Focir pensament

Global Science Diplomacy as a New Tool for Global Governance

Luk Van Langenhove
United Nations University
Vrije Universiteit Brussel

3.

Executive Summary

1. The world is increasingly faced with a set of global problems and challenges that transcend national boundaries and that are threatening the whole of humanity as well as the planetary biosphere. These global problems and challenges are on the one hand related to the globalisation of human activities and on the other hand to human impact on the environment. Both the globalisation and anthropogenic challenges pose serious governance problems for the multilateral system.

2. The first problem is that the state-driven nature of governance is giving ample room for global governance. While global problems by definition require global solutions, the policy authority remains largely in the hands of states.

3. The second problem is that coping with global problems requires a deep understanding of the issues at stake. The relationship between scientific knowledge and policy-making is, however, not obvious as states try to keep as much control as possible over policy-making processes.

4. Both of the aforementioned problems may be related to the way in which the current multilateral system is organised.

5. However, there is on-going shift towards a new Multilateralism Mode 2.0 where states allow other actors more and more involvement in global policy-making. This gives S&T more opportunities for input in the process of dealing with current global problems. Despite this, the science-policy nexus at a global level needs to be strengthened. One way to do this is by developing a new form of science diplomacy that is not driven by states but rather by the scientific community itself as well as by the multilateral system.

6. The main conclusion of this paper is that there is therefore a need to develop a global science diplomacy agenda, consisting of three components: a **Science in Global Diplomacy** initiative aimed at mobilising the science and technology (S&T) community to carry out research that is relevant for global problems; a **Diplomacy for Global Science** initiative aimed at facilitating scientific collaborations for dealing with global problems; and a **Global Science for Global Diplomacy** initiative aimed at developing the institutional nexus between the S&T community and the realm of policy-making at a global level.

Introduction: what is the problem?

The world today is faced with a growing set of so-called global problems and challenges that require global actions. The first set of these problems is related to the **anthropogenic challenges** in the environment. Humanity has now such a powerful and often negative impact on the planet that geologists have started to call the present geological era in which we live the Anthropocene of the 'Human Age' (Ackerman, 2014). Climate change and the warming of the planet is the most prominent and troubling effect of the influence of humanity on its environment. A second set of problems is linked to the accelerated development of information and communication technologies that, combined with increased transportation facilities, are resulting in different kinds of **globalisation challenges** that amongst other things make borders for governance increasingly more irrelevant. The irreversible trends of the anthropogenic impact on the planet and of the globalisation and growing inter-connectivity of human activities on the planet result in both threats and opportunities. Among the threats are global warming, biodiversity preservation, the spreading of pandemic infectious diseases, migration, refugees and terrorism. But there may also be opportunities, such as economic growth, poverty reduction and increased resilience to natural risks.

Global problems require scientific evidence both in order to understand them as well as to cope with them.

Global climate change is perhaps the most exemplary illustration of the issues at stake. It took a while before it was understood that there is a relation between climate change and the atmospheric accumulations of carbon dioxide and 'greenhouse gases' such as methane. And with this came the insight that the planet has a single climate system that does not recognise the borders between states. It does not make a difference where on the planet the greenhouse gases are emitted, the only thing that matters for global warming is their cumulative effect, regardless of their origin. This makes it difficult for states to deal with the problem, because in order to see any effect of a single state policy towards greenhouse gases, all other states need to go along as well.

Coping with these challenges requires two things: (i) a deep **understanding** of the problems in order to generate ideas about possible solutions and (ii) policy actions by different **governance** actors at both local and global level. The much-needed deep understanding implies the mobilisation of S&T towards global problems and the translation of their input into governance practices and goals. The equally needed policy actions imply a governance structure that moves away from the traditional Westphalian model where sovereign states are in the driving seat when dealing with global problems. Global governance is needed to deal with threats and unleash opportunities.

There are thus two sets of problems related to the present '*condition humaine*'. On the one hand, the current state-centred structure of governance is not fit to deal with global problems. On the other hand, global problems require scientific evidence both in order to understand them as well as to cope with them. Enhancing the capacity of humanity to deal

with global problems needs therefore two innovations. First, global governance needs to change, as it needs to move away from a state-centred approach where sovereignty blocks effective actions. Secondly, it needs more input from S&T to develop policies that deal effectively with global problems.

This paper argues that the S&T community has not only the potential to contribute significantly on how to deal with global problems, but that it can also act as a change agent towards establishing a global governance structure that is fit for purpose. In order to do so, new forms of science diplomacy need to be developed in order to strengthen the policy-science nexus at different levels of governance. The argument will be developed in four steps. First, in Section One, a critical assessment will be made of the present structure of global governance that is based upon the primary role of sovereign states in a basically intergovernmental multilateral system. It will be argued that there is a need for a new take on multilateralism and that there are signs that such a new multilateralism, which can be labelled 'multilateralism mode 2.0', is in the making.

Section Two will illustrate this claim by presenting an overview of how the S&T community is presently involved in dealing with a number of global challenges. The role of S&T in the UN endeavour to reach the so-called Sustainable Development Goals through the Agenda 2030 will be especially highlighted.

In Section Three it will be argued that in order to fully unleash the potential of S&T to help deal with global problems in the context of an appropriate global governance structure, the praxis of science diplomacy needs to be further developed. This entails a moving away from a state-interest driven science diplomacy towards a 'global commons' driven science diplomacy.

Finally, the concluding Section Four will outline the aspects of a Global science diplomacy agenda that aims to develop a better multilateral response to urgent global problems.

1. The need for a Multilateralism 2.0

Ever since the Treaty of Westphalia in 1648, governance has been the almost exclusive preserve of sovereign states, and indeed, the modern state as we know it today achieves in many countries remarkable things for its citizens, such as the provision of public goods in areas of security and social welfare (health, education, etc.) as well as the stimulation of economic prosperity. But the ascent of state governance has also led to great inequalities between states and to inter-state conflicts. The latter has everything to do with the way states deal with international conflicts and international cooperation. The very essence of the notion of sovereignty is that states in principle do not accept a higher authority. As such, the governance space above the level of states is limited, which has prompted scholars of International Relations to describe the supra-national level as a state of anarchy. States fight and compete with each other, but they also have to work together. To do this, a set of international regimes and international (or intergovernmental) organisations have been designed. Today, there exists an international system that is accepted (within certain limits) by a majority of the existing states. This system is often called the multilateral system and it comprises institutions dealing with peace and security, basically the UN and its Security Council, as well as institutions and regimes dealing with economic and financial governance (the so-called Bretton Woods system).

Multilateralism was thus initially created as a form of cooperation between states that institutionalises intergovernmental cooperation in order to replace anarchy. In such classical multilateralism or "Multilateralism Mode 1.0", states are the principal actors in the interstate realm of international relations. They are the building blocks of multilateralism. National governments are therefore the "star players" and intergovernmental organisations, such as the UN or the World Bank, are only dependent agents whose degree of freedom only goes as far as the states allow them to go. The primacy of sovereignty is the ultimate principle of international relations. In this sense, it is a closed system dominated by states. Governance is delivered in a hierarchical (bottom-up or top-down) way, following the principle of subsidiarity. This means that in general there is a reluctance by states to hand over some of its powers to a higher authority such as the UN. Consequently, the power of the UN for global governance is therefore limited to how far states are willing to go.

This multilateralism 1.0 is clearly facing challenges in the 21st century. More than a reflection of the failure of the concept, this is a sign of a changing international context, which has rendered anachronistic the traditional intergovernmental multilateralism of the immediate Post-World War Two era. This changing context consists of many aspects. Amongst them are the anthropogenic changes in the environment that have global consequences. Take climate change: there is overwhelming evidence that it is induced by man-made activities, which implies that it is possible to reverse the trend if the right policies are put in place. But no single state can combat climate change on its own. Moreover, if a single state decided to take drastic measures to stop the emission of greenhouse gases for instance, if other states did not act in the same way, that particular state would risk being economically outcompeted. Another major change has been induced by the development of information and communication technologies that have significantly lowered the salience of borders and stimulated worldwide flows of goods and information. As a result, the national economies of the sovereign states have become very interconnected. The financial crisis of 2008 is just one dramatic illustration of this trend: what started as a sub-prime housing crisis in the US resulted in a sovereign bond crisis in Europe. And finally, states have to share their monopoly of governance increasingly with governance units at both the sub-national regional level and the supra-national level such as the EU (Van Langenhove, 2011). This has resulted in complex governance landscape where sta-

tes find it more and more difficult to keep their positions as sovereign 'star players'.

All of this also puts a lot of stress on the existing multilateral system that was designed after the Second World War. The aforementioned global problems are especially challenging because "*the policy authority for tackling global problems still belongs to the states, while the sources of the problems and potential solutions are situated at transnational, regional or global level*" (Thakur and Van Langenhove, 2006, p. 223). But there are signs that multilateralism is undergoing a transformation from mode 1.0 to mode 2.0. A Multilateralism 2.0 that is more open instead of closed, more networked than hierarchical and less state-centric (Van Langenhove, 2010).

A first sign of this move towards Multilateralism 2.0 is the growing diversification of multilateral organisations. In recent years, there has been a dramatic rise of all kinds of international organisations and regimes. The number of intergovernmental organisations has grown from 37 to well over 400 in the period between 1990 and 2000. While mostly operating on an inter-governmental basis, some of them have acquired quite a lot of autonomy in the exercise of their competences or even have a "legal personality", just as states do. And increasingly, these organisations look more to networks than to formal (bureaucratic) organisations. In line with a "transnationalisation of policies", one can state that Multilateralism 2.0 embodies the rise of transnational policy networks (Stone, 2013).

Secondly, there is the growing importance of non-state governance actors. Here, regions play an important role. States have nowadays created a large number of so-called regional institutions that have themselves become players in the international order. Such regional organisations exist at both the supra-national and sub-national level. This is related to the phenomena of integration and devolution whereby national powers are in some states transferred to either supra-national or sub-national regions. The European Union is perhaps the most typical example at the supra-national level: it is not a state, but it has a lot of statehood properties with the European Commission and European Council as its executive power, the European Parliament as its legislative power and the European Court of Justice as its legal power. Not being a state, the EU is not entitled to be a member of the United Nations, but it has been granted an enhanced observer status with the right to speak at the UN General Assembly. The same holds for many sub-national regions. A typical example would be the Belgian region of Flanders. Again, it is not a state, but it has its own parliament and government. And Flanders has the power to engage in bilateral agreements with states. Some of these subnational regional entities even have growing ambitions to be present on the international stage as well. Therefore, some of these new players, although not states, do strongly resemble states and increasingly act on the global stage *as if they were states*. As a result, we are currently witnessing a transition from a world of states to a world of states and regions (Van Langenhove, 2011). While states still hold the policy au-

The multilateral system comprises institutions dealing with peace and security, basically the UN and its Security Council, as well as institutions and regimes dealing with economic and financial governance.

thority for dealing with global issues, the potential solutions to the challenges of globalisation are more and more often developed at a transnational, regional or institutional level. As a result, sub-and supra-national representation arises when a system needs to have a level of problem solving and a stabilisation capacity that is adequate to deal with the problems that are likely to be generated in pursuing agreed integration objectives of a certain level of ambition. Typical examples are: at the supra-national level, the European Union, the African Union, MERCOSUR or ASEAN, or even federations of states such as the US or Australia, and at the sub-national level, Belgian regions, Austrian and German *Länder* and Spanish *comunidades autónomas*.

Many other non-state actors are also knocking on the doors of the multilateral system, amongst them scientific organisations.

Thirdly, along with the increased relations between 'vertical' levels of governance, there is a growing horizontal interconnectivity between policy domains. We can see increased interconnections between policy domains: finance cannot be divorced from trade, security, climate, etc. A distinctive characteristic of Multilateralism 2.0 is therefore that the boundaries between policy domains are becoming more and more permeable. Instead of clearly separated areas of policy concern treated within separate institutions, there are now groupings of different actors and layers that together form global *epistemic communities*.

Fourthly, in Multilateralism 2.0, the system is more open to civil society. This is perhaps the most revolutionary aspect of Multilateralism 2.0, but also the most difficult one to organise. This is related to the state-centric and institutional focus of classical multilateral organisations where there was hardly any room for open debate, let alone for the involvement of citizens. But there is evidence that an alternative is emerging, that of multilateral institutions functioning not so much as an organisation, but rather as an *agora*, that is a public realm in which issues can be debated and perhaps, be decided. As mentioned before, sovereign states are thus not the only actors that play a role in the world: on the contrary, the system becomes much more open, coming to include states, regional organisations, sub-and supra-national regions, NGOs and civil society. These actors may even challenge the notion of sovereignty. What was once an exclusive playing ground has now become a space that states have to share with others. This system is increasingly becoming participatory. Governance is exerted in concert by the various levels involved.

Finally, we can also point to emerging new modes of diplomacy: Multilateral diplomacy has undergone a substantial expansion in recent decades. Originally, diplomacy was seen as a system of representation and communication between states at a bilateral or multilateral level (Pigman, 2010, p. 5). Such diplomacy was driven by the self-interest of states in the areas of trade and security. As the global agenda has widened to include issues far beyond the traditional politico-security and economic spheres, and the borders between foreign and domestic policy have been challenged, diplomacy has gradually been broadened to include cultural diplomacy for instance. In this context, new actors and networks (business actors, NGOs, civil society organisations) have increased in influence –supported by the development of new technologies. With the Internet and the social media, they enter

into the blogosphere, and represent themselves to others –known and unknown– in other parts of the world.

The metaphor *Multilateralism 2.0* aims to capture this transformation and gives a strong conceptual basis to understand these new developments, including the emergence of international networks, and the definition of multilateralism as an open system rather than closed in the context of international relations. The concept of Multilateralism 2.0 also seizes on the fact that the Westphalian model of governance is questioned by other non-state actors that are challenging the primacy of sovereignty (this was the primary principle constraining Intergovernmental organisations). This is especially the case for supra-national regional organisations and sub-national entities that both have multilateral ambitions and behave in a similar way to the states that created them. But many other non-state actors are also knocking on the doors of the multilateral system, amongst them scientific organisations.

2. The crucial role of S&T in dealing with global problems

The on-going transformation from Multilateralism 1.0 to Multilateralism 2.0 is well illustrated by how the S&T community in recent decades has become increasingly involved, firstly in several multilateral environmental agreements and then in other global problems as well. Two intertwined developments occurred: on the one hand the multilateral system gradually opened up to the participation of the S&T community. On the other hand, the S&T community organised itself in order to maximise its participative power in the global governance system.

Early developments

As early as the late 1960s and early 1970s there was a significant amount of scientific evidence available that pointed towards anthropogenic climate change. The increase of greenhouse gases in the atmosphere was especially well monitored and modelled. International science organisations such as the World Meteorological Organization (WMO) and the International Council of Scientific Unions (ICSU) started to launch programmes to expand data gathering. One of the first was the WMO/ICSU joint 'Global Atmospheric Research Programme' that was launched in 1967. By 1985 they announced an international consensus that there would be a rise in the global average temperature between 2000 and 2050. That same year the British Antarctic Survey of ozone in the upper atmosphere revealed the existence of an 'ozone hole' that was linked to the emittance of chlorofluorocarbon, the so-called CFC gases, used in spray cans and refrigerators. In 1987 this led to an international treaty, the Montreal protocol, which eventually led to the phasing out of CFCs. Today all UN member states have ratified the Montreal Protocol and it is regarded as perhaps the most successful international agreement to date. It also demonstrates how the UN multilateral system could reach a consensus on a global policy with the help of the S&T community.

Meanwhile, in 1988 the WMO and other UN agencies set up the Intergovernmental Panel on Climate Change (IPCC) as a multilateral tool to both generate scientific consensus and translate them into suitable policy recommendations. The IPCC currently has 194 member states. It is conceived as a UN body with reporting responsibilities to the WMO, the United Nations Environment Programme (UNEP), the UN Framework Convention on Climate Change (UNFCCC) and the UN General Assembly. It is however said that the IPCC acts more independently than its legal status suggests (Bernhardt, 2012, p. 5). The establishment of the IPCC within the UN framework was not an easy achievement and the form it took was the result of a compromise between the UN and its member states. Governments were given the right to set the agenda and own the process. Scientists are involved as actors who ensure credibility. But it is governments that nominate experts, approve the outline of the reports and review the drafts of the Synthesis Report. In practice this has resulted in long discussions and negotiations between the scientists/lead authors and government officials concerning the wording of each of the reports to be released.

The innovative aspect of the IPCC is that it carries characteristics of both a scientific and intergovernmental organisation. This hybrid situation is a consequence of the defined purpose of the IPCC, namely to prepare, based on available scientific information, a report on all aspects of climate change and its impacts, with a view to formulating realistic response strategies. Although it does not conduct research itself but only collects and reviews existing scientific knowledge, it can be considered as a scientific body as it involves thousands of scientists who take part in the data analysis process, which is fairly com-

prehensive. At the same time, it also acts as an intergovernmental body, because government representatives play a crucial role in the decision-making processes. As a result, the IPCC has a rather complex structure that illustrates that bridging science and politics is not an easy thing (Bernhardt, 2015). The most important bodies of the IPCC are the Panel, the Bureau, the Working Groups (WG), the Task Force on National Greenhouse Gas Inventories, the Technical Support Units and the Secretariat. In the Panel, government representatives from all member states meet together with hundreds of experts. It is here that the most important decisions regarding the IPCC process are made. The Bureau brings together all the Chairs, co-chairs and vice-chairs of the different organs, advises the Panel on both the scientific and technological matters and on managerial and strategy issues. Funding comes primarily from regular contributions by the WMO, the UNEP and the UNFCCC, topped up with voluntary contributions from member states. It is in the Panel that government representatives meet and make final decisions. The Working Groups constitute the scientific core of the IPCC system. Working Group I covers the physical science basis of climate change; Working Group II deals with climate change impacts, adaptation and vulnerability; and Working Group III collects and evaluates information related to the reduction of climate change. There is also a Task Force on National Greenhouse Gas Inventories (TF1), a Task Group on Data and Scenario Support for Impacts and Climate Analysis (TGICA) and several other task forces or steering groups related to the investigation of specific problems and questions. For each Working Group and for the TF1, a Technical Support Unit (TSU) facilitates the respective body's activities. These TSUs are hosted and financed by the governments of one of the WG members. And then there is also a secretariat hosted by the WMO in Geneva that plans, oversees and manages all IPCC activities.

The First IPCC Assessment Report was published in 1990, and a second report followed in 1995. The first report played an important role at the Rio Summit in 1992 where the UN Framework Convention on Climate Change (UNFCCC) was agreed upon. The second informed the negotiations on the Kyoto Protocol in 1997. In 2001, 2007 and 2015 the third, fourth and fifth reports followed, each time announcing firmer consensus agreements on the existence and dangers of global warming. But meanwhile, the IPCC also became the subject of attacks by industrial lobbyists and the agreements reached were only possible after diluting the original statements, because many governments could not agree with was proposed out of pure self-interest. Nevertheless, the story of the IPCC is a unique development in putting a global problem on the agenda for global governance and in organising dialogue between scientists and policymakers. At present, five Assessment Reports

In 1988 the WMO and other UN agencies set up the Intergovernmental Panel on Climate Change (IPCC) as a multilateral tool to both generate scientific consensus and translate them into suitable policy recommendations.

have been delivered along with a number of IPCC Special Reports that are issued in response to particular problems or questions. The Sixth Assessment Report is expected to be finalised in 2022.

The IPCC can be regarded as a clear example of how the transition from Multilateralism mode 1.0 to mode 2.0 is taking place as it is an endeavour that involves states, classical multilateral organisations and the S&T community. The established structure is however incredibly complex. This can certainly be related to the complexity of the issue, but also to the positions of the member states who by and large aim to stay in control of the whole process. The IPCC case also illustrates that bringing S&T knowledge to the global policy-making level is not a straightforward issue.

The broadening and institutionalisation of S&T input to global governance

Gradually, the conclusions that climate change needs to be tackled at a global level and that S&T needs to play a crucial role in that process, found their way to thinking about other areas of global concern, especially to the sustainable development agenda. Today, we are witnessing a growing presence of S&T in the whole UN system, although none of these S&T advice systems are as developed and institutionally sophisticated as the IPCC.

As early as the first UN Conference on Environment and Development in 1992, the socalled Earth Summit, it was recognised that achieving sustainable development is not something that can be left to states alone. It requires the active participation of all sectors of society. The Agenda 21, adopted at the Earth Summit, formalised this by identifying nine sectors of society as the main channels through which such participation needs to be realised. This has led to the setting up of 'the Major Groups' system that since 2002 has been used by the UN to organise the inclusion of stakeholders in UN processes. They include: women, children and young people, indigenous people, NGOs, local authorities, workers and trade unions, business and industry, farmers and researchers. The S&T community is thus one of these designated groups. Two decades after the Earth Summit, the importance of effectively engaging with these nine sectors was reaffirmed at the Rio+20 Conference in 2012.

The UNEP also started to use this 'Major Groups' model in 2004, allowing the ICSU to participate in the annual stakeholder forums and the UNEP General Conference. It also allowed the ICSU to participate in numerous conference calls and additional consultation meetings that the UNEP holds throughout the year as part of its stakeholder coordination and outreach strategy. Meanwhile, major UN summits on the environment and development have also started using the Major Groups system, notably the World Summit on Sustainable Development (WSSD) held in South Africa in 2002 and the Rio+20 conference in 2012.

By installing the Major Groups model of participation inside the UN system, the S&T community now has the chance to participate directly in UN work alongside governments. In practice this means the chance to attend meetings, often with a time allotted to make statements as well as having the opportunity to submit written input at key points in the processes. In some cases there can even be a co-organising mandate.

For the S&T community, this work is mainly done by the ICSU. This global body is devoted to international cooperation in the advancement of science. Its members are national scientific bodies and international scientific unions. Today, it comprises 120 multi-disciplinary national scientific members, associates and observers representing 140 countries and 31 international, disciplinary scientific unions. The ICSU also has 22 scientific associates. The ICSU is one of the oldest non-governmental organisations in the world and represents the evolution and expansion of two earlier bodies known as the International Association of Academies (IAA; 1899-1914) and the International Research Council (IRC; 1919-

1931). The ICSU's mission is to strengthen international science for the benefit of society. To do this, the ICSU mobilises the knowledge and resources of the international science community to:

· Identify and address major issues of importance to science and society.

· Facilitate interaction between scientists across all disciplines and from all countries.

· Promote the participation of all scientists –regardless of race, citizenship, language, political stance, or gender– in the international scientific endeavour.

· Provide independent, authoritative advice to stimulate constructive dialogue between the scientific community and governments, civil society, and the private sector.

Activities focus on three areas: International Research Collaboration, Science for Policy, and Universality of Science (Greenaway, 2006).

The ICSU works in close partnership with the International Social Science Council (ISSC), the World Federation of Engineering Organisations (WFEO). Since the establishment of the UN Commission on Sustainable Development the ICSU has been acting as a co-organiser of the UN Commission on Sustainable Development. Again, this can be seen as an important step towards the establishment of a Mode 2.0 multilateral system as it demonstrates an opening up international organisations to non-state actors (Talberg, et al, 2013). And it certainly has made the input of S&T to the global policy agenda almost mainstream. This is illustrated by the fact that a 2014 report by the Scientific Advisory Board of the Secretary-General of the United Nations (UNSG SAB) acknowledged that science is critical to help meet the challenges for sustainable development, as it lays the foundation for new approaches, solutions and technologies to identify, clarify and tackle global challenges for the future. The report therefore recommended that the transformative power of science needs to be anchored prominently in a preamble to the Sustainable Development Goals and called for a set of well-designed, measurable, policy-relevant, easy to interpret, baseline-oriented and disaggregated indicators.

The development of a global agenda

Along with the institutionalisation of the participation of the S&T community and other civil society groups, another development occurred that strengthened the science-policy nexus: the idea to work with measurable and monitorable targets and goals. In 2000, the UN set nine international development goals, known as the Millennium Development Goals (MDG), which were to be achieved by 2015. These goals included the eradication of extreme poverty, universal primary education, gender equality, reduced child mortality, improved material health, reduced HIV/Aids and other diseases, environmental sustainability and global partnership for development. A crucial aspect of the MDG programme was that it tried to reconcile environmental concerns with developmental concerns. Today, the results of this programme are at best mixed and we could say that most of the goals are still works

Today, we are witnessing a growing presence of S&T in the whole UN system.

in progress. But it was the first time in history that UN member states agreed upon an ambitious global governance project, and it paved the way for the direct involvement of the S&T community.

At the Rio+20 conference in 2012, a process was launched to develop a strong post-2015 development agenda. Part of that process resulted in calls for the greater involvement of the S&T community in the setting and monitoring of the global goals. In 2013, a resolution of the UN General Assembly on Science, technology and innovation for development stated that S&T and innovation are "essential enablers and drivers" for the achievement of the MDG. S&T have found their way to global policy making through the 2030 Agenda for Sustainable Development.

The 2030 Agenda adopted in September 2015 firmly acknowledges the crucial role of S&T and formalises its involvement through the establishment of initiatives such as the Technology Facilitation Mechanism (TFM).

There now exists for the first time in history an over-arching policy agenda for the whole UN system; the 2030 Agenda for Sustainable Development (also known as the SDGs) as adopted at the United Nations Sustainable Development Summit on 25th September 2015. The Agenda is a plan of action for people, the planet and prosperity. It also seeks to strengthen universal peace in larger freedom. It deals with many different governance issues, such as climate change, migration, disaster risk reduction and drugs policies. Seventeen Sustainable Development Goals have been identified:

· Goal 1: End poverty in all its forms everywhere

· Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

· Goal 3: Ensure healthy lives and promote well-being for all at all ages

· Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

· Goal 5: Achieve gender equality and empower all women and girls

· Goal 6: Ensure availability and sustainable management of water and sanitation for all

· Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all

· Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

· Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation

· Goal 10: Reduce inequality within and among countries

· Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable action to combat climate change and its impacts

· Goal 12: Ensure sustainable consumption and production patterns

· Goal 13: Take urgent action to combat climate change[1]

1. Interestingly, this is the only Goal that comes with an asterix. It states: "*Acknowledging that the United Nations Framework Convention on Climate Change*

· Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

· Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

· Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

· Goal 17: Strengthen the means of implementation and revitalise the global partnership for sustainable development

These Goals cover a wide range of topics, from social (such as poverty, education, migration, etc.), to economic (such as energy, production and consumption, jobs etc.), environmental (such as water, ecosystems, or climate change) and the rule of law and governance (such as combatting corruption, enhancing transparency, policy coordination, etc.) and have been translated into no less than 169 targets. And the Agenda not only sets out targets and ambitions, it also aspires to monitor progress by establishing an indicator framework. Thus, the SDGs encourage a focus on integrated policy interventions demonstrated to have measurable impact. The ambitions of the 2030 Agenda are very high and achieving the set targets will only be possible if the UN member states and non-state governance actors at all levels from global to local work together in collaborative partnerships. In the SDGs framework, S&T features strongly both in Goal 17, as well as a multi-disciplinary issue to achieve several sectorial goals and targets. Moreover the related **Addis Ababa Action Agenda** (AAAA), outcome of the Addis Ababa Conference on 'Financing for Development' identified concrete S&T policies and actions as a key for meeting the SDGs. In particular, the AAAA recognised that "the creation, development and diffusion of new innovations and technologies and associated know-how, including the transfer of technology on mutually agreed terms, are powerful drivers of economic growth and sustainable development".[2] The document, which contains an entire chapter on S&T, also stresses that S&T strategies need to be integral elements of national sustainable development strategies. Attention is drawn to the need to design polices that incentivise the creation of new technologies and that promote research that supports innovation in developing countries as well as to the importance of regulatory and governance frameworks for nurturing science and innovation, and the dissemination of technologies.

The **High-Level Political Forum on Sustainable Development** is the UNs central platform for the follow-up and review of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals. The forum, which adopts a Ministerial Declaration, is expected to provide political leadership, guidance and recommendations on the 2030 Agenda's implementation and follow-up. It can be regarded as the top-level political venue for considering the implementation of the 2030 Agenda. This means keeping track of the progress of the SDGs, promoting consistent policies informed by evidence, scientific and national experiences, as well as addressing new and emerging issues. The High-Level Political Forum (HLPF) met for the first time since the adoption of the 2030 Agenda on 18th-20th July 2016. On that occasion, the first-ever Sustainable Develop-

is the primary international, intergovernmental forum for negotiating the global response to climate change".

2. The groundbreaking agreement, the Addis Ababa Action Agenda (AAAA), provides a foundation for implementing the global sustainable development agenda that world leaders are expected to adopt this September. The agreement was reached by the 193 UN member states attending the Conference, following months of negotiations between countries. It marks a milestone in forging an enhanced global partnership that aims to foster universal, inclusive economic prosperity and improve people's well-being while protecting the environment.

ment Goals tracking report on the new global development agenda was launched. Among other functions, the HLPF aims to strengthen the science-policy interface through a review of documentation, bringing together dispersed information and assessments. There seems to be a desire to make the reviews more robust and evidence-based. The HLPF aims to strengthen the science-policy interface by both promoting the provision of policy-relevant data and the supporting of enhanced dialogue between science and policy-makers.

The 2030 Agenda adopted in September 2015 firmly acknowledges the crucial role of S&T and formalises its involvement through the establishment of initiatives such as the **Technology Facilitation Mechanism** (TFM). The first annual multi-stakeholder Forum on Science, Technology and Innovation for the SDGs (Science Technology and Innovation Forum) was held on 6th-7th June 2016 in New York. The TFM is composed of three parts:

· A UN Interagency Task Team on Science, Technology and Innovation for the SDGs that promotes coordination, consistency and cooperation within the UN system on S&T related matters with the goal of enhancing synergy and efficiency. The task team includes representatives from the scientific community, the private sector and civil society.

· A collaborative Forum on Science, Technology and Innovation (STI) for the SDGs that will be convened once a year to discuss S&T cooperation around thematic areas for the implementation of the SDGs. The Forum brings together all relevant stakeholders and will produce input for the HLPF.

· An Online Platform for Technology Knowledge and Information Sharing (OPTKIS) that will be used for a comprehensive mapping of existing S&T initiatives as well as for the development of independent technical assessments of best practices.

States have now rolled out a global agenda with measurable goals and have agreed upon involving the S&T community in both achieving and monitoring the global goals. This is Multilateralism 2.0 in action!

Therefore, there are now high expectations regarding the involvement of the worldwide scientific community in achieving the 2030 Agenda. In an editorial published in Science, William Colglazier (2015) rightly pointed to the fact that Agenda 2030 provides a unique opportunity for a continued interaction between scientists and policy makers at a global level. According to Colglazier, science's contributions to the SDGs could be fourfold:

· science could inform our understanding of the challenges that these goals may come up against;

· science could help policy-makers to select those actions that will actually make a difference towards achieving their goals;

· science could be a critical tool in monitoring the progress made towards these goals; and

· science could provide insight into innovative solutions needed to achieve these goals.

Being one of the nine Major Groups, the S&T community has been granted comprehensive participatory opportunities in the HLPF through UN General Assembly Resolution

A/RES/67/290. Since then, the Scientific and Technological Community (STC) Major Group, has been working on providing governments, policy-makers and larger society with a better understanding of what is scientifically and technologically achievable based upon what we know and what we can do with the knowledge and the technological tools available or under development.

The present Agenda 2030 for sustainable development provides an unprecedented opportunity to increase the global governance capacity of the world and scientists can play a major role in that by both providing data and evidence that identifies the challenges, providing advice on the policy actions needed and helping to find innovative solutions. Moreover, science can also contribute to the monitoring of how global problems are dealt with. Indeed, the 2030 Agenda opens up major new opportunities for researchers not only for delivering input but also for increasing impact.

As noted by Colglazier (2015), the world's science communities should view the 2030 Agenda as a great opportunity for strengthening the UN science-policy interface to benefit everyone in the world. Colglazier, who became science and technology advisor to the US Secretary of State in 2011, sees two specific opportunities. First there is the chance that the science community has to deliver input to the Global Sustainable Development Reports (GSDRs). This UN initiative foresees between now and 2030 a series of four-year cycles of reporting where there will be three annual reports that focus on special issues followed by a comprehensive report in the fourth year. In the 2016 report there will be room to include input from the scientific community. The Technology Facilitation Mechanism (TMF) as created by the 2030 Agenda offers a second opportunity. The UN Secretary-General has created a group of high-level people representing science and civil society to work with the UN agencies on the role of STI for achieving the SDGs. The TFM convenes an annual STI forum of which the first took place in June 2016. The results of that forum have been discussed at the July 2016 meeting of the High-Level Political Forum, the highest UN body dealing with the 2030 agenda.

Therefore, we are on the brink of a new era in multilateralism: one where the states have now rolled out a global agenda with measurable goals and where states have agreed upon involving the S&T community in both achieving and monitoring the global goals. This is Multilateralism 2.0 in action! But this is not to say that scientists are going to rule the world (or that this would be desirable). The Multilateralism 1.0 system is still in place, which means that states are still very much in control of the decision-making processes and that they continue to measure anything that is proposed against their self-interests.

This poses several challenges for the S&T community. Amongst them is the delicate issue of how to translate research results into (global) policy. This is not only a matter of impact, it is also a matter of power politics within the S&T community. Scientific results are seldom straightforward and the whole process of scientific progress is driven by debates and competing paradigms. This makes influencing the policy-making realm no easy task. Just doing the necessary research is not enough. Results need to be disseminated and translated in consensus through interactions with policy-makers. This is not only difficult and time consuming; it also puts scientists in a position for which they were not trained. And finally, we should not forget that states are not only in control of the multilateral system, to a large extent they also control the national S&T systems through their funding policies for research.

3. Mobilising for a new science diplomacy

The aforementioned processes for the institutionalisation of S&T input in global policy can be related to a broader evolving relationship between science and diplomacy. In principle the realms of science and diplomacy can be regarded as two distinct spheres of human activity that have little in common. As one scholar once put it: science and diplomacy are not obvious bedfellows. But nevertheless, scientific networks and scientific evidence are playing an increasingly important role in diplomacy efforts initiated by both states and non-state actors. We can call this practice "science diplomacy". This is a relatively new concept, but it refers to an old practice, as scientists always have been at the forefront of international collaboration. As early as 1723, the UK Royal Society instituted the post of Foreign Secretary. And today scientists all over the world are connected to each other through "invisible colleges", that is, networks organised around scientific disciplines or problems. However, the ascent of science diplomacy is also related to what is labelled as the 'soft power' of states. This concept of soft power has been mainstreamed in International Relations Theory, but it is not always clear what exactly is meant by it. Nye (2004) has tried to provide some theoretical clarity by contrasting soft power to the hard power of military forces and economic resources. But he then describes soft power as "the ability to shape the preferences of others" (Nye, 2004,1). Later, he refined his definition into "the ability to affect others through the co-optive means of framing the agenda, persuading, and eliciting positive attraction in order to obtain preferred outcomes" (Nye, 2011, pp. 20-21). Soft power is according to Nye partly controlled by states, as it is reflected in political values and foreign policies, but it also escapes state control as it also implies culture in general. Therefore, there are two dimensions to soft power: an essentially interest-driven governmental practice and a value-driven practice by non-state actors.

In recent years, S&T have become increasingly perceived as potential instruments for soft power policies. Advocates of science diplomacy argue that science can achieve goals that are in line with national interests. First, it is often said that the "invisible colleges" of scientists across state-borders can contribute to building trust between nations or cultures. Secondly, it is also argued that the language of science can contribute to discovering technical solutions to political problems. One can thus distinguish between S&T relations that occur without government intervention and science diplomacy when governmental officials try to shape and stimulate relations to advance national interests.[3]

Three varieties of science diplomacy

It is not exactly clear when the concept of science diplomacy was coined and first used, but today it is becoming widely used by policymakers, scientists and scholars of international relations. Turekian et al (2012, p. 4) defines science diplomacy as "the process by which states represent themselves and their interests in the international arena when it comes to areas of knowledge - their acquisition, utilisation and communication - acquired by the scientific method". Through the available definition we can see a consensus that it makes sense to see science diplomacy as "a recognisable and legitimate form of diplomacy" (Davis and Patman, 2015, p. 261).

In 2010 the U.K. Royal Society and the American Association for the Advancement of Science (AAAS) published a landmark report in which they distinguished between three forms of science diplomacy: diplomacy for science, science in diplomacy and science for diplomacy.

Diplomacy for science is mainly about the facilitation of international scientific collaboration. Here, classical tools of diplomacy are put

3. See Arndt (2006) for the introduction of distinction when discussing cultural diplomacy.

to use to support the scientific and technological community. It is about using diplomacy in order to establish cooperation agreements at government or institutional level. The goal of diplomacy for science actions is to benefit from foreign S&T capacity in order to improve the national capacity.

With **Science in Diplomacy** the roles are reversed: here the scientists are prompted towards supporting foreign policy. In times of war this has resulted in mobilising national scientific and technological resources for the development of arms. In times of peace this is about using scientific knowledge in foreign policy decisions. The goal of such activities is to improve foreign policy actions through the use of scientific knowledge.

Science for diplomacy goes one step further: here science is used as a tool to build and improve relations between states. This can be done when there are tensions in relations between certain states or when states are faced with common problems that they cannot solve on their own. Scientific collaboration is used here to provide collaborative relationships that are based upon a non-ideological basis. The goal is here to support foreign policy actions by mobilising scientific networks.

This triple approach to science diplomacy has been neatly summarised by Davis and Putman (2015, p. 262) as follows: "Diplomats need to be guided by science to deal with the pressing issues of the day (science for diplomacy); the way for science often needs to be leavened by diplomats (diplomacy for science); and sometimes diplomats can use science for other ends (science in diplomacy)".

Within these three broad categories of science diplomacy, many different science diplomacy practices exist. Such practices can emerge spontaneously, but more often they will be the result of deliberate policies and/or support schemes with the involvement of some governmental agencies. The most important available governmental tools and instruments that can be used in promoting or supporting science diplomacy are strategic tools, operational tools and support tools.

Strategic tools are governmental communications that set out policies for science diplomacy. Such documents can contain general 'visions' of what a government aims to achieve or it can be more specific strategy declarations issued by the government or a governmental department, such as a ministry of science and technology policy or a department of foreign affairs. Moreover, in principle it is possible that such strategic documents also occur at the level of subnational entities with governance responsibilities in either S&T policy or foreign relations. And of course, semi-governmental institutions such as research foundations or academies can issue strategic documents with a science diplomacy perspective as well.

"Diplomats need to be guided by science to deal with the pressing issues of the day (science for diplomacy); the way for science often needs to be leavened by diplomats (diplomacy for science); and sometimes diplomats can use science for other ends (science in diplomacy)". Davis and Patman, 2015

Furthermore, there are many different **operational tools** to put science diplomacy into action. A first important category is the **bilateral or multilateral S&T cooperation agreements** between two or more states. Many of these agreements focus on mobility schemes between the counties involved or upon joint

projects. A special case of such agreements are the ones that are foreseen in the creation of joint international S&T institutions by two or more states. A second category, dealing with 'science in diplomacy' are the **S&T advisory boards** at state level. These advice systems can take the form of a council or high-level group. They can be installed at the level of the prime minister or be related to the department of foreign affairs or the ministry for science and technology. In principle such bodies can also be institutionalised, as an S&T office within a department of foreign affairs, for example. In all cases the purpose is to inject scientific knowledge into state governance. A third category is the **S&T advisors attached to embassies** where the objective is to assist the national diplomatic mission in establishing cooperation with the scientists of the country where the embassy is located. Fourthly, there is the **opening of national or regional research funding schemes** to third-party researchers. This can take the form of financial support of individual fellowships or staff exchange programmes, financial support for specific cross-border S&T cooperation programmes or joint calls for S&T projects issued by two or more states.

Networks of S&T communities and policy-makers at national and global level are dramatically expanding.

Finally there are so-called **support tools** for science diplomacy that aim to promote or facilitate science diplomacy activities. These tools include training and awareness building activities regarding science diplomacy where the audiences can be either diplomats or scientists.

States and scientists as science diplomacy actors

In general science diplomacy can thus be regarded as an instrument that can be used by states that use science and scientists as instruments to pursue their foreign policy goals. This can be done in order to promote their national interests or to help solve problems that the states are involved in. However, scientists themselves can also embark upon science diplomacy activities without states being directly involved. They can intentionally act on existing diplomatic goals or what they do may have intended or un-intended diplomatic effects. Therefore, science diplomacy is a concept used in either labelling on-going activities as being of a diplomatic nature or as a label used to qualify certain policy actions in a certain way. In other words, science diplomacy can refer to both practices and discourses.

There are several interesting cases of the state-driven mobilisation of scientific communities for science diplomacy. A classic case is the scientific cooperation between the US and the USSR during the Cold War. And when in 1954 the European Organisation for Nuclear Research (CERN) was established in Europe it became an arena where France and Germany could work together. The most recent example of a successful science diplomacy initiative is the nuclear agreement between the US and Iran.

Today, a major promoter of science diplomacy is the American Academy for the Advancement of Science (AAAS), as is the Royal Society of the United Kingdom. In 2008 the AAAS created a Centre for science diplomacy and in 2012 it launched an open source journal called "Science and Diplomacy". Also in the US a 'science envoy programme' was

initiated in 2009 by the Obama administration. Several other states now have their own science diplomacy programmes. And even if no national science diplomacy programme is available, many states have long had scientific attachés in their embassies. An interesting case is Spain, where the Spanish Foundation for Science and Technology has recently appointed three international coordinators to its embassies in London, Washington and Berlin. They operate as offices for the cultural and scientific affairs of the Embassies of Spain. In Europe, the EU also pays increasingly attention to science diplomacy as part of its foreign policy, although the driving force comes from its Directorate General for Research, not from its European External Action Services. But science diplomacy is increasingly on the EU agenda, since Carlos Moedas, the EU Commissioner for Research, Science and Innovation in a speech delivered at the European Institute in Washington on 1st June 2015, boldly stated that he wants "*science diplomacy to play a leading role in our global outreach for its uniting power*".[4] In that same speech, he compared science diplomacy to a torch that can "*light the way, where other kinds of politics and diplomacy have failed*".

The aforementioned institutionalisation of a broad science-policy nexus at a global level has in recent years resulted in a growing awareness and willingness of S&T organisations and S&T funding agencies to be part of this new development. As such, networks of S&T communities and policy-makers at national and global level are dramatically expanding. Some of them are initiated by policy-makers, others by scientists themselves. Below is a short overview of some of these networked organisations that are playing a major role in how S&T relate to policy-making concerning global problems.

The **Inter Academy Council** (IAC) was established in 2000 by science academies from all over the world with the purpose of facilitating the provision of advice and recommendations on issues of global and regional importance for international organisations, multilateral organisations and national governments. The IAC has instituted several expert panels that conduct comprehensive reports that touch upon science, technology and health. Based in Amsterdam, the IAC receives its basic funding from the Royal Netherlands Academy of Arts and Sciences. In 2010 the UN Secretary-General Ban Ki-moon requested the IAC to conduct an independent review of the IPCC.

The **Group on Earth Observation** (GEO) was established in 2005 and renewed in 2014 for another 10-year period. The GEO is an intergovernmental organisation that brings together major actors in global Earth observation and whose decisions are taken by consensus in a plenary session including representatives from 98 states and the European Commission as well as representatives from around 90 international organisations with a remit in earth science. The GEO plays a major role in the follow up of SDGs.

The **Global Green Growth Institute** (GGGI) and the **Green Growth Knowledge Platform** (GGPK) are two initiatives established concerning the development of a so-called green economy. The GGKP, which has a membership that includes the OECD, the UNEP and the World Bank, is both a knowledge exchange and learning initiative as a funding structure. The GGGI is a Korea-based international organisation set up to promote the green growth agenda.

The **Sustainable Development Solutions Network** (SDSN) is a global network initiated by Jeffrey Sachs of Columbia University. It was launched in 2012 under the auspices of the UN Secretary-General Ban-Ki Moon, but remains independent of the UN system.

The **Belmont Forum** was created in 2009 and represents a group of the world's major funders of global environmental change research. The aim of the Belmont Forum is to accelerate the delivery of the environmental research needed to remove critical barriers to sustainability by aligning and mobilising international resources. As one of its major activities, the Belmont Forum launches Colla-

4. Moedas, C. The EU approach to science diplomacy. https://ec.europa.eu/commission/2014-2019/moedas/announcements/eu-approach-science-diplomacy_en

borative Research Actions (CRAs) on specific themes that are agreed upon collectively. The funding, however, is the responsibility of the various participating agencies.

Future Earth was launched at the Rio+20 Summit following the promotion by the Science and Technology Alliance for Global Sustainability. This Alliance is composed of the ISCU, the ISSC, the UNEP, the United Nations University (UNU), the WMO and the Belmont Forum.

Future Earth forms a global platform for scientific collaboration on global change research and sustainability around diverse key challenges, namely:

· Deliver water, energy, and food for all, and manage the synergies and trade-offs among them, by understanding how these interactions are shaped by environmental, economic, social and political changes.

· Decarbonise socio-economic systems to stabilise the climate by promoting the technological, economic, social, political and behavioural changes enabling transformations, while building knowledge about the impacts of climate change and adaptation responses for people and ecosystems.

· Safeguard the terrestrial, freshwater and marine natural assets underpinning human well-being by understanding relationships between biodiversity, ecosystem functioning and services, and developing effective valuation and governance approaches.

· Build healthy, resilient and productive cities by identifying and shaping innovations that combine better urban environments and lives with declining resource footprints, and provide efficient services and infrastructures that are robust to disasters.

· Promote sustainable rural futures to feed rising and more affluent populations amidst changes in biodiversity, resources and climate by analysing alternative land uses, food systems and ecosystem options, and identifying institutional and governance needs.

· Improve human health by elucidating and finding responses to, the complex interactions amongst environmental change, pollution, pathogens, disease vectors, ecosystem services, and people's livelihoods, nutrition and well-being.

· Encourage sustainable consumption and production patterns that are equitable by understanding the social and environmental impacts of consumption of all resources, opportunities for decoupling resource use from growth in well-being, and options for sustainable development pathways and related changes in human behaviour.

· Increase social resilience to future threats by building adaptive governance systems, developing early warning of global and connected thresholds and risks, and testing effective, accountable and transparent institutions that promote transformations to sustainability.

It is a 10-year programme that brings together existing global environmental change programmes and incorporates the outcomes of recent planning and agenda-setting processes led by the Alliance members.

The aforementioned cases illustrate that mobilising the S&T community to deal with today's global problems is thus a complex matter. It is not only a matter of doing the research. Equally important is the translation into useable knowledge and the organisation of dialogue with the policy-making realm. This is where science diplomacy comes in as a tool to streamline and professionalise the relations between the S&T community and the multilateral system.

4. Conclusion: towards a global science diplomacy activity?

The recent trend to step up scientific diplomacy activities in different parts of the world is an interesting one to monitor. It poses the question, for what purposes will states and scientists work together? States have their own reasons, namely the pursuit of their self-interests. But scientists are putting other issues on the table and this might be changing the practices of science diplomacy. Perhaps the most salient development for the future of science diplomacy is indeed the growing awareness of global problems that sovereign states are faced with. They are not only all global in nature; they are also all connected to scientific and technological issues both in order to monitor them and to find solutions to them. Almost all of today's pressing global problems such as climate change or energy security have a scientific component. Hence the need to link global governance with scientific evidence. This is exactly what Agenda 2020 foresees. For the sustainable development goals to be reached, different actors need to do their part: governments, the private sector, civil society and also the scientific communities. Science diplomacy might therefore be just the tool we need to realise these goals.

In conclusion, we can say that the UN and the S&T community have already embarked upon an increased involvement of S&T in global policy making. This is not only bringing hope for better global policy-making in order to tackle today's serious global problems, it also contributes to a change-process of the multilateral system itself. But the result is also an increasingly complex global governance structure where scientists and policy-makers can interact. These interactions are not without problems, as both states and the scientific communities have their own interests and speak a different language. Bringing S&T to the global policy realm is therefore not a simple endeavour and in order to be effective it needs to be further professionalised and developed as a practice. This can be done through moving science diplomacy away from the soft power rhetoric and self-interests of states towards a global level where it can be used as a tool to achieve better global governance. Inspired by the triple approach to science diplomacy at a national level, one can therefore see three areas where such a **global science diplomacy** effort can be further developed.

The first area is that of **science in global diplomacy**. As most of the S&T community is for obvious reasons primarily interested in doing research, and not necessarily in diplomatic actions, the issue is how to bring all relevant issues to the right places. While not all scientists need to engage in science diplomacy directly, there should at least be a general understanding amongst all of them on the mechanisms of science advice at a global level. And for those scientists who do act as science diplomats, awareness and skills are needed regarding the processes of interacting with diplomats and policy-makers.

A second area is that of **diplomacy for global science**. Here we are talking about diplomatic actions at the level of multilateral organisations aimed at facilitating S&T collaborations in the context of dealing with global problems. At a multilateral level this mainly involves the opening up of the policy realms to S&T advice. States could do the same, but meanwhile they also have to open up their national funding schemes in order to fund the required research. Furthermore, diplomats and policy-makers at both state and multilateral level need more awareness and skills on how to engage with the S&T community.

A third area can be labelled **global science for global diplomacy**. The S&T community is not only organised into disciplinary and epistemic communities but also in advocacy networks. These organisations are at the nexus of global science-policy interactions and need funding for the support structures in order to deliver S&T advice at a global level. Helping to support not only the relevant research but

also the much-needed international organisations for partnering using the multilateral system, can be seen as a major responsibility of states.

Together, these three areas can be regarded as the building blocks of a global science diplomacy programme or agenda. Further developing such an agenda could be a joint effort of the S&T organisations such as the ICSU or the ISSC, S&T funding agencies and global organisations. The stakes are high, as dealing with global problems such as climate change are major challenges for humanity. This paper has pointed to a number of developments that bear the promise of making the global governance of such problems more feasible. Amongst them are the opening up of the multilateral system to S&T input that goes well beyond the passive practice of science advice as well as the introduction of measurable and monitorable global governance goals. Obviously, this does not mean that we can expect that scientists will save the world, or that states will (or even should) hand over their sovereign powers to scientists. But multilateral policy-makers badly need S&T input in order to understand the problems and challenges, to draft effective policies, to monitor what is happening and to develop innovative solutions. This means not only that scientists and diplomats need to step up their interactions in the context of the Multilateral Mode 2.0 environment. It also means that states, regions, NGOs as well as the S&T community all need to take actions to further their progress their dialogue and collaboration. Developing a global science diplomacy agenda should therefore be a priority for all those concerned for the sustainable future of the planet and its present and future inhabitants. A first step towards such a global science diplomacy initiative could be the drafting of a strategic document that outlines a vision on how S&T could be best integrated into the tackling of global challenges. Such a vision could then be operationalised in tools that deal with both the complexities of formulating often disputed scientific advice and the complexities of global policy-making. The big question then is: who is willing and capable to take the lead in such an initiative? Perhaps the answer is: a coalition of S&T organisations, major funding agencies and multilateral organisations. After all, global challenges deserve global solutions.

States, regions, NGOs as well as the S&T community all need to take actions to further their dialogue and collaboration.

References

Ackerman, D. (2014). *The Human Age. The World Shaped by Us*. London: Headline publishing group.

Agar, J. (2012). *Science in the Twentieth Century and Beyond*. Cambridge: Polity Press.

Arndt, R. (2006). *The First Resort of Kings: American Cultural Diplomacy in the Twentieth Century*. Washington, DC: Potomac Books.

Bernhardt, J. (2012). *Science-Policy Interaction and the IPCC. A Proposal for a Comprehensive Concept of Effectiveness and an Analysis of the Current Structure of the Intergovernmental Panel on Climate Change*. Hamburg: BIOGUM Research Paper, No. 26.

Colglazier, W. (2015). Sustainable Development Agenda: 2030, *Science*, Vol. 349, Issue 6252, pp. 1048-1050.

Davis, L.S. and Patman, R.G. (2015). *Science Diplomacy: New Day or False Dawn?* Singapore: World Scientific Publishing Co.

Greenaway, F. (2006). *Science International: A History of the International Council of Scientific Unions*. Cambridge University Press.

Moedas, C. (2016). Science Diplomacy in the European Union, *Science & Diplomacy*, vol. 5, (1).

Nye, J. (2004). *Soft Power: the Means to Success in World Politics*. New York: Public Affairs.

Nye, J. (2011). *The Future of Power*. New York: Public Affairs.

Pigman, G.A. (2010). *Contemporary Diplomacy*. Cambridge: Polity Press.

Stone, D. (2013). *Knowledge Actors and Transnational Governance: The Private-Public Nexus in Policy Making in the Global Agora*. London: Palgrave Macmillan.

Talberg, J. et al. (2013). *The Opening Up of International Organisations. Transnational Access in Global Governance*. Cambridge: Cambridge University Press.

Thakur, R. and Van Langenhove, L. (2006). "Enhancing Global Governance Through Regional Integration", *Global Governance: A Review of Multilateralism and International Organisations*, Vol. 12, No. 3, pp. 233-240.

Turekian, V.C., Neureiter, N.P. (2012). Science and Diplomacy: the Past as Prologue, *Science Diplomacy*.

Van Langenhove, L. (2010). The Transformation of Multilateralism Mode 1.0 to Mode 2.0, *Global Policy*, 1(3), pp. 263-270.

Van Langenhove, L. (2011). *Building Regions: The Regionalisation of the World Order*. London: Ashgate.

The author

Luk Van Langenhove has been Director of the United Nations University Institute for Comparative Regional Integration Studies (UNU-CRIS) since 2001. Since 2016 he has also been a research professor at the Institute of European Studies at the Vrije Universiteit Brussel where he acts as the scientific coordinator of a project on science and cultural diplomacy. This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 693799 as part of the "European Leadership in Culture Science and Innovation Diplomacy" (EL-CSID) project (see www.el-csid.eu). Since 2016 he has also been Senior Advisor on European Affairs for Warwick University.

Previous appointments and assignments include: Deputy Secretary-General of the Belgian Ministry for Science Policy, Vice-President of the International Social Sciences Council and has held lecturing posts at the College of Europe, Maastricht University, Murdoch University, the S. Rajaratnam School of International Studies (Singapore) and the Université Libre de Bruxelles.

He is the author of several monographs, including *Innovating the Social Sciences* (2007), *Building Regions* (2011), *People and Societies* (2010) and *De Opmars van de Regios* (2015), and editor of numerous academic books such as *Positioning Theory* (1998), *Global Politics of Regionalism* (2005), *The EU as a Global Player* (2006) and *The EU and Multilateral Security Governance* (2013). He has also published many articles in journals such as *Nature, The Journal for the Theory of Social Behaviour, Contemporary Politics*, and *The European Journal of Integration*.

Acknowledgements

The author wishes to thank Richard Higgott and Sebastian Oberthur, both affiliated to the Institute of European Studies at the Vrije Universiteit Brussel, for their comments and remarks on a previous draft of this text and Pascale Vantorre at UNU-CRIS for her editorial help.

Col·lecció FOCIR pensament Edita FOCIR, Federació d'Organitzacions Catalanes Internacionalment Reconegudes
Autor Luk Van Langenhove Disseny gràfic Artefacto Impressió Igràfic Correcció Tradnologies
Dipòsit legal B-9931-2016 ISSN 2462-5086

FOCIR Via Laietana, 54, 2n pis, despatx 213. 08003 Barcelona
932 690 540 · www.focir.cat · secretaria@focir.cat

Focir pensament

F·O·C·I·R

FEDERACIÓ
D'ORGANITZACIONS
CATALANES
INTERNACIONALMENT
RECONEGUDES

Diputació Barcelona

Generalitat de Catalunya
Departament d'Afers i Relacions
Institucionals i Exteriors i Transparència
Secretaria d'Afers Exteriors
i de la Unió Europea