Science Diplomacy in and for Sweden

STINT
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Contents

List of abbrevations

AAAS	American Association for the Advancement of Science
EU	European Union
GDPR	General Data Protection Regulation
S4D4C	Using Science for/in Diplomacy for Addressing Global Challenges
SD	Science Diplomacy
STI	Science, Technology, & Innovation
STINT	The Swedish Foundation for International Cooperation in Research and Higher Education
UK	United Kingdom
UN	United Nations
US	United States of America

Preface

The mission of STINT, The Swedish Foundation for International Cooperation in Research and Higher Education, is to internationalise Swedish higher education and research. STINT promotes knowledge and competence development within internationalisation and invests in internationalisation projects proposed by researchers, educators, and leaderships at Swedish universities.

In recent years science diplomacy has been gaining increased importance internationally, as the world has become more complex and polarised. However, in Sweden the topic has received little attention, apart from the government inquiry on the "Internationalisation of Swedish Higher Education and Research" underlining its importance. While many activities in related organizations, agencies, and ministries would likely fit into the realm of science diplomacy, it remains largely uncharted territory in Sweden, both as a concept and as a topic of discussion of how it might be viewed or applied in a policy context.

To assess options for science diplomacy in Sweden, STINT asked two leading European experts in the field, Prof. Stefan Kuhlmann and Dr Ewert Aukes at University of Twente, to explain and examine Science Diplomacy in a Swedish context. With this report, we hope to lay a foundation for a discussion on strategic dimensions of science diplomacy in and for Sweden, and address questions such as what is it, why might it be relevant, what could be done and by whom?

We would like to thank the researchers and the interviewees that have participated in the study.

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Stockholm, Sweden, February 2022

Executive Summary

This green paper explores the uncharted territory that "science diplomacy" (SD) is in Sweden. It gives an overview of the state of play regarding SD in general and in Sweden. Two main questions are addressed: What potential for science diplomacy exists in the Swedish science, technology and innovation (STI) ecosystem? Which actions can be undertaken to tap into the potential for science diplomacy in the Swedish context? The paper is based on (a) the authors' experience in research projects concerning science policy and science diplomacy, (b) secondary analysis of existing science diplomacy literature, and (c) a set of eight interviews.

While SD-like activities such as trade in the domain of STI or international science cooperation are known to occur for centuries, the term itself received its most notable push onto the world stage in 2008 when the American Association for the Advancement of Science (AAAS) opened its Center for Science Diplomacy. Up until today there is no generally agreed definition of SD. Rather, this green paper argues that it is exactly this fuzzy character of science diplomacy that represents its practical value.

Thus, for the purposes of this paper we treat SD broadly as "collaboration between existing and new stakeholders working in the science, technology and innovation community, the diplomacy community and the policy community on different levels in the multi-level spectrum of decision making within an international politico-scientific context that can be characterised by activities ranging from competition to collaboration."

For long, Sweden's international relations have been based on the principle of non-alignment in peacetime and neutrality during periods of war. The country has a long tradition of initiating and leading international diplomatic initiatives. A prominent example is the "Swedish initiative" in the United Nations (1967–1968) that led to the highly influential 1972 UN Conference on the Human Environment. Applying the aforementioned broad and procedural understanding of Science Diplomacy, one could say that Sweden indeed has long standing experience and considerable performance in what can be read as "implicit" science diplomacy. Still, the notable career of the very term 'science diplomacy' in the last 15 years in the US, UK and the EU is hardly reflected in contemporary Swedish science and technology policy as well as international relations. At the same time, key representatives of the Swedish STI ecosystem expressed interest in the concept.

The remarkable differentiation of Sweden's institutional landscape in science, technology and international relations surely does not make initiating or keeping up a SD discourse easy. Publicly funded science organisations – in particular universities – enjoy considerable scientific independence, not only vis-à-vis the government but also amongst each other. Even within a university, activities of academics and their departments may be rather disjointed, also when it comes to international collaboration.

Many actors in this fragmented system see a need to better orchestrate Swedish international knowledge and diplomatic efforts. Yet, in the Swedish institutional context, science diplomacy would not work if designed in a rigid way and organised in a top-down mode. Orchestrating science diplomacy, especially in the Swedish context, can only work if it starts from an acknowledgement of the different purposes envisioned for it by different stakeholders. Therefore this green paper proposes a non-partisan forum enabling and facilitating debates and joint initiatives of semi-independent Swedish actors around science diplomacy. The forum would offer a curated interaction space for stakeholders interested in orchestrating their international science-based activities. To this end and building on previous work, the green paper suggests a number of procedural and infrastructural principles and requirements, aiming to make the envisaged interaction constructive and productive. Hereby, a key infrastructural recommendation is the establishment of a **"strategic intelligence clearing house"** for science diplomacy, co-owned by all major stakeholders in the Swedish system.

1. Introduction

One of the first times that the notion 'Vetenskapsdiplomati' ("Science Diplomacy") found its way into a Swedish governmental report was in 2017. It was mentioned in a government inquiry on the "Internationalisation of Swedish Higher Education and Research" (Bladh et al. 2018). Besides this 'honourable mention' of science diplomacy as a means for improving bilateral relationships, it has remained remarkably quiet around it in the Swedish science, technology, and innovation (STI) ecosystem. While the concept has stirred foreign policy and science policy practitioners across the globe, the Swedish government – in particular embassies, consulates and trade, investment, innovation and culture promotion and funding actors – has been working with the concept of "innovation diplomacy" under the auspices of the Ministry of Enterprise.

At the same time, with a changing geopolitical scenery and grand societal challenges, such as the UN Agenda 2030 to be tackled, there is arguably a window of opportunity to re-evaluate the means by which Swedish STI actors interact with their international peers. This coincides with Sweden's ambition to position itself as a 'norm entrepreneur' (Thorhallsson & Bailes 2016) global leader in the implementation of that Agenda 2030, which is frequently thwarted by market constraints and geopolitical realities (cf. Kemp Spies 2016).

A definition of science diplomacy is:

"Collaboration between existing and new stakeholders working in the science, technology and innovation community, the diplomacy community and the policy community on different levels in the multi-level spectrum of decision making within an international politico-scientific context that can be characterised by activities ranging from competition to collaboration." (Aukes et al. 2020a; cf. Melchor 2020)

In the wake of a shift from traditional 'club diplomacy' to a more networked form, which runs parallel to the shift from government to governance, science diplomacy often involves a broader range of stakeholders from sub-national or non-governmental organizations (Hampson et al. 2013). This has already led to institutionalized governmental science diplomacy networks in, for example, the United States, United Kingdom, France or Switzerland (Flink and Rüffin 2019; Flink and Schreiterer 2010). Other stakeholders, such as the EU with its dedicated European External Action Service or other EU member states, are also keen on using science diplomacy for foreign policy objectives.

In this green paper, we explore the uncharted territory that science diplomacy is in Sweden. We aim to give an overview of the state of play regarding science diplomacy in and by Sweden, as well as to open up avenues for STINT, The Swedish Foundation for International Cooperation in Research and Higher Education (see also textbox 1) and other Swedish actors to consider when it comes to science diplomacy. Hence, the main questions to be answered here are:

– What are the key issues concerning science diplomacy in the Swedish STI ecosystem?
– Which actions can be undertaken to tap into the potential for science diplomacy in the Swedish STI ecosystem?

To answer these questions, we have undertaken an interview campaign among relevant stakeholders in the Swedish STI ecosystem (see section 2). Through these interviews we explored

a) what stakeholders' understanding of science diplomacy is,
b) how stakeholders assess the potential value of science diplomacy,
c) which stakeholders might already be involved in activities close to science diplomacy, and
d) which stakeholders would or could be interested in investing in science diplomacy activities.

In the following, we describe our approach to this study about science diplomacy in Sweden (section 2). In section 3, we describe the state of the art regarding science diplomacy, including a selection of the latest literature and project outcomes (see also textbox 2). Section 4 covers the empirical results of our interview campaign, e.g. which aspects we found to be crucial for reflecting on science diplomacy in Sweden and for designing science diplomacy interactions in the Swedish context. Then, we describe the recommendations we have for the Swedish STI ecosystem to embrace science diplomacy (section 5) and draw conclusions (section 6).

Textbox 1:
STINT, The Swedish Foundation for International Cooperation in Research and Higher Education

STINT is the commissioning body of this green paper. It is a foundation with the objectives of funding international cooperation, including mobility of researchers on various career levels and educators. STINT has offices in North America and Asia, and organises activities related to the foundation's objectives. Examples of such activities relating to science diplomacy include:

1. University Presidents' summit in Tokyo 2015 and in Kyoto 2018, which resulted in the Mirai project initially funded by STINT;
2. University Presidents' delegations to Korea 2012, Indonesia 2014, and Botswana and South Africa in 2016. The delegation visit to South Africa resulted in SASUF 1 and 2 projects funded by STINT;
3. Contribution to delegation programs organised by the Ministry of Higher Education and Research;
4. Delegations of funding agencies to/from Sweden, examples:

a) Swedish funding agencies to Qatar and return visit by QatarNational Research Fund to Sweden
b) Sri Lankan funding agency with Sri Lankan university presidents to Sweden
c) Nigerian university delegation to Sweden (resulting in their acquisition of a 10-day innovation course at Lund University)

Textbox 2:
S4D4C – "Using Science for/in Diplomacy for Addressing Global Challenges"

S4D4C has been an EU-Horizon 2020-funded Research and Innovation Action ("RIA") and ran from 2018 to 2021. The project was led by the Center for Social Innovation, Vienna, and included a total of 10 European partners ranging from universities, through national academies to science and technology foundations. It revolved around the following topic description
(see also https://www.s4d4c.eu/about/):

"In the current political and societal landscape, the needs, stakes and opportunities pertaining to science diplomacy have increased. However, communication between the scientific and diplomatic communities is not straightforward. There is potential for better harnessing European science and science cooperation for European science diplomacy and foreign policy goals, both at EU and EU Member State-level. Not only can new approaches to scientific advice in EU foreign policy benefit from advances in research, but science diplomats can also harness new ways of carrying out research that offer opportunities for foreign policy impact. The overall objective of S4D4C is to support current and future European science diplomacy for the benefit of European capacities, EU foreign policy goals and especially the development of solutions for grand societal challenges. S4D4C has shaped its partnership so that it can effectively address this objective from an academic as well as a practitioners' perspective."

The S4D4C project is coordinated by the Centre for Social Innovation (ZSI). This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 770342.

2. Study approach

This study is based on (a) the authors' experience in research projects concerning science policy and science diplomacy, (b) secondary analysis of existing science diplomacy literature, and (c) a set of eight interviews. The eight interviewees had different positions in the Swedish science and foreign policy ecosystem. See Table 1 for details about the interviews.

We were provided with the contact information of the interviewees by our contact persons at STINT. Before we reached out to them, our contact persons at STINT inquired each interviewee if they would be interested in a conversation. Although the interviews pinpointed other potentially valuable interviewees, contacting these was outside the scope of this exploratory study.

Type of organisation	# of interviews	Name of organisation(s)
Higher Education	2	Uppsala University, Stockholm School of Economics
Swedish national ministry	2	Ministry of Foreign Affairs, Ministry of Edu cation and Research
Intermediary/Funder	3	Swedish Research Council, Swedish Institute, STINT
Private research funder/conglomerate company	1	Wallenberg Office

Table 1: **Overview of interviewees**

Each interviewee received an information sheet containing a breakdown of the context within which the interview was occurring (Appendix I), as well as an informed consent form (Appendix II). All interviewees returned the signed consent form agreeing to most data uses. All interviews lasted for about 60 minutes. During the semi-structured interviews, we covered topics, such as the cross-border activities of the organisation, interviewee's and their organisation's experience with science diplomacy, potential activities and expectations regarding science diplomacy, and the Swedish international science policy context. Where applicable probing questions or clarification questions were asked. Most interviews had different emphases regarding which topic was interesting for the interviewee. The most striking outcomes of the interviews are discussed in section 4. The interviews were recorded and detailed minutes were taken. The recordings remain confidential on the GDPR-proof, secure servers of the University of Twente. The minutes have been shared with STINT and are deleted from all non-STINT storage.

3. Science Diplomacy: state-of-the-art

Science diplomacy is by no means a solidified policy domain or policy activity, yet. Nevertheless, current debates in academia and results from recent scientific projects, such as S4D4C (textbox 2), point to the fact that science diplomacy has considerable potential as a bridge-building or bridge-maintaining activity across borders. However, the notion is not undebated. In this section, we portray the state of the art regarding the concept of science diplomacy and suggest further readings where applicable. This section is an amalgamation of results from our own project and to a lesser extent from the scientific literature on science diplomacy at large.

3.1 Understanding science diplomacy

The history of the term 'science diplomacy' differs considerably from that of the activities subsumed under it. *Activities* such as trade in the domain of science, technology, and innovation, or international science cooperation are known to occur for centuries. The *term*, however, received its most notable push onto the world stage in 2008 when the American Association for the Advancement of Science (AAAS) opened its Center for Science Diplomacy. As Flink & Schreiterer (2010) note, this rise of the term did not come out of the blue. It was rather the result of various shifts in the global interconnections between STI on the one hand and international relations on the other (see also Rungius & Flink 2020).

Science diplomacy was initially picked up most eagerly by actors in the domain of science advice and only received intensified scientific scrutiny in the past five years.[1] The most-adopted definition of science diplomacy was popularised in 2010 by the British Royal Society in collaboration with the AAAS. It captured science diplomacy as all those processes contributing to (a) the use of more and better scientific evidence in diplomatic activities, (b) the state-supported development of international research connections, and (c) the maintenance of research channels in countries with which relations are tense (Royal Society, 2010). Since then, alternative suggestions to conceive of science diplomacy distinguish types of interest - national, bilateral, multilateral (Gluckman et al. 2017) - or rationales. Based on an empirical analysis, Rungius & Flink (2020) show that science diplomacy can be seen to be based on the following rationales:

Science diplomacy activities have been understood as

– response to global challenges,
– remedy to the collective action failure of which global challenges are a symptom,
– reiteration of the arguably collaborative nature of science,
– promotion of scientific conduct also outside the original domain,
– rationalisation of politics through science (technocratisation), or
– soft power mechanisms to strategically increase national influence abroad.

These conceptions of science diplomacy and the debates about them are by no means definitive and its value is still scrutinised. Part and parcel of the difficulty of grasping the term in a concrete, clear-cut manner is the fact that policy practitioners active in science diplomacy often include such divergent activities as science advice, STI trade, strategic foreign STI policy, or international science cooperation in it. This wide variety of activities has led Rungius & Flink (2020, 7) to conclude that science diplomacy has the danger of being an empty "catch-all phrase", from this point of view [2].

In terms of conceptual clarity, this can be interpreted as a disadvantage of the notion and might lead to questioning its purchase. However, we argue that it is exactly this fuzzy character of science diplomacy that represents its practical value. First of all, science diplomacy has been characterised as a 'boundary object'. Boundary objects are "both adaptable to different viewpoints and robust enough to maintain identity across them" (Star and Griesemer 1989). We follow Kaltofen & Acuto (2018) in that science diplomacy is a phenomenon that exhibits a productive tension due to the different interpretations of the notion, which each actor brings to the table. Neither interpretations by scientists nor those of diplomats take precedence in what science diplomacy could mean. Interpretations from both spheres have to be respected (Aukes et al. 2020a). In other words, collaborating in science diplomacy does not require an upfront clear-cut definition of what it is (and what it isn't). We argue, and present this also in our approach of how to organise science diplomacy activities (Aukes et al. 2020b; 2021), that any interaction between actors from the two epistemic communities of science and diplomacy about scientific diplomatic activities needs to begin with a reflection phase in which an ad hoc definition of science diplomacy is sought.

[1] In the European Union, this scientific scrutiny is represented by three Horizon 2020 research projects on the topic: EL-CSID, InsSciDE, and S4D4C. The efforts of these research projects resulted among others in the launch of a "European Union Science Diplomacy Alliance", which aims to bring together interested actors from both the scientific and diplomatic sphere.
[2] For a similarly strong conclusion, see Penca (2018).

In consequence, what science diplomacy is exactly in any given situation is a matter of discussing and negotiating its meaning between actors who intend to get involved with it. The inclusive image of an 'umbrella term', thus has our preference (Aukes et al. 2020b).

Besides conceptual debates, there is also a critique targeting science diplomacy that has to do with its affirmative character. Flink (2020) notes that participants in the science diplomacy discourse portray it as a silver bullet and that it supposedly can easily address grand challenges, while risking instrumentalisation of scientists for (geo-)political gain.[3]

3.2 Doing science diplomacy

The question of how to do science diplomacy and – related to that – when a policy practitioner or scientist is a 'science diplomat', is similarly unanswered as the one about the concept's definition. Nevertheless, a few publications have recently attempted to concretise this. The main aspect of this debate is whether someone doing science diplomacy is

a) either a "scientist with uncanny diplomatic capabilities",
b) or a "diplomat who understood the implications of the underlying science",
c) or someone who cannot be allocated to either group, but represents its own, new role on the intersection between the two spheres (cf. Moomaw 2018).

Following Melchor (2020), the above is not so much an either/or question: all three types exist in the science diplomacy ecosystem. Melchor (2020) sees the important difference in whether or not the science diplomat holds an institutionalised, i.e. formal, position in the field or whether it is rather informal.[4] This point of view is echoed in the comparative case analysis of the S4D4C project, where Young & Rungius (2020) contend and elaborate that there are explicit and implicit forms of science diplomacy. Regardless of the institutionalised/non-institutionalised or explicit/implicit divides, due to the fuzziness of the professional arena, science diplomats benefit from "personal initiative, advocacy [skills], creativity, abilities, networks, priorities and professional identification" (Rungius & Melchor, 2020b). Given the empirical observation that there is a large variety of science diplomats in terms of institutionalised position and that professionals

[3] This has already led to an episode in which the Spanish government renamed Spanish diaspora scientists Spanish 'science diplomats', although they left Spain due to unfavourable funding conditions in the first place (Moro-Martín, 2017). In any science diplomacy arrangement, the interests of both the scientific and diplomatic community must be respected and treated equally.

[4] Melchor (2020, 418) also gives an overview of what kinds of knowledge and skills are valuable for science diplomacy scientists and diplomats to bring to the table.

may deliberately choose not to identify as science diplomats, we see the defining aspect of *doing* science diplomacy and *being* a science diplomat not in being called or paid as 'science diplomat', but rather in the 'literacy' in both spheres professionals exhibit that enables them to translate and mediate between both (Aukes et al. 2020a). From our point of view, science diplomats can thus be understood as professionals "at the interface of science and foreign policy" (Degelsegger-Márquez et al. 2019), who engage in practices of scientific knowledge production, societal problem deliberation, and politics relating to those problems (Aukes et al. 2020b).

Various publications have explored actors involved in what could arguably be called science diplomacy, be it explicitly, or implicitly. Selected publications cover national approaches in France, Switzerland, United Kingdom, Germany, Japan, and the United States of America (Flink & Schreiterer 2010), a comparison of German and Swiss science and innovation centres (Epping 2020), or the foreign policy and science diplomacy set-up of the European Union (Lopez de San Roman and Schunz 2018; Rüffin 2020). Additionally, publications cover types of science advice mechanism (Melchor et al. 2020, 27) and a generic typology of scientific diplomatic job descriptions (Melchor 2020).

3.3 Purposes

Science diplomacy has been found to be positioned for various purposes. One of the earlier understandings that was still clearly coloured by the international relations context the notion stems from, is that of being a mechanism of soft power. Soft power represents mechanisms that do not coerce other actors to act in a desirable way (i.e. the domain of 'hard' power), but rather to persuade them to do so (Nye 2008; Wilson 2008). Examples of such soft power mechanisms that can be subsumed under science diplomacy are cooperation in the domain of STI (Legrand and Stone 2018) or, specifically, research funding programs (Leese 2018). Although it may be conceptually interesting to contemplate what power effects science diplomacy has, it is of less value, if the goal of a science diplomacy activity is to address global challenges. If we follow the German sociologist Ulrich Beck, the transboundary grand challenges we face globally, which are characterised by civilisational selfendangerment and planetary finiteness, give reason to abstain from the rivalry between states that is so common for the soft power notion of international relations.

The debate on this point has developed such that it does not anymore strongly question what kind of 'power' science diplomacy is, but rather, where on a spectrum between collaboration and competition a science diplomacy activity or mechanism can be situated. Ruffini (2020), for example, notes that the mainstream debate about science diplomacy is very much dominated by its cooperative and collaborative nature. He juxtaposes this with his observation that science diplomacy inherently incorporates a competitive trait and illustrates this with national schemes to attract foreign knowledge workers and the general discourse in selected Ministries of Foreign Affairs, which is influence-oriented (Ruffini 2020, 374-376). Such mixed goals are also reported by "professionals [...] at the interface of science and foreign policy" in a needs assessment carried out by S4D4C (Degelsegger-Márquez et al. 2019, 19-23). The inherent "interest paradox" is also mentioned in S4D4C's transversal case analysis by Rungius & Melchor (2020a, 5) as a problem stemming from the unclear role of national interest. They pinpoint the crucial issue that competition means something else in the economic domain (e.g. market competition), political domain (e.g. influence and progress vis-a-vis other countries), and the science domain (e.g. the generation of new knowledge and acquiring the funds to do so). In other words, depending on the eye of the beholder, science diplomacy should function differently, and should be geared towards different goals.

Besides these more analytic perspectives of scholars attempting to understand the phenomenon of science diplomacy, one can also take a normative stance - as the authors have done - and propose a way, in which science diplomacy can be positioned to contribute towards addressing the global challenges that have arisen due to detrimental socio-technical systems currently in place. If we consider science diplomacy to carry the potential of a reflective governance mechanism, constructive and productive principles of interaction can be formulated that guide actors who want to collaborate towards tackling grand challenges (Aukes, Kuhlmann & Ordóñez-Matamoros 2021; Aukes, Ordóñez-Matamoros, Kuhlmann & Honarmand Ebrahimi 2020b; Aukes, Wilsdon, Ordóñez-Matamoros & Kuhlmann 2021).

Science diplomacy is not the only 'niche diplomacy' being pushed onto the global foreign policy agenda (Van Genderen & Rood 2011). 'Niche diplomacies' can be positioned by middle powers, such as Sweden (Kemp Spies 2016), in policy domains that they are strong in, as they are usually not capable of investing in a broad range of diplomatic areas (Van Genderen & Rood 2011, 14) (see Textbox 3).

Textbox 3: Science diplomacy and (other) niche diplomacies

Examples of such niche diplomacies are economic diplomacy or technology diplomacy, as promoted by ministries in the Netherlands. However, awareness is also raised for innovation diplomacy (Leijten 2017; Griset 2020), cyber/digital diplomacy (Tanczer et al 2018; Kadlecova et al. 2020; Gilboa 2016), environmental diplomacy (Ruffini 2018; Özkaragöz Doğan et al. 2020; Paglia 2021; Ali & Voinov Vladich 2016), water diplomacy (Wilder et al. 2020; Van Genderen & Rood 2011). Already in 2017 a report by the Dutch Advisory Council for Science, Technology, and Innovation ("Adviesraad voor Wetenschap, Technologie en Innovatie", AWTI) advocated the introduction of the notion of STI diplomacy, which may make sense given the overlap between those domains (Rosenthal et al. 2017).

The variety and diversity of niche diplomacies not only points to the possibility of specialisation of middle powers lacking diplomatic force. It also shows that stakeholders in many policy domains begin to realize the geopolitical dimension and potential of said policy domain. Thus, there is a competition for policy-maker's attention and resources. Furthermore, oftentimes, domains are not exclusively related to one policy domain, as the example of STI diplomacy illustrates: in common ministerial organisations, such diplomacy could be associated with the ministry for science, higher education, economy, technology etc. As the term is used here, it is not a problem if what becomes a science diplomacy mechanism de facto overlaps with another policy domain. In the end, there needs to be an interaction space, in which stakeholders receive the opportunity to define what science diplomacy means in their specific case; and this is especially the case with grand societal challenges that oftentimes do not anymore fit traditional ministerial silos, but require cross-cutting governmental and governance engagement.

Textbox 4: Science diplomacy-related actors and initiatives in Sweden

Although Sweden as of now lacks actors or initiatives that are explicitly characterised as science diplomacy, there are some that can be called related to it. First, Sweden has invested in a considerable network for innovation diplomacy (cf. textbox 3). The network is managed by the Ministry of Enterprise, but is a collaboration between the Ministries of Enterprise, Education, Infrastructure and Environment, in close collaboration with the Ministry of Foreign Affairs. By now, this has yielded seven innovation and research offices across the world. The network's purpose is the promotion and support of innovation cooperation and Sweden as an 'innovation country'. The counsellors posted at the network's offices function as brokers, advisors and 'door-openers'. Besides this innovation diplomacy network, the Swedish government has bilateral innovation partnerships with France and Germany.

A variety of networks has also been initiated for Swedish government agencies. These include, for example Team Sweden, in which governmental agencies cooperate on various international activities. Another example of such agency networks is IntSam, which brings together governmental funding agencies such as Vinnova, the Swedish Research Council, Formas, and Forte for coordinating their international activities.

Swedish universities have been active in structural international cooperations, as well. Examples are the Karolinska Institutet in Hong Kong, the Stockholm School of Economics with campuses in Riga and St Petersburg, and declined or defunct initiatives such as the Joint Research Centre on Photonics (collaboration between KTH Royal Institute of Technology and Zhejiang University) or the Sino-Swedish Campus Fudan (collaboration between KTH Royal Institute of Technology, Karolinska institutet, and Chalmers University; 2005-2010). An ongoing project involves Swedish and US American universities for Collaboration, Academic Leadership & Innovation in Higher Education (CALIE).

Of course, globally well-known events related to knowledge and science that are hosted by Sweden are the Nobel Prizes and the Nobel Week.

4. Leveraging dormant Science Diplomacy potentials

The country profile compiled by the Innovation Policy Platform characterises the Swedish science and technology ecosystem as strong.[5] Sweden's universities and many companies are among world leaders in their respective domains. Nevertheless, the relatively small size of the country in terms of population, requires a considerable degree of international collaboration to achieve and maintain a competitive position in global science, technology and economy. Indeed, Swedish universities and companies are commonly well embedded in international networks.

Since the 20th century, the country's international relations have been based on the principle of non-alignment in peacetime and neutrality during periods of war. What is more, Sweden has a long tradition and culture of initiating and leading international diplomatic initiatives. A prominent example is the "Swedish initiative" in the United Nations (1967–1968) that led to the highly influential 1972 UN Conference on the Human Environment, with science as an essential component (Paglia 2021; Groom 2013; cf. Kemp Spies 2016) - practically the inception of international environmental policy.

Applying a broad and procedural understanding of Science Diplomacy (as we suggest in section 3.2 above) one could say that Sweden indeed has long standing experience and considerable performance in what can be read as "implicit" science diplomacy (Young & Rungius 2020). That being said, it is surprising that the notable career of the very term 'science diplomacy' in the last 15 years in the US, UK and the EU is hardly reflected in contemporary Swedish science and technology policy as well as international relations. Key representatives of Swedish science, technology and foreign policy, we have talked with, do not normally make use of the term 'science diplomacy'. Nevertheless, most of them expressed interest in the concept.

Regardless of the increasing interest in international attractiveness and engagement (Bladh et al. 2018), there is currently no "Science diplomacy discourse" in Sweden. The differentiation - if not fragmentation - of Sweden's institutional landscape in science, technology and international relations, certainly in view of the country's small size, surely does not make initiating or keeping up such a discourse easy. Publicly funded science organisations - in particular universities - enjoy considerable scientific independence, not only vis-à-vis the government but also amongst each other. Even within a university, activities of academics and their departments may be rather disjointed, also when it comes to international collaboration.

Also, the central government itself in Sweden is rather 'light' in terms of its organisational capacity: The implementation of most public policy is delegated to semi-independent 'agencies', steered by the government mainly with the help of annual, not necessarily much specified, agreements. Many of these semi-independent organisations are pursuing their own strategies and policies when it comes to knowledge and innovation-related international initiatives, such as the Swedish Institute, the Swedish Higher Education Authority, the Swedish Council for Higher Education, the Swedish Research Council, Sweden's Innovation Agency (Vinnova), STINT, and coordination platforms, such as Team Sweden, IntSam and others (see Textbox 4).[6]

In this context of international norm entrepreneurship, on the one hand, and a diversified domestic institutional landscape, on the other, the report "Internationalisation of Swedish Higher Education Institutions" (Bladh et al. 2018) has revealed a latent and growing interest of many actors in this fragmented system to better orchestrate Swedish international knowledge and diplomatic efforts. This is where the broad and procedural character of the notion "Science Diplomacy" can be positioned to its strengths and where it has quite something to offer. The "boundary object" character of Science diplomacy can work as a mechanism of integration (see section 3.1). Thus, tinkering with (the notion of) science diplomacy and signalling its orchestrating advantage could bring actors together even if their interests in and interpretations of the concept differ.

In the Swedish institutional context, science diplomacy would not work if designed in a rigid way and organised in a top-down mode. Orchestrating science diplomacy can only work if it starts from an acknowledgement of the different purposes envisioned for it by different stakeholders. Furthermore, science diplomacy mechanisms across the globe are familiar with the tensions that the sometimes opposing interests of collaboration and competition bring. Stakeholders in the Swedish STI ecosystem must, therefore, reflect on the various objectives stakeholders attach to their international activities.

[5] https://www.innovationpolicyplatform.org/www.innovationpolicyplatform.org/content/sweden/index.html.

[6] Team Sweden and IntSam are no agencies, but collaboration initiatives. They focus on international cooperation and are (co-)hosted by the government or constellations of government agencies. Team Sweden could be argued to focus more on promotion (economic benefits). IntSam seeks to coordinate and create more synergies among research and innovation funding actors and activities. As such, IntSam does not really have a strategy independent of its member organisations.

Besides these objectives that are certainly valuable in interaction with friendly powers, science diplomacy presents an ambivalent mechanism for engaging with unfriendly powers. Depending on whether Sweden targets more cooperation or exactly the opposite, this changes the role of science diplomacy. Science has for long been acknowledged as a final straw for countries in fierce geopolitical struggle. This makes science diplomacy a potentially strong means to engage with geopolitical adversaries to at least leave open some channels of communication. On the other hand, organising scientific collaboration such that one does not give an unfriendly power salient knowledge is hard, which may plead against implementing science diplomacy mechanisms. In the end, there is no one-size-fits-all answer to when Swedish stakeholders should enter into scientific diplomatic interactions, and when they should not. It depends on many factors that can only be mapped and aligned, if the relevant stakeholders interact about the specific situation at hand.

Thus, a **non-partisan forum as a curated interaction space** may be needed, enabling and facilitating debates and joint initiatives of semi-independent Swedish actors around science diplomacy - provided science diplomacy is understood as a cosmopolitan approach "rooted in an open minded world view recognising that both diplomatic and scientific efforts to address (...) challenges must be international. This entails an understanding of what makes the two domains [of diplomacy and science] different and how they could work together" (Aukes et al. 2021a). We suggest picking up the forum proposal made by the above mentioned Internationalisation Report (Bladh et al. 2018) and enrich it with the spectrum of existing and future concepts and initiatives that are related with Swedish science diplomacy.

5. Recommendation

5.1 A frame for Swedish science diplomacy

The Swedish STI ecosystem poses a set of challenges that need to be addressed to initiate a discussion about concrete science diplomacy interactions. On the one hand, Sweden has as a country played a norm-entrepreneurial role in the arguably science-based international environmental policy domain (cf. Thorhallsson & Bailes 2016). It wants to keep engaging in such interactions and at the same time promote its strong STI ecosystem. On the other hand, there is an institutional reality characterised by autonomy among those (non-)governmental organisations that may in other countries collaborate closely to coordinate science diplomacy mechanisms. This also means that there are few to no central actors that can simply take matters into their own hands. Any recommendation needs to take this reality into account and find a middle ground that lets all the stakeholders in the Swedish STI ecosystem play to their strengths.

Our understanding of **science diplomacy as an interaction space** for stakeholders interested in orchestrating their international science-based activities caters to this. Opening up such an interaction space on the Swedish national level to develop an understanding of what science diplomacy should, but also can, mean in the particular situation at hand (cf. boundary object; section 3.1 & 4) requires an opportunity to meet and reflect. Much in the vein of the guidelines for international science cooperation by STINT, this process can be opened up and involve other stakeholders from the Swedish STI ecosystem. To leave the autonomy of stakeholders intact, the creation of a Swedish science diplomacy interaction space could be realised through the creation of a forum for exchange in the first place, and minor coordination if need be and desired. However, creating a curated interaction space for science diplomacy is not a matter of putting stakeholders into a room and to see what happens. In international science diplomacy interaction spaces, the interactions have to adhere to a set of normative principles to make sure the interactions indeed address the intended goals. These principles hold for domestic science diplomacy forums, too.

In our view, there are two kinds of principles that should be taken into account (Aukes et al. 2021b). First, there are **procedural principles**, which delineate the quality of the interaction between stakeholders. These principles should be enabled when the science diplomacy interaction process is designed. Such processes should be made inclusive (i.e. the relevant stakeholders, but include 'unusual' suspects), transparent and sensitive to contextual change. Stakeholders should be empowered to play to their strengths, but the interactions must always remain reciprocal. The process needs to become legitimate. Ways of legitimising such a science diplomacy interaction are to

Figure 1: **Icons used to represent each procedural principle of the new science diplomacy protocol (https://www.s4d4c.eu/protocol/;cf. Aukes et al. 2021b).**

incorporate the sharing and use of strategic intelligence wherever possible, and address any issues on the lowest level possible. Finally, processes need to have in-built evaluation to enable learning and target-orientedness.

Second, there are **infrastructural principles**, which ensure that the necessary resources are in place. This entails not only resources such as funds, political will or (increasing) trust among participants, but also the capability of stakeholders to understand issues from both the science side and the diplomacy side. In other words, there need to be sufficient stakeholders in the interactions who are 'literate' in both science and diplomacy (Aukes et al. 2020a). We think that adhering to these principles can alleviate the difficulty posed by the autonomous institutional landscape in Sweden, as these principles are designed to allow for respectful, eye-level interactions without impeding another's sovereignty.

Figure 2: **Icons used to represent each infrastructural principle of the new science diplomacy protocol (https://www.s4d4c.eu/protocol/;cf. Aukes et al. 2021b).**

5.2 Potential structural components of a science diplomacy forum

5.2.1 Understanding science diplomacy: A strategic intelligence observatory

The dynamic global context of knowledge development and international relations, in particular in view of global (climate and other) challenges, needs to be continuously observed and analysed. The Swedish options for interventions on an international level need to be understood. **"Strategic intelligence" is the required resource** to assess and to weigh intervention options based on science (Kuhlmann et al. 1999). Such intelligence comes from foresight methods such as science and technology foresight or technology assessment, but also from evaluations of STI investments and policies (ibid.).

It is quite probable that a considerable amount of strategic intelligence is already generated in the differentiated Swedish STI ecosystem. Hence, a science diplomacy forum does not (only) need to set up dedicated services generating strategic intelligence. It could also institutionalise a central node bringing together the **distributed intelligence** already present in the ecosystem (Kuhlmann et al. 1999). All partners to the forum, such as universities, government agencies, companies and civil society organisations could be encouraged to help build individual and organisational capabilities to understand related challenges, needs and options for science diplomacy by contributing their distributed strategic intelligence. One could go so far as to agree that becoming a partner of the science diplomacy forum requires an attitude not only of taking, but also of giving strategic intelligence - partners need to be willing to share their strategic intelligence and receive other strategic intelligence in return, thereby producing a reciprocal relationship between partners. Thus, whichever organisation runs the science diplomacy forum could be supported by a science diplomacy **"Clearing House"** (Edler & Kuhlmann 2008, 272) or observatory, which collects, analyses, and interprets data and information on pressing science diplomacy issues. Such an observatory for scientific diplomatic strategic intelligence contributes to the principles of a deliberative science diplomacy interaction. When the deliberative process is built on strategic intelligence, not only can the latest insights be used to determine the 'right' course of science diplomacy action for forum stakeholders. It can also be context sensitive, if strategic intelligence is frequently updated; and inclusive, if the strategic intelligence points to 'unusual suspects', which were not yet involved.

5.2.2 Communicating science diplomacy: science diplomacy advice channels

The collected, analysed, and interpreted strategic intelligence, be it from distributed sources or self-generated by the science diplomacy forum, then, needs to find its way to the relevant stakeholders. For this, **science diplomacy advice channels** need to be constructed. Such channels may involve but are not limited to

- frequent forum meetings on specific topics with relevant external invitees
- capacity-building in specific policy domains in which Sweden wants to be present (choice based on strategic intelligence)
- creation of science diplomacy posts across the globe, in countries that are attractive for the focus policy domains
- both trade and science missions to potential partner countries or combinations thereof
- strengthening the research and development executed in the domains of Sweden's geopolitical ambition and its norm-entrepreneurial ideas and finding the connections with domestic interests (e.g. climate neutrality, global inequality or other normative goals).

Many of these channels may already exist, but can be improved or geared towards strategic science diplomacy advice. This may also involve strengthening the ties with dedicated international organisations such as the European Academies network SAPEA ("Science Advice for Policy by European Academies"), the International Network for Government Science Advice (INGSA), or the European Union Science Diplomacy Alliance. Applying a well thought-out selection of science diplomacy communication channels can create a situation in which each stakeholder can play to their strengths. This ties to the principle of complementarity. By carefully deliberating which channel to use by whom based on which strategic intelligence also contributes to the proper alignment of science diplomacy activities. In other words, the broader the repertoire of communication channels at the forum's disposal, the easier it will be to find the appropriate measures to take to create additional science diplomacy interaction spaces.

6. Conclusions

Science diplomacy is a trending term in foreign policy as well as international science policy. This trend has not yet caught hold in the Swedish STI ecosystem. Partly, this is because of the careful consideration of new, fashionable notions that is common among Swedish policy stakeholders. At the same time, the Swedish diplomatic tradition, among others in international environmental policy, represents a logical starting point for a stronger role of science diplomacy in the country.

Strengthening a dialogue about science diplomacy can bring together the Swedish landscape of agencies, governmental organisations and research institutions, which is by some regarded as differentiated, if not fragmented. One of science diplomacy's strengths is its boundary character, allowing stakeholders with different understandings to be able to converge upon it. As mentioned above, as a boundary object, science diplomacy can open up an interaction space for stakeholders to discuss and debate topics that relate to foreign policy and international science policy, the specifics of which are at the liberty of the participants of the interaction space.

Hence, our main recommendation is to strive for an institutionalisation of such a curated interaction space, for example, in the form of a non-partisan forum. Adhering to a set of procedural and infrastructural principles, stakeholders interested in science diplomacy can discuss potential fields of action relevant for the STI ecosystem or the country at large. Such a forum could be supported by an observatory for strategic intelligence, ideally combining available distributed intelligence across organisations, too. Finally, forum partners should develop a range of communication channels that are tailored to the specific needs of science diplomacy.

7. References

Ali, S. H., & Voinov Vladich, H. (2016). Environmental Diplomacy. In C. M. Constantinou, P. Kerr, & P. Sharp (Eds.), The SAGE Handbook of Diplomacy (pp. 601-616). Los Angeles: Sage.

Aukes, E., Honarmand Ebrahimi, S., Ordóñez-Matamoros, G., & Kuhlmann, S. (2020a). Towards effective science diplomacy practice. S4D4C Policy Brief no. 2. Retrieved from Vienna: https://www.s4d4c.eu/wp-content/uploads/2020/01/S4D4C-Towards-effective-science-diplomacy-practice.pdf.

Aukes, E., Ordóñez-Matamoros, G., Kuhlmann, S., & Honarmand Ebrahimi, S. (2020b). Governance framework report, recommendations, process descriptions and chart, Deliverable 4.4. Retrieved from Vienna: https://www.s4d4c.eu/wp-content/uploads/2021/02/D4.4-Governance-framework-report_final.pdf.

Aukes, E., Kuhlmann, S., Ordóñez-Matamoros, G. (2021a). Reshape science diplomacy for an interconnected world, Research Europe | ResearchProfessional News, 22 Jul 2021.

Aukes, E., Wilsdon, J., Ordóñez-Matamoros, G., & Kuhlmann, S. (2021b). Global resilience through knowledge-based cooperation: a new Protocol for Science Diplomacy. F1000Research, 10. doi:10.12688/f1000research.55199.1

Bladh, A., Wilenius, M., & Gaunt, A. (2018). Internationalisation of Swedish Higher Education and Research – A Strategic Agenda: Summary of the report of the Inquiry on increased internationalisation of higher education institutions (SOU 2018:3). Stockholm: Swedish Government Inquiries.

Degelsegger-Márquez, A., Flink, T., & Rungius, C. (2019). What it takes to do science diplomacy: Practices, identities, needs and challenges of science diplomacy practitioners. Baseline analysis and needs assessment. Retrieved from Vienna: https://www.s4d4c.eu/wp-content/uploads/2019/03/S4D4C_WP2_D2.3_ZSI.pdf.

Edler, J., & Kuhlmann, S. (2008). Coordination within fragmentation: Governance in knowledge policy in the German federal system. Science and Public Policy, 35(4), 265-276. DOI: 10.1504/IJTM.2003.003366

Epping, E. (2020). Lifting the smokescreen of science diplomacy: comparing the political instrumentation of science and innovation centres. Humanities and Social Sciences Communications, 7(111). doi:https://doi.org/10.1057/s41599-020-00599-4

Flink, T. (2020). The Sensationalist Discourse of Science Diplomacy: A Critical Reflection. The Hague Journal of Diplomacy, 15(3), 359-370. doi:10.1163/1871191x-bja10032

Flink, T., & Schreiterer, U. (2010). Science diplomacy at the intersection of S&T policies and foreign affairs: toward a typology of national approaches. Science and Public Policy, 37(9), 665-677. doi:10.3152/030234210x12778118264530

Gilboa, E. (2016). Digital Diplomacy. In C. M. Constantinou, P. Kerr, & P. Sharp (Eds.), The SAGE Handbook of Diplomacy (pp. 540-551). Los Angeles: Sage.

Gluckman, P. D., Turekian, V. C., Grimes, R. W., & Kishi, T. (2017). Science Diplomacy: A Pragmatic Perspective from the Inside. Science & Diplomacy, 6(4), 1-13.

Griset, P. (2020). Innovation diplomacy: A new concept for ancient practices? The Hague Journal of Diplomacy, 15(3), 383-397. doi:10.1163/1871191X-BJA10036

Groom, A. J. R. (2013). Conference Diplomacy. In A. F. Cooper, J. Heine, & R. Thakur (Eds.), The Oxford Handbook of Modern Diplomacy (pp. 264-276). Oxford: Oxford University Press.

Hampson, F. O., Crocker, C. A., & Aall, P. (2013). Negotiation. In A. F. Cooper, J. Heine, & R. Thakur (Eds.), The Oxford Handbook of Modern Diplomacy (pp. 320-333). Oxford: Oxford University Press.

Kadlecová, L., Meyer, N., Cos, R., & Ravinet, P. (2020). Cyber Security: Mapping the Role of Science Diplomacy in the Cyber Field. In M. Young, T. Flink, & E. Dall (Eds.), Science Diplomacy in the Making: Case-based insights from the S4D4C project. Vienna: S4D4C.
Kaltofen, C., & Acuto, M. (2018). Science Diplomacy: Introduction to a Boundary Problem. Global Policy, 9, 8-14. doi:https://doi.org/10.1111/1758-5899.12621.
Kemp Spies, Y. (2016). Middle Power Diplomacy. In C. M. Constantinou, P. Kerr, & P. Sharp (Eds.), The SAGE Handbook of Diplomacy (pp. 281-293). Los Angeles: Sage.
Kuhlmann, S., Boekholt, P., Georghiou, L., Guy, K., Heraud, J.-A., Laredo, P., Lemola, T., Loveridge, D., Luukkonen, T., Moniz, A., Polt, W., Rip, A., Sanz-Menendez, L., Smits, R. (1999). Improving Distributed Intelligence in Complex Innovation Systems. Final Report. Retrieved from https://mpra.ub.uni-muenchen.de/6426/
Leese, M. (2018). Between a Carrot and a Stick: Science Diplomacy and Access to EU Research Funding. Global Policy, 9, 48-52. doi:10.1111/1758-5899.12546
Legrand, T., & Stone, D. (2018). Science diplomacy and transnational governance impact. British Politics, 13(3), 392-408. doi:10.1057/s41293-018-0082-z.
Leijten, J. (2017). Exploring the future of innovation diplomacy. European Journal of Futures Research, 5(1). doi:10.1007/s40309-017-0122-8
López de San Román, A., & Schunz, S. (2018). Understanding European Union Science Diplomacy. JCMS: Journal of Common Market Studies, 56(2), 247-266. doi:https://doi.org/10.1111/jcms.12582.
Melchor, L. (2020). What Is a Science Diplomat? The Hague Journal of Diplomacy, 15(3), 409-423. doi:10.1163/1871191x-bja10026
Melchor, L., Elorza Moreno, A., & Lacunza, I. (2020). Calling for a Systemic Change: Towards a European Union Science Diplomacy for Addressing Global Challenges. Version 1.0. Retrieved from Vienna: https://www.s4d4c.eu/calling-for-a-systemic-change-towards-a-eu-science-diplomacy-for-addressing-global-challenges/
Moomaw, W.R. (2018). Scientist Diplomats or Diplomat Scientists: Who Makes Science Diplomacy Effective? Global Policy, 9, 78-80. doi:https://doi.org/10.1111/1758-5899.12520.
Moro-Martín, A. (2017) 'How Dare You Call Us Diplomats'. Nature News, 543(7645), 289.
Nye, J.S. (2008). Public Diplomacy and Soft Power. Annals of the American Academy of Political and Social Science, 616(1), 94-109. doi:10.1177/0002716207311699
Özkaragöz Doğan, E., Uygun, Z., & Akçomak, İ.S. (2020). Can science diplomacy address the global climate change challenge? Environmental Policy and Governance. doi:10.1002/eet.1911
Paglia, E. (2021). The Swedish initiative and the 1972 Stockholm Conference: the decisive role of science diplomacy in the emergence of global environmental governance. Humanities and Social Sciences Communications, 8(1), 2. doi: https://doi.org/10.1057/s41599-020-00681-x.
Penca, J. (2018). The rhetoric of "science diplomacy": Innovation for the EU's scientific cooperation? EL-CSID Working Paper Issue 2018/16. Retrieved from Brussels: http://aei.pitt.edu/id/eprint/102624.
Rosenthal, U., Blank, D.H.A., Cools, R., Debackere, K.D., Frissen, V.A., Van der Hagen, T.H.J.J., Heimovaara, S., Meijer, E.M., Peels, A.J.H.M., Schuurmans, M.F.H. (2017). WTI-Diplomatie: Offensief voor internationalisering van wetenschap, technologie en innovatie. The Hague: Adviesraad voor wetenschap, technologie en innovatie (AWTI).
Royal Society. (2010). New frontiers in science diplomacy: Navigating the changing balance of power. Retrieved from London: https://royalsociety.org/~/media/Royal_Society_Content/policy/publications/2010/4294969468.pdf

Rüffin, N. (2020). EU science diplomacy in a contested space of multi-level governance: Ambitions, constraints and options for action. Research Policy, 49(1). doi:10.1016/j.respol.2019.103842
Ruffini, P.-B. (2018). The Intergovernmental Panel on Climate Change and the Science-Diplomacy Nexus. Global Policy, 9, 73-77. doi: https://doi.org/10.1111/1758-5899.12588.
Ruffini, P.-B. (2020). Collaboration and Competition: The Twofold Logic of Science Diplomacy. The Hague Journal of Diplomacy, 15(3), 371-382. doi:10.1163/1871191x-bja10028
Rungius, C., & Flink, T. (2020). Romancing science for global solutions: on narratives and interpretative schemas of science diplomacy. Humanities and Social Sciences Communications, 7(1). doi:10.1057/s41599-020-00585-w
Rungius, C., Flink, T., & Degelsegger-Márquez, A. (2018). State-of-the-art report: summarizing literature on science diplomacy cases and concepts. Retrieved from Vienna: https://www.s4d4c.eu/wp-content/uploads/2018/08/S4D4C_State-of-the-Art_Report_DZHW.pdf
Rungius, C., Melchor, L. (2020a). 2. Interests. In: Young, M., Rungius, C., Aukes, E.J., Melchor, L., Dall, E., Černovská, E., Tomolová, E., Plumhans, L.-A., Ravinet, P., Flink, T., Elorza Moreno, A. (2020). The 'Matters' of Science Diplomacy: Transversal Analysis of the S4D4C Case Studies. Retrieved from Vienna: https://doi.org/10.5281/zenodo.4041041.
Rungius, C., Melchor, L. (2020b). 6. Individuals. In: Young, M., Rungius, C., Aukes, E.J., Melchor, L., Dall, E., Černovská, E., Tomolová, E., Plumhans, L.-A., Ravinet, P., Flink, T., Elorza Moreno, A. (2020). The 'Matters' of Science Diplomacy: Transversal Analysis of the S4D4C Case Studies. Retrieved from Vienna: https://doi.org/10.5281/zenodo.4041041.
Star, S. L., & Griesemer, J. R. (1989). Institutional ecology,translations' and boundary objects: Amateurs and professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39. Social studies of science, 19(3), 387-420.
Tanczer, L. M., Brass, I., & Carr, M. (2018). CSIRTs and Global Cybersecurity: How Technical Experts Support Science Diplomacy. Global Policy, 9, 60-66. doi:10.1111/1758-5899.12625
Thorhallsson, B., & Bailes, A. J. K. (2016). Small State Diplomacy. In C. M. Constantinou, P. Kerr, & P. Sharp (Eds.), The SAGE Handbook of Diplomacy (pp. 294-307). Los Angeles: Sage.
Van Genderen, R., & Rood, J. (2011). Water Diplomacy: a Niche for the Netherlands? Retrieved from The Hague: https://www.clingendael.org/sites/default/files/pdfs/20111200_cling_report_waterdiplomacy_rgenderen_jrood.pdf
Walker, K. (2015). The Rhetorical Work of Science Diplomacy: Border Crossing and Propheteering for U.S.-Muslim Engagement. Poroi, 11(2). doi:10.13008/2151-2957.1238
Wilder, M. O., Varady, R. G., Gerlak, A. K., Mumme, S. P., Flessa, K. W., Zuniga-Teran, A. A., . . . Megdal, S. B. (2020). Hydrodiplomacy and adaptive governance at the U.S.-Mexico border: 75 years of tradition and innovation in transboundary water management. Environmental Science and Policy, 112, 189-202. doi:10.1016/j.envsci.2020.05.013
Wilson, E. J. (2008). Hard Power, Soft Power, Smart Power. Annals of the American Academy of Political and Social Science, 616(1), 110-124. doi:10.1177/0002716207312618
Young, M., Rungius, C. (2020) 1. Explicitness/Implicitness. In: Young, M., Rungius, C., Aukes, E.J., Melchor, L., Dall, E., Černovská, E., Tomolová, E., Plumhans, L.-A., Ravinet, P., Flink, T., Elorza Moreno, A. (2020). The 'Matters' of Science Diplomacy: Transversal Analysis of the S4D4C Case Studies. Retrieved from Vienna: https://doi.org/10.5281/zenodo.4041041.
Young, M., Rungius, C., Aukes, E.J., Melchor, L., Dall, E., Černovská, E., Tomolová, E., Plumhans, L.-A., Ravinet, P., Flink, T., Elorza Moreno, A. (2020). The 'Matters' of Science Diplomacy: Transversal Analysis of the S4D4C Case Studies. Retrieved from Vienna: https://doi.org/10.5281/zenodo.4041041

Appendices

Appendix I: Information sheet for interviews

Information Sheet: Science Diplomacy in Sweden
Prof.dr. Stefan Kuhlmann & Dr. Ewert Aukes, 18th June 2021

Introduction

Science diplomacy is not a hot topic in Sweden right now and can rather be characterised as uncharted territory. It is observed that the institutional setup in Sweden – with relatively small national governmental ministries relying on agencies for their strategic intelligence – does not support a quick uptake of the kind of trendy concepts that science diplomacy represents. In addition, there are many research funding organisations, including the Swedish Research Council and all kinds of governmental agencies, which make for a fragmented system. Furthermore, the national discourse regarding scientific collaboration with partners in some parts of the world, e.g. China, is polarising and putting researchers in a predicament, as there are few guidelines or individual experience with what kind of collaboration can and should be begun and what kind shouldn't.

Sweden positions itself as a global leader in the implementation of the Agenda 2030, advocating openness. Unfortunately, this moral ambition is frequently frustrated by market and geopolitical realities. Moreover, Sweden always also positions itself in relation to the other Nordic/Scandinavian countries.

Commissioning party

This study has been commissioned by the Swedish Foundation for International Cooperation in Research and Higher Education (STINT).

Goal of the study

The goal of the study is to gain an overview of the state of play regarding science diplomacy in/by Sweden and open up avenues for STINT and other Swedish actors to consider.

Report

The report will be based on a set of audio-recorded, qualitative and semi-structured interviews and previous research in the field of science diplomacy. STINT will be the sole owner of all materials and results and cannot be used by the researchers independently of this study.

Interview topics

– Cross-border activities of the organisation
– Experience with science diplomacy
– Activities and expectations regarding science diplomacy
– Swedish international science policy context

Background of the researchers

Stefan Kuhlmann is Full professor of Science, Technology and Society and chair of the dept. Science, Technology, and Policy Studies (STəPS), University of Twente (NL). He is Academic Director of WTMC, the Dutch Graduate Research School Science, Technology, and Modern Culture. Until 2006 he held leading positions at Fraunhofer Institute for Systems and Innovation Research ISI, Germany, and was Professor of Innovation Policy at University of Utrecht. He studies research and technological innovation as social and political processes, focusing on governance, and publishes widely in the field of research and innovation policy studies. Currently he is partner of the EU-funded research project "S4D4C - Using Science for/in Diplomacy for Addressing Global Challenges".

Ewert Aukes is Assistant Professor in the field of the energy transition at the dept. Governance and Technology for Sustainability (CSTM), Unversity of Twente (NL). His tasks comprise research and teaching. After obtaining his PhD in 2017 with a dissertation on framing in Dutch coastal policy innovation, he has worked on two EU H2020 projects in the fields of forestry ecosystem services governance innovations and science diplomacy. He has published in scientific as well as professional journals relating to environmental sciences, policy analysis and social science methods, and authored reports for the Dutch public works agency concerning innovations in Dutch water management. In his previous position as postdoctoral research at the dept. Science, Technology, and Policy Studies (STəPS) at the same university, he participated in the EU-funded research project "S4D4C - Using Science for/in Diplomacy for Addressing Global Challenges".

Benefits and risks of participation

– As an interviewee, there is the possibility of learning more about a hot topic in science and international policymaking.
– Risk: Although we anonymise all data that are used in the report, it cannot be ruled out completely that the subject positions you express will remain unidentifiable

Procedures for withdrawal

During the interview, you can indicate your withdrawal by stating it. Before or after the interview, you can indicate your wish to withdraw from the study at any time by sending an e-mail.

Data management

Personal information: For the purpose of our own administration we will maintain your name, organisation and position for orientation. In any texts communicated with the study commissioner, anything you have contributed to the study will be represented in anonymised form. You have the right to request access to and rectification or erasure of your personal data at any time.

Data archiving and use: Interview recordings will be stored in a secure location inaccessible for third parties. They will only be used for the commissioned report.

Retention period: The data will be retained until the study is completed and offered to the commissioning party. At that time, the data will be deleted.

Researcher contact

You can contact us at any time at s.kuhlmann@utwente.nl and e.j.aukes@utwente.nl.

Appendix II: Informed consent form for interviews

Consent Form for "Science Diplomacy in Sweden"

YOU WILL BE GIVEN A COPY OF THIS INFORMED CONSENT FORM

Please tick the appropriate boxes	**Yes**	**No**
Taking part in the study		
I have read and understood the study information dated 18th June 2021, or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	☐	☐
I consent voluntarily to be interviewed for this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	☐	☐
I understand that taking part in the study involves participating in an audio-recorded, qualitative and semi-structured interview. The audio recording will be transcribed and destroyed after the study is completed.	☐	☐
Risks associated with participating in the study		
I understand that taking part in the study involves the following risks: Even though all data are used in anonymised form, it can never be completely ruled out that my subject positions will remain unidentifiable.	☐	☐
Use of the information in the study		
I understand that information I provide will be used for compiling a report about the study topic for the commissioning party.	☐	☐
I understand that personal information collected about me that can identify me, such as [e.g. my name or where I live], will not be shared beyond the study team.	☐	☐
I agree that my information can be quoted in research outputs.	☐	☐
I agree that my real name can be used for quotes.	☐	☐
Consent to be audio/video recorded		
I agree to be audio recorded.	☐	☐

Signatures

Participant

_____	_____	_____
Name of participant [printed]	Signature	Date

Researcher

I have accurately read out the information sheet to the potential participant and/or, to the best of my ability, ensured that the participant understands to what they are freely consenting.

_____	_____	_____
Researcher name [printed]	Signature	Date

Study contact details for further information: Prof.dr. Stefan Kuhlmann (s.kuhlmann@utwente.nl) and Dr. Ewert Aukes (e.j.aukes@utwente.nl).

Authors (biographical sketches)

Ewert Aukes is Assistant Professor in the field of energy transition and transition governance at the dept. Governance and Technology for Sustainability (CSTM), Unversity of Twente (NL). His tasks comprise research and teaching. After obtaining his PhD in 2017 with a dissertation on framing in Dutch coastal policy innovation, he has worked on two EU H2020 projects in the fields of forestry ecosystem services governance innovations and science diplomacy. He has published in scientific as well as professional journals relating to environmental sciences, policy analysis and social science methods, and authored reports for the Dutch public works agency concerning innovations in Dutch water management. In his previous position as postdoctoral research at the dept. Science, Technology, and Policy Studies (STəPS) at the same university, he participated in the EU-funded research project "S4D4C - Using Science for/in Diplomacy for Addressing Global Challenges".

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