Research Academy Industry for Sustainable Ecosystem (RAISE)

A PRESENTATION FROM
CSIR-CENTRAL LEATHER
RESEARCH INSTITUTE

University - Industry Linkage in Research

Benefits to the Industry

- Access to research at university
- Good use of faculties and students
- Gaining access to competitive minds
- Accelerating the innovation process
- Reputation

Benefits to the University

- Access to real time solutions
- Working on industrial problems
- Funding
- Branding
- Every one job in manufacturing industry creates 2.2 jobs in other sectors

Framework of Industry – University Linkage in Research, DSIR 2019

University - Industry Linkages

Link structured knowledge in universities with tacit knowledge in industry

- For industry this accelerates growth
- For academy it helps explore innovative technologies for increased resource and efficiency

Some initiatives to strengthen UIL

- HDFC bank partnership with 50 technology companies, business schools and IIT-B/IIT-R
- MHRD funding for IIT-M to tune of Rs 300 Crores
- India Electronics and Semiconductor Association – IIT – Kharagpur for robust talent pipeline for electronic system design and manufacturing

For better success, R&D wings of academy need to be strengthened to avoid home grown companies betting for their requirements elsewhere

Identified Priorities to Strengthen UIL

- Multilayered policy interventions to facilitate UI synergy
- Entrepreneurial eco-system
- Industry reorientation of university programs and curricula
- Developing university – industry connect
- Mobility between industry and university
- Technology Innovation Centres

Global Scenario in UIL

12.04 University-industry collaboration in R&D

In your country, to what extent do business and universities collaborate on research and development (R&D)? [1 = do not collaborate at all; 7 = collaborate extensively]

Rank/137	Country / Economy	Score	Trend	Distance from best
1	Switzerland	5.8		
2	United States	5.7		
3	Israel	5.7		
4	Finland	5.6		
5	Netherlands	5.6		
6	United Kingdom	5.4		
7	Germany	5.4		
8	Singapore	5.3		
9	Belgium	5.3		
10	Sweden	5.2		
11	Malaysia	5.2		
12	Qatar	5.1		
13	Ireland	5.0		
14	Guinea	5.0		
15	Hong Kong SAR	4.9		
16	Taiwan, China	4.8		
17	New Zealand	4.8		
18	Luxembourg	4.8		
19	Austria	4.8		
20	Norway	4.8		
21	Denmark	4.8		
22	Iceland	4.7		
23	Japan	4.7		
24	Canada	4.6		
25	United Arab Emirates	4.5		
26	India	4.4		
27	Korea, Rep.	4.4		
28	China	4.4		
29	South Africa	4.4		
30	Indonesia	4.3		
31	Tajikistan	4.3		
32	Kenya	4.3		
33	Australia	4.3		
34	Azerbaijan	4.2		
35	France	4.2		
36	Portugal	4.2		
37	Lithuania	4.1		
38	Malta	4.0		
39	Thailand	3.9		
40	Estonia	3.9		
41	Czech Republic	3.9		
42	Russian Federation	3.9		
43	Italy	3.8		
44	Slovenia	3.8		
45	Bahrain	3.7		
46	Saudi Arabia	3.7		
47	Ethiopia	3.6		
48	Lebanon	3.6		
49	Mexico	3.6		
50	Costa Rica	3.6		
51	Oman	3.6		
52	Uganda	3.6		
53	Colombia	3.6		
54	Sri Lanka	3.6		
55	Lao PDR	3.6		
56	Senegal	3.6		
57	Rwanda	3.5		
58	Chile	3.5		
59	Philippines	3.5		
60	Jamaica	3.5		
61	Tanzania	3.5		
62	Viet Nam	3.5		
63	Pakistan	3.5		
64	Jordan	3.5		
65	Ghana	3.5		
66	Turkey	3.5		
67	Spain	3.5		
68	Hungary	3.4		
69	Albania	3.4		
70	Brazil	3.4		
71	Guatemala	3.4		
72	Cyprus	3.4		
73	Ukraine	3.4		
74	Bulgaria	3.4		
75	Kazakhstan	3.3		
76	Madagascar	3.3		
77	Slovak Republic	3.3		
78	Mali	3.3		
79	Panama	3.3		
80	Uruguay	3.3		
81	Argentina	3.3		
82	Botswana	3.3		
83	Namibia	3.3		
84	Zambia	3.3		
85	Cameroon	3.3		
86	Brunei Darussalam	3.3		
87	Mozambique	3.2		
88	Armenia	3.2		
89	Poland	3.2		
90	Cape Verde	3.2		
91	Montenegro	3.2		
92	Bhutan	3.2		
93	Mauritius	3.2		
94	Iran, Islamic Rep.	3.2		
95	Serbia	3.2		
96	Cambodia	3.1		
97	Romania	3.1		
98	Lesotho	3.1		
99	Liberia	3.1		
100	Latvia	3.1		
101	Honduras	3.0		
102	Ecuador	3.0		
103	Burundi	3.0		
104	Venezuela	3.0		
105	Morocco	3.0		
106	Tunisia	3.0		
107	Peru	2.9		
108	Kuwait	2.9		
109	Benin	2.8		
110	Congo, Democratic Rep.	2.8		
111	Bosnia and Herzegovina	2.8		
112	Sierra Leone	2.8		
113	Trinidad and Tobago	2.8		
114	Dominican Republic	2.8		
115	Nepal	2.8		
116	Georgia	2.8		
117	Egypt	2.8		
118	Croatia	2.7		
119	Malawi	2.7		
120	El Salvador	2.7		
121	Moldova	2.7		
122	Mauritania	2.7		
123	Nicaragua	2.7		
124	Seychelles	2.7		
125	Algeria	2.6		
126	Paraguay	2.6		
127	Mongolia	2.6		
128	Chad	2.6		
129	Greece	2.5		
130	Bangladesh	2.5		
131	Zimbabwe	2.5		
132	Kyrgyz Republic	2.5		
133	Nigeria	2.5		
134	Yemen	2.3		
135	Gambia, The	2.3		
136	Swaziland	2.1		
137	Haiti	1.9		

Source: World Economic Forum, Executive Opinion Survey. For more details, refer to Appendix C of this [i]Report[i]

UIL – international lessons

Model considered as best is the triple helix model of the United States – Government, industries and universities

The country (government) pushes the interaction from all sides

China has a similar program

Patent – license –start up model to foster growth of startups from within universities

Bayh-Dole Act (1980) incentivized the research activities and usage of innovations. Similar example is the Inventor's law from Germany

Parameter	US	Germany	Japan	China	Australia	UK
UIL	Strong	Strong	Relatively developed	Well developed	Less developed	Strong
R&D expenditure (% of GDP)	2.79	2.88	3.28	2.07		1.7
Global Innovation Index	4	9	14	22	23	5

UIL – international lessons

Impact of UIL in USA

Good Effects

Rise in offices of technology licensing in Universities

Emergence of diverse pattern of commercial arrangements

- Small companies – 50%, large – 35% and spin-outs – 15%

Increasing trend towards non-exclusive licensing

Increase in income

Negative Effects

Change in nature of academia

Shift of focus from innovation to incremental research

Culture of secrecy

Non protection of public goods

UIL: India Status

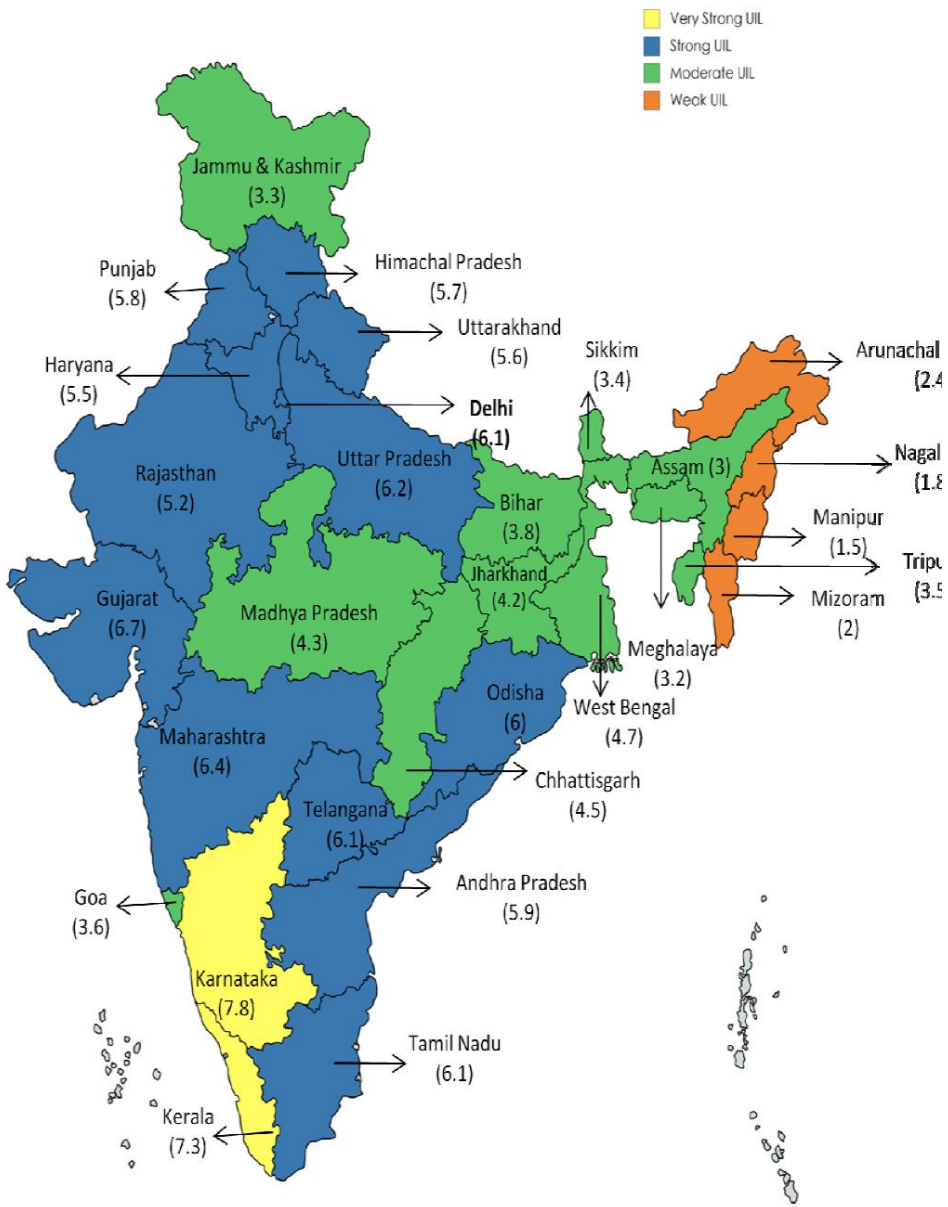
India does not have a legislation to facilitate university – industry linkage in research

Framework for industry – academia connect is weak

Some successful models such as IITK – Boeing, INIT (Karnataka) – Bosch, IITB – Society for Innovation and Entrepreneurship, GITAM – TCS etc. exist

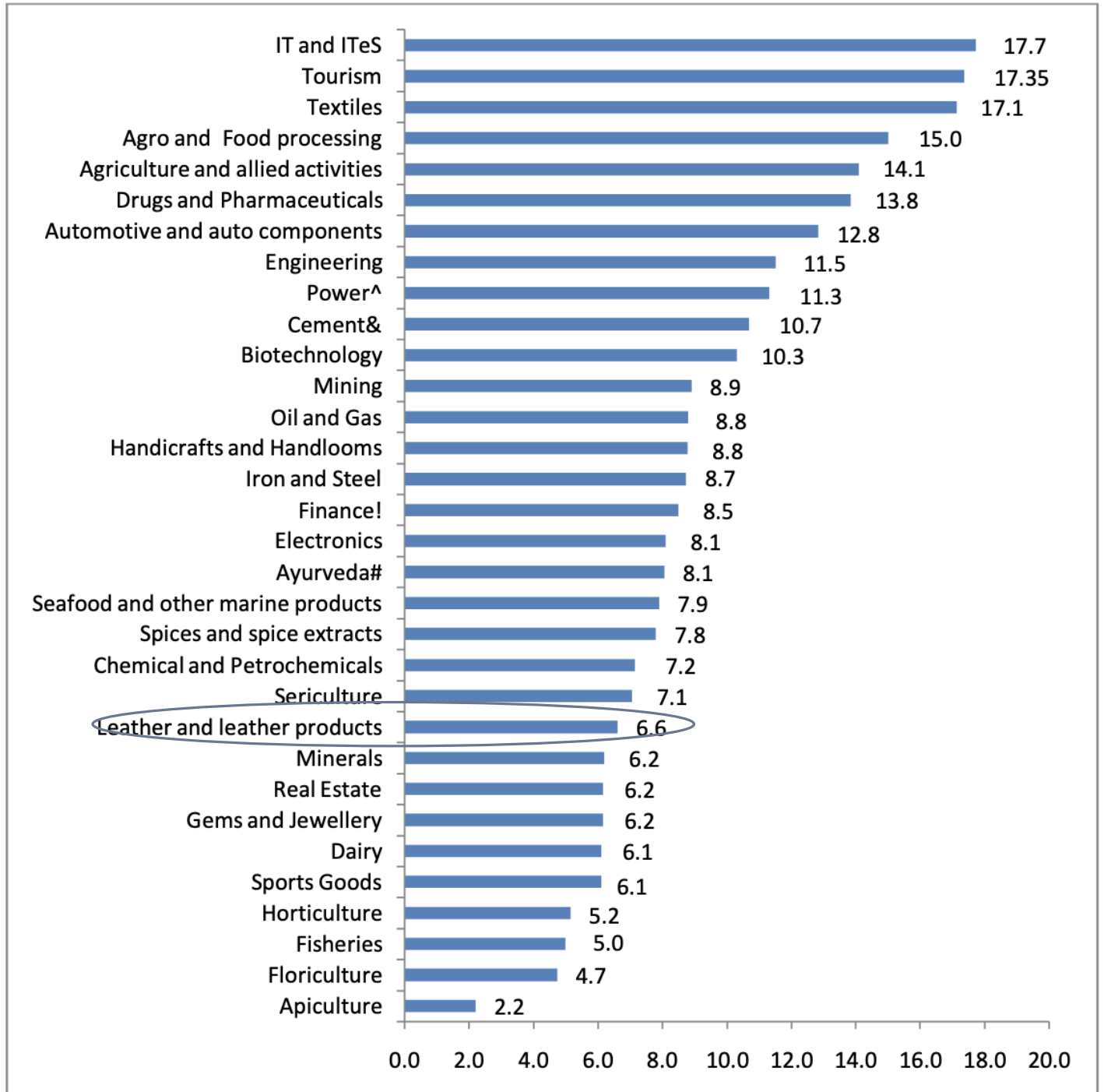
Industries/ industrial associations have partnered with government bodies for skilled manpower development

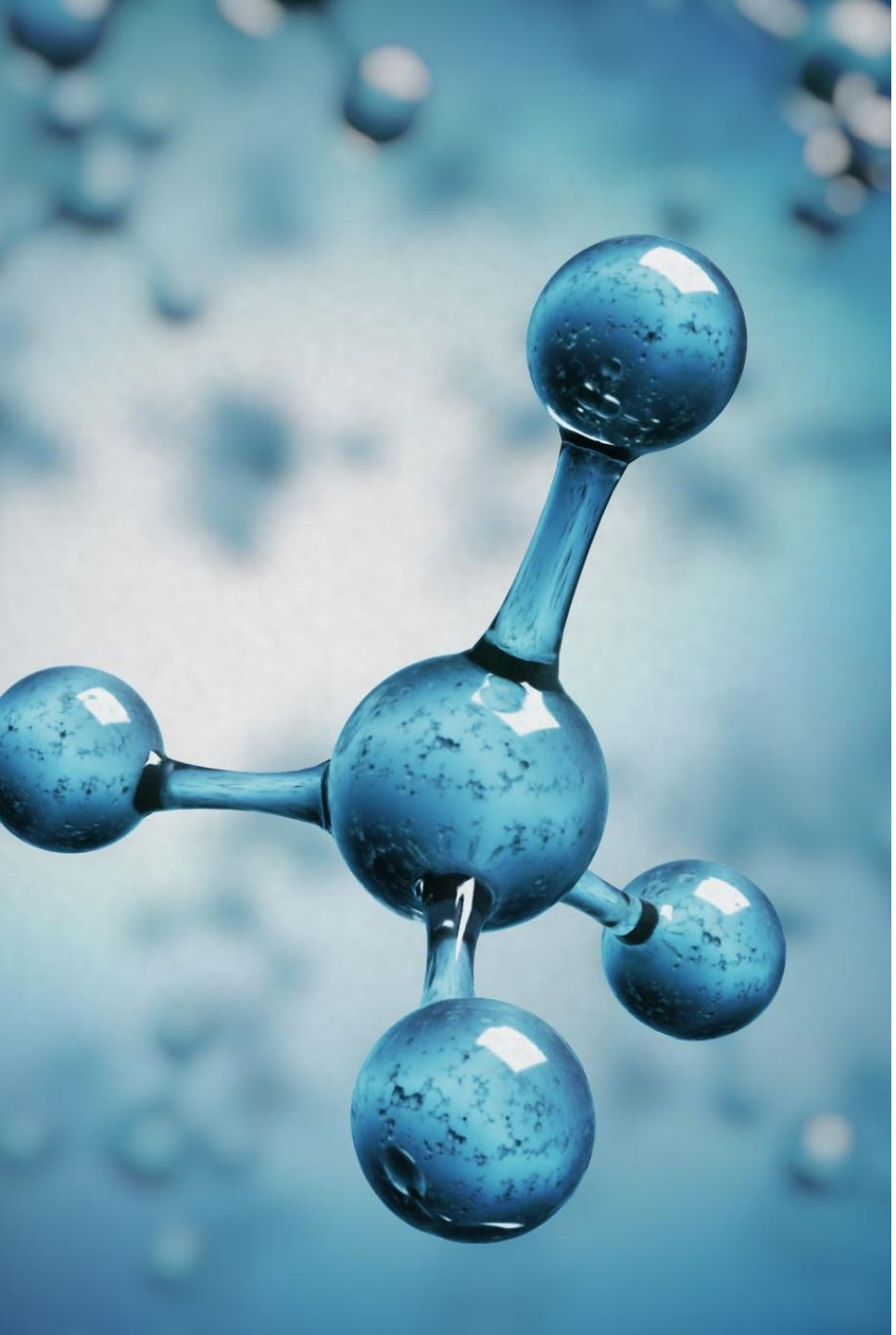
- **NASSCOM – UGC; TCS - NSDC**



Source: PHD Research Bureau, compiled from the study on Framework for University-Industry Linkages in Research

Sector wise UIL Score





Complementarity Score

Complementarity happens when research in university is useful in the states and vice-versa and if the existing industry is facilitated by research institute, centres of excellence and incubation centres

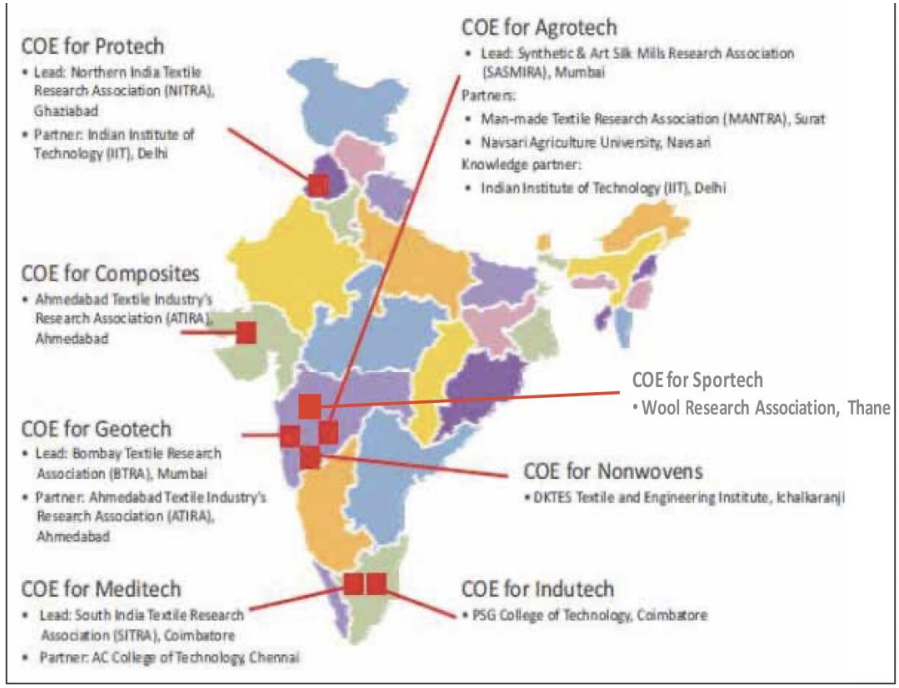
A strong complementarity (Score = 1) is found in tourism, textiles, IT and ITeS, followed by agro and food processing, agriculture, pharma etc. (score = 2) and a medium complementarity is observed in areas such as steel, leather, chemical and petrochemical (score = 3)

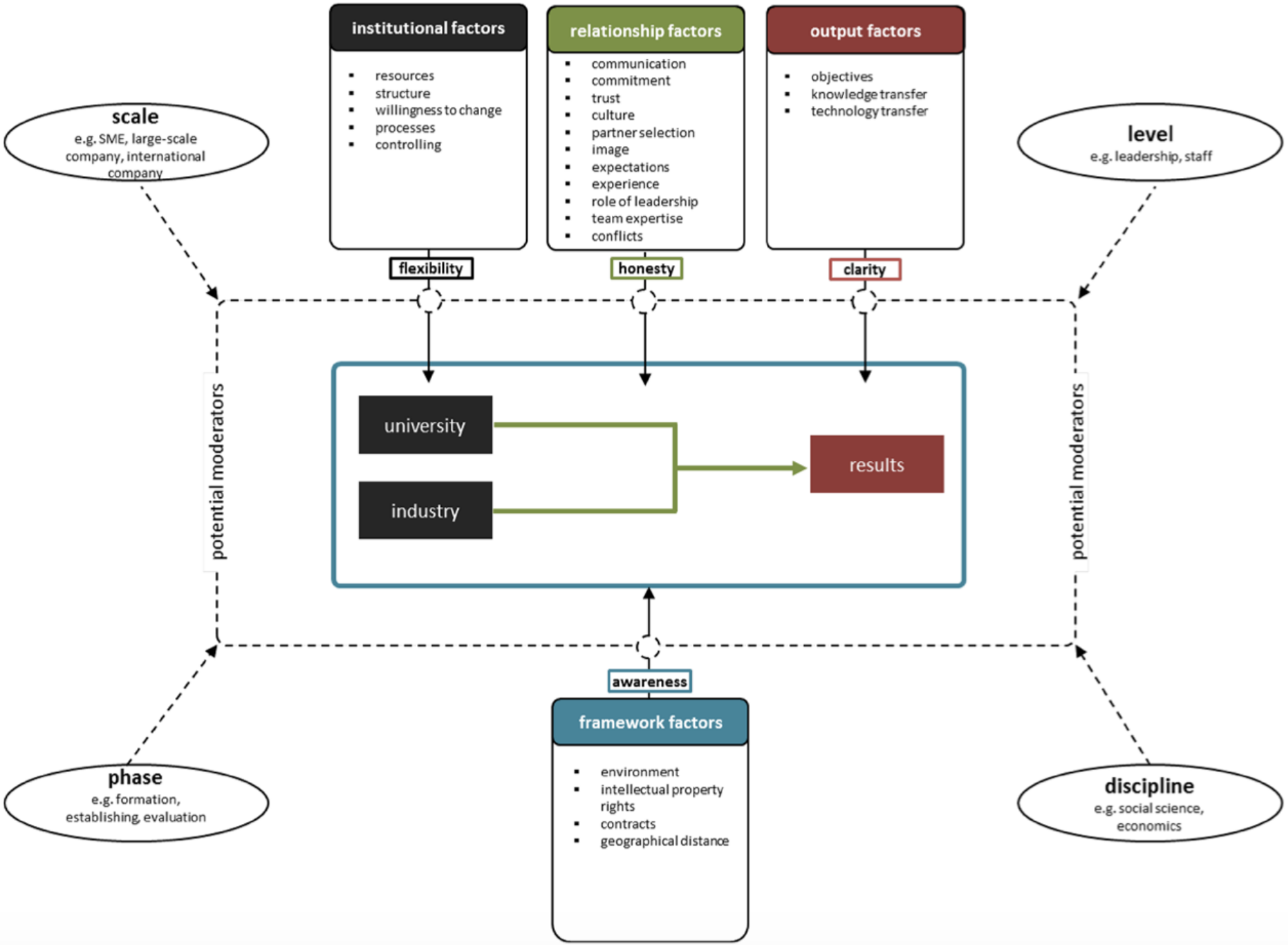
Industries like floriculture, fisheries and apiculture is seen with a score of 4, indicating a weak complementarity

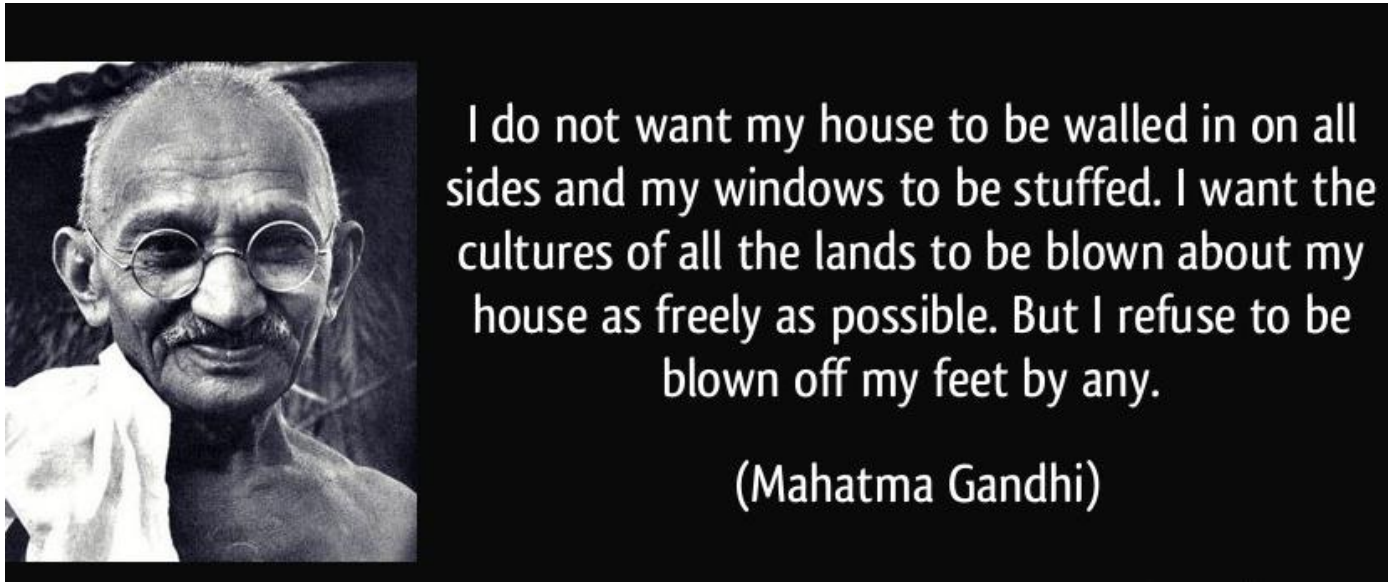
Analyzing the Score of Textiles

Possible reasons for Score of 1 for textiles

- Textile education institutions are predominantly developed and managed by textile industries
- There is a strong presence of textile institutes in the industrial clusters
- A large number of textile institutions have industrial leaders in the academic boards
- NIFT as a partner for design interventions
- A strong linkage between industry and research associations under the ministry – such as ATIRA (Ahmedabad), BTRA (Mumbai), NITRA (North Indian), SITRA (South India) etc.
  - Centres of Excellence created around these bodies
  - Rs. 139 Crore investment, 530 prototypes, 142 BIS standards, 360 Consultancies, 105 DPR




institutional factors
resources
structure
willingness to change
processes
controlling
relationship factors
communication
commitment
trust
culture
partner selection
image
expectations
experience
role of leadership
team expertise
conflicts
output factors
objectives
knowledge transfer
technology transfer
scale
e.g. SME, large-scale company, international company
level
e.g. leadership, staff
flexibility
honesty
clarity
potential moderators
university
industry
results
potential moderators
awareness
framework factors
environment
intellectual property rights
contracts
geographical distance
phase
e.g. formation, establishing, evaluation
discipline
e.g. social science, economics



The INDIA scenario

This is the uniqueness of India. We are open to worldwide influences, but we choose to follow our own unique path

A democracy with a billion people and a 5000 plus year civilization has strong likes, dislikes and culture

Academy – Research – Industry Model in Leather

A vibrant partnership with then University of Madras (now Anna University), leather institute (CLRI) and industry enabled the simultaneous generation of technologies and skill sets

Several alumni turned entrepreneurs, thanks to the industrial research environment prevalent at the institute

Industrial investments (direct and indirect) into the institute both in terms of sharing of knowledge and financial was high

Academy of Scientific & Innovative Research (AcSIR) replicates this concept born in CLRI throughout the CSIR

The Leather Scenario in mid 90s

The triple helix model of the US existed in Indian leather from 1948 itself

- **University – Research – Industry relationship in leather transformed a trade into a technology driven industry**

Research at CLRI facilitated development and commercial production of indigenous chemicals specifically tailor made to Indian conditions

By having researchers as faculty, University produced the best minds for industrial needs, without change in academic activities

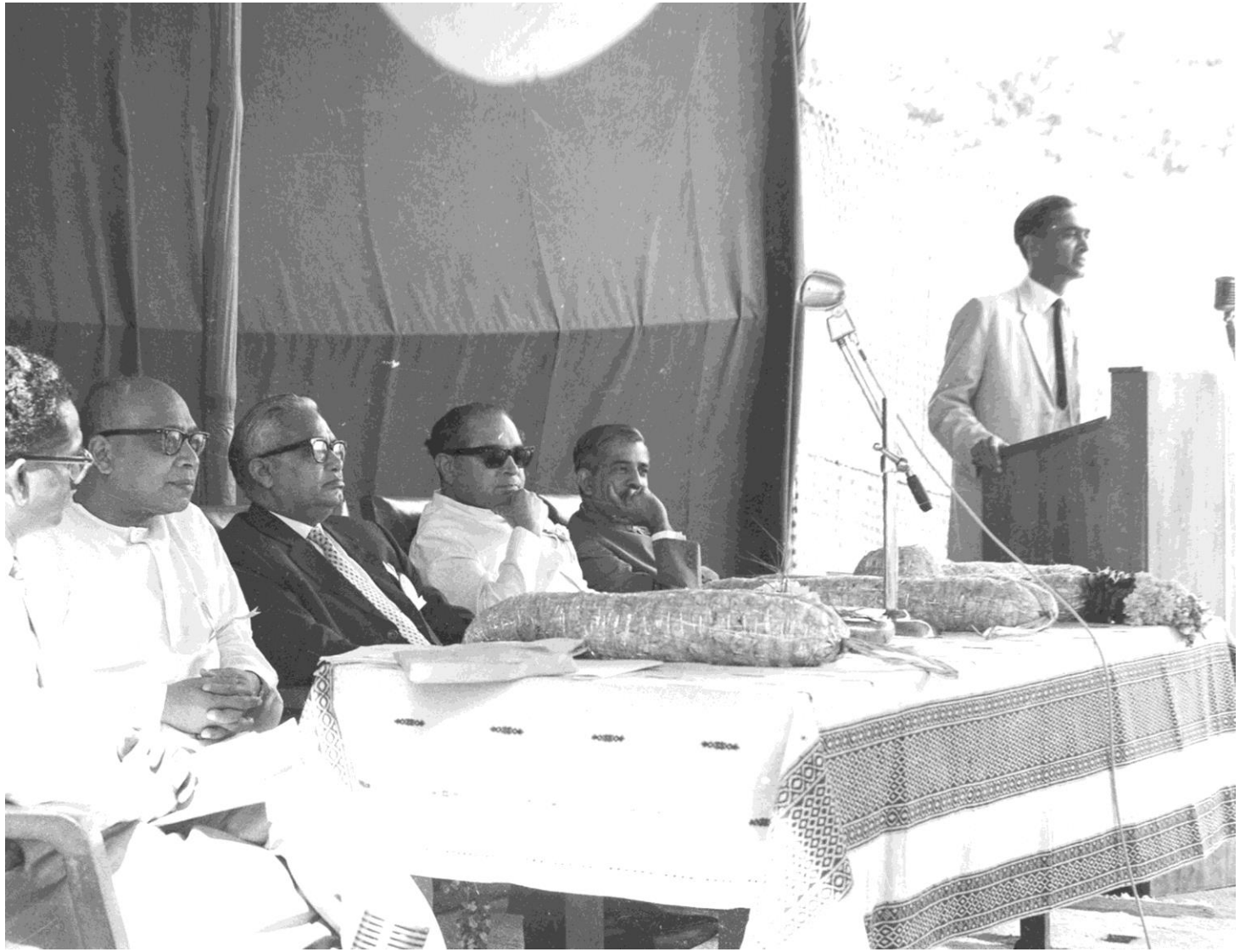
Institute also worked with the industry to frame appropriate policy for university – research – industry collaboration

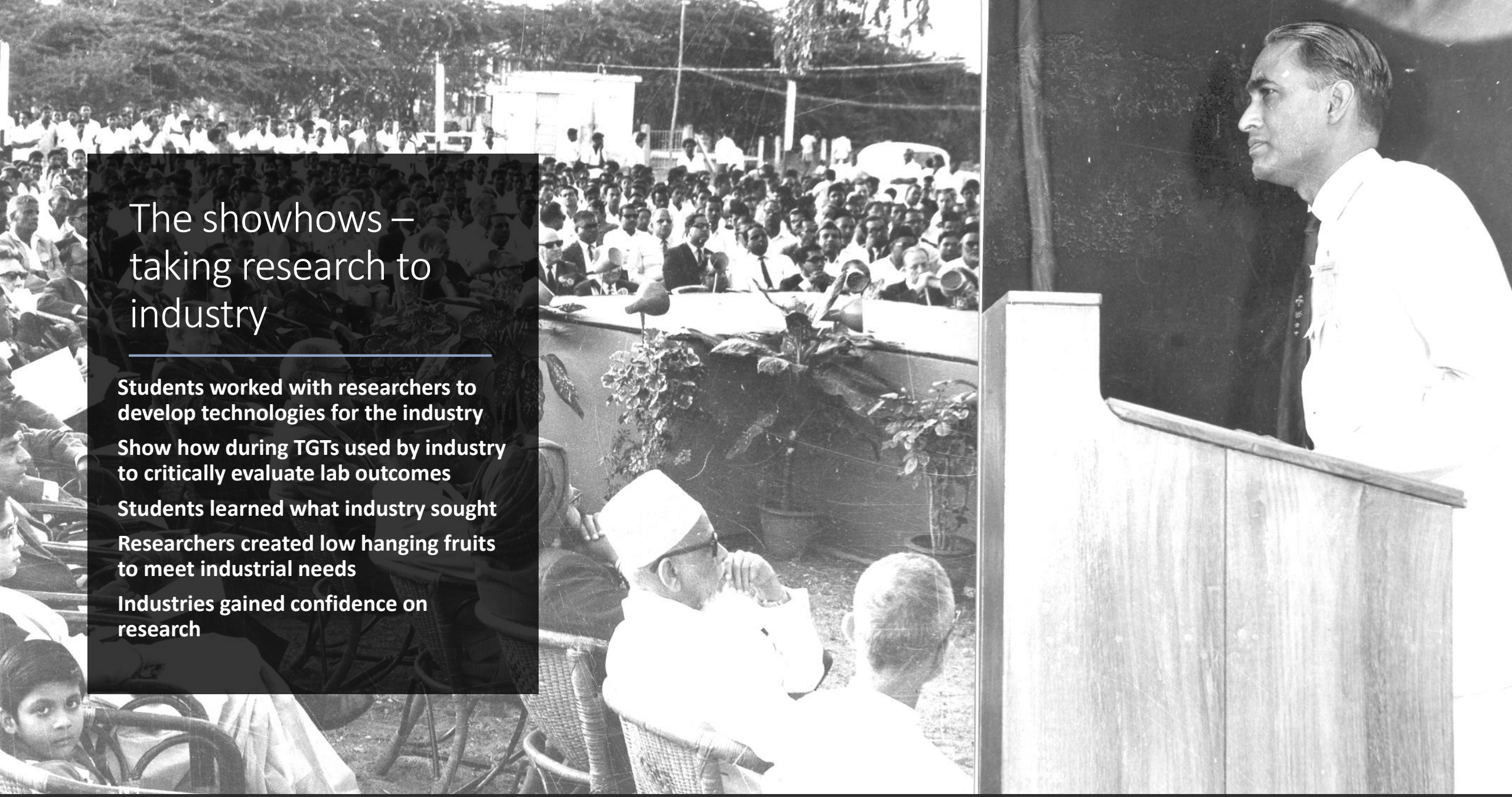
Cementing the partnership with academy and industry

Conceived as TGT in 1965

Research welcomes industry to a continued partnership

Brought Government, Industry, Research and Academy on the same platform





The showhows – taking research to industry

- **Students worked with researchers to develop technologies for the industry**
- **Show how during TGTs used by industry to critically evaluate lab outcomes**
- **Students learned what industry sought**
- **Researchers created low hanging fruits to meet industrial needs**
- **Industries gained confidence on research**

Partnership on a Mission Mode

Took technology to every part of India

- Fine tuned technology to meet need of various segments of the industry

Challenges to the Triple Helix Model in Leather Sector

R&D, technology and innovation is more in the research institution

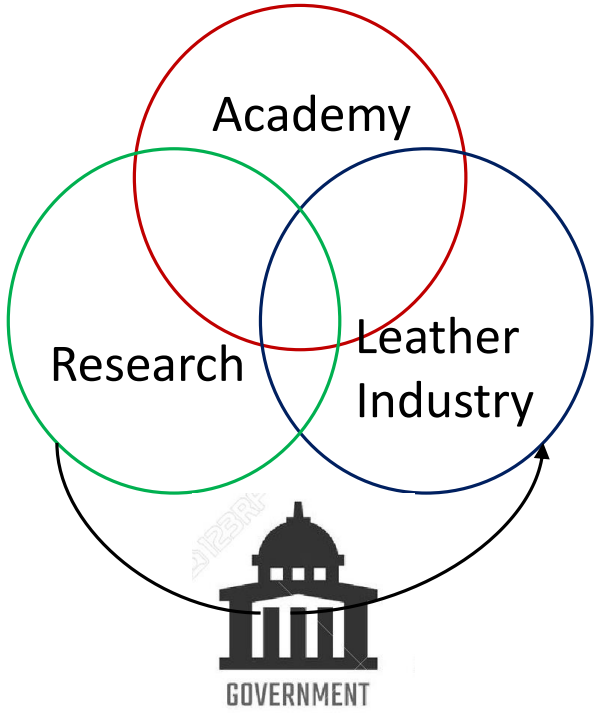
The SME character of the industry provides little scope to take risks in investing in newer technologies

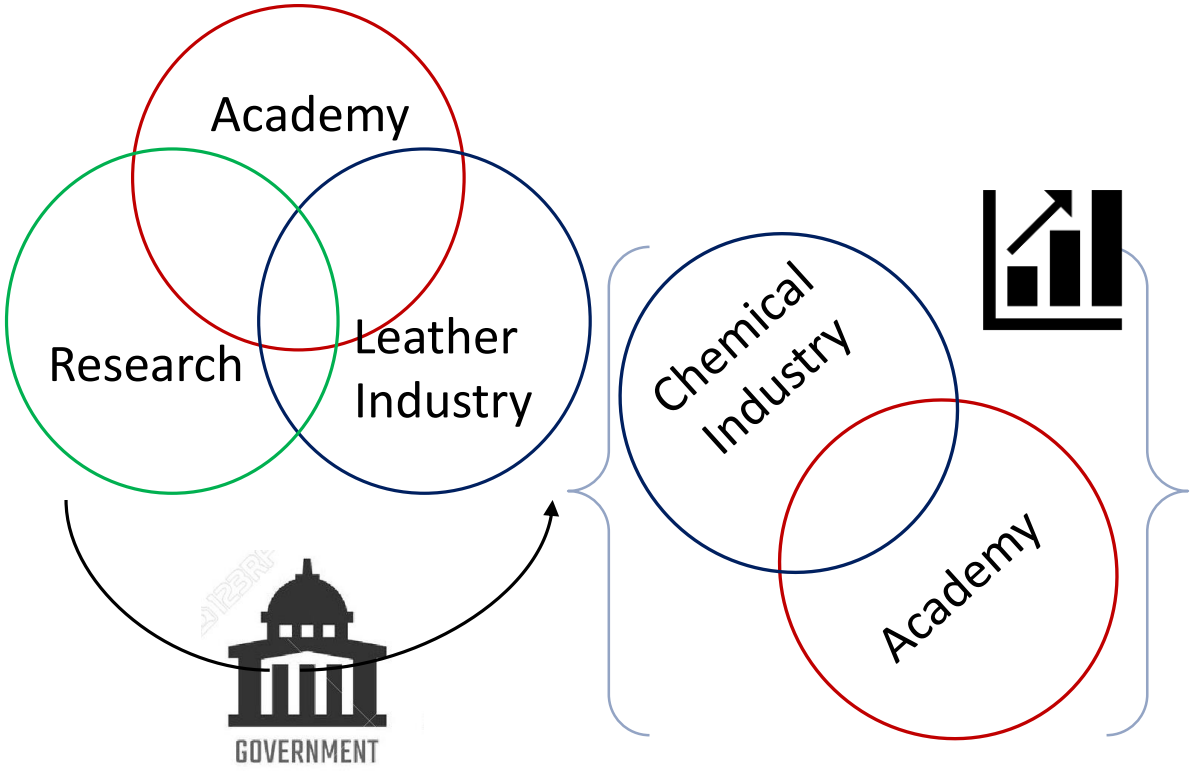
- Government support is sought for technology upgradation/modernization

Being a consumer driven industry, process innovations are considered risky

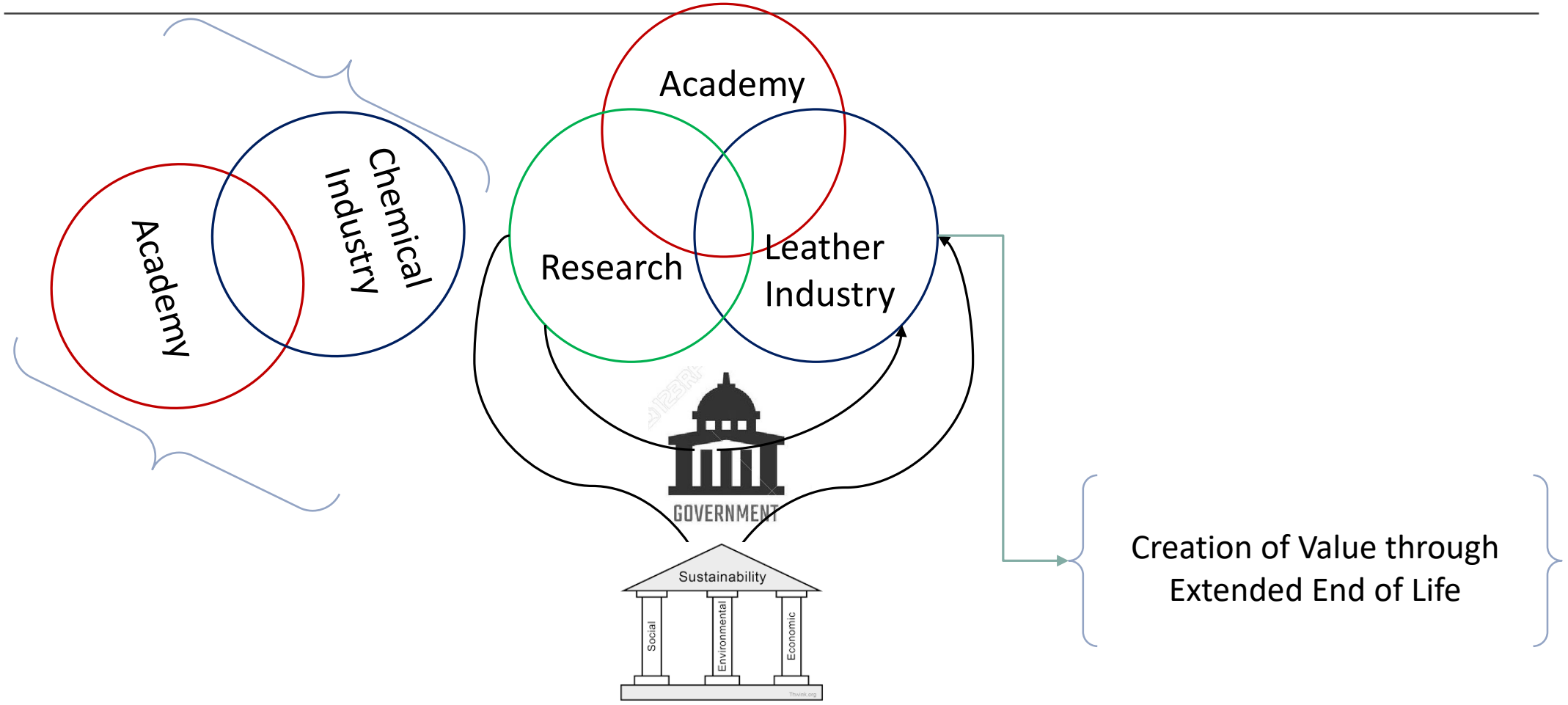
The fluctuating global market on leather is a deterrent to investments on plant and equipment

Perceived Challenges of Triple Helix Model of Leather





The Triple Helix Model for Leather: Way Forward



A Technology Platform for Indian Leather

To bring together various parties – government, business, research, education

- To identify challenges in the near, medium- and long-term scenarios
- Developing a program for strategic research with defined time goals
- Implementation of research outcomes
- Developing skillsets for adopting new innovations in industrial environment

Basic Principles of the Technology Platform

Evaluation of Challenges

Develop research and academic strengths

Ensure sufficient research in long-term priorities and blue sky research

Define ways of realization and implementation including policy support

Combine efforts of all stakeholders

Create start ups and add on units

Promote entrepreneurship and SHGs

What Motivates the Setting up of Technology Platform?

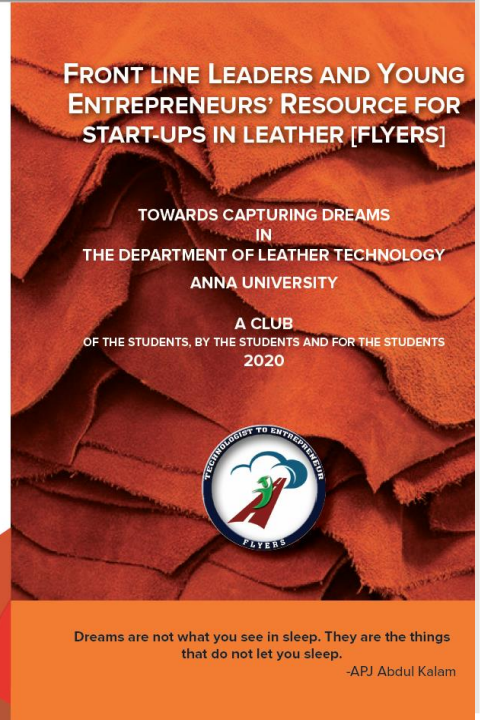
How does LERIG 2020 Contribute to Building of Technology Platform?

सत्यमेव जयते

Department of Commerce
Ministry of Commerce and Industry
Government of India

सत्यमेव जयते

Ministry of Science & Technology
Government of India



10.00 AM – 11.15 AM	***Leather and Leather Products Education*** **Chairman:** Shri Habib Hussain, Director, AVT Group **75 Years of Excellence in Leather Education,** Dr J Raghava Rao, Chief Scientist, CSIR-CLRI **Design and Technology Education for Footwear & Leather Products Industries- Present Trends, Challenges & Future Directions,** Dr M Aravendan, Professor, NIFT **Empowering Leather Sector by Skilling,** Dr Swarna V Kanth, Senior Principal Scientist, CSIR-CLRI
11.15 AM – 11.30 AM	***TEA BREAK***
11.30 AM – 01.00 PM	***TECHNICAL SESSION II*** ***Sustainability of Leather Sector*** **Chairman:** Dr B Chandrasekaran, Former Director, CSIR-CLRI **New Chemistry for Sustainable Leather Chemicals,** Dr V Vijayabaskar, Chief Manager, M/s Balmer Lawrie & Co **Sustainable Development of Leather Value Chain in India**, Shri A Sahasranaman, Vice-Chairman, CEMCOT **Chemicals for Sustainable Leather Manufacture,** Shri M Prasanna, Campus Manager, M/s Stahl India Pvt Ltd **Green Beamhouse – A Toolbox for Cleaner Wastewater** Shri P Rajasekaran, Head of BU (India) M/s Lanxess **Measures for sustainable development in Leather Products,** Shri TR Sankaranarayanan, Associate Professor, NIFT

Let us create a platform to RAISE the leather industry