IIT MADRAS RESEARCH PARK

A Case Study on Nurturing Innovation and Industry-Academia Collaboration

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ABOUT THE CASE STUDY

IIT Madras Research Park has proved its excellence in industry-academia collaborations and commercialising R&D efforts, particularly around deep technology. This case study captures the Research Park's successes, strengths and learnings to develop a framework that can be utilised by the ecosystem of Indian educational & research institutions.

One of the lessons of the past 50 years is that higher education institutions are the biggest producers of disruptive discoveries in Science & Technology (S&T). Globally, universities have become the place for open-ended research, whereas government laboratories tend to perform the majority of mission-driven research. Indian higher education institutions, while being many in number and of strong academic credentials, are expected to produce far higher scientific output.

FAST India believes there is a need to identify and study best practices from successes in Indian Institutions and create public goods in the form of case studies for utilisation by the ecosystem of Indian educational and research institutions. While success models in the West and even in our rapidly growing Asian neighbours are well researched, we need to enrich this understanding with Indian examples.

The idea was to come up with something that is truly informative and motivational. The case study is crafted using a narrative approach to engage the readers while using clear and straightforward language to ensure accessibility. A balanced perspective is maintained throughout, presenting multiple viewpoints to offer a well-rounded analysis supported with data, quotes and real life examples.

About FAST India:

Foundation for Advancing Science and Technology (FAST India) is a non-profit institution of excellence dedicated to building capacity and advancing policy solutions that foster scientific enquiry and research, and facilitate the creation, dissemination, and translation of new scientific knowledge. FAST's mission is to catalyse India's ascent to become a top three S&T nation.

EXECUTIVE SUMMARY

The IIT Madras Research Park (IITMRP), established in 2010, exemplifies a transformative model of fostering innovation through seamless collaboration between academia and industry. The core values and approach of the Research Park in building this ecosystem is summarised below.

1. Bringing unlike minds together

The Research Park brings together academia, industry, startups, and youth. Bringing these unlike minds together is key to the thriving innovation ecosystem at the park. The team recognized early on that young Indians hold a lot of value and do not know what cannot be done. Their ability to take risks drives breakthroughs in technology and entrepreneurship. Academia is the source of knowledge and industry knows how to convert knowledge into wealth.

2. Entrepreneurial leadership and independent governance

From the very beginning, the Research Park was driven by not just faculty, but a leadership that had a strong business acumen along with technological understanding. Along with that, the goal of nation-building inspired every decision that the leadership took. The Research Park functions independent of the government and IITM and is governed entirely by its board. It is supervised by the board for policy but there is no day-to-day interference in its functioning.

3. Becoming one with the ecosystem

If the Research Park had to build an ecosystem, it had to become one with the ecosystem. That meant shedding off the perception of being safe, slow, and bureaucratic that was usually attached with academic institutions. While the Research Park worked closely with an academic institute, it was not one. Only this dynamic behavior would generate confidence in industry clients. A part of this effort meant long working hours and a six-day work week for the team.

4. Focus on sustainability and financial independence

Structured as a self-sustaining, non-profit entity, IITMRP has always operated like a startup, prioritizing sustainability, and growth. The Research Park paid back all its ₹400 crore ($47 million) debt in 2021 and has a revenue of ₹50-60 crore ($6-7 million) every year now. Embodying the principle of 'Easy money hurts', the team worked with the clarity that only seed money would be taken and no other grants should come in.

5. Passionately nurturing startups with an emphasis on commercialization

The IITM Incubation Cell, co-located with IITMRP, exclusively nurtures deep-tech startups. With 400 incubated companies achieving a valuation of ₹50,000 crore ($6 billion) and 80% survival rate, it sets a benchmark in startup success. Every incubatee is nurtured individually and the idea that technological success is meaningless without commercial success, is embedded in them. They benefit from mentorship, funding, and credibility through the IITM Incubation Cell, alongside access to world-class R&D facilities, networking opportunities, and comprehensive operational support.

6. Integrating Incubation Cell and Research Park

Legally, the Research Park and the Incubation Cell are two separate entities with separate purposes. However, they work very closely with each other and there are multiple programs that run across both organisations. This integration allows for effective and diverse collaborations.

7. Models to bring together industry and academia

IITMRP revolutionized industry-academia collaboration through a credit-based system mandating active partnerships for the Research Park clients. Till date, over 900 joint projects have been executed, with ₹680 crore ($82 million) invested in R&D. The industry is also incentivised through measures like variable salary components for senior personnel, opportunity to contribute as Adjunct Faculty at IITM and opportunities for project staff to join part-time Master's or PhD degrees at the institute.

8. Changing faculty mindset

Consistent efforts were made over the years by IITM leadership to change the orientation of faculty members from just research to technology commercialization. This included setting up of an Intellectual Property (IP) Cell, incubation policy and integration of joint industry-academia projects into IITM faculty promotions. Today, 117 companies at the Research Park have IITM faculty as their founders or minority shareholders.

INTRODUCTION

THE GENESIS OF IIT MADRAS RESEARCH PARK

Located at a cycling distance from IIT Madras, the IIT Madras Research Park (hereafter referred to as IITMRP or Research Park) was founded in 2010. A group of industry-active faculty at IIT Madras envisioned creating a place where the three sets of people salient to innovation — faculty, industry and youth — could come together. It emerged from their experience of building effort intensive technologies and the realisation that industry-academia collaboration was needed at scale.

Almost fourteen years later, on January 4th 2024, the Research Park team was meticulously preparing for the highly anticipated visit of the 14th President of India, Honb'le Shri Ram Nath Kovind. The President interacted with startups and witnessed the innovative tech products developed at India's first university based Research Park. All around them, the place was brimming with activity. Its team handled visitors ranging from policymakers and industrialists exploring potential partnerships to students gaining first hand exposure to groundbreaking research. The buzz of networking was omnipresent, with impromptu meetings in cafes, break-out areas, and shared workspaces. The Research Park started with around 10-15 companies. Today, it has five buildings and no room to spare.

Uniphore, which builds deep-tech conversational AI tools for enterprises, was the first startup to set up its office in the Research Park. It was started in 2008 by two young computer science graduates from a Tier 2 engineering college, with a small team and shoe string budget. Ravi Saraogi, co-founder and President APAC Uniphore, recalls:

> "Back in 2008, there were hardly any structured programs to support startups. IIT Madras was one of the few places in India that had such a program to support budding entrepreneurs like us. It was called Rural Technology Business Incubator (RTBI) back then. The honest and transparent feedback we received from Prof. Jhunjhunwala in our early days helped to solidify our approach."

Uniphore began by offering multilingual speech recognition and voice biometrics technology. Over time, it has evolved into an advanced conversational automation platform, integrating conversational AI, tonal emotion analysis, and computer vision to accurately identify language, dialect, emotions, and intent in real time. Today, Uniphore is a $2.5 billion unicorn. It gave an exit of ₹11.5 crores (approx $1 million) to the ₹10,000 ($118) invested by IIT Madras Incubation Cell (IITMIC) in 2010.

Uniphore's success story, along with the success of other well known names like Ather Energy, MediBuddy and GUVI stand tall as a testament to the enduring approach of the Research Park. It is also home to more than 100 established R&D companies including Saint-Gobain, Titan, BHEL, Toyota and Tata Steel, and has eleven Centres of Excellence (CoEs).

In the late eighties, three faculty members at IITM, Professor Jhunjhunwala, Professor Bhaskar Ramamurthy and Professor Timothy Gonsalve formed the TeNeT (Telecommunications and Computer Networks) Group. Their vision was to develop low cost technologies to enable telecom growth in India. The group had by this time studied the Indian telecom system in some detail: due to high capital expenditure in installing a telephone line, the number of telephones in India had stagnated at only about seven million for a country whose population in 1993 stood at 850 million[1]. Against this background, the TeNeT Group put forth its vision of achieving 100 million telephone lines in India within a decade. They zeroed in on the Wireless in Local Loop (WiLL) technology, which would replace the copper cables in the telephone line responsible for the high capex.

Prof. Jhunjhunwala was awarded the Padma Shri in 2002 for his work on wireless communication systems. This was also the time when the idea of a Research Park was starting to form in his mind.

> "I realised that industry and academia did not work together in India. Academia is a source of knowledge and industry knows how to convert that into wealth, but I noticed that there was this *Saraswathi-Lakshmi* divide that did not allow them to collaborate, without which the country would not be able to prosper. India was a large market for affordable products and if we could innovate and make our products affordable, the economy would gain immensely. This required not just entrepreneurship, but also for academia and industry to come together. In my mind though, this collaboration needed to go much beyond the efforts of one Jhunjhunwala or one group like TeNeT. Being at IITM amidst a large number of bright faculty in most engineering disciplines, we thought of encouraging them in academia-industry interaction."
>
> *Prof. Jhunjhunwala*

This was the beginning of the journey to establish the Research Park. A few years were spent discussing and shaping this idea with alumni, faculty members and industry veterans. The unanimous opinion from industry was not wanting to set up their R&D within the IIT Campus. Also, learning from IIT Delhi, which had earlier had an unsuccessful attempt at setting up a Research Park within its campus, it was decided that it had to be outside the campus and deeper thought needed to be given to make industry and academia work together.

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1. RTBI website, http://www.rtbi.in/Ashok/milestone.html, Accessed on 11th October 2024

The Research Park ran into some delays and challenges regarding land acquisition due to change of state government post allocation of land by the previous state government. On suggestion of the ex-chief secretary, the team initiated the work for a new file by garnering support of several government secretaries. Finally, the construction of the first tower of IITMRP was initiated in 2008.

Its infrastructure also houses two other bodies that act as large-scale enablers for innovation – Rural Technology Business Incubator (RTBI) and IITM Incubation Cell (IITMIC). The oldest, RTBI, was started in 2006, in the Electrical Engineering department of IITM and was later moved to the Research Park. It is registered as a not-for-profit society with the mission to incubate start-ups whose focus is to impact rural/underserved societal segments, leveraging Information and Communication Technologies (ICT). IITMIC is the umbrella body for nurturing and overseeing innovation and entrepreneurship at IIT Madras, and was established in 2013.

PILLARS OF IIT MADRAS RESEARCH PARK

The Research Park stands on five pillars that are both foundational and indispensable to its existence and functioning. These basic principles are critical to the success of IITMRP, driving its achievements till date.

1. INSTITUTION AND OPERATION — ADOPTING THE START-UP MENTALITY

The call to operate the Research Park like a start-up was taken early on. IITMRP was set up as an independent, not-for-profit entity (Section 8 company) that would be self-supporting like any other venture. The focus, like any other startup, was on sustainability, revenue generation, and growth.

The team was able to raise some money from alumni which was used for initial work and hiring a team. The Research Park took a loan of ₹100 crore ($11.8 million) from the union government, which, post-payment of ₹37 crore ($4.4 million) as interest, was later converted into a grant-in-aid. This was used as seed money to establish the Research Park[2]. The team worked with the clarity that only seed money would be taken and no other grants should come in. '*Easy Money Hurts*' is the mantra that is strongly embedded in the working of the Research Park and in fact, the same is advocated for all startups supported by it. Post the construction of the first tower, the team took the hard call of taking additional loans in tranches, mortgaging the built-up areas each time. The Research Park paid back all of its ₹400 crore[3] ($47 million) debt in 2021 and has a revenue of ₹50-60 crore ($6-7 million) every year now.

The team behind the Research Park had an extensive experience in building businesses centred around scientific and engineering innovations. As a result, their decisions were guided by a blend of entrepreneurial acumen and a strong grasp of technology.

2. JOINT R&D — CHANGING MINDS OF INDUSTRY AND ACADEMIA

In India, there is a gulf between industry and academia. Industry imports technology, indigenises it, manufactures, and sells. Academia on the other hand is mostly occupied with publishing and doing occasional patents.
The objective of Research Park is to make industry and academia work together and undertake R&D.

To make that happen, the following measures were taken:

2. Setting Research Parks in IITs, Press Information Bureau website, *https://pib.gov.in/Pressreleaseshare.aspx?PRID=1523301*, Accessed on 7th October 2024
3. Hindustan Business Line, *https://www.thehindubusinessline.com/news/education/valuation-of-iit-m-incubation-cells-start-ups-seen-touchi ng-40000-crore/article66528309.ece*, Accessed on 6th October 2024

a. **Mandatory collaboration through credit system:** A unique R&D credit system was introduced, where companies were required to earn 100-150 credit points every year per thousand sq. ft. of space occupied by them in the Research Park. The credits requirement could be met by joint collaboration with IITM via joint R&D projects, consultancy work, student guidance, and lectures (See Exhibit 1). Non-compliance led to penalties or eviction. For example, an R&D company which occupies 10000 sq. ft. of space in the Research Park, has to meet the requirement of 1000 credit points in a year – which can be fulfilled by earning points through collaboration with IITM.

b. **Faculty Advisory Committee:** A Faculty Advisory Committee was formed with representatives from each IITM department. This committee evaluated and assigned credit points based on the type of collaboration between the industry and IITM.

c. **Integration into faculty promotions:** Industrial consultancy and joint industry-academia projects were incorporated as one of the evaluation criteria for faculty promotions, incentivising IITM faculty to engage with industry.

d. **Auditable agreements:** The collaboration clause was included in rental agreements, making credit requirements auditable by R&D companies' risk management committees.

e. **Incentivising industry leaders:** The variable salaries of senior personnel from R&D companies are linked to fulfilling credit requirements, motivating top management to drive joint R&D efforts. They also have the opportunity to collaborate and contribute as Adjunct Faculty/Professor of Practice at IITM.

f. **Client and Faculty Councils:** A Client Council with members from the industries and a Faculty Council with IITM faculty were established to continuously review and promote collaboration efforts, ensuring regular interaction and alignment.

IITMRP currently houses 250+ R&D organisations including global corporations, government research agencies, large public sector and private sector companies, start-ups, and CoEs across industrial sectors that have engaged in 900+ research projects with IITM. Over 300 faculty members from IITM have collaborated with the R&D organisations at the Research Park. A total of 5,80,000 credit points have accrued from these collaborations, resulting in an overall spending of ₹680 crore ($82 million) in R&D activities by the Industry.

If one looks at startups, 117 companies have IITM faculty as their founders or minority shareholders.

3. GOVERNANCE — INDEPENDENT AND DRIVEN BY VISIONARIES

IITMRP Board is a mix of successful private entrepreneurs, government officers and IITM faculty (See Exhibit 2). The Research Park functions independent of the government and IITM and is governed entirely by its board. It is supervised by the board for policy but there is no day-to-day interference in its functioning.

4. LEADERSHIP — FORGED AT THE INTERSECTION OF TECHNOLOGY AND BUSINESS

The leadership of the Research Park is characterised by having strong technological understanding, business acumen, and passion, coupled with a willingness to take risks and learn from failures.

5. SUPPORTING STARTUPS — NURTURING INNOVATION KEEPING THE BASICS PRINCIPLES INTACT

The IITM Incubation Cell only incubates R&D intensive or deeptech startups. It has supported 400 startups in the last 11 years with a total valuation of ₹50,000 crore ($6 billion). With an impressive **startup survival rate of 80%** (which is typically 8-10%), it has emerged as one of India's leading deeptech startup hubs (See Exhibit 3). 60% of the founders are non-IITians, showcasing the large reach and diversity of the beneficiaries of the Incubation Cell.

Like the Research Park, IITMIC was also set up as a Section 8 company, governed by an independent board. Legally, the Research Park and Incubation Cell are separate organisations with separate histories and separate purposes. The Research Park is focused on industry-academia collaboration and taking R&D to commercialization. IITM Incubation Cell creates and nurtures start-ups and helps them become a commercial success. Though they are different, the two are also related; they are placed together as if there is a relationship between them. There are multiple programs that run across both these organisations.

The key areas in which the startups get supported by the Incubation Cell are the following:

a. **Strategic and operational mentorship:** The Incubation Cell connects startups to mentors who are experienced leaders of industry, including alumni with long years of industry experience. They help youngsters understand what may or may not work for the company, and that makes a huge difference. Arun Prakash, CEO of GUVI, an edtech platform for vernacular upskilling, attributes a pivotal decision for the company to the nudge of his mentor, Mr. Mohan Narayanan, Governing Board Member of PAN IIT Alumni Leadership Series (PALS).

He recalls,

> "Mr. Mohan suggested that GUVI should move from a B2B model to a B2C model. He told me that to understand what would work better for the company, I, as a founder, should first introspect into my own nature as a person — Do I work well with more activity and sudden changes, or am I somebody who has patience and prefers stability? We decided to switch to B2C. GUVI had earlier made a total revenue of ₹2.5 crores after five years in B2B. Post the switch, our revenue went to ₹1 crore in the first year, ₹7 crores in the second year and reaching ₹67 crores in the fifth year."

b. **Credibility:** Being associated with IIT Madras lends immediate credibility to startups. Especially for founders without the 'IIT tag' from their education, this association helps in building trust with potential customers, investors and even vendors. Association with IIT Madras as an incubated company gave Prakash's startup immediate credibility, which was immensely valuable since he had no prior business experience. Till date, GUVI calls itself an IIT Madras incubated company.

c. **Training:** A lot of the entrepreneurs supported by the incubation cell are first-time entrepreneurs and exposure to multiple theoretical frameworks is crucial to their jour-

ney. Training programs are designed to enhance the skills of entrepreneurs and would cover the entire spectrum ranging from product development to market analysis.

d. **Network:** Startups benefit from the extensive network of the Research Park — this includes well known industry names that visit the campus, their peer group at the incubation cell, personnel from the established R&D centres and faculty at IITM. Saloni Malhotra, who got connected to the Research Park in 2006, wanted to make a difference to rural India through her work. After spending a year and a half trying to figure things out, she established a company called DesiCrew. DesiCrew set up multiple computers in villages, provided connectivity and power back-up and hired people who had studied up to class 10 or 12 and trained them to work on these computers. What began as a rural BPO project is now a 1000-people strong entity offering AI and ML solutions and working on cutting edge technology platforms.

For Malhotra, the peer group at the incubation cell acted as a shield against failure.

> "While this is not the most tangible benefit of being in an incubation cell, the borrowed wisdom of the peer group helps in more ways than one can imagine. Basic watercooler conversations with other folks who have gone through a similar ride of building a company, would turn out to be a life saver. A problem that one is stuck with for a long time, would get resolved so quickly."

Apart from fellow incubatees, chance meetings with prominent industry leaders could also lead to positive far-reaching outcomes. The head of Google India R&D centre visited the Research Park and Malhotra got a chance to have a quick conversation with him about the work that DesiCrew does. This conversation led to Malhotra convincing him to visit the DesiCrew office in Chennai and bag a contract with Google which sowed the seeds for setting up DesiCrew's office in San Francisco, many years later.

e. **Infrastructure and Support Services:** Startups have access to world-class R&D infrastructure at IITM, enabling the translation of innovative ideas into market-ready products. They also benefit from workspaces designed for both hardware and software companies, along with essential business support services, including accounting, legal, company secretary and IP.

In May this year, Agnikul Cosmos, an IIT Madras incubated space startup, successfully carried out a sub-orbital test-flight of its home-built 3D-printed semi-cryogenic rocket—Agnibaan—from its own launch pad at Sriharikota, making it India's second private entity to do so. According to its founder, Srinath Ravichandran, full access to IITM's resources is a game-changer for deeptech startups.

Srinath elaborated on the support he received from IITMIC:

> "Agnikul felt well-supported, with the incubation cell assisting in key operational aspects such as legal work, corporate lawyers, and company secretarial support, all vetted and streamlined, allowing us to focus on core tech competencies, value addition and building a sustainable model.

> The IITMRP ecosystem promotes meaningful, sector-level focus and deep-tech, resisting the urge to follow fleeting trends that may change with time such as crypto. Formal and informal collaborations with faculty members enhance tech development.

> Agnikul operates with full autonomy, as IITMRP helps startups but does not control their operations. This autonomy ensures that startups can make independent decisions while leveraging the ecosystem's benefits."

Agnikul currently has two spaces in the Research Park, one is used as an office space and the other is a storage facility/lab. It has had a stellar growth journey, moving from an incubatee to a client of the Research Park in just three years.

ECOSYSTEM AND STRUCTURE

INNOVATION ECOSYSTEM @IITM RESEARCH PARK

The ecosystem created at the Research Park encompasses the infrastructure, incubators, labs, Centres of Excellence (CoEs), students and research scholars, faculty and field experts (See Exhibit 4).

The Centres of Excellence were instituted to offer guidance and resources to R&D centres, startups and to propel path-breaking research. For example, the Centre of Excellence in Energy and Telecommunications (CEET) develops technologies for EV and renewable energy. Last year in November it launched a DC portable charger for 2W and 3W electric vehicles, entirely designed and manufactured in India in partnership with the Ministry of Electronics and Information Technology (MeitY), Government of India. CoEs bridge the gap between academic research and industry needs; most people hired at CoEs are not faculty but people who have worked in industry for 25+ years.

The Research Park retains close physical access to IIT Madras via the aptly named Industry-Academia Bridge. While the bridge is symbolic to the proximity of IIT Madras with the Research Park, the institute is deeply integrated with the ecosystem at the Research Park. Prof. Krishnan Balasubramanian, Professor in the Department of Mechanical Engineering and Head, Centre for Non- Destructive Evaluation expanded on this:

> "It is not the building or the infrastructure. The ecosystem, nurtured by the activity that goes on inside the building, makes all the difference. The students, the faculty, the research and everything else that goes on in the IIT Madras campus is integrated very closely with the Research Park. The Innovation Hub, located in IIT Madras, serves as a pre-incubation space, helping students develop ideas into startups through bodies like Centre For Innovation (CFI) and Nirmaan. Alumni support through mentorship and funding, combined with a strong pre-incubation process, ensures technologies are mature before entering the startup phase. This unique setup has produced successful startups like Ather Energy, Agnikul, and HyperVerge."

ORGANISATIONAL STRUCTURE

The key functions performed by the management team at the Research Park can be broadly understood as follows:

a. **Industry-Academia Partnership:** A dedicated client management team with the primary goal of enabling collaborative research. With 600+ faculty, 3600 research scholars, 6200+ students, 400 incubated startups - the opportunities for collaboration are rich in both variety and volume. The primary role of the team here is to connect the industry to the relevant faculty, based on the confluence of the industry's need and the research area of the faculty. Post the connection, the industry and faculty work out the type and terms of collaboration. IITMRP has defined around 25-30 collaboration pathways, offering multiple ways for companies to engage (See Exhibit 1). The secondary role of the team includes setting initiation meetings, tracking and monitoring client progress.

b. **Marketing, Communication and Partnerships:** This team focuses on branding and marketing, primarily through social media and their website, to keep people informed about ongoing activities and events. They also handle event organization, including ideation, conferences, and seminars at both national and international levels.

c. **Administrative Support:** This includes provision of infrastructure support, ensuring 24/7 operation of labs and other facilities to enable industry clients to run their labs smoothly.

UNDERSTANDING INDUSTRY-ACADEMIA ENGAGEMENT

DEEP DIVE INTO INDUSTRY ENGAGEMENT

Saint-Gobain Research India (SGRI) is one of the eight cross-functional R&D centres for the Saint-Gobain Group. In early 2012, Saint-Gobain was looking to set up its R&D centre in India and had to choose between Pune, Bangalore, and Chennai as the possible locations. IIT Madras Research Park at Chennai was zeroed in as the location. In fact, SGRI was the first industry partner to IITMRP and helped it in securing the loan. SGRI has undertaken 22 R&D projects with IIT Madras faculty and students, 20 of which have been launched as profitable products and solutions in the market.

However, for the first six years, initial collaborations faced challenges due to a mismatch between the Technology Readiness Levels (TRL) of academic projects and industry requirements.

Kartik Kumar, Centre Director of SGRI, expanded on this:

> "Academia tended to view intellectual property as an end goal, while industry saw it as a means to generate innovation. This created friction in the collaboration process. Academia is trained to discover and publish, not necessarily to exploit knowledge for commercial gain. This mindset made it challenging to adopt a utilisation-oriented system that industry sought."

According to Kumar, in the initial years there was low participation from professors in industry-related research, which hindered meaningful collaboration.

Saint-Gobain adopted several changes in strategy to enhance their collaboration with academic institutions and startups:

1. They developed a more holistic approach, bringing together various elements such as student recruitment, faculty knowledge exchange, and government policy influence.
2. The company began acting more like a corporate venture capitalist, investing directly in startups. They started utilising accelerators and incubators to foster innovation.
3. The strategy evolved to connect TRL 3 and above projects with other industries to work collaboratively.
4. The company began participating in infrastructure development projects, like road-making systems and water filtration, which combined their product expertise with academic research and government policy.
5. They adopted a long-term view, focusing on generating new business proposals and ideas through these collaborations, even if the immediate benefits were not always apparent.

The dedicated team at the Research Park provides a strong support structure to all the entities there, assisting with lots of seemingly small but important operational tasks, making it easier for collaborations to happen.

Toyota Connected India, which leads the engineering of Connected Mobility Intelligence Systems at Toyota and Lexus, has its office space in IITMRP. According to its CEO, GK Senthil, Toyota was initially unfamiliar with the concept of a university-based Research Park and was more focused on tech parks. With time, they were able to recognise the benefits of this ecosystem which included hiring students, proximity to startups, subsidised office space, flexible credit point system and efficient facilitation of engagement with different entities at the Research Park by the management team. The industry staff also has the opportunity to upskill themselves through part time courses as well as pursuing Masters or PhD at IIT Madras.

DEEP DIVE INTO FACULTY ENGAGEMENT

Prof. Gaurav Raina, Professor of Electrical Engineering at IIT Madras, has extensively worked with industry in the space of data science and AI. He is actively involved in the entrepreneurial ecosystem at IITMRP, where he also runs a company in data science and AI.

Expanding on the role of entrepreneurship in a faculty's life, Prof. Raina said:

> "Expectations from faculty are research, teaching, research grants, consultancy projects etc. The role of entrepreneurship in a faculty's life is interesting because it is not measured in the usual matrix of success. Startup partnerships often show no tangible results until a breakthrough occurs, making the journey very 'zero to one'. While success and product-market fit may lead to significant revenue, until that point, progress is essentially invisible."

He suggests a 'low touch model' which could be the starting point of working with industry:

a. Working with companies in the Research Park through MTech students. Essentially this gives the faculty a nice segue into the world of industry and startups. They start learning the vocabulary, start understanding problems, and gain insights. One of the successes of the Research Park is Uniphore, which is a unicorn. Almost 13-14 years ago, few of the early MTech students who worked with Uniphore were Prof. Raina's students.

b. Moving one step further, faculty can be a part of S&T advisory for startups. From there, involvement with startups can increase. Faculty can help solve hard problems in industry and not just apply things off the shelf. A particular data science problem that Ola approached Prof. Raina with, led to two interns, two MTech students, two MS students and one PhD student working on it in succession.

The low touch model can then possibly progress to a medium touch model and a heavy touch model.

Using learnings from his work at various startups, Prof. Raina incubated his own startup in 2019. This hands-on entrepreneurial experience gave him a first-hand understanding of startup operations. He now integrates real industry problems faced by startups into his research work, leading to publications and solutions that directly benefit the startups. This

collaborative research approach builds trust and demonstrates value. This also feeds into his teaching and courses.

One best practice that has emerged over the years in the engagement of faculty as Research Advisors to industries at the Research Park is the creation of a Research Roadmap based on the problem shared by the industry. The Research Roadmap is then further broken down into specific research goals as per the time scale. This helps to characterize the problems on a scale of *priority* and *time taken to solve*, enhancing stakeholder alignment and project output.

WAY FORWARD – THE 10X PROGRAM

In January 2020, the progress and the achievements over the past 10 years of all the three entities – Research Park, Incubation Cell and RTBI – were reviewed in a joint board meeting. While the board was happy with the progress and noted that the team managed to achieve a lot of impossible goals, they wanted to set up similar impossible-looking goals for the next decade. This was called the 10X Program. It envisages an impact large enough to move the nation forward.

The program has three core goals, each addressing a key area of growth and development:

1. **Accelerated Incubato**r: Tapping into India's grassroot entrepreneurial talent by identifying, collaborating and incubating startups from partner institutes.

2. **Making of Rancho**: The 'Making of a Rancho' program is inspired by the tech genius character with the same name, from the Hindi movie *3 Idiots*. The goal is to invest in young engineering talent to nurture them into the next generation of top-tier technologists for India. Another aspect of this goal is to have youngsters working at the Research Park and as IITM project staff join part-time Master's or PhD degrees at the institute.

3. **Making India a global leader in key technology areas**: The 10X program will attempt to work with technologists, entrepreneurs and industry in the identified areas, such that India is recognised as amongst the leaders in these areas by 2031. The current identified areas include *Assistive Technology*, *Fintech for Inclusion* and *Towards 100% Renewable Energy*.

For example, in Assistive Technology, the team uses two primary approaches to drive collaboration: gathering problem statements from NGOs in the field to guide targeted R&D efforts, and supporting startups by addressing their challenges and enabling innovative solutions. The team was successful in setting up an EMI scheme with SBI and Zomato for Neomotion, a startup that developed motor wheelchairs. This created new avenues for livelihood for people with disabilities.

While the team had set ambitious goals for itself, questions did arise about the execution of the 10X program. To execute this program, they decided to build a separate team by hiring young but experienced people. The vision is for a period of ten years, and not a short-term goal. Thus, it would have to be calibrated frequently, every quarter or maybe every month.

Nat Malupillai, CEO of IITMRP, emphasises building the accessibility and usability of intellectual capital at IIT. He elaborates,

> "Technology should translate into helping to uplift people beyond the confines of the institution. Through the 10X program, we are concentrating on bringing various

efforts together to reach not just major urban areas but also Tier 2 and Tier 3 cities, ensuring broader inclusivity and impact. Proximity to IITMRP is advantageous for those involved, but it's also possible to collaborate effectively from a distance."

The Government of India had sanctioned establishment of Research Parks at IIT Bombay, IIT Kharagpur, IIT Kanpur, IIT Delhi, IIT Guwahati, IIT Hyderabad, IIT Gandhinagar and IISc Banga-lore to augment the research ecosystem in the country. The Research Parks at IIT Kharagpur and IIT Delhi are functional and others are in advanced stages of completion[4]. But is the Re-search Park model replicable and can other aspiring institutions benefit from it?

Prof. Bhaskar Ramamoorthy responds,

"Exact replication is not possible everywhere. What matters is the ease with which people can get together and build something. That means, institutions need to enable entrepreneurship even in faculty. Just throwing money and building fancy infrastructure is the biggest mistake one can make. Conscious nurturing of facul-ty, youth and industry will show results."

EXHIBIT 1
Collaboration pathways for credit points

IITM Research Park offers diverse collaboration opportunities, including joint R&D projects with IITM, Centres of Excellence, and incubated companies, along with consultancy, royalty/license fees, and co-guidance for research. RP clients can engage IITM faculty as advisors or sponsor employees for Ph.D., M.S., or MTech programs. They can also contribute to teaching, deliver guest lectures, and co-guide IITM students. Other options include joint patent filings, participation in RP 10X initiatives, pro-bono support, R&D grants, and employment pathways for IITM graduates.

Some current approaches through which the ecosystem promotes industry-academia collaboration, ensuring continuous engagement and monitoring include the following:

1. Joint R&D Project with IITM, IITM Centres of Excellence, IITMRP, IITM Incubators or IITM Incubated Companies

2. Consultancy with IITM, IITM Centres of Excellence or IITM Incubated Companies

3. Royalty/ License Fees to IITM, IITM Centres of Excellence or IITM Incubated Companies

4. Engaging IITM Faculty as an Advisor

5. RP Client Employee as Adjunct Professor, Chair Professor or Professor of Practice at IITM

6. Sponsoring Employee for PhD at IITM

7. Sponsoring Employee for MS/ MTech at IITM

8. RP Client engaged in Teaching activities/ delivering guest lectures at IITM

9. RP Client providing Joint PhD Co-Guidance at IITM

10. RP Client providing Joint MS Co-Guidance at IITM

11. RP Client providing Joint MTech Co-Guidance at IITM

12. RP Client providing Joint BTech/MSc Guidance at IITM

13. Joint Patent Filed as part of Collaborative Projects with IITM Faculty (Domestic or Global)

14. Joint Patent Granted as part of Collaborative Projects with IITM Faculty (Domestic or Global)

15. RP Clients involved in RP 10X Initiatives

16. IITM Faculty as Advisor, compensated via RP Client Company stock

17. Pro-bono support from RP Clients for IITM Projects funded by IITM or External Agencies

18. R&D Grants made to IITM, IITMRP, IITM Centres of Excellence, IITM Incubators or IITM Incubated Companies for non-Joint-R&D Projects. (Grants could come from CSR)

4. PIB website, https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1946417, Accessed on 6th October 2024

EXHIBIT 2
Board members of
IIT Madras Research Park

19. Full-Time Employment for IITM BTech Graduates of IITM - Campus Hire

20. 20. Full-Time Employment for IITM MS/ MTech Graduates of IITM - Campus Hire

21. Full-Time Employment for PhD Scholars of IITM - Campus Hire

22. Part time Employment or Internships for BTech/ MTech/ M.A/ MSc students of IITM

23. Part time Employment or Internships for MS/ PhD Students including Dual Degree Students/ Scholars of IITM

24. RP Client Employee sponsored for Continuing Education at IITM; Participating in Training Sessions conducted by IITM Faculty, IITM Centres of Excellence or IITM Incubated Companies

25. IITM Faculty delivering Lecture to RP Client Employees

26. RP Client Sponsoring National/ International Technical Events at IITM or IITM RP involving Faculty and Scientists

27. RP Client Sponsoring Student Technical Events at IITM

28. Non-Research Grants (Grants could come from CSR) made to IITM, IITMRP, IITM Centres of Excellence, IITM Incubators or IITM Incubated Companies

Each collaboration pathway has a certain number of credit points allocated to it which could be fixed based on the unit of measurement. For example: 200 credit points are given per ₹10 lakhs (~$12K) paid by industry for a joint R&D project with IITM. The credit points may also be decided on a case-by-case basis by the RP Internal Committee (RPIC). This approach is constantly updated to meet evolving demands.

Prof. V.Kamakoti
IITM Director

Prof. Ashok Jhunjhunwala
Former President , IITM Research Park & IITM Incubation Cell

Mr. Kris Gopalakrishna
Co-founder, Infosys

Mr. M.M. Murugappani
Executive Chairman, Murugappa Group Corporate Advisory Board

Mr. B.Santhanam
CEO, Saint-Gobain Asia Pacific & India

Mr. Gopal Srinivasan
Chairman, TVS Capital Funds Limited

Prof. Manu Santhanam
Dean, IC&SR, IIT-Madras

Mr. S.Mahalingam
Chief Financial Officer & Executive Director of Tata Consultancy Services (Retd.)

Mr. Kumar Jayant
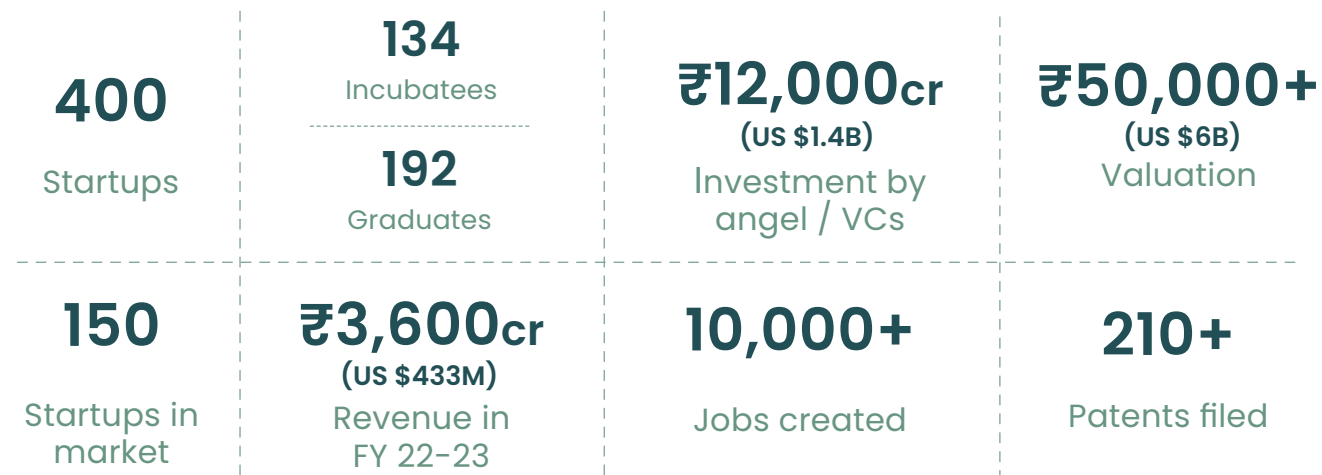Information Technology and Digital Services Department

Mr. V. Arun Roy
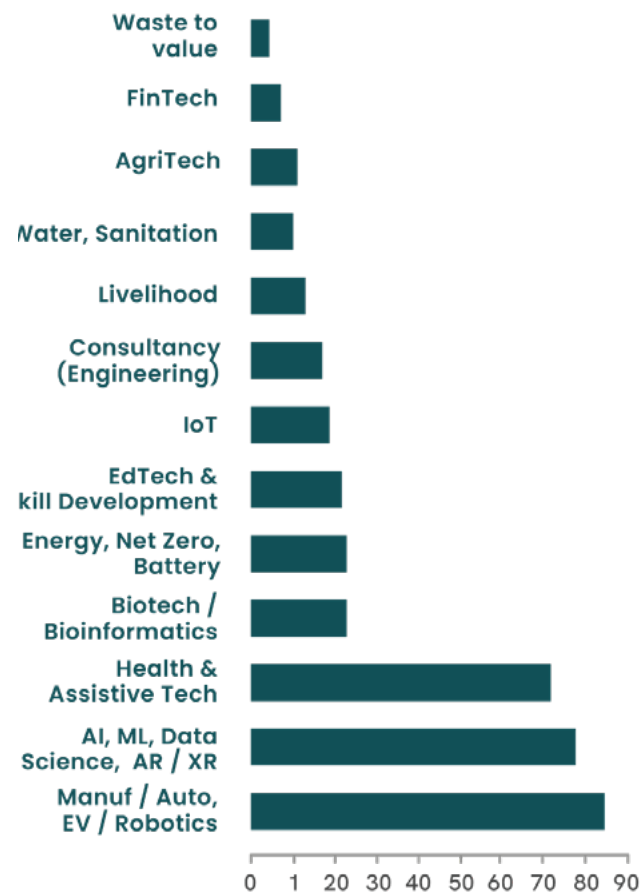Industries, Investment Promotion & Commerce Department

Ms. P. Amudha
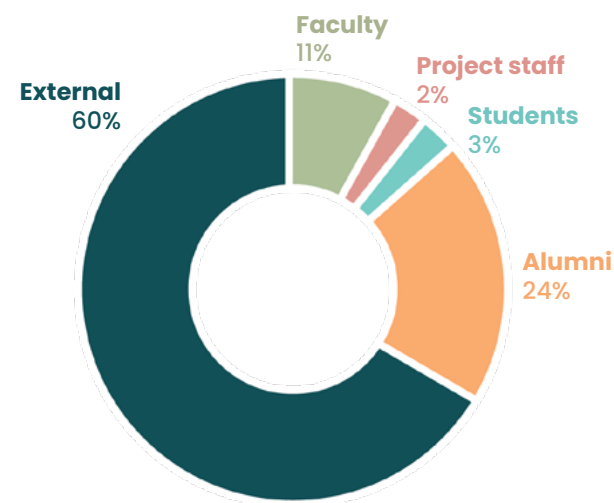Revenue and Disaster Management Department

EXHIBIT 3

Metrics of startups supported by
IIT Madras Incubation Cell

400
Startups

134
Incubatees

192
Graduates

₹12,000cr
(US $1.4B)
Investment by
angel / VCs

₹50,000+
(US $6B)
Valuation

150
Startups in
market

₹3,600cr
(US $433M)
Revenue in
FY 22–23

10,000+
Jobs created

210+
Patents filed

SECTOR CLASSIFICATION

Waste to value
FinTech
AgriTech
Water, Sanitation
Livelihood
Consultancy (Engineering)
IoT
EdTech & kill Development
Energy, Net Zero, Battery
Biotech / Bioinformatics
Health & Assistive Tech
AI, ML, Data Science, AR / XR
Manuf / Auto, EV / Robotics

0 1 10 20 30 40 50 60 70 80 90

FOUNDER CLASSIFICATION

Faculty 11%
Project staff 2%
Students 3%
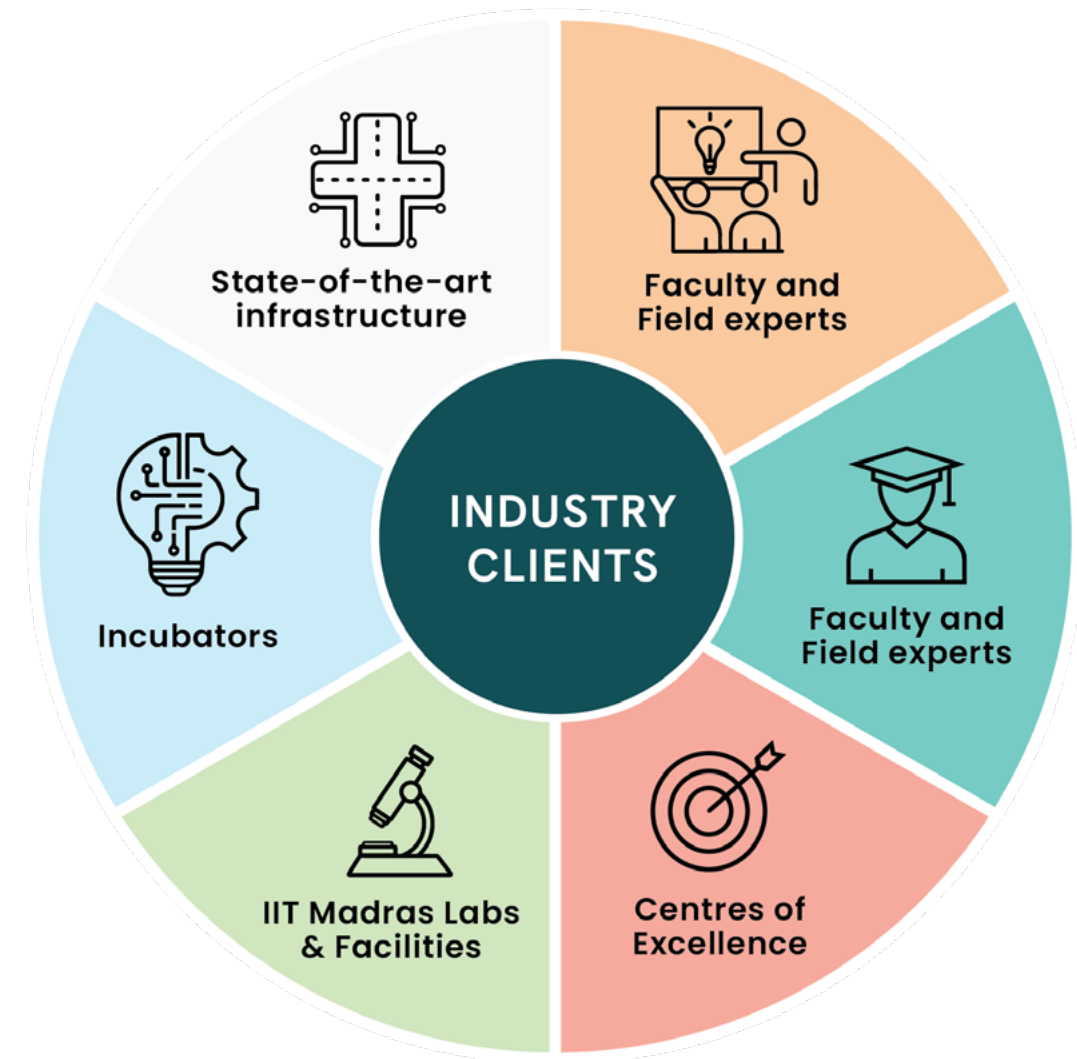External 60%
Alumni 24%

868 Founders

117 Cos. have IITM faculty as founders
or minority shareholders

99 IIT faculty members are founders
or minority shareholders

EXHIBIT 4a

Innovation Ecosystem at
IIT Madras Research Park

INDUSTRY CLIENTS

State-of-the-art infrastructure
Faculty and Field experts
Faculty and Field experts
Centres of Excellence
IIT Madras Labs & Facilities
Incubators

EXHIBIT 4b

Breakup of research areas of IITMRP clients

Over 250 organisations in RP- Global Corporations, Governement Research Agencies, Large Public Sectors & Private Sector Companies, Start-ups, IIT-M Centres across Industry Sectors in R&D

900+ Research Projects
Among RP clients, IITM Faculty, and Startups

900+ Employee Engagements
For Courses / MS / MTech / PhD at IIT M

300+ IITM Faculty
Project engagements with clients

5,80,000 Credit Points Accrued
₹290 Cr in value

1100+ IITM Students
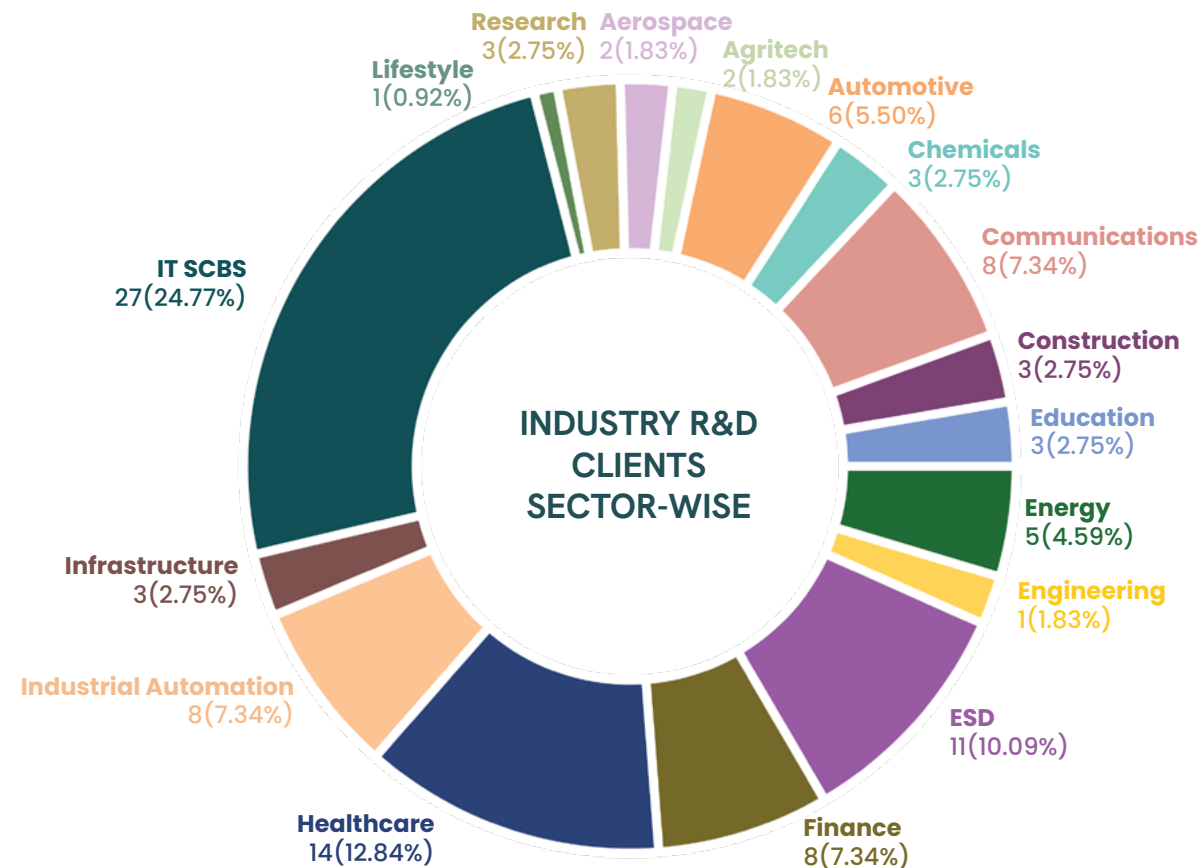Hired as Interns / Employees

IITM CoE Projects
₹387 Cr in value

INDUSTRY R&D CLIENTS SECTOR-WISE

- Research 3(2.75%)
- Aerospace 2(1.83%)
- Lifestyle 1(0.92%)
- Agritech 2(1.83%)
- Automotive 6(5.50%)
- Chemicals 3(2.75%)
- Communications 8(7.34%)
- IT SCBS 27(24.77%)
- Construction 3(2.75%)
- Education 3(2.75%)
- Energy 5(4.59%)
- Engineering 1(1.83%)
- Infrastructure 3(2.75%)
- ESD 11(10.09%)
- Industrial Automation 8(7.34%)
- Healthcare 14(12.84%)
- Finance 8(7.34%)

Source: IIT Madras Research Park (Accessed on 28th November 2024)

EXHIBIT 4c

Centres of Excellence at IIT Madras Research Park

Healthcare Technology Innovation Centre

Developing medical technology product & solutions

ICCW INTERNATIONAL CENTRE FOR CLEAN WATER

Nurtutring disruptive technologies for clean water

CEET

Developing technologies for EV & Renewable energy

amtdc

Advanced technologies in capital goods maufacturing sector

cube Centre for Urbanisation, Buildings & Environment

Tackling multifaceted challenges facing the built environment

IITM Bioincubator Nurturing Biopreneurs

Promoting biotechnology based innovation & entrepreneurship

NCAHT
National Center for Assistive
Health Technologies

**Enabling R&D in
Assistive technology**

IITM PRAVARTAK
CATALYSING INNOVATION

**Innovation hub on sensors,
networking, actuators, and
control systems (SNACS)**

**Encouraging indigenious production
of lab-grown diamonds (LGD)**

CEWiT INDIA

**Building a dynamic wireless
R&D ecosystem in India**

CRR

**Promoting technological
advancements for railway**

Source: IIT Madras Research Park Brochure (accessed on 28th November 2024)

FAST INDIA