

The 'S' in UNESCO: key challenges for UNESCO's science programmes and priorities

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“There is a role for a global organisation like UNESCO to focus its efforts on creating the frameworks, the global conditions within which scientific endeavours can prosper. [...] Forget the science, forget the research, make creating the conditions for science your goal.”

– Member of UK scientific community

1/ Executive Summary

UNESCO is the only UN agency with a specific mandate for science. It has also been named the lead agency in the UN's Scientific Advisory Board, which has been tasked with advising the UN on how to strengthen the interface between science and policy.

UNESCO's scientific mandate and global reach is impressive, but with a severely constrained budget, to what extent does UNESCO have the capacity to deliver its full scientific programme and have maximum impact across each of its six Main Lines of Action (MLAs)¹?

UNESCO is recommended to further prioritise its current scientific programmes to focus on the areas where it can have the greatest impact and add the greatest value.

The following recommendations and related challenge questions are intended to aid UNESCO's thinking in its next phase of prioritisation of its science programme:

Recommendation 1. Further prioritise scientific programmes focusing on those that work very specifically towards its fundamental objectives of peace, security and sustainability

Challenge question – Do all current scientific activities contribute directly to UNESCO's objectives of peace and sustainable development?

1 See Appendix II for the full list of MLAs

Recommendation 2. Focus on support rather than delivery

Challenge question – Could UNESCO achieve more with limited resources through influencing policy in Member States, rather than delivering programmes?

Recommendation 3. Proactively seek opportunities for partnership working

Challenge question – Could UNESCO more effectively leverage its resources by brokering partnerships and fostering collaboration with other organisations (corporate businesses, international organisations or other UN agencies)?

Recommendation 4. Recognise the value of integration

Challenge question – Can UNESCO deliver more impact in sustainable development through collaboration within the Natural Sciences Sector and by integrating these programmes with those in the Social and Human Sciences?

Recommendation 5. Ask whether 'legacy programmes' correspond to 21st century priorities

Challenge question – Are all UNESCO's programmes addressing contemporary scientific research priorities? If UNESCO were established today, would it be funding all of the activities that currently feature in its Natural Sciences programme?

Recommendation 6. Widen access to the benefits of research in developing countries

Challenge question – Can UNESCO do more to widen access in the developing world to the results of scientific research?

Recommendation 7. Promote technology transfer and build capacity across science and, in particular, engineering

Challenge question – Is UNESCO placing enough emphasis on innovation, technology transfer and capacity building across the sciences, including engineering?

Recommendation 8. Ensure quality of research and impact of results

Challenge question – How does UNESCO ensure the quality of its research, evaluate its relevance to contemporary need and assess its impact?

Recommendation 9. Raise UNESCO's profile in the sciences

Challenge question – How can UNESCO build its scientific profile, reputation and working-relationships with the scientific communities within its member states? How can UNESCO's National Commissions be mobilised to more effectively bridge the information gap between the scientific communities within Member States and at UNESCO?

2/ Introduction

Prioritising expenditure

In response to current pressures on UNESCO's overall budget, funding for the Natural Sciences sector was reduced in 2013 by 28%, to US\$44.85 million over the three-year period 2014–17. Member States rose to this challenge by ranking UNESCO's main Natural Sciences activities in terms of budgetary priorities. As a result, although all UNESCO Natural Science programmes have seen their funding reduced, projects received differential levels of reduction according to the priority allocated to them; outcomes ranged from over 85% of previously planned funding for projects assessed to be of the highest priority to under 40% for those ranked lowest.

The UK National Commission for UNESCO (UKNC) applauds UNESCO's process of prioritisation as a pragmatic response to budget cuts. However, such significant budget cuts will inevitably impact on the viability of some Natural Sciences programmes, and the results that they are able to deliver. Given its severely reduced budget, it is likely that UNESCO will need to further prioritise its programmes in the future to ensure maximum impact with the available funds. The UKNC believes this is an opportune moment to take stock of UNESCO's overall science portfolio, to enable future decisions about its current relevance and direction to be taken on a longer timescale and with the benefit of wide-ranging input from all Member States.

Forming a UK view

In order to support this thinking at UNESCO, the UKNC wanted to present UNESCO with a UK view of UNESCO's science priorities. To start to formulate this view, the UKNC organised a town meeting² for interested members of the

2 A meeting of representatives from a community to discuss shared issues

UK's science and engineering community, held in the Royal Society in London on 13 May 2014.

UNESCO's interim Assistant Director-General for the Natural Sciences Sector, Dr Wendy Watson-Wright, gave a presentation on UNESCO's science programmes and priorities. The meeting also heard a personal view on the importance of international collaboration in science from the Royal Society's Foreign Secretary and Vice-President, Professor Martyn Poliakoff.

In breakout discussion groups³, participants were asked to review the scope and coverage of UNESCO's Main Lines of Action (MLAs) in science, evaluate their relevance to current international scientific issues and identify any other areas where they would like to see UNESCO play a more active role.

Without in-depth background knowledge of UNESCO's science programmes, it was not possible for participants to make detailed recommendations on their content or prioritisation at this stage. However, there was a clear consensus on some aspects of the overall direction, summarised in Section 3. These issues highlighted a number of challenging questions for UNESCO to address in future evaluation of its science programmes, summarised in Section 4.

3 See Appendix III for the questions addressed by breakout groups

3/ Current situation, implications and recommendations

UNESCO is commended for recognising the need to prioritise activities within the science programme to meet a reduced budget, but there is a continuing need to focus on prioritisation. UNESCO's original budget for 2014–17 of \$62million was unlikely to be enough to make a real difference across the many fields that UNESCO's scientific programmes seek to address, even before the necessary reductions were made. The following sections assess the current situation and the implications for UNESCO, and offer recommendations to assist further prioritisation exercises.

1. Further prioritise scientific programmes focusing on those that work very specifically towards UNESCO's fundamental objectives of peace, security and sustainability

UNESCO should concentrate its resources and expertise on areas which contribute directly to its objectives. There is a natural tendency for programmes to 'drift' over long periods of time into areas which are more broadly defined and more loosely connected to the original intent. In assessing the different activities within UNESCO's current programmes, a valuable check would be to articulate the link with the organisation's core objectives.

2. Focus on support rather than delivery

UNESCO could have a greater impact with its limited resources by focusing on supporting science, technology and innovation (STI) in Member States through policy, governance and capacity building, rather than delivering science programmes. This would lead to an increased prioritisation of strengthening STI policies, governance and the science–policy–society interface (MLA 1)

and building institutional capacities in science and engineering (MLA 2) and consequently, decreased prioritisation of the other MLAs⁴.

UNESCO has a major role to play in promoting, facilitating and coordinating global efforts to use science and innovation to solve global challenges from climate change to economic growth. UNESCO is urged to focus in particular on establishing frameworks and guidance for governance and the science-policy-society interface, and for institutional capacity building.

3. Proactively seek opportunities for partnership working

Many corporate businesses and other international organisations, (e.g. the European Union), also fund scientific research in areas of interest to UNESCO. UNESCO is recommended to continue to identify and exploit opportunities for partnership working, which could significantly expand the impact of its own limited funding, and to use the convening potential of the UNESCO 'brand' to facilitate increased collaboration and information sharing within the global scientific community.

Many other UN agencies carry out research programmes in different fields (e.g. food and agriculture, health, meteorology). UNESCO is encouraged to explore opportunities to share resources and expertise through partnership with the relevant agencies within the UN system. This is especially pertinent in relation to the use and protection of data. As the only UN agency with a specific mandate in the sciences, UNESCO should be playing a more high profile role within the UN system in scientific leadership and coordination.

The areas where UNESCO's Natural Science sector could partner with others could be broadened to include educational programmes alongside scientific research programmes.

4. Recognise the value of integration

UNESCO could reconsider the logic behind the separation the Social and Human Sciences sector from its Natural Sciences sector. Social and Human

4 See Appendix II for full list of MLAs

Sciences will be key in translating the results of scientific research into sustainable policies and activities, and collaboration between the social and natural sciences is increasingly seen to be essential as a way of responding to global environmental challenges, e.g. climate change. Increased integration between the two programmes could offer significant benefits towards achieving sustainable development.

UNESCO could also consider the degree of integration between individual MLAs within UNESCO's Natural Sciences sector, given the savings in cost, and improvement in processes that can be obtained from shared working.

5. Ask whether 'legacy programmes' correspond to 21st century priorities

A number of UNESCO's current programmes were established in the 1960s or 70s. If UNESCO were established today, would it be funding all of the activities that currently feature in its Natural Sciences programme? There is a risk that these programmes represent a 'legacy' mission, reflecting the priorities of that time rather than contemporary global needs. UNESCO's science programmes need to be flexible and agile if they are to remain relevant to addressing 21st century priorities. Additional activities addressing contemporary issues can only be envisaged if legacy activities are reduced – a further incentive for UNESCO's clear focus on prioritisation.

6. Widen access to the benefits of research in developing countries

UNESCO has a clear role to play in widening access to the benefits of scientific research in the developing world. More could be done in this area, for example the creation of multilingual platforms to share research results; and promotion of the open publication of research data.

7. Promote technology transfer and build capacity across science and, in particular, engineering

Over recent years, the UK has become increasingly aware of the need to maximise the value obtained from scientific research through transferring its results into

applications which benefit society and the economy. UNESCO should place more focus on technology transfer, including support for appropriate frameworks under MLA 1, and increase focus on engineering capacities under MLA 2.

8. Ensure quality of research and impact of results

UNESCO is asked how it evaluates research proposals within the Natural Sciences programme, and how the output and impact of projects are evaluated? In the light of the rigorous standards of peer review and impact assessment applied to national activities in the UK, it is important for UNESCO's international activities to be subject to similar quality standards.

9. Raise UNESCO's profile in the sciences

Many members of the UK's science and engineering community are unaware of the scope and coverage of UNESCO's Natural Sciences programme. There is a clear message here for both UNESCO and the UKNC about the need for improved communications and engagement with the science community within its Member States.

The UK is UNESCO's fourth largest core funder contributing towards approximately 6.6% of UNESCO's regular budget (approximately £15–£16 million per year)⁵ even under the reduced expenditure plan. As a key stakeholder group, the science and engineering community should be familiar with the activities covered by that programme, and with the impact that it delivers.

In order to build its profile among the scientific community within its Member States, UNESCO should produce regular information on its science programmes, in an accessible format, demonstrating their relevance to current scientific issues and the impact they deliver.

UNESCO's National Commissions should take responsibility for disseminating information produced by UNESCO on its science programmes through its scientific networks, highlighting contributions by and implications for their country's scientists and engineers.

5 UNESCO's Assessed Contribution – UK Department for International Development

4/ Challenge questions for future prioritisation

Given that there appears to be a continuing need to prioritise its scientific programme, UNESCO is recommended to review its science priorities in good time before the current budgetary cycle comes to an end in 2017. The challenge questions outlined below correspond to the recommendations outlined in the previous section and are intended to guide future evaluation and prioritisation of UNESCO's Natural Sciences programmes. UNESCO is recommended to start this review as early as possible, to enable UNESCO to address the challenges comprehensively, and to engage the scientific communities within Member States in their own evaluation of UNESCO's programmes.

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The UKNC plans to provide a UK view on some of these challenge questions in future policy briefs

5 / Acknowledgements

This policy brief was made possible by the contributions of members of the UK science community who participated in the meeting at the Royal Society on 13 May, and others who have commented on their conclusions. It was produced for the UKNC by its Natural Sciences Director, Dr. Beth Taylor and UKNC Policy and Communications Officer, Sophie Leedham. A draft of the brief was circulated among attendees at the town meeting for their comments and feedback. The views contained in this policy brief are those of the UKNC and do not necessarily reflect those of the UK Government or of the individuals or organisations that have contributed to the production of this report.

6/ Appendix I

Overview of UNESCO's Science Programmes

The Natural Sciences programme

Natural Sciences represent one of UNESCO's five major programmes, along with Education, Social and Human Sciences, Culture, and Communication and Information. In terms of expenditure, Natural Sciences is UNESCO's 3rd biggest programme (after education and management of field offices), accounting for \$62 738 000 from 2014–15, or 9.6% of UNESCO's total budget (\$653 000 000)⁶.

The programme supports UNESCO's fundamental goals of peace and sustainable development through its contribution to two medium-term strategic objectives:

- Strengthening science, technology and innovation systems and policies – nationally, regionally and globally; and
- Promoting international scientific cooperation on critical challenges to sustainable development.

UNESCO is the only UN agency with a specific mandate for science, and hosts the new UN Scientific Advisory Board, which met for the first time in January 2014. However, other UN agencies with specific sectoral missions (e.g. the Food and Agricultural Organisation, the World Health Organisation, the World Meteorological Office) also undertake scientific research programmes in support of their activities.

6 37 C/5 Draft Resolutions. Draft appropriation resolution for 2014–2015

UNESCO's Natural Sciences programme is broken down into six Main Lines of Action (MLAs). The MLA's fall into two overarching strategic objectives:

1. Supporting science, technology and innovation (STI) in Member States through policy, governance and capacity building;
2. Delivering scientific programmes, in particular where international co-operation is required to meet critical challenges to sustainable development.

1. Supporting STI in Member States

MLA 1: Strengthening STI policies, governance and the science–policy–society interface

The specific objectives of MLA 1 include:

- Establish, review or improve Member States' national Science Technology and Innovation (STI) policies including on renewable energy/assessment of trends in STI investment;
- Regional cooperation and capacity building in science technology and innovation policies;
- Develop science parks and technology incubators;
- Focus on Africa and Small Island Developing States; and
- Strengthen the links between Science, Policy and Society.

A key project for delivery of these objectives is GO-SPIN⁷, a global observatory of STI policies, policy instruments and indicators which provides tools for knowledge brokers, decision-makers and STI policy experts. UNESCO is producing a series of GO-SPIN Country Profiles in STI Policies mapping research and innovation in individual Member States, starting with Botswana (November 2013), Zimbabwe (June 2014) and Malawi (July 2014).

7 GO-SPIN

MLA 2: Building institutional capacities in science and engineering

MLA 2 involves supporting the development of networks and partnerships in the basic sciences (e.g. the SESAME⁸ project which brings together middle eastern countries in engineering and renewable energy projects).

The Abdus Salam International Centre for Theoretical Physics (ICTP)⁹ Trieste, Italy, is a Category 1 Institute of UNESCO, which fosters pure and applied physics, mathematics and better working conditions for scientists in developing countries. The World Academy of Sciences for the advancement of science in developing countries (TWAS)¹⁰ is also a programme of UNESCO.

2. Delivering Scientific Programmes

MLA 3: Promoting knowledge and capacity for protecting and sustainably managing the ocean and coasts

UNESCO's activity under MLA 3 is delivered through the Intergovernmental Oceanographic Commission (IOC)¹¹, established in 1960, which has functional autonomy within UNESCO. IOC is the only intergovernmental organisation specifically mandated to promote marine science in all ocean basins. It fosters sustainable development of the marine environment through science, services, observations, data exchange and capacity development.

IOC has four high level objectives:

- Healthy ocean ecosystems. IOC coordinates ocean observation and monitoring through the Global Ocean Observing System (GOOS)¹² which aims to develop a unified network providing information and data exchange on the physical, chemical and biological aspects of the ocean;
- Early warning for ocean hazards. IOC leads a global effort to establish ocean-based tsunami warning systems as part of an overall multi-hazard

8 Synchrotron-light for Experimental Science and Applications in the Middle East (SESAME)

9 International Centre for Theoretical Physics (ICTP)

10 The World Academy of Science (TWAS)

11 Intergovernmental Oceanographic Commission (IOC)

12 Global Ocean Observing System (GOOS)

disaster reduction strategy. It coordinates and fosters the establishment of regional intergovernmental coordinating tsunami warning and mitigation systems in the Pacific and Indian Oceans, in the Caribbean Sea and in the North East Atlantic, Mediterranean and connected seas;

- Resiliency to climate change and variability. IOC builds the knowledge base of the science of climate change as well as the impact of acidification from increasing CO₂ levels in the ocean; and
- Enhanced knowledge of emerging issues. Through its International Oceanographic Data and Information Exchange programme (IODE)¹³, IOC maintains the Ocean Biogeographic Information system (OBIS)¹⁴, a global marine biodiversity knowledge base that provides an integral view on the past and current diversity, abundance and distribution of marine life in the ocean.

MLA 4: Fostering international science collaboration for earth systems, biodiversity, and disaster risk reduction

UNESCO works with international institutions that aim to improve our understanding of global earth system science:

- The International Geoscience Programme (IGCP)¹⁵ is a joint programme with the International Union for Geological Sciences (IUGS)¹⁶ promoting collaborative projects with an emphasis on benefit to society, capacity-building, and the advancement and sharing of knowledge;
- Under the auspices of UNESCO, the Global Geopark Network (GGN)¹⁷ celebrates geodiversity through 100 Global Geoparks in 32 different countries – including seven in the UK – which serve local communities through sustainable activity, public education and outreach;

13 International Oceanographic Data and Information Exchange programme (IODE)

14 Ocean Biogeographic Information System (OBIS)

15 International Union for Geological Sciences (IGCP)

16 International Union for Geological Sciences (IUGS)

17 Global Geoparks Network (GGN)

- UNESCO's Earth Science Initiative in Africa created and supports the African Network of Earth Science Institutes (ANESI)¹⁸ and includes a mobile geological mapping unit, earth science education in schools and studies on the impact of abandoned mines.

UNESCO is a partner in the Intergovernmental Platform on Biodiversity and Ecosystems Services (IPBES), and in the Hyogo Framework for Action 2005–15¹⁹ which addresses disaster preparedness and mitigation through research and technical capacity-building in the areas of earthquakes, landslides, volcanoes, and building codes.

MLA 5: Strengthening the role of ecological sciences and biosphere reserves

Through the Man and the Biosphere Programme (MAB)²⁰, UNESCO helps Member States achieve a balance between biodiversity, conservation and local sustainable development. MAB comprises a world network of Biosphere Reserves (621 in 117 countries, including 5 in the UK), which provide site-specific examples of sustainable development, including scientific, economic, social and cultural aspects.

Specific research programmes focus on:

- Mountains;
- Drylands (e.g. sustainable management of marginal drylands, a ten year MAB project on combating desertification at pilot Biosphere Reserves in nine countries);
- Tropical forests;
- Urban systems;
- Wetlands;

18 African Network of Earth Science Institutes (ANESI)

19 Hyogo Framework for Action

20 Man and Biosphere Programme (MAB)

- Marine;
- Island and coastal systems.

MLA 6: Strengthening freshwater security

UNESCO implements programmes to develop the knowledge and capacity to manage freshwater resources:

- The International Hydrological Programme (IHP)²¹, an intergovernmental programme which aims to address water security and sustainability through mobilising international cooperation to improve knowledge and innovation; strengthening the science-policy interface; and developing institutional and human capacity. The current phase of the IHP runs from 2014–21, and aims to tackle local, regional and global challenges in the areas of:
 - water related disasters and hydrological changes;
 - groundwater in a changing environment;
 - water scarcity and quality;
 - water and human settlements of the future;
 - ecohydrology;
 - education.
- The UNESCO-IHE Institute for Water Education²² is a Category 1 institute of UNESCO, the largest international graduate water education facility in the world, based in Delft, the Netherlands;
- The World Water Assessment Programme²³ is a UN programme hosted by UNESCO, involving 29 separate UN agencies. It produces a series of World Water Development Reports and carries out other tasks such as case studies, scenario development and regional assessments.

UNESCO also accredits around 30 water research institutes and 30 UNESCO Chairs in the field of water, representing in total more than 1000 water experts worldwide.

21 International Hydrological Programme (IHP)

22 UNESCO-IHE Institute for Water Education

23 World Water Assessment Programme

7/ Appendix II

Allocation of Priorities, 2014–17

In June 2013, Member States ranked the programmes within UNESCO's Natural Sciences sector into High, Medium and Low priorities. In terms of their original budget allocation for 2014–17:

- High ranked activities were to receive 80% or more;
- Medium Ranked activities were to receive between 40% and 80%; and
- Low ranked activities were to receive less than 40%.

Priorities were allocated to the MLA's described in Appendix I above as follows²⁴:

MLA	Description	Priority
MLA 1	Strengthening STI policies, governance and the science-policy-society interface	High
MLA 2	Building institutional capacities in science and engineering	Low
MLA 3	Promoting knowledge and capacity for protecting and sustainably managing the ocean and coasts	High
MLA 4	Fostering international science collaboration for: <ul style="list-style-type: none">• Earth systems• Biodiversity• Disaster reduction (except tsunami warning)• Tsunami warning	Low Medium Medium High
MLA 5	Strengthening the role of ecological sciences and biosphere reserves	Medium
MLA 6	Strengthening freshwater security	High

²⁴ Report of the working group established by 191 EX/Decision 15 (ii)

8/ Appendix III

Discussion points at town meeting

- What are your initial thoughts on UNESCO's current scientific programmes?
- Were you aware that these were the scientific programmes that UNESCO has prioritised?
- How well do you think each of these activities supports UNESCO's overall objectives of peace?
- To what extent, if at all, do you perceive UNESCO to be a global leader in these programme areas?
- How, if at all, could UNESCO raise its profile among the international scientific community on its role in these areas?
- What are the 'big issues' for the international scientific community?
- To what extent, if at all, are these issues addressed by UNESCO's current scientific programmes?
- To what extent, if at all, do you think that UNESCO could and should engage with your priority issues?
- To what extent, if at all, has UNESCO currently got the balance right with its priorities?
- Which, if any of UNESCO's current scientific programmes should it prioritise the highest? And the lowest?

- What should UNESCO be focusing on? What needs to be added to the list?
And taken away?

