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The Science-Policy Forum: a call for action to strengthen the science-policy interface

Note by the secretariat

Summary

The inaugural Science-Policy Forum, held in Nairobi on 19 and 20 May in the framework of the second session of the United Nations Environment Assembly, brought together more than 250 representatives from the science and policy-making communities in over 100 countries. The two days saw discussion of current and emerging issues concerning human interaction with the environment, with sessions covering the Sustainable Development Goals, the Sixth Global Environment Outlook (GEO-6) assessments and a range of other issues, all from the perspective of strengthening the science-policy interface and the governance underpinning it in the context of the Assembly as the global authority on the environment, and delivering the environmental dimension of the 2030 Agenda for Sustainable Development. The Forum was deemed a valuable addition to the Assembly's programme, and it was recommended that the event be repeated as an integral part of future sessions.

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A. Summary of key observations from the Forum

(a) The challenges facing the world today are now increasingly complex, but simple solutions with immediate potential to address direct problems should be sought and encouraged; these should always be developed and implemented in terms of addressing gender equality and poverty reduction.

(b) Scientists and policy-makers should expand on our understanding of underlying patterns of failure, for example as they relate to inequalities between rich and poor, critical survival of ecosystems and issues such as famine and conflicts, and address the root causes as a priority, using wherever appropriate a nexus approach, in order to help develop transformational pathways to a more sustainable future;

(c) The science-policy interface should explicitly refer to traditional and indigenous knowledge, and citizen science, encourage inter-disciplinarity in the natural and social and environmental sciences and look for coherence across policy areas;

(d) The science-policy interface needs to develop a range of boundary organisations to support cross-linking and communications between the scientific research and the policy communities;

(e) It was recognized that the world is in an age of post normal science where uncertainty is high and there is a lot at stake, that science-policy dialogues will need to be instrumental in providing the latest evidence whilst highlighting the limitations of current understanding and accepting that decisions will be made in light of different levels of uncertainty;

(f) The science policy interface needs to be mindful of human context and values and alternative views of nature when developing a coherent logic for policy-making;

(g) The rapid growth of digitisation offers significant opportunities to support the science policy interface, but at the same time it is fundamentally changing democracy through the loss of power in nation states which should not be underestimated;

(h) Policy relevance and legitimacy need to be embedded into the science-policy interface, with a geographical and expert balance and an inclusive co-design process;

(i) The time lapse between knowledge and action will need to be shortened by joining forces across national boundaries, promoting a closer interaction between disciplines and across different contexts so as to address value systems of actors involved;

(j) No voice providing scientific evidence should be left behind in the science policy interface;

(k) Effective global action requires effective national scientific institutions; the science policy interface will need to help build this capacity;

(l) Capacity building and education, especially for women, and fostering science literacy are critical to underpin the science policy process.

B. Thematic Breakout Sessions

The themes selected for the thematic breakout session were couple with some of the draft resolutions before UNEA for consideration. Key observations and recommended actions from the six breakout sessions are listed below.

1. Sustainable Consumption and Production; Resource Efficiency

(a) A **four Ps principle** should be upheld: People centred to stress human dimension; Policy relevant and sensitive; Private sector engaged; and Practical (close to home).

(b) Science-policy interface should be **participatory and inclusive**: involving major players; conducive to exchange different views and perspectives and build common understanding and concerted action; and nurturing new partnership and collaboration.

(c) Resource use and efficiency must be examined from a **nexus lens** to consider interdependency and interplay between various kinds of natural resources and their environmental impact (water, land and food). Likewise policy on resource efficiency and sustainable consumption and production cannot be made in silo. A **systems thinking** could create some of the critical synergies and trade-offs between the SDGs from a resource nexus perspective.

(d) In a globalized economy, how to produce and consume natural resources, such as materials, biomass, respects no national boundary; the role of international trade should be examined.

(e) Science-policy interface should communicate positive scientific findings - such as that resource efficiency measures and practices can provide significant net cost savings - to industry for both the scientific and policy community to better engage with the **business sector** to ensure such practices are taken up.

(f) **Education** plays an important role in promoting RE-SCP to induce behavioural changes, changes in values and in consumerist lifestyles, and in support of a zero growth (de-growth) agenda in some developed countries and nurture responsible consumption patterns in emerging economies and other developing countries.

(g) **Policy incentives**, such as supportive fiscal policy, taxation and target subsidy, are proven effective to reduce waste (including plastic waste), promote recycling and reuse of natural resources, and build a circular economy.

(h) Science-policy interface should provide **clarity** to challenges and opportunities faced to sustainable development in a **simple and communicable manner**. In this regard, establishing well defined indicator and gathering necessary data is critical and developing countries need technical assistance and capacity-building.

2. Marine: Identifying policy options and targeted information to address ocean and coastal degradation as a prerequisite for sustainable development.

(a) **Global marine assessment**: There is a need to evolve and expand future cycles of the World Ocean Assessment by developing a different approach to capture new information on the state of the marine and coastal environment, complementing existing sources of information sources and literature reviews. This could include a consultative approach that makes use of both conventional digital-indicator data and captures first hand observations from experts living in the areas under assessment, covering ecological, social and economic aspects. There is also an opportunity to apply new robust indicators being developed for monitoring of SDG 14 targets. Importantly, there is a need to build capacity in developing countries to enable them contribute to marine and coastal assessments.

(b) **Ocean acidification**: Ocean acidification is a new field of scientific research, we are only beginning to comprehend the scale and significance of ocean acidification. In addition to urgently reducing global carbon emissions, actions to address ocean acidification must include, among others, fast-tracking the establishment of the Global Ocean Acidification Observation Network (GOA-ON), the identification of particularly vulnerable ecosystems (e.g. upwelling zones, coral reefs, cold water systems), and the removal at local scales of other stressors (e.g. nutrient and heavy metal pollution, over-fishing, and habit destruction) with a view maintaining natural levels of ecological resilience. Furthermore, extensive scientific research is still needed to better understand how specific species and ecosystems will respond/adapt to ocean acidification over the long term under different CO2 emission scenarios. This should exploring species behavior and growth, trophic interactions and overall functioning and resilience of oceans to sustain food-security and other services, as well as the use of blue carbon, e.g. seagrass meadows, as a tool for reducing marine carbon levels at local scales.

(c) **Cumulative impacts**: Climate change adds more pressure on marine and coastal ecosystems that are already under pressure from other stressors like overfishing, nutrient pollution, marine litter, habitat destruction, etc. We need to improve our methods to assess cumulative impacts and our understanding on how resilience of ecosystems can be strengthened by reducing various specific stressors.

(d) **Blue carbon**: There is a need to incorporate knowledge on carbon mitigation services in national policies, including Blue Carbon in Nationally Appropriate Mitigation Actions (NAMAs); as well as enhancing understanding regarding the contribution of coastal and marine ecosystems in mitigating carbon emissions;

(e) **Social science gap**: Given the complex social, economic and environmental interactions that exist in coastal and ocean areas, it is critical to adopt a whole-system approach that incorporates all relevant information. To achieve such an approach, it is necessary to enhance the current contribution of social science and economics to the current debate about the conservation and sustainable use of oceans and coasts. This requires: (a) The development of improved mechanisms for the inclusion of social and economic evidence (and scientists) into assessments of ocean and coastal systems from the national to global levels; (b) The development of improved models that demonstrate the interconnections and co-dependencies between social, economic and environmental aspects of ocean and coastal systems; (c) The development of policy-making approaches to the sustainable use and conservation of oceans

and coasts which draw upon the full suite of relevant social, economic and environmental evidence.

(f) **Citizen science** offers a useful tool to establish global and regional information on environmental changes, e.g. coastal temperature patterns based on time-series data obtained from routine dive-logs of private scuba-divers.

(g) To further strengthen and promote the science-policy interface addressing oceans issues it would be useful to develop a narrative that places healthy coastal and marine ecosystems as a basis for functioning services and uses underpinning sustainable development. This should articulate economic, environmental and social values - ranging from energy exploration, food security, carbon sequestration to recreational and cultural values.

3. Food-Energy-Water Nexus

(a) The term **NEXUS** is a concept focusing on **interaction of elements** i.e. the sectors and on flows materials, capital and energy – it is not a simple view on integration.

(b) It can be defined as a means of implementation expected to be instrumental in achieving the SDGs by considering the context of major drivers and boundary conditions provided by e.g. climate change, demography and economic development;

(c) As such it can inform about trade-offs in balancing the interplay of water, food and energy and opportunities of sustainable socio-environmental development, the necessary behavioural changes and new business models needed;

(d) SDGs are characterized by multiple interlinkages all of which can be approached by the strategic concept of a Nexus approach;

(e) Nexus interactions can be viewed along different scales: vertically from household level to global level and encompassing transboundary systems (spatial scale), horizontally across SDGs or sectors (cross-sectoral scale); and the third dimension along the axis of changing with time hence informing short term, medium term and long term planning and decision making;

(f) A Nexus approach needs sound information/knowledge across relevant scales, the relevant SDGs and being inclusive to involve all relevant communities;

(g) A Nexus approach can inform resource efficiency and development of new business models for green economy transitions;

(h) The Nexus concept needs to promote a blended outreach approach, avoiding technical jargon, to engage relevant stakeholders including the youth and local / indigenous knowledge to foster achievement of resilience in the interaction between humans and nature;

(i) The Food-Energy-Water Nexus is highly related to Sustainable Consumption and Production (SCP);

(j) The Nexus approach speaks to development of new business models and behavioural change that is needed to achieve decoupling of development and environmental resource use;

(k) The Nexus approach needs to be seen under macroeconomic and boundary conditions of population growth and climate change as key driving factors of increasing and changing demands;

(l) The Nexus approach should in general enable bottom up approaches encompassing a balance of smart and innovative technical as well as traditional solutions at various scales (i.e urban rain water and rural challenges)

(m) The Nexus approach requires a stocktaking of the water-food-energy developments under macro-economic developments , of best practices of implementing nexus approaches;

(n) A Nexus approach requires research informing evidence based decisions while highlighting the limits of knowledge, aspects of uncertainty and implications for development options across actors and sectors;

(o) To foster exchange and dialogue on the options and limitations of science and the Nexus a dialogue conference should be convened for different actors to elaborate on the Nexus potential as a means of fulfilling the SDGs and SCP and providing alternative business models and societal transition.

4. Natural Capital

(a) Using the Natural Capital concept provides an opportunity to institutionalise the gathering of data and the transformation of data into information that is easy to use and communicate for policy makers and which integrates sectors where linkages have been previously difficult to understand and to work with.

(b) Natural capital information should also be made accessible to communities, who need to be engaged in the decision-making processes.

(c) Related to the above, the development of templates for governments to support the use of the natural capital concept (not to be confused with natural capital accounting) would be a useful project.

(d) Tools and case studies/evidence should be also seen in terms of enabling the politics around this issue, helping politicians find a narrative, identifying who the beneficiaries of natural capital are and describing a way forward for implementing sustainable development in a manner that attracts sectors, voters, etc.

5. Addressing Secondary Impacts in the Extractives Sector - the contribution of REDD+ and forest data

(a) There is a need to find better ways to establish baselines and monitor the status of secondary impacts. The SDGs and their 169 indicators provide an opening for us to achieve that as these indicators will be based in solid science.

(b) There is a need to consolidate data from many sources, governments, communities, companies, etc. For example, REDD+ data can be used to plug data gaps if we can reuse and recycle such data and to repurpose it for other goals.

6. Climate Change, Air Quality, Sand & Dust Storms

(a) Policy making will benefit from regional assessments of SLCP like the recent assessment in the LAC region which has identified a framework for action in each country in the region, informing policies on which measures can be effective in each specific country.

(b) Member States are encouraged to exploit new low-cost, sensor-based air quality measurement approaches, aiming to increase the ability of communities and policy makers to quantify and learn about local air quality.

(c) Tackling the problem of Sand and Dust Storms calls for strong evidence based policies. At a national level, it is important to formulate a national master and action plan by taking the following steps: 1) Formulating a national strategic management plan to combat SDS; 2) Setting up an inter-sectoral structure or institution to address SDS at national level; 3) Allocation of national budget; 4) National capacity assessment; 5) Technology needs assessment.

C. Plenary Sessions

1. UNEP 2016 Frontiers and Displacement and its impacts on Sustainable Development

UNEP 2016 Frontiers Report: The UNEP new yearly report series on emerging issues of environmental concern entitled the UNEP Frontiers Report replaces the *UNEP Year Book* series. The 2016 edition of the UNEP Frontiers presents six diverse emerging issues, including the crucial role of the financial sector in advancing environmental sustainability; the close linkages between zoonotic disease emergence and ecosystem health; microplastics in the food chain; unavoided loss and damage to ecosystems due to climate change; toxin accumulation in crops as influenced by climate variability; and illegal trade in live animals. The report attracted significant attention and generated dynamic discussions among the participants and panel members.

Displacement and the Environment: A representative from International Organization for Migration provided a keynote presentation that focussed the attention of the Forum to the complexity of the issues, ranging from various driving factors of displacement (e.g. natural disasters, sudden- and slow-onset events of environmental change and degradation, resource and social conflicts) impacts of displacement on the lives and safety of displaced people and on the environment. The Forum exchanged views on a number of pertinent issues surrounding the displacement, including migration being a solution contributing to sustainable development; migration and adaption; data gaps and policy-oriented research in relation to the need for integrated work between the natural science and social science communities; and accountability and overarching framework to tackle the issue and integration into receiving communities.

Emerging issues: The Forum exchanged on various aspects surrounding the emerging issues such as adaption, engagement of citizen as policy actors, the use of genetically modified crops. One common aspect across the diverse discussions in the session is the fundamental need and reliable mechanism for better interdisciplinary integration between social science and natural science to bring about evidence-informed policies. It was also noted that, while science cannot solve all the problems, science can inform the conversation and decision. A number of problems that may seem complex but share common root causes and they can be solved by simple solutions.

2. SDGs and the multi-level, multi-thematic, multi-sectoral data landscape

The following key observations and recommendations were highlighted.

(a) In terms of reporting on the SDGs it should be recognized that there is complexity at all levels and complexity requires a system approach, and a complex integrated solution. Technology should play a key role.

(b) There are a large number of existing accounting systems including a huge number of indicators and these need to identified and incorporated in the SDG reporting process.

(c) The importance of communicating science to different target audiences was highlighted. Tools exist but they need to be used efficiently.

(d) New data sources and initiatives exist such as citizen science; the open water data initiative; and improved cloud access to imagery, all of which need to be incorporated.

(e) The private sector has embraced data gathering for better intelligence, but so much of this message needs to go to CEOs to change their business models.

(f) A substantial amount of data exists but it needs to be integrated by establishing structures aimed at bringing the communities of statistics and other data together, and eliminating the inefficiencies associated with running parallel systems.

3. Highlights of the GEO-6 Regional Assessments and the Global Gender and Environment Outlook (GGEO)

(a) The future of GEO data collection and analysis was highlighted by a group of young Kenyan scientists who are participants in the Global Learning and Observation for the Benefit of the Environment (GLOBE) programme. They highlighted their work collecting data for the GLOBE programme and this data has multiple uses, including assisting NASA to calibrate earth observation satellites.

(b) The co-chairs of the six GEO-6 regional assessment presented the key findings and policy messages from their reports. Many common themes were found in the reports, but there were also many regionally specific environmental problems that required urgent policy action to resolve. The regional assessment process highlighted how an evidence and data based assessment process can help inform environmental policy development in the regions. The session also highlighted how the new e-book format allowed greater access to the underlying data and evidence for the conclusions in the reports.

(c) It was noted that the data revolution is happening in environmental assessment, but much more is needed to be done in some regions on collection of environmental data. It was also noted that policy innovations are now being implemented that were only experimental just a few years ago. Another key observation made was that new accounting frameworks, such as Natural Capital Accounting, and policies, such as Sustainable Consumption and Production, are emerging to help manage complex and interrelated environmental challenges where the social and economic components of environmental policies need to be strengthened in order to have more impact and successfully manage these new challenges.

(d) One of the key messages from the Global Gender and Environment Outlook (GGEO) is that gender roles and norms position women and men differently in relation to the environment. All aspects of the environment are gender-differentiated – drivers, impacts, perceptions, actions, responses, and knowledge. Environmental projects, and policies that do not take gender into account will not yield sustainable solutions.

D. Recommendations made about the Science-Policy Forum

Overall, the Forum was deemed to be a valuable addition to the UNEA programme, and should be repeated for future UNEAs. The following specific recommendations were made:

(a) Evolve the Science-Policy Forum into a more inclusive multi-stakeholder event.

(b) Be more demand driven in selecting themes.

(c) Use the scientific knowledge presented as additional inputs to UNEA draft resolutions.

(d) Align the Forum with OECPR or alternatively, non UNEA years.

(e) Ensure better alignment with policy process and other windows of opportunity including other intergovernmental processes.

(f) Enhance the inclusion of social sciences and traditional knowledge.

(g) Focus on follow up and new initiatives.