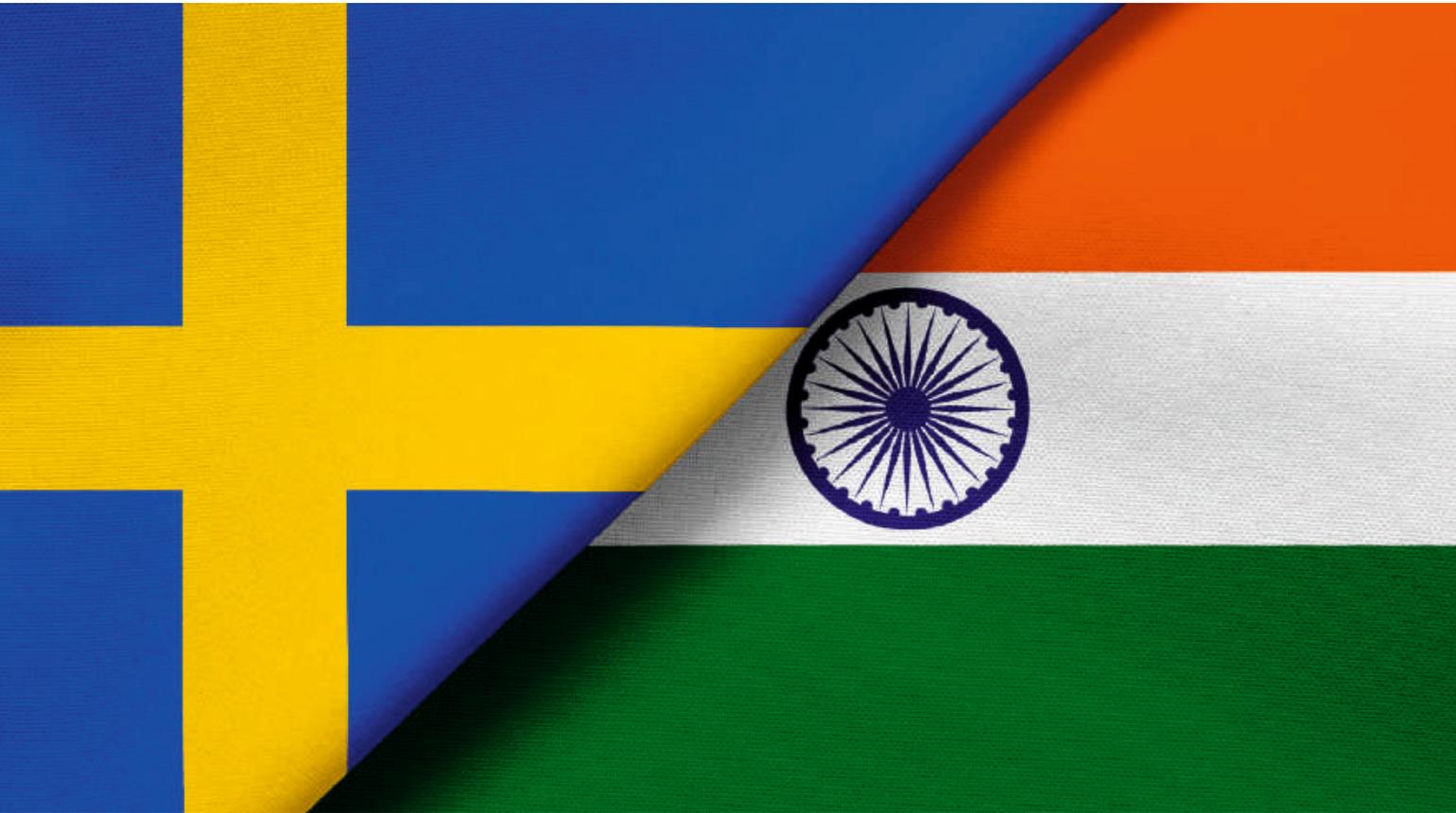


SWEDEN-INDIA PARTNERS IN RESEARCH and INNOVATION



SWEDEN-INDIA
INNOVATION PARTNERSHIP



Embassy of Sweden
New Delhi



**SWEDEN-INDIA
PARTNERS IN
RESEARCH and INNOVATION**



January, 2024



Table of Contents

Forewords	5
Timeline	8
Overview	10
Joint Innovation Partnership	12
Swedish and Indian funding agencies	13
State visit 2019	14
The partnership evolves	17
Five years of pioneering the possible and exploring future opportunities	18
SheSTEM	20
Case studies	21
Office of Science and Innovation (OSI)	29
Team OSI	31





Foreword

2023 marked the 5th anniversary of the Sweden-India Joint Declaration on Innovation Partnership for a Sustainable Future. This partnership aims to increase the impact of bilateral cooperation on innovation, science and sets the framework for future cooperation to tackle societal challenges, including innovation-driven challenges on cross sectoral issues involving multiple stakeholders and agencies from both countries.

The partnership has accelerated the ability of both Sweden and India to recognise each other's capacities and foster stronger and more productive collaboration. The joint projects showcased in this booklet area testament to the shared commitment of the Swedish and Indian science and innovation communities to work together towards continued excellence in innovation and research. They clearly demonstrate that this partnership is not only characterized by collaboration and strength, but also by transformative effects that impact the lives of people in both our countries and around the world.

Finally, Sweden and India are dedicated to taking our relationship to the next level, a partnership that is based on the principles of co-creation and mutual benefits with a resolute focus on shaping our shared future both bilaterally and on the global stage. After five successful years of collaboration, it is now time to usher our partnership into a new era, paving the way for a brighter decade ahead.

A handwritten signature in blue ink, appearing to read 'Jan Thesleff', with a stylized, cursive script.

Jan Thesleff
Ambassador of Sweden to India





Foreword



It is heartening to observe that the science and innovation partnership between India and Sweden, as formally established through the India-Sweden Joint Declaration on Innovation Partnership for a Sustainable Future, is marking its fifth anniversary. This collaboration has demonstrated its value by adhering to the principles of 'reciprocity, co-funding, and co-creation. Various departments involved in this endeavor are pooling their excellence and expertise to advance trans disciplinary work on both national and international fronts, addressing common challenges. It is truly gratifying to see that the strategic goals of these departments, among others, are strongly reflected in their research and innovation portfolios in conjunction with Sweden. Together, these partnerships are setting an example by bridging the gap between academia and industry, thereby fostering technology-driven innovation and investment through public-private models.

It is essential for bilateral collaboration models to adapt and innovate beyond conventional joint R&D projects. In this context, the India-Sweden innovation partnership, in conjunction with the Office of Science and Innovation in India, collaborated closely with Indian agencies to foster partnerships that extend beyond conventional boundaries. Some of these joint projects, spanning a wide range of subjects, are showcased in a booklet, showcasing impressive scholarly and societal outcomes. The foundation for a paradigm shift in bilateral collaboration has been laid through our partnership, and we are committed to witnessing the emergence of more joint projects in the years to come.

I am confident that this report serves as both evidence and a catalyst for ongoing cooperation and investments between India and Sweden, with the aim of building a secure and sustainable future.


(Abhay Karandikar)

- Signing of the Sweden-India Joint Innovation Partnership.
- Inauguration of the Joint Innovation Partnership with India and the Swedish government earmarks 50 MSEK.

- Launch of artificial intelligence for advancing healthcare across India & Sweden programme co - funded by India's Department of Biotechnology (DBT) and Biotechnology Industrial Research Assistance Council (BIRAC) & Vinnova.
- Launch of India-Sweden healthcare innovation healthcare centre.

2018

2019

2020

- Launch of the Cooperation with India, company-driven research & innovation programme, co-funded by India's Department of Science Technology (DST) through Global Innovation & Technology Alliance (GITA) & Vinnova.
- The first Sweden-India high-level dialogue on Innovation Policy co-chaired by Prime Minister and the King of Sweden.

Timeline

- University delegation visits to premier Indian universities.
- Officials from the Office of the Principle Scientific Advisor (PSA) to the Government of India visit Sweden to build strategic collaboration.
- Delegation from Sweden for matchmaking events.

2021

2022

2023

- Launch of Indo-Swedish Joint Call for Proposals within Circular Economy, co-funded and led by multiple agencies. Led by DBT, BIRAC, DST and the Ministry of Earth Sciences in India, in partnership with Vinnova, Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas), Swedish Research Council for Health Working Life and Welfare (Forte), the Swedish Research Council, Swedish Energy Agency and Vinnova in Sweden.
- A Sweden-India 42-hour digital hackathon on mobility to tackle issues regarding safe and sustainable transportation.

- Signing of a Memorandum of Cooperation (MoC) between Science and Engineering Research Board (SERB), and The Swedish Foundation for International Cooperation in Research and Higher Education (STINT) to strengthen cooperation and promote research networking between research institutions.
- 5th anniversary of Sweden India Innovation Partnership.

Overview

2023 was an important year for the Sweden - India relationship, as we celebrated the 5th anniversary of the Joint Declaration on Innovation Partnership for a Sustainable Future, and Jubilee Year for India and Sweden, marking 75 years of bilateral relations.

The connection between India and Sweden has a rich history that spans centuries, with its roots dating back to an archaeological discovery made in 1954. During an archaeological dig in Helgö, Sweden, a remarkable 8th-century Indian Buddha statuette was unearthed, serving as an intriguing link between these two distant lands. Swedish companies, however, had already established their presence in India well before this archaeological find in 1954. Ericsson received its first order for a manual switch from India in 1903. SKF, the Swedish ball bearing manufacturer, initiated its operations in India in 1923. This year SKF is celebrating its 100th anniversary in India. On the cultural front, Rabindranath Tagore received the Nobel Prize in Literature in 1913, and Sir Chandrasekhara Venkata Raman received Nobel Prize in Physics in 1930.

In April 2018, during Prime Minister Narendra Modi's visit to Sweden, relations between the two countries entered a new phase. Both countries agreed to deepen their cooperation through the Joint Declaration on Innovation Partnership for a Sustainable

Future. The partnership encompasses various key areas such as smart cities, transportation, green energy, smart industry and clean technologies, new materials and advanced manufacturing, AI and digitalisation, space, circular and bio-based economy, and health and life sciences.

The Sweden-India Innovation Partnership provides a bridge between institutions, R&D - intensive industries and creative entrepreneurs to address global challenges in alignment with the United Nations 2030 Sustainable Development Goals. To further the collaboration outlined in the joint innovation partnership declaration, several initiatives have been announced, including:

- Matchmaking and partnership development activities
- Joint industrial R&D projects
- Start-up and incubator collaboration
- Infrastructure, cluster, & R&D collaboration
- High-level policy dialogues.

The partnership is led by the Swedish Ministry of Climate and Enterprise and Ministry of Education and Research, supported by the Ministry of Foreign Affairs and Trade, in conjunction with two Indian Government departments - the Department of Science and Technology and the Department of



Biotechnology. The partnership encompasses various activities, including research projects, targeted workshops and seminars, delegation visits, matchmaking activities and researcher fellowships.

Over the past five years, our countries have set out to tackle important challenges through this partnership, which is Sweden's largest fund for bilateral science and innovation collaboration with India. One of the key areas of collaboration within the partnership is promoting cooperation between scientists and companies from both countries to use cutting-edge research and innovation for solving a wide range of significant challenges.

An example of multiple funding agencies coming together within this partnership, is the joint call to support research and innovation projects on transition to a circular economy. Five Swedish Funding Agencies

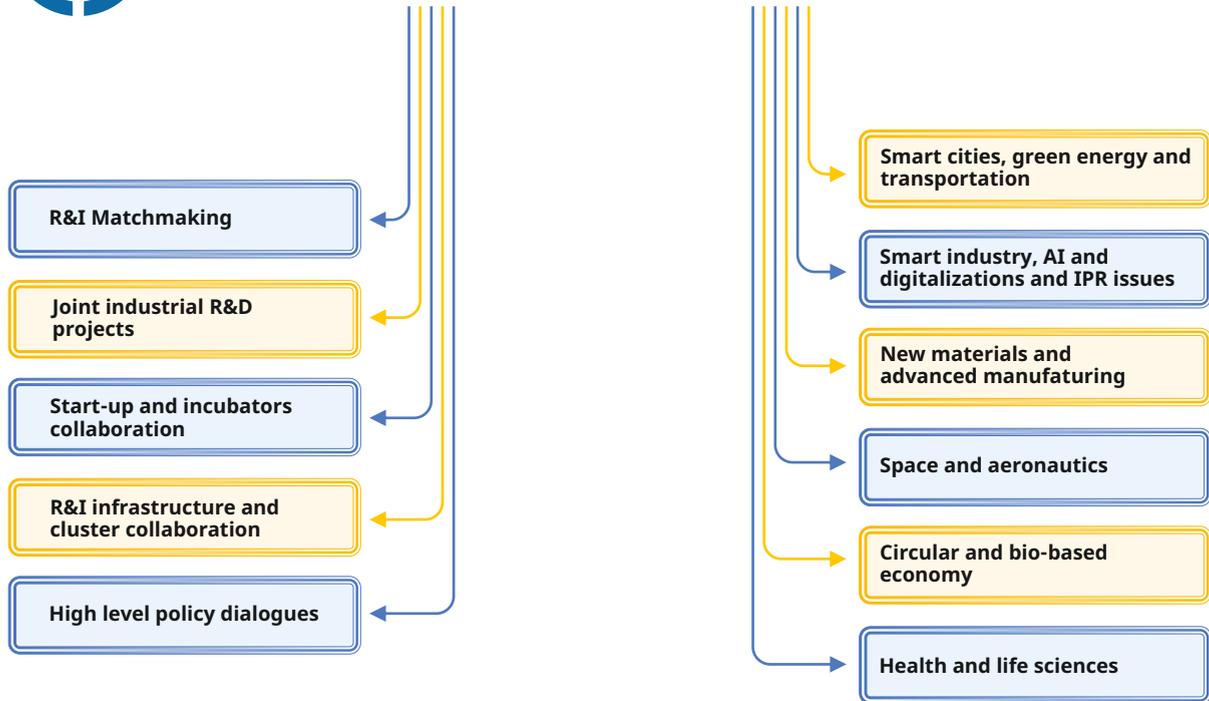
(Vinnova, Forte, Swedish Energy Agency, Swedish Research Council and Formas) are collaborating with four Indian funding agencies (DST, DBT, BIRAC and MoES) with funding of SEK 69 million from Sweden and matched resources from India.

Over the last five years, the Swedish-Indian Innovation Partnership has consolidated, in 2023 the Swedish Foundation for International Cooperation in Research and Higher Education (STINT) and the Indian Science and Engineering Research Board (SERB) signed a Memorandum of Cooperation to facilitate academic collaboration through mobility activities, seminars, workshops, and conferences. It is evident that the Sweden- India Innovation Partnership has laid a solid foundation for developing & strengthening knowledge and innovation collaboration between the two countries.

Joint Innovation Partnership



Areas for Collaboration





Swedish and Indian Funding Agencies

Swedish Agencies

- Swedish Energy Agency (SEA)
- Swedish Foundation for International Cooperation in Research and Higher Education, (STINT)
- Swedish Governmental Agency for Innovation Systems, Vinnova
- Swedish Research Council
- Swedish Research Council for Health, Working Life and Welfare (FORTE)

Swedish Research Council for Sustainable Development, (FORMAS)

Indian Agencies

- Biotechnology Industry Research Assistance Council (BIRAC)
- Department of Biotechnology (DBT)
- Department of Science and Technology (DST)
- Indian Council of Medical Research, (ICMR)
- Ministry of Earth Sciences, (MoES)
- Scientific Engineering Research Board (SERB)

State visit 2019: High-level policy dialogue



Photo: Their Majesties the King Carl XVI Gustaf and Queen Silvia of Sweden with Indian Prime Minister Narendra Modi.

In the joint declaration on India-Sweden innovation partnership for a sustainable future, it was agreed that both countries would explore optimising the formal bilateral collaboration mechanisms, in order to increase synergies, exchange of experiences and best practice on policy, especially focusing on innovation for the creation of vibrant joint innovation ecosystems.

In 2019, Their Majesties the King Carl XVI Gustaf and Queen Silvia of Sweden visited India at the invitation of Honourable President of India, Mr Ram Nath Kovind. This was the first visit of the royal couple to India since 1993 and an important milestone in the bilateral relations between the two nations. During the visit, the King met with Indian President Ram Nath Kovind and Prime Minister Narendra Modi to discuss various issues of mutual interest, including enhancing cooperation in areas such as innovation, sustainable development, and clean energy.

A high-level policy dialogue created the perfect platform in a triple helix format bringing key stakeholders from the government, private sector, and academia together to provide strategic direction for joint innovation policy formulation. The dialogue jointly formulated and implemented short and long-term projects in strategic areas such as, but not limited to, circular economy, digital health, artificial intelligence, sustainable energy, and future mobility.

The major announcement made during the dialogue was the Agri - Waste to High Energy Bio-coal, a pilot established under the Indian Prime Minister's Science, Technology, and Innovation Advisory Council (PM-STIAC) Waste to Wealth Mission. The Office of the Principal Scientific Adviser (PSA) to the Government of India, in partnership with Bioendev, Sweden, set up a torrefaction pilot plant for the conversion of agri - waste into bio-coal at National Agri - Food Biotechnology Institute in Punjab.

Other major announcements made during the dialogue were:

- Under the India-Sweden Collaborative Industrial Research & Development Programme in area of 'Smart Cities and Clean Technologies' and 'Digitisation and Internet of Things' aimed to develop technologies that can be commercialised after two years through further cooperation between India and Sweden. Co-funded by DST, Vinnova and the Swedish Innovation Agency, with up to 25 MSEK available as grant for Swedish applicants and conditional grant of up to 50% with a limit of INR 1.5 crores available for Indian applicants per project.
- Under the Indo-Swedish Joint Network Grant Awards, DST and Swedish Research Council agreed to fund 20 bilateral projects in the area of Computer Science and Material Science. Swedish Research Council provided funding of 14 MSEK for

two years with matched resources from DST.

- Through the Strategic Indo-Swedish Cooperative Innovation Programme, DBT and Vinnova announced a joint programme in the area of digital health. The programme aimed to provide scalable, sustainable, implementable, and innovative health solutions in both countries using artificial intelligence-based technologies as a tool.
- India-Swedish Collaborative Industrial Research & Development Programme in the area of 'Smart Grids, co-funded by DST and Swedish Energy Agency, with 25 MSEK allocated over the next four years for this industry-led call.

- The establishment of the new 'Joint Centre of Excellence in Innovation and Entrepreneurship' between KTH Royal Institute of Technology and IIT Madras, in Chennai. The centre is the first of four planned centres and aims to build an entrepreneurial spirit and cross-border teams creating innovations targeting markets both in Sweden and India, and globally.
- The Ministry of Earth Sciences (MoES), India, and the Ministry of Education and Research, Sweden, agreed on a MoU on cooperation in Polar Science. The Ministries are committed to study polar research by coordinating and sharing resources and data.



The partnership evolves



Photo: MoC signed by Dr Akhilesh Gupta, Secretary SERB and Dr Andreas Göthenberg, Executive Director STINT.

In March 2023, a Memorandum of Cooperation (MoC) was signed between India's Science and Engineering Research Board (SERB), and the Swedish Foundation for International Cooperation in Research and Higher Education (STINT), to strengthen cooperation and promoting research networking between research institutions from both countries.

The primary goal of the MoC is to enhance funding opportunities for mobility between both countries by facilitating academic cooperation through various mobility activities like seminars, workshops, and conferences.

The signing of the MoC took place in presence of Dr. Akhilesh Gupta, Secretary, SERB and Dr. Andreas Göthenberg, Executive Director, STINT, along with Dr. Erik Forsberg, Representative in APAC, STINT, and Secretary of Department of Science and Technology (DST), Dr. S. Chandrasekhar and Håkan Jevrell, State Secretary to Minister for International Development Cooperation and Foreign Trade.

Five years of pioneering the possible and exploring future opportunities

India will become the third largest economy in a couple of years and its economic momentum is reflected in the country's growing middle class, which is expected to more than double by 2047 to more than one billion people. This creates opportunities of further collaboration for businesses and research cooperation, for Sweden and India, because of global impact India will have in the future.

With 50% of the population under the age of 25, India is a young country, dynamic and passionate about change, innovation and entrepreneurship. From 40 unicorns to over 100 in just one year, and aiming for 250 by 2025, India's progress on the startup is impressive. And now, as India has put its first space rocket on the moon, its ambitions know no bounds.

Sweden-India cooperation is unique, based on long-term commitment, humanism, and equal partnership. Some Swedish companies have been in India for more than a century. Our collaboration is evidenced by diplomatic relations that celebrate 75 years in 2023 but also through the successful five-year Swedish-Indian innovation collaboration for a sustainable future, which

this brochure celebrates.

For future opportunities it is important to maintain the people-oriented partnerships and eagerness to develop our collaboration. We need to drive towards the future based on the successful collaboration, but we must never rest upon it. Sweden is one of the world's strongest countries in terms of innovation and sustainability and these strengths need to continue to be utilized in our joint development efforts. Sweden should aim to continue to collaborate with a multiple helix agenda and collaborate with India and other like minded partners and be open to multilateral collaborations.

Sweden has a strong presence and partnership in India and there is lot more to be done. The pace at which India is rapidly developing, needs constant connection and keeping up, back home. There is a need and growing enthusiasm to inform Swedish stakeholders in government, business, academia, higher education institutions about opportunities in India. We need more networks to connect the best researchers, entrepreneurs, innovators in our countries and more joint successes to be achieved. Our partnership is testimony of our people, bringing the best together.

And this is where Team Sweden India plays an integral role. With representatives from the Embassy in Delhi, the Consulate in Mumbai, OSI and other Swedish companies and organisations, we need to make both India and Sweden aware about the countless opportunities and to maintain our future collaboration seamless and impactful. With a growing Indian diaspora in Sweden, there are opportunities to further build bridges between the two in science, innovation, business, education and trade.

So, as we celebrate five years of the Swedish-Indian innovation collaboration, we look forward to a future filled with even greater impact, excellence, and success that science and innovation deliver. Looking back, we extend our gratitude to former colleagues, particularly Leena Arora Kukreja, former Senior Adviser, for shaping the joint innovation partnership and its course over the last five years. We also express our thanks to India and Sweden, who together can pioneer possibilities and create a sustainable and innovative future for all.



2023 began with the Swedish Presidency of EU Council during the first half of the year. OSI represented Sweden across several G20 meetings on Science 20, Start up 20, G20-Chief Science Advisers Roundtable (CSAR), and Research and Innovation Gathering Initiative (RIIG).

SheSTEM

SheSTEM is a strategic flagship event initiated by Office of Science and Innovation (OSI) at the Embassy of Sweden in New Delhi to encourage young girls and women to study STEM (Science, Technology, Engineering and Mathematics) education and share their journey and learnings. The event has been held since 2020 to celebrate women leaders in science, technology, sustainability and innovation from India and Sweden. Innovation in STEM plays a key role in shaping the future, and it is imperative that women are part of the transformation for a better world.

In the last three editions, SheSTEM has partnered with Atal Innovation Mission of the Government of India. Speakers included women leading space missions, spearheading innovation and research and those part of cutting-edge technology designed for a more sustainable world.

Following the success of the Insta-reels Video Challenge in 2021, SheSTEM hosted the SheSTEM 2022 Video Challenge across Instagram, YouTube, Facebook, and Google Drive for students of age category between 13 to 19 years, asking them to imagine themselves in the year 2047 and speak about an innovation tackling climate change. The response was overwhelming with over 930 videos of which 15 were shortlisted.

SUCCESS STORY



“Today, we see more and more women taking up leadership roles. While there is still a long way to go and the journey to the top is not easy, I believe that regardless of who you are, you can become what you want”. Cecilia Oskarsson, Trade and Invest Commissioner India at Business Sweden

SheSTEM 2022



Sanchi Bansal, winner of SheSTEM challenge 2021



G. Nivethiga Rani, winner of SheSTEM challenge 2022

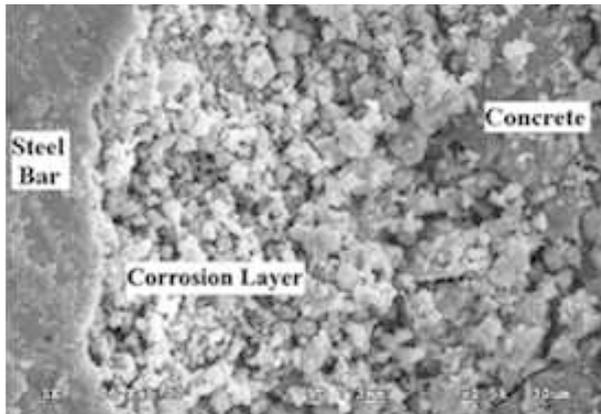
Case studies

Sweden and India join hands for bone implant integration

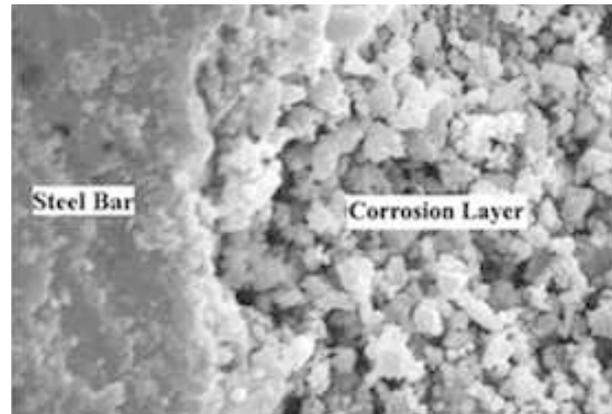
University West (Sweden) and Vellore institute of Technology (India)

In India, the number of patients affected by bone defects is expected to exceed 300000 per year due to the increasing number of open fractures occurring in the femur, tibia, lower and upper limb. These segmental bone defects can result from high-energy trauma, developmental deformities, revision surgery, and resection of a tumour or osteomyelitis. Traditional treatments for these defects include autologous bone

grafts, vascularized bone grafts, demineralized bone matrix, and distraction osteogenesis. However, there are several challenges associated with these treatments, including limited availability of donor sites, risk of disease transmission, prolonged treatment, and healing time, extended operative time, additional cost, infection, and chronic donor site pain.



1500 x



3000 x

To overcome these challenges, researcher from Sweden and India aimed to develop an appropriate Ti6Al4V implant with the following attributes to accelerate bone healing:

- Porosity to enhance vascularization and bone integration
- Bio-nanostructured coating to overcome bionertness
- Microenvironment consisting of collagen hydrogel and stem cells to induce osteogenesis

The axial suspension plasma spraying technology developed by this project can replace existing industrial coatings on orthopaedic implants for fractured and

diseased bone.

This project is a platform to test this technology at TRL 5 level in an animal model. The resulting enhancement of the service period of an implant will lead to better bone-implant integration, thereby reducing implant failure, revision surgeries, and overall cost. In conclusion, this project aims to develop a porous implant with a nanostructured coating and biomimetic environment to accelerate bone formation. By addressing the challenges associated with traditional treatments, this project has the potential to revolutionize the treatment of segmental bone defects, leading to better outcomes for patients.



Adopting Cities to Climate Change

KTH Royal institute of Thechnology (Sweden), Institute of Technology Madras (India) and University of Manchester (UK)

Peri-urbanisation refers to scattered, mixed urban and rural characteristics that are significant drivers of climate change, ecosystem degradation, and social vulnerability. This project aimed to explore the interactions between peri-urbanisation and climate risk, and to co-design adaptive pathways for more sustainable and resilient forms of peri-urbanisation. The researchers found that new forms of collaborative and entrepreneurial governance are needed to address climate risks in peri-urban areas through policy, social, and economic innovation



The project was a collaboration between Swedish KTH Royal Institute of Technology, Indian Institute of Technology Madras and University of Manchester (Manchester Urban Institute), UK. Through this project, the researchers developed a better understanding

of the climate implications in the peripheral areas of cities and to engage with stakeholders to develop new approaches to realise more climate resilient futures.

The project teams analysed the scope and impacts of peri-urbanisation, climate impacts and risks, societal vulnerability, and governance capacity at the local, city-region, and global scales through desk-based study, geospatial analysis, questionnaires, semi-structured interviews, and focus group discussions with policymakers, practitioners, and researchers in 16 city-regions. The project team then developed adaptive pathways and tested them with stakeholders in the city-regions of Chennai (India) and Manchester (UK) and produced generalised findings that are relevant to all city-regions.

The project findings provide new insights on how peri-urban areas can be developed to reduce climate risks. A key outcome of the study is the development of collaborative approaches for stakeholders to learn and act more effectively. The insights from the project serve as a foundation for future research to build a more robust knowledge base of what is occurring in specific city-regions and to support the development of context-specific ways of managing climate resilience involving all stakeholders.

New drugs will help people with diabetes

Uppsala University (Sweden) and Amrita Vishwa Vidyapeetham (India)



Type 1 diabetes (previously known as insulin-dependent, juvenile or childhood-onset) is characterized by deficient insulin production and requires daily administration of insulin. In 2017 there were 9 million people with type 1 diabetes and this number is increasing rapidly. Type 1 diabetes mellitus (T1D) is a chronic condition where the immune system mistakenly attacks and destroys insulin-producing cells in the pancreas, leading to a lifelong dependence on insulin injections and glucose monitoring. Pancreatic islet transplantation is a promising therapy that could restore the body's natural insulin production, but there are challenges to its widespread use. One of the biggest challenges is the risk of the patient's immune system rejecting the transplanted islets. To prevent rejection, patients must take

immunosuppressive drugs, which can have negative side effects

Currently, no optimal immunosuppression protocol exists that can prevent islet allograft rejection without being toxic to the grafted islets. To overcome these challenges, researchers from Uppsala University, Sweden and Amrita Vishwa Vidyapeetham, in India are investigating a new method that could protect the transplanted islets from the body's immune system. The researcher teams are developing a small capsule made of special materials that can surround the islets and prevent the body's immune system from attacking them. Additionally, the capsule will release certain natural chemicals that can help the islets survive and function properly. This approach will eliminate the need for immunosuppressive drugs, which can have negative side effects. The teams are currently exploring the best materials and techniques to use in the capsule.

If successful, this technology could have a significant impact on the lives of T1D patients and reduce the costs associated with diabetes care. Patients could receive a one-time transplant of encapsulated islets and potentially eliminate the need for daily insulin injections and glucose monitoring. Ultimately, the success of this project could have wide-ranging benefits for both countries.

New methods for analysing large-scale data for modern material design.

Linköping University (Sweden) and Indian Institute of Science

This is an ongoing collaboration with the goal to develop methods for topological feature extraction, tracking, and comparison for large scale dynamic data from material imaging and molecular simulations integrated in a visual analysis pipeline that aids domain scientists in analyzing their data. Developing novel materials for the future is of high importance for many commercial applications as well as for society. Two examples that lie at the centre of this project are lightweight materials and organic materials with applications in automotive and biomedical sectors.



Topological methods provide powerful concepts for data abstraction that are characterized by their robustness, rigorous guarantees, and multi-scale nature. Visual data exploration generates the link to an intuitive navigation through large data sets. The project focused on data from new material design research in two application areas (i) study of electronic transitions which plays an important role in the design of organic materials, and (ii) the study of

materials using CT-scans for additive manufacturing.

Researchers from Swedish Linköping university and Indian Institute of Science (IISc) have developed a complete data analysis pipeline incorporating novel techniques and computationally efficient algorithms to support domain scientists with their data analysis task. The scientific objectives of the project include the development of new computational, algorithmic, visualization, and data analysis techniques. The techniques and methods developed as a part of this project have direct application to the study of (a) electronic transitions in molecules due to absorption or emission of light, and (b) x-ray CT scan images of granular materials. The former plays an important role in the design of novel organic materials and the latter helps in understanding the behaviour of granular ensembles, which are studied in geo technical engineering. It is important to recognize that the above-mentioned applications are supported by multiple technological advances, including the techniques developed as a part of this project. The project has resulted to 7 joint scientific publications.

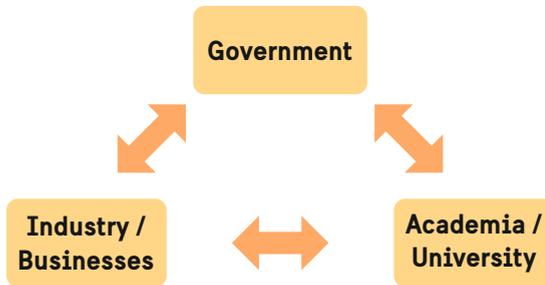
In addition to publications describing the research result, the project has also led to the development of open-source software. Morse Gram is a software tool for segmenting three-dimensional X-ray computed tomography data of (cemented) granular/discrete material systems.

Triple Helix will bring road safety in India

Sweden-India Transport Innovation and Safety Platform (SITIS)

India has only 1% of the world's vehicles but 11% of the global deaths from road accidents occur in India, according to a report by the World Bank. About 450,000 accidents take place in India annually, of which 150,000 people die.

Leading Swedish and Indian companies and institutes with expertise in safety have come together to form the Sweden-India Transport Innovation & Safety Platform (SITIS) as a long-term platform for innovation and a center for excellence on traffic safety research.



The SITIS platform aimed to

- build deeper understanding of traffic safety in India and provide insights into the core challenges facing many fast-growing economies with similar challenges and their potential solutions.
- provide a unique ability to inform and evaluate policy and technology priorities.
- create a partnership that fosters innovation and business growth in Sweden and India, by stimulating collaboration between Indian and Swedish stakeholders.

- be a primary example of concrete bilateral collaboration between India and Sweden.
- leverage the learning potential of big data, AI and deep tech with respect to transport systems.

The expected results include:

- a) scalable and re-usable methodology for data collection and analysis,
- b) initial understanding of safety, security and efficiency challenges of public coach transport.

Partners include:

Autoliv, Ericsson, Manipal Hospitals, Altair, SAAB Group, LTIM indtree and Volvo Group, as well as premiere universities and research institutes; India Institute of Science (IISc), India Institute of Technology (IIT TRIPPA), Chalmers University, Research Institutes of Sweden (RISE), and the technical authorities ARAI, and the Swedish National Road and Transport Research Institute (VTI). Sweden-India Business Council is the secretariat for SITIS.

The platform is a unique example of triple helix governance for impact, through the effective alignment of overall partnership objectives and individual incentives for engagement.

Nordic Solutions in Sewage and Sludge Treatment

Nordics

Today, India with its large and dynamic population, is one of the fastest-growing economies in the world. Rapid population growth, intensive agricultural activities, the need for sustainable water sources to meet the environmental restrictions on construction of storage reservoirs for potable water and the long distances between cities and water sources are other factors promoting more reclaimed wastewater use. Access to drinking water is becoming more costly due to environmental pollution and increased water demands, human consumption of potable water conflicts with other major water consumers, such as agricultural and industrial uses.



The reuse of treated municipal wastewater in India has been identified as the most responsible solution to manage water scarcity issues while building a sustainable society. The Indian government has launched the sanitation initiative Clean India mission and decided to build wastewater treatment plants in important cities, to start with.

Sweden was one of the first countries to recognize wastewater treatment plants as production facility where sewage water is seen as a resource so that treated water can be reused to farmer land, industries or even to take back to ground water after infiltration, to produce energy (electricity and biogas) and nutrients (phosphorous and nitrogen). Wastewater treatment plants in Nordic countries produce a large share of the biogas used by road vehicles today.

Innovative Nordic solutions in water sector have leading position in the international market and contribute globally to safer drinking water, sustainable storm water solutions and resource efficient water and wastewater management for better environment.

The collaboration aimed to improve public health, create employment opportunities, promote sustainable practices, and improve the quality of life in urban areas through knowledge-, expert-, and technology exchange. Furthermore, this collaboration between India, Sweden and other Nordic countries has helped drive economic growth and development in India, while also promoting sustainable practices and reducing the negative impact of waste on the environment.

The implementation of Nordic solutions in India is a successful example of international cooperation in addressing global challenges

Office of Science and Innovation (OSI), India

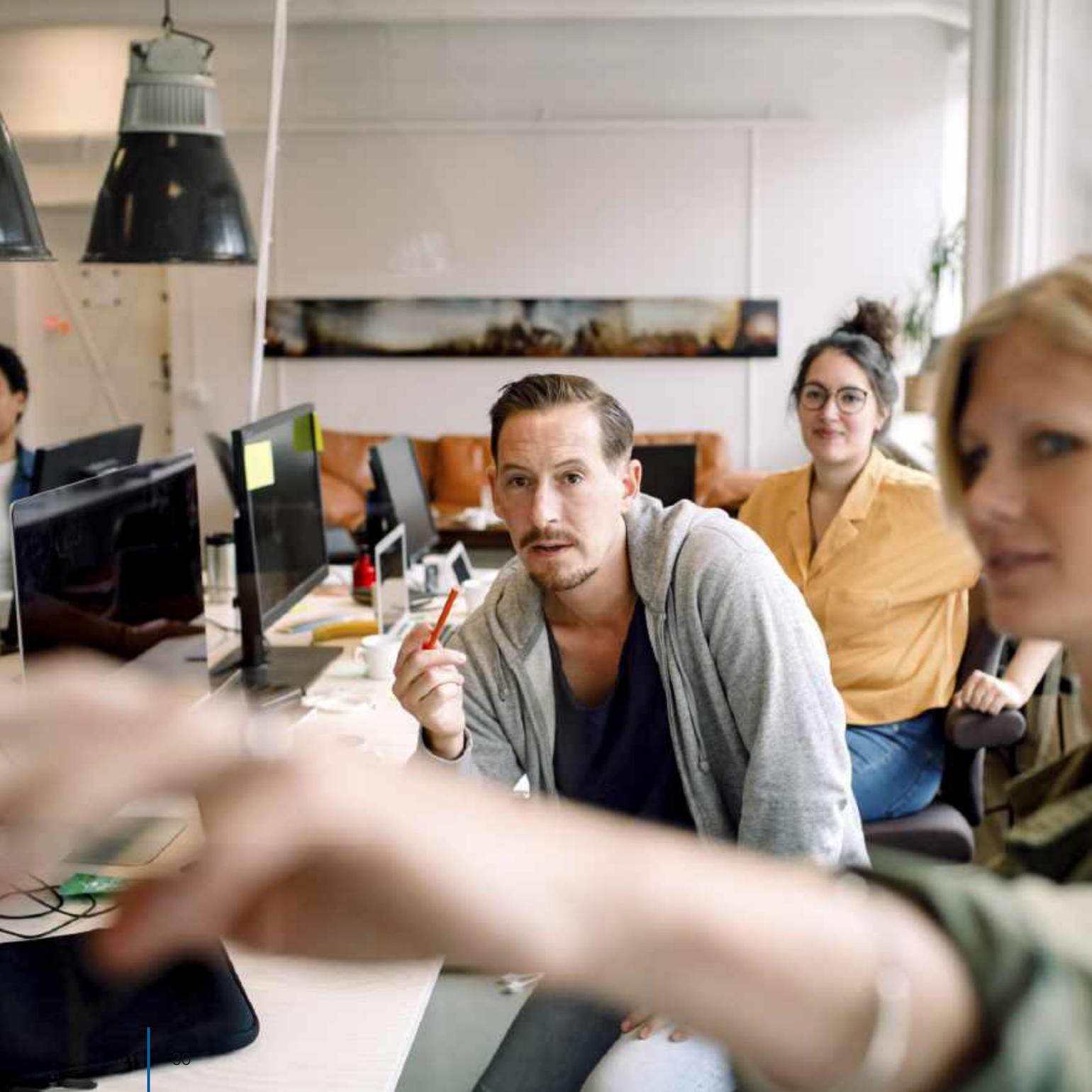
What we do?

The Office of Science and Innovation (OSI) is based at the Embassy of Sweden in New Delhi, India. The goal of the Office is to strengthen and promote Sweden as a leading knowledge nation with one of the world's foremost innovation systems, attractive for investment and cooperation.

OSI plays a key role in building long-term, strategic, and sustainable partnership with India on innovation, research and higher education. OSI strengthens connections between the Swedish and Indian communities by:

- Laying the foundation for continued strong bilateral exchanges
- Analysis of the possibility of establishing a broader Swedish-Indian innovation platform
- Strategic promotion at diplomatic, political level and cooperation with the Embassy
- Strategic promotion in the areas of innovation, research and higher education
- Work with Team Sweden and other cooperation with Swedish actors
- Support work to strengthen collaboration between start up and entrepreneurs between India and Sweden
- Plan, in consultation with other key stakeholders the actors affected, for building a bridge of skilled workforce. for how we can work on attracting skilled Indian workers to young innovative companies in Sweden





Team OSI, India



Dr Per-Arne Wikström

Counsellor

Dr. Per-Arne Wikström joined as the Innovation and Science Counsellor at the Embassy of Sweden, New Delhi in May 2021. As Head, Office of Science and Innovation India, he is responsible for delivering a vision for a stronger Sweden-India research & innovation & higher education partnership, working with key stakeholders to achieve impact. Dr Wikström is an expert who led promotion efforts within the fields of research, trade, investment and innovation to help attract excellence to Sweden and to develop partnerships. Prior joining the Ministry, Dr Wikström worked as Director Sweden Communication, Swedish Institute, Head of External Relations, Stockholm University, Head of Collaboration and Communication, University of Gavle. Dr Wikström received his PhD in business administration from Royal Institute of Technology (KTH), Sweden.

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Geeny George Shaju

Senior Adviser

Geeny joined as Senior Adviser, Innovation and Science in August 2023.

Enthusiastic about research and innovation, Geeny brings more than a decade of experience of working in international science and research collaboration, communications strategy, and delivery. She is committed to strengthen partnerships between countries and build connections across disciplines. Prior to joining Office of Science and Innovation, she was the Interim Deputy Director at UK Research and Innovation (UKRI) India, at the British High Commission in New Delhi.

Geeny is particularly interested in Social Sciences and holds a degree in Sociology from Delhi University. She also has a degree in Public Relations from the Chartered Institute of Public Relations, UK.

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Mini Nair

Mini has been working as the team secretary with the office since 2008. She is responsible for managing administrative activities, handling extensively high-level visits, budgets, needed in developing and delivering bilateral activities. Prior to this, Mini worked with UNESCO office New Delhi as Programme Assistant in the communications department.

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