

Empowerment of women through Entrepreneurship



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S & T Based Enterpresural Development



‘S&T based Entrepreneurship Development’

Celebrating 75 years of India's independence



Jointly organized by

**National Botanical Research Institute (CSIR-NBRI), Lucknow
The National Academy of Sciences, India (NASI), Prayagraj
&**

Biotech Consortium India Limited (BCIL), New Delhi

Plan

1) Why entrepreneurship is an important tool for bringing benefits of science to society.

2) Why entrepreneurship particularly relevant in the context of women in Science.

3) Many avenues these days to pursue this path

Few thoughts on entrepreneurship in general

It is clear that one needs science, technology and innovation to bring the fruits of the new developments to the society.

When this comes together with the enterprenual spirit it adds economical development to the benefits.

We have myriads of examples , particularly in the context of the Covid-19 Pandemic:

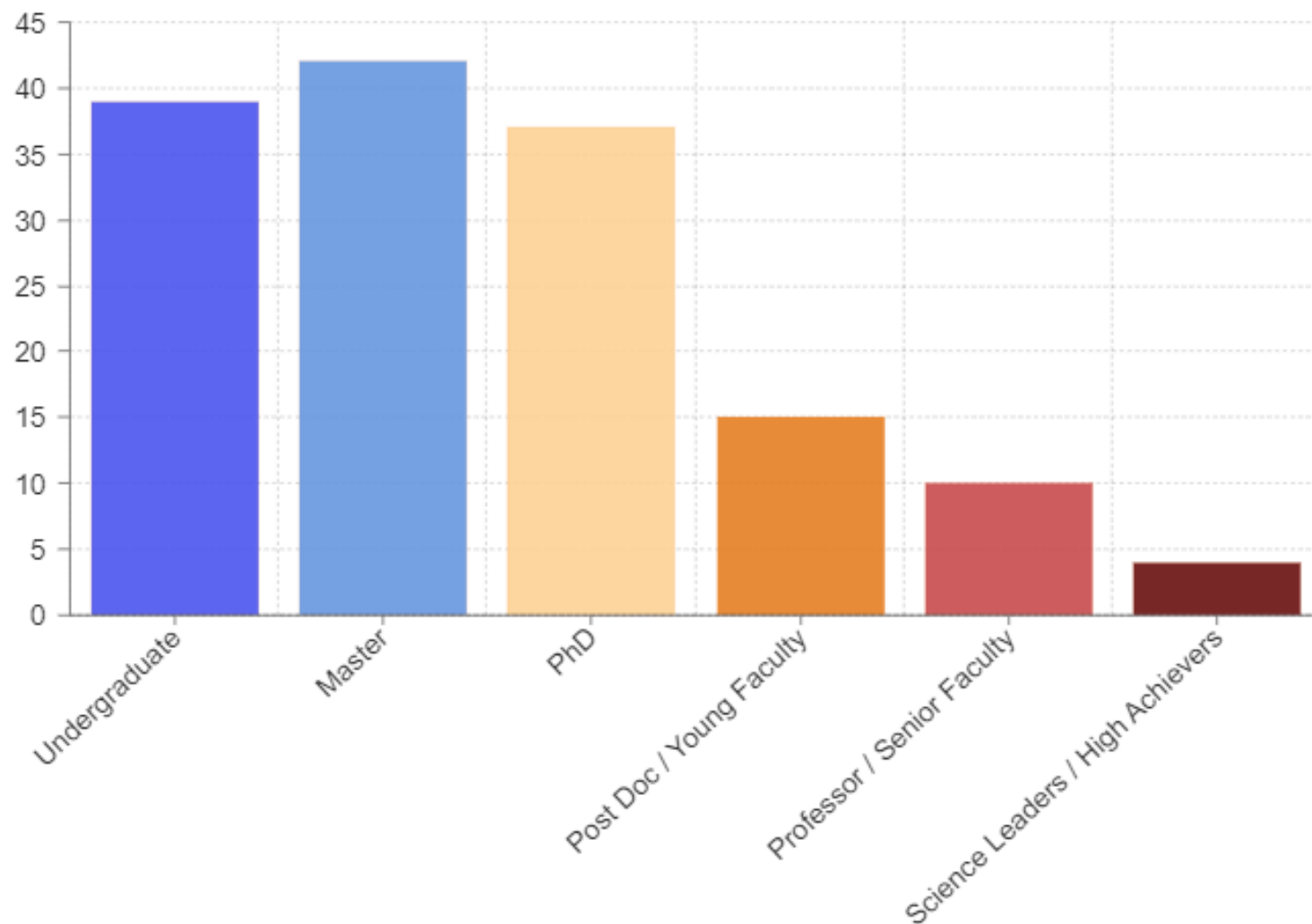
- Vaccine development
- Development of rapid , accurate and in field testing protocols
- Inexpensive designs of ventillators

Why entrepreneurship specially important in the context of women in science?

For women who are trained in science this provides a particularly interesting pathway to follow after the very special knowledge and capabilities that training in science imparts them

Why do I say this?

To understand this first look at the story of women in science in India!



WiS : Indian Story, the big fall!

Real data available.

Sources for Numbers

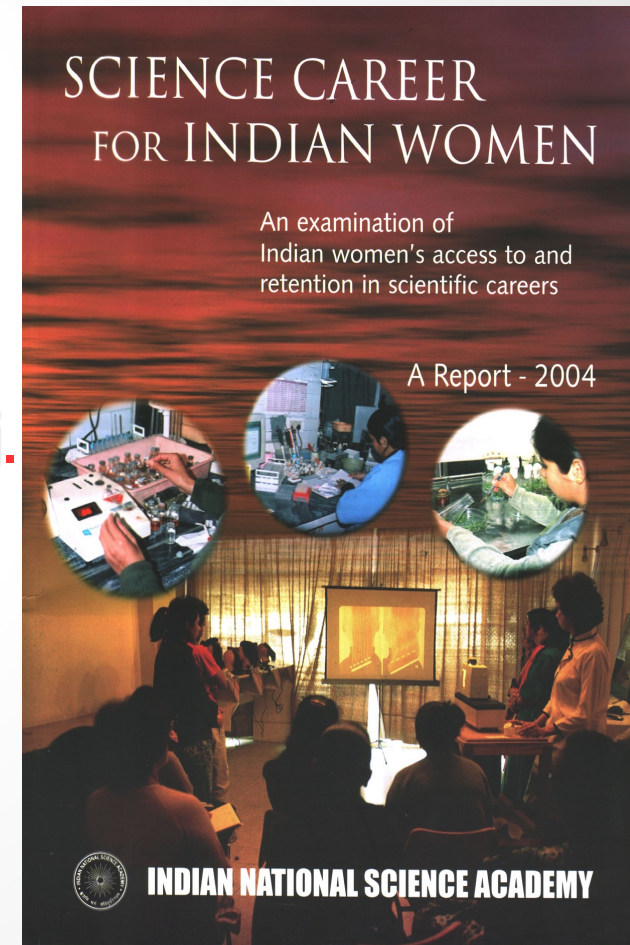
1) A report brought out by the Indian National Science Academy (INSA) (**Mehtab Bamji, Rohini Godbole, Vinita Bal**)

The report (2004) led to formation of a DST task force for women in Science.

2) The DST Task Force report, **Ed: M. Bamji.**

This led to the formation of Standing committee on WiS of the Govt. of India.

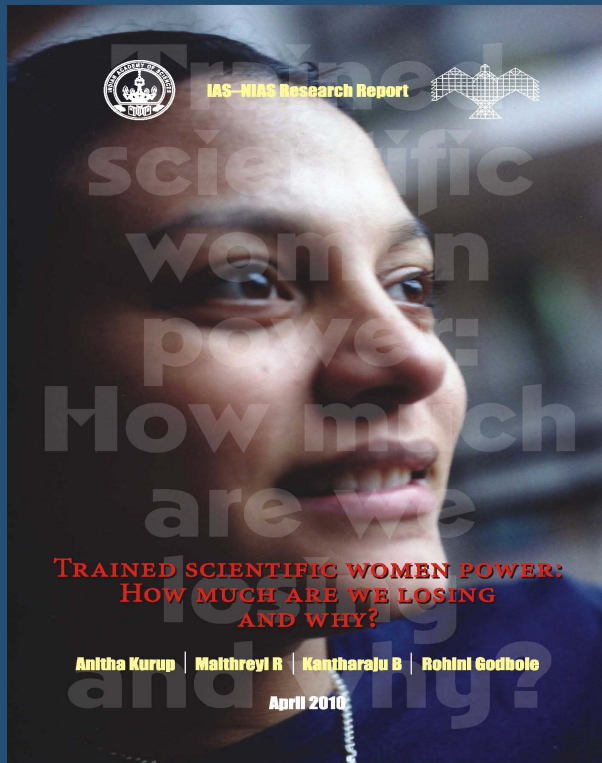
(It remained standing for many years!)



Why do we lose trained women? (Survey)

Survey report is available from the web page of the WiS Panel:

http://www.ias.ac.in/womeninscience/surveyreport_web.pdf (2010)



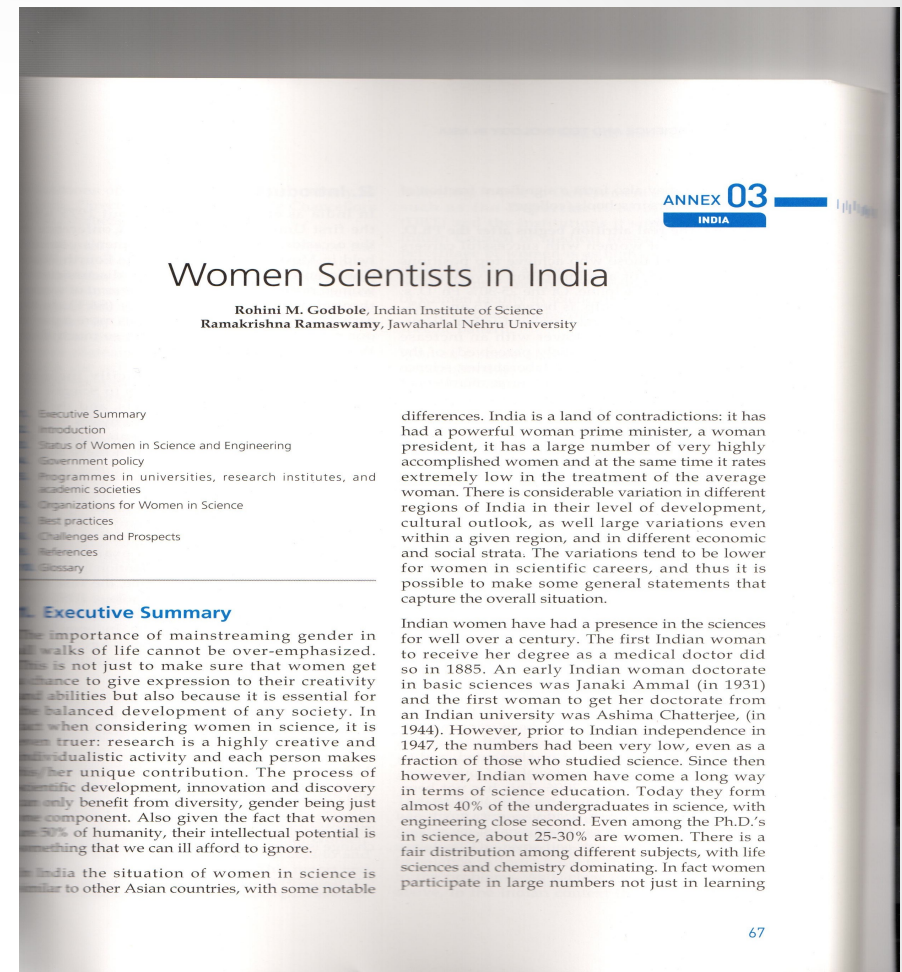
*Trained Scientific Woman Power:
How much are we losing and
Why? (Anitha Kurup, Maithreyi
B., R. Godbole et al)*

*A joint project between natural
scientists and social scientists.*

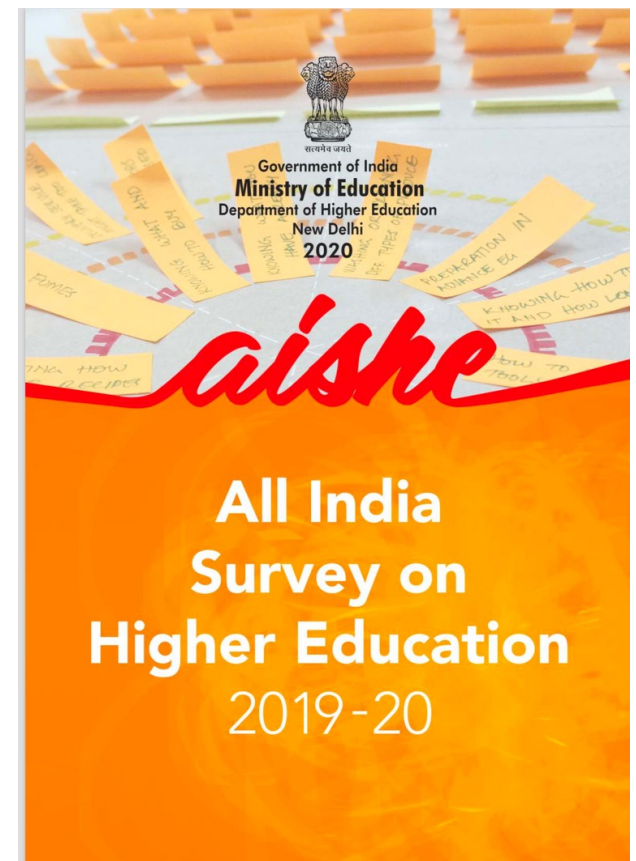
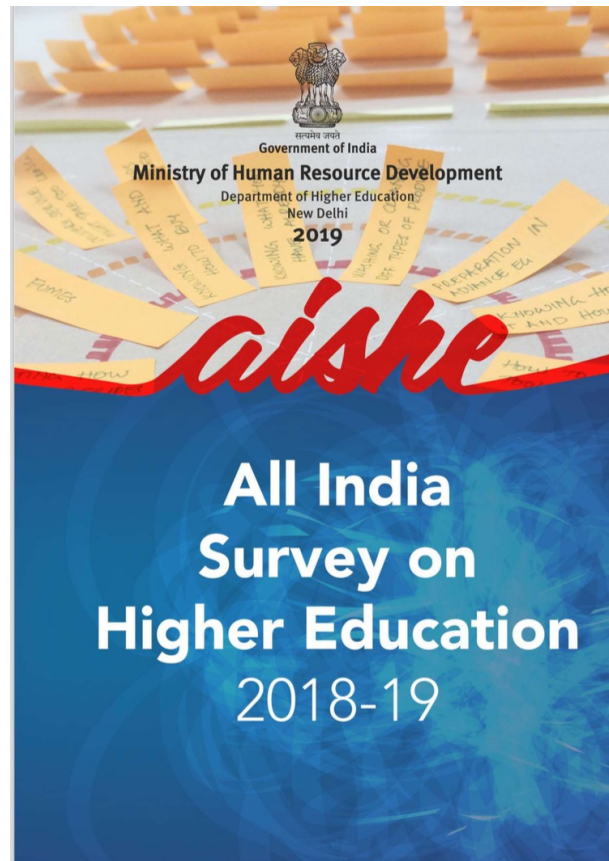
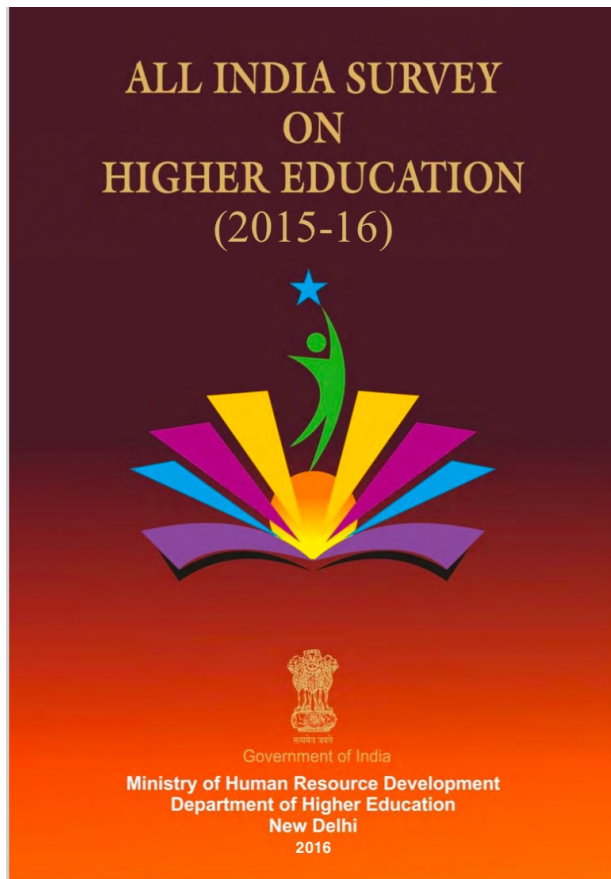
3) Some more recent reports :



*Association of Academies and
Societies of Sciences in Asia:
AASSA report (2015-2016)*



*India Report prepared by
Rohini Godbole and R.
Ramaswamy*



No shortage of **girls studying science** or women teaching science but number of **women doing science is small**

Women in science : India

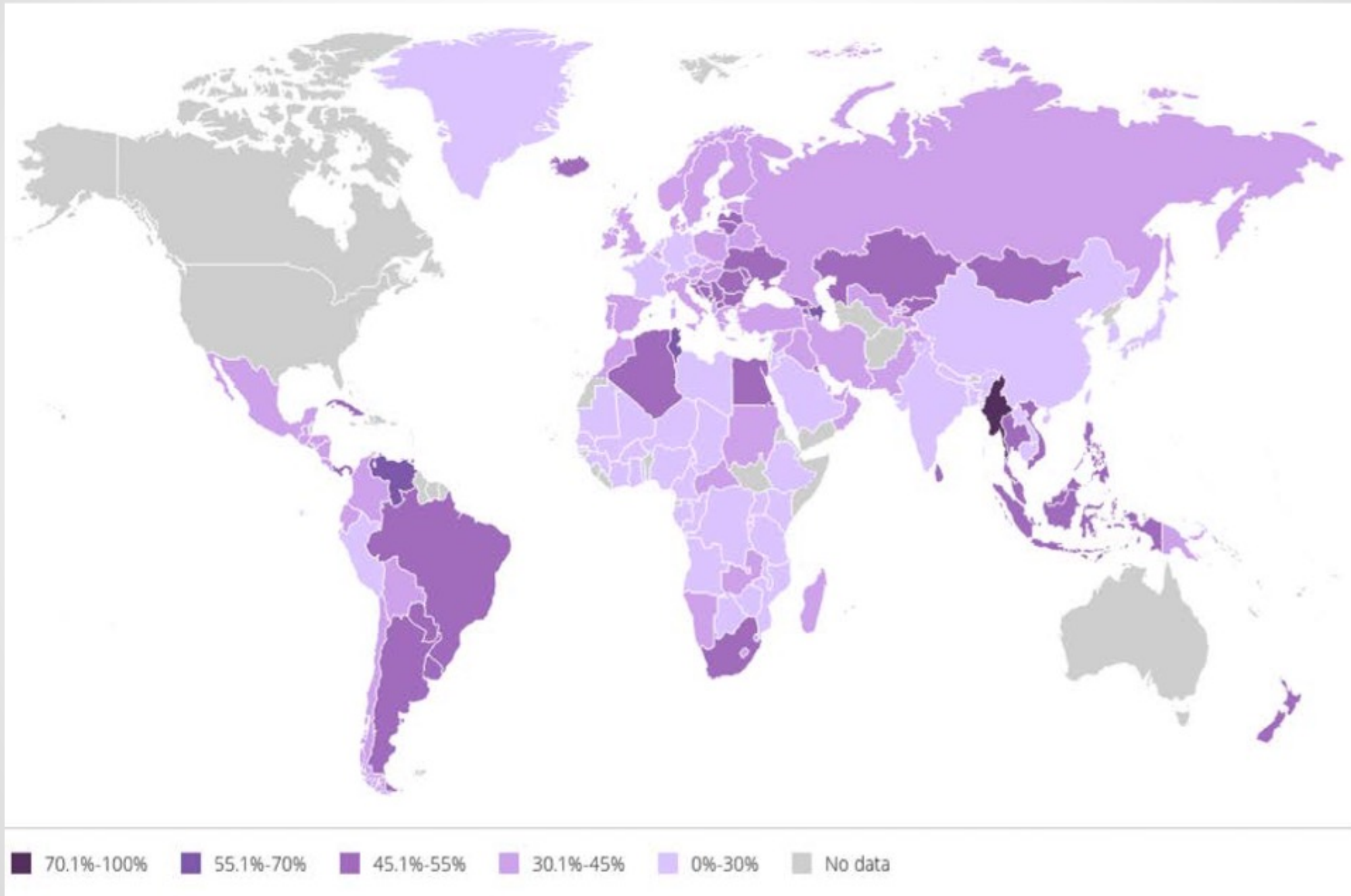
In India the participation of women in ***studying science*** or for that matter in ***teaching science***, at all levels, is NOT LOW AT ALL.

However, number of women ***doing science*** is certainly NOT commensurate with their participation in the other two aspects of scientific activity.

Number of women in science in India is not small but surely the number of women in Indian Science is small

We are always agonising and trying to figure out how to prevent this 'loss' of Indian science!

How do we compare with the world?



Plug the drain!

Indian problem: Not just *development* of human resource
BUT ALSO human resource *deployment (for women)* !

Apart from losing the *advantages* that *diverse* work force
brings, this is *pragmatically also a* problem of *low return on
investment.*

A country committed on path of innovation based progress can
not afford this '*brain drain*'! **Loss of trained scientific
human resource needs to be plugged!**

Obvious and Visible Causes

a) Specific to science:

Ticking clocks !

Body clocks are ticking but so are the clocks of the career! Beginnings are tender and essential!

b) Common in other spheres as well:

Family and career balance.

This is faced by women in all careers!

Will taking care of these two problems be enough?

Obvious cures to obvious problems

Perception:

Sort these problems and all will be well.

- Policies exist to come back to a career after a break.
- Policies for flexi times.
- Encourage young girls to choose S&T
- **Hold training programs for Women Scientists.....**

Reality:

It is necessary but not sufficient.

All these directed towards getting women in Faculty and R&D jobs

Entrepreneurship one more way to plug the drain!

Entrepreneurship for sure provides one extra pathway to avoid the brain drain.

This is one road where flexi times are possible, a break in the career is not as detrimental to future development as in basic science research where the clock of science is ticking continuously

There exist many possibilities of the use of special skills that one acquires during a ph.d.

May it be the expertise in the core subject or tools/techniques required in the niche area or simple things such as understanding of research methodology.

Entrepreneurship one more way to plug the drain!

Possibilities are almost endless:

Beginning from scientific communication, offering copy editing services to students/scientists and journals alike to using the core knowledge towards developing drug delivery systems.

Everything goes!

There are examples. A lot of them in area of bio technology (BIRAC plays a special role)

DST offers skill development programs in science communication, science editing..

Who we are affects what science we do!

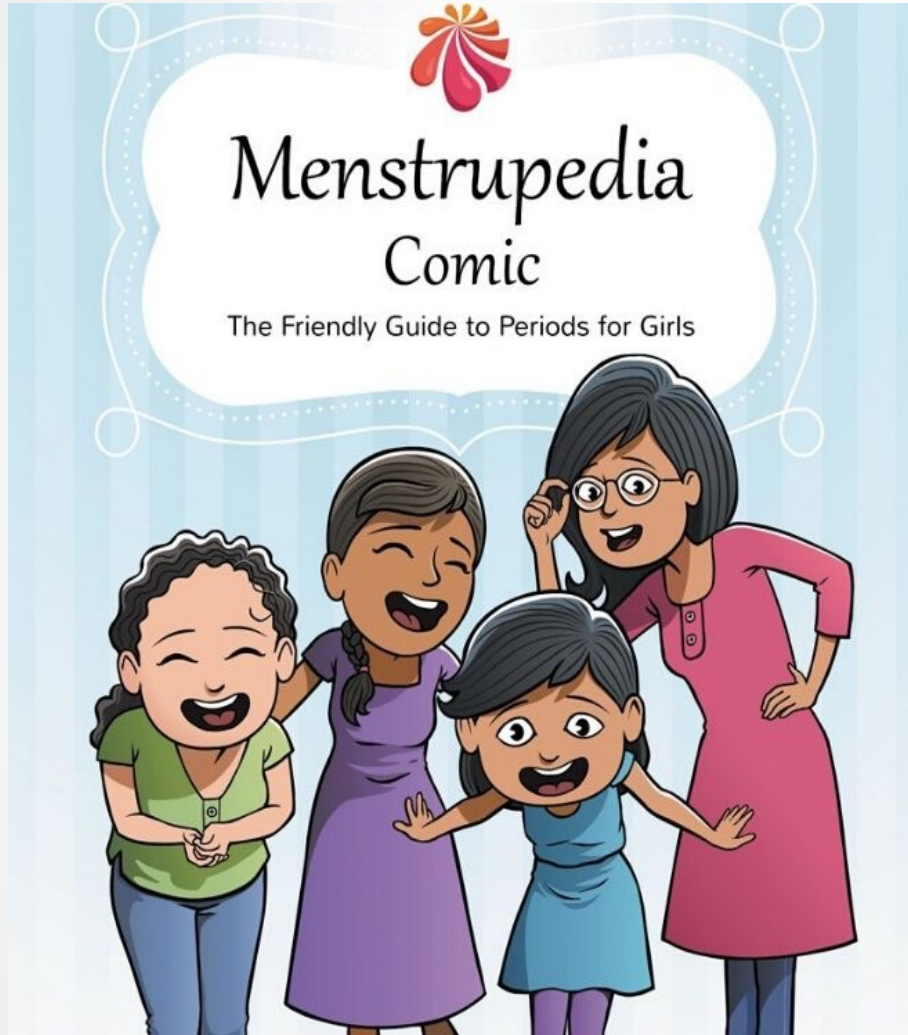
One more advantage of women embracing enterpresuership: who we are affects what we do.

Science is objective and universal but

Issues in science one chooses to investigate, processes that are put in place can be influenced by cultural or gender background!

Women contributions are at times really unique!

Aditi Gupta – Founder & Creator of Menstrupedia:



Aditi and Tuhin received ₹50 lakh at 20% equity from Namita Thapar (CEO of Emcure Pharmaceuticals) for their start-up

Many avenues!

Many paths for women entrepreneurs

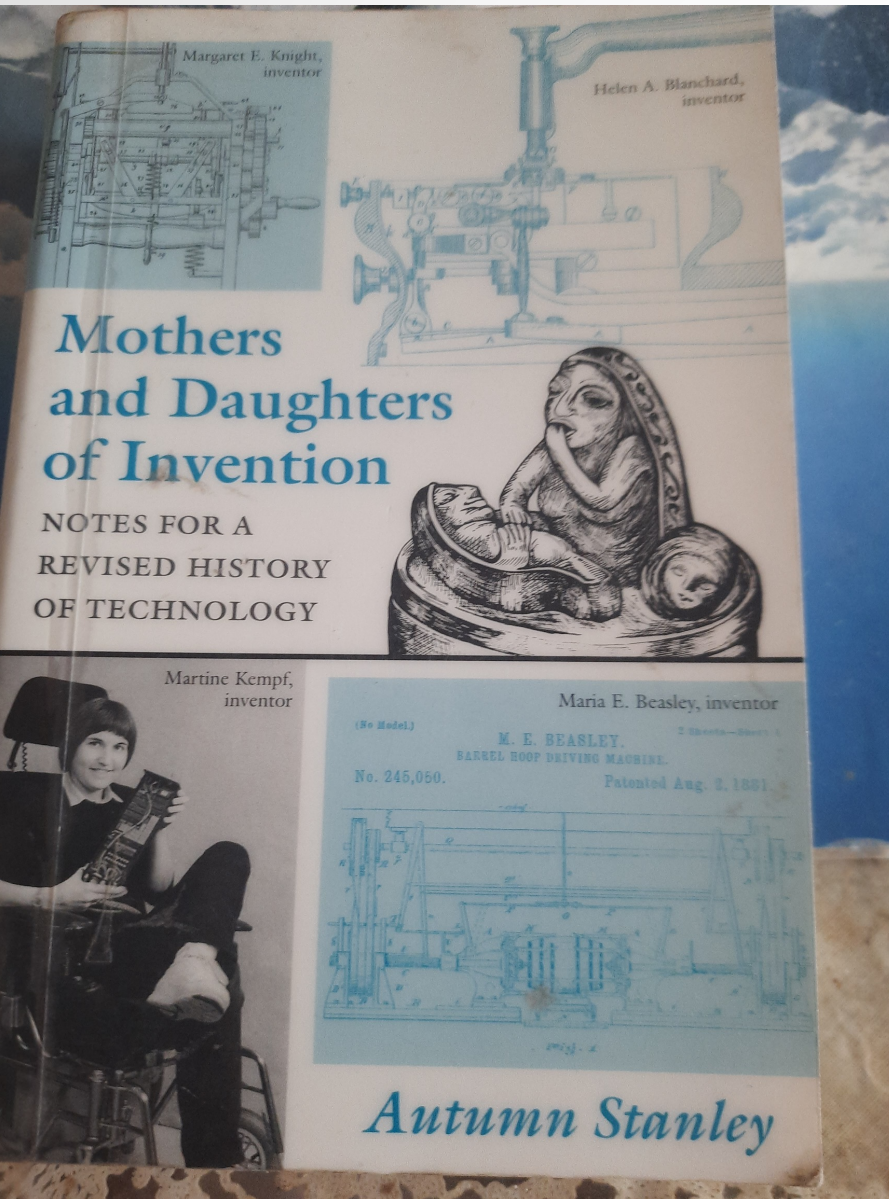
1) Agriculture and related technology

2) Medicine and health
(Kiran Mazumdar Shaw)

3) Fertility and antifertility
(our own Indira Hinduja)

4) Tools and Machines (phase contrast microscope: Carline Bleeker)

5) Computers and related technology
(Ada Lovelace) (Suchi Mukherjee)



Grandmother of them all!

A wonderful book by Gangaben Yagnik published in 1898

Compilation of about 2080 trades, skills and household tips for self-employment. It includes the information on methods of preparation of traditional medicines; such as for bites, eyes and ears; on Metallurgy as well as on indigenous cottage industries such as soaps, paper, perfumes, hair oil, artificial pearls, herbal colours, detergent, tooth powder.....,

Training in Science adds to the ways and means women can be entrepreneurs , become financially independent, add to the development of society, increase impact of science

Current story in entrepreneurship!

According to Forbes India, over 20% of MSMEs are owned by women entrepreneurs in India which amounts to 23.3% of the labor force.

The number is rising at a much faster pace with 50% of India's start-up ecosystem empowered by women in some or another way.

All the major research and teaching institutes are investing in incubation centres..so the possibilities are endless

Is it smooth sailing for women entrepreneurs compared to women scientists?

Current story in women entrepreneurship!

Obstacles similar to those faced by women traversing the paths in science..

The rewards of increasing this participation to the society are considerable

₹79.92 *Price at which banks sell

Challenges women face while starting a business

Their empowerment could transform India's economic and social trajectory

AMITESH SAHU

The Master Card Index of Women Entrepreneurs states that only seven out of every 100 business enterprises are directly owned or run by women. Unlocking female entrepreneurship in India is a complex endeavour, but it offers an unprecedented opportunity to change the economic and social trajectory of India for future generations.

Following are the three biggest challenges faced by women-led businesses:

Accessing funds
Money is the fuel for businesses to run smoothly. Women in India struggle to be taken seriously when it comes to accessing funds as they are perceived to be low risk-takers. More often than not their own friends and family do not feel very confident about supporting women's initial entrepreneurial journey. Banks and other financial institutes do not consider women credit-worthy, especially unmarried women who're looking for such opportunities.

A solution is for more female investors to support one another. Women are frequently unaware of most of the financial schemes and assistance programs devised by the government and other high-end institutes, and as a result, they miss out on significant benefits. There is a need for more awareness of what is already available for women in business, rather than them taking the more difficult path due to ignorance.

Lack of industrial knowledge
Even while no formal education is required to open a business, the majority of women nevertheless lack the fundamental knowledge of accounting, purchasing, sales, and competition analysis. This

tise needed to operate a successful business. Despite the gradual dismantling of stereotypes, there remains a general lack of exposure in these fields. STEM (science, technology, engineering, and mathematics) education can help female entrepreneurs bridge the gender gap. Digital literacy has also resulted in a revolution in empowering women to obtain the necessary tools for learning.

Societal bias and male dominance
Despite an increasingly educated population, women having limited access to relevant business and technical skills is a major impediment in scaling and tapping the necessary resources. Hence, the dominance of male counterparts is viewed in almost every field, challenging women's security and mobility. Cases of harassment at workplaces and women not being paid equally as their male counterparts have also been on the rise.

With important law reforms, vigilant law enforcement, and an effective judicial system, the situation can be sufficiently improved to create a safer environment for women attempting to enter entrepreneurial roles. Women are expected to follow typically set gender roles and even halt their business operations due to minimal reasons. Social permission to work can be difficult to obtain because of cultural practices, social beliefs and safety concerns. Hence, society needs to be more supportive and



Invisible and Unconscious Bias

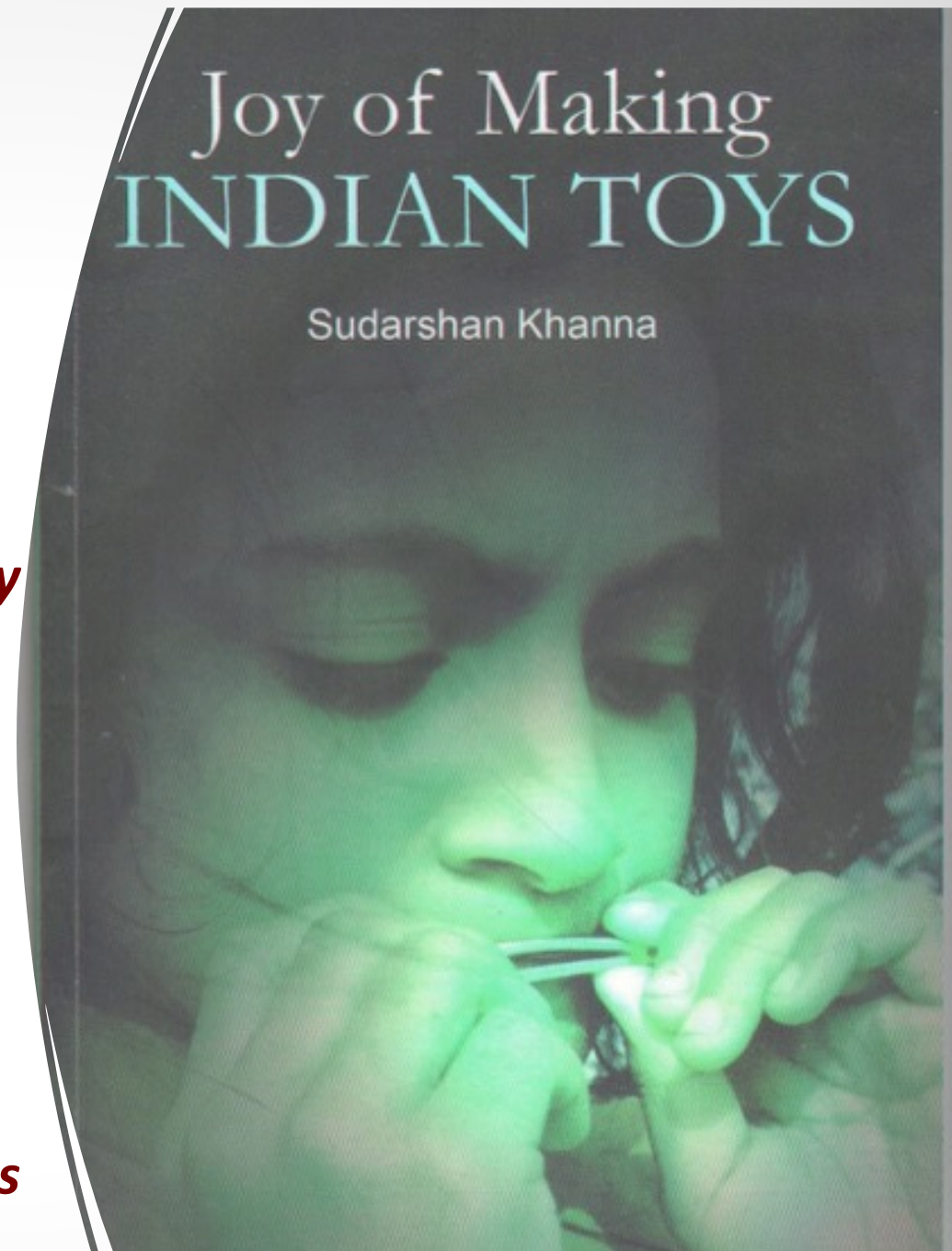
Biases about what women can do and can not do, Biases about what women should do and should not do. **Impacts the mentoring we give to young women!**
Impacts decisions young men and women take!

This can directly impact both the number of women that stay in S&T and what they can achieve

Almost all arise from (lack of) importance attached to women's participation in Science in the eyes of Society and scientists. Proper realisation of this issue can then lead the society/institutions/scientists to plan what they can do to overcome the bias!

Bias is induced unknowingly and starts early!

- *Story of a young girl. Parents definitely did not have any bias in the upbringing of the child. They had only a girl child.*
- *Gave her a book 'Joy of Making Indian Toys' By Sudharshan Khanna*
- *She made only a few of the toys!*
- *When asked 'why'? Her answer was 'I made only those where girls were shown making them!'*



This is the modified cover after the little girl's comment

Invisible and Unconscious bias

In fact ,even Royal Society displays this on their webpage!

A film 'Picture A scientist' brings this out through interviews and conversations. **(Available on Netflix)**

So, in our lives we need to look at the content of the message that we hear in an exchange. It should not be '**coloured**' by our biases about the messenger.

We must '**Introspect** and **autocorrect**' for invisible bias!

STIP-2020?

Science, Technology and Innovation Policy (**STIP**) of India released in January 2021 has taken a big step by having a separate discussion of **E&I**

The discussion cuts across all issues ..previously one had a separate discussion for **gender equity** another for including **those on margins of society** in the march on path of science etc.....

A holistic approach can take towards our aim perhaps faster and better.

Diversity and Science

Equity and Inclusion in STIP-2020.

The policy provides renewed impetus to the mainstreaming of equity and inclusion within the STI ecosystem. An India-centric Equity & Inclusion (E&I) charter will be developed for tackling all forms of discrimination, exclusions and inequalities in STI leading to the development of an **institutional** mechanism.

Last word

The path to go to a situation when we will just speak of scientists/engineers and not their gender, surprisingly, goes through the path of being very aware of the same for a while!
(R.G. Current Science Editorial)

*All of us, individuals, society, and the governments
need to work towards this*