its evidence. If an external organisation champions the new UNGA SAM, it must already have the trust and confidence of UN actors and MS.

8.3 Research Limitations

While the methodology aimed to be comprehensive, several notable topics warrant further investigation to deepen understanding of the interactions and processes at the UNGA SPI. Despite efforts to include a diversity of perspectives, most interviewees shared similar sociocultural backgrounds, which may have influenced the findings. We were unable to conduct interviews with representatives from indigenous or business communities due to unavailability during the interview period. Both those communities play a central role in policy design and implementation. Expanding interviews to include these underrepresented perspectives could provide valuable insight into how non-scientific knowledge is integrated with scientific evidence in EIPM.

8.4 Areas of Further Research

A couple of interviewees noted the emerging role of artificial intelligence (AI) in UNGA policymaking. Some delegations have already begun using AI to draft statements (13D), and one supply-side interviewee (3S) predicts the use of AI in KB. However, disparities in AI capabilities between nations may introduce new inequalities, and related issues such as data security and

risk of information stagnation need to be addressed (13D). As AI's role in EIPM grows, it will be valuable to investigate its implications further.

The challenge of measuring the policy impact of SA also remains an area for further study. Examining the linkage between SA and policy implementation (through more inclusive interviews) could provide deeper insights into the effectiveness of current practices and the feasibility of proposed alternatives. Continued research in these areas will be invaluable for advancing the effectiveness and equity of science-policy interactions at the UNGA.

8.5 The Way Forward

Our SWOT analysis of the "UNGA SA System" provides a strategic overview of the strengths, weaknesses, opportunities, and threats shaping the integration of science advice into UNGA decision-making. These findings inform actionable recommendations for reform, detailed in Section 9, underscoring the need for a robust, adaptable, and inclusive science-policy interface. By embracing a centralized SAM, harnessing the expertise of KBs, and addressing entrenched structural issues, the UNGA can make significant strides toward realizing its mandate of evidence-informed, equitable policymaking.

Table 6: SWOT Analysis of the current UNGA SA system.

Strengths

- **Strong institutional capacity** through the UN system with a wealth of scientific and practitioner expertise (e.g., specialised agencies, intergovernmental bodies)
- **Global legitimacy** through UNGA's status as a universal global policymaking platform
- **Established formal mechanisms** for integrating SA (HLPF, TFM, GSDR)
- **Access to a diverse knowledge base** from a vast array of external evidence (i.e., scientific communities, indigenous knowledge, civil society, etc.)
- **A Flexible Approach** by leveraging informal channels and ad-hoc mechanisms which allow for adaptability and responsiveness to emerging scientific and policy challenges

Weaknesses

- **Absence of a mandated and structured SAM,** coupled with fragmented governance and limited resources
- **Procedural challenges** such as complex bureaucratic processes, short timelines and unclarity about the status of different types of evidence
- **Capacity constraints,** limited capabilities of MS, fragmented UN knowledge system, and shortage of skills in interpreting science
- **Inclusivity and equity concerns,** triggered by overreliance on Western-centric knowledge and limited participation of stakeholders
- **Political interference** over the selection, use, and dissemination of scientific evidence

Opportunities

- **An institutionalised SAM** mandated to provide more structured SA directly to the UNGA
- **Increasing recognition among MS** about the importance of science to fight global challenges creates a favourable environment for strengthening SA arrangements
- **Leveraging partnerships** like collaborations with external networks, the ISC, and Major Groups, to expand the scope and impact of SA
- **Building on existing mechanisms** such as the HLPF or the TFM to strengthen the role of evidence in decision-making

Threats

- **The UN's complex governance structure** and resource constraints can impede the effective functioning of SAMs
- **Geopolitical tensions and differing national priorities** can undermine the acceptance and implementation of SA
- **The difficulty of defining robust SA effectiveness metrics** can limit its credibility and influence
- **The lack of clear incentives for scientists to engage** in policy-relevant research hinders the availability and flow of evidence
- **Limited public trust** with growing scepticism towards scientific expertise and complex policy issues

9 Recommendations

The following recommendations are proposed to strengthen SA in the UNGA. The recommendations for the UNGA focus on middle to long-term, high-level changes, with a few specific measures suggested for the PGA. The recommendations for the ISC target both its activities at the UNGA and internal goals, complementing its current action plan (International Science Council, 2021).

Recommendations for the UNGA SA System

1. **Institutionalise a UNGA Science Advisory Body/Mechanism (SAM).** A dedicated centralised SAM should directly report to the UNGA with a clear mandate defining its purpose, structure and processes (Section 7.2; Table 4) and a sufficiently resourced secretariat (Section 7.2.1). Formal institutionalisation will ensure continuity, inclusivity, equal access, and independence of the advice (Section 7.2). Safeguards to limit political influence (Table 4) should include: transparent member selection processes based on merit to ensure credibility of the advice; a sufficient number of seats allocated to UN-external advisors to strengthen independence; a diverse membership to guarantee legitimacy of the advice; financial independence with adequate funding beyond Member State contributions to strengthen its autonomy; regular evaluation to assess its performance and to identify potential conflicts of interest; and provision of public access to SAM proceedings for greater transparency. The SAM can establish its governance framework and related procedures, develop an institutional framework for science advice at the UNGA, provide strategic guidance, identify knowledge gaps, and prioritise research needs. Thematic session calls for evidence would ensure that the outputs of the SAM directly align with the UNGA agenda (7.1).

2. **Develop guiding principles for evidence integration.** Clear guidelines and processes would support evidence integration at the UNGA (Section 7.1). These guidelines should outline sources of scientific information, clarify the relationship between different types of evidence, and address their strengths and limitations in various policy contexts (Espey and Casarin, 2024). The PGA could elaborate and manage such guidelines.

3. **Promote knowledge exchange among Member States**. There are considerable differences in capacities between Member States and a remarkable North-South imbalance (Sections 6.3, 6.4, 6.7). Sharing of scientific evidence and best practices among Member States via a centralised knowledge repository would help to level the playing field, enhance collaboration, and foster trust (Section 7.2.1). The GoF could take a key role in facilitating the flow of evidence by raising awareness among MS about evidence resources, like the proposed knowledge repository and/or relevant output of Specialised Agencies to the UNGA (Section 7.2.2). Complementarily, the GoF, with the ISC as their secretariat, may leverage their current informal meetings to include short best practice sessions where MS share their ways of dealing with evidence (Section 5.2).

4. **Enhance horizontal collaboration and coordination of existing channels**. A standardised approach to scientific advice among UN agencies is essential to optimise the use of their expertise and resources (Section 6.1). Common standards and methodologies across UN agencies for data collection, analysis, and reporting would enhance consistency, comparability, and the flow of evidence to the UNGA (Section 6.1). Encouraging collaborative research projects and joint initiatives among UN agencies would break siloes and help to address complex global challenges. Existing science advice channels like the CSTD, the TFM, the GSDR, the STI-Forum and one-off events like science days would benefit from lateral networking to enhance synergies (Section 6.1). Such networking could be achieved by clearly delineating their responsibilities and establishing information-sharing channels to reduce redundancies. Regular briefings between the SG, the UN agency Chief Scientists and the head of the potential SAM would facilitate the coordination of evidence supply across the UN system.

5. **Expand representation of external experts**. Stakeholder inclusion during UNGA deliberations is limited (Section 6.4). Increased collaborations with and representation of leading research institutions, academies, civil society organisations and industry actors (Section 7.2.1) would broaden the UNGA knowledge base and strengthen the co-production of policies (Section 3.2). These collaborations could leverage the Major Groups (Section 5.3) by granting them a regular consultative function during UNGA deliberations. The ISC's network also could play a key role by providing the UNGA access to a wider range of scientific perspectives.

6. **Leverage the role of PGA to strengthen Science Advice.** As a key figure in UNGA proceedings, the PGA has scope to play a proactive role in optimising the integration of science into UNGA deliberations (Section 4.1). Formally, the PGA should announce key scientific questions aligned with their agenda in advance to encourage scientific engagement and establish guidelines of engagement to ensure the integrity and transparency of the evidence presented (Section 7.1). The PGA can also strengthen informal channels between evidence suppliers and policymakers by, for example, including scientific experts in discussions with ambassadors or by aligning scientific briefings with the UNGA agenda (Section 7.1).

Recommendations for the ISC

7. **Advise the establishment of an alternative UNGA SAM.** Based on its broad membership, independence, and track record (Section 7.3), ISC is well-positioned as a strategic advisor to support the UNGA's effort in establishing a dedicated SAM. Building on the findings of this report, the ISC could conduct a comprehensive assessment of existing mechanisms and compare them with other international organisations to explore successful models of science advice. The ISC could also help develop a conceptual framework for the SAM's structure, functions, and governance, including the roles and responsibilities of the different actors involved. Additionally, ISC could draft guidelines on how to engage with evidence, potentially aiding the PGA as needed (Recommendation 2). The drafting of such guidelines, requested by demand-side interviewees (Section 7.1),

could trigger the start of greater integration of evidence demand and supply, potentially involving the GoF and UN bodies.

8. **Strengthen ISC visibility and engagement**. The ISC should invest in strategic communication and outreach activities to increase its visibility among Member States, UN agencies, and the scientific community (Section 7.4). ISC should elaborate a communication strategy with clear messaging, utilising various channels to raise awareness of its role, capabilities, and impact. A targeted outreach plan should meaningfully engage with Member States across different regions and increase interactions with the UN Secretariat and the OPGA. Such activities require a strong ISC presence at UN Headquarters. Additionally, ISC can contribute to capacity development of the supply side, for example through workshops, to enhance scientists' skills in policy engagement specific to the UN system (Section 6.5).

9. **Enhance the ISC's responsiveness and relevance to the UNGA.** The ISC should tailor its offerings to respond to the UNGA's need for timely and relevant scientific evidence. Developing a Rapid Science Response Platform/Channel would allow Member States and staff to submit urgent science-related questions, which ISC's diverse network of experts could be mobilised for to provide rapid responses across various disciplines. Additionally, the ISC should form partnerships with countries with limited research capacities to provide evidence (Section 6.3). Leveraging its global network, the ISC can strategically support these MS through systematic regional and topical collaborations.

10. **Coordinate with other science advice networks and innovation, technology, and business actors.** Innovation, technology, and private business are deeply connected to science and SA (Section 7.2.1). The ISC might explore partnerships with actors from those fields to complement planned collaborations with other influential international bodies outlined in the ISC's current action plan (International Science Council, 2021). Moreover, the ISC could coordinate efforts with other SA networks by area of specialty to clarify supply-side responsibilities and maximise the impact of science advice at the UNGA (Section 7.3). Given its vast network and history of achievement, the ISC well-positioned to play a key role in the high-level coordination of knowledge brokerage at the UNGA.

10 Conclusion

The need for greater incorporation of SA into the processes of the UNGA has gained increasing recognition, but challenges remain. Key issues include the absence of a standardised mechanism for integrating scientific evidence into UNGA deliberations, fragmentation across existing channels, capacity constraints, and inequities among Member States. To address these issues, the report findings highlight the necessity of establishing institutionalised, formalised, and centralised SAM at the UNGA. Such a mechanism would ensure equal access to scientific expertise and create a more equitable policymaking environment, improve the integration of robust evidence.

There is growing support for stronger science advisory systems within and without the UN. At UN Headquarters, there is increasing momentum for integrating science and evidence into UNGA deliberations. Simultaneously, academic institutions are increasingly emphasising research impact rather than volume as a metric of success, encouraging academics to engage more with policy. Capitalising on these concurrent momentums presents a unique opportunity to establish a UNGA SAM, which would not only enhance the quality and impact of policy decisions made by the UNGA but also reinforce the role of science in addressing global challenges. The findings also suggest that the ISC—with its global network, independence, and convening power—is well-positioned to play a pivotal role in this transformation.

11 References

Aeschlimann, J. (2021) *The ECOSOC handbook a practical guide to the United Nations Economic and Social Council*. Bern: Federal Department of Foreign Affairs of Switzerland (FDFA).

Akhtar-Schuster, M. *et al.* (2016) 'Designing a new science-policy communication mechanism for the UN Convention to Combat Desertification', *Environmental Science and Policy*, 63, pp. 122–131. Available at: https://doi.org/10.1016/j.envsci.2016.03.009.

Angeli, F., Camporesi, S. and Dal Fabbro, G. (2021) 'The COVID-19 wicked problem in public health ethics: conflicting evidence, or incommensurable values?', *Humanities and Social Sciences Communications*, 8(1). Available at: https://doi.org/10.1057/s41599-021-00839-1.

Aricò, S. (2024) *Completing the puzzle: Bridging the gaps by building a resilient future through science missions for sustainability*, *Frontiers Policy Labs*. Available at: https://policylabs.frontiersin.org/content/commentary-completing-the-puzzle-bridging-the-gaps-by-building-a-resilient-future-through-science-missions-for-sustainability (Accessed: 12 October 2024).

Aula, V. (2023) 'Evidence-based policymaking in the legislatures: timeliness and politics of evidence in Finland', *Policy and Politics*, 51(4), pp. 673–694. Available at: https://doi.org/10.1332/030557321X16873376680333.

Avery, S., Ivanova, M. and Turner, R.L. (2016) *The Future of scientific advice to the United Nations*. UNESCO. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000245801 (Accessed: 17 July 2024).

Benzaghta, M.A. *et al.* (2021) 'SWOT analysis applications: An integrative literature review', *Journal of Global Business Insights*, 6(1), pp. 55–73. Available at: https://doi.org/10.5038/2640-6489.6.1.1148.

Betsill, M.M. and Corell, E. (eds) (2007) *NGO Diplomacy: The Influence of Nongovernmental Organizations in International Environmental Negotiations*. The MIT Press. Available at: https://doi.org/10.7551/mitpress/7512.001.0001.

Bhatia, D., Allin, S. and Di Ruggiero, E. (2023) 'Mobilization of science advice by the Canadian federal government to support the COVID-19 pandemic response', *Humanities and Social Sciences Communications*, 10(1). Available at: https://doi.org/10.1057/s41599-023-01501-8.

Boswell, C. (2009) *The political uses of expert knowledge: Immigration policy and social research*. Cambridge University Press.

Capano, G. and Malandrino, A. (2022) 'Mapping the use of knowledge in policymaking: barriers and facilitators from a subjectivist perspective (1990–2020)', *Policy Sciences*, 55(3), pp. 399–428. Available at: https://doi.org/10.1007/s11077-022-09468-0.

Carter, A. (2018) *Mechanism for International Science Advice for Disaster Risk Management: Discussion of a proposal to support the post 2015 agenda - Meeting report*. United Kingdom: UK Collaborative on Development Research. Available at: https://www.ukcdr.org.uk/wp-content/uploads/2018/03/Summary-Statement.pdf (Accessed: 4 June 2024).

Cash, D. *et al.* (2003) 'Salience, Credibility, Legitimacy and Boundaries: Linking Research, Assessment and Decision Making', *SSRN Electronic Journal* [Preprint]. Available at: https://doi.org/10.2139/ssrn.372280.

Cash, D.W. *et al.* (2003) 'Knowledge systems for sustainable development', *Proceedings of the national academy of sciences*, 100(14), pp. 8086–8091.

Croese, S., Dominique, M. and Raimundo, I.M. (2021) 'Co-producing urban knowledge in Angola and Mozambique: towards meeting SDG 11', *npj Urban Sustainability*, 1(1). Available at: https://doi.org/10.1038/s42949-020-00006-6.

De Donà, M. (2023) 'Is it only about science and policy? The "intergovernmental epistemologies" of global environmental governance', *Journal of International Relations and Development*, 26(1), pp. 86–110. Available at: https://doi.org/10.1057/s41268-022-00276-w.

De Donà, M. and Linke, S. (2023) '"Close but not too close"–experiences of science-policy bridging in three international advisory organizations', *Critical Policy Studies*, 17(1), pp. 82–100. Available at: https://doi.org/10.1080/19460171.2022.2028173.

Directorate-General for Research and Innovation, European Commission, and Directorate-General for Translation (2017) *Science and policy making : towards a new dialogue : the 2nd International Network for Government Science Advice Conference, 29 & 30 September 2016, Brussels*. 9789279630200. European Union. Available at: https://doi.org/10.2782/977668.

Directorate-General for Research and Innovation, European Commission, and Group of Chief Scientific Advisors (2019) *Scientific advice to European policy in a complex world*. 9789276125570. European Union. Available at: https://doi.org/10.2777/80320.

Dumitriu, P. (2018) *Strengthening policy research uptake in the context of the 2030 Agenda for Sustainable Development*. JIU/REP/2018/7. Geneva. Available at: https://www.unjiu.org/sites/www.unjiu.org/files/jiu_rep_2018_7_english_0.pdf (Accessed: 27 July 2024).

Dunn, G., Bos, J.J. and Brown, R.R. (2018) 'Mediating the science-policy interface: Insights from the urban water sector in Melbourne, Australia', *Environmental Science and Policy*, 82, pp. 143–150. Available at: https://doi.org/10.1016/j.envsci.2018.02.001.

Espey, J. (2023) *Science in Negotiation: The Role of Scientific Evidence in Shaping the United Nations Sustainable Development Goals, 2012-2015*. Cham: Springer International Publishing (Sustainable Development Goals Series). Available at: https://doi.org/10.1007/978-3-031-18126-9.

Espey, J. and Casarin, G. (2024) 'Strengthening Science Advisory Processes within the UN General Assembly'.

European Public Health Alliance (2017) *Recommendations on a new model for the provision of scientific advice*. Netherlands: Health Action International. Available at: https://epha.org/recommendations-on-a-new-model-for-the-provision-of-scientific-advice/ (Accessed: 8 June 2024).

Fraisl, D. *et al.* (2023) 'The contributions of citizen science to SDG monitoring and reporting on marine plastics', *Sustainability Science*, 18(6), pp. 2629–2647. Available at: https://doi.org/10.1007/s11625-023-01402-4.

Gleckman, H. (2018) *Multistakeholder governance and democracy: a global challenge*. New York, NY: Routledge.

Gluckman, P. (2015) *Principles of Science Advice – From the National to the International Dimension*. International Network for Government Science Advice. Available at: https://ingsa.org/wp-content/uploads/2023/01/Address-to-INGSA-Workshop-at-World-Science-Forum-Budapest.pdf (Accessed: 4 June 2024).

Gluckman, P. *et al.* (2022) *Principles and Structures of science advice: An outline - ISC and INGSA Occasional Paper*. France: International Science Council. Available at: https://policycommons.net/artifacts/2281383/principles-and-structures-of-science-advice/.

Gluckman, P., Bardsley, A. and Kaiser, M. (2021) 'Brokerage at the science–policy interface: from conceptual framework to practical guidance', *Humanities and Social Sciences Communications*, 8(1), p. 84. Available at: https://doi.org/10.1057/s41599-021-00756-3.

Gluckman, P. and Wilsdon, J. (2016) 'From paradox to principles: Where next for scientific advice to governments?', *Palgrave Communications*, 2. Available at: https://doi.org/10.1057/palcomms.2016.77.

Goldman, A.I. (2001) 'Experts: Which Ones Should You Trust?', *Philosophy and Phenomenological Research*, 63(1), pp. 85–110. Available at: https://doi.org/10.1111/j.1933-1592.2001.tb00093.x.

Grainger, A. (2009) 'The role of science in implementing international environmental agreements: The case of desertification', *Land Degradation and Development*, 20(4), pp. 410–430. Available at: https://doi.org/10.1002/ldr.898.

Grundmann, R. (2017) 'The Problem of Expertise in Knowledge Societies', *Minerva*, 55(1), pp. 25–48. Available at: https://doi.org/10.1007/s11024-016-9308-7.

Gundersen, T. (2024) 'Trustworthy Science Advice: The Case of Policy Recommendations', *Res Publica*, 30(1), pp. 125–143. Available at: https://doi.org/10.1007/s11158-023-09625-z.

Gundersen, T. and Holst, C. (2022) 'Science Advice in an Environment of Trust: Trusted, but Not Trustworthy?', *Social Epistemology*, 36(5), pp. 629–640. Available at: https://doi.org/10.1080/02691728.2022.2101564.

Head, B.W. (2013) 'Evidence-based policymaking–speaking truth to power?', *Australian Journal of Public Administration*, 72(4), pp. 397–403.

Heink, U. *et al.* (2015) 'Conceptualizing credibility, relevance and legitimacy for evaluating the effectiveness of science–policy interfaces: Challenges and opportunities', *Science and Public Policy*, 42(5), pp. 676–689. Available at: https://doi.org/10.1093/scipol/scu082.

Huang, A. *et al.* (2024) 'Development assistance, donor–recipient dynamic, and domestic policy: a case study of two health interventions supported by World Bank–UK and Global Fund in China', *Global Health Research and Policy*, 9(1), p. 7. Available at: https://doi.org/10.1186/s41256-024-00344-3.

International Science Council (2021) 'Science and Society in Transition, ISC Action Plan: 2022 - 2024'. Available at: https://council.science/wp-content/uploads/2020/06/202110_ISC-Action-Plan_ONLINE.pdf (Accessed: 13 July 2024).

International Science Council (2023) 'Creation of a Group of Friends on Science for Action at the UN', *International Science Council*, 15 April. Available at: https://council.science/current/press/launch-group-of-friends/ (Accessed: 5 May 2024).

International Science Council (2024a) *About us*, *International Science Council*. Available at: https://council.science/about-us/ (Accessed: 5 May 2024).

International Science Council (2024b) *Our work at the UN and global policy processes*, *International Science Council*. Available at: https://council.science/our-work/un-global-policy/ (Accessed: 5 May 2024).

International Science Council (2024c) 'Scientific and Technological Community Major Group', *International Science Council*. Available at: https://council.science/science-technology-major-group/ (Accessed: 5 May 2024).

International Science Council (2024d) *Scientific Committee on Antarctic Research (SCAR)*, *International Science Council*. Available at: https://council.science/member/scientific-committee-on-antarctic-research-scar/ (Accessed: 5 August 2024).

IPCC (2024) 'Procedures — IPCC'. Available at: https://www.ipcc.ch/documentation/procedures/ (Accessed: 14 August 2024).

Juhola, S. *et al.* (2024) 'Knowledge brokering at the environmental science-policy interface — examining structure and activity', *Environmental Science and Policy*, 153. Available at: https://doi.org/10.1016/j.envsci.2024.103672.

Kenny, C. *et al.* (2017) 'Legislative science advice in Europe: the case for international comparative research', *Palgrave Communications*, 3(1). Available at: https://doi.org/10.1057/palcomms.2017.30.

Kettle, N.P., Trainor, S.F. and Loring, P.A. (2017) 'Conceptualizing the science-practice interface: Lessons from a collaborative network on the front-line of climate change', *Frontiers in Environmental Science*, 5, p. 33.

Koetz, T. *et al.* (2008) 'The role of the Subsidiary Body on Scientific, Technical and Technological Advice to the Convention on Biological Diversity as science-policy interface', *Environmental Science and Policy*, 11(6), pp. 505–516. Available at: https://doi.org/10.1016/j.envsci.2008.05.001.

Koetz, T., Farrell, K.N. and Bridgewater, P. (2012) 'Building better science-policy interfaces for international environmental governance: Assessing potential within the Intergovernmental Platform for Biodiversity and Ecosystem Services', *International Environmental Agreements: Politics, Law and Economics*, 12(1), pp. 1–21. Available at: https://doi.org/10.1007/s10784-011-9152-z.

Kohler, P. (2022) *Science-Policy Interfaces: From Warnings to Solutions*, *International Institute for Sustainable Development*. Available at: https://www.iisd.org/articles/science-policy-interfaces (Accessed: 5 May 2024).

Kohler, P.M. (2019) *Science Advice and Global Environmental Governance: Expert Institutions and the Implementation of International Environmental Treaties*. Anthem Press.

Lemos, M.C. and Morehouse, B.J. (2005) 'The co-production of science and policy in integrated climate assessments', *Global Environmental Change*, 15(1), pp. 57–68. Available at: https://doi.org/10.1016/j.gloenvcha.2004.09.004.

Lomas, J. (2007) 'The in-between world of knowledge brokering', *BMJ*, 334(7585), pp. 129–132. Available at: https://doi.org/10.1136/bmj.39038.593380.AE.

MacDonald, B.H. *et al.* (2015) 'How information in grey literature informs policy and decision-making: The need to understand the processes', pp. 31–40.

Marton-Lefèvre, J. (2021) *Final report of the Steering Group advising the ISC on its strategy in the intergovernmental system*. Paris: International Science Council. Available at: https://council.science/wp-content/uploads/2020/06/ISC-and-the-intergovernmental-system_2021.pdf (Accessed: 3 May 2024).

Moher, D. *et al.* (2009) 'Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement', *BMJ*, 339(jul21 1), pp. b2535–b2535. Available at: https://doi.org/10.1136/bmj.b2535.

National Research Council (2002) *Science Advice in the United Nations System*. Washington, D.C.: National Academies Press. Available at: https://doi.org/10.17226/10577.

O'Dwyer, L. (2003) *A Systematic Review of the Evidence-Based Policy Literature - Review Protocol*. Australia: Australian Housing and Urban Research Institute. Available at: https://www.ahuri.edu.au/sites/default/files/migration/documents/AHURI_Positioning_Paper_No45_A_systematic_literature_review_of_evidence_based_policy.pdf (Accessed: 4 June 2024).

OECD (2015) *Scientific Advice for Policy Making: The Role and Responsibility of Expert Bodies and Individual Scientists*. OECD Science, Technology and Industry Policy Papers 21. Available at: https://doi.org/10.1787/5js33l1jcpwb-en.

OECD (2018) *Scientific Advice During Crises: Facilitating Transnational Co-operation and Exchange of Information*. OECD. Available at: https://doi.org/10.1787/9789264304413-en.

Oldham, G. (2006) 'Science and technology advice within the United Nations: Some lessons from past experience', *Science and Public Policy*, 33(9), pp. 647–651. Available at: https://doi.org/10.3152/147154306781778597.

Oliver, K. and Cairney, P. (2019) 'The dos and don'ts of influencing policy: a systematic review of advice to academics', *Palgrave Communications*, 5(1), p. 21. Available at: https://doi.org/10.1057/s41599-019-0232-y.

Oliver, K. and Faul, M.V. (2018) 'Networks and network analysis in evidence, policy and practice', *Evidence & Policy*, 14(03), pp. 369–379. Available at: https://doi.org/10.1332/174426418X15314037224597.

Ostrom, E. (1990) *Governing the Commons: The Evolution of Institutions for Collective Action*. 1st edn. Cambridge University Press. Available at: https://doi.org/10.1017/CBO9780511807763.

Petersen, A. (2015) 'Charting science advice at local, national and international levels'. Available at: https://www.ucl.ac.uk/steapp/sites/steapp/files/steapp_document_on_charting_science_advice_24_april_2015.pdf (Accessed: 14 May 2024).

Pielke, R.A. (2007) *The honest broker: making sense of science in policy and politics*. Cambridge: Cambridge University Press.

Reillon, V. (2016) *Scientific advice for policy-makers in the European Union*. European Parliamentary Research Service. Available at: https://www.europarl.europa.eu/EPRS/EPRS-Briefing-559512-Scientific-advice-for-policy-makers-in-the-EU-FINAL.pdf (Accessed: 29 April 2024).

Rietig, K. (2014) '"Neutral" experts? How input of scientific expertise matters in international environmental negotiations', *Policy Sciences*, 47(2), pp. 141–160. Available at: https://doi.org/10.1007/s11077-013-9188-8.

Science Advice for Policy by European Academies (2018) *Shaping European Science Advice: Insights and Experiences*. BE: Science Advice for Policy by European Academies. Available at: https://doi.org/10.26356/Insights2 (Accessed: 7 August 2024).

Science Advice for Policy by European Academies (2019) *Making sense of science for policy under conditions of complexity and uncertainty*. DE: Science Advice for Policy by European Academies. Available at: https://doi.org/10.26356/masos (Accessed: 15 June 2024).

SDSN (2024) *About Us - Sustainable Development Solutions Network*. Available at: https://www.unsdsn.org (Accessed: 5 August 2024).

Skjott Linneberg, M. and Korsgaard, S. (2019) 'Coding qualitative data: a synthesis guiding the novice', *Qualitative Research Journal*, 19(3), pp. 259–270. Available at: https://doi.org/10.1108/QRJ-12-2018-0012.

Soomai, S.S., MacDonald, B.H. and Wells, P.G. (2013) 'Communicating environmental information to the stakeholders in coastal and marine policy-making: Case studies from Nova Scotia and the Gulf of Maine/Bay of Fundy region', *Marine Policy*, 40(1), pp. 176–186. Available at: https://doi.org/10.1016/j.marpol.2013.01.017.

Stewart, R. (2023) 'How evidence, implementation, policy, and politics come together within evidence systems: Lessons from South Africa', *Development Policy Review*, 41(2). Available at: https://doi.org/10.1111/dpr.12657.

Stone, D. (2019) *Making global policy*. (Making Global Policy), p. 93. Available at: https://doi.org/10.1017/9781108661690.

Sundqvist, G. and Linke, S. (2024) 'Making Science Relevant: Comparing Two Science Advisory Organizations Beyond the Linear Knowledge Model', *Minerva* [Preprint]. Available at: https://doi.org/10.1007/s11024-024-09528-0.

the interacademy partnership (2019) *Improving Scientific Input to Global Policymaking with a focus on the UN Sustainable Development Goals*. Available at: https://www.interacademies.org/sites/default/files/publication/final_-_online_sdgs_report_2019.pdf (Accessed: 30 November 2024).

The World Academy of Sciences (2016) *United Nations Secretary-General's Scientific Advisory Board*. Available at: https://twas.org/united-nations-secretary-generals-scientific-advisory-board (Accessed: 14 August 2024).

Tyler, C. (2020) 'Legislative Science Advice in Europe and the United Kingdom: Lessons for the United States', in. *Symposium on Technology Assessment*, Washington (DC): Lincoln Network. Available at: https://discovery.ucl.ac.uk/id/eprint/10097482/ (Accessed: 23 May 2024).

UN General Assembly (2022) *Rules of Procedure of the General Assembly*, *A/520/Rev.20**. Available at: https://documents.un.org/doc/undoc/gen/n22/592/76/pdf/n2259276.pdf?token=zzbgkvUwNAegGDwcWb&fe=true (Accessed: 23 July 2024).

UN Secretary-General (2023a) 'UN 2.0 Forward-thinking culture and cutting-edge skills for better United Nations system impact'. Available at: https://www.un.org/sites/un2.un.org/files/our-common-agenda-policy-brief-un-2.0-en.pdf (Accessed: 8 August 2024).

UN Secretary-General (2023b) *UN Secretary-General Creates Scientific Advisory Board for Independent Advice on Breakthroughs in Science and Technology | Meetings Coverage and Press Releases*. Available at: https://press.un.org/en/2023/sga2223.doc.htm (Accessed: 14 August 2024).

UNFCCC (2024) *Bureau of the COP, CMP, and CMA | UNFCCC*. Available at: https://unfccc.int/process/bodies/supreme-bodies/bureau-of-the-cop-cmp-and-cma (Accessed: 14 October 2024).

United Nations (2021) 'The United Nations System'. United Nations Department of Global Communications. Available at: https://www.un.org/en/pdfs/un_system_chart.pdf (Accessed: 6 June 2024).

United Nations (2023) *SDG Summit 2023 - Informal Stakeholder Dialogue – Inputs to the Political Declaration Zero Draft | Department of Economic and Social Affairs*, *United Nations*. Available at: https://sdgs.un.org/events/sdg-summit-2023-informal-stakeholder-dialogue-inputs-political-declaration-zero-draft-52657 (Accessed: 12 October 2024).

United Nations (2024a) *ECOSOC at a Glance*, *Economic and Social Council*. Available at: https://ecosoc.un.org/en/about-us (Accessed: 11 June 2024).

United Nations (2024b) *General Assembly of the United Nations*. United Nations. Available at: https://www.un.org/en/ga/ (Accessed: 11 June 2024).

United Nations (2024c) *Global Sustainable Development Report (GSDR) | Department of Economic and Social Affairs*. Available at: https://sdgs.un.org/gsdr (Accessed: 14 August 2024).

United Nations (2024d) *High-Level Political Forum on Sustainable Development*. Available at: https://hlpf.un.org/home (Accessed: 3 August 2024).

United Nations (2024e) *Major Groups and Other Stakeholders (MGoS)*, *High-Level Political Forum on Sustainable Development*. Available at: https://hlpf.un.org/mgos (Accessed: 3 August 2024).

United Nations (2024f) *Our Work*, *United Nations*. United Nations. Available at: https://www.un.org/en/our-work (Accessed: 14 August 2024).

United Nations (2024g) *Pact for the Future zero draft - SOF*, *United Nations*. United Nations. Available at: https://www.un.org/en/summit-of-the-future/pact-for-the-future-zero-draft (Accessed: 14 August 2024).

United Nations (2024h) 'Scientific Advisory Board'. Available at: https://www.un.org/scientific-advisory-board/sites/default/files/2024-03/SAB%20one-pager%20flyer%202024.pdf (Accessed: 3 August 2024).

United Nations (2024i) *Secretariat*, *United Nations*. United Nations. Available at: https://www.un.org/en/about-us/secretariat (Accessed: 3 August 2024).

United Nations (2024j) *UN Technology Facilitation Mechanism (TFM)*. Available at: https://sdgs.un.org/tfm (Accessed: 26 July 2024).

United Nations Group of Friends on Science for Action (2024) 'United Nations Group of Friends on Science for Action Terms of Reference'.

United Nations University (2024) *About UNU*, *United Nations University*. Available at: https://unu.edu/about (Accessed: 5 August 2024).

Van den Hove, S. (2007) 'A rationale for science–policy interfaces', *Futures*, 39(7), pp. 807–826.

Van Woensel, L. (2020a) 'Scientific Policy Advising: Exploring the Science-Policy Ecosystem', in *St Antony's Series*, pp. 1–16. Available at: https://doi.org/10.1007/978-3-030-32126-0_1.

Van Woensel, L. (2020b) 'Towards Responsible Scientific Advice: Painting the Complete Picture', in *St Antony's Series*, pp. 85–113. Available at: https://doi.org/10.1007/978-3-030-32126-0_5.

Van Woensel, L. (2021) *Evidence for policy-making: Foresight-based scientific advice*. European Parliamentary Research Service. Available at: https://policycommons.net/artifacts/1434509/evidence-for-policy-making/.

Weber, E.P. and Khademian, A.M. (2008) 'Wicked Problems, Knowledge Challenges, and Collaborative Capacity Builders in Network Settings', *Public Administration Review*, 68(2), pp. 334–349. Available at: https://doi.org/10.1111/j.1540-6210.2007.00866.x.

Wiegleb, V. and Bruns, A. (2023) 'Working the boundary: science–policy interactions and uneven knowledge politics in IPBES', *Sustainability Science*, 18(3), pp. 1069–1084. Available at: https://doi.org/10.1007/s11625-022-01238-4.

Wilson, C. (2014) 'Semi-Structured Interviews', in *Interview Techniques for UX Practitioners*. Elsevier, pp. 23–41. Available at: https://doi.org/10.1016/B978-0-12-410393-1.00002-8.

12 Appendix

Appendix A: Search Strategy

The literature review included academic and grey literature. Since academic literature may offer limited insights into the practical aspects of providing SA, grey literature produced by civil society organisations, policy organisations or advisory groups was expected to help corroborate academic findings. Zotero was used to manage the literature.

Academic Literature

The database search adhered to the Meta-Analysis Protocol (PRISMA) guidelines. Initially, three multidisciplinary databases (Scopus, PubMed, Web of Science) have been selected. Since the results from PubMed and Web of Science highly overlapped with the ones from Scopus, only Scopus was used.

The following concepts were included in the search terms: Science advice, mechanism, UNGA, SPI. Search terms have been determined by the Research Team with input from supervisors. An example of a search string for the Scopus database is provided below:

> TITLE-ABS-KEY ((‘knowledge brokerage’ OR ‘science policy interface’ OR ‘science policy intersection’ OR ‘science policy interplay’ OR ‘scien* taskforce’ OR scien* advis* OR ‘evidence-based policy’ OR ‘evidence-informed policy’ OR ‘knowledge transfer’ OR ‘techn* advice’ OR (scien* AND advice)) AND (mechanism* OR network* OR pathway* OR ecosystem*) AND (‘United Nations’ OR ‘General Assembly’))

Grey Literature

Grey literature including policy papers, organisational publications, and consultancy papers were identified through Policy Commons and UNGA, OECD and ISC official websites. An example of a search string covering the same concepts as above is provided below:

> TITLE-ABS-KEY ((‘Scien* advis*’ OR ‘vidence-based policy’ OR ‘evidence-informed policy’ OR ‘Scien* advice’) AND (mechanism* OR network* OR pathway* OR ecosystem*) AND (‘UNGA’ OR ‘United Nations’ OR ‘General Assembly’))

Study Selection

Inclusion Criteria:

- Published academic paper, peer reviewed, with clear methodology
- Documents explicitly addressing the role of science advice in informing policy decisions
- Documents produced by a credible source (i.e., government agencies, research institutes, universities, NGOs, and international organisations)
- Documents produced from 2000 onwards in English language
- A final selection of papers with as equal a global representation as possible while maintaining high robustness and relevance.

Exclusion Criteria:

- Documents without a policy context
- Unreliable sources like personal blogs, marketing materials, or advertisements
- Duplicates
- Abstract-only papers or unavailable full texts

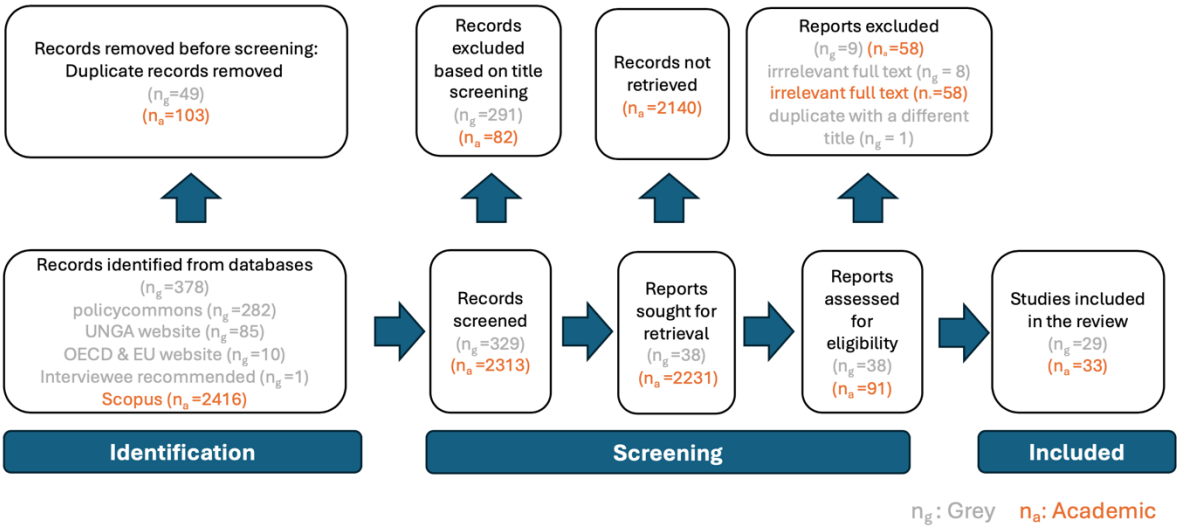

Figure 6: PRISMA Chart (Moher et al.*, 2009).*

Appendix B: Interview Questions

Mapping of Current State

1.1 Through which channels are evidence and knowledge communicated and disseminated to the UNGA (informal and formal)?
1.2 What kind of institutional advisory and incentive structures of the UNGA are relevant regarding the interaction of evidence and policy?
1.3 What are the needs of the demand-side and the supply-side of evidence?
1.4 How would you describe the role of knowledge brokers in facilitating the exchange of evidence?

Issues

2.1 What are strengths/weaknesses of the demand and supply-sides?
2.2 What are the main issues that you see regarding evidence production, provision, and uptake?
2.3 Is there an imbalance between the Global North/South and between different types of knowledge?

Alternatives

3.1 What future pathways do you see for science advice at UNGA level?
3.2 What are essential components of a successful SAM?
3.3 Do you see knowledge broker organisations, like the ISC, having a more prominent role in facilitating the exchange and usage of evidence in UNGA policymaking?
3.4 How do you perceive the role of the Group of Friends for Science in Action?