Imperial College
London

Imperial College London & India

Partner with us

If you are interested in partnering with us, please get in touch with the College's International Relations Office at international.relations@imperial.ac.uk.

FIND OUT MORE

TWITTER: @imperialcollege
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Visit our Global Imperial webpage to learn more about our partnerships in India and elsewhere in the World: https://www.imperial.ac.uk/about/introducing-imperial/global-imperial/

Welcome

Imperial is a global top ten university with a world-class reputation in science, engineering, business and medicine.

Located in the heart of London, Imperial is a multidisciplinary space for education, research, translation and commercialisation, harnessing science and innovation to tackle global challenges.

Founded in 1907, the College builds upon a distinguished past, having pioneered penicillin, holography and fibre optics, to shape the future. Imperial researchers work across disciplines to improve health and wellbeing, understand the natural world, solve major engineering problems, lead the data science revolution and improve health and well-being. The blend of academic excellence and its real-world application feeds into Imperial's exceptional learning environment, where students participate in research to push the limit of their degrees.

Global Imperial

Imperial is one of the world's most international universities. The College's excellence arises from its talented students and staff who come from all over the world, and support from a global network of alumni, friends and collaborators.

Over half our publications are the result of collaborations spanning 192 countries and we are establishing partnerships to tackle global challenges in areas such as healthcare, engineering, technology and sustainability.

We are a global academic community where people from different cultures contribute diverse perspectives, new ideas and fresh approaches to solving complex problems.

Contents

At a glance

22,000
22,000 STUDENTS AND 8,000 STAFF

60%
THE UK'S MOST INTERNATIONAL UNIVERSITY, WITH 60% OF STUDENTS COMING FROM OUTSIDE THE UK.

14 NOBEL LAUREATES AND THREE FIELDS MEDALLISTS.

3RD
3RD IN EUROPE AND 7TH IN THE WORLD IN THE QS WORLD UNIVERSITY RANKINGS 2022.

HOME TO THE GREATEST CONCENTRATION OF HIGH-IMPACT RESEARCH OF ANY MAJOR UK UNIVERSITY

Imperial College London & India

The College is proud of its strong and longstanding connections with India.

Imperial academics enjoy rich and diverse research collaborations with partners in India across a range of disciplines.

In the last five years our academics co-authored just over 1,200 research publications with partners at more than 300 Indian institutions. Research partners include the Indian Institute of Science Bangalore, All India Institute of Medical Sciences, Christian Medical College, Indian Institute of Technology Bombay, Indian Institute of Technology Kharagpur, the Bhaba Atomic Research Centre and the Tata Institute of Fundamental Research.

The College is committed to strengthening our connections with India and building upon our valuable engagement with partners across research, education and innovation.

"India is an incredibly exciting place for research and innovation collaboration. At the National level, the UK and India make excellent knowledge partners, with the impressive response of the UK-India Scientific community to Covid-19 serving to highlight this further. There is a great deal of opportunity to build upon this success and I hope that Imperial can be at the fore of supporting and forging UK-India partnerships in the coming decade".

PROFESSOR MAGGIE DALLMAN, Vice-President (International) and Associate Provost (Academic Partnerships)

Partnerships to tackle the Covid-19 crisis

The College's existing two-way flow of ideas and innovation with partners in India meant colleagues in both countries were able to respond quickly and come together to tackle the Covid-19 crisis.

Imperial's School of Public Health and the The Indian Council of Medical Research (ICMR), India's top institution for biomedical research, have been collaborating to support India's COVID response. The collaboration has involved performance modelling analysis to address key questions faced by public health authorities. The Imperial- ICMR team also developed a user-friendly, web-based modelling tool that was subsequently deployed at state level, to help states model the health impact of different scenarios for a third wave of COVID-19. While much this work has so far focused on COVID-19, the College and ICMR plan to build on these collaborations, in partnership with the Jameel Institute, to broaden the scope of work to other major infectious disease challenges.

FIND OUT MORE
www.imperial.ac.uk/stories/imperial-and-india/

At a glance

32%

OF CO-PUBLICATIONS WERE IN THE AREA OF CLINICAL, PRE-CLINICAL AND HEALTH, 24% IN PHYSICAL SCIENCES AND 23% IN ENGINEERING AND TECHNOLOGY.

500

THERE ARE CURRENTLY 500 INDIAN STUDENTS ENROLLED AT THE COLLEGE

3,000

IMPERIAL HAS MORE THAN 3,000 INDIAN ALUMNI, MANY OF WHOM HAVE RISEN TO THE TOP OF THEIR PROFESSIONS, INCLUDING HIKE FOUNDER, KAVIN MITTAL, COMPUTATIONAL FLUID DYNAMICS PIONEER SUHAS PATANKER, AND THE LATE PRIME MINISTER RAJIV GANDHI.

43%

OF INDIAN STUDENTS ARE BASED IN THE FACULTY OF ENGINEERING, 19% IN THE IMPERIAL COLLEGE BUSINESS SCHOOL, 19% IN THE FACULTY OF MEDICINE AND 18% IN THE FACULTY OF NATURAL SCIENCES.

1,230

IMPERIAL ACADEMICS HAVE CO-AUTHORED 1,230 RESEARCH PUBLICATIONS WITH MORE THAN 300 INDIAN PARTNER INSTITUTIONS IN THE LAST FIVE YEARS.

Imperial College London & India

Imperial is currently home to just over 500 students from India, who are often at the heart of enterprise and innovation at the College. The number of Indian students studying with us has steadily risen over the last five years and we look forward to welcoming even more talented students from India in the future.

"Imperial's research community is unparalleled and has provided me with so many opportunities. Being in London has it's perks too – it's a bustling multicultural city that allows me to meet so many people from such different places."
RAASHI SHAH, MBBS, School of Medicine

"I love every bit of studying here, where am appreciated, heard, understood and supported."
DR PRERANA GOGOI, MSc Surgical Innovation, Department of Surgery and Cancer

JOSEPH XAVIER, Commonwealth Scholar Joseph, a Commonwealth split-site scholar, is spending at year at Imperial to conduct lung research at the National Heart and Lung Institute (NHLI). "Imperial is one of the best institutes in the world for lung research and the NHLI is world-renowned. It was mine, and many other people's, dream to come here. It's a great experience to look into solving a problem with other international researchers in great scientific facilities."

"My course, the MSc Genes Drugs Stem Cells, is designed in such a way to nurture and empower early career researchers. Imperial will be a life-changing experience for me. The knowledge assimilated, skills learned, experiences and friends I have made will be cherished for a very long time."
SUNEEL THARIMENA, GREAT-Imperial College London Scholar, National Heart and Lung Institute

PROFILE

Narinder Sing Kapany
The Father of Fibre Optics

Narinder Singh Kapany (1926 to December 2020) was born in Moga, Punjab. He graduated from Agra University before joining the College in 1952 where he was the first to transmit images through fiber optics in 1954 and laid the foundation for high speed internet technology. He was later a teacher of physics at Stanford University, California. In 1962, he cofounded the Sikh Foundation International in California, with the mission to preserve and promote Sikh heritage. Kapany was named one of the seven "Unsung Heroes" of the 20th century by Fortune magazine and was a role model for many in the Imperial community.

Research collaboration highlights

1. MANDI
Wastewater treatment
In collaboration with the Indian Institute of Technology Mandi, Imperial researchers in the Department of Earth Science and Engineering are combining novel experimental techniques and numerical modelling as tools for improving systems and equipment for wastewater treatment.

2. NEW DELHI
COVID-19 risk factors
Researchers from Imperial's School of Public Health, the Devki Devi Foundation, the Madras Diabetes Research Foundation and the CSIR-Institute of Genomics and Integrative Biology are using data from established research participant cohorts in the UK and India to determine primary risk factors for the disease, with the aim to inform health policy and practice for control of the disease globally.

INDIA
Household finance
A committee led by an Imperial's Professor Tarun Ramadorai has provided policy recommendations to India's central bank, outlining challenges facing Indian households when managing their finances.

7. GUWAHATI
Brighter LEDs
Imperial chemists and physicists have collaborated with researchers from the Indian Institute of Technology Guwahati to make LEDs brighter and more energy-efficient.

8/10. INDORE AND AHMEDABAD
Climate finance
Imperial's Centre for Climate Finance and Investment is working with partners at the Indian Institute of Management Indore and Indian Institute of Management Ahmedabad to assess the impact of declining coal use in India and the energy transitions that will need to be made over the coming decade.

13. MUMBAI
Nuclear engineering
Since 2015, the College's Nuclear Engineering Group has led and supported a network of joint nuclear science and engineering research activities under the Indo-UK Civil Nuclear Programme. Working with a key collaborator, the Bhabha Atomic Research Centre, researchers have developed measurements and models associated with various aspects of nuclear thermal hydraulics.

17. BANGALORE
Climate change
Imperial's Grantham Institute for Climate Change and the Environment enjoys close and longstanding ties with its sister institute, the Divecha Centre, based at the Indian Institute of Science, Bangalore. Both institutes are influential on climate change policy.

18. VELLORE
Vaccine development
Imperial is leading an international network of researchers who are developing human infection challenge studies to accelerate the development of vaccines against pathogens of high global impact. In India, Imperial is working with network partners at the Christian Medical College and the Translational Health Science Technology Institute to develop ethical frameworks.

9. AHMEDABAD
Climate change mitigation
Imperial's Centre for Environmental Policy and Ahmedabad University are currently home to the Technical Support Unit (TSU) for Working Group III of the Intergovernmental Panel on Climate Change (IPCC).

3. NEW DELHI
Non-communicable diseases
The School of Public Heath's Policy Evaluation Unit works closely with partners at the Public Health Foundation of India to evaluate strategies for preventing and managing non-communicable diseases.

4/6/11. NEW DELHI, KHARAGPUR AND KANPUR
RE-EMPOWERED Academics in the Department for Electrical and Electronic Engineering are partnering with IIT Delhi, IIT Kharagpur and IIT Bhubaneswar and IISc Bangalore to lead the development of an eco-Energy Management System as part of an ambitious EU-India consortium that aims to empower European and Indian communities through renewable energy.

5/12/14/15/16. BOMBAY, NEW DELHI, HYDERABAD, PUNE AND BANGALORE
Solar energy
Imperial academics are part of an international consortium working with industry partners and local communities to build five solar-powered building demonstrators in rural India using local manufacturing supply chains.

20. PUDUCHERRY
Malaria interventions
Working alongside scientists from the country's Vector Control Research Centre, an Imperial team are constructing a model of malaria transmission that encompasses the diverse ecological settings seen across India, in the hope that this will enable intervention deployment to be carried out in a manner sensitive to local and regional malaria contexts.

19. CHENNAI AND PUDUCHERRY
Tackling antimicrobial waste
Imperial academics are working with partners in India to better understand the link between antibiotics and contamination levels in water, sediments, animals and humans.

21. KERALA
Antimicrobial resistance
Imperial's Department of Infectious Disease is working with the Amrita Institute of Medical Sciences on antimicrobial resistance in surgical pathways.

Key to Faculty
- Engineering
- Business
- Natural Sciences
- Medicine

CASE STUDY:
THE ANTIMICROBIAL RESISTANCE PANDEMIC

Imperial's Department of Infectious Disease has been working with the Amrita Institute of Medical Sciences to tackle antimicrobial resistance before, during and after surgery.

Antimicrobial resistance (AMR) is a global health concern, with growing numbers of infections becoming resistant to available antibiotics. It develops when the microorganisms that cause infections, such as bacteria, are exposed to antibiotics used to treat infections. The overuse and misuse of antibiotics is a contributing factor.

Infection prevention and correct antibiotic use in surgical patients can have a major positive impact, but it is an area that has traditionally been under researched. Qualitative research led by Imperial's Dr Esmita Charani highlighted gaps in surgical pathways and led to the development of the ASPIRES research programme: Antibiotic use across Surgical Pathways - Investigating, Redesigning and Evaluating Systems.

The international programme was funded by the UKRI and ESRC and led by Professor Alison Holmes (Professor of Infectious Diseases, Imperial College). It was a partnership between Imperial, the Amrita Institute of Medical Sciences in Kerala and the University of Cape Town, South Africa. Dr. Sanjeev Singh and Professor Marc Mendelson were the co-Leads in India and South Africa, respectively.

ASPIRES aimed to develop behavioural, structural, technological, and context-specific solutions to reduce the risk of infection and optimise the use of antibiotics before, during and after sugary. The team used innovative methods, including sociograms, to highlight gaps in how teams communicate about infections in the hospital settings. They found that using these methods drastically changed how ward rounds were conducted, improving communication about infection management in teams.

MUTUAL LEARNING AND KNOWLEDGE EXCHANGE

Another success of the collaboration is the platform it provided for the development of early career researchers at all participating institutions, who came to the project from a range of backgrounds and were trained and mentored by the ASPIRES co-Investigators. Building on the work, the investigators developed a Massive Open Online Course on applying Social Science Research in AMR. The course has had over 3,500 learners from over 70 countries and is a free online resource for applying the methodologies adopted in the research.

"We need to do a lot more to tackle drug-resistant infections right now and we cannot wait for new solutions. There needs to be a focus on improving how we use existing agents and we need to understand how to better prevent and treat infections."
PROFESSOR ALISON HOLMES,
Department of Infectious Diseases, Imperial College London

"Gradually over time the program was able to create impact, especially on appropriateness of antimicrobial prescription, improving compliance to stewardship recommendations" says
DR VRINDA NAMPOOTHIRI,
Research Pharmacist at Amrita Institute of Medical Sciences

Dr Esmita Charani with the ASPIRES early career researchers in India team from left to right: Ms Fabia Edathadathil (data manger), Ms Surya Surendran (anthropologist), Dr Vrinda Nampoothiri (Pharmacist and PhD student), Ms Anu George (project manager), and Dr Pranav Veepanattu (pharmacist), February 2022

FIND OUT MORE
www.imperial.ac.uk/arc/aspires/patient-involvement-and-engagement/

CASE STUDY:
ANTIMICROBIAL RESISTANCE AND MANUFACTURING WASTE

A team from Imperial College's Centre for Environmental Policy and Puducherry (Pondicherry) University are working with the Indian Government to monitor and regulate antibiotic discharges from manufacturing and support global efforts for tackling AMR.

Emissions from the manufacturing of antibiotics can pollute the environment and contribute to antimicrobial resistance (AMR). India is one of the world's main producers of antibiotics and several studies have shown excessively high concentrations of antibiotics and AMR in the environment near manufacturing sites. Unfortunately, there are no international standards to regulate manufacturing discharges in the environment and such pollution can result in environmental bacteria becoming resistant, ultimately transferring AMR to human bacteria, with potential harmful health consequences for everyone, regardless of where the pollution occurred.

Focusing on Chennai and Puducherry, two regions in India that have a significant number of pharmaceutical companies producing a range of products including amoxicillin, cephalosporins, macrolides, tetracyclines, and fluroquinolones, the UK-India AMRWATCH project team is investigating the link between antibiotics manufacturing and contamination levels in the surrounding environment compared to samples collected upstream and downstream of manufacturing sites.

They sample for antibiotics and antimicrobial resistance in waters, sediments, animals, and humans. The methods for these are being developed by the Indian partners with the support of colleagues at Imperial for the bacterial, genomic and metagenomic analysis of AMR. AMR data will be integrated with locations of sampling and levels of antibiotic contamination to determine the degree of association between these factors, providing a library of AMR risk in this region of India.

The Principal Investigator of the project, Professor Nick Voulvoulis (Centre for Environmental Policy, Imperial College London) described potential impacts of the research: "Our work will provide a platform to advise on the risk posed by emissions from antimicrobial manufacturing and identify the need for risk-reducing investments by industry to deal with the proliferation of AMR. Global implications of this work relate to the sustainable sourcing of antibiotics; there may be a need to consider that the low cost of antibiotics should be balanced by a need to maintain environmental performance and sustainability of their manufacturing methods. Our work will encourage and support the Indian government in its determination to monitor and regulate antibiotic discharges from manufacturing, whilst supporting global efforts for tackling AMR".

"The project will develop novel analytical methods for the quantification of active pharmaceutical ingredients related to antibiotic manufacturing and novel approaches to quantify and characterise the penetration of AMR into the environment and animal and human microbiota. Findings will be used for the development of mass balance methods and risk assessment tools that predict concentrations and risk based on production loads of antimicrobials."
PROFESSOR JOSEPH SELVIN,
Department of Microbiology, Pondicherry University

FIND OUT MORE
www.imperial.ac.uk/stories/antimicrobial-resistance/#group-section-Pharmaceutical-Waste-U75kjdoHlm

CASE STUDY:
SUSTAINING WATER RESOURCES FOR FOOD, ENERGY AND ECOSYSTEM SERVICES

Academics in Imperial's Department of Civil and Environmental Engineering have worked with partners in India to investigate water challenges in the Gadak Basin of northern India.

Water Challenges in the Gadak Basin

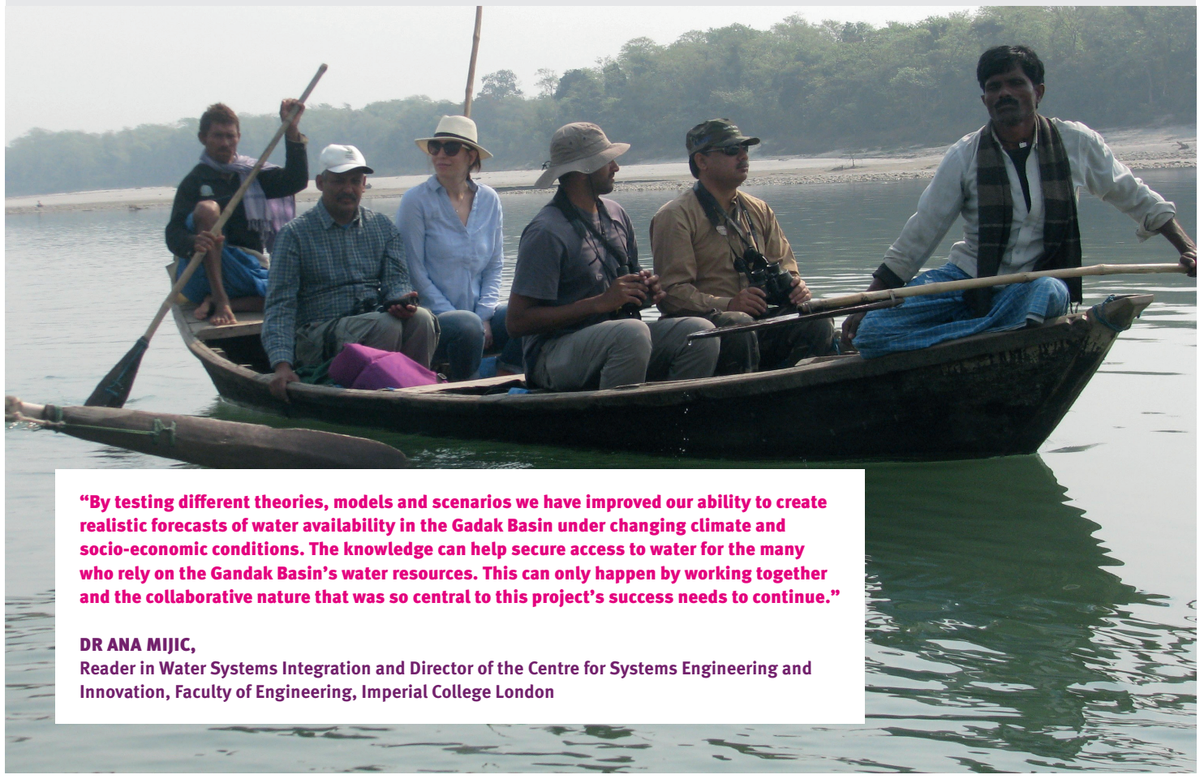
The Gandak River is central to the lives of millions of people who live and work within its basin. The river and its floodplains play a pivotal role in supporting farming and fishing communities while providing a habitat to endangered species. Yet, the habitat and the lives of the people that rely on the river are threatened by competing water demands. Irrigation canals regularly run dry, which puts strain on farming communities, and continued urbanisation, including the emergence of new cities, only adds to the water management challenges. Factor in the unpredictable nature of seasonal weather events and it becomes clear that balancing the supply and demand of water in the Gandak Basin is a complex challenge.

The approach

The CHANSE research project set out to better understand the factors that influence the management of water in the Gandak Basin. The collaboration was led by Principle Investigators Dr Ana Mijic (Reader in Water Systems Irrigation at Imperial College London) and Dr Subimal Ghosh (Indian Institute of Technology Bombay). The programme partners were the Indian Institute of Science Bangalore, the Ashoka Trust for Research in Ecology & the Environment (ATREE), the Indian Institute of Tropical Meteorology, Pune, T.M Bhagalpur University, Bihar, the British Geological Survey and the University of Exeter.

The relationship between humans and their natural environment was a particular focus for the team. Their research looked at the interactions between climate change, hydrology, ecology, land use and socio-economic factors, bringing together all these elements together to create detailed and complex models to develop an understanding of the system. Since it is impossible to manage water by looking at individual elements in isolation, this meant creating the tools to reflect the relationship between the different elements.

The team developed their understanding through in-depth interviews with water users, water and ecological monitoring, developing modelling tools, applying climate change scenarios and socio-economic change scenarios.



"By testing different theories, models and scenarios we have improved our ability to create realistic forecasts of water availability in the Gadak Basin under changing climate and socio-economic conditions. The knowledge can help secure access to water for the many who rely on the Gandak Basin's water resources. This can only happen by working together and the collaborative nature that was so central to this project's success needs to continue."

DR ANA MIJIC,
Reader in Water Systems Integration and Director of the Centre for Systems Engineering and Innovation, Faculty of Engineering, Imperial College London

CASE STUDY:
RESEARCH AND INNOVATION PARTNERSHIPS FOR THE TRANSITION TO CLEAN ENERGY

Three customers of Oorja's affordable pay-per-use solar irrigation service, "Oonnati", in Gumdapur village, Uttar Pradesh, India. Credit: Oorja Development Solutions Limited.

Building climate resilient communities

In 2016, chemical engineer and Imperial alumnus Dr Clementine Chambon, co-founded the start-up company, Oorja, with social entrepreneur Amit Saraogi.

Oorja Development Solutions Ltd is a farming-as-a-service company providing irrigation, milling and cooling services to smallholder farmers in northern India. Oorja finances, installs, operates, and maintains community-scale solar agri-infrastructure. It has pioneered an inclusive pay-per-use business model to eliminate the upfront technology acquisition cost for farmers to access solar technology.

FIND OUT MORE
www.oorjasolutions.org

Empowering communities in India and Europe

Academics in the Department for Electrical and Electronic Engineering are working with the Indian Institute of Technology Delhi, Indian Institute of Technology Kharagpur, Indian Institute of Technology Bhubaneswar, Indian Institute of Science Bangalore and a range of European partners to develop an eco-Energy Management System (eco-EMS) and knowledge transfer activity as part of an ambitious EU-India consortium that aims to empower European and Indian communities through renewable energy. The lead for the study at Imperial College is Professor Bikash Pal, Professor of Power Systems and co-investigator for the project at Imperial.

The RE-EMPOWERED project will develop a complete set of solutions for local multi-energy systems in Europe and India. The collaboration will also facilitate the development of an eco-community tool, which will facilitate citizen engagement, enhancing the active participation with the new technology. Users will be able to monitor their energy data (production, consumption), make electronic payments and enjoy several services that will enable them to shape their own energy profile. "This important collaboration is economically enabling geographically isolated communities through energy", says Prof Bikash Pal.

New technologies for Solar Power

The World Bank estimates that in 2019 759 million people globally were still without access to electricity, with rural areas lagging behind the global average. Solar power could be the logical solution to providing affordable, reliable power to areas where the grid connection is poor or non-existent, yet traditional silicon solar panels have remained expensive to install and maintain, preventing their widescale adaptation.

Recent advances in efficient, low-cost photovoltaics means the deployment of solar energy in remote locations has become far more viable. SUNRISE is an ambitious programme to address global energy poverty through developing next generation solar technologies. Imperial academics are part of an international consortium working with industry partners and local communities to build solar-powered building demonstrators in rural India using local manufacturing supply chains, most recently recognised by award of a Queen's Anniversary Prize for its work 'revolutionising applications for renewable energy'. The Principal Co-Investigators at Imperial are Professor James Durrant (Department of Chemistry) and Professor Jenny Nelson (Department of Physics).

CASE STUDY:
AN ENTERPRISING STUDENT COMMUNITY

Indian students are at the heart of enterprise and innovation at Imperial. Meet Divya Gupta, the co-founder and CEO of momzjoy.com, India's leading maternity and nursing fashion wear brand.

Divya completed an MSc in Management at the Imperial College Business School in 2013, and was Highly Commended for the Alumni Entrepreneur Award 2021.

Divya had always wanted to start her own business but just wasn't sure what it would be."After leaving Imperial and getting married, it was then the idea of maternity clothes struck me". Founded by Divya and her childhood friend Kriti Baveja, Momzjoy has found it's own niche in the market for maternity and nursing fashion wear in India. Self-funded and sustainable, Momzjoy is profitable and selling over 1200 unique products within four years of it's launch.

The business has been awarded The Best Maternity Wear Brand in India 2019, 2018, 2017 and 2016 by leading parenting portal Kidsstoppress, as well as the National Entrepreneurship Award 2018 by the Govt. of India (MSDE). The founders have also been awarded Businessworld's India's Hottest Young Entrepreneurs 2017 and Divya has been awarded Top 50 most influential e-commerce professionals by Asia Retail Congress in 2018.

Imperial College Business School gave Divya the platform to believe in the power of technology, and she still uses the management acumen developed during the course today. As a wife and mother,

"Being at Imperial and living in London opened my eyes to different things, and exploring disruptive innovation was really insightful. I think subconsciously this is when ecommerce started to become an option for me."

Divya enjoys the flexibility being an entrepreneur gives her. For Divya, giving back to the community is important too. She donates fabric scraps for making reusable bags and pouches for sustainable fashion. As a policy, the team also allocated 7% of its profit for charitable activities. So far, they've supported flood reliefs, surrogate homes and food distribution.