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SD-Training Game //

Common-Interest Building: Training Game with the UN Sustainable Development Goals

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Introduction

The 17 United Nations Sustainable Development Goals (SDGs) are a gift to humanity because they are inclusive at local-global levels across generations, with implementation limited only by our imagination (Fig. 1). As a result, all eight billion¹ of us can find relevance and inspiration among the 17 SDGs. This observation reveals the SDGs as a pedagogical playground for next-generation leaders to learn negotiation skills with common-interest building – in contrast to conflict resolution – and so emerged the COMMON-INTEREST BUILDING – TRAINING GAME.

Inclusion is an underlying challenge we each address across our lifetimes, which means there



Figure 1. UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS (SDGs) with international, transdisciplinary and inclusive relevance to balance economic prosperity, societal well-being and environmental protection at local-to-global levels.²

is an opportunity to be inclusive with lifelong learning. All humans are taught six fundamental **elements of inclusion** as children in every language and culture across the Earth. These six elements are the questions: who, what, when, where, why and how.

The skill to be inclusive starts with questions. In turn, questions build common interests with natural sciences, social sciences and Indigenous knowledge to make decisions that respond to change. Ultimately, this transdisciplinary process integrates research into action to make informed decisions that operate across a 'continuum of urgencies'. Informed decisionmaking (Fig. 2) is the context of the COMMON-INTEREST BUILDING – TRAINING GAME.

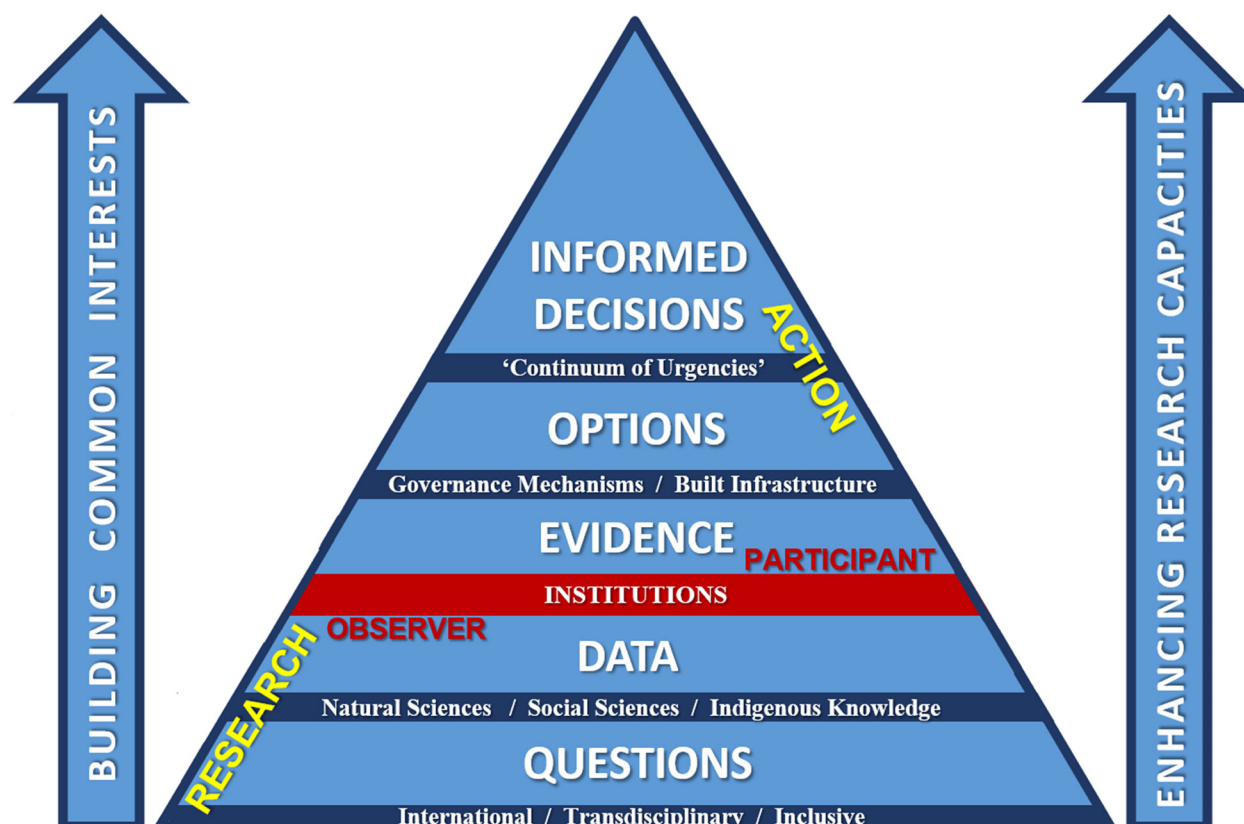


Figure 2. PYRAMID OF INFORMED DECISIONMAKING reflects the international, transdisciplinary and inclusive skills, methods and theory to produce **informed decisions**, operating across a 'continuum of urgencies' short-to-long term at personal-to-planetary levels as a scalable process "for the benefit of all on Earth across generations". Informed decisionmaking is the engine of science diplomacy as a language of hope, building common interests among allies and adversaries alike by triangulating education, research and leadership.³⁻⁵

How to Play the COMMON-INTEREST BUILDING – TRAINING GAME

The objective of the COMMON-INTEREST BUILDING – TRAINING GAME is for a team to justify a single SDG as the *umbrella SDG*, overarching the capacities to implement all 17 SDGs (Fig. 1). The outcome is an informed decision made with inclusion (who, what, when, where, why and how) by building common interests (Fig. 2).

Rule: Any of the 17 SDGs can serve as the *umbrella SDG*.

Step 1: Form a team. It can be small (2-10) or large (>25).

Step 2: Each team member chooses any 3 of the 17 SDGs (Fig. 1) by personal decision.

Step 3: All individual selections of 3 SDGs are shared with the team and recorded in a prepared spreadsheet that totals all selections from the team across the 17 SDGs (Fig. 3).

Step 4: Initiate the team dialogue to discover the umbrella SDG, addressing questions (who, what, when, where, why and how) from team members iteratively, with voting as appropriate, ultimately to produce an informed decision (Fig. 2) justified by the team based on their common interests.

NAME		SUSTAINABLE DEVELOPMENT GOAL (SDG) - SEE FIGURE 1																
First name	Surname	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Name 1a	Name 1b			1	1									1				
Name 2a	Name 2b		1											1			1	
Name 3a	Name 3b	1	1	1														
Name 4a	Name 4b	1						1		1								
Name 5a	Name 5b			1										1			1	
Name 6a	Name 6b	1		1										1				
Name 7a	Name 7b		1				1										1	
Name 8a	Name 8b	1			1						1							
Name 9a	Name 9b			1						1				1				
Name 10a	Name 10b			1						1							1	
20-May-21	Total	4	3	6	2	0	1	1	0	4	0	0	0	5	0	1	3	0

Figure 3. COMMON-INTEREST BUILDING – TRAINING GAME spreadsheet example from the UNITED NATIONS DIPLOMACY 4.0 TRAINING PROGRAMME with MODULE 6 (SCIENCE DIPLOMACY), hosted by the UNITED NATIONS INSTITUTE FOR TRAINING AND RESEARCH (UNITAR 2022) during the six-week session in Spring 2021. Each spreadsheet is prepared in advance to record the three SDG choices of each team member and automatically total each SDG column to consider subsequently (see Step 4).

The team dialogue is facilitated by an individual who empowers the team to be respectful with inclusion, building common interests (which includes self-interests) with questions (Fig. 2) rather than resolving conflicts with answers. The facilitator serves as the broker of the dialogue by emphasising inquiry. With facilitation and questions, each team has the shared task to track their iterative progress from Step 3 (above) – across stages of informed decisionmaking (Fig. 2) on their journey to discover a single ‘umbrella SDG’ justified in view of their common interests. Optimally, there will be an opportunity for all team members together to reflect on lessons learned after playing the COMMON-INTEREST BUILDING – TRAINING GAME.

Applications of the COMMON-INTEREST BUILDING – TRAINING GAME

The COMMON-INTEREST BUILDING – TRAINING GAME began with the diplomatic corps of Armenia in Fall 2018 at the invitation of Amb. Vahe Gabrielyan for Prof. Paul Arthur Berkman to train “Science Diplomacy” through the Diplomatic School of the Ministry of Foreign Affairs of the Republic of Armenia. During this period, Prof. Berkman also applied the COMMON-INTEREST BUILDING – TRAINING GAME in the video-conferencing course on “*Science Diplomacy: Environmental Security in the Arctic Ocean*”, which was offered jointly in the United States and Russia with The Fletcher School of Law and Diplomacy at Tufts University and Moscow State Institute of International Relations (MGIMO University), respectively.⁵ Additionally, the COMMON-INTEREST BUILDING – TRAINING GAME has been played repeatedly by 7th-grade students in the classes of Ms Kathryn Berkman at the Munich International School in Germany.

Since 2019, the COMMON-INTEREST BUILDING – TRAINING GAME has been applied among diverse diplomatic communities, in light of science diplomacy and informed decisionmaking initiatives with UNITAR, enabled by Mr Rabih El-Haddad, Director of the Division of Multilateral Diplomacy. These communities include: (1) the diplomatic corps of five nations through their Ministries of Foreign Affairs; and (2) students, diplomats and other professionals in eight week-long sessions online with the UNITED NATIONS DIPLOMACY 4.0 TRAINING

PROGRAMME (Fig. 3). Diplomatic corps training with science diplomacy and informed decisionmaking (Fig. 2) is illustrated by the week-long virtual session in October 2021, invited by Amb. Carmen Isabel Claramunt Garro with the Academia Diplomática Manuel Maria de Peralta in Costa Rica.

Among the diverse sessions with the COMMON-INTEREST BUILDING – TRAINING GAME, the teams with the Diplomatic School of Armenia from 2019-2022 are most comparable for cultural, gender, age and professional demographics (Table 1). The 3-day “Science Diplomacy” sessions with the Diplomatic School of Armenia were in Yerevan in 2019-2020 and virtual afterward virtual during the pandemic.

Table 1. Selection Totals among the Sustainable Development Goals (SDGs) with the COMMON-INTEREST BUILDING – TRAINING GAME (Fig. 3) in “Science Diplomacy” Courses at the Diplomatic School of Armenia

TRAINING SESSION		SUSTAINABLE DEVELOPMENT GOAL (SDG)																
Students	Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
12	APR '22	0	1	3	8	2	0	1	3	0	0	1	2	4	2	1	6	2
10	DEC '21	0	2	3	6	1	1	1	1	2	0	2	0	3	0	2	6	0
11	MAR '21	4	0	2	7	1	4	1	0	1	0	0	0	5	0	0	5	3
10	NOV '20	0	1	3	8	2	0	0	4	1	0	0	0	0	0	0	8	3
15	OCT '19	2	2	4	9	3	1	1	2	1	2	0	0	4	1	2	9	1
20	FEB '19	5	3	7	7	0	3	0	8	1	1	0	1	7	2	1	9	4
AVERAGE		1.8	1.5	3.7	7.5	1.5	1.5	0.7	3.0	1.0	0.5	0.5	0.5	3.8	0.8	1.0	7.2	2.1
Session Consensus Most Frequent Umbrella SDG																		

Table 1 reveals several commonalities among the above applications of the COMMON-INTEREST BUILDING – TRAINING GAME (FIGS. 1-3).

- ❖ Identification of a single “umbrella SDG” justified by the team may be a bridge too far, noting that consensus on a single SDG happened in 4 of the 6 sessions above (Table 1). In the other two sessions, the teams decided to have two umbrella SDGs, changing the rules of the game with common interest.
- ❖ Inevitably, in every application of the COMMON-INTEREST BUILDING – TRAINING GAME, the team dialogues started with a selection of the most popular SDGs. But what about the minority SDGs? To be inclusive – how do we effectively address who, what, when, where, why and how with sustainable development at local-to-global levels, short-to-long term in our climate-challenged civilisation of the 21st century? It is noteworthy, in two sessions (Table 1), the teams revealed their common interests with an “umbrella SDG” they initially considered to be of minor importance.
- ❖ Across the six sessions with the Diplomatic School of Armenia, QUALITY EDUCATION (SDG 4) was highly ranked and recognised as the “umbrella SDG” in half of the sessions (Table 1).
- ❖ PEACE AND JUSTICE STRONG INSTITUTIONS (SDG 16) also was highly ranked in all sessions and recognised twice as the “umbrella SDG”.
- ❖ Other “umbrella SDG” justified by the teams with their common interests included: GOOD HEALTH AND WELL-BEING (SDG 3), CLIMATE ACTION (SDG 13) and PARTNERSHIPS FOR THE GOALS (SDG 17), which also were represented among the outcomes across the UNITAR sessions.

What will your team decide about common interests with the SDGs?

Lessons Learned with the COMMON-INTEREST BUILDING – TRAINING GAME

The COMMON-INTEREST BUILDING – TRAINING GAME is itself inclusive in view of lifelong learning. Imagine 17 blocks simply coloured as the SDGs with symbols, but without words, offering a group of children the choice of any three blocks before they can read, playing the game with Steps 1-4. With words comes increasing complexity, but the elements of inclusion remain unchanged across our lifetimes as we learn to frame and address questions, which build common interests (Fig. 2).

The 17 SDGs are rich with complexity that can be tailored as a 'pedagogical playground' across lifetime stages of learning: K-12 (education), universities (research) and professions (leadership). More steps with the COMMON-INTEREST BUILDING – TRAINING GAME can be added, based on the educational objectives and facilitator creativity. The opportunity is a matter of exploration for each team member and teams together, asking questions that can be addressed given the 169 targets and 231 unique indicators aligned with the 17 SDGs,⁶ which can be treated as data points with methods across stages of research (Fig. 2).

More broadly, the depth and breadth to explore the SDGs are amplified across all countries on Earth, noting that 187 of 195 nations have contributed at least one Voluntary National Review (VNR) of their progress with the SDGs since 2015.⁷ The context of the SDGs can also be explored across the arena of global institutions that operate short-to-long term,⁸ as exemplified by the *United Nations Framework Convention on Climate Change*⁹ with its ongoing annual Conferences of the Parties (COP). Moreover, there are many analyses that consider interests in the SDGs from diverse perspectives, addressing primary questions, such as equitability.¹⁰ Inclusion (who, what, when, where, why and how) with the SDGs is revealed by their very existence, evolving from OUR COMMON FUTURE.¹¹

Inspiration with the SDGs (Fig. 1) exists across the Earth for next-generation leaders to become champions for humanity. Across the spectrum of subnational-national-international jurisdictions, the gift of the SDGs is with a common-interest building to transform our globally-interconnected civilisation with informed decisionmaking skills (Fig. 2) that can be shared equitably among all 8 billion of us with lifelong learning, creating synergies with education, research and leadership. This is the hope and imagination with the COMMON-INTEREST BUILDING – TRAINING GAME...*"for the benefit of all on Earth across generations"*.

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Technology Cooperation and Industrial Growth: Leveraging the ASEAN Opportunity

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Introduction

South and South-East Asia constitute an important geopolitical realm in the present world order and have the potential to become a global fulcrum of south-south collaboration. India's [Act East policy](#) is envisaged to leverage trade and strategic partnerships with the countries of South-East Asia. Over the years, the ambit of this partnership has expanded into wider areas that include, among others, cultural, scientific and technological cooperation.

The industrially diverse [ASEAN](#) countries hold ample opportunities for India and vice-versa. This, coupled with geographic proximity, has led to a continuous consolidation of partnerships. Nevertheless, the volume of trade or technical cooperation between India and the ASEAN continues to remain low. Other than the [OECD](#) economies, China exercises almost complete dominance in such partnerships.

Industrial cooperation and associated transfer of technology is the key to leverage India's linkages with the ASEAN, and in the process, position India as a major competitor to China and the west. Fortunately, the industrial structure in India and ASEAN shows some degree of similarity, in the fact that both are dominated by micro, small and medium enterprises. 96% of ASEAN manufacturing industries fall within the SME category and therefore constitute a key driver in the ASEAN economy. Correspondingly, MSMEs contribute more than 30% to India's GDP with a scope of further enhancement.

Indo-ASEAN Complementarities

Economically and technologically, ASEAN exhibits a lot of diversity. Among the ASEAN countries, Cambodia, Brunei, Laos, and Myanmar are predominantly agrarian; Singapore, Thailand, Indonesia, and Malaysia are relatively industrially progressive; while Vietnam and the Philippines are located somewhat midway. Synergy and complementarities with India exist in almost all countries.¹

Given the preponderance of small and medium enterprises in the economic fabric of both India and the ASEAN countries, the industrial ecosystems of the future in both regions are likely to be built around them. The distribution of such industries is diverse and disparate, and they exist at various levels of maturity. Agglomeration and formation of clusters typify the scene. Significant synergy has been noticed among the SME clusters in India and various ASEAN countries. The upgradation needs of the above clusters focus on product innovation and the need for advanced technology; access to finance; direct market access;

improvement in regulatory and work environment; access to raw materials; and skill development & capacity building.

Table 1 gives a snapshot of some representative clusters focusing on commonly used products that were mapped during a pilot study involving the Indian (state of West Bengal) and ASEAN counterparts.² All of them have product innovation requirements, relying on technology. The mapping, despite its limited coverage, has been seen to be reasonably similar across India.

Table – 1

India	Indonesia	Singapore	Cambodia	Laos	Thailand	Vietnam	Philippines	Myanmar	Brunei	Malaysia
Clay & Ceramics										
Lac products								√		
Horn products										
Dye and bleaching										
Plastic products			√		√					√
Brass and Bell metals										
Metal fabrication								√		√
Gems and Jewellery	√	√								
Food products	√		√	√		√	√		√	
Jute, Bamboo	√	√	√							√
Readymade garments			√	√		√	√			√
Woollen garments										√
Machinery and Spares				√		√			√	√
Wooden furniture			√						√	√
Leather			√			√				√
Shuttle cock	√									
Rubber products	√	√	√		√		√			√

Technologically, the Council of Scientific and Industrial Research-India ([CSIR](#)) is poised to become a strong player in India-ASEAN relations; primarily because the portfolio of CSIR encompasses a broad gamut that covers virtually all industrial domains; and, the existing scientific cooperation that already exists among CSIR laboratories and institutions of ASEAN countries. Thus, a CSIR-India led collaborative ecosystem is likely to be benefitted both from the technology end-user as well as the technology provider perspective.

As evident from the above table, many of the clusters are found in both India and various ASEAN member countries. Almost all the domains listed could have CSIR laboratories as technology/innovation providers to address their needs. These could include (but are not restricted to) CSIR-CGCRI for clay and ceramics; CSIR-NCL/CSIR-IICT for dye and bleaching; CSIR-NML for brass & bell metal/metal fabrication; CSIR-CMERI for metal fabrication/machinery and spares; CSIR-CFTRI on food products; CSIR-CLRI on leather and so on. Several technological elements could map onto multiple laboratories.

Evolving Policy Models for SME Growth

Mechanisms of cluster engagement within the SME sector could be diverse. It might either occur through the upfront transfer of technology (from relevant technology providers); or by capacity building through

training/ mentoring from technology providers. Usually, both the above processes necessitate the key role of technology institutions or academia. Yet another relatively less prevalent way could be cluster twinning – that is envisaged to involve two clusters, each of them mutually complementing the other's needs. Twinning could be an excellent model for engagement among Indian and ASEAN clusters. R&D institutions and academia in both regions would serve as key drivers in the success of the twinning process. There are some examples of twinning among Indian and Indonesian clusters; Indian and Malaysian clusters, etc.

Digital connectivity and e-commerce have also emerged as key drivers to connect SMEs of developing countries and to make them technologically compliant with Industry 4.0 (4IR). Studies have shown that the adoption of 4IR technologies would enable SMEs in India and ASEAN to diversify their clientele at lower costs while providing customers with a wider range of products. New policies, therefore, tend to focus increasingly on upgrading the constituent SMEs in both regions with appropriate 4IR. The ASEAN Digital Integration [Framework](#) (2019–2025) and the Master [Plan](#) of ASEAN Connectivity 2025 are focused on leveraging the collaborative strengths of regional players including India. A recent working paper on “Innovation, Transfer and Diffusion of 4IR Technologies to catalyse Sustainable Development in Asia-Pacific” published by [ESCAP](#) has further highlighted the role of collaboration and capacity building in evolving sustainable technology ecosystems.³⁻⁵

While countries such as Singapore and Thailand are leaders in the adoption of 4IR, many others like Myanmar or Cambodia lag substantially. There is also a noticeable diversity in the application domain. Thailand, for example, focuses its IoT (Internet of Things) spending more on leveraging the manufacturing sector; Vietnam on intelligent transport systems, environmental monitoring, etc.; Cambodia envisages harnessing IoT for farm management and water management.³

India has managed to develop a reasonable digital infrastructure through its Digital India Mission and its start-up policies. A large section of its industrial and financial base is gearing up for nurturing and sustaining the 4IR. While it can adopt technologies from countries like Singapore, it can effectively provide technologies and capacity to most of the least developed countries in ASEAN.

Technology institutions in India undoubtedly have a significant role to play in such capacity-strengthening and resource-mobilisation processes. CSIR took a lead during India's 12th Five Year Plan (2012-2017) to develop an R&D capacity for promoting big data analysis by establishing the Fourth Paradigm Institute. This can be an appropriate platform along with others for building India's ASEAN outreach in 4IR.

Barriers to Technology Cooperation

Notwithstanding the various initiatives and interventions, technology cooperation between India and ASEAN exhibits several barriers that need to be overcome primarily at the policy level. While several parameters have been identified, it is felt that the following four elements could be starting points in addressing the gap:

- **Disparity in IPR regimes:** The IP regimes of various countries of the ASEAN among themselves vis-à-vis India shows marked disparity, although most of them are signatories to the [TRIPS](#). This is a major impediment to the free movement of technology and knowledge. It is important to develop a more seamless regime conducive to the specific needs of the region.
- **Low collaborative R&D:** Research collaboration among the technology providers is of primal importance in achieving effective capacity building and transfer of knowledge. India and ASEAN have a low degree of collaboration, including co-publications, MoUs, institutional HR exchanges and so on. While initiatives such as the ASEAN-India Research Initiative of DST-India endeavour to address this gap, the quantum of collaboration is far from satisfactory. A greater and wider degree of collaboration is required to be espoused with more involvement of industries from both regions.
- **Inadequate International Technology Transfer Policy:** The policy for the international transfer

of technology is rather inadequate in India which impedes seamless exchange. This is true for institutions such as CSIR as well, which require a special focus.

- **Low innovation among firms:** The innovation capacity and innovation index among the various firms, especially the SMEs continues to remain low both in India and most of the ASEAN countries (with few exceptions in Singapore and Thailand). This serves as an impediment to adopting 4IR technologies to enhance their competitiveness. Cooperative models to leverage capacity could prove effective for both players.

Conclusion

The approaching SDG target of 2030 provides a major opportunity for India to enhance its technology outreach and trade partnerships. Such an endeavour is also poised to leverage the capabilities and output of our major technology institutions. Against such a backdrop, a deeper ASEAN connection holds out immense promise.

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Strategic Autonomy and Science Diplomacy: India and the Path Ahead

Manoj Saxena*

In recent times, there has been a visible recognition of the importance of science diplomacy as an instrument of foreign policies of states in the international system. The concept had also formally seeped into New Delhi's state policy by 2013 when the Ministry of Science and Technology, Government of India (2013) stated its will to deploy 'Science Diplomacy, Technology Synergy and Technology Acquisition models', according to the multiple strategic partnerships as fielded by the South Asian power in the country's *Science, Technology and Innovation Policy 2013*.¹ However, science diplomacy – like other components of diplomacy such as cultural diplomacy and economic diplomacy – remains a component of a state's overall foreign policy, meant to serve national interests.

In India, the science diplomacy component has always been closely connected with its other foreign policy component of *strategic autonomy* – and its previous antecedent in the shape of non-alignment in the last century. In 1959, India's first Prime Minister Jawaharlal Nehru – the core architect of its non-alignment policy – stated that the country needed science to enable its rise but would not be drawn to either inter-state competition or rivalry in the process. Nehru (1959) further sought access to advances made in international science and technology but only in the spirit of cooperation.²

In international relations, it is given that a state's foreign policy – however well-intentioned – will be subjected to external turbulence from the International system. And India's case during the last century was no different. Independent India managed to gain early access to multiple sources of science and technology to address its national needs in areas as basic as industrialisation and as advanced as its nuclear or space programmes. However, following the first Chinese nuclear weapons test in 1964 – New Delhi was coerced to demonstrate its own nuclear weapons technology in the shape of Operation *Smiling Buddha* in 1974. This brought upon compelling US-led sanctions in the nuclear technology sphere – complicating India's overall position as both a recipient and a donor of science and technology in the international system. India's attempts to pursue missile technology would further be impeded by US sanctions in the 1990s. New Delhi was impelled to tilt towards Moscow and further received a sympathetic understanding from Paris – both India's only enduring strategic partners towards the end of the last century.

Whilst reiterating India's commitment to the ethical use of nuclear technology, India's President KR Narayanan asserted that all measures will be taken to preserve the country's strategic autonomy in his address to the parliament on 25 October 1999.³ Given a thaw in Indo-US relations during the early half of this century, India was able to enter the global mainstream not only in the nuclear, space and missile technology domains but was also able to build science and technology relationships in other areas with states as diverse as ranging from Europe to the Gulf with strategic partnerships further emerging from varied sources like South Korea, Japan, Australia and the US itself.

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More recently, India's Foreign Secretary Harsh Vardhan Shringla (2021) stated that 'the notion of national security has broadened beyond recognition. Strategic autonomy today is not just a political or military construct; it applies equally to dependencies in technology, supply chains, and critical commodities, including pharmaceuticals and medical equipment. These trendlines have sharpened during the Covid-19 pandemic'.⁴ Foreign Secretary Shringla (2022) also placed India's strategic autonomy as 'not the same as a rigid, isolationist, ideological aversion to partnerships and alignments'.⁵ India's incumbent External Affairs Minister, Dr S. Jaishankar situated post-COVID changes in the international system as having greater 'risk aversion in a world now clearly more insecure and encouraging strategic autonomy to address over-dependence'.⁶

However, turbulence from the external environment continues to haunt both India's science diplomacy and its strategic autonomy designs in the present day. Since the advent of the Russia-Ukraine crisis, Russia, India's most steadfast strategic partner in the international community, has been facing international sanctions – including those in the science diplomacy domain.⁷ This presents obvious issues for India's science diplomacy, given the deep and abiding science and technology cooperation between the two states in the global system.⁸ That India maintains multiple *strategic partnerships* but not treaty alliances in this century means that country has enough space to navigate through the troubled waters without renegeing on its state-sanctioned commitments. But as events escalate, keeping a diverse set of strategic partnerships – with some states at discord with each other will have implications for India's existing science diplomacy endeavours.

Furthermore, the external environment by 2022 is turbulent, to state the very least. There is post-COVID-19 recovery; China's aggressive rise; a given hostility with Pakistan; and the erasure of Ukraine as a source of India's imports. India has long sought access to global sources of science and technology. But it has also sought *self-sufficiency* in all its formal science policies – that currently manifests as *Atmanirbhar Bharat* under the incumbent Narendra Modi administration. Given rivals in the shape of China and Pakistan at borders and its own strategic partners at war with each other – India's science diplomacy will increasingly rely on its strategic autonomy calculations in the days, months and possibly years ahead.

Both of India's foreign policy components of strategic autonomy and science diplomacy will now have to enter unseen circumstances. India's strategic partnership with Russia – now at war with Ukraine amid global sanctions – is perhaps one of the most solid inter-state relationships since the pre-Brexit US-UK partnership in the international system. Given the advent of the Russia-Ukraine crisis – amidst existing post-pandemic recovery and rivalries with China and Pakistan – all features of India's foreign policy will be tested.

As India takes over the presidency of the Group of Twenty (G20) from 1 December 2022 to 30 November 2023, the focus should be on conflict mitigation and maximum inter-state cooperation on the way ahead. India of 2022 remains the one state in the international system that fields multiple strategic partnerships despite its strategic partners being at inter-state discord even in fields as basic as science and technology. For this to manifest, the country's foreign policy personnel and its science and technology workforce will have to come together to not only answer national needs but also global issues and challenges to ensure that science diplomacy works in this century, however severe the inter-state discord.

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In particular, India is concerned about rules that impose restraints on domestic policy around [data localisation](#) – that is a legally mandated restriction on the cross-border flow of data belonging to Indian citizens. A 2019 draft agreement published by JSI members prevents domestic policy mandates restricting the cross-border transmission of information by electronic means and the local storage of computing facilities along with an exception that allows violations on the grounds of a 'legitimate public policy objective'.

Now, India has put in place several domestic policy measures that impose data localisation, including notably a [2018 directive](#) from the Reserve Bank of India that mandates restrictions on the cross-border flow of financial data. The 2019 draft allows for exceptions on the grounds of 'legitimate public policy objectives', thus, ostensibly providing India with some domestic policy space. However, this does open India up to potential litigation at the WTO, where the judicial bodies have held for the side invoking a general exception only in two out of the forty-eight instances where they have been invoked.

Given the heavily contested progress at the WTO, states have also tried to bring digital trade provisions into "mega-regional" trade agreements, including the [Regional Comprehensive Economic Partnership \(RCEP\)](#) and the [Comprehensive and Progressive Trans-Pacific Partnership \(CPTPP\)](#). These agreements are crafted similarly to the draft WTO text discussed above.

India has not signed these agreements that have brought on board several Indo-Pacific powers. However, [reports](#) suggested that India was instrumental in crafting an additional exception on the grounds of 'essential security interests' in the RCEP, which, unlike the 'legitimate public policy' exception discussed above provides full discretion to the state invoking it. Ultimately, India's decision to not sign RCEP was reportedly [not](#) because of the e-commerce chapter, thereby indicating a willingness on India's part to engage with and sign up for digital trade agreements if compatible with India's interests.

India has also cautiously engaged with plurilateral mechanisms such as the Indo-Pacific Economic Framework (IPEF) that aim to ferment trade agreements in the Indo-Pacific region. While India is a key member of the IPEF and has signed onto the pillars of trusted supply chains, a fair economy and a clean economy (clean energy), it has [chosen](#) to be an observer rather than participate in or commit to the 'trade' pillar of the IPEF till the contours of the overall framework emerge. Officials from the United States, which is the key architect of the IPEF, have [indicated](#) that they desire collaboration concerning devising standards for cross-border flows, data protection and artificial intelligence governance. Given this ambitious agenda, it may be too early for India to commit to the trade pillar of the IPEF right away.

Rather than prematurely commit to multilateral or plurilateral obligations, India has preferred to negotiate bilateral trade agreements with key partners. For example, a Free Trade Agreement (FTA) with the United Arab Emirates does not impose strict digital trade obligations on either party. It only states that both parties should "endeavour" to promote the cross-border flow of information subject to existing laws and regulations and adopt laws protecting personal information. Further, India has signed a bilateral trade deal with Australia without inserting a chapter on digital trade, whereas a [potential deal](#) with the United Kingdom has run up against roadblocks reportedly due to disagreements over cross-border flows.

Factors shaping India's digital trade diplomacy

Like with other [regimes](#), India's digital trade diplomacy has been driven by an appraisal of immediate strategic interests which is in turn shaped by the interests of key domestic stakeholders combined with institutional capacity and cohesion within the government. India's immediate interest is to secure the domestic policy space needed to enable its nascent digital economy to grow while protecting consumers' and users' rights and domestic businesses as they integrate with the digital economy. Data localisation has been a [policy priority](#) for government ministries across the finance, health and electronics sectors, but remains an issue on which multiple stakeholders continue to engage with the government. While foreign

technology companies have always been opposed to data localisation in any sector due to increased compliance costs, reports suggest that policymakers may be more [receptive](#) to recent requests by Indian start-ups to ease localisation requirements in domestic law. However, till robust domestic consultations are completed and a robust and holistic policy is put in place, it would be premature to accept legal obligations imposed externally by signing up to trade agreements.

At the same time, sitting out of trade agreements entirely would mean that the standards governing digital trade would get brokered without India at the table. Therefore, like with the e-commerce chapter of RCEP, opportunities have been sought to diplomatically engage at multiple forums. However, commitments have been made and obligations accepted only when domestic policy space is assured. Bilateral trade agreements also serve as an option where two parties are on equal footing at the negotiating table and a mutually acceptable agreement can be brokered without multilateral pressure.

India has not stepped away from multilateral conversations entirely either. Even though they are not formally a part of the JSI, India's communications to the WTO, often jointly co-authored with South Africa, are well-researched and explore legally and economically sound points of view. This has been made [possible](#) both through the construction of in-house capacity within government institutions negotiating international trade as well as increasing engagement with external experts such as trade lawyers at firms and academics.

The normative rigour of India's trade diplomacy is not a new phenomenon and has been in place since the 1990s when India started robustly engaging with the increasingly complex negotiations at the World Trade Organisation. This expertise has helped India navigate the new era of bilateral and regional trade agreements as well. Further, crucially, India has not allowed disagreements on digital trade to impact cooperation with countries such as Japan, Australia and the USA through other avenues, including cybersecurity and supply chain resilience through mechanisms such as the [Quadilateral Security Dialogue](#). This flexibility combined with a fierce assertion of strategic interests and preservation of domestic policy space has been the hallmark of India's digital trade diplomacy, and will serve Indian interests well going forward.

Data Diplomacy and its Implications

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We live in an age where data has been termed the new oil. Like oil, data in its raw form needs processing to obtain useful insights. But the relationship between data and the source of data is extremely complicated. The basic premise of the field of Data Analytics lies in recognising patterns in the collected data so that improved estimates can be made about the future. So, data is an extremely important tool in the arsenal of policymakers for informed decision-making. With decision-making becoming increasingly scientific by the day, the raw material for the process, the data itself, must be high quality. Otherwise, spurious relationships can be shown to steer the decisions for a specific agenda.

Data sharing is a strategic tool for negotiations among states to govern crucial aspects of society.¹ Countries across the globe are setting up dedicated departments that handle the affairs of obtaining relevant data from other states and using the data to quickly gauge the ground reality and provide timely aid to those in need. The emerging field of data diplomacy focuses on the advantages 'big data' can provide to diplomats engaged in foreign policy.² Data diplomacy helps connect the dots between the data at hand and its usage for the multiple dimensions of negotiations.³ Diplomacy is a very nuanced field and requires several years of exercise to form strong bonds between two parties. With the help of data, a redefinition of relationships can occur that is based more on objective truth than qualitative discussions. This sudden shift can be difficult for diplomats to inculcate and needs a touch of subtlety on their part.

The world is currently host to several problems that are global in nature. Climate change, rising wealth disparity, food insecurity and the prevalence of deadly diseases lie on the agenda of several global welfare institutions. Measuring something is the first step in acknowledging the extent of the problem at hand. Data on these issues quantifies the task at hand. The global nature of these problems motivates the need for cooperation among different states. Access to raw data is imperative for pioneering the discussion concerning a solution. Diplomats across the world can use advanced data analytics to have leverage over strategic negotiations with a high level of confidence in possible scenarios. Advancement of technology has prompted the collection of data from a myriad of sources which was earlier simply not in the realm of possibilities. This has brought new horizons into the picture. Several new applications, like the collection of genetic information, health indicators, behavioural activities, etc., have come up that provide new avenues for research.⁴

Data sharing is riddled with challenges at every step of the process. Data sharing can be done either within an organisation or externally. Both sets of processes have different challenges associated with them. The one we are interested in is external data sharing. Governments worldwide take help from the research community for assistance in making public policy decisions. Many times, this involves sharing sensitive public data with the researchers. For data sharing, the most crucial challenge is maintaining an efficient data management system. This helps track where and how data is being used and prevents data copies.

Thus, it reduces the risk of dissemination by preventing unauthorised data sharing. Another key challenge is data privacy and compliance with data security regulations. Different countries might have different legal speak when it comes to following security laws. A translation of the laws in a language that is standardised universally will go a long way in curtailing this barrier. Similarly, privacy laws tend to act as hurdles when sharing data among different organisations are involved. As technology improves, the insecurity related to data sharing will reduce, unlocking different avenues for research and collaboration.

International collaborations rely on sharing information among countries for mutual benefit. Big data can be one form of information that helps in discovering patterns and trends with sophisticated techniques. The UN project of Humanitarian Data Exchange (HDX) is a positive initiative that is bridging the gap between the data and the policies that are derived from it. This project provides the availability of big data in an open source for researchers to draw inferences that will aid public policy. Security is another key arena where countries share their data to eliminate potential threats. Solving the above-mentioned challenges can go a long way in enabling countries to trust each other when it comes to sharing big data.

It took years to collate information about the cause of the black death. At the same time, the disease continued to devastate populations in Asia, Europe and Northern Africa, wiping out one-third of their total populations. Contrast that to the spread of COVID-19 and the dissemination of information regarding every aspect of the disease. All this happened due to data sharing regarding the number of infections and deaths. Mass testing allowed governments to plan for resource allocation and predict the intensity of the disease. Sharing the genetic data of the Sars-CoV-2 virus allowed for the development of vaccines in an extremely compressed time frame. The data regarding the number of infections in a locality can be used to plan for improved allocation of doses. The Decision Engineering and Pricing (DEEP) Lab at IIT Madras is working on a possible solution for optimal vaccine allocation strategies. Data regarding the changing efficacy of the vaccine doses has brought up conversations regarding the requirements of yearly booster doses to keep the threat of viral infection at bay. There is no doubt that data sharing has been crucial in establishing a singular frontier in the fight against the pandemic.

Data sourcing is an essential feature which forms the foundation upon which the entire structure of data analysis is built. Data should be collected in an ethical manner that ensures the privacy of the data provider. Many-a-times, the permission to collect data is hidden in pesky terms and conditions, which can trick the data provider or discourage the user altogether from participating. One method of eliciting true ground reality is forming the consensus of the general public. Game theory can help in achieving this goal with the help of a concept termed mechanism design. Instead of forcing people to provide true information about the ground truth, they are incentivised to do so. The consensus or the average value reported by the aggregation of the information reported by all the agents can then be assumed to be the ground reality. Participants who report observations close to the ground reality are rewarded, while those who try to report maliciously are not. Honest reporting of true values is the dominant strategy for each agent. This method of truth elicitation is termed as 'Community Sensing', and depicts how primary data can be collected. It can be employed in sensing the levels of air pollution, the prevalence of a disease in a locality, or even feedback on government services in the region.

Data is a key pillar in the 'Digital India' revolution. Collecting high-quality data is a vital ingredient that will facilitate several objectives. The government aspires to improve the quality of decision-making by using the data it collects from the citizens. This data can be utilised to estimate several key economic indicators, which can be employed for formulating global policies in an informed way. The data is also used for safeguarding the public from potential security threats.

In an age where the decision-making process is becoming more scientific by the day, trust must be established between the data scientists and those involved in making diplomatic relationships. It is also crucial that both these stakeholders remain autonomous in their functionality. Data scientists, under the domination of diplomats, may be forced to derive spurious relationships with the data to achieve specific

diplomatic goals, which may not represent the true ground truth. Audits must be carried out diligently to ensure truthful behaviour.

Finally, the data collected must protect the fundamental rights of the citizens. Cyber privacy laws are becoming a topic of hot discussion in several global forums, especially when the ethics of sharing personal data is involved. The road towards achieving a consensus regarding data sharing is a rocky one and needs to be tread with extreme caution. Global issues call for actions at a global scale, and global collaborations require extreme forms of diplomacy. Unlike oil, countries do not have a strict monopoly over their data. Some countries might not be willing to share their data. The rate of digital innovation across countries will widen the gap between the development rate as well.⁵ Data is critical for the next revolution of global development and diplomacy is the means for its facilitation.

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Citizen Science //

RAD@home India Citizen Science Diplomacy at the International Astronomical Union Symposium 375, Nepal

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"When you look at the stars and the galaxy, you feel that you are not just from any particular piece of land, but from the solar system" - Kalpana Chawla

The striking words of Kalpana Chawla give us a reason to believe that all of us are just a dot in the Universe. And we are separated by human-made borders, although astronomically, we belong to one of the solar systems. [RAD@home](#) Astronomy Collaboratory, which is India's first citizen science research project in astronomy, has gone beyond the Indian border and was part of the International Astronomical Union's (IAU) [Symposium 375](#), "The multi-messenger chakra of blazar jets", held in Kathmandu, Nepal between 5-9 December 2022. Leading members of the Collaboratory presented their recent discovery of a black hole galaxy system RAD12(1-3) and also conducted an Astronomy workshop for Nepali citizens. The collaboratory has been active in India for almost a decade now. It enables the science-educated masses from across the country in discovering Radio Galaxies by training them with the support of various Indian institutes.



Figure 1. RAD@home Astronomy Workshop, an outreach event as part of IAU symposium 375, Kathmandu, Nepal

It was the first outreach program organised in Nepal under the guidance of Indian scientists and citizen scientists. As part of the IAU symposium, this outreach program aimed to teach astronomy to Nepali citizens (school students, college graduates and citizens) that can lead to publishable discoveries. The event was held in collaboration with the leading local astronomy agency, the Nepal Astronomical Society (NASO). The collaboration was financially and logistically supported by IAU to conduct RAD@home Astronomy Workshop as part of the symposium.

Nepal and India enjoy excellent bilateral relations. These relations found their roots in the same cultural, historical and matrimonial ties. Also, the religious similarity due to Hinduism and Buddhism plays a crucial role in keeping the two nations together. India's neighbourhood first policy, the treaty of peace and friendship (1950) between the two nations brings closeness.

India - Nepal shares immense potential in Science, Technology and Innovation cooperation. India is one of the largest providers of higher education which depicts its soft power diplomacy with neighbouring countries. And such institutional collaborations allow a bottom-up approach toward educational empowerment in our neighbouring countries.

In the long term, RAD@home plan to train Nepali students and citizens in astronomy and lead them toward astronomical discoveries using the Indian telescope facility and Nepali human resources. It will require collaborations and MOUs, which is a work in progress. Such collaborations, if executed well, can be mutually advantageous on several levels. RAD@home also taps into Nepal's STEM population and ensures scientific development of Nepalese. Access to Indian scientists will enhance scientific networks and educational interchanges in Nepal.

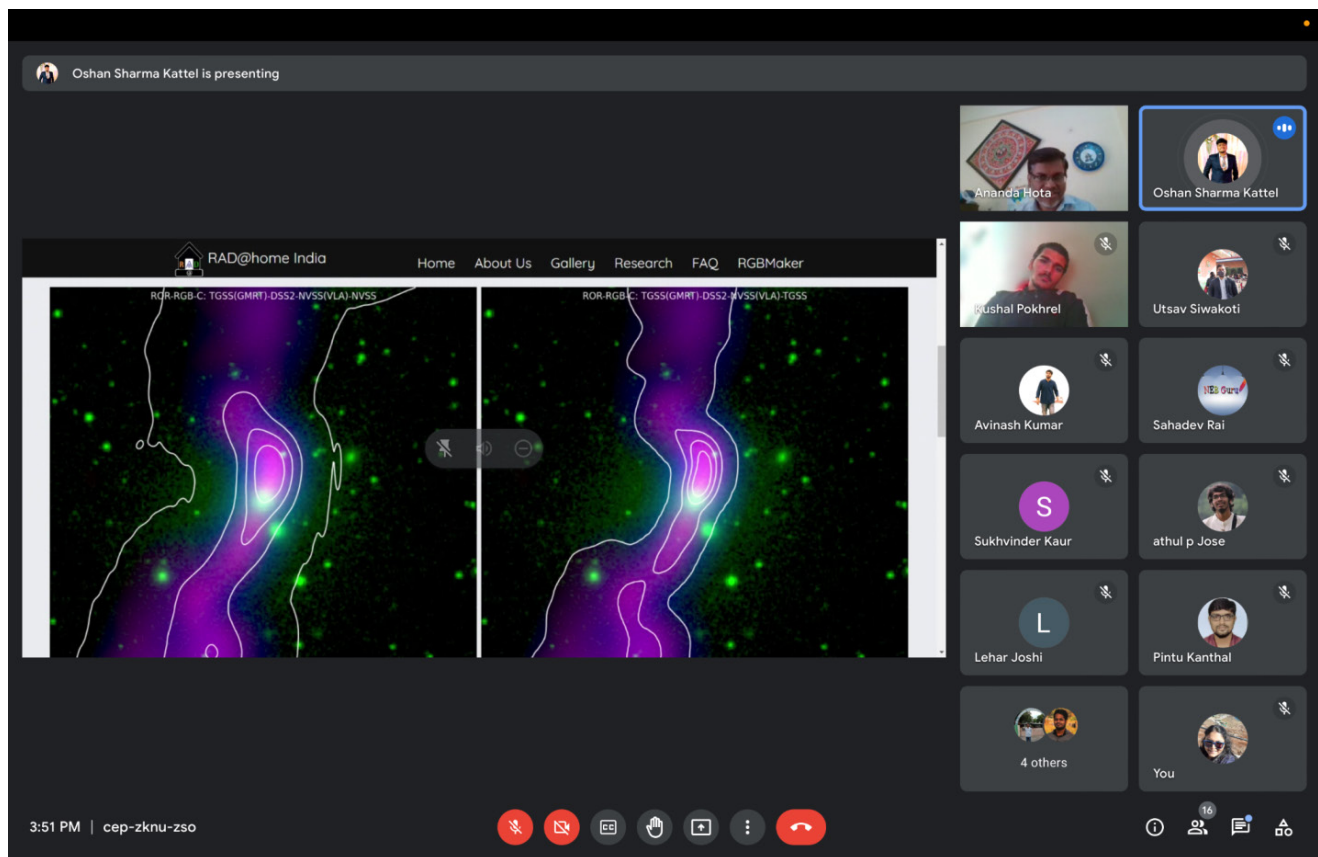


Figure 2. RAD@home online e-class during weekends training the Nepali citizens/students for citizen science research with RGB-image analysis

Moreover, they would be encouraged to participate in the ongoing GMRT Observation of Objects Discovered by RAD@home Collaboratory (GOOD-RAC) observational project at the Giant Metrewave Radio Telescope (GMRT) near Pune, which is primarily used by the collaboratory for its discoveries. It would benefit the Indian science community as well. Given it is a citizen science collaboratory, the discoveries will be from an Indian telescope with the Indian scientists' collaborations.

Such collaborations will increase our international footprints and the formation of a community that is working beyond borders. With the power of the internet and freely available tools, Nepalese are already getting trained through weekly e-classes. These e-classes empower them to understand the basics of multi-wavelength (UV-Optical-IR-radio) extragalactic astronomy by making Red-Green-Blue (RGB) images of the various types of galaxies with/without active black holes, using the RAD@home RGB-maker web-tool. It provides hands-on training to the participants aiming to become e-astronomers or trained citizen scientists. This way e-astronomers become part of the collaboratory and achieve co-investigatorship in GMRT research proposals and co-authorship in international publications. The plan is to expand this partnership to other nations within the SAARC countries.

If numbers are to be interpreted beyond adjectives, over 200 people had registered online for our outreach/educational programmes, and over 100 got the training during the in-person event. Nepali media also highlighted the participation of scientists in the IAU375 symposium from India, China, United States, Russia, Germany and United Kingdom. The RAD@home educational/outreach programme gathered huge public participation. Promoting the use of GMRT and AstroSat (the Indian space telescope) in people from SAARC countries will facilitate the growth of human resources, and the RAD@IAU-375 event is just the beginning of that era.

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News //

Indian Biological Data Center: India's first national repository for life science data

Indian Biological Data Bank (IBDC) is the first national repository for life science data in India established at the Regional Centre for Biotechnology (RCB), Faridabad in collaboration with the National Informatics Centre (NIC), Bhubaneswar. IBDC is supported by the Department of Biotechnology and is mandated to archive all life science data generated from publicly-funded research in India. It has a data storage capacity of about 4 petabytes and houses the 'Brahm' High-Performance Computing (HPC) facility. It also hosts an online 'Dashboard' for the genomic

surveillance data generated by the [INSACOG](#) labs. The dashboard provides customised data submission, access, data analysis services, and real-time SARS-CoV-2 variant monitoring across India. IBDC has started nucleotide data submission services via two data portals viz. the 'Indian Nucleotide Data Archive (INDA)' and 'Indian Nucleotide Data Archive - Controlled Access (INDA-CA)' and has accumulated over 200 billion bases from 2,08,055 submissions from more than 50 research labs across India.

India's first Virtual Global Skill Summit to facilitate overseas mobility

The first Virtual Global Skill Summit (VGSS) was jointly organised by the Ministry of External Affairs (MEA), Ministry of Commerce and Industry (MoCI), Ministry of Education (MoE) and Ministry of Skill Development and Entrepreneurship (MSDE) with the Indian Ambassadors/ High Commission representing India Missions from ten nations on 15 November 2022. Indian Ambassadors from Australia, France, Germany, Japan, Malaysia, Mauritius, Singapore, Tanzania, United Arab Emirates, and United Kingdom

participated in this summit. The summit aimed at institutionalising a robust mechanism for the exchange of information on the skill requirements of countries and the skill availability in India. It also deliberated on skill harmonisation and benchmarking of qualifications, quality standardisation, capacity building, and knowledge exchange to promote global mobility, employability, and readiness for the youth to join the global workforce.

MoUs Signed //

All India Institute of Ayurveda signs MoU with National Institute of Advanced Industrial Science and Technology, Japan

The All India Institute of Ayurveda (AIIA), under the Ministry of AYUSH, and the National Institute of Advanced Industrial Science and Technology (AIST), Japan signed an MoU for academic establishment on 7 October 2022. With this MoU, AIIA aims to promote Institute's research activities both on a national

and international stage. The MoU will enable both countries to promote research collaboration and build capacities in the field of the Indian Ayurvedic system of traditional medicines. The scope of activities that are intended by the participants includes research activities in the field of Ayurveda including studies

in design and execution to develop evidence-based guidelines for integrating Ayurvedic principles and practices with conventional medicine, evolving safety standards and protocols for the use of Ayurveda in Japan in conformity with medical guidelines,

exchanging scientists, researchers and staff as determined by the collaborators on a project-to-project basis, students' participation in collaborative activities to achieve excellence in Ayurveda towards achieving scientific advances, tools and techniques.

Announcements //

Call for Special Issue: "Gender and Socially-Inclusive Approaches to Technology for Climate Action"

Submission deadline: 17 February 2023

Further information at:

https://www.mdpi.com/journal/sustainability/special_issues/Gender_and_Socially_Inclusive_Approaches_to_Technology_for_Climate_Action

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Call for Proposals //

CSIR-TÜBİTAK Call For Academia-Industry Cooperation Joint Project Proposals-2022

Last Date: February 28, 2023

Further information at:

<https://www.csir.res.in/csir-t%C3%BCbi%CC%87tak-call-academia-industry-cooperation-joint-project-proposals-2022>

Forthcoming Events //

Seminar: "Thinking, Debating, and Shaping Science Diplomacy"

Date: January 25, 2023

Further information at:

<https://www.science-diplomacy.eu/events/thinking-debating-and-shaping-science-diplomacy/>

Future Talks on Science Diplomacy: From Data to Policy Implementation

Date: January 26, 2023

Further information at:

<https://www.science-diplomacy.eu/events/future-talks-on-science-diplomacy-from-data-to-policy-implementation/>

MCAA Annual Conference "Challenges in Science Diplomacy & Sustainable Development"

Date: February 23–25, 2023

Further information at:

<https://www.science-diplomacy.eu/events/mcaa-annual-conference-challenges-in-science-diplomacy-sustainable-development/>