

Welcoming You!

**UNAPCTT-CSIR workshop on
Technology Commercialization and Transfer
1st November 2017**



TREC-STEP

**Tiruchirappalli Regional Engineering College –
Science and Technology Entrepreneurs Park**

Entrepreneurial Traits

Are innovative in action and thought

Take Ownership

Are Leaders

Able to generate resources beyond what is available

Persevere

Start Ventures – A socio economic phenomena

Seed Support for growth of Innovative Technology Ventures

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Idea
germination



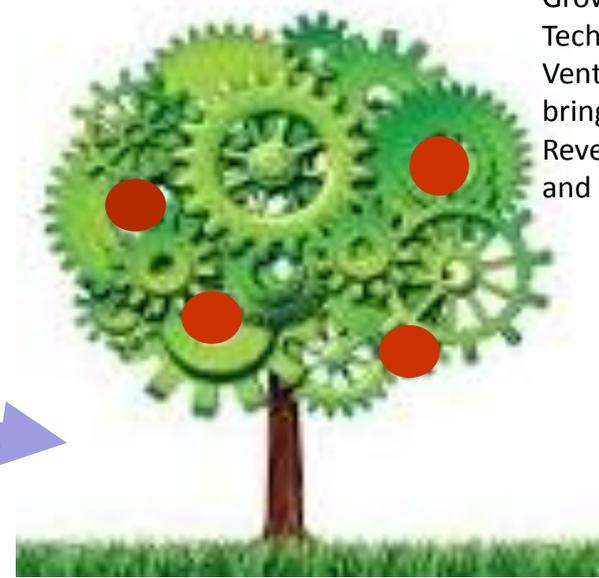
Proof of
Concept



Proposal to
convince Investors

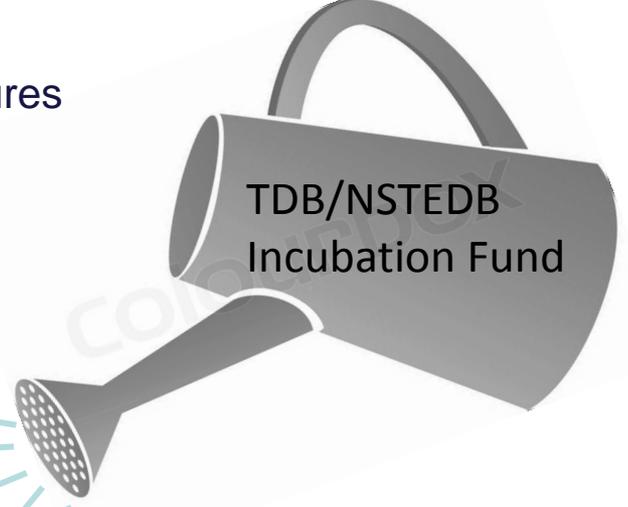


Dream to
Reality



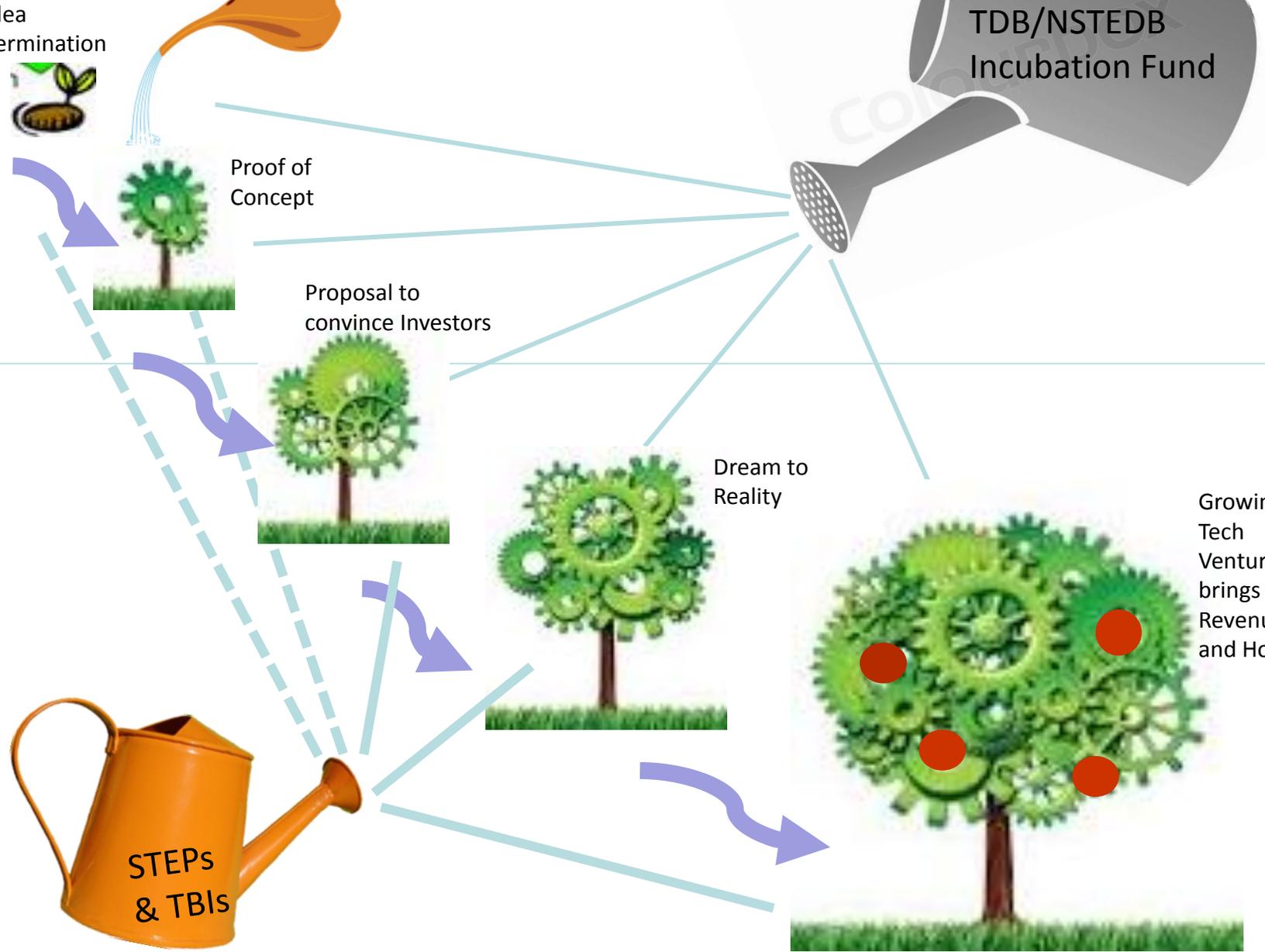
Growing
Tech
Venture
brings Jobs,
Revenue
and Hope

TDB/NSTEDB
Incubation Fund



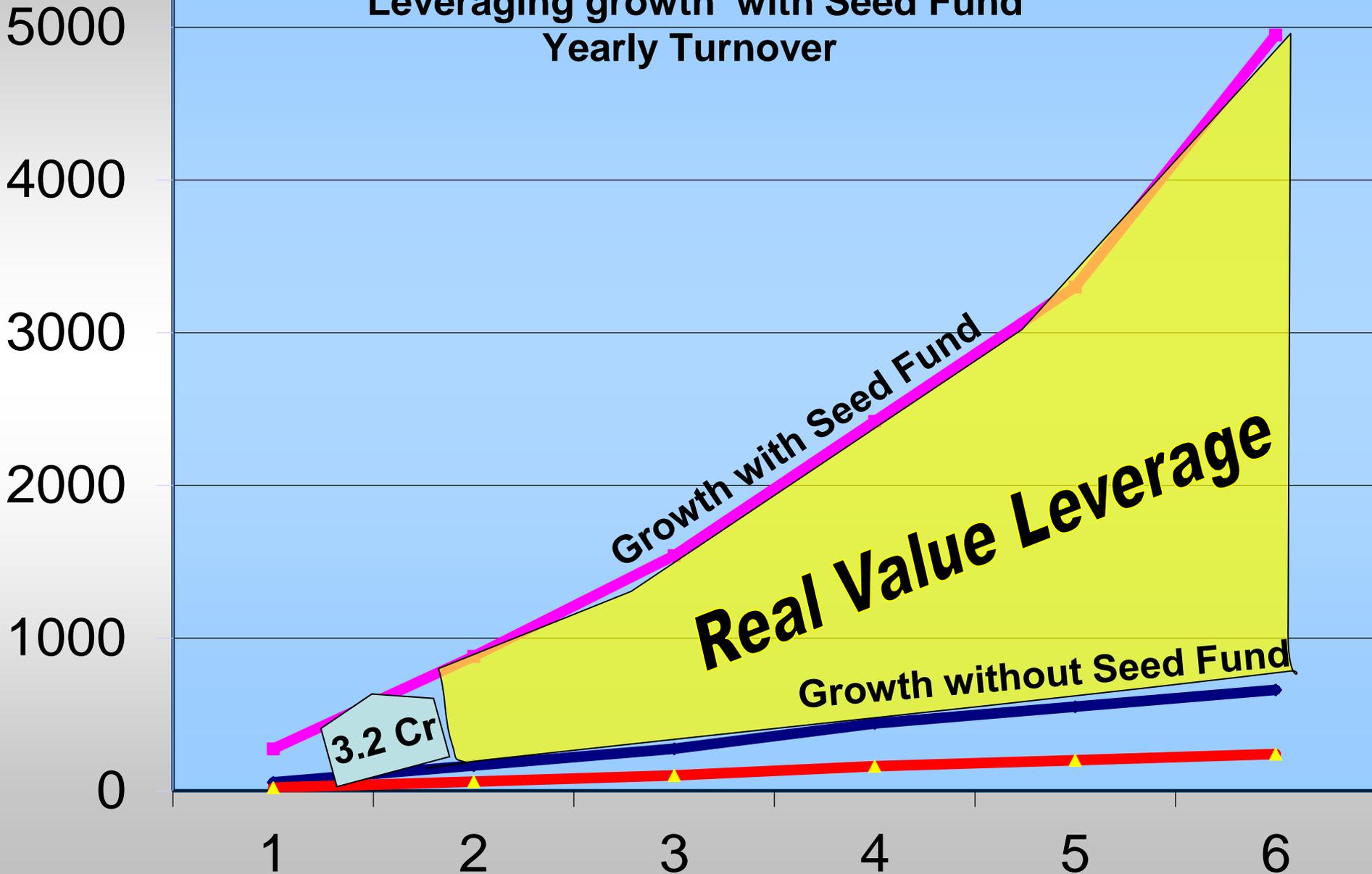
STEPS
& TBIs

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Leveraging growth with Seed Fund

Yearly Turnover



3.2 Cr

Growth with Seed Fund

Real Value Leverage

Growth without Seed Fund

Case 1: World Bank Development Market place sponsored Mini Cold Storage Units Project

Preamble

- Post harvest wastage of vegetables in India - nearly \$6 billion
- Affects the earnings of > 10 mln farmers
- Yawning gap between large cold storage and domestic refrigerators
- Optimum tailor made Mini Cold Stores for farmers markets are needed



Project Idea

venture promotion
knowledge

technology domain expertise
and networks

- Promoted 200+ start-ups
- Train nearly 2000-3000 youth in technology skills
- Supported more than 4000 Micro ventures

Micro ventures

Mini Cold Storage Units Project

- Competent technology solution
- Studying field conditions
- Designing Mini Cold Storage Units – 5 nos
- Training and Deploying rural youth

operation and A/C

based training

training facilities

trainers,

partnership with OEMs,

local technology inputs

delivery systems

Storage requirements Study - Trichy farmers market

Development Market Place : Cold Storage Units at Farmers Markets - Study

Vegetable Clasifciation as "A, B and C" Classes as per Storage Requirements

SI.NO	Vegitables Name	Price in indian Rupee	Vegetable Arrival	Wastage	Storage	Waste %	Value of Wastage of Vegetables	% of Value of Wastage of Vegetables	Cumulative % Value of Wastage of Vegetables
1	Tomatto	14	3300	300	500	9%	4200	34%	34%
2	Broad Beans	24	625	50	100	8%	1200	10%	44%
3	Ladies finger	12	500	100	50	20%	1200	10%	54%
4	Brinjal	20	700	50	100	7%	1000	8%	62%
5	Carrot	15	300	50	50	17%	750	6%	68%
6	Bittergaurd	14	300	50	50	17%	700	6%	74%
7	Beans (motchai)	15	300	30	50	10%	450	4%	78%
8	Ginger	42	130	10	20	8%	420	3%	81%
9	Potato	12	1300	30	300	2%	360	3%	84%
10	Greens (kerai)	3	600	100	100	17%	300	2%	87%
11	Cauliflower	15	160	20	30	13%	300	2%	89%
12	Beet root	7	220	30	40	14%	210	2%	91%
13	Cluster Beans	10	140	20	10	14%	200	2%	92%
14	Snake Guard	10	350	20	30	6%	200	2%	94%
15	Beans	20	270	10	30	4%	200	2%	96%
16	Cabbage	5	180	30	50	17%	150	1%	97%
17	Radish	6	250	20	30	8%	120	1%	98%
18	Long Beans (thataikai)	8	125	10	10	8%	80	1%	99%
19	Banana	3	1500	20	50	1%	60	0%	99%
20	Green chilli	10	130	5	20	4%	50	0%	100%
21	Mint Leafs (puthina)	6	90	5	10	6%	30	0%	100%
22	Corienda leaf	6	100	5	10	5%	30	0%	100%
Total Value of Vegetables			11570	965	1640	212%	12210		
Average % Wastage of Vegetables			8%						
Average % Storage of Vegetables			14%						

A

B

C

Vegetable Classification on Storage Requirements- Trichy farmers market

Grouped together in terms of Temperature and Humidity Requirements :

Sl.No	Vegetables	Age Temperature	Humidity	Arrivals	Class Total	% ge	Storage	Total	Percentage
1	Carrot	8	85-90	300	6500	75%	50	1140	74%
2	Bitter Gourd	5 to 7	85-90	300			50		
3	Potato	8	85-90	1300			300		
4	Cauliflower	8	85-90	300			50		
5	Brinjal	7 to 10	85-95	700			100		
6	Beans	4 to 10	90-95	300			90		
7	Tomatoe	10	85-90	3300			500		
8	Broad Beans	25	80-90	625	1625	19%	100	200	13%
9	Ladies Finger	24 to 26	70-75	500			50		
10	Spinachs (Keerai)	32	95-100	500			50		
11	Beet root	0	95	220	540	6%	50	200	13%
12	Cluster Beans	0	85-95	140			70		
13	Cabbage	0	90-95	180			80		
Total					8665			1540	

Mini Cold Storage Design



- TREC-STEP Refrigeration team studied the survey outputs
- Series of interaction meetings with farmers, farmers market managers and Govt. officials in Tamilnadu Government
- Design Interaction Meetings with cold storage manufacturers and finalize the design and requirements
- designed 2 mini chambers
- sizes 5ft X 3ft X 7.4ft & 10ft X 3ft X7.4ft
- Polyurethane foam Puf panels for wall and ceiling
- Condenser units
- Humidifier units with sensors

Establishing Mini Cold Storage Units

- First Phase - Mini Cold Storage Units at Karur and Kumbakonam
- Conducted field Surveys to fine tune design
- Modified units installed – size increased, door position etc. at Palayamkottai, Salem and Nanganallur

Training unemployed youth in Technical / Business Skills

- 36 unemployed youth were given 3 months technical Training in Refrigeration and A/C
- 18 candidates were trained in Business Skills
- On-site technical training at Mini cold units



Currently ...

- **5 Mini cold storage units –Small Farmer mkts.**
- **Handed over to the State Government**
- **Successful case study - documentary by WB**
- **Replicated in 40 locations across India and Worldwide ++**

Future plans....

- **Solar Power-Hybrid Cold Storage units**
- **Bio-mass powered Cold Storage units**
from the waste of the farmers markets



**Case 2 : Nilgiri Mountain Railway Project
Upgradation of Coal firing to Oil-firing system**



- Engineering wonder of Yester years
- 127 bridges and 13 tunnels
- Period of the project 1 year
- Team of Entrepreneurs
- 110 trials

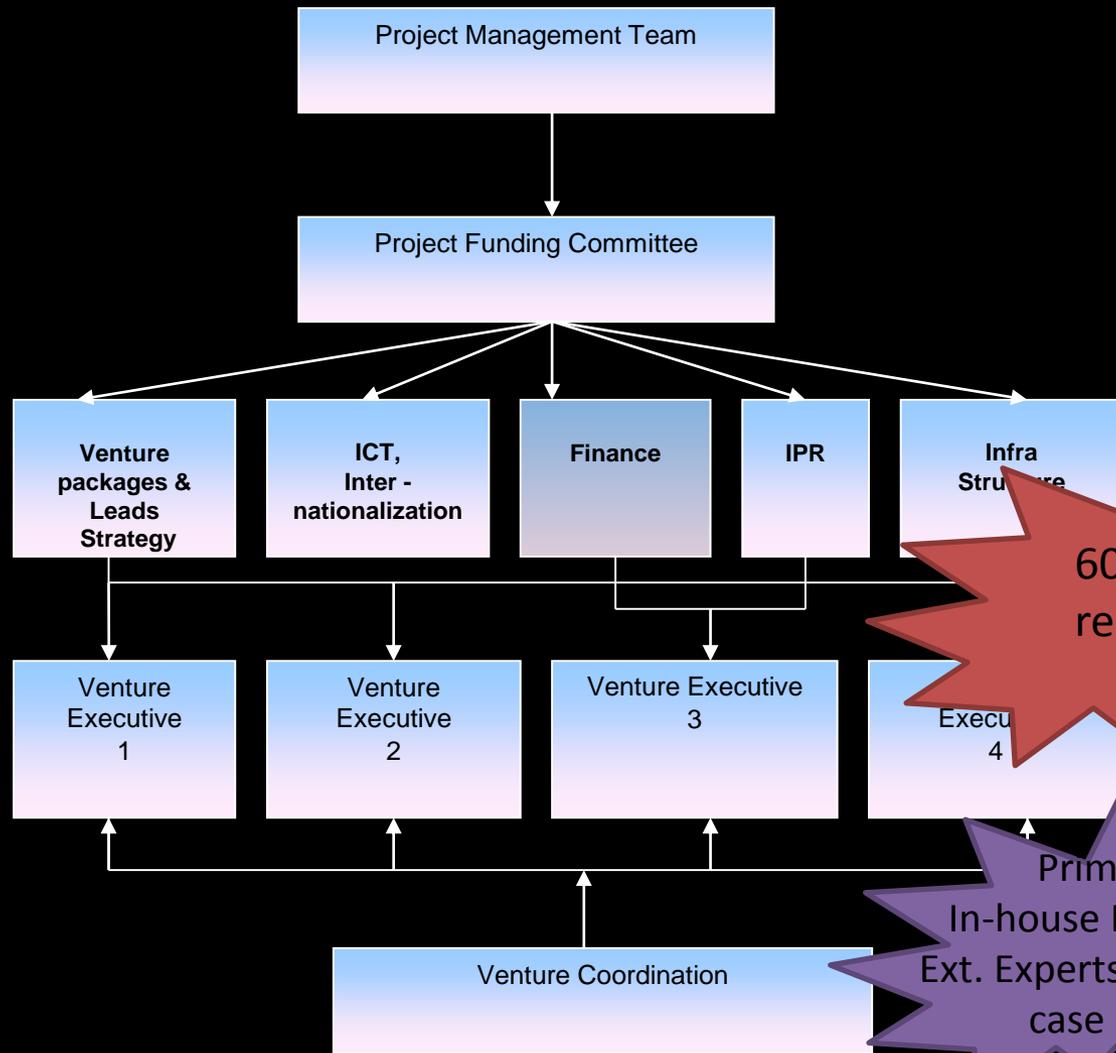


- ✓ **Launched on 22nd Sept.,02 – Perfectly Smooth Functioning, so far**
- ✓ **Pulling 6 coaches & ahead of schedule after 17 years**
- ✓ **Champion & Rescuer Engine**
- ✓ **Eliminated Manual fuel handling and Pollution**
- ✓ **Best Innovation Award 2003 from Railway Board**

Incubation Process

TREC-STEP has an iteratively tested and developed a robust Incubation process with adequate due diligence and review mechanism and trained Incubation team, in place

- Reach out events and Venture selection with evaluation grid
- Review, finalizing Funding modalities/ milestones and release of funds
- Venture incubation services packages – cross cutting themes by In House Experts
- Assigned Monitor for individual venture
- Marketing & Prodtn. Cash flow projection, Working Capital etc.
- Regular Review & monitoring of performance, Repayments, Audits & Documentation



60 % Loans recovered

Primarily In-house Expertise. Ext. Experts on case to case basis

Mining Innovations...

Incubating Innovative Tech Ventures

Process...

Innovation Mining

- Media / Reach-out Campaigns
- Application process
- Counselling
- Analysis

Technology Evaluation

- Expert Evaluation
- Fine tuning
- Business & Tech. mentoring
- Funding Application

Innovation Funding

- Technology Development
- Facilities & Expert Access
- Innovation Dvlpt.

Monitoring Growth

- Monitoring growth milestones
- Joint resolution of issues
- Graduating to VC/ commercial finance
- Graduation strategy



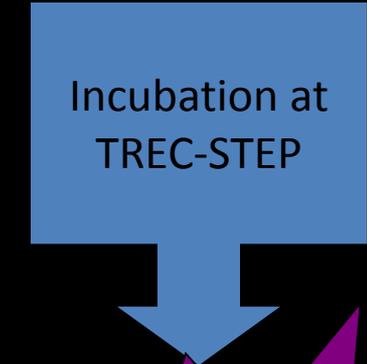
Selection Grid

		Weight	
1	Innovation Potential	15%	
1.1	Is the venture idea Novel		5
1.2	Does the idea have good marketability?		8
1.3	Is there true IP Value for Idea ?		2
2	Techology Content	15%	
2.1	Is it an Hi-tech venture w.r.t end product ?		10
2.2	Is it Green Technology ?		5
3	Venture Vision and Targets	10%	
3.1	Is it a High growth venture ?		7
3.2	Does the venture has other social values? (Health, Education, Gender, Jobs)		3
4	Capability of the Incubatee wrt 3	20%	
4.1	Qualification		5
4.2	Venture Knowledge/Experience		8
4.3	Knowledge Acquisition Plans		7
5	Commitments to the venture	20%	
5.1	Prior Work		5
5.2	Interactions with trecstep/NIT		6
5.3	Planning And Detailing		5
5.4	Future Commitments		4
6	Importance of Inc Support	10%	
6.1	Will venture be impossible without trecstep?		4
6.2	Is the Infrastructural facilities critcial ?		3
6.3	Are other Incubation support critcial ?		3
7	Suitability to trecstep	10%	
7.1	NIT TRECSTEP Linkages		3
7.2	Thrust area focus		3
7.3	Returns for trecstep funding		4
		100%	100

Seed Funding

Incubation at
TREC-STEP

**Successful
Innovative tech
venture**



Bio-mining



2013 All India Management Association
Dr. J.S. Juneja Award for Creativity & Innovation

Leverage with Seed Support

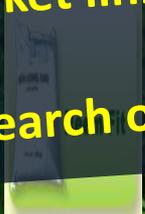
TDB Seed Fund 15 Lakhs
TePP Phase II- 28 Lakhs,
NABARD - 15 L
Pitching to Argentinian VC

- Organically certified product
- Contains neem kernel power integrated with formulated carbon substance



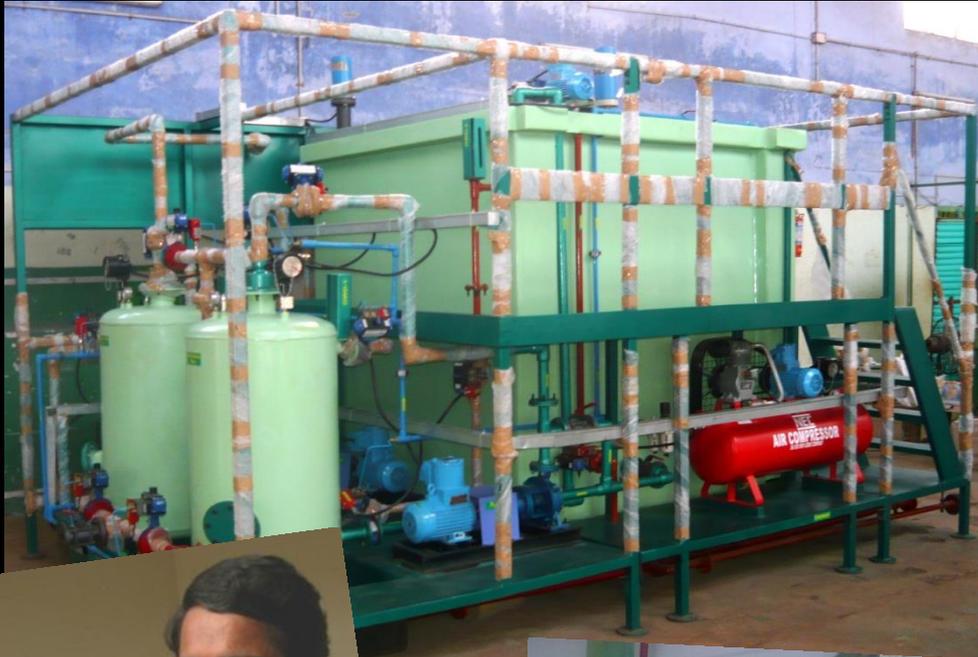
- Plant growth stimulator
- From Seaweed extracts, humic and related natural fillers
- For better and systemic resistance by augmenting photosynthesis

- Reached 5000 + farmers across Tamilnadu, Karnataka, Maharashtra
- Established market links in Malaysia, Singapore, Switzerland, Turkey etc.
- Continuous research on new bio-fertilizers and pesticides



Water soluble biological insecticide
Contains extracts of Neem Kernel

Case2: Aravind, Pure Tech India



Liquid Pollution Control Systems

- Water – Oil Recovery Systems
- Coolant Recovery System
- Pickling Acid Recovery System
- Market size 4000 crores – *Frost & Sullivan*

Funding leverage with Seed Support

TDB Seed Fund 15 Lakhs
DSIR Waste to Wealth – 80 Lakhs
Gol Funds – 20 Lakhs

Significant achievements

- Exporting to 15 countries
- Novel Products launched –
 - Water Factory with new hollow fibre ultra filtration tech.
 - Skid mounted effluent/ sewage treatment plant
 - Sludge Interceptors for Petrochemical Industries
- Consistently bagging orders from IOCL, Reliance Industries, TATA Power, Pepsico



Eurooffice, France: Best
Success Story Award

AABI Best Entrepreneur
Award @ Taiwan



Case 3 : Vinayak, Biramha Machine tools



**National ISBA Award 2009
Best Start-up for
Innovative Manufacturing**

- Split profile cutting tools
- Water Jet Manufacturing of wood working tools
- Carpenter Safe Tools
- Knowledge Intensive : New Tech for New Applications
- Bringing World class tech. to Grass Roots

Fund Leverage with Seed Support
TDB Seed fund – 15 Lakhs
TePP II Grant 45 Lakhs, PNB – 50 L
Indo German Grant of 8 Lakhs



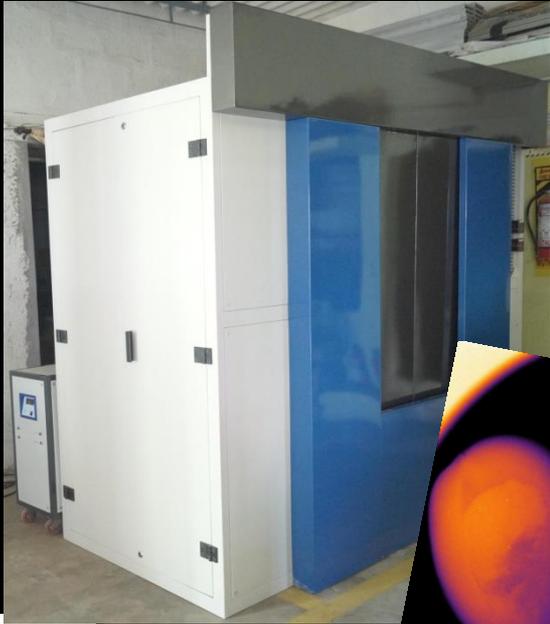
Challenges
Acute Power problems
Machine breakdown
Bankers issues

KSFs
Knowledge intensive –
Perseverance – Inspirational
Leadership

Vinayakapandi



Case 4: Adhitya Medical Systems



Digital X Ray Sensors

- Detection of plastic, magnetic and non magnetic metals etc in processed Food Industry
- NDT Applications-a major segment

Incubation Support
Seed Fund 20 Lakhs

Significant Achievements

Recently concluded Tie-Up with

1. Thales, France , for Tech Support:
 - X-Ray Source
 - Irradiation Technology

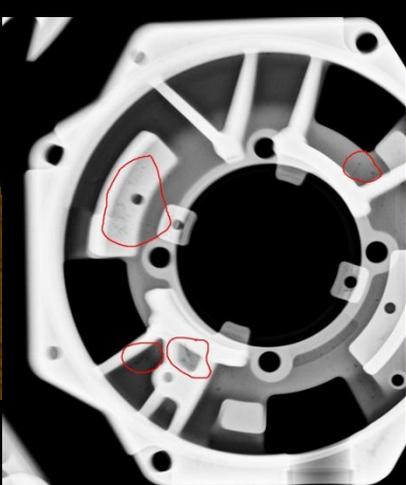
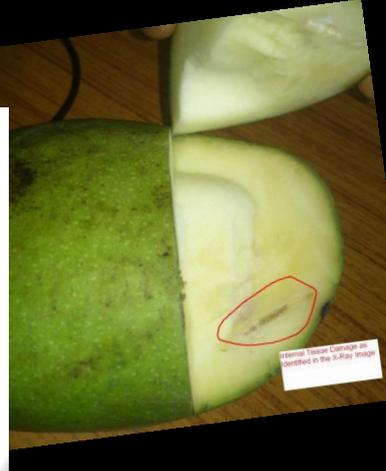
2. Talks with GE for machine integration

Installed 4 machines

- **Fruit Pulp – ITC**
- **Large Spice bags – Synthit, Cochin**
- **Packed Rava – Mayil mark, Coimbatore**
- **Inspection of Seed weevil in Mangoes**

Winner- DST Lockheed Martin India
Innovation Growth Programme

Karthikeyan

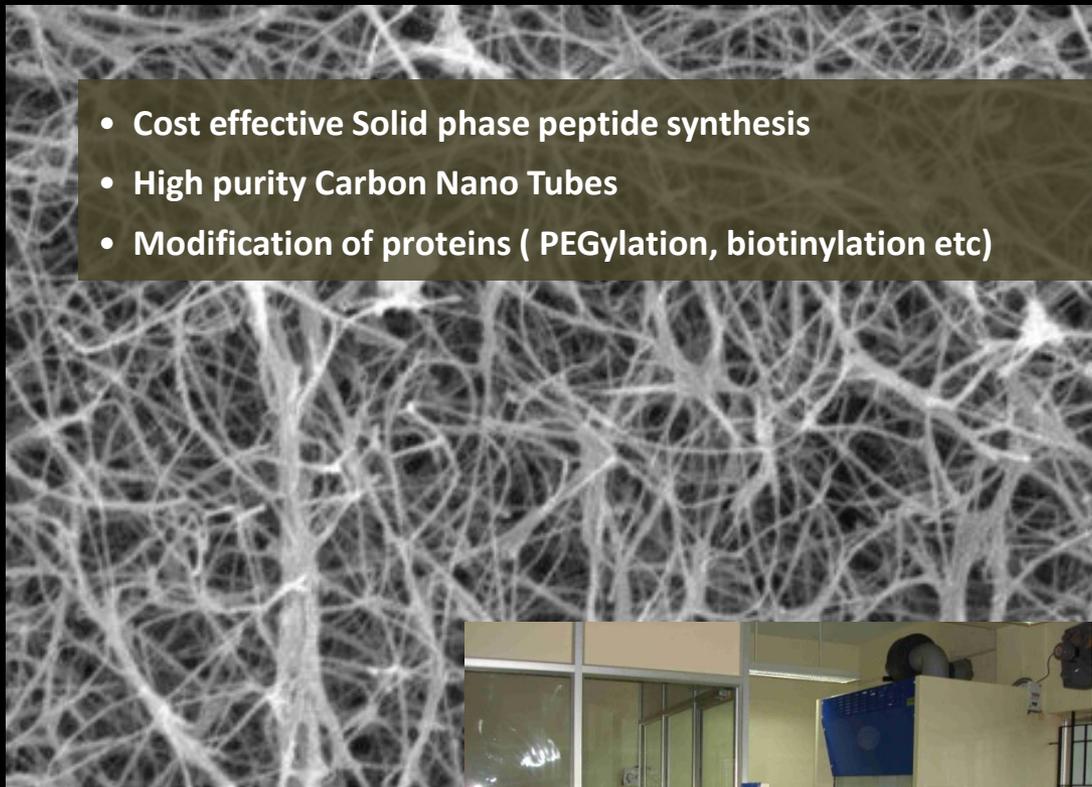


Case 5 : Grey Matter Research Foundation P Ltd



- Synthesis of small organic compounds
- Multi-step synthesis
- Library design and synthesis
- Process development and optimization
- Resins for organic synthesis
- Resins for peptide synthesis
- Microporous and macroporous resins
- Chromatographic resins
- Scavenger resins
- High purity CNTs for academic and industrial research
- Internal markets are NCL, IIT, IISc, CCMB etc
- Potential markets are multinational pharma players like Pfizer, Sigma, Biocon etc.

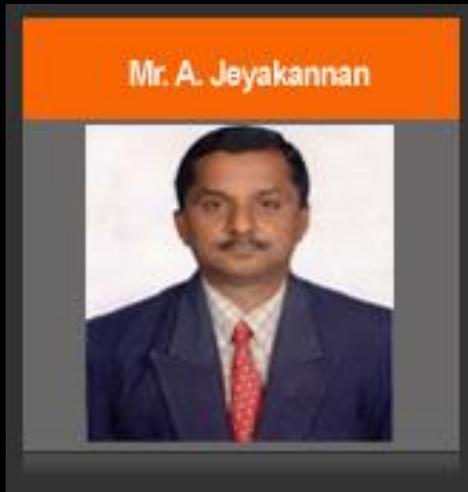
- Cost effective Solid phase peptide synthesis
- High purity Carbon Nano Tubes
- Modification of proteins (PEGylation, biotinylation etc)



10kV X10,000



Recovery of Tungsten Carbide



- Huge quantity of Tungsten carbide scraps are generated
- Highly expensive and scarce metal
- Innovative cost effective Thermo Mechanical process
- Will save up to 270 tonnes per annum of carbon



THE UNREASONABLE FELLOWS



SPIRIT OF ADVENTURE



RISK-TAKING ABILITY



OPEN TO NEW IDEAS



POSITIVE ATTITUDE

"The reasonable Man adapts himself to the World. The unreasonable Man persists in trying to adapt the world to himself. All progress therefore, depends on the **unreasonable man**"

George Bernard Shaw

Challenges of Business Incubators I

BUTTERFLIES:

Once a little girl saw a pupa

She was watching it for many hours as the butterfly inside was struggling to come out.

Then it got stuck. Wanting to help the butterfly she cut open the cocoon and freed it.

BUT ALAS! IT COULD NOT FLY AND IT NEVER WOULD.

The Butterfly's struggle to get through the small opening is nature's way of forcing fluid from the body to its wings, so it would be ready for flight.



Challenges of Business Incubators: II

Next day the same thing happened

She saw another butterfly struggling to come out.

She can not do anything.

She stood there shouting and yelling

“ Come up “, “ Be careful“, Don’t get hurt “,” Keep it up” “ No-No”,

“Yes-Yes” “ Prepare a Business Plan”, “ No good strategy”

Finally the butterfly came out and started flying beautifully.

She was in laughter and tears

The Butterfly came , sat on her shoulders & said

“ Thank you, I became a butterfly only because of you ! ”



The inspiration....



“Don’t be encumbered by history, go out and do something wonderful...”

Robert Noyce, Intel Founder

Thank You!



Mr. Dakshinamoorthy
Manufacturing
Innovations



Dr. Subhas Chandran
Nano Tech Venture
Peptides and
Carbon Nano Sponges



Mr. Vinayaga Pandi
Water Jet Cutting
Wood Cut Tools

Seed Fund Rs 15 lakhs each venture
Out puts



Mr. Augustine

Bio Mining

**Scientist Turned
Entrepreneur**

**Plant Growth
Stimulator**

Mr. Karthikeyan

Digital X rays

**Now at Product
Development Stage.**

High Potential

Mr. Aravind Narayan

**Coolant Recovery
Systems**

**Range of Innovative
Green Tech products**

Poster campaigns and Innovation booths for Promotion



TePP
Technoentrepreneur Promotion Programme

Department of Scientific and Industrial Research (DSIR),
Government of India
TFAC & TREC-STEP

Invites...

- Any innovative Indian say, an engineer, Scientist, Farmer, Artisan, Housewife or even a student, with an original idea/know-how can apply for support under TePP.
- The maximum Support under this scheme is Rs.10.00 lakhs *
- TREC-STEP shall provide counseling and prescreening of applications for interested innovators and also provide Incubation support for entrepreneurial aspirations of innovators with end-to-end venture.
- Generic Proposals on software development or only for patenting or for basic research projects with no immediate commercial implications will not be accepted for consideration under TePP.

Making your innovation reach the world.

For Details & Applications please contact:
Programme Co-ordinator- TePP, TREC-STEP,
Tiruchirappalli - 620015
Phone 0431-2501681 / 2500757 / 2500085
Email : trecstep_event@yahoo.co.in

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Tiruchirappalli Regional Engineering College
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* Project shall be selected based on due diligent process. The Decision of the Ministry shall be final.



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Helping your bright idea come to light.

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At the Organic Farmer's expo

Poster Campaign
launched in 60
selected
Academic
Institutions