Innovating Together? The Age of Innovation Diplomacy

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As the globalization of science and innovation intensifies, policy makers around the world are looking for new ways to shape and influence its dynamics.

Until recently, these efforts have focused on *science diplomacy:* enabling international scientific research partnerships and influencing foreign policies with scientific evidence and advice. However, there is a growing interest in facilitating international collaboration on innovation, with a range of new collaborative approaches emerging.

At first blush, these efforts at *innovation diplomacy* look merely like a continuation of science diplomacy into a somewhat more commercial arena. Yet this is precisely what makes international collaboration more complex: thorny questions need to be resolved about which parties in the relationship are capturing the commercial as well as the public benefits. This is not to say that collaborating on innovation is a zero-sum game; on the contrary, such collaboration often results in strong mutual advantages. However, recent experience has shown that policy makers, businesses, and other stakeholders need a more sophisticated approach to assessing the risks and opportunities found at every stage of the innovation value chain.

This chapter describes the shift from science diplomacy to innovation diplomacy, drawing attention to the new challenges encountered and the new skillsets required. It then highlights the range of initiatives implemented by policy makers around the world to shape these dynamics for both national and mutual interest. Finally, it sets out steps that policy makers need to put in place for a more effective approach to innovation diplomacy in the future.

From science diplomacy to innovation diplomacy

Diplomats have never really had a monopoly on influencing international relations. The power of the international scientific community to shape international relationships, for instance—from sidestepping politics to helping avoid military conflict—has been demonstrated as early as the 18th century. The United Kingdom (UK)'s Royal Society appointed its first Foreign Secretary in 1723, nearly 60 years before the British government created an equivalent post.[1]

Yet there is no doubt that science has become an ever more important force for intermediating global relations in recent decades. In their analysis of the trend, the Royal Society outlines three different ways in which governments have sought to support and shape these collaborative relationships:[2]

- informing foreign policy objectives with scientific advice (science in diplomacy);
- facilitating international science cooperation (diplomacy for science); and
- using scientific cooperation to improve international relations between countries (science for diplomacy).

Although science diplomacy may have multiple objectives, it is most commonly couched in the language of global public goods. A former Chief Scientific Advisor at the US State Department (a role first created in 2001, and one that has since been replicated by many countries around the world) defined 'science diplomacy' as 'the use of scientific interactions among nations to address the common problems facing humanity and to build constructive, knowledge based international partnerships.'[3]

The international networks and institutions used for science diplomacy have grown significantly in profile and professionalism in recent years: from the annual G7 meeting of science ministers last held in Berlin in October 2015 and the first World Summit of official government scientific advisers held in Auckland in 2014 to the creation of a new Scientific Advisory Board to the UN.[4]

Yet as science has become ever more a global endeavour, so has innovation—not just with the relocation of multinational corporation R&D, but

also with the globalization of many kinds of value chains and the ability to commercially exploit discoveries ever further from their origin.

In response, a shift is under way to move beyond the traditional agendas of science diplomacy—which are often operationalized by promoting academic research collaborations—to the more expansive and at times treacherous terrain of innovation diplomacy. In this diplomacy, collaborative opportunities and risks need to be assessed across every link in the innovation value chain.[5]

Although there is no agreed definition of 'innovation diplomacy', the term is widely considered to include publicly funded support for the following four types of activities:

- exerting soft power and influence through the attractiveness (to talent, ideas, and investment) of a nation, region, or cluster as an innovation hub;
- developing early-stage international pre-commercial and commercial partnerships between businesses, or between businesses and universities, that sow the seeds for future national economic growth and competitiveness;
- creating the framework conditions (intellectual property regimes, migration rules, trade conditions, and information about opportunities and threats) for regional and global innovation partnerships to flourish; and
- encouraging and enabling collaborations between public, private, and non-governmental actors to address global grand challenges from health pandemics to climate change.

Innovation policy initiatives are already undertaken under conditions of 'radical uncertainty'.[6] International collaboration adds a host of additional challenges that range from contrasting national intellectual property regimes and enforcement capabilities and shifts in the alignment of incentives and interests between public and private actors acting overseas to unequal national abilities to absorb and exploit the results of partnerships. Although most innovation diplomacy initiatives are at least intended to allow partners to reap mutual advantage, some analysts have warned of a growing trend in 'innovation mercantilism' in which countries try to exploit international collaborations and trade scenarios to boost domestic innovation capacity—for example, through forced technology transfer or discriminatory public procurement.[7]

Innovation diplomacy should not be seen merely as an 'add-on' to science diplomacy, but as a distinct set of activities and capabilities. The next section looks at how different countries are undertaking innovation diplomacy.

How policy makers around the world approach innovation diplomacy

Despite a dearth of published strategies for innovation diplomacy, the number of bilateral and multilateral dialogues, networks, programmes, and funds designed to boost international innovation collaborations is growing all the time.

A toolkit of practical initiatives for innovation diplomacy is emerging that reaches beyond the realm of foreign affairs to engage several different ministries. For example:

- **Incentivizing collaboration through new funding opportunities.** Examples include collaborative R&D partnerships—both independent bilateral funds and matched funding for bilateral R&D partnerships—which are gradually becoming more common. MATIMOP, the Israeli Industry Centre for R&D, operates over 40 of these international partnerships.[8]
- **Influencing policy frameworks and conditions.** For example, policy dialogues can take multiple forms, from innovation policy and intellectual property dialogues to chief executive forums or joint economic and trade commissions. They can often proliferate—which requires coordination, as seen recently with the latest approach to refining and consolidating the US-India Strategic and Commercial Dialogue in September 2015.[9]
- **Improving access to information and capabilities.** International institutional networks are an example. Internationalizing institutional footprints has become a common strategy for leading global universities and research institutes. This has been far less true for publicly funded organizations that focus on innovation support. Germany's network of Fraunhofer Institutes, with bases in over a dozen countries beyond Europe, is a notable exception.[10]
- **Clarifying national priorities and objectives for innovation to chosen partners.** Examples would include published regional or national strategies. Despite the obvious benefit in helping diplomats craft engagement models, these formal strategies are extremely rare. The political challenges to implementing this type of long-term strategy are exemplified by the fact that one of the best-known instances of this kind of strategy, Australia in the Asian Century,[11] developed

in 2012 under Prime Minister Julia Gillard, was 'officially dumped' a year after its release by Tony Abott's government.[12]

- **Addressing cross-border innovation challenges.** Examples include building global coalitions: These are often facilitated by multilateral or non-governmental actors. Notable recent efforts include Mission Innovation, a commitment by 20 countries and a host of leading industrialists at the United Nations Climate Change Conference in Paris (COP 21) held in November 2015 to work together to accelerate the green energy revolution.[13]

The case of the UK

Some countries have taken very visible steps to improve their ability to shape and influence global science and innovation relationships and outcomes. A case in point is the UK. The UK boasts one of the most highly internationalized systems of science and innovation in the world. Approximately 46% of the UK's scientific publications have an international co-author, and an exceptionally high proportion of UK business R&D is funded from abroad.[14]

The last 10 years have seen a significant increase in the UK's efforts to build capabilities for influencing and enabling international collaboration on science and innovation. Part of this is the result of greater information sharing. The Global Science and Innovation Forum, for instance, chaired by the UK government's chief scientific advisor, helps coordinate the various efforts of UK ministries, funding bodies, academies, and government-funded agencies. Part of this is the result of growing infrastructure—for example, the UK's Network of Science and Innovation attachés has grown to over 90 staff, based in embassies and consulates in 28 countries and 47 cities around the world, and is supplemented by an international network of IP experts.[15] Additionally, in a move that would have been seen as countercultural to the UK's bottom-up approach to science in the past, the UK research funding body Research Councils UK now has several permanent overseas offices, including in India and China.

One of the biggest shifts, however, has been in the creation of significant new funds to enable global collaborations not only in research, but also in innovation. One example is the Newton Fund. Launched in 2014, this fund originally committed £75 million a year for five years to support collaboration with 15 emerging economies in three types of activity:

- **People:** increasing capacity in science and innovation, individually and institutionally, in partner countries;
- **Research:** establishing research collaborations on development topics; and
- **Translation:** translating science into commercial activities and creating collaborative solutions to development challenges and strengthening innovation systems.

In 2015, the Newton Fund was extended by two years (from 2019 to 2021) while the UK's annual commitment to the fund was set to double—from £75 million per year to £150 million per year by 2021—leading to an overall investment of £735 million, with partner countries expected to provide matched resources.

A similar level of ambition is displayed by the 2015 commitment from the UK's Foreign Office to create a £1.3 billion Prosperity Fund over the next five years to 'promote the economic reform and development needed for growth' in priority partner countries.[16]

The case of China

Another notable case is that of China. China's approach to international collaboration as a whole is increasingly strategic.[17] Ever since it began the process of opening up in 1978, foreign policy has been used to advance economic development. More recently, an intensifying web of international connections has spread across every aspect of China's innovation system— from joint academic research to technology transfer and licensing, foreign direct investment, and mergers and acquisitions.[18] As a result, the Chinese innovation system is now densely connected to sources of expertise elsewhere. One thing that distinguishes China's innovation pathway from that of Japan or the Republic of Korea is its willingness, where necessary, 'to buy expertise off the shelf'.[19] Time and again, examples of highly targeted collaborations in research and innovation are evident.[20] As Adam Segal, a China expert at the US Council on Foreign Relations, outlined in his testimony to Congress, 'One of China's great strengths has been a laser-like focus on shaping foreign interactions to serve national innovation goals.'[21]

Steps towards a more effective and impactful approach to innovation diplomacy

Although it is possible to discern a broad range of strategies and a growing prioritization of innovation diplomacy in many countries, it is far

harder to be clear about *what works*—and about the specific link between a particular intervention and its outcome. Evaluating diplomatic initiatives is notoriously difficult. Their influence is often indirect and very long term. However, instead of waiting for a future historian's account of the impact of innovation diplomacy, it is useful to consider whether it is possible (1) to construct a better framework for analysis by identifying the players and principles of innovation diplomacy; (2) to identify and improve the range of tools and public initiatives in question and determine how they map onto different strategic goals; and (3) to consider whether the right data are being collected to judge what is working.

First, it is clear that innovation diplomacy is not merely a subset of science diplomacy. Because of this, policy makers need to be cautious about applying the approaches of science diplomacy to innovation diplomacy. Acknowledging the wider range of players (and therefore interests and incentives) involved is a first step. These players include:

- national innovation agencies, which are playing a greater role as their initiatives become more internationalized;[22]
- companies, both large and small, with wide-ranging risk appetites as well as widely varied preparedness and commitments to corporate nationality;[23]
- philanthropic and powerful non-governmental organizations, such as the Bill & Melinda Gates Foundation; and
- new supranational or multilateral bodies—such as the EU's proposed European Innovation Council—which stem from a recognition that current science diplomacy initiatives do not meet the needs of small and medium-sized enterprises or provide sufficient support to scaling.[24]

Second, investment must be made in mapping, evaluating, and improving the toolkit of public programmes, exploiting what has been learned about successfully promoting open innovation in recent decades. Much of the focus of international economic relations to date has been on the overall enabling conditions, legal frameworks, and trade agreements, with efforts to connect individuals often limited to one-off workshops and trade missions. However, support to build relationships and trust over time can be critical to the success of innovation partnerships.[25] As Nick Rousseau, former Head of Innovation Strategy at the UK's Department of Business Innovation and Skills, points out, 'We need to build skills and relationships across governments to facilitate the human side of innovation diplomacy, including recognition of the extensive time and effort involved in reaching agreement about shared priorities across such a diverse range of stakeholders and perspectives.'[26]

Given what has been learned about the complementary investments in innovation required to exploit R&D spending (such as design, organizational learning, and training),[27] innovation diplomacy initiatives should not be limited to forging R&D partnerships.

Indeed, one of the most valuable aspects of innovation diplomacy initiatives could be to improve the quality and flow of information to companies, universities, and policy makers about the new opportunities and dynamics of innovation around the world. By now, the tropes of globalization are entirely familiar: these include the emergence of transnational production and innovation chains; the growing flows of people, goods, money, and ideas through multiple networks; the shift of economic and hard power towards new strategic centres; and the growing importance of soft power, culture, and people-to-people connections in shaping the evolution and performance of different communities. Policy makers and companies are getting used to the idea that disruptive technologies and business models could arise from and be exploited by any number of emerging innovation hubs. There is constant analysis of what these new forms of power mean—from social media storms that could topple dictators to new business models and methods that range from Uber to 3D printing that might eclipse existing industries. Yet this analysis veers from wildly romanticized to dangerously underestimated. Innovation diplomacy efforts could support a more balanced analysis that helps companies and other stakeholders make better strategic decisions about innovation investment and collaboration around the world.

Third, and finally, if 'what gets measured gets done', it is important to ensure that the right things are being measured. That has implications for how innovation diplomacy efforts are tracked and evaluated. Policy makers need to invest in their theory of change for innovation diplomacy, and they need to get far better at articulating desired goals and outcomes. Standard metrics such as joint publications and joint patents are only one part of the story of judging the impact of collaboration, while even metrics like the number of joint ventures agreed are in danger of being lagging indicators that provide information only at an advanced stage. What is required is to see how

relationships are blossoming early on, in real time, using innovative sources of data such as web scraping, social media, and collaboration platforms (such as GitHub in software development)—these better reflect the wider intangible investments in relationships beyond formal R&D, and thus eventually lead to successful innovation outcomes.

Notes

1 Royal Society, 2010.

2 Royal Society, 2010.

3 Royal Society, 2010, p. 2.

4 See G7 Germany, 2015; the International Network for Government Science Advice, available at http://www.ingsa.org/; and UNESCO, 2014.

5 Wilsdon et al., 2013.

6 Bakhshi et al., 2011.

7 Atkinson, 2013.

8 Information about MATIMOP is available at http://www.matimop.org.il/bilateral.html.

9 U.S. Department of State, 2015.

10 Information about Fraunhofer is available at http://www.fraunhofer.de/en/institutes/international.html.

11 Australian Government, 2012; Bason, 2014; Bentley, 2104.

12 Beeson, 2013.

13 Information about Mission Innovation is available at http://mission-innovation.net/.

14 BIS, 2011, p. 2; BIS, 2012—see Figure 24, p. 34.

15 Nesta's Innovation Policy Toolkit articulates a range of case studies of the Science and Innovation Network's efforts in innovation diplomacy. See http://www.nesta.org.uk/innovation-policy-toolkit.

16 See the UK government's Cross-Government Prosperity Fund, available at https://www.gov.uk/government/publications/cross-government-prosperity-fund-programme.

17 Simon, 2012.

18 Bound et al., 2013.

19 Breznitz and Murphree, 2013.

20 Shambaugh, 2013.

21 Segal, 2011.

22 Glennie and Bound, 2016.

23 Jones, 2006.

24 Information about the European Commission's Research & Innovation website and its 'Designing a European Innovation Council: A Call for Ideas' is available at https://ec.europa.eu/research/eic/index.cfm.

25 Reid et al., 2015.

26 Private communication from Nick Rousseau, BIS, March 2016.

27 Information about Nesta's Innovation Index project is available at http://www.nesta.org.uk/project/innovation-index.

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