IARE
INSTITUTE OF
AERONAUTICAL ENGINEERING

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Innovation and Incubation Centre

From Knowledge Consumption to Commercial Creation

Empowering Ideas • Enabling Innovation • Building Startups

Innovation Hub | Pre-Incubation | Incubation | Entrepreneurship Development

Hand Booklet
2026-27

About the Innovation and Incubation Centre

From Knowledge Consumption to Commercial Creation

Most engineering and science education is built around consuming knowledge: attending lectures, working through problem sets, passing examinations. The Innovation and Incubation Centre exists to complete the other half of that equation turning knowledge into something that creates value in the real world, whether that value is a product, a company, a patent, or a measurable improvement in someone's life. This is the shift the Centre's own tagline captures: moving "from knowledge consumption to commercial creation."

The IIC is best understood as a dedicated innovation ecosystem rather than a single facility or department. It is deliberately positioned at the intersection of three worlds that do not always talk to each other easily — academia, industry, and government and its core job is to translate between them. Academia brings research depth and a pipeline of curious, trainable young people. Industry brings market discipline, technology needs, and capital. Government brings policy support, funding schemes, and a mandate to solve problems at national scale. The Centre exists so that a student's idea, a faculty member's research finding, or a community's unmet need does not have to find its own way across these three worlds — the Centre builds the bridge and walks the idea across it.

The Centre is deliberately open rather than exclusive. It supports students who have never started a company before, faculty and researchers who want to see their published work become a working product, and members of the surrounding community including rural entrepreneurs, NGOs, and local enterprises — who benefit from the Centre's facilities and mentoring even if they have no formal affiliation with the institution. This breadth matters: an innovation ecosystem that only serves one of these groups quickly runs out of ideas, money, or credibility. By serving all three, the Centre keeps a continuous flow of raw ideas (mostly from students), technical depth (mostly from faculty), and real-world grounding (mostly from the community).

In practical terms, the Centre converts ideas into startups, promotes the commercialisation of research that would otherwise sit in a journal or a final-year project report, and aligns its own activity with national innovation missions the government schemes and policy priorities described later stages that reward institutions for building exactly this kind of ecosystem. None of this happens in one step. It happens through a structured, repeatable pathway that every idea entering the Centre is expected to travel:

Idea → Prototype → Incubation → Startup → Scale-up

This five-stage pathway is the spine of the entire handbook. Every stage that follows governance, infrastructure, funding, programming exists to move ideas along this pathway faster, with a higher survival rate, and with more real-world impact at the end of it.

Strategic Objectives

An innovation centre that tries to do everything for everyone tends to do nothing particularly well. To avoid that trap, the IIC concentrates its programmes, mentorship, and funding linkages around seven strategic objectives. Each objective answers a specific question about what the Centre is trying to change, and together they form the criteria against which every new programme or partnership is judged: does this help us foster a culture of innovation, provide structured support, unlock funding, promote entrepreneurship as a career, drive societal impact, strengthen ecosystem linkages, or support the institution's own goals? If an activity does not clearly serve at least one of these seven objectives, it does not belong on the Centre's calendar.

1. Foster a Culture of Innovation

Identify real-world problems and develop creative, technology-driven solutions through design thinking and cross-disciplinary collaboration.

2. Provide Structured Incubation Support

Ideation, prototyping, mentoring, IP support, and market validation.

3. Promote Entrepreneurship as a Career Pathway

Build entrepreneurial mindset and skills through training and mentorship, connecting aspiring founders with industry experts and de-risking early ventures.

4. Enable Access to Funding and Financial Support

Facilitate linkages to government schemes and support startups in preparing for seed, angel, and venture funding.

5. Strengthen Industry and Ecosystem Linkages

Build partnerships with industry, investors, and other incubators/accelerators to facilitate technology transfer, industry-sponsored problem statements, and market access for startups.

6. Drive Societal and Sustainable Impact

Align incubated ventures with SDGs and local/ regional challenges, promoting ESG-conscious entrepreneurship and measuring impact.

7. Support Institutional Goals and Sustainable Scale-up

Contribute to accreditation parameters and generate IP, while helping ventures grow beyond incubation into a self-sustaining ecosystem.

Strategic Focus Areas — Innovation for Society

An objective describes what the Centre is trying to achieve; a focus area describes where it chooses to point its effort. The IIC has deliberately chosen nine thematic focus areas rather than leaving innovation entirely open-ended, because unfocused innovation centres tend to spread thin across trendy topics without building any real depth. These nine areas were chosen because they combine two things: a genuine, unmet societal need (particularly in rural and underserved communities) and a reasonable technical fit with the institution's existing strengths in engineering and applied sciences.

Read together, the nine areas tell a consistent story: technology aimed at people who are usually last in line for it rural patients, smallholder farmers, off-grid households, and under-resourced schools. A student choosing a focus area is encouraged to ask not "what is technically impressive?" but "who specifically benefits, and how would they access this solution?"

#	Focus Area	Scope
1	Aerospace	Disaster management, precision agriculture, and remote healthcare delivery in rural/underserved areas
2	Artificial Intelligence	Early disease diagnosis and crop health monitoring for accessible healthcare and farming support in rural communities
3	Robotics & IoT	Robotic assistive systems, remote patient monitoring, and smart home automation in underserved communities
4	Renewable Energy	Solar, biogas, off-grid energy solutions & clean technology innovations
5	Healthcare & Wellbeing	Affordable diagnostics, telemedicine, assistive technology & preventive health solutions
6	Agri-Tech and Rural Development	Agri-tech, food security, farmer-centric innovations
7	Smart Villages and Community Development	Rural enterprise solutions for connected, self-sufficient communities
8	Water and Environment Management	Water tech, purification, sanitation innovation & environmental monitoring solutions
9	Education and Digital Inclusion	Rural enterprise and digital-access solutions

These focus areas are intentionally broad enough to admit many different kinds of projects a low-cost soil-moisture sensor and a rural telemedicine app both belong under Focus Areas 6 and 5 respectively while still being specific enough to guide mentor assignment, lab access, and funding conversations toward the right specialists within the Centre's network.

Governance Structure

An innovation centre that runs entirely on enthusiasm eventually collides with the practical realities of budgets, compliance, and institutional politics. The IIC's governance structure exists to prevent that collision by making clear, at every level, who is responsible for what from the Governing Body setting policy down to the individual founder building a prototype on the workshop floor.

It is useful to read this structure as a funnel of increasing hands-on involvement. The layers at the top of the table below set direction and unlock resources; the layers in the middle translate that direction into day-to-day mentoring and technical guidance; and the layer at the bottom the innovators themselves is where all of that support is ultimately supposed to show up as a working prototype, a registered company, or a measurable community benefit. Figure1 shows a balanced governance and operational structure of SBI centre showing a top-down flow of authority and a bottom-up impact pathway.

Level	Role
Governing Body	Provides strategic direction, policy support, and institutional commitment
Principal	Provides leadership, administrative support, and ensures alignment of Centre activities with the institution's vision and mission
Dean	Drives incubation initiatives, formulates policies, develops the innovation ecosystem, and promotes an entrepreneurship and startup culture
Faculty Mentors	Technical guidance, academic support, and mentoring to refine innovative ideas
Research Advisors	Research support, technical expertise, strengthening innovation and intellectual property
Industry Experts	Industry insights, market guidance, and networking opportunities
CEO / Founder (Startup level)	Leads student innovators, startup teams, and community entrepreneurs to develop innovative solutions, prototypes, and entrepreneurial ventures — producing startups, prototypes, enterprises, social impact, and employment generation

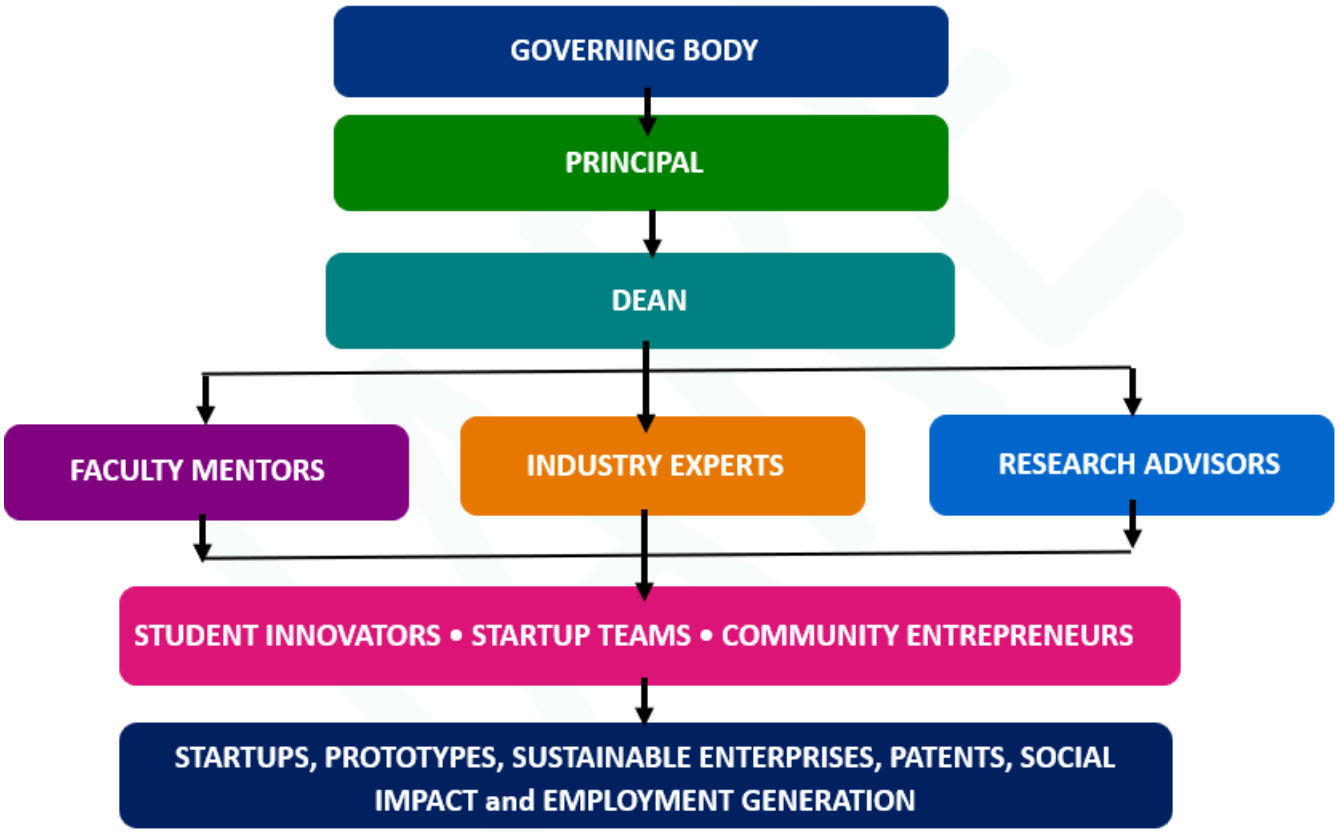


Figure1: Governance Structure

Two things are worth noting about how this structure is designed. First, faculty mentors, research advisors, and industry experts sit at the same functional level, deliberately a founder is expected to draw on all three simultaneously rather than treating them as a sequence, because a good venture typically needs academic rigour, market judgement, and technical credibility at the same time, not one after another. Second, the structure explicitly names the founder or CEO as its own governance level, not merely a recipient of governance from above — recognising that once a venture is incubated, decision-making authority genuinely shifts to the founding team, with the Centre's role becoming advisory rather than directive.

Innovation Ecosystem — The Structured Journey

This section introduced a simple five-stage pathway Idea, Prototype, Incubation, Startup, Scale-up. This section expands that pathway into the seven operational stages the Centre actually uses to plan its programming and to track where a given project sits at any moment. The distinction matters in practice: two ventures that both look like they are "still at the idea stage" from the outside might actually be at very different points — one still needs a problem to solve, the other already has a validated problem and just needs a prototyping bench.

- **Problem Identification** — identifying real-world problems worth solving through research
- **Idea Generation** — hackathons and design-thinking bootcamps that shape ideas

- **Innovation Hub** — a space for prototyping and mentorship on early concepts
- **Pre-Incubation** — validating ideas through mentorship and proof-of-concept work
- **Incubation** — workspace, mentorship, and seed-linkage to help ventures grow
- **Startup** — formal launch of the venture with legal and financial support
- **Scale-up** — scaling through funding, partnerships, and wider market access

A structured innovation journey like this accelerates ideas from research to successful, market-ready ventures precisely because it prevents the two most common failure modes seen in unstructured incubation efforts: teams skipping validation and building a polished product nobody asked for, and promising ideas dying quietly at the pre-incubation stage simply because no one was assigned to follow up. Each of the seven stages above has a named owner within the governance structure, and a defined exit criterion before a project is allowed to move to the next stage details of which are covered, stage by stage.

Core Verticals

The seven stages an idea moves through, this section describes the four organisational "verticals" the Centre runs to actually deliver that support. Think of a vertical as a standing programme with its own entry criteria, activities, and outputs a founder does not simply drift from one stage to the next; they apply into, and graduate out of, each vertical in turn. Integrated together, these four verticals nurture innovation through ideation, incubation, entrepreneurship, and commercialisation stages.

Innovation Hub

The Innovation Hub is the entry point of the ecosystem, and deliberately the easiest one to enter — it is open to every student and faculty member with an idea, with no prior track record required. Its job is to lower the barrier to a first attempt at innovation as far as possible, through:

- Ideation workshops and design-thinking sessions
- Hackathons, ideations, and innovation challenges
- Maker-space access for early prototyping
- Awareness sessions on IPR, patents, and copyrights

Pre-Incubation

Pre-Incubation is a structured, time-bound phase to test and validate an idea before it is allowed into formal incubation. This is deliberately the stage where the Centre is most willing to say "not yet" the whole point is to filter out ideas that sound good but do not survive contact with a real customer, before scarce incubation resources are committed to them. Activities include:

- Problem-solution fit and market validation exercises

- Minimum Viable Product (MVP) development support
- Customer discovery and early feedback loops
- Business Model Canvas and pitch-readiness workshops

Incubation

Incubation is the formal onboarding of shortlisted ventures into the incubation programme with dedicated support this is where the Centre commits real resources (space, mentor time, funding facilitation) to a venture on the expectation that it is genuinely trying to become a company. Support includes:

- Co-working space and infrastructure access
- Seed support and facilitation for government/private funding
- Legal, accounting, compliance, and IP filing assistance
- Dedicated mentor allocation and milestone-based tracking

Entrepreneurship Development

Unlike the first three verticals, Entrepreneurship Development is not about any single idea at all it is about building the entrepreneurial mindset across the wider student and faculty community, including people who may never found a company themselves but benefit from understanding how one is built. It runs largely through:

- Credit-linked and non-credit Entrepreneurship Development Programmes (EDPs)
- Guest lectures and fireside chats with founders and investors
- Industry immersion visits and startup internships
- Alumni entrepreneur mentorship circles

Stakeholder Engagement

One Centre, three stakeholder journeys — from a first-year idea to a community-scale venture.

The Centre does not treat "users" as a single undifferentiated group. Students, faculty, and the surrounding community arrive with different starting points, different constraints, and different definitions of success, so the Centre runs three distinct though overlapping engagement journeys.

For Students

For students, engagement is designed to run continuously from year one all the way to founding a startup, rather than being confined to a single final-year project. Early engagement is low-stakes and exploratory; later engagement becomes progressively more hands-on:

- Ideation clubs, hackathons & design-thinking bootcamps
- Pre-incubation and incubation support, with workspace and seed-linkage
- Mentorship, internships & maker-space access
- **Benefit** — certificates, credits & a pathway to co-founding a venture

For Faculty & Researchers

For faculty and researchers, the Centre's role is about translating research into applications and mentoring student innovation recognising that a faculty member's greatest asset is often not free time but deep technical judgement, which the Centre tries to make usable well beyond the walls of a single lab:

- Research-to-innovation translation & IP filing support
- Faculty-led startup incubation & technology transfer
- Mentorship roles & funding-scheme linkages
- **Benefit** — recognition and credit toward academic appraisal & accreditation

For the Community

For the community, the Centre works to extend its resources beyond campus to entrepreneurs and schools, treating the institution's facilities and expertise as a shared regional asset rather than a private one:

- Community innovation challenges & outreach workshops
- Incubation support for socially-rooted startups
- Collaboration with NGOs, government bodies & industry
- **Benefit** — a platform for scaling sustainability-linked solutions

This collaborative engagement model is deliberately reinforcing: students bring energy and fresh ideas, faculty bring depth and credibility, and the community brings grounding and real demand together empowering all three groups more than any one of them could achieve alone.

Stakeholder Benefits

Stakeholder group engages with the Centre; this section sets out what each group actually gets in return. Making these benefits explicit matters because an incubation centre that cannot clearly answer "what's in it for me?" for each of its five stakeholder groups will eventually struggle to keep any of them engaged. Comprehensive, clearly stated benefits are what foster innovation, employment, research excellence, and sustainable entrepreneurial growth over the long run.

Stakeholder	Key Benefits
Students	Hands-on entrepreneurship experience; mentorship and industry experts; seed funding and pitching opportunities; internship & co-founder placement opportunities
Faculty	Applied research & commercialization; consulting & equity participation; industry-sponsored grants; converting IP & patents into ventures
Startups	Subsidized workspace and facilities; structured mentoring & go-to-market support; investor support & VC introductions; government scheme linkage
Industry	Early access to disruptive innovations; co-innovation and R&D partnerships; entrepreneurially-minded talent pipeline; CSR & ESG programs
Society	Job creation & reduced unemployment; solutions to socio-economic challenges; inclusive growth for underserved groups; green & sustainable business models

Read down the rows, the benefits form a chain rather than five separate lists: a student's hands-on experience feeds a startup's need for talent; a faculty member's applied research becomes the startup's core technology; industry's need for co-innovation partners gives that startup its first paying customer; and the resulting jobs and socio-economic solutions are what ultimately justify the institution's, the government's, and the industry partners' continued investment in the Centre.

The 9-Stage Technology Readiness Level (TRL) Framework

One of the hardest problems in running an innovation centre is comparing projects that look nothing alike — a mobile health app and a CNC-machined drone component cannot be judged by the same yardstick if that yardstick is just "is it a good idea?" The Technology Readiness Level (TRL) framework solves this by measuring something more objective: how far a piece of technology has actually progressed from a laboratory concept toward something a customer could buy and rely on. It was originally developed for aerospace engineering and has since become a globally recognised standard used across many fields of applied research.

The Centre uses this same 9-point scale to evaluate student projects, faculty research initiatives, and startup projects side by side, and as the next section shows to decide what kind of support a project needs next. A project at TRL 2 needs help proving a concept works at all; a project at TRL 8 needs help with supply chains and regulatory approval. Treating both projects identically would waste the Centre's limited mentoring time.

TRL Range	Stage	Description
TRL 1 – 3	Research and Ideation	Basic principles observed, technology concepts formulated, and initial proof of concept validated in the lab
TRL 4 – 5	Development	Reduced-scale system testing and full-scale simulation validating functionality in a relevant simulated environment
TRL 6 – 7	Pilot and Beta	Operational prototype tested under real field conditions; final manufacturing and regulatory pathway mapped

TRL Range	Stage	Description
TRL 8 – 9	Deployment and Scale	Pre-commercial architecture qualified; active supply chain scaling to high-rate production and market entry

Notice the pattern across the four bands: each one moves the project from a more controlled, forgiving environment (the lab, a simulation) to a less forgiving one (a real field pilot, a live market) before advancing further. A project is not considered to have genuinely reached a TRL band until it has survived the harder, more realistic test associated with that band, which is precisely why the framework is trusted enough to be used in funding and accreditation decisions.

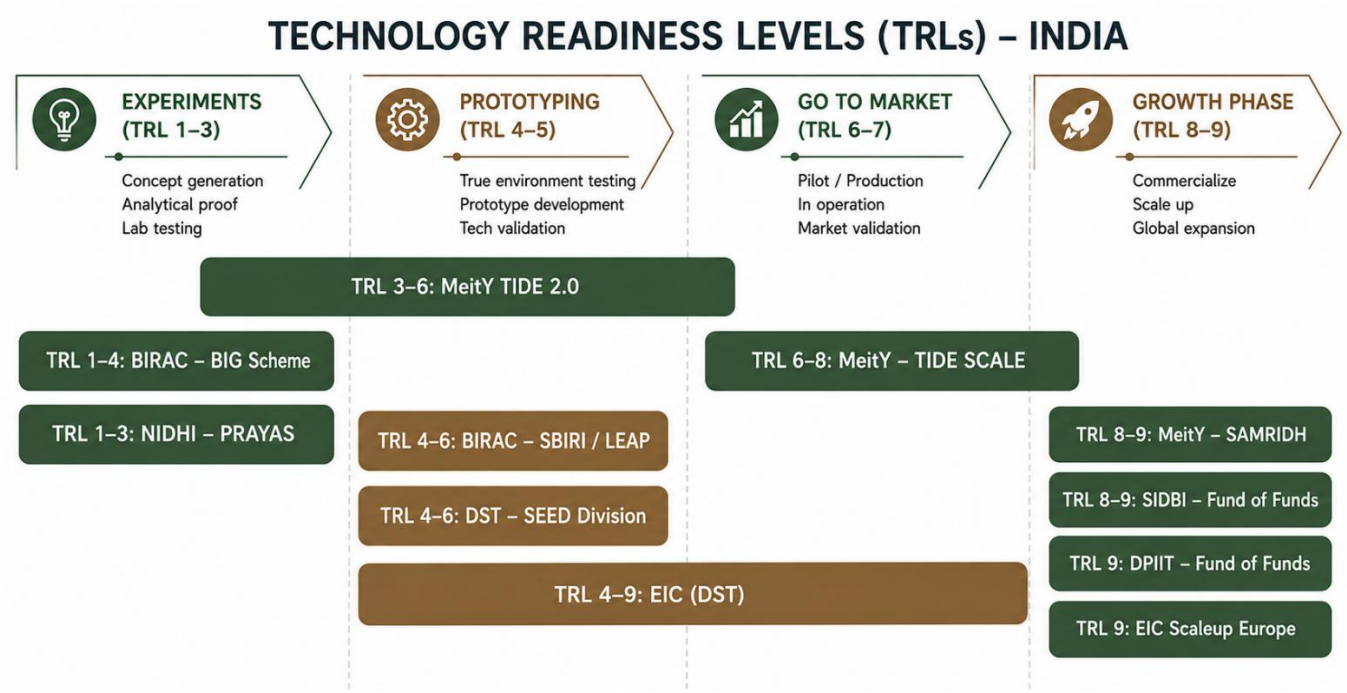


Figure 1: TRLs with probable public funding agencies

The Technology Readiness Levels (TRLs) framework (Figure 1) provides a structured pathway for assessing the maturity of a technology from basic research to full-scale commercialization. It comprises four major phases: Experiments (TRL 1–3), Prototyping (TRL 4–5), Go to Market (TRL 6–7), and Growth Phase (TRL 8–9). During the Experiments phase, technologies undergo concept generation, analytical proof, and laboratory validation, supported by programmes such as BIRAC BIG Scheme and NIDHI-PRAYAS. The Prototyping phase focuses on prototype development and validation in relevant environments, with support from MeitY TIDE 2.0, BIRAC SBIRI/LEAP, DST SEED Division, and EIC (DST). In the Go to Market phase, technologies are demonstrated through pilot production, operational validation, and market readiness, facilitated by MeitY TIDE SCALE and continued support from EIC (DST). The Growth Phase emphasizes commercialization, large-scale deployment, and global expansion through initiatives such as MeitY SAMRIDH, SIDBI Fund of Funds, and DPIIT Fund of Funds. Together, these programmes create a comprehensive innovation ecosystem that enables researchers, startups, and industries to successfully transform laboratory innovations into market-ready technologies and scalable enterprises.

Technical Milestone Matrix Highlights

The milestone matrix in this section tells you what the Centre concretely does about it at each of four key checkpoints. For each checkpoint, the matrix names an operational definition the specific, verifiable deliverable that proves the project has actually reached that TRL, not just claimed to and pairs it with the support protocol the Centre commits to providing at that exact moment.

TRL Segment	Operational Definition / Deliverables	Centre Support Protocols
TRL 3 Proof of Concept	Numerical models completed; laboratory-scale mock-up validated	Simulation tool licenses & early validation frameworks
TRL 5 Relevant Validation	Integrated full hardware prototype verified under simulated environments	Domain mentoring & technical feasibility reviews
TRL 7 System Demonstration	Deployed in live field pilots; local regulatory compliance cleared	Go-to-market strategies & seed funding coordination
TRL 9 Commercial Proven	Optimized high-rate tooling and commercial scaling realized	Strategic business acceleration and VC investment tracks

Notice how the nature of the Centre's support shifts as the deliverables get more demanding. At TRL 3, the founder mostly needs tools and a way to check their own work (simulation licences, validation frameworks). By TRL 5 they need a second opinion from someone with domain expertise. By TRL 7 the problem is no longer technical at all it is regulatory and commercial. And by TRL 9 the Centre's job is almost purely about connecting the venture to serious growth capital. A mentor who only knows how to help at one of these four checkpoints is of limited use to a founder moving through all of them — which is why the Centre deliberately maintains faculty mentors, industry experts, and research advisors together.

Innovation Life Cycle — Twelve Stages

The Centre's seven ecosystem stages and four core verticals at a fairly high level. This goes one level deeper, breaking the full journey into twelve concrete stages, each with its own named activities, resources, or outcomes. Where the TRL framework measures technical maturity, the twelve-stage life cycle measures organisational and entrepreneurial maturity the two run in parallel, and a healthy project generally advances through both at a similar pace. Each stage in this life cycle strengthens the project's innovation readiness, intellectual property position, and entrepreneurial prospects a little further.

Stage 1 — Innovation Culture

Before any specific idea exists, the Centre works to build a general appetite for innovation across the campus. This stage is sustained through the Innovation Club, Expert Talks, an annual Innovation Week, hands-on Workshops, and Hackathons recurring events designed to keep innovation visible and normal rather than a once-a-year special occasion.

Stage 2 — Problem Identification

Genuinely useful innovation starts with a real problem, not a cool technology looking for a use case. This stage asks participants to root their search for problems in specific sectors Community, Industry, Agriculture, Healthcare, Environment, and Education so that the eventual idea is anchored to a group of people who actually feel the pain of the problem being solved.

Stage 3 — Idea Generation

With a problem identified, the focus shifts to generating candidate solutions through Brainstorming, structured Innovation Challenges, Hackathons, Design Thinking exercises, and dedicated Creativity Sessions. The goal at this stage is volume and diversity of ideas, not premature narrowing to a single "best" answer.

Stage 4 — Prototype

An idea only becomes real once it can be touched, tested, or demonstrated. This stage draws directly on the Centre's physical infrastructure the Maker Space, 3D Printing equipment, the IoT Lab, the AI Lab, and the Electronics Lab to build and test a first working version.

Stage 5 — Validation

A working prototype still needs to prove it solves the problem for real customers under real conditions. Validation activities cover idea validation itself, market analysis, customer discovery, structured mentoring, feasibility assessment, and a technology assessment to confirm the solution is not just clever but appropriate for its intended users.

Stage 6 — Intellectual Property

Once a validated idea exists, protecting it becomes a priority before it is shared any further. This stage covers Patents, Copyright, Trademarks, Technology Transfer arrangements, and the broader process of IP Commercialization ensuring the founder, not a later imitator, captures the value of the work already done.

Stage 7 — Pre-Incubation

With the idea protected, the founder moves into formal pre-incubation activities: building a Business Model Canvas, applying Lean Startup and MVP thinking, running further Customer Validation, developing a Pitch Deck, and receiving structured Mentoring, now expressed as a life-cycle stage.

Stage 8 — Incubation

Formal incubation support becomes available: Infrastructure and Office Space, Business Support, Technical Support, Legal Support, and Financial Support the practical scaffolding a founding team needs while they are still too early to afford these functions themselves.

Stage 9 — Startup

The venture formally becomes a company: Company Registration, enrolment under Startup India, GST registration, ongoing regulatory Compliance, and deliberate Team Formation the bureaucratic but essential steps that convert a project into a legal business entity.

Stage 10 — Funding

With a registered company in place, the founder climbs what the Centre calls the funding pyramid starting with a Seed Fund and moving through government sources such as DST, AICTE, and MSME schemes, CSR funding, and eventually Angel Investors, Venture Capital, and Banks as the venture's needs and credibility grow.

Stage 11 — Commercialization

The venture begins to generate real commercial traction through Technology Transfer arrangements, Licensing deals, formal Industry Collaboration, Pilot Projects with early customers, and, finally, a full Market Launch.

Stage 12 — Scaling

In the final stage, a proven venture expands beyond its original market: Expansion into new regions, Exports, deliberate Branding investment, entry into Global Markets, and International Collaborations that extend the venture's reach well past the campus that first incubated it.

Stakeholder Services

The benefits each stakeholder group receives in principle, this section lists the concrete, named services that deliver those benefits day to day. These customized services are what actually accelerate innovation, research translation, entrepreneurship, and community development in practice the operational face of the Centre that a student, faculty member, or community partner would actually interact with.

Group	Services
Students	Innovation projects, hackathons, startups, internships
Faculty	Research translation, patents, consultancy funding
Community	Social innovation, entrepreneurship, rural development, NGOs

Infrastructure and Innovation Facilities

None of the programming described so far would mean much without somewhere to actually do the work. This section is a tour of the Centre's physical infrastructure a comprehensive ecosystem built specifically to transform ideas into scalable solutions, spanning six distinct facility types. Each facility is designed to serve

a different point on the prototype-to-product journey, from a quiet room to sketch a business plan, to a CNC machine capable of producing a market-ready component.

- **Co-working & Meeting Spaces**
- **Maker Space & Prototyping**
- **Robotics & Automation**
- **3D Printing & CNC Fabrication**
- **IoT, Sensors & Embedded Systems**
- **AI & Deep Learning Laboratory**

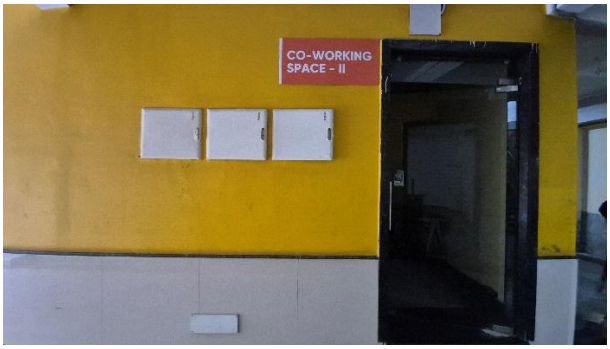
Co-working and Meeting Spaces

Not every stage of building a company requires a workshop bench a great deal of it happens around a table, in a pitch rehearsal, or in a quiet planning session. The Centre provides two kinds of space for exactly this purpose.

- **Co-Working Space** — flexible seating for startups, students, and innovators, with high-speed internet and modern infrastructure throughout
- **Meeting Rooms** — professional rooms for mentoring sessions, investor presentations, workshops, and client interactions, equipped with presentation facilities and comfortable seating

Together, what these spaces (Figure 2) enable is just as important as their furniture: creativity, teamwork, knowledge sharing, and real-world problem-solving in a genuinely collaborative environment, where a student team and a visiting industry mentor can sit down together without needing to book a separate department's conference room.

CO – Worker Space - 1



CO - Worker Space - 2

Meeting Rooms

Figure 2: Co- Worker Space & Meeting Rooms

AI and Deep Learning Laboratory

Artificial intelligence now touches nearly every focus area, from crop-health monitoring to early disease diagnosis, so the Centre maintains a dedicated laboratory rather than treating AI as a service bought in from outside. The lab is organised around three application domains and three supporting resources:

- **Predictive Analytics** — data-driven decision systems and forecasting models
- **Computer Vision** — image recognition, object detection, and visual AI applications
- **Natural Language Processing** — text analysis, chatbots, and language AI solutions
- **High-Performance Computing** — GPU clusters and AI development platforms
- **Curated Datasets** — domain datasets for research and model training
- **Community Alignment** — solutions aligned with national development priorities

Together, this advanced AI infrastructure (Figure 3) empowers intelligent solutions aimed at real-world societal and industrial challenges, rather than AI experimentation for its own sake.

Figure 3: AI Experience Centre

IoT & Embedded Systems

A great many of the Centre's rural and community-facing focus areas depend on cheap, rugged sensors and connectivity rather than on AI alone. This facility is equipped with sensors, microcontrollers, communication modules, embedded system kits, and cloud platforms, supporting application domains such as:

- IoT infrastructure for e-governance, smart services, and digital connectivity
- Urban IoT deployments in traffic, waste, water, energy, and public safety
- Sensor networks for infrastructure monitoring and logistics optimization
- Indigenous embedded product development and electronics manufacturing
- IoT-based water quality monitoring and distribution management
- Embedded systems for EV battery management and charging infrastructure

Collaborative Innovation Hub — Maker Space

Where ideas are physically prototyped, tested, and iteratively refined.

The Maker Space is where a sketch or a simulation becomes a physical object a customer or investor can actually hold. It brings together six categories of equipment, each suited to a different fabrication need:

Equipment	Purpose
3D Printers	Rapid fabrication of engineering models and prototypes
Laser Cutters	Precision cutting of acrylic, wood, leather, plastics
PCB Fabrication	Custom PCB enclosure and circuit board production
Electronic Workbenches	Hands-on electronics assembly and testing
Design Workstations	CAD/CAM software for product design
CNC Engraver X-1325	Large-format precision engraving and routing

Major Facilities — Robotics & Automation

For ventures whose products need to be manufactured, not just prototyped, the Centre (Figure 4) also maintains an advanced machining floor: CNC machines, robotic systems, and precision manufacturing equipment that bridge academic learning with real industrial practice under the broader banner of Industry 4.0. The equipment roster includes:

- CNC Lathe TL 160
- CNC Vertical Machining Center
- CNC FANUC Simulator
- CNC 4-Axis Wood Routing Machine
- 5-Axis Mini Robot (Aristosim)
- Industry Standard Planning Machine
- Double Spindle PCB Drilling CNC
- Cylindrical Grinding Machine
- Electro Discharge Rapid Drill
- BFW Vertical Milling Machine
- Desktop 5-Axis CNC Router

CNC Engraver & 3D Printing — A Closer Look

Two machines anchor the Centre's fabrication capability and are worth describing individually, since between them they cover most of what an early manufacturing venture needs before it can justify outsourcing production.

- **CNC Engraver X-1325** — a large-format flat-bed machine with an aluminium grid, suited to small-to-medium fabrication tasks including precision engraving & marking, wood & acrylic cutting, PCB routing, foam & composite cutting, and general custom fabrication
- **Elegoo 4PRO 3D Printer** — an industrial-grade, large-format printer capable of complex prototypes and functional components with high accuracy, supporting large-scale prototype development, mechanical component fabrication, product design validation, startup product development, and research and innovation projects

Infrastructure at a Glance

Metric	Value
Innovation Labs & Facilities	6+
CNC & Machining Equipment	12+
Coverage	360° — from Concept to Commercialization

Taken together, this infrastructure exists to support student entrepreneurs, faculty innovators, researchers, and startup teams as they transform ideas into real-world, deployable technologies that address societal and national development challenges.

Figure 4: Maker space

(b) CNC Vertical Machine

(c) Fatigue Testing Machine

(d) Rapid Drill Machine

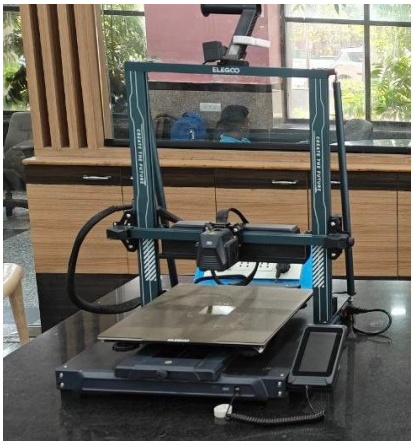
(e) CNC Horizontal Machine

(f) Micro Grinding Machine

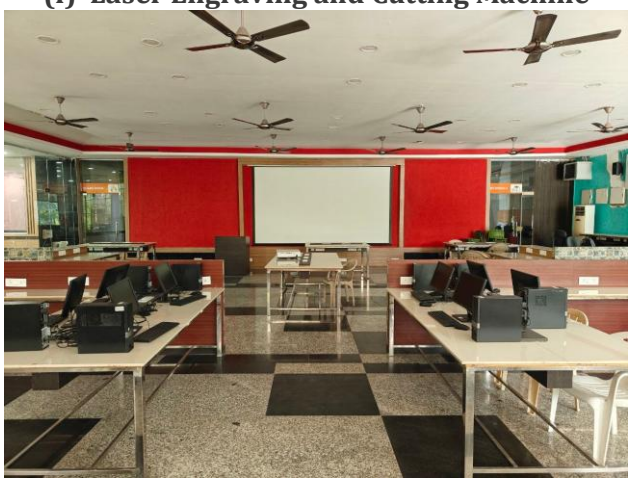
(g) CNC 5 Axis Vertical Machine Centre

(h) CNC Wood Router with rotary axis

(i) Laser Engraving and Cutting Machine



(j) 3D Printer



(k) Computing Facility

(l) Ultimaker 3D Printing Machine

Figure 4: (a) Maker Space (b) CNC Vertical Machine (c) Fatigue Testing Machine (d) Rapid Drill Machine (e) CNC Horizontal Machine (f) Micro Grinding Machine (g) CNC 5 Axis Vertical Machine Centre (h) CNC Wood Router with rotary axis (i) Laser Engraving and Cutting Machine (j) 3D Printer (k) Computing Facility (l) Ultimaker 3D Printing Machine

Incubation Services

Infrastructure gives a founder somewhere to build; incubation services give them the expertise and connections to know what to build and how to sell it. The Centre organises this expertise into six named services, each addressing a distinct kind of risk a young venture faces — technical risk, execution risk, financial risk, legal risk, market risk, and technology-transfer risk.

Service	Description
Idea Validation	Social relevance, technical feasibility, and market potential assessed through faculty expertise, lab resources, prior-art searches, and prototype support & testing
Mentoring & Coaching	Structured guidance from faculty mentors, industry experts, and alumni entrepreneurs focused on business planning, commercialization & financial management
Business Development	Entrepreneurship training, skill workshops, leadership programs; funding facilitation via government grants, CSR, angel investors & financial institutions

Service	Description
Legal & IP Assistance	Company registration, compliance, licensing, patent awareness programs, prior-art searches, IP filing support & technology commercialization guidance
Market Access Support	Industry partnerships, buyer networks, exhibitions, e-commerce platforms, branding assistance & investor networking programs
Technology Transfer	Faculty experts, labs, and industry specialists supporting product development, prototyping, testing, and transitioning innovations to scalable social enterprises

A founder rarely needs all six services at once. Idea Validation and Mentoring & Coaching dominate the early months of a venture's life; Business Development and Legal & IP Assistance become more urgent once the venture starts generating revenue and hiring; and Market Access Support and Technology Transfer typically matter most once a product is ready to leave the Centre's own walls and reach paying customers at scale.

Collaborative Ecosystem

An institution's own students, faculty, and facilities can only take a venture so far. Beyond a certain point, growth depends on relationships the Centre has deliberately cultivated outside its own walls. These strategic partnerships expand innovation opportunities by connecting the Centre's ventures to government, industry, academia, and community networks that would otherwise take years for an individual founder to build alone.

- Academia & Community Linkage
- Industry Partnerships
- NGO Collaborations
- Government Schemes
- CSR Engagement
- International Organizations

Each of these six relationship types serves a different purpose: academic and community linkages keep the Centre grounded in real local needs; industry partnerships supply mentors, pilot customers, and eventual acquirers; NGO collaborations extend the Centre's social-impact ventures into communities it could not otherwise reach directly.

Research & Funding Support

The schemes below range from small, product-development grants suited to a very early venture, to multi-crore support intended for ventures that are already scaling.

Scheme	Support Offered
DST NIDHI–TBI	Up to ₹15 Cr supporting Technology Business Incubators to convert R&D into ventures
AICTE – Idea Lab	Infrastructure grants for innovation labs
DST – TBI	Incubation support for technology-based startups
SISFS / NIDHI–SSS	Seed funding capped at ₹100 lakh per startup for product development, equipment & prototyping
MSME Schemes	Soft loans and grants for SMEs
Atal Innovation Mission	Up to ₹10 Cr in grants and incubation support
TIDE 2.0	Supports 2,000+ tech startups across 51 incubators nationally
MeitY – Digital India	Digital solution funding for IT/ITeS startups
MeitY Startup Hub – SAMRIDH	Co-investment alongside private investors, doubling funding rounds
NABARD	Support for rural agri-tech and agribusiness

Funding opportunities like these accelerate research commercialization, technology development, and startup sustainability precisely because they reduce a founder's dependence on any single source of capital. A venture that has secured, say, a DST NIDHI-TBI grant for its early product development and a SAMRIDH co-investment for its growth round is far more resilient than one relying entirely on a single angel investor or a single institutional budget line.

Programmes & Activities

Strategy and funding schemes only matter if they show up as concrete, scheduled activity that students and faculty can actually attend. This section lays out the Centre's recurring calendar, organised into annual flagship events, semester-level touchpoints, and periodic outreach activities. Running these continuous programs — rather than one-off events — is what cultivates entrepreneurial skills, an innovation culture, and startup readiness throughout the institution over time, rather than in short bursts around a single competition.

Annual

- **Ideathon / Hackathon** — Problem Identification Workshop, Design Thinking Workshop, Innovation Challenge, SDG-Based Ideathon, Hackathon, Idea Pitch Competition

- **Entrepreneurship Bootcamp** — Awareness Program, Business Model Canvas, Lean Startup & MVP, Value Proposition Design, Startup Planning, Legal & Ethical Steps, Sales & Marketing, Financial Planning

Semester

- **Mentor Connect Sessions** — "My Story" motivational sessions by entrepreneurs, expert talks, startup mentoring, technical mentoring, prototype review, one-to-one mentor clinics, alumni entrepreneur interaction
- **Investor / Demo Day** — Raising Capital Workshop, Angel Investment Session, Venture Capital Awareness, Funding Opportunities, Investor Pitch Preparation, Investor Meet

Periodic

- **Startup Yatra / Outreach** — Innovation Outreach, ATL Visits, Community Innovation Programs, Rural Innovation Challenge, Innovation Awareness Campaigns, Startup Ecosystem Awareness Programs
- **Industry Immersion Visits** — Industrial Visits, Incubation Centre Visits, Startup Visits, Technology Park Visits, Exposure to Manufacturing Units, Innovation Hub Visits, Industry Expert Interaction

Notice the deliberate rhythm here: annual events (the Ideathon and Bootcamp) exist to bring in a fresh cohort of ideas and founders each year; semester events (Mentor Connect and Investor Day) keep existing ventures moving forward at a steady cadence; and periodic outreach (Startup Yatra and Industry Immersion) keeps the whole Centre connected to the world outside campus, which is exactly where its ventures eventually need to sell.

Institutional Accreditation and Rankings

The Centre's work is not only valuable to the founders it supports directly it is also one of the clearest ways an institution demonstrates its quality to external accreditation and ranking bodies. Innovation excellence of this kind significantly enhances institutional rankings, accreditation, and national recognition, across five major frameworks.

Framework	Relevance
NIRF	Core criteria — innovation and incubation ecosystem directly assessed
NBA	Program outcomes on entrepreneurship, problem-solving & real-world application
NAAC	Innovation & industry connect, social responsibility & knowledge transfer
AICTE Compliance	Mandatory entrepreneurship development activities & startup culture promotion

Two of these frameworks — ARIIA and NIRF — assess the innovation and incubation ecosystem directly, meaning the Centre's activity is not a peripheral bonus for these rankings but a core, weighted criterion. The other three treat innovation as one input among several, but still reward the Centre's work: NBA through

programme outcomes on entrepreneurship and real-world application, NAAC through industry connect and knowledge transfer, and AICTE through its mandatory entrepreneurship-development compliance requirements.

Sustainable Development Goals (SDG) Alignment

The centre committed to "driving societal and sustainable impact," and the United Nations' Sustainable Development Goals (SDGs) provide the common vocabulary the Centre uses to make that commitment specific and comparable across very different projects. Rather than treating sustainability as a separate add-on, the Centre asks every venture to identify which SDGs (Figure 5) it's work actually advances. Innovation initiatives run through the Centre directly contribute toward achieving multiple Sustainable Development Goals in this way.

Figure 5: Sustainable Development Goals

Mapping ventures to specific SDGs like this does two things at once: it gives founders a disciplined way to articulate their social impact beyond a vague claim of "doing good," and it gives the Centre a common measurement language it can use across the Focus Areas, a solar-energy venture and a rural healthcare app can both be reported against SDG 7 and SDG 3 respectively, in a form that funders, accreditors, and government partners all recognise.

SDG	Contribution
SDG 1 — No Poverty	Income generation for rural communities
SDG 2 — Zero Hunger	Agri-tech solutions for food security

SDG	Contribution
SDG 3 — Good Health	Affordable healthcare solutions
SDG 4 — Quality Education	Edu-tech for learning access
SDG 7 — Clean Energy	Renewable startup solutions
SDG 8 — Decent Work	Job creation through startups
SDG 9 — Industry, Innovation & Infrastructure	Technology and IP creation
SDG 10 — Reduced Inequality	Reduced urban and rural inequality
SDG 11 — Sustainable Cities	Smart city and urban tech solutions
SDG 13 — Climate Action	Green tech and climate solutions
SDG 17 — Partnerships	Industry–Academia–Society collaborations

KPIs and Impact Measurement Framework

SDG alignment tells the Centre what kind of impact it should be pursuing; this Key Performance Indicators (KPIs) tell it how to actually measure whether that impact is happening. Without measurable indicators, ambitious language about innovation and impact remains just that language. These indicators are what ensure continuous evaluation, accountability, and sustained performance of the innovation ecosystem, organised across four dimensions.

Innovation Impact

These indicators track how much genuinely new, protectable technology the Centre is producing, not just how many meetings were held or ideas were pitched.

- Startups incubated per cohort
- Patents filed & deep-tech venture count
- Patents commercialized
- Research-to-product conversion rate

Economic Impact

These indicators track the tangible financial and employment outcomes of the Centre's work the numbers most likely to be quoted in institutional and funder reports.

- Jobs created & revenue generated
- Employment generation & gender diversity

- R&D collaborations
- Mentorship engagement

Social Impact

These indicators track how far the Centre's benefit is reaching beyond the ventures themselves, into the wider community it is meant to serve.

- Community beneficiary reach
- Skill development hours
- Community enterprises supported

Environmental Impact

These indicators track whether the Centre's ventures are actually delivering on the sustainability commitments, rather than merely claiming an SDG alignment.

- Green technologies developed
- Renewable energy adoption
- Waste reduction & water conservation
- Carbon emission reduction
- TRL progression tracking

Performance Dashboard

The categories of indicators the Centre tracks, this section shows what those indicators actually look like once real numbers are recorded against them, year over year. Performance dashboards like these enable informed decisions by turning raw activity into transparent innovation and impact analytics visible not just to the Centre's own leadership, but to the funders and accreditors. The figures below are tracked across six categories: Innovation, Entrepreneurship, Research, Community, Sustainability, and Employment.

Ideas Generated & Prototypes

Year	Value
2023	640
2024	651
2025	658

Publications

Year	Value
2023	649
2024	992
2025	1,000

Carbon Reduction

Year	Value
2023-24	2
2024-25	7
2025-26	9

Community Employment

Year	Value
2023	14
2024	16
2025	20

The trend across all four tables is consistently upward, which is itself the point of tracking them over multiple years rather than reporting a single snapshot it is the trajectory, not any one year's figure, that demonstrates whether the Centre's ecosystem is actually maturing.

Future Roadmap

Every section so far has described the Centre as it exists today. This section looks forward, laying out a five-phase strategic roadmap (Figure 6) that positions the Centre for national leadership and global innovation excellence by 2030. The roadmap deliberately moves through a consistent progression foundation, expansion, deepening impact, scaling, and finally national leadership with each phase building directly on the milestones of the one before it.

Phase	Theme	Key Milestones
2026: Phase 1	Foundation & Consolidation	Establish a ₹2 Cr internal seed fund; launch 15 startups across AI, IoT, Healthcare, Renewable Energy, and Agri-tech
2027: Phase 2	Expansion & Ecosystem Building	Launch pre-incubation hackathons; upgrade AI/IoT labs; commission an SDG alignment audit
2028: Phase 3	Deepening Impact	Sign 20+ MoUs; expand the makerspace; raise ₹10 Cr via investor pitch days

Phase	Theme	Key Milestones
2029: Phase 4	Scaling & Commercialization	Launch climate-tech and fintech tracks; graduate 10+ revenue-positive startups per cohort
2030: Phase 5	National Leadership	Achieve DPIIT certification; incubate 100+ ventures; create 1,000+ jobs

Reading the roadmap phase by phase, the emphasis shifts from internal capacity-building (Phases 1–2, where the Centre is mostly investing in its own fund, labs, and audit processes) to external validation and reach (Phases 3–5, where the emphasis moves to partnerships, external capital, and, ultimately, national certification and job creation at scale). This mirrors the same overall pattern seen throughout the handbook, the Centre first builds internal readiness before extending its reach outward.

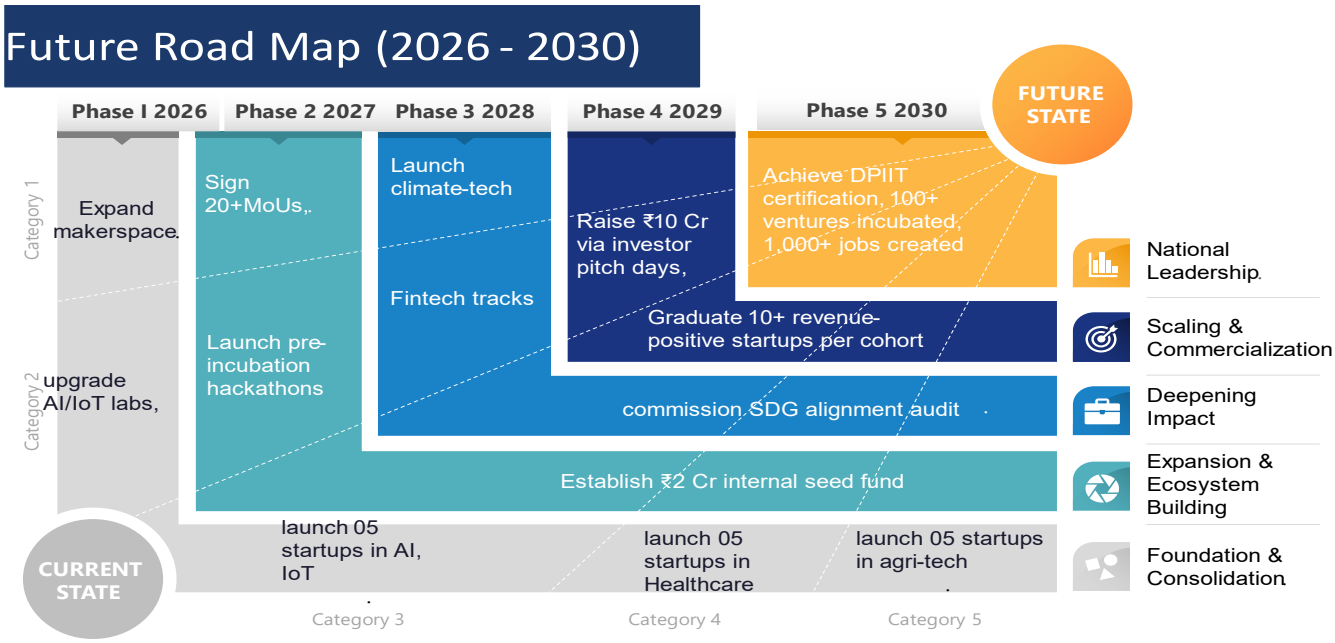


Figure 6: Future Road map

Key Challenges and Way Forward

No handbook of this kind would be credible if it only described successes. The Centre is explicit about the obstacles standing between its current state and the roadmap, separating them into challenges within its own control and those imposed by the wider environment. Addressing both proactively rather than waiting for them to become crises is what strengthens the Centre's long-term sustainability, innovation capacity, and societal impact.

Internal Challenges

These are obstacles the Centre can address directly through its own programming and resourcing choices, described throughout.

- Limited entrepreneurial mindset & risk appetite among students
- Inadequate seed funding and infrastructure
- Difficulty sustaining operations post-grant period
- Measuring and quantifying social impact accurately
- Faculty with insufficient industry or startup exposure

External Challenges

These obstacles sit largely outside the Centre's direct control and instead depend on the wider industry, regulatory, and market environment.

- Limited industry-institute collaboration in many regions
- Complex regulatory compliance for student-run companies
- Community resistance or low awareness in target areas
- Competition from well-funded private incubators
- Market access barriers for socially-focused products

Connect

This handbook closes where the Centre's own mission statement begins and ends — a single sentence that summarises the entire journey, from a first unmet need to a community transformed by the venture that addressed it.

"Identify Needs → Innovate Solutions → Incubate Enterprises → Scale Impact → Transform Communities"

Readers of this handbook — students with an idea, faculty with research to translate, industry partners looking for a way to collaborate, or community members seeking support, are welcome to reach the Centre directly.

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