EVOLUTION OF DIPLOMACY AND THE FUTURE OF EPISTEMIC COMMUNITIES: SCIENTISTS AS THE DIPLOMATS OF THE 21ST CENTURY

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Abstract:

The structure of world politics has changed to a great extent due to the increasing variety and number of actors and issues that matter for the conduct of international relations. This led to a change in the way that diplomatic communication operates between states. With the diversification of means and interlocutors of diplomacy, diplomacy has evolved and science has been recently understood as a diplomatic tool. Due to this, epistemic communities have appeared as the new actors of diplomacy. As the importance of epistemic community for establishing international relations based on trust has increased, states have started to conduct science diplomacy and to appoint 'science envoys' to foreign countries in order to get maximum benefit from the science diplomacy activities.

Key Words: Public diplomacy, epistemic community, science diplomacy, scientific community, science envoy

Introduction

States have been and still are the primary actors of international relations. However, they are not any more the sole actors of international actors. As a result of globalization and development of a variety of new communication technologies; international organisations, non-governmental organisations, multi-national corporations, and high-profile individuals have become a concern for states to establish and maintain peaceful international relations. The change in the profile of actors of international relations also triggered a change in the rules of the game. As being the most common way of interaction between international actors, diplomacy has evolved to a great extent. Besides traditional ways and actors of diplomatic correspondence, new interlocutors and methods of diplomacy have appeared.

Science has emerged as one of these new dimensions of diplomacy. As it has become much more difficult for the states to gain credibility in the international arena due to the increasing number and variety of actors, epistemic communities have been understood as new diplomatic actors. Their role to create both cognitive and practical changes has been recognised as a useful instrument to build firm relations with the publics of foreign states. Based on this, science diplomacy has appeared as the novel mode of diplomacy.

With the use of science in and for diplomacy, states have started to realize the importance of scientific community in the conduct of science diplomacy. This resulted in the appointment of well-known national scientists as science envoys in order to perform science diplomacy activities with foreign countries much more effectively. States' approach towards appointing scientists as science envoys has confirmed the evolution of diplomacy and the likelihood of the continuity of this evolution in the future.

Evolution of Diplomacy from Traditional to Public Diplomacy

Diplomacy is the most common way of interaction between states. In narrow terms, it can be described as 'the mechanism of representation, communication and negotiation through which states and other international actors conduct their business'.[37] In that sense, until recent times, it was practiced largely by state officials that represent their own countries. The rules that those officials had to follow and the tools that were in their use were clearly set. It was mostly bilateral and/or multilateral meetings organised between foreign policy officials.[38]

However, diplomatic practice has evolved to a great extent due to the changing structure of world politics and development of new technologies. Despite the fact that it is still the basic mode of establishing communication between states, the number and variety of actors responsible for and influential in conducting diplomacy in addition to the issues that have become an issue of diplomacy have increased.In other words, while the state has been the sole actor of diplomatic correspondence and high politics was the core of diplomatic interaction, new actors such as international organisations, multinational corporations, non-government organisations, and high-profile individuals and new issues have gained importance.

[37] Jan Melissen, 'The New Public Diplomacy: Between Theory and Practice', in *The New Public Diplomacy*, ed. Jan Melissen (London: Palgrave Macmillan, p. 5

[38]Naren Chitty, 'Broadening Public Diplomacy', *The International Journal of the Humanities* 6, no. 5 (2008): 48.

Due to the emergence of 'a world with a variety of agents at work',[39] traditional diplomacy has become insufficient for the states to carry out their international relations. Management of international relations through the medium of accredited representatives, particularly with the goal of problem-solving, was the main focus of states while pursuing traditional diplomacy. However, as the environment in which diplomacy is at work has transformed, roles and responsibilities of actors have become blurred. Additionally, counterparts of interlocutors of foreign service officers have also become diversified. Various types of actors that are either involved in diplomatic activity or are at the receiving end of international politics have become a concern for performing diplomacy.[40] Besides the increasing variety and number of actors influential in the international arena, the increasing complexity and uncertainty of global issues has also necessitated pursuing collaborative diplomatic relations at multi-level.

As a result of the enlargement of the scope of diplomatic correspondence and the increasing velocity of diplomacy,[41] governments have realized the necessity and use of sharing information with non-state actors and attaching importance to agenda items beyond the limited framework of political ones. As governance has become more public,[42] the requirements of diplomacy have been transformed and traditional diplomacy has evolved into public diplomacy. Hence, public diplomacy that is about communicating with asymmetrical actors such as foreign publics, non-official groups, organisations, and individuals has appeared as the new dimension of diplomatic communication.[43]

The Role of Epistemic Communities in the Age of Public Diplomacy

As states have felt the need of getting support for their foreign policies, public diplomacy has started to be widely used by them. They have started to employ public diplomacy in order to create perception and legitimize their power based on the approval of their policies by foreign publics.[44] Through 'promotion of the national interest by informing and influencing citizens of other nations'[45] they aimed to increase their power and public diplomacy allowed them to get the ability of setting and framing the agenda.[46] This has become possible with public diplomacy's enabling states perform bottom-up diplomacy in

[39] Robin Brown, 'Information Technology and the Transformation of Diplomacy', *Knowledge, Technology, & Policy* 18, no. 2 (2004):15.
[40]Melissen, 'The New Public Diplomacy', 5.
[41] Chitty, 'Broadening Public Diplomacy', 47.
[42] Brown, ' IT & Transformation of Diplomacy', 17.
[43]Melissen, 'The New Public Diplomacy', 5.
[44] Javier Noya, 'The Symbolic Power of Nations', *Place Branding* 2, no. 1 (2005):57.
[45] Anthony Pratkanis, 'Public Diplomacy in International Conflicts: A Social Influence Analysis', in *Routledge Handbook of Public Diplomacy*, eds. Nancy Snow and Philip M. Taylor (New York: Routledge, 2009), 112.
[46] Brown, ' IT & Transformation of Diplomacy', 15.

order to exert indirect power.[47] To exert indirect power, states carried out public diplomacy through various dimensions, such as media, culture, sports, education, science, and technology.

Due to states' recognition of these new dimensions to be used for diplomatic purposes, the role and place of epistemic communities in world politics have become much more apparent. Given the increasing complexity and uncertainty of international political issues, states have encountered with the difficulty of identifying their interests and making appropriate policies. This led them to attach their attention to the epistemic communities,[48] which are the networks of knowledge-based experts.[49]

In much detail, Peter M. Haas defines the epistemic community as a 'network of professionals with recognised expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue-area'.[50] According to Haas, this network of professionals can be accepted as an epistemic community in case they meet these four conditions: a shared set of normative and principled beliefs that provide the community members with a value-based rationale for their social actions, shared causal beliefs that allow them to clarify various linkages between possible policy actions and expected outcomes, shared notions of validity to identify a set of criteria for assessing and confirming knowledge in the specialized field, and a common policy enterprise that match a set of common practices with a set of problems based on the belief that applying those practices to that set of problems will boost human welfare. [51]

Based on these four characteristics, epistemic communities have been considered as playing an important role in today's international relations in two different aspects. These are international policy coordination[52] and construction of world politics.[53] In other words, epistemic communities that consist of both natural and social scientists from any discipline or profession get the power to create an impact on different aspects of international relations. As long as they have 'a sufficiently strong claim to a body of knowledge that is valued by

[47] Joseph S. Nye, Jr., 'Public Diplomacy and Soft Power', *The Annals of the American Academy of Political and Social Sciences* 616(2008): 94-109.
[48] Peter M. Haas, 'Introduction: Epistemic Communities and International Policy Coordination', *International Organization* 46, no. 1 (1992): 13; Andreas Antoniades, 'Epistemic Communities, Epistemes and the Construction of (World) Politics', *Global Society* 17, no. 1 (2003): 34
[49] Haas, ' Introduction', 12.
[50] Ibid., 3.
[51] Ibid.
[52] Ibid.
[53] Antoniades, 'Epistemic Communities'.

society', they acquire the authority to get involved in policymaking process. [54]While their expertise in specific issues allow them gain authority and power in the decision making process, their common enterprise, that is getting accustomed to certain ways of behaviour and having a vision, leads and allows them to infiltrate their ideas and beliefs to the policies they propose.[55]

Concerning their role to coordinate international policy, epistemic communities' ability to clarify cause-and-effect relationships should be mentioned. Due to their ability to analyse the causes and effects of an issue and to make recommendations about the possible results of various courses of action, epistemic communities can elucidate complex inter-linkages between issues. Epistemic communities' clarification of complexities inherent in the issues and of the results of taking different paths shape states' understanding of the issue in debate and lead them to reassess their interests in following a certain policy path. Considering that epistemic community's intervention into the process affects states' identification of their interests and conceptualization of the issue in debate, epistemic communities make an important impact on the policymakers that seek their advice to formulate policies. More importantly, their involvement in the policymaking process leads to the recognition of new ideas and hence, to the recognition of new policy options. This provides epistemic communities with the power and opportunity to coordinate international policies.[56]

Accordingly, by conceptualizing the conflictual issue from a novel perspective, epistemic communities do not only propose new policy options. They also define the borders of political discourse and steer policymakers under the light of certain norms.[57]The standards set by epistemic communities redefine the range of political bargain. Their values and beliefs in addition to their knowledge help generation of new understandings and this results with political evolution. As the epistemic communities establish interaction with institutional bodies and find the opportunity to convey their ideas, cognitive changes become possible. New practices and new goals can be adopted by the policymakers as a result of the learning acquired due to interaction with epistemic communities.[58]

[54]Haas, ' Introduction', 16.
[55]Antoniades, 'Epistemic Communities', 25.
[56]Haas, ' Introduction', 12-15. For an analysis of the role of epistemic communities in international policy coordination, please see Peter Haas, 'Banning Chlorofluorocarbons: Epistemic Community Efforts to Protect Strato-spheric Ozone', *International Organization* 46, no. 1 (1992): 187–224; Emanuel Adler,'The Emergence of Cooperation: National Epistemic Communities and International Evolution of the Idea of Nuclear Arms Control', *International Organization* 46, no. 1 (1992): 101–145.
[57] Emanuel Adler and Peter M. Haas, 'Conclusion: Epistemic Communities, World Order, and the Creation of a Reflective Research Program', *International Organization* 46, no. 1 (1992): 375-379,
[58] Adler and Haas, 'Conclusion', 385-388.

As a result of the cognitive changes stemming from the interaction between epistemic communities and policymakers, role of epistemic communities goes beyond formation of new policies. Epistemic communities also play an important role in the reconstruction of world politics.[59] The epistemic community members convince other actors in the legitimacy of their ideas. In relation to it, recognising the issue at stake from different perspectives and at a new level of awareness becomes possible.[60] Based on this power to influence the decision-making process, epistemic communities acquire the power to construct politics.[61]

In other words, as being 'socially constructed thought frameworks',[62] interaction of epistemic community with decision-makers makes a change both in the social discourse and practice based on their common enterprise. Since epistemic communities cannot be thought in isolation from their social context, their impact does not remain limited to proposing solutions to a policy problem. They also play role in creating a change in the existing views and hence, in the discourse. Since reality is based on their knowledge, epistemic communities have the ability and power to impose certain discourses and inject particular beliefs on and within social structures through making a change in people's conceptualization of an issue. [63] Through providing new ideas and vision as a result of their political and social interactions, epistemic communities shape reality.

More clearly, while the knowledge of epistemic communities operates at practical levels, their values and common enterprise operate at the cognitive level and these two levels shape and are reshaped by each other.[64] This becomes possible either with the direct or indirect involvement of epistemic communities to the policy process. They directly influence the process as representatives of bureaucracy, of international organisations, and/or as decision makers themselves, or indirectly as advisors, officers of think-tanks, journalists.[65]

Through both direct and indirect involvement, epistemic community members make an impact on the agenda-setting. Within the framework of their common enterprise, they contribute in the inclusion of new issues, exclusion of the existing ones, and reshaping the conceptualization of an issue. They can also mobilize people to get support for their ideas. International meetings, presentations, press conferences, public discussions, lectures, and

[59]Antoniades, 'Epistemic Communities'.
[60] Adler, 'The Emergence of Cooperation', 124.
[61]Antoniades, 'Epistemic Communities', 21.
[62]Ibid., 22.
[63]Ibid., 29.
[64]Ibid., 28-29.
[65]Ibid., 31-32.

publications provide them with the necessary tools they require in order to achieve this.[66] These all enable them have the power they require in order to exert pressure on the political system and to make it act in accordance with their outlook.

Hence, interaction of epistemic communities with different political and social groups in policy process leads to a change both at the cognitive and practical level. They play role in states' conceptualization of the issues at stake and of their interests. This change in states' conceptualization of the issues under discussion and of their interests in relation to these issues leads to a revision in the actors' self-understanding and behaviour. At the end, the interplay between the cognitive and practical level triggers a structural change or continuity in world politics as the proof of the impact of epistemic communities on its construction.

Science Diplomacy

The impact of epistemic communities on coordinating and shaping state policies is especially evident in foreign policy making. Epistemic communities contribute in the formation of new practices that would not be taken into consideration without their intervention. As their understandings and values become a part of international politics and as epistemic communities penetrate into bureaucracy through direct or indirect ways, they become influential in the formation of international relations.[67] This creates an impact on the nature of policies drafted since 'cognitive proximity'[68] of the epistemic community influences policymaking process for drafting much more collaborative policies.

The commonalities that epistemic communities share allow them to act as the 'promoters of cooperation' beyond their national borders[69] since policymaking process that depends on shared understanding ends much more possibly with designing collaborative policies. [70]Their knowledge and shared values increase the importance of epistemic communities while conducting negotiations on transnational basis. Due to their contribution to find a fresh and collaborative solution to the existing problem and to convince other actors including the society for the implementation of that policy option,[71] foreign policy makers recognise epistemic communities as one of the influential actors of public diplomacy. This

[66]Ibid., 33.
[67] Adler and Haas, 'Conclusion', 373-374.
[68] Cited from Stefan Hennemann, Diego Rybski, Ingo Liefner, 'The Myth of Global Science Collaboration—Collaboration Patterns in Epistemic Communities', *Journal of Infometrics* 6 (2012): 218.
[69] Aysegul Kibaroglu, 'The Role of Epistemic Communities in Offering New Cooperation Frameworks in the Euphrates-Tigris River System', *Journal of International Affairs* 61, no.2 (Spring/Summer 2008): 192.
[70] Adler and Haas, 'Conclusion', 371-372.
[71]Kibaroglu, 'The Role of Epistemic Communities ', 191-192.

leads to the appearance of science as a new tool of public diplomacy and as offering public diplomacy a novel and an effective tool to go beyond its old instruments.[72]

Accordingly, science and technology (S&T) activities carried out by epistemic communities have become to be understood as providing a platform for establishing a true dialogue, instead of one-way messaging.[73] Science has been recognised serving the purpose of public diplomacy as S&T activities were considered to be influential in providing information about foreign publics via direct experience, allowing for attitudinal change amongst a target population, and contributing in the establishment of relationships based on trust and mutual understanding between publics.[74] This clarified the place of epistemic community in the 21st century as the new age diplomats.

Since science is 'the one human endeavor where common purpose and common interests among nations overlapped',[75] capability of the epistemic communities to work beyond national boundaries has offered foreign policy makers the opportunity to get benefit from such a collaborative environment in order to build coalitions or resolve conflicts.[76] The epistemic community established various international networks in order to make research in a larger scale with a higher budget and with more qualified human capital. The foreign policy makers assessed these networks useful for political gains. [77] Hence, due to the raising awareness of the possibility that science can be used to establish peaceful international relations, foreign policy makers and scientific people have become key parts of diplomacy. The relationship between the interests and motivations of these two separate groups[78] increased the potential of science to be used as a diplomatic tool. As a result of the interaction between science and diplomacy, science diplomacy has operated through three different ways: science in diplomacy, diplomacy for science, and science for diplomacy.

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[72] Antônio F. de Lima, Jr., 'The Role of International Educational Exchanges in Public Diplomacy', *Place Branding and Public Diplomacy* 3, no. 3 (2007): 235.

[73] Peter van Ham, 'Power, Public Diplomacy, and the Pax Americana', in*The New Public Diplomacy*, ed. Jan Melissen (London: Palgrave Macmillan), 62.

[74] John Robert Kelley, 'Between Take-offs and Crash Landings: Situational Aspects of Public Diplomacy, in *Routledge Handbook of Public Diplomacy*, eds. Nancy Snow and Philip M. Taylor (New York: Routledge, 2009),73-74.

[75] Joseph Manzione, 'Amusing and Amazing and Practical and Military: The Legacy of Scientific Internationalism in American Foreign Policy, 1945–1963', *Diplomatic History* 24, no.1 (Winter2000): 27.

[76] The Royal Society, *New Frontiers in Science Diplomacy: Navigating the Changing Balance of Power* (London: The Royal Society, 2010), iv.

[77] Jasmina Lijesevic, 'Science Diplomacy at the Heart of International Relations', *E-International Relations* http://www.e-ir.info/?p=3704 (accessed 11 October 2011), 1; The Royal Society, 'New Frontiers', p. iv.

[78] Council for Science and Technology Policy, 'Toward the Reinforcement of Science and Technology Diplomacy (19 May 2008)', http://www8.cao.go.jp/cstp/english/doc/s_and_t_diplomacy/20080519_tow_the_reinforcement_of.pdf (accessed 25 October 2011), 6.

Science in diplomacy is about using scientific information while making foreign policy decisions. As the credibility of the epistemic communityimproved based upon the increasing need for getting benefit from scientific knowledge in carrying out international relations, [79] this dimension of science diplomacy has become important.Wider appearance of scientific issues as a matter of international relations, such as environment, energy, space, health, and as a matter of global challenge increased the need for using science in diplomacy. This required participation of an epistemic community of scientists to the foreign policy issues together with traditional diplomats in order to make the most rational decision.[80]

Diplomacy for science is the second dimension of science diplomacy. It is about the use of diplomacy for scientists and performed in order to facilitate international science cooperation. Scientists need establishment of larger networks in order to carry out international research projects with high budgets and improved infrastructure that is beyond the capacity of one country. Besides budget and infrastructure, implementation of research projects does also require various expertises on different issues and hence, establishing international scientific and technological cooperation is required. Nevertheless, it is not always easy for the members of the epistemic community to build dialogue and establish communication with their foreign colleagues. In order to overcome impediments to building international scientific and technological collaboration, diplomatic support becomes a necessity. Diplomacy for science dimension provides this support to diplomacy through cooperation agreements in science and technology either at government or institutional level.[81]

The third dimension of science diplomacy, science for diplomacy is about benefiting from scientific cooperation with the aim of improving international relations of a country. It includes signature of science cooperation agreements on governmental and institutional level, establishment of institutions for the conduct of international research projects, allocation of educational scholarships, and organisation of science festivals and exhibitions.[82] Through such activities, science contributes to the existing forms of diplomacy that are in the need of alliances established on wider networks. It provides an enabling environment for collaborative relationships as the scientific partnerships are set on non-ideological basis due

[79] Haas, 'Banning Chlorofluorocarbons', 196.
[80] The Royal Society, 'New Frontiers', 5; Bruce Alberts, 'Policy Making Needs Science', *Science* 330 (December 2010), www.sciencemag.org (accessed 26 December 2011), 1287. Also, see Elizabeth L. Chalecki, 'Knowledge in Sheep's Clothing: How Science Informs American Diplomacy', *Diplomacy & Statecraft* 19, no.1 (2008), 1-19.
[81] The Royal Society, 'New Frontiers', 9.
[82] Ibid., 10-11.

to the common enterprise and shared values of the epistemic community members. These commonalities allow the epistemic community to the exchange of ideas freely without regarding cultural, national or religious backgrounds.[83]

Regarding these three different uses of science and diplomacy to the benefit of each other, science offers new ways to carry out international relations. With the involvement of epistemic community into the establishment and conduct of diplomatic relations, 'track two diplomacy' becomes possible besides the official one.[84] This allows for carrying out international relations with additional tools on an informal basis and opens new horizons to achieve peaceful communication between foreign publics in the short-term and between states in the long-term.

Epistemic Communities Becoming Diplomats: Science Envoys

Science diplomacy has three main goals. One of them is to benefit from foreign scientific and technological capacity in order to improve national S&T capacity. That is related to diplomacy for science dimension of science diplomacy.[85] It means being able to access to the frontiers of science without borders, to research facilities, and to leading scientists. It allows getting advantage from foreign capabilities in order to accelerate the scientific development across a broader front without using its own resources to the fullest extent. [86] The second goal of science diplomacy is to promote a country's own achievements in research and development in order to increase its attractiveness for the foreign scientific community and prestige in the international arena. That is about the science for diplomacy dimension of science diplomacy.[87] The third goal is to enable the spread of reason, tolerance, discipline, and critical thinking in the resolution of conflicts. It is about creating scientific internationalism and relates to the science in diplomacy dimension of science diplomacy.[88]

With the aim of achieving these goals, states see epistemic community members as the ambassadors that are able to establish international relations through scientific activities. Due to their engagement with their foreign colleagues, epistemic community is regarded as

[83]Ibid., 11.
[84]Ibid., 12; Mohan J. Dutta-Bergman, 'US public diplomacy in the Middle East: A Critical Cultural Approach', *Journal of Communication Inquiry* 30, no. 2 (April 2006), 102-124.
[85] Tim Flink and Ulrich Schreiterer, 'Science Diplomacy at the Intersection of S&T Policies and Foreign Affairs: Toward a Typology of National Approaches', *Science and Public Policy* 37, no. 9 (2010), 669.
[86]Saban Center for Middle East Policy, The Brookings Institution, '*Science and Technology in U.S. Policy Towards the Islamic World* (January 2005), http://www.brookings.edu/research/papers/2005/01/05islamicworld-singer (accessed 8 October 2011), 4.
[87] Ibid., 4; Flink and Schreiterer, 'Science Diplomacy',669.
[88] Flink and Schreiterer, 'Science Diplomacy', 669; Manzione, 'Amusing and Amazing and Practical and Military', 24.

capable of promoting international cooperation.[89] However, as mentioned before, it does not mean that it is only the politics that benefit from their interaction with the epistemic community. The epistemic community also benefits from its interaction with political actors. Science informs foreign policy makers to find consensus on issues with scientific content[90] and offers new ways of interaction with foreign publics while diplomacy benefits scientists as it facilitates establishment of scientific partnerships.[91] Considering this, science diplomacy requires 'science envoys' both with scientific thinking and with diplomatic skills to get directly involved in policy process and to get maximum benefit from performing science diplomacy.[92]

However, for a scientist to become a science diplomat, there are various qualifications that he should gain and certain responsibilities that he should fulfill. At first, a science envoy should have a vision on the possible role of science for building collaborative international relations. Equally importantly, since building trust facilitates fostering civil relations between different and even adversarial cultures,[93] science envoys should also have reliable names in order to be able to establish relationships based on trust and cooperation between countries.[94]

Furthermore, science envoys should be acquainted both with S&T terminology and with diplomatic language. This can be possible through diplomatic training, secondments, and by pairing between diplomats and scientists and by recruiting science graduates to the foreign service.[95] Also, a scientist entering the diplomatic realm can get used to diplomacy through 'reading diplomacy journals, publications, joining diplomacy associations and organisations, and becoming active in related online communities'.[96] Based on his acquaintance with political and scientific community, a science envoy should be aware of the realities of policymaking and the role and limits of science for foreign policy interests as well. [97]

[89] Farouk El-Baz, 'Science Attachés in Embassies', *Science* 329 (July 2010) www.sciencemag.org (accessed 26 December 2011), 13.
[90] For an explanation of the use of science in diplomacy, see Alberts, 'Policy Making Needs Science', 1287.
[91] Kristin M. Lord and Vaughan C. Turekian, 'Time for A New Era of Science Diplomacy', *Science* 315 (February 2007) www.sciencemag.org (accessed 28 December 2011), 770.
[92] Andrew D. Leavitt, 'A Vote for Scientists As Politicians', *Science* 331 (February 2011) www.sciencemag.org (accessed 28 December 2011), 1010; Karen Kaplan, 'International Opportunities: The Science of Diplomacy`, *Nature* 470 (01 February 2011) http://www.nature.com/nature/journal/v470/n7334/full/nj7334-425a.html (accessed 23 February 201), 425.
[93] Flink and Schreiterer, 'Science Diplomacy',665.
[94] Elias A. Zerhouni, 'US Science Envoy Program Lessons Learned and Recommendations', http://www.whitehouse.gov/files/documents/July_PCAST_Zerhouni.pdf (accessed 12 March 2012).
[95] The Royal Society, 'New Frontiers', 16.
[96] Kaplan, 'International Opportunities', 427.
[97] The Royal Society, 'New Frontiers', 6.

Additionally, a science envoy should have detailed information on the S&T system of his own country. He should be acquainted with various stakeholders of science diplomacy, which include both the research funding and research performing institutions. In other words, a science envoy should have knowledge about the conditions under which S&T stakeholders operate in his country. This requires the science envoy to get into interaction with universities, research centres, industry, and end-users. Through his interactions with different players that are present in the S&T configuration of his own country, a science envoy should have a clear idea about the needs and expectations of these different stakeholders from the conduct of science diplomacy. Moreover, based on the information that he collects through his contacts, he should be able to select priority areas and priority countries for performing much more intensive science diplomacy activities.

Besides having knowledge about the S&T structure of his country, a science envoy should also have an understanding on the S&T structure and the population of the target country. In order to achieve this, a science envoy should follow conferences and events organised by the target country.[98] Through these activities, a science envoy would find the opportunity to collect information about the developments in that country's S&T on real basis besides the ones he would get by analysing written sources or statistics. Also, following S&T activities closely would enable a science envoy to establish and cultivate contact with policymakers and researchers for a proactive, mutual, and systematic sharing of information.[99]

Hence, science envoyship is a challenging task and a scientist that is charged with this mission should have a certain extent of knowledge, capacity, and skills. Based on his knowledge, capacity, and skills, a science envoy should be able to prepare necessary conditions for the initiation and continuity of science diplomacy activities between his own country and the target country. When the atmosphere of mutual trust and understanding is created as a result of the efforts of science envoys, performing effective and durable science diplomacy becomes possible. [100]

[98] Kaplan, 'International Opportunities', 427.
[99] '2nd Report on the Networking of the Science Counselors of the EU Member States and the European Commission in the United States of America', European Union (April 2010) http://eurunion.org/eu/images/stories/eumsscicouns%26cssn2ndrept-4-10.pdf (accessed 9 March 2012), 8.
[100] Manfred Horvat and Nannan Lundin, 'Review of the Science and Technology (S&T) Cooperation between the European Community and the Government of the People's Republic of China' (October 2008) http://ec.europa.eu/research/iscp/pdf/china_eu_en.pdf (accessed 7 March 2012).

Use of a Science Envoy for Effective Science Diplomacy

The need for science envoys is obvious for several decades as the use of science for foreign policy goals has been witnessed in various cases in the past. However, it has become much more evident when the US President Obama in his Cairo speech in 2009 announced implementation of a science envoy programme by US. In his speech, Obama focused on the potential of science to make a new beginning with the countries which do not have peaceful relations with US.[101] Through integrating science to politics -scientopolitics-,[102] he argued that science could facilitate establishing friendly relations between different nations.

Obama stated that the US initiative was about launching a new fund to support technical developments and to facilitate creation of new job opportunities, opening centres of excellence in order to achieve scientific and technological developments in Africa, the Middle East, and Southeast Asia, and appointing science envoys for the establishment of new partnerships between US and Muslim countries. [103]

This focus of US on the implementation of science diplomacy and on the role of science envoys to build diplomatic ties and collaborative relationships highlighted the significance of appointing science envoys to build peaceful foreign relations in the current decade.[104] In addition to this, US emphasis on science envoy programme for performing effective science policy clarified the role of science envoys to eliminate the imperfections in the existing political and scientific configuration.

First of these imperfections is the lack of a clear strategy and lack of a clear division of responsibility among different authorities responsible for conducting science diplomacy activities. Mostly, it is the case that both the country implementing science diplomacy activities and the target country do not have a clear idea on what to offer and what is being offered to them and with whom to establish contact in order to proceed the process. However, to be successful in science diplomacy, a country should have a definite roadmap designed towards a target country or region and the interlocutors of this strategy should be clear about their tasks. In order to enable this, people charged with applying science diplomacy should

[101] Barack Obama, 'Remarks by The President On A New Beginning (4 June 2009)', http://www.whitehouse.gov/the-press-office/remarks-president-cairo-university-6-04-09 (accessed 2 January 2011).
[102] Ahmed H. Zewail, 'Science in Diplomacy', *Cell*141 (16 April 2010) http://www.cell.com/abstract/S0092-8674(10)00376-4 (accessed 15 March 2012), 204.
[103]Obama, 'A New Beginning'.
[104] Zewail, 'Science in Diplomacy', 206.

also have working communication channels amongst themselves and with relevant institutions.[105]

Having knowledge both about the S&T system of his own country and of the target country, a science envoy can ameliorate these deficiencies by developing ideas on the ways to improve the existing collaboration mechanisms between countries. He can analyse the deficiencies that hinder the development of relations and suggest the establishment of new ones in order to improve the cooperation. Having an understanding on the shortages of the existing S&T system of the target country and the needs and demands of the scientific community in that country, science envoy can identify the opportunities that truly serve the needs of the target country' scientists. Hence, knowing about the S&T systems of both sides would help the science envoy to identify the opportunities that would be attractive for the targeted scientific community.[106]

Moreover, having knowledge about the target country in several aspects would make an important difference while designing a science diplomacy strategy towards the target country. With his knowledge, a science envoy can contribute in preparation of a utile science diplomacy strategy towards that country. Since effectiveness of a strategy designed towards a specific country depends on the extent to which it regards the peculiarities of that country, a science envoy can provide foreign policy makers with valuable information on that country. Also, he can detect the obstacles that hinder development of partnerships between the target country and his own country on a more truly basis.

Furthermore, a science envoy can help in tailoring consistent policies towards the target country. Since there are a large number of different organisational actors, government and nongovernmental organisations, private companies that are influential in the conduct of science diplomacy, interactions of a science envoy can be informative about their perspectives and the S&T capabilities and needs of the target country.[107] Based on this, it becomes much easier and possible for the political authorities to make much relevant policies regarding the importance of scientific relationships for peaceful international relations. [108]

In addition to above, as science envoys are officially authorized to carry out science diplomacy activities in and towards the target country, their presence can avoid problems stemming from the ambiguity of roles and responsibilities of various authorities. When a

[105] Flink and Schreiterer, 'Science Diplomacy',676.
[106]For the suggestions on the responsibilities of a science counselor based on the analysis of China-EU relations, see Manfred Horvat and Nannan Lundin, 'Review of the Science and Technology', 70.
[107] El-Baz, 'Science Attachés in Embassies'.
[108] Flink and Schreiterer, 'Science Diplomacy', 676.

country appoints a science envoy, it becomes clear that there is a certain science diplomacy strategy to be applied or at least, to be designed towards the target country. It also becomes clear that it is the science envoy that will be the primary authority to be responsible for carrying out science diplomacy activities and hence, will be the authority to be applied at first both by the national and foreign authorities.

Likewise, as the division of labour and the role of science envoys become clear in the conduct of science diplomacy, cooperation and exchange of information among different states' envoys can also proceed much more effectively. This would facilitate coordination among various state institutions responsible for the conduct of science diplomacy. Improvement of the coordination between state institutions and science envoys of different states facilitates initiation and conduct of collaborative activities and development of a strategic framework for bilateral and multilateral S&T cooperation.

Also, science envoys can be helpful to keep the balance between science and politics while pursuing science diplomacy. Since a science envoy will have updated information both about the scientific activities and political arena, he can impede the scientific interests being exploited or even being sacrificed for political gains. Moreover, in case a science envoy understands that the political and scientific interests clash to such an extent that scientific collaborations are threatened by this clash, he can prevent scientific partnerships from being negatively influenced by the political games with making recommendations for a revision of science diplomacy strategy.[109]

Moreover, science envoys will be helpful to enable continuity between science diplomacy efforts spent in different periods. Since S&T activities should be performed with a long-term horizon and since they require attention over extended periods of time, presence of science envoys facilitates keeping record of the activities carried out so far.[110] In other words, the incoherence and discontinuity between science diplomacy efforts spent in different periods decreases the effectiveness of science diplomacy activities to a great extent. However, if the relationships established and the networks created are institutionalized, science envoys can serve for lasting partnerships. In the absence of such mechanisms and institutions, it becomes much more difficult to carry these networks into the future. Science envoys can avoid this by creating a linkage between the efforts spent in previous times and by different actors. They can act as archives of science diplomatic activities and therefore, both the networks established and the experiences gained can be transmitted into the future.

[109] Ibid.
[110] El-Baz, 'Science Attachés in Embassies'.

Concerning above, a science envoy, as an inexpensive diplomatic tool to improve international relations, can provide states with tangible results in the conduct of science diplomacy.[111] Since in most of the countries existing institutional structure is inadequate for performing effective science diplomacy, science envoys can remedy this deficiency through their efforts mentioned above. Hence, it would not be wrong to argue that appointing science envoys will facilitate establishment of diplomatic ties and collaborative relationships between states and getting such useful results will contribute in the endurance of science diplomacy.

Conclusion

In the recent decades, the conditions under which international relations are carried out have changed to a great extent. The issues that are in the concern of states to carry out their international relations have become diversified. This also led to an obvious diversification in the nature and number of actors that are influential in the international arena. It is to say that, now, states are not the sole actors of international actors. Instead, they have to consider and negotiate with many other actors, such as international organisations, non-governmental organisations, multi-national corporations, and even high-profile individuals and have to negotiate a number of issues with those actors to pursue their interests.

This change in the structure of international politics entailed a revolution in diplomatic communication. Traditional diplomacy remained insufficient in order to meet states' needs that stem from the changes of circumstances under which they establish and execute international relations. As the targets and issues of diplomacy have become various, actors and the instruments to pursue diplomacy have changed. Emergence of new interlocutors and new issues of diplomacy resulted in the evolution of traditional to public diplomacy.

With public diplomacy's gaining importance, science has become to be recognised as an effective tool to perform diplomatic activities targeting foreign publics. Using science to resolve political conflicts with a scientific dimension, getting benefit from diplomacy to further S&T partnerships, and establishing diplomatic relations through S&T activities were considered as constituting various dimensions of science diplomacy.

Due to science's becoming a way of diplomacy, members of epistemic communities have become to be understood as modern diplomats that would serve for establishing peaceful international relations. Since peaceful international relations is based on establishing mutual trust between nations, scientists have been considered as capable of achieving this

[111] Zerhouni, 'US Science Envoy Program'.

through their interactions with foreign scientists. The possible positive impact of S&T activities on establishing collaborative relationships between foreign nations resulted with the appointment of scientists as science envoys to the countries with which states aim to strengthen their relationships. States realized the fact that a science envoy, in case he is vested with certain qualifications, can achieve a lot more than a scientist or a diplomat can achieve through their own separate courses. Owing to his diplomatic skills and knowledge of both scientific issues and political processes, it has been realized that a science envoy can fulfill a great number of tasks for peaceful international relations.

Hence, seemingly members of the epistemic communities will be the diplomats of the 21st century. As being the concrete result of the evolution in the conduct of diplomacy, they will offer new ways of diplomacy besides official negotiation. As a result of the emergence of these new practitioners and new mode of diplomacy, international relations will be hopefully much more friendly and long-lasting.

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