



Dual-Use Technology & Science in India's Foreign Policy

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New Millennium Perspectives

> “..Repositioning of India in regional and world affairs”

> *PM during his visit to the US, September, 2K*

> “There is a growing trend of international collaboration in research and development... We should take full advantage of this.

For this reason, I have placed science and technology at the forefront of our diplomatic engagement.”

> *PM in his address to the Indian Science Congress, Mumbai, January, 2015*

Geopolitical re-positioning

‘Repositioning’ is possible only if a significant part of India’s T&S, and related military capabilities, are grown and shaped to be globally deployable as instruments of India’s Foreign Policy so as to be:

- > One of the non-carbon energy pioneers with co-responsibilities for global climate stewardship
- > One of the nuclear weapons 8 (15?), until abolition
- > One of the Space Security steward-members of MTCR (Note: China has not been admitted into MTCR)
- > One of the P (7-9?) of the UNSC with global co-responsibilities for international peace and security

A morphological distinction

Needs to be recognised as between:

- > **International collaborations** in scientific and technological fields,
and
- > **S&T in Foreign Policy**: When the findings of science, or use of technology may have ramifications for international relations beyond the 'S' or 'T' themselves, then the pursuit of the 'S' or the use/denial-of-use of the 'T' influence – and are influenced by – Foreign Policy.

S&T in diplomatic engagement -I

- > When a *quid pro quo* is negotiated for India in return for India's participation *as a State* using her scientific or other advantages, such as:
 - locational* > UN-sponsored TERLS at the Magnetic Equator;
 - epidemiological* > WHO-sponsored vaccine trials;
 - technological* > contribution in kind of sub-systems; e.g. for ITER in France; mirror actuators for the Thirty Metre Telescope in Hawaii;
 - reciprocal use of facilities* > GMRT (Pune) and Arecibo (Chile)
- > Non-reciprocal offers of unique Indian facilities, e.g. Infra-red telescope in Ladakh > Soft power

S&T in diplomatic engagement-II

> Excellent relations with Mauritius enabled placement there in the late 70s of a satellite tracking station essential for our Space programme.

> But an instance of a dual-use S&T engagement with *later* adverse diplomatic consequences was in the nuclear field

++ 1960, CIRUS reactor was built with Canadian assistance while the United States provided the initial supply of heavy water

Science-in-diplomacy

- > As human threats to the global commons become ever-more severe, global diplomatic negotiations over treaty-based national actions to mitigate them become increasingly underpinned by a common trans-national appreciation of the underlying science.

Two hardly-known Indian traces to international science-informed diplomatic negotiations

- > Kothari report on the Effects of Nuclear Explosions
 - >> LTBT
- > Kulkarni-Ramanathan (late 1940s) work on the vertical transport of Ozone in the atmosphere > Ozone-CFC chemistry >> Montreal Protocol

Dual-Use Technology Engagement

... has traversed from India being a targeted discriminatee: 1974 N-test > NSG; 1987-ASLV > MTCR; 1998 N-tests > 'Entities List'; to being a participant-discriminator > MTCR member in 2016

- > Since 1993, regulations periodically notified listing 'dual-use' and military materials and technologies whose export from India is controlled in ways designed to advance India's Foreign Policy goals through trade in such technologies
- > Indian Export Control evolution over two decades: 1993 > 2000 CWC Act > 2005 UNSCR 1540 WMD Act > 2013 selective concordance with regime-lists
- > By 2014: Wide extant-member support for India's membership of dual-use technology control regimes

Science 're-balance' to Asia?

“A fundamental shift is taking place in the geography of science. Networks of research collaboration are expanding in every region of the globe. The established *science superpowers* of the United States and Europe have dominated the research world since 1945. Yet this *Atlantic axis* is unlikely to be the main focus of research by 2045, or perhaps even by 2020”

Data-supported article in Nature 18 October 2012.

*[Note use of **these** expressions]*

The Confluence

- > As India enlarges her “scientific presence” in more fields of S&T, more entities from more countries with similar “scientific presences” will seek to collaborate with her State and non-State institutions. And conversely.
- > As India’s dual-use technological capabilities diversify; as the underlying sciences themselves become dual-capable -- e.g. synthetic biology – increasing proportions of the implications of these collaborations will lie at the confluence of
T&S, Foreign Policy and National Security

Thank You