INTRODUCTION (EXECUTIVE SUMMARY) TO THE REFERENCE PAPER ON MODELS TO INFORM THE DEVELOPMENT OF TERMS OF REFERENCE OF THE INDEPENDENT PANEL ON EVIDENCE FOR ACTION AGAINST AMR

February 2020

The expectation is from the Advisory Group to review the Executive summary and the Reference Paper (**Annex 1**) and provide their feedback and comments on each of the models presented and its suitability for the Independent Panel on Evidence for Action Against AMR. The focus should be on identifying the most suitable operating model, the needed expertise, categories of science and types of evidence based on this analysis. The information related to these focus areas was summarized in **Table 2** to facilitate the appraisal and discussion by the Advisory Group.

BACKGROUND

The Interagency Coordination Group on Antimicrobial Resistance (IACG) requested the United Nations Secretary-General (UNSG), in close collaboration with the Tripartite organizations (FAO, OIE and WHO), UN Environment and other international organizations, to convene an Independent Panel on Evidence for Action against Antimicrobial Resistance in a One Health context. The purpose of the Panel is to provide independent, robust and authoritative assessments of the science, data and evidence related to antimicrobial resistance across the One Health spectrum including in animal, human and plant health, food and feed production and the environment in the form of periodic reports. The reports will include rigorous evaluation of the new findings, gaps, impacts and future risks based on available data and recommend options for generation of new evidence.

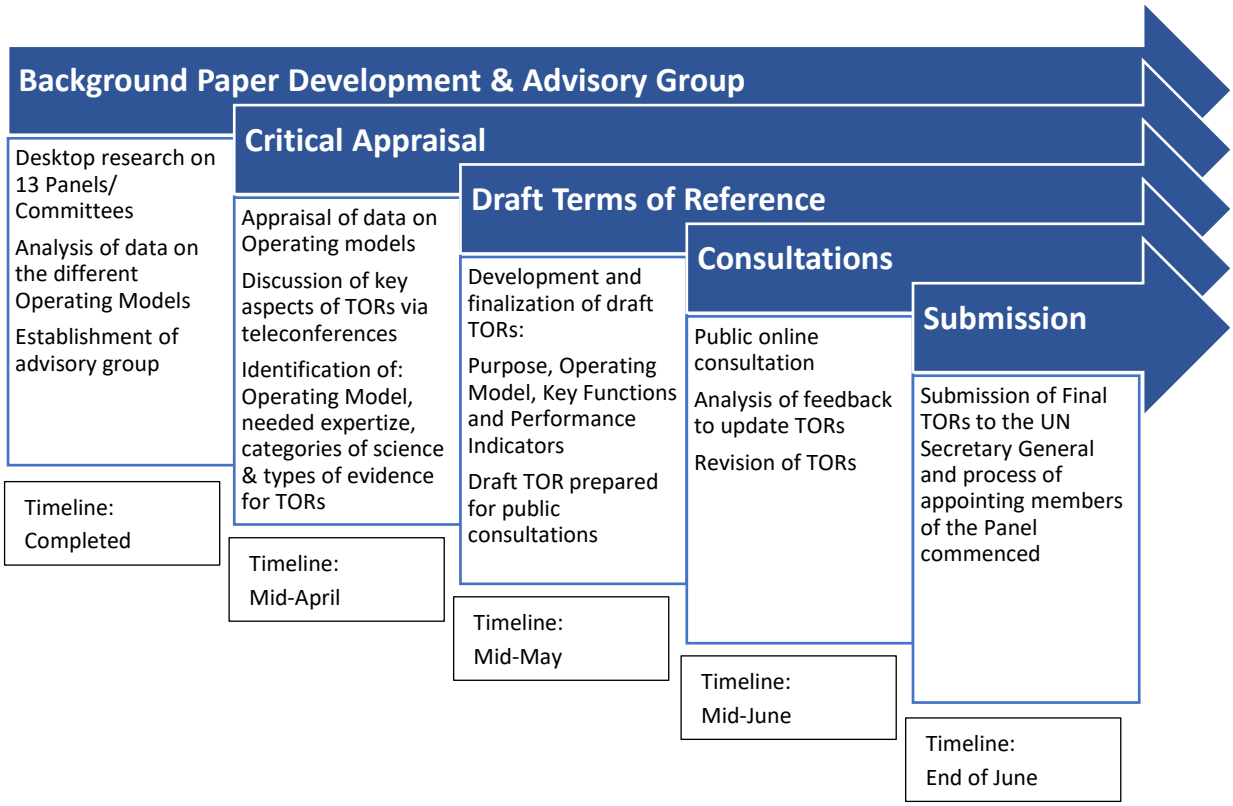
The UNSG requested the Tripartite in close consultation with his office to propose the terms of reference and mechanisms of establishment of the Independent Panel on Evidence for his consideration. The Tripartite in consultation with the SG Office is following a process which includes convening an Advisory Group to guide and support the development of the terms of reference for the Panel. The Advisory Group will assist in developing the terms of reference of the Panel in line with the IACG recommendations and the UNSG report on the implementation of the 2016 Political Declaration.

The Advisory Group has the following specific functions:

- Critically appraise operating models of similar Panels/Committees presented in the background paper as well as other relevant models and structures it can identify.
- Suggest the most suitable operating model, needed expertise, data, scientific information and assessment of evidence on Antimicrobial Resistance that are required to achieve the purpose of the Panel.
- Supported by the Tripartite Joint Secretariat, draft the terms of reference for the Panel to provide clarity on the purpose, operating model, key functions and key performance indicators.

Membership to the Advisory Group to develop the TORs does not preclude consideration for membership to the Evidence Panel.

The workflow and expected timeline are as follows:



INTRODUCTION

An expert panel (also known as a scientific/advisory committee) is usually established to provide technical expertise and evidence-based information to prepare a policy, develop recommendations or reach a decision. A large number of sectors depend on expert panels to inform the decisions of their policymakers and practitioners (1, 2). As the demand for evidence-based decisions has increased so has the demand for such panels. The WHO alone reported 43 expert advisory panels with 554 members in 2017 covering a wide range of health topics including communicable disease, non-communicable disease, health promotion and drugs (2). Although a number of studies have investigated design features that influence the operations of panels (3-5), there is limited evidence on what design factors make these panels effective (6). An important feature of a panel is a clear operating model at the outset. Clearly defining model inputs and model outputs including how they are developed, reviewed and disseminated is essential to ensure objectives are obtained. This background paper was developed to present the advisory group with a number of models to appraise and discuss.

The main objectives are to:

1- Assist the process of identifying the most suitable operating model for the Panel;

2- Identify the needed expertise, categories of science and types of evidence that are required;

3- Inform the terms of reference for the Panel.

MODEL SELECTION & DATA EXTRACTION

The models were purposefully selected to represent a wide variety of sectors related to the One Health spectrum which includes human, animal and plant health, food and feed production and the environment.

The models were selected based on the following criteria:

1- Provide support in a sector directly linked to the One Health spectrum; and
2- Have a clear mandate, governance structure and output(s) that is published or available in the public domain; and
3- Develop output(s) that include some type of assessment/synthesis of data and report

Based on the criteria above, 13 models were identified:

1- The African Institute for Development and Policy (AFIDEP)
2- Cochrane
3- European Academies' Science Advisory Council (EASAC)
4- The Global Environment Outlook (GEO)
5- High Level Panel of Experts of Food Security and Nutrition (HLPE)
6- The International Assessment of Agriculture Knowledge, Science and Technology Development (IAASTD)
7- InterAcademy Partnerships (IAP)
8- Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)
9- The Intergovernmental Panel on Climate Change (IPCC)
10- Joint FAO/WHO Expert Committee on Food Additives (JECFA)
11- National Center for Ecological Analysis and Synthesis (NCEAS)
12- The National Socio-Environmental Synthesis Center (SESYNC)
13- The Tripartite Advisory Group on Intersectoral Support on Antimicrobial Resistance (T-AGISAR)

Two models AFIDEP and T-AGISAR were excluded. The following were the reasons for their exclusion: AFIDEP is an institute and think tank that focuses on the African Region and there was limited information available in the public domain. T-AGISAR has not yet been established by the Tripartite Organizations.

Data Extraction

Information was extracted from the public domain (i.e. websites) using a standard extraction template. The template was based on six predefined areas which would help define the scope of the Terms of Reference for the Independent Panel on Evidence for AMR. These areas include:

1- Organizational overview: Includes a description of the model's mandate, goals, objectives and approach.

2- Governance structure (**Figure 1**): Describes the composition and responsibilities of the different levels including plenary, executive, oversight/project management, output production and secretariat levels.

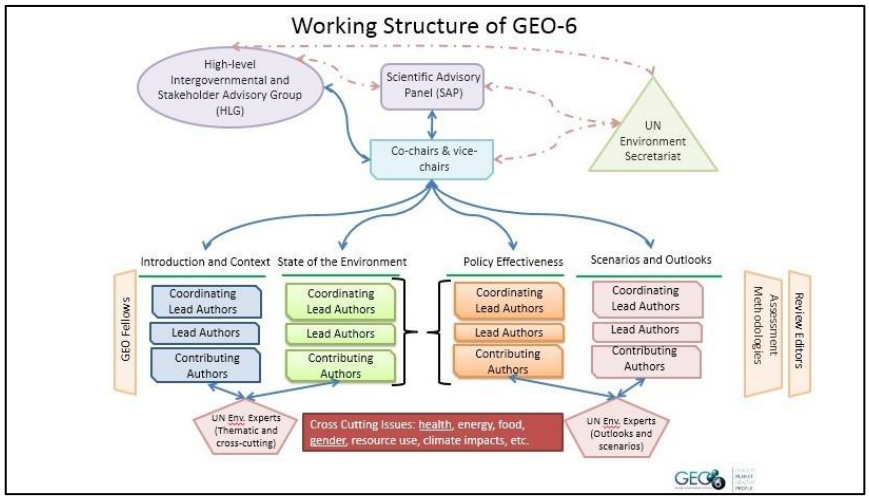


Figure 1: The working structure of the 6th Global Environmental Outlook (GEO-6)

3- Funding mechanism: Reports the different approaches taken to funding as well as additional sources of support for their work through in-kind contributions.

4- Prioritization: Outlines the approaches to selection of topics and priority areas and who is involved in the process.

5- Outputs: Describes the types of model outputs and how they are developed, peer reviewed, disseminated and evaluated (**Figure 2**).

6- Principles: Defines the principles that guide the evidence assessment and reporting which include:

   a. Non-duplication and complementarity
   b. Independence and political neutrality
   c. Transparency, peer review and open access
   d. Inter and intradisciplinary approach

Information was extracted for each model as presented in the public domain and displayed as is in this background paper. It is important to note that for a model if a certain model feature is not presented in the background paper, it means that it was not available in the public domain, but it might actually exist.

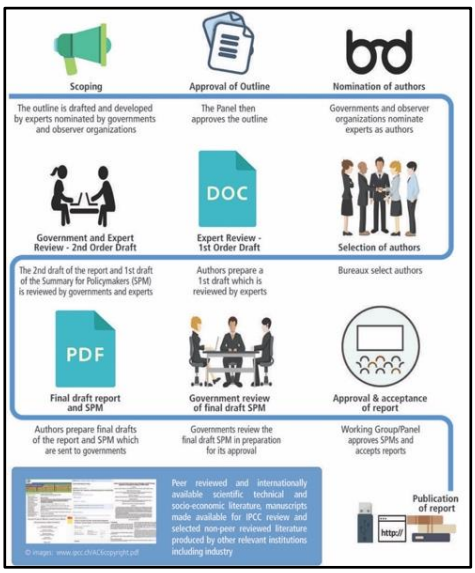


Figure 2: The output development chart of the Intergovernmental Panel on Climate change (IPCC)

THE MODELS

The final list of 11 models is not meant to be comprehensive but meant to give useful examples of a variety of operational models that can be examined and appraised by the Advisory Group with the aim of informing the development of terms of reference for the Panel. A brief general description of each model is listed below in **Table 1**.

Table 1: General description of the 11 models

Model	General Description
Cochrane	A global independent network of researchers, professionals, patients, carers and people interested in health. The network synthesizes the best evidence to inform health decision making (7). https://www.cochrane.org
European Academies' Science Advisory Council (EASAC)	EASAC brings together the National Academies of Science of the EU member States, Norway and Switzerland to provide independent science-based evidence to policy makers on important challenges for Europe (8). https://www.easac.eu
The Global Environment Outlook (GEO)	The GEO is a consultative and participatory process to develop environmental assessments to inform the development of evidence-based policy and decision making (9). http://www.unenvironment.org/global-environment-outlook
High Level Panel of Experts of Food Security and Nutrition (HLPE)	HLPE is the science-policy interface of the UN Committee on World Food Safety (CFS). It aims to facilitate policy debates and inform policy making by producing independent, comprehensive and evidence-based analysis and advice at the request of CFS. (10) http://www.fao.org/cfs/cfs-hlpe/reports/en/
The International Assessment of Agriculture Knowledge, Science and Technology Development (IAASTD)	IAASTD was a multidisciplinary/multi-stakeholder assessment which aimed to assess the current status, identify gaps, make the outputs of their work publicly available and further capacity of low and middle income countries to generate, access and use agricultural knowledge, science and technology that promote sustainable development.(11) https://projects.worldbank.org/en/projects-operations/project-detail/P090963?lang=en
Inter-Academy Partnership (IAP)	IAP is a global network of science, engineering and medical academies working together to produce evidence-based statements and reports examining major priorities for sustainable development and to provide independent expert advice to national governments and inter-governmental organizations (including the UN) on critical science based issues (12). http://www.interacademies.org
Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)	IPBES is an intergovernmental science policy platform on biodiversity and ecosystems services. IPBES conducts assessments on specific themes or methodological issues to provide policy-relevant knowledge to catalyze policies at all levels in government, private sector and civil society (14). https://ipbes.net
The Intergovernmental Panel on Climate Change (IPCC)	IPCC is the United Nations body for assessing the science related to climate change. It provides rigorous scientific information to decision makers and governments at all levels (13). https://www.ipcc.ch
Joint FAO/WHO Expert Committee on Food Additive (JECFA)	JECFA is an International scientific expert committee administered jointly by the FAO and WHO to evaluate the safety of food additives, contaminants, naturally occurring toxicants and residues of veterinary drugs in food (15). https://www.who.int/foodsafety/areas_work/chemical-risks/jecfa/en/

National Center for Ecological Analysis and Synthesis (NCEAS)	NCEAS is an independent research affiliate of the University of California, with a global network. NCEAS uses scientific synthesis to conduct transformational science focused on informing solutions that will allow people and nature to thrive (16). https://www.nceas.ucsb.edu
National Socio-environmental Synthesis Center (SESYNC)	SESYNC an institution funded by the University of Maryland (National Science Foundation. It brings together the science of the natural world with the science of human behavior and decision-making to find solutions to complex environmental problems (17). https://www.sesync.org

SUMMARY OF MODELS, EXPERTISE INVOLVED, CATEGORIES OF SCIENCE COVERED AND TYPES OF EVIDENCE PRODUCED

Table 2: Summary of the 11 models, expertise involved, categories of science covered, and types of evidence produced

	Operating Model	Expertise Involved	Categories of Science Covered	Types of Evidence Produced	Member State Governmental Involvement
Cochrane Collaboration	**-Global independent network of researchers** (11,000 members and over 68,000 supporters from 130 countries) -Scientific Committee consists of 6-8 members from the Cochrane community and 4-6 external members	Members of the scientific committee have expertise in guidelines, awarding and managing grants, software development and support many other high-level Committees and research organizations	-All aspects of human health care and health policy - In addition, cover 11 thematic Fields which focus on dimensions of health care other than a condition or topic - including the setting of care (primary care), the type of consumer (children, older people), or the type of provider (nursing); also have 17 Methods Groups which provide policy advice and space for discussion on methods	"Cochrane Reviews" including intervention reviews, diagnostic test accuracy reviews, methodology reviews, qualitative reviews and prognosis reviews and other synthesized research evidence	**No Member State engagement**
European Academies' Science Advisory Council (EASAC)	-Association of the **National Academies** of Science of the EU Member States, Norway and Switzerland -Council consists of 29 scientists nominated by each Academy and 2 other organizations -3 Steering Panels on: 1-energy; 2-environment; 3-biosciences	-Expertise depends on the scope of the project -Council consists of a wide range of scientists in the areas of medicine, statistics, biology, chemistry, physics, arts, geology, basic sciences, animal health, plant sciences, biosecurity and others	-Diverse topics related to energy, environment and biosciences -Current projects include: "Traditional Chinese Medicine", "Changes in Ocean Circulation: Implications for Europe" and "Decarbonation of Transport"	Authoritative reports, scientific articles, assessments, statements and commentaries on scientific topics to inform EU policy	**No Member State engagement** -However, experts from National Academies of the EU Member States, Norway and Switzerland form the Council that acts at the executive level setting direction, agreeing on the initiation of projects, nominating experts, monitoring their progress and reviewing/approving reports for publication among others (Some academies were established by national governments, but they were constituted as independent bodies)

Global Environmental Outlook (GEO)	-The **Scientific Advisory Panel** consists of: 3 **experts** from each UNEP region and up to 6 global experts, nominated by Member States and stakeholders -Guided by the High-Level Intergovernmental and Stakeholder Advisory Group (HLG) consists of 40 members: 5 members from each UN regional group and 5 stakeholder representatives	-Expertise in one or more areas relevant to the scope of the report including natural and social science, local and traditional knowledge, assessment and policy analysis - Experience in communicating, promoting and incorporating science into the policy development processes	-Environmental assessment -Recently published the UN Environment's 6th Global Environment Outlook (2019) including 6 regional assessments.	-Global & regional assessment reports, specialized reports (GEO for Youth, GEO for Business; GEO for local governments; GEO for policy makers) and thematic reports - Policy options are provided in the reports	**Member States are engaged** -Member States nominate panel experts for various roles. The Panel's mandate is to guide the assessment process and ensure the scientific credibility and overall quality and integrity[1] -5 Members from each of the UN regional groups of Member States are included in the HLG among others to provide guidance to the policy assessment process and leadership on the summary for policy makers
High Level Panel of Experts of Food Security and Nutrition (HLPE)	A Steering Committee of 12 world-renowned **experts** appointed by the Bureau of the UN Committee on World Food Security	Expertise in a variety of food security and nutrition related fields	-Food security and nutrition -Recently produced a report "Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition" (HLPE report 14)	Reports on a particular topic every 1-2 years	**Member States engaged** -Member States through the Committee on World Food Security (CFS)[2] define the HLPE mandate at the plenary level and present the report for discussion and policy debate -However, HLPE produces its reports, recommendations and advice independently from governmental positions
The International Assessment of Agriculture Knowledge, Science and Technology	-**Intergovernmental** process (58 Member States and 400 scientists) -A 4-year project initiated by the World Bank and	-Agronomists, economists, biologists, chemists, ecologists, meteorologists, anthropologists, botanists, medical scientists,	Ecological, economic, social and cultural aspects of agriculture, agriculture production, marketing processing, research…etc. as well as health, nutrition, gender, rural	Global report, regional reports, synthesis report and summaries for decision makers	**Member States engaged** -Member States of the co-sponsoring agencies make up the intergovernmental panel/plenary which is the decision-making body. Among its numerous tasks,

[1] Expert reviewers execute their task in their individual capacities.
[2] CSF is open to all Member States of FAO, the International Fund for Agricultural Development of The World Food Program and non-member States of FAO that are member states of the UN.

Development (IAASTD)	United Nations to evaluate global agriculture -Multi-stakeholder Bureau consists of 30 governments and 30 members of civil society, the private sector, scientific institutions and co-sponsoring organizations FAO, UNDP, WHO, UNEP, UNESCO, WB (ex-officio)	geographers, historians and philosophers -Expertise with appropriate local and institutional knowledge for each chapter of the report	development and the environment		the Panel nominates experts, reviews and gives comments on the report, signs the final draft report and reviews and approves the summaries for decision makers[3] -30 governments are included in the Multi-stakeholder Bureau which agrees on the basic question to be addressed, selects authors and reviewers, approves membership of scientific organizations, makes decision on financial matters and others
InterAcademy Partnership (IAP)	-Group of **National Academies** (more than 140 academies of science, medicine and engineering) -3 constituent networks: 1-IAP for Health; 2-IAP for Science; 3- IAP for Policy) -4 regional networks: Africa, Asia, Europe and Americas	Expertise depends on the scope of the project and the constituent network and regional network conducting the project	-Very broad and depends on the constituent network and regional network conducting the project -Covers 14 main topics which include: Agriculture and food security, biosecurity and biotechnology, environment and climate, health, careers in science, disaster risk reduction, energy, science advice, science education and literacy, Sustainable Development Goals, water, women in science, young scientist and others	Reports and statements to provide evidence-based advice to governments and intergovernmental organizations	**No Member State engagement** -However, membership is open to National Academies of Science who represent various regions of the world to connect with other academies, build capacity, participate in IAP and regional network projects and nominate academicians to IAP leadership positions (Many academies were established by national governments, but they were constituted as independent bodies)
Intergovernmental Science-Policy Platform on Biodiversity and	-**Intergovernmenta**l **platform** of UN member countries (Civil society and other organizations-observers) with a	-A range of scientific, technical and socio-economic expertise (e.g. natural and social sciences, scholars from the	-Biodiversity assessment and identification of policy relevant tools	Assessment reports, synthesis reports, summary for policy makers and technical summary	**-Member States engaged** -Member States make up the plenary level and nominate a national focal point. They are the

[3] If Panel experts contribute to the preparation and peer-review of outputs they were invited in their personal capacity.

Ecosystem Services (IPBES) "IPCC for biodiversity"	**Multidisciplinary Expert Panel** composed of five **experts** from each of the five UN regions and nominated by Member States	humanities, knowledge holders and experts in indigenous and local knowledge). -Experts from multiple disciplines based on the type of assessment. These disciplines currently include the thematic assessment of pollinators, pollination and food production and methodological assessment of scenario analysis and modelling; the thematic assessment on land degradation and restoration; global and reginal assessment of biodiversity	-Produced reports on specific themes (e.g. "Pollinators, Pollination and Food Production"); methodological issues (e.g. "Scenarios and Modelling); and at both the regional and global levels (e.g. "Global Assessment of Biodiversity and Ecosystem Services") -Recently developed the 7th Global Assessment on Biodiversity and Ecosystem Services (IPBES-7)		decision-making body and their mandate includes: Election of bureau and multidisciplinary panel; decide topics for assessments, consider the report on implementation of the work program, review the reports, consider outputs for acceptance and approval of the summary for policy makers, financial and budgetary arrangements
Intergovernmental Panel on Climate Change (IPCC)	-I**ntergovernmental** panel of 195 member countries of the World Meteorological Organization and United Nations (Civil society and other organizations-observers) -3 Working groups: 1-The physical science basis; 2-Impacts, adaptation and vulnerability; 3-Mitigation of climate change	-A range of scientific, technical and socio-economic expertise -Expertise depends on the scope and working group developing the report. Example: Report coming up on "Climate Change and Cities" required experts from: 1-Academia; 2- Urban practitioner; 3- Relevant scientific bodies and agencies	- Cover a wide range of disciplines in fulfilling its mandate of assessing scientific, technical and socio-economic evidence - Depends on the scope of the report. Main focus being climate change, its impact and mitigation -Recently produced a "Special Report on Climate Change and Land" and a "Special Report on the Ocean and Cryosphere in a Changing Climate"	- Summary for policy makers for governments - Working group reports, synthesis reports (written in non-technical style suitable for policy makers), special reports, methodological reports	**-Member States engaged** -Member States make up the Panel and identity focal points. The Panel decides the budget and work program, the scope and outline of reports, select experts, approve the reports, elect chair and others. The focal points prepare the list of experts and arrange for provision of integrated government comments on the draft reports
Joint FAO/WHO Expert Committee on Food Additives (JECFA)	**Independent experts** (10 to 15 internationally recognized experts in food security and nutrition relation fields)	Scientific expertise include: toxicology, pharmacology, metabolism, microbiology, pathology, epidemiology, molecular biology,	-Risk assessment practice: human health risk assessment, food consumption and exposure assessment, toxicology, epidemiology,	Report published in the WHO Technical Report Series; Monograph in the WHO Food Additive Series	**Member States engaged** Member States can directly request for evaluation of certain food additives and contaminants

		veterinary medicine, biostatistics and exposure assessment	veterinary medicine, chemistry, biology, biochemistry, life sciences. Cross-cutting scientific issues: statistical approaches in risk assessment, the preparation of guidance for risk assessment in the areas of food and feed.		or for veterinary drug residues in food through the Secretariat
National Center for Ecological Analysis and Synthesis (NCEAS)	**Independent research institute** (affiliate of the University of California) with a global network	Depends on the scope of the project. Mainly a wide range of ecologists and programmers/software engineers	-Environmental science, geography, ecology and epidemiology, marine biology, conservation and informatics -Researchers have produced publications on a diversity of topics including climate change, infectious disease, ecosystem services, marine ecology and conservation	A range of output including: publications, datasets, dissertations, presentations, reports and software	**No Member State engagement**
The national Socio-Environmental Synthesis Center (SESYNC)	**Independent research institute** (funded by University of Maryland)	Expertise depends on the scope of the project	-Environmental science, geography, ecology and epidemiology, marine biology, conservation, informatics, economics, business and sociology -Projects address broad national and international issues such as water resources management, land management, agriculture and species protection	Mainly research papers, datasets and presentations	**No Member State engagement**

REFERENCES

1. World Health Organization. Expert advisory panels and committees 2017. Available from: [https://www.who.int/about/collaborations/FactsheetEAP2017.pdf?ua=1].

2. Andresen S, Baral P, Hoffman SJ, Fafard P. What Can Be Learned from Experience with Scientific Advisory Committees in the Field of International Environmental Politics? Global Challenges. 2018;2(9):1800055.

3. Behdinan A, Gunn E, Baral P, Sritharan L, Fafard P, Hoffman SJ. An Overview of Systematic Reviews to Inform the Institutional Design of Scientific Advisory Committees. Global Challenges. 2018;2(9):1800019.

4. Fretheim A, Schünemann HJ, Oxman AD. Improving the use of research evidence in guideline development: 3. Group composition and consultation process. Health Res Policy Syst. 2006;4:15-.

5. Fretheim A, Schünemann HJ, Oxman AD. Improving the use of research evidence in guideline development: 5. Group processes. Health Res Policy Syst. 2006;4:17-.

6. Hoffman SJ, Ottersen T, Baral P, Fafard P. Designing Scientific Advisory Committees for a Complex World. Global Challenges. 2018;2(9):1800075.

7. Cochrane. Available from: [https://www.cochrane.org/].

8. European Academies Science Advisory Council. Science Advice for the Benefit of Europe. Available from: [https://www.easac.eu/].

9. United Nations Environment Programme. Global Environment Outlook. Available from: [https://www.unenvironment.org/global-environment-outlook].

10. Committee on World Food Security. HLPE - High Level Panel of Experts on Food Security and Nutrition. Available from: [http://www.fao.org/cfs/cfs-hlpe/en/].

11. The World Bank. International Assessment of Agricultural Science & Technology for Development (IAASTD). Available from: [https://projects.worldbank.org/en/projects-operations/project-detail/P090963?lang=en].

12. Interacademy Partnership. Science Health Policy. Available from: [http://www.interacademies.org/].

13. Intergovernmental Panel on Climate Change. Available from: [https://www.ipcc.ch/].

14. United Nations Environment Programme. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). Available from: [https://ipbes.net/].

15. World Health Organization. Joint FAO/WHO Expert Committee on Food Additives (JECFA). Available from: [https://www.who.int/foodsafety/areas_work/chemical-risks/jecfa/en/].

16. National Center for Ecological Analysis and Synthesis. Available from: [https://www.nceas.ucsb.edu/].

17. National Socio-Environmental Synthesis Center. Available from: [https://www.sesync.org/].