A decorative background featuring a light blue circuit board pattern with various lines and nodes, set against a dark grey background with a fine white dot grid.

SOCIAL ENGINEERING FOR DIVERSITY IN INDIAN SCIENCE AND TECHNOLOGY

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BIOTECHNOLOGY DIVISION ,

JNANA PRABODHINI, NIGDI, PUNE .

PERSISTENT GENDER GAP IN SCIENCE, TECHNOLOGY AND INNOVATION

- **Science and Technology : Masculine Activity**
- **Qualities : Creativity, perseverance and intelligence**
- **Lack of Diversity in Science, Technology and Innovation in India**
- **Literature Survey**
- **Analysis : Global Scenario**
- **Analysis : Indian Scenario**
- **Solutions : Application of Gender lenses**

The image features a dark gray background with a fine, light gray dot grid. In the four corners, there are decorative white circuit-like patterns consisting of thin lines and small circles, resembling a stylized PCB or network diagram. The central text is in a bold, black, serif font.

GLOBAL SCENARIO

1. NATIONAL ASSESSMENTS ON GENDER, SCIENCE, TECHNOLOGY AND INNOVATION (2012)

- **Numbers of women alarmingly low in the world's leading economies**
- **Engineering, Physics and Computer Science are the fields where women participation is less than 30% in most countries.**
- **Proportion not only is less but is declining.**
- **Gender parity linked to multiple factors : higher economic status, larger roles in government and politics, access to economic, productive and technological resources, supportive policy environment.**

2.DEFINED BY ABSENCE: WOMEN AND RESEARCH IN SOUTH ASIA (2015)

THE MISSING WOMEN: IN NUMBERS

Indicators	Year	India	Pakistan	Sri Lanka
Female enrolment in tertiary level	2003	38.45%	43.16 %	-
	2011	41.76%	46.71%	-
% of Researchers who are females	2006/7	8.7%	8.7%	32%
	2010/11	14.35 %	23.6%	39.3%
Proportion of articles with female authors published in Peer reviewed journals	2012	23 %	21%	32%

3. UIS FACT SHEET (2015)

PARTICIPATION OF WOMEN IN S & T ACROSS THE GLOBE.

Sr. No.	Region	Share of Female Researchers For 2013
1	Arab States	36.8%
2	Central and Eastern Europe	39.9%
3	Central Asia	47.1%
4	East Asia and The Pacific	22.6%
5	Latin America and Caribbean	44.3%
6	North America and Western Europe	32.0%
7	South and West Asia	18.9%
8	Sub-Saharan Africa	30.0%
9	World	28.4%
10	India	14.3%

4. AASSA REPORT (2015)

Percentage of women in science education and research in Asia.

Sr No	Country	Bachelors	PhDs	Researchers
1	Australia	57	51	20
2	Bangladesh	42	38	14
3	China	51	-	38
4	Japan	43	33	14
5	India	39	37	11
6	Korea	41	38	17
7	Malaysia	59	43	49
8	Nepal	48	10	8
9	Pakistan	48	29	27
10	Philippines	55	60	52
11	Shri Lanka	61	41	37
12	Turkey	46	43	36

AASSA REPORT : INDIA

- The real attrition begins after the Ph.D.
- The fraction of women with successful careers is very small and is independent of discipline
- Out of the 25-30 % Ph.D.'s only 15 to 20 % continue to occupy faculty positions. This proportion still reduces further at higher levels
- Women scientists have to face innate prejudices, biases and patriarchal attitudes at work place
- Women scientists experience widespread gender insensitivity and explicit sexual harassment

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INDIAN SCENARIO

INSTITUTIONAL STUDIES IN INDIA

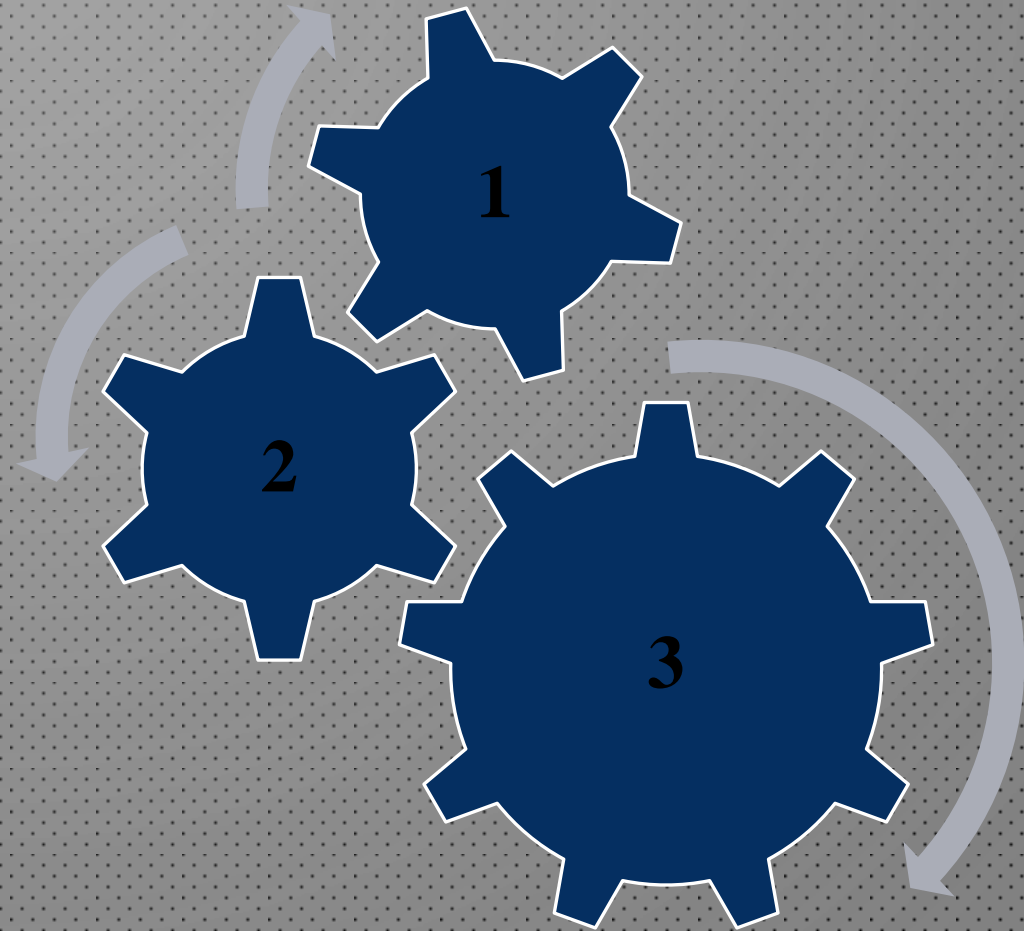
- 1. 'Science career for Indian women: An examination of Indian women's access to and retention in scientific careers' (October 2004) by Indian National Science Academy (INSA).
- 2. Status of Women Scientists in S&T/R&D Institutions in Delhi; Report by Society for Environment & Development; Submitted to National Commission for Women.
- 3. Trained Scientific Women Power: How much we are losing and why? IAS–NIAS Research Report (2010).

EFFORTS FOR GENDER MAINSTREAMING BY DEPARTMENT OF SCIENCE AND TECHNOLOGY (DST)

- 1 Re-entry Opportunity for Women in Research and Development Sector
- 2. Capacity Building and Training
- 3 Entrepreneurship Development
- 4. Nourishing pipe line of Women Scientists by Strengthening R&D Infrastructure
- 5. Refresher Training Courses for Scientists as Career Advancement Measure
- 6. The New Mobility Scheme for Employed S&T Manpower
- 7 DISHA-Science Communicators

CHALLENGES IN FRONT OF INDIAN SOCIETY

- 1. 'Problem of Wastage'
- 2. 'Lack of Recognition'
- 3. 'Gender biases and stereotypes'



The image features a dark grey background with a fine, light grey dot grid. In the four corners, there are decorative white line-art elements resembling circuit traces or neural network connections, with small circles at the end of the lines. The main text is centered in a bold, black, serif font.

SOLUTIONS : APPLICATION OF GENDER LENSES

SOLUTION TO INDIAN CHALLENGES: APPLICATION OF GENDER LENS

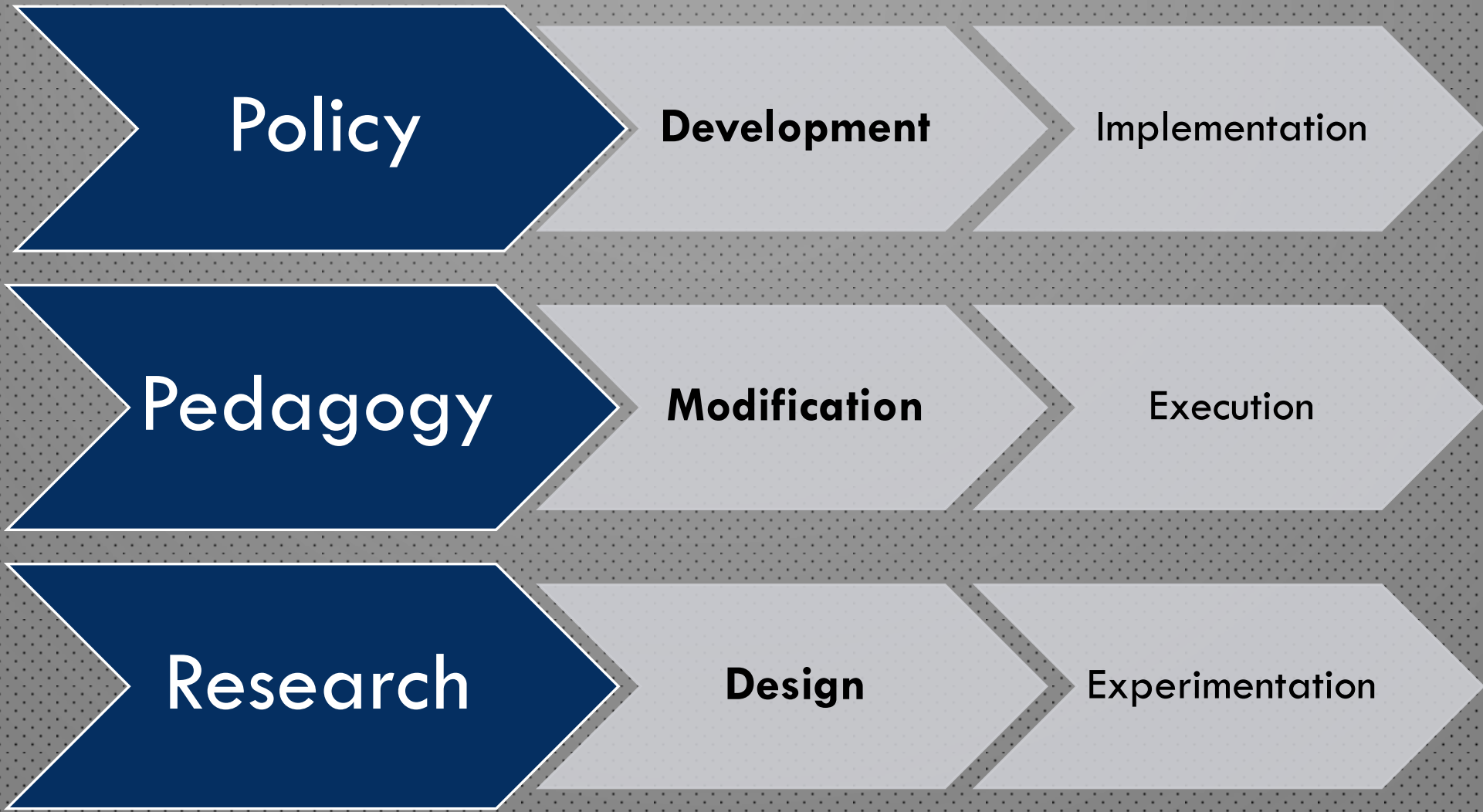
- 1. Application of Gender Lens at Policy Development and Implementation Level
- 2. Application of Gender Lens at Pedagogy Level
- 3. Application of Gender Lens at Research Level

SOCIAL ENGINEERING

Social Engineering is the term coined for inter disciplinary interventions which envisage simultaneous use of “gender lenses” at policy, pedagogy and research level to achieve Gender Parity in STI.



APPLICATION OF GENDER LENSES





- **Consideration of abilities of both women and men in all aspects of STI policy-making : aims, concerns, situations**
- **Promotion and leveraging of science and technology: support women's development : Key sectors : agriculture, water, energy and transport**
- **Promote gender equality in S&T-related education, careers and leadership**
- **encourage and support the role of women in innovation.**
- **Three pronged Application**
 - Science for Women, Women in Science, Women in Innovation**

Pedagogy

Modification

Execution

- **Redressing of process and content instruction of S& T**
- **Rethinking of structure and perspective of S & T instruction**
- **Cognizance of the issues of diversities**
- **Demystification of Science as a masculine activity**
- **Narration and creation of gender free or gender neutral scientific activity**

Research

Design

Experimentation

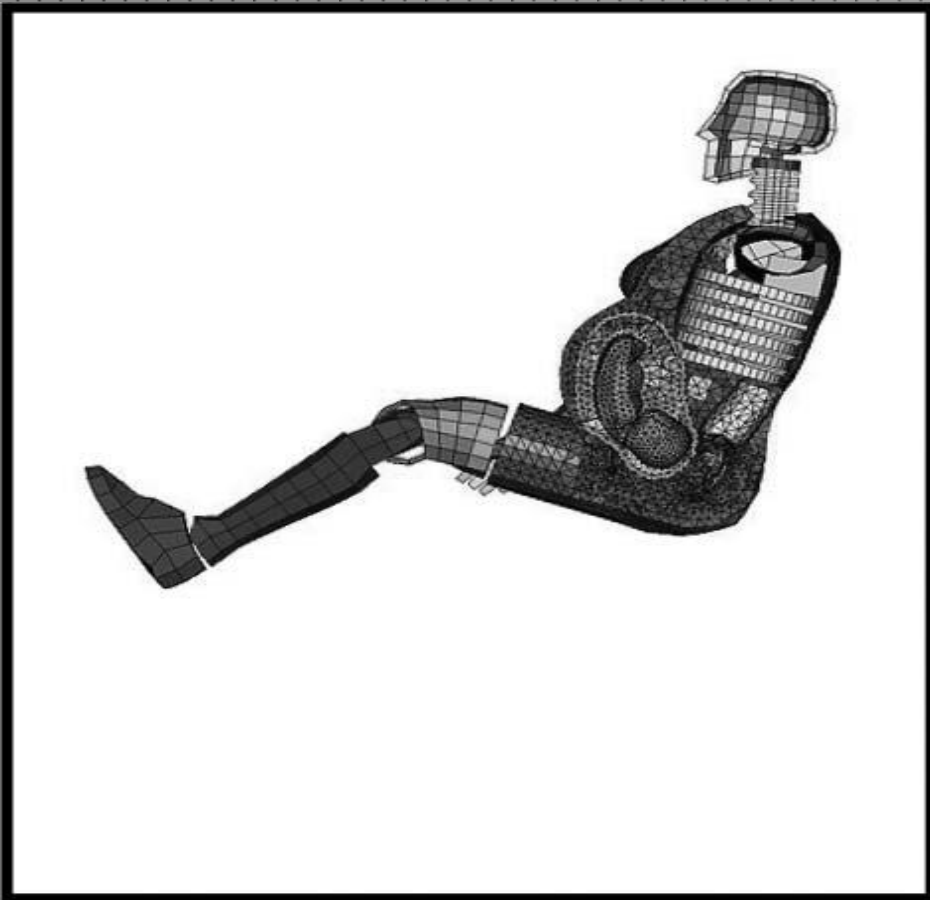
Aim : Creation of gender equality and enhance creativity

Methodology :Deep interdisciplinary collaborations : gender experts, scientists, designers and engineers: More Social Responsibility

Uses gender analysis :1. Enhancement of scientific knowledge and technology design 2. Removal of gender bias 3. Design : in all phases of basic and applied research 4. Tool to usher scientific creativity for creation of novelty

GENDERED INNOVATION : LINDA

PREGNANT CRASH TEST DUMMY



- Conventional seat belt
- 3/4 Fold Pressure on Uterus
- Foetal deaths during motor vehicle collisions.
- Technology design
- Crash safety in foetus

'LINDA' BY VOLVO

THE WORLD'S FIRST VIRTUAL PREGNANT CRASH-TEST DUMMY

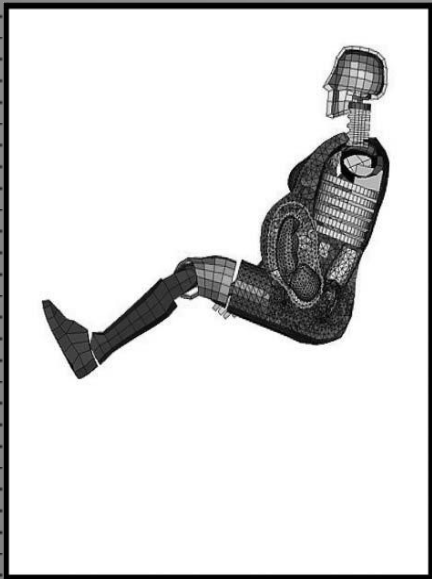


- 1950 : First Installation
Conventional seat belt
- 1980: Common Use
- 1996 : Safety During Pregnancy at
Thought Level
- 2002 : Gendered innovation “Linda”.
Technology design
- Mechanical engineer :Laura
Thackray
- Crash safety in foetuses

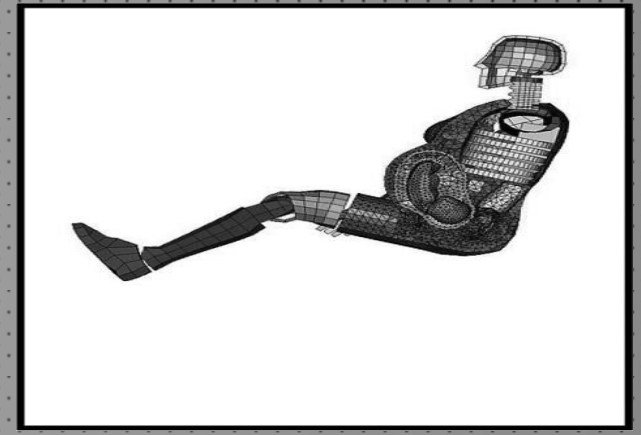
SOCIAL ENGINEERING

APPLICATION OF GENDER LENS

POLICY, PEDAGOGY, RESEARCH



- Use of Gender Lens
- Better Sampling Methods
- Cognizance of User Population
- Regions, social classes, ages and reproductive status
- Social Diversity



Thank
You