SCIENCE DIPLOMACY, SUSTAINABLE DEVELOPMENT GOALS, AND DRUG POLICY

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Abstract

This article explores the relevance of science diplomacy's capacity to advance the Sustainable Development Goals (SDGs), applied to global drug policy challenges. The article illustrates how interdisciplinary working across scientific communities and diplomatic posts leads to fresh thinking about transnational issues such as drug trafficking and substance misuse, and the consequent public health challenges. This in-depth article demonstrates how scientific collaboration could improve border security with new detection technologies and encourages public health-based drug control. Case studies of international efforts provide examples where science and drug control efforts have combined in successful initiatives, contributing to improved drug interdiction and harm reduction programs. These cases highlight the need to integrate research institutions and policy-making institutions to come up with complete answers to drug-related problems. The article explores how science diplomacy helps to intercalibrate national drug policies with global SDG targets, specifically SDG Goal 3 (Good Health and Well-being), Goal 16 (Peace, Justice and Strong Institutions), and Goal 17 (Partnerships for the Goals). The study identifies positive examples of transnational cooperation, such as joint research projects, standardized data gathering, and the creation of multilateral training programs that strengthen security and health responses and enable capacity-building measures. The results of the study indicate that the science diplomacy model is a more moderate approach to balancing law enforcement and public health factors in drug policy. The findings of the analysis underscore the imperative for long-term investment in scientific collaboration as a route to more equitable, efficient, and sustainable resolution of global challenges in drugs and the concomitant advancement of wider development goals. This investigation contributes to existing debates over how to promote science in global governance in the service of policy and offers direct implications for stakeholders engaged at the nexus of science, diplomacy, and sustainable development.

Keywords

Drug Policy, Science Diplomacy, Sustainable Development Goals (SDGs), Public Health, International Cooperation

Introduction

In the era of globalization and transcending threats, science and diplomacy are coming closer in order to provide solutions to tricky global problems like drug trafficking. Science diplomacy is increasingly appreciated as an important tool to harmonize the activities of governments, research institutions, and international organizations concerned with science-based and sustainable responses to the drug phenomenon (Turekian et al., 2015; Royal Society, 2010). Scientific cross-border collaboration and joint research, as well as timely data exchange, are contributing to a more consistent international policy aimed at reducing illicit drugs production, trafficking, and consumption (Reuter & Trautmann, 2009; Keohane & Nye, 2012).

The issue of drug trafficking is a global crime that does not recognize borders or legal and cultural backgrounds and is predicated on loopholes in governance and international relationships (UNODC, 2021a). Unilateral action to confront illicit drugs has failed to mar the flow of drugs and the harms associated with use, which by the way encompasses health crises such as overdose epidemics and transmission of infectious diseases (World Health Organization (WHO), 2020). Science diplomacy, in this respect, provides an auspicious venue for partnership in the remediation of organized crime syndicates, public health security, and achievement of Sustainable Development Goals (SDGs) with particular reference to health, peace, and justice (UNODC, n.d.; United Nations, 2015).

This non-domestic complexity is to be negotiated not just technically, but in political terms based on a continuing eagerness, confidence, and durable international engagement (Eligh, 2010; Flink & Schreiterer, 2010). Science diplomacy's negotiating function allows engaged actors to negotiate political and cultural barriers that accompany and impede drug policy collaboration/ cooperation, providing a space to speak, to learn, and to innovate together (Flink & Schreiterer, 2010). It bridges science and policy so that drug control is based on the most up-to-date scientific knowledge and global best practice (Turekian et al., 2015; The Royal Society, 2010).

Various international initiatives demonstrate how science diplomacy can be used to support drug control. In particular, the AIRCOP programme (Airport Communication Project), the Global SMART programme, and the SHERLOC platform illustrate how science diplomacy can support international cooperation for capacity building in the area of drug detection as well as for the timely exchange of intelligence (UNODC, 2020b). These third goal-oriented projects included both the development and the deployment of sophisticated detection technologies such as IONSCAN (ion mobility spectrometer) and also portable chemical analyzer (Smiths Detection, n.d.), as well as systems for monitoring novel (emerging) threats such as NPS – new psychoactive substances (European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), n.d.). Science Diplomacy can facilitate joint action and common methodologies, strengthening countries' ability to respond rapidly and effectively to changing drug supply dynamics (UNODC, 2021).

Science diplomacy is also a critical tool to mainstream global drug policy within the broader SDGs. In particular, it supports the realization of the SDG Goal 3 (Good Health and Well-being), Goal 16 (Peace, Justice, and Strong Institutions) and Goal 17 (Partnerships for the Goals) through promoting evidence-informed health-sensitive drug policies with a focus on harm reduction and human rights (United Nations, 2015; Turekian et al., 2015). This allows for connecting ideological fissures which commonly interfere with drug policy discussions (e.g., between punitive law enforcement approaches and public health ones (Jelsma et al., 2017; Bewley-Taylor et al., 2016).

This article examines the function of science diplomacy in combating transnational drug crime by analyzing several important pathways. These have included the growth of international scientific partnerships (IONSCAN, RADAR, International Drug Enforcement Conference (IDEC)), international scientific data sharing, analytical methods, and technology development (SHERLOC, CENcomm), and the support for science-based, health-oriented drug policy by international organizations and public/private/academic partnerships (Smiths Detection, n.d.; EMCDDA, n.d.; U.S. Department of State, n.d.; Turekian et al., 2015). By analyzing these mechanisms, the paper illuminates how science diplomacy can help to reconcile national interests with international obligations, ultimately fostering collective security and sustainable development.

The need to respond to synthetic drugs, digital drug markets, and ever more elaborate trafficking patterns could not be more pressing. Synthetic opioids (e.g., fentanyl) and so-called novel psychoactive substances have had a global impact on drug markets, making their detection and law enforcement more challenging UNODC, 2021a; EMCDDA, 2022). On the dark web, digital markets also complicate traditional interdiction efforts because illicit purchases that are anonymous and borderless can also be made (Europol, 2020). In this fast-changing context, science diplomacy serves as a critical bridge linking scientific discovery, policy architecture, and multilateralism, reinforcing an inclusive and sustainable drug response based on collaboration (Miller et al., 2018).

With the slow transitioning of global drug policy towards greater harmonization, and away from models that are narrow, criminal justice-based and lead to the displacement of policy burdens across countries, science diplomacy will continue to play a central role in connecting domestic policies with the broader global objectives, in which drug control is part of the contribution towards peaceful, just and healthy life for all (Bewley-Taylor et al., 2016; UNODC, 2021b). It also fosters capacities, knowledge transfer, and trust among nations, all necessary for successful multilateralism in drug policy (Flink & Schreiterer, 2010).

Methodology

This research uses a qualitative research design utilizing an extensive literature review, thorough policy analysis, and multiple case studies to examine the utility of science diplomacy in promoting global drug policy and the Sustainable Development Goals (SDGs). The qualitative methodology was considered appropriate because it would

facilitate the exploration of complex social phenomena, which can hardly be adequately described using only quantitative measures, such as the dynamics of international cooperation and policy interactions (Creswell, 2013; Denzin & Lincoln, 2018).

The main data are institutional reports, policy papers, and international frameworks about science diplomacy and drug control. Prominent sources include the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA, n.d.), Interpol (Interpol, n.d.), the International Narcotics Control Board (INCB, n.d.), and the United Nations Office on Drugs and Crime (UNOD), 2021a; UNODC, n.d.). The reports present empirical information and descriptive analysis, as well as contextual information, relating to global efforts to disrupt the illicit production and trafficking of opium, cocaine, and cannabis. Furthermore, formal United Nations documents related to the 2030 Agenda for Sustainable Development provide normative guidance, tying drug policy to wider development goals (United Nations, 2015).

A literature review of science diplomacy was developed to include current theories and research, along with applications of this to drug policy. The review covered peer-reviewed journal articles, policy briefs, and conference proceedings retrieved from databases including Scopus, Web of Science, Google Scholar, with the search terms "science diplomacy," "drug policy," "international cooperation," and "Sustainable Development Goals." The inclusion criteria tended towards recent studies (2010–2023) to reflect the shifting science diplomacy environment and the development of new innovative technologies and multilateral endeavors (Flink & Schreiterer, 2010; Turekian et al., 2015).

Policy analysis addressing international and national drug control policy frameworks and implementation studies was considered in addition to the literature review. This entailed scrutinizing agreements, such as the Single Convention on Narcotic Drugs (1961) and the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances (1988), and more recent policy instruments, such as the Global SMART Programme and the SHERLOC platform (UNODC, 2020; Bewley-Taylor et al). This national policy analysis identifies an imbalance between global declarations and local realities, and suggests that SDC mechanisms link the two.

A central feature of our research design is the comparative case study approach, which allows an in-depth exploration of the functioning of science diplomacy in different settings. Examples are the Airport Communication Project (AIRCOP) and the International Drug Enforcement Conference (IDEC), as well as technological activities as IONSCAN and RADAR (UNODC, n.d.-b; Smiths Detection, n.d.). Every case was studied to find relevant mechanisms of scientific cooperation, technology transfer, and policy impact. The comparative strategy can help to explore commonalities and differences in how Science Diplomacy (SD) and Drug Control (DC) work to advance science diplomacy in the two contexts (Yin, 2017).

The triangulation of the sources of data literature review, policy analysis, and case studies enhances the validity and reliability of the findings as cross-verification of the evidence can be made (Patton, 1999; Flick, 2018). Methodological triangulation like this is important in complex social research where various actors and levels of governance are

involved (Jick, 1979). In addition, it permits the study to combine empirical grounding and theoretical elucidation: to provide both detailed and comprehensive perspectives in putting large-scale forces into concrete perspective.

Integrating these perspectives, the study focuses on the mutual influence of scientific discoveries, diplomatic negotiations, and policy implications. The study looks at the way in which collaborative science initiatives socialize and frame global drug policy, particularly in the context of the SDG targets, including the targets on Good Health and Well-being (Goal 3), Peace, Justice and Strong Institutions (Goal 16), and Partnerships for the Goals (Goal 17), (United Nations, 2015). Attention was also devoted to the problems arising from fast-changing synthetic drugs and digital drug markets, and how science diplomacy can address these new challenges, focusing on adaptive governance and international collaboration (Europol, 2020; UNODC, 2021a).

Considerations regarding source attribution include the necessity for accurate citation and unbiased representation of institutional contributors, as well as the responsible use and presentation of information. Because the present study is mainly secondary data-based, using publicly available documents, and does not involve any direct human subjects, there was no need for formal ethics approval. However, all sources have been properly cited to ensure academic integrity, for the references are more than enough to ensure the sake of academic honesty and transparency.

Finally, the study provides evidence-based suggestions for policy-makers, practitioners, academics, and diplomats working in the fields of science diplomacy and international drug control. These are based on the case study and policy analysis, and seek to make global drug governance more effective, fair, and sustainable.

Results

The utilization of science diplomacy in the field of international drug control has, in practice, led to concrete, tangible positive impacts on international cooperation and key evidence-based building blocks for the creation of stronger drug policies, such as the systematic gathering, exchange, and use of scientific evidence. Among the key science diplomacy achievements in this area has been better coordination among border control and law enforcement authorities (e.g., via the Airport Communication Project (AIRCOP) and the SHERLOC, Sharing Electronic Resources and Laws on Crime, database). Supported by the UNODC, these activities create essential channels for customs officials, police, and similar agencies from various jurisdictions to liaise, exchange actionable intelligence, and quickly react to new threats on the illicit drugs front (UNODC, n.d.-a). Responding rapidly to common intelligence has enhanced interdiction success insofar as drug trafficking activities are concerned. Furthermore, such cooperative patterns have promoted regional legislative harmonization across member states, leading to more homogenized and concerted global efforts in combating transnational drug trafficking (Reuter & Trautmann, 2009; UNODC, n.d.-a).

Science diplomacy has been instrumental, too, in establishing institutional partnerships for dealing with newer threats like synthetic drugs. Notable among these is the Global SMART (Synthetics Monitoring: Analyses, Reporting and Trends) Programme, which affords 132 Member States (at December 2009) an opportunity to conduct in depth data analysis, trend monitoring and technical assistance in furtherance of the identification, and also determining the nature of, new psychoactive substances (UNODC, n.d.-b). Through the systematic monitoring of data on synthetic drugs, the Global SMART Programme also allows Governments to track and respond to emerging drug use patterns and trends as a basis for timely, grounded policy responses based on empirical evidence (EMCDDA, n.d.). This anticipatory governance capacity illustrates how science diplomacy has the potential to act not only as a response-based instrument but also as a proactive mechanism for anticipating policy needs.

The current state of science diplomacy has facilitated the development of new technologies that improve drug interdiction. The IONSCAN project from Smiths Detection is one such example of portable forensics solutions that can rapidly detect drug residue from a range of surfaces, including luggage and cargo (Smiths Detection, n.d.). With its mobile and quick-detection capabilities, this technology makes it possible to conduct on-site detection with high efficiency, greatly improving management capacity in key terminals such as airports and border crossings. The use of such sophisticated scientific technology demonstrates the very tangible results of science diplomacy in terms of transferring and operationalizing cutting-edge technology to the field, making the processes of detection and enforcement more efficient and effective (Interpol, n.d.). These improvements provide a higher chance of interception and ensure reliable forensic evidence, which in practice can inform data-driven policies.

Beyond the direct mechanisms of technology transfer and data sharing, science diplomacy also shapes legislative change, policy alignment, and the harmonization of rules and regulations at the national and regional levels. Kyrgyzstan is a good example in this respect, where progress in forensics, backed up by regional discussions and cross-border cooperation, has contributed to informing the Kyrgyz National drug policy reform. Significantly, the infusion of forensic evidence in judicial and policy conversations has facilitated a rhetorical and programmatic move toward harm reduction approaches in the context of Kyrgyzstan's drug control policy (Resolution of the Government of the Kyrgyz Republic, 2022). This harmonization with global norms is evidence of the efficacy of science diplomacy at the convergence of scientific creativity, diplomatic dialogue, and health-focused policy-making. Kyrgyzstan is better served to align its national policies with global standards for addressing drug use and abuse with a focus on health-based interventions, rather than reliance solely on criminal sanctions (Bewley-Taylor et al., 2016).

Part of the problem in Kyrgyzstan shows the inherent tension between policing and public health priorities, an area where science diplomacy can often play a role in mediation. On the one hand, drug interdiction work demands that enforcement and security matters must be respected and enhanced; on the other, the need for policy to reflect harm reduction principles regarding the health and social outcomes of drug use is

increasingly seen to be required (Turekian et al., 2015). Science diplomacy enables dialogue and cooperation between stakeholders with different backgrounds - government, science, civil society, international organizations - in order to establish a collaborative climate in which both the enforcement and health aspects can be harmonized and mutually reinforced (European Monitoring Centre for Drugs and Drug Addiction, n.d.).

A further well-known example of the relevance of science diplomacy in fighting transboundary crime is the platform for real-time sharing of data on new psychoactive substances (NPS) among customs and law enforcement authorities worldwide, developed through science diplomacy via a shared platform such as SHERLOC (UNODC, n.d.-a). There is an urgent need to quickly distinguish and categorize NPS, given that new substances can emerge on the drug market much quicker than traditional regulatory and control measures can be developed (EMCDDA, 2023). The SHERLOC portal allows countries to easily share legal information, analytical data, and operational details, enabling a rapid, coordinated international response to any emerging threats. This case study shows how science diplomacy is a way to combine scientific knowledge and diplomatic instruments to improve global readiness and regulatory flexibility.

In addition, science diplomacy also contributes to capacity development and knowledge sharing. Through international trainings and workshops, common research projects and scientific exchanges, not only technical capacity but also mutual understanding and trust between countries are developed, a condition sine qua non for continued cooperation in the field of drug control (Turekian et al., 2015; Interpol, n.d.). For example, the AIRCOP network provides ongoing training for customs and law enforcement personnel on the most up-to-date scientific information related to drug detection and interdiction strategies (UNODC), n.d.-a). These capacity-building activities contribute to the institutional resilience and strengthen the collective capacity.

In its effect, science diplomacy has also affected the normative architecture of international drug control. The incorporation of scientific knowledge in discussions within bodies like the Commission on Narcotic Drugs (CND) and the International Narcotics Control Board (INCB) underscores the growing significance of science in determining the global drug policy debate (INCB, n.d.). Through promoting an evidence and science-based understanding that recognizes drug markets and drug use as complex social phenomena, science diplomacy can contribute to tempering international debates around them, and to finding more nuanced, health-informed, and development-compliant policies for them in line with the ambitious sustainable development agenda (United Nations, 2015).

Yet it is crucial to recognize that the effects of science diplomacy do not translate equally in all situations. Despite clear gains from many of these efforts, a need for more equitable participation, resource allocation, and political resolve across a variety of countries persists. Disparities in technological capacity, in institutional configurations, and in national geopolitical interests may affect whether science diplomacy is an effective tool

(Eligh, 2010). But the cumulative advances from multilateral science diplomacy initiatives show that it plays an essential part in addressing the complex, cross-national problem of global drug trafficking and use.

In summary, the results indicate that science diplomacy is a multi-strand tool in the global fight against drugs through intergovernmental cooperation, movement of innovative technology between institutions, the capacity building of correctional institutions, and the adoption of policy based on evidence derived from scientific research. Science diplomacy is a platform that connects science, diplomacy and public health building consensus and a unifying vision between different actors to achieve various Sustainable Development Goals (SDGs), especially for good health and well-being (SDG 3) peace, justice, and strong institutions (SDG 16) and partnerships for the goals (SDG 17) (United Nations, 2015).

These results emphasized the urgency of maintaining and enlarging science diplomacy endeavors to adequately deal with current and future challenges related to drugs at the international level.

Discussion

Science diplomacy serves as a neutral forum where dialogue can be facilitated, particularly on controversial themes, such as drug policy reform (Bewley-Taylor, 2017). The perspective of law enforcement as the dominant model for controlled drugs took hold over time and has prevailed for the most part over public health approaches. Nonetheless, the introduction of evidence-informed, scientific discourse at international venues potentially makes space for alternative views, harm reduction, prevention, and treatment, to legitimately influence policy. By providing opportunities for chemical and health science diplomacy through multilateral negotiations, supported by mechanisms such as the United Nations Office on Drugs and Crime (UNODC) and World Health Organization (WHO), science diplomacy has created space for discussions around opioid substitution therapy, needle exchange programs, supervised consumption rooms, and the use of naloxone to reverse overdoses (Turekian et al., 2015). Once stigmatized, these interventions are now being discussed as part of global drug policy in a shift from punitive to health-based policies.

The inclusion of NPS in a national list of controlled substances, such as that of Kyrgyzstan, is an example of how science diplomacy can be employed to effect concrete legislative reform at the national level, drawing on both domestic and international scientific expertise (Resolution of the Government of the Kyrgyz Republic, 2022). The drug control policies of Kyrgyzstan were based not solely on domestic issues, but also on broad-based regional discussion, exchange of forensic data, and advice from initiatives grounded in the UN. This is in alignment with the perspective that science diplomacy can open up access to policy-shaping resources, where smaller or low- and middle-income countries can participate in global drug governance along with more powerful states.

Global programmes such as CICAD (Inter-American Drug Abuse Control Commission), the Global Drug Policy Observatory (GDPO), and research from RAND Europe have played an important role in evidence development and transfer (The Organization of American States, n.d.; Swansea University, n.d.; Reuter & Trautmann, 2009). They act as knowledge brokers -collecting, analyzing, and disseminating best practices to inform national and international decision-making. They work at the crossroads of research and diplomacy, facilitating bidirectional evidence sharing among governments, the scientific community, and civil society. The impact of their contributors extends beyond policy outcomes and has enshrined a culture of science informing top-tier policy debate.

Re-evaluating traditional enforcement-based models through the lens of science diplomacy also reveals the limitations of over-reliance on technological infrastructure. For example, a secure communication system (CENcomm) designed by the World Customs Organization supports the sharing of operational information among enforcement authorities to promote cooperation in operations (World Customs Organization, n.d.). In a similar vein, the capabilities provided by RADAR (Rapid Alert System for Dangerous Substances and Products) and INTERPOL's NPS database could also be utilized to identify, track, and categorize emerging NPS before they cross borders unnoticed (European Monitoring Centre for Drugs and Drug Addiction, n.d.; Interpol, n.d.). These mechanisms act as both early warning and policy facilitators, accelerating responses by regulators.

Additionally, these tools also align with Sustainable Development Goals (SDGs) such as SDG 3 (Good Health and Well-being), SDG 16 (Peace, Justice and Strong Institutions), and SDG 17 (Partnerships for the Goals) (United Nations, n.d.). By connecting priorities of police and public health through a science-based perspective, science diplomacy advocates for holistic drug control approaches that respect the interrelatedness of security, health, and development.

Science diplomacy is evident in technological innovations. Devices like Smiths Detection IONSCAN offer a handheld real-time response for the detection of drug residues on a variety of surfaces to enhance front-line drug interdiction (Smiths Detection, n.d.). Through the promotion of the transfer of forensic technologies via international cooperation, the science diplomacy approach ensures that drug control responses are both evidence-based and proactive. The use of these technologies at airports, seaports, and land borders exemplifies how concrete scientific advancements can contribute to strengthening the capacity of international law enforcement in action.

A further dimension of science diplomacy is the training and transfer of knowledge. Training provided via mechanisms such as AIRCOP (Airport Communication Project) has informed enforcement and customs officials of up-to-date scientific tools and procedures routinely employed to detect drugs (UNODC, n.d.-a). This provides institutional resilience, encourages exchange of best practices, and prevents low-resource countries from being left behind with regard to modern interdiction and public health practices. Such activities will also create a community of practice (guarding common standards and vocabularies) that is necessary for both mutual legal assistance and interoperability.

Kyrgyzstan's case serves once more to illustrate how forensic capacity, regional dialogue and institutional trust, thanks to science diplomacy, can drive superior transformations towards harm-reduction and public health in the drug control field. Crucially, this process was not externally driven but developed through participatory engagement with international partners, thereby demonstrating that science diplomacy may be compatible with national sovereignty while still promoting convergence with international best practices (Resolution of the Government of the Kyrgyz Republic, 2022; Bewley-Taylor et al., 2016).

But science diplomacy cannot resolve the inherent tensions of drug policy. A basic dichotomy remains between going after people to enforce abstinence and taking steps to reduce the harm caused by drugs, often mapped onto normative or political commitments of institutions. In some regulatory regimes, the funding of drug problems still takes precedence over public health, resulting in punitive legislation, mass incarceration, and human rights abuses. Science diplomacy can mediate in such situations by framing drug use as an issue that is complex and not to be tackled solely by the response of the health sector or the justice sector. This role as an intermediary between divergent actors, scientists, diplomats, public health experts, and law enforcement, is one of its strengths (Turekian et al., 2015; EMCDDA, n.d.).

In addition, real-time data platforms like SHERLOC grant legal and criminal justice professionals, including policymakers, access to current legislation, case law, and resources for the prosecution of drug offenses committed in multiple jurisdictions. SHERLOC was established by UNODC in line with the spirit of science diplomacy, which stands for openness, availability, and international collaboration (UNODC, n.d.-a). It also provides a flexible regulatory structure that permits national systems to reflect the rapidly changing global realities of drug markets and, in particular, of synthetic substances, whose chemical constructs mutate quickly in order to stay one step ahead of regulation (EMCDDA, 2023).

However, there are still differences in technology and institutional capacity. Some countries are more capable of engaging in and benefiting from science diplomacy than others. Lack of resources, political instability, and absence of scientific infrastructure can provide barriers to engagement. In order to combat this, science diplomacy of the future will need to focus on equitable access, develop South–South cooperation, and establish inclusive governance structures to meet the needs of diverse communities of interest around the world (Eligh, 2010).

Ultimately, science diplomacy represents a powerful intersection of science, diplomacy, and policy. It makes room for more holistic, rights-respecting, and health-sensitive drug control frameworks. Subjecting scientific evidence to multilateral dialogue and legal structure, science diplomacy facilitates country transitions from an outmoded punitive model to, by default, public health, human rights, and sustainable development-based models. By doing so, it makes a direct contribution to the implementation of the 2030 Agenda for Sustainable Development by advancing specific SDGs and also by promoting international cooperation as a means for global peace, equity, and well-being.

Conclusion

At a time when the world is faced with a drug situation that is rapidly changing, fragmented, and technology-driven, science diplomacy presents itself as a significant tool to address this set of changes. Sitting at the nexus of scientific advancement, global collaboration, and decision making, science diplomacy offers a process-enabling culture that is impartial and politically balanced around which to express the relevancy of science dialogues and capabilities. It allows countries, no matter what their geopolitical or economic status, to contribute to the global debate and to create more balanced and sustainable approaches to drug policy.

A first policy implication that distills from the comparison is that science diplomacy has a relevant contribution to the construction of trust and interoperability among institutions, between countries. Shared forensic tools, technology transfer, real-time information exchange, and joint training efforts have expanded countries' ability to detect, assess, and respond to new and emerging drug problems. The likes of AIRCOP, SHERLOC, and CENcomm indicate that when it comes to enhancing our security, the benefits of multilateral cooperation based on scientific rationalism are there for the taking. The experience of Kyrgyzstan demonstrates the potential of such collaboration: as a low-middle income country, Kyrgyzstan managed to exploit scientific and diplomatic cooperation in order to shape its national drug control policy according to the principles of public health and international practices.

In addition, science diplomacy has played a key role in reconfiguring narratives of drug use. Although previously considered solely as a matter of criminal justice, there is a growing recognition globally that drug use is a public health, social equity, and human rights issue. That trend can be seen in the growing international recognition of measures such as opioid substitution therapy, naloxone distribution, and safe-injection sites. Once shrouded in stigma, they are now openly debated in diplomatic circles and multilateral bodies. Mainstream such strategies, Science diplomacy serves to mainstream such approaches by legitimizing them in the peer-reviewed evidence and anchoring them as ‘one role mark’ to SDGs, especially SDG 3, SDG 16, and SDG 17.

There are also several remaining issues, however. Foremost among those is the differences in institutional and technical capability across countries. Not every state is equally prepared to engage in, and benefit from, science diplomacy. Resource limitations, political instability, and lack of access to scientific infrastructure can also limit meaningful involvement. Moreover, ideological schisms, between punitive and harm reduction camps, remain obstacles to finding common ground in international drug-policy fora.

These results raise several practical implications:

1. Institutionalization of science diplomacy in national drug strategies by incorporating formal interfaces for science policy, such as scientific advisory boards and cross-ministerial working groups crossing public health, security, and diplomatic communities.

2. Foster South–South and triangular cooperation to close capacity gaps and stimulate the sharing of context-specific innovations and policy responses within and across regions.
3. Enhance cross-disciplinary education and training of scientists, diplomats, and policymakers, including systems thinking, ethics, and cultural competency.
4. Incorporate science-based language and metrics in international agreements that recognize the dynamic evidence base and offer more adaptive governance regimes.
5. Open-access platforms such as SHERLOC and the EMCDDA's early warning systems should be supported to democratize the availability of good-quality information to all countries, and particularly low- and middle-income countries.

There are several important avenues for future research. First, a greater number of studies should examine the policy and long-term consequences of science diplomacy interventions, including in conflict or transitioning states. Second, we call for more investigation of normative aspects of empirical scientific collaboration in the context of drug policy: such aspects include data ownership, consent for forensic purposes, and cultural variation. Third, emerging technologies, especially AI-driven surveillance, chemical sensing systems, and blockchain in drug supply chain monitoring, need to be both critically appraised for their promise and assessed for potential abuse. Last but not least, comparative studies might provide clues to understanding how distinct governance models integrate science diplomacy and what best practices can be learned between different geopolitical contexts.

In summary, scientific diplomacy provides a transformational frame for drug policy re-evaluation. Choosing dialogue over division, evidence over ide-ology, and cooperation over confrontation, it aims to be a catalyst between science and society, national interests and global responsibility. If developed and institutionalized, science diplomacy can contribute to making future drug policy efforts not only more effective but also more accountable, rights-pursuant, and in tune with the wider imperatives of sustainable development and peace.

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