Science, Technology and Innovation: Imperatives for Socio-Economic Development

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Pakistan---An Exciting Beginning !!

- My appointment as Federal Minister of Science & Technology (2000) and Chairman Higher Education Commission (2002-2008)

- 6000% Increase in Development Budget of Science Ministry and 2400% increase in Dev. Budget of Higher Education

- ***HEC an autonomous body reporting to PM***

- ***Challenges: Quality, Access, Relevance***

Challenge: How do we attract our brightest to Education/Research ?

- ***Pakistan has 85 million below age 19 (54% of population) !***
- *Select and train the Brightest in top universities abroad*
- *Attract them back*--- by creating an enabling environment :
- Salaries
- Research Funding
- Access to Literature/ Instrumentation
- Critical Mass—create clusters !

Attracting the Brightest !

- ***Dramatic Change in Salary Structures/Benefits***

  Under new "Tenure Track" system salaries of Professors raised to over US $ 5,000 per month (equal to US$ 7,000 per month after tax concessions)---five times more than Federal Ministers in Government !

Performance based system

75% Tax waiver for University Teachers (maximum 5%)

- ***Massive Foreign scholarship programs***
  - **Nearly 11,000 awarded (mostly for Europe)**
  - **Each returning scholar given access to $ 100,000 research fund with guaranteed jobs at excellent salaries on tenure track system**
  - ***About US$ 1 Billion being spent on Foreign Scholarships (1500 in IT)***

Emphasis on Quality/International Linkages

- QUALITY ASSURANCE SYSTEMS

  Quality Assurance Cells

  External Peer Review

  Tougher Criteria for PhD Thesis evaluation and Faculty Promotion

Linkages with Foreign Universities: 35
Linkages with British Universities

UNIVERSITY RANKINGS

Digital Library / Video-Conferencing

- *Pakistan Educational Research Network (PERN)*
- *E-Journals/E-Books:* 25,000 full text journals and 60,000 books
- PAKSAT-1 (Educational Satellite)
- Video-Conferencing: 1500 lectures delivered (USA/Europe/Australia etc)

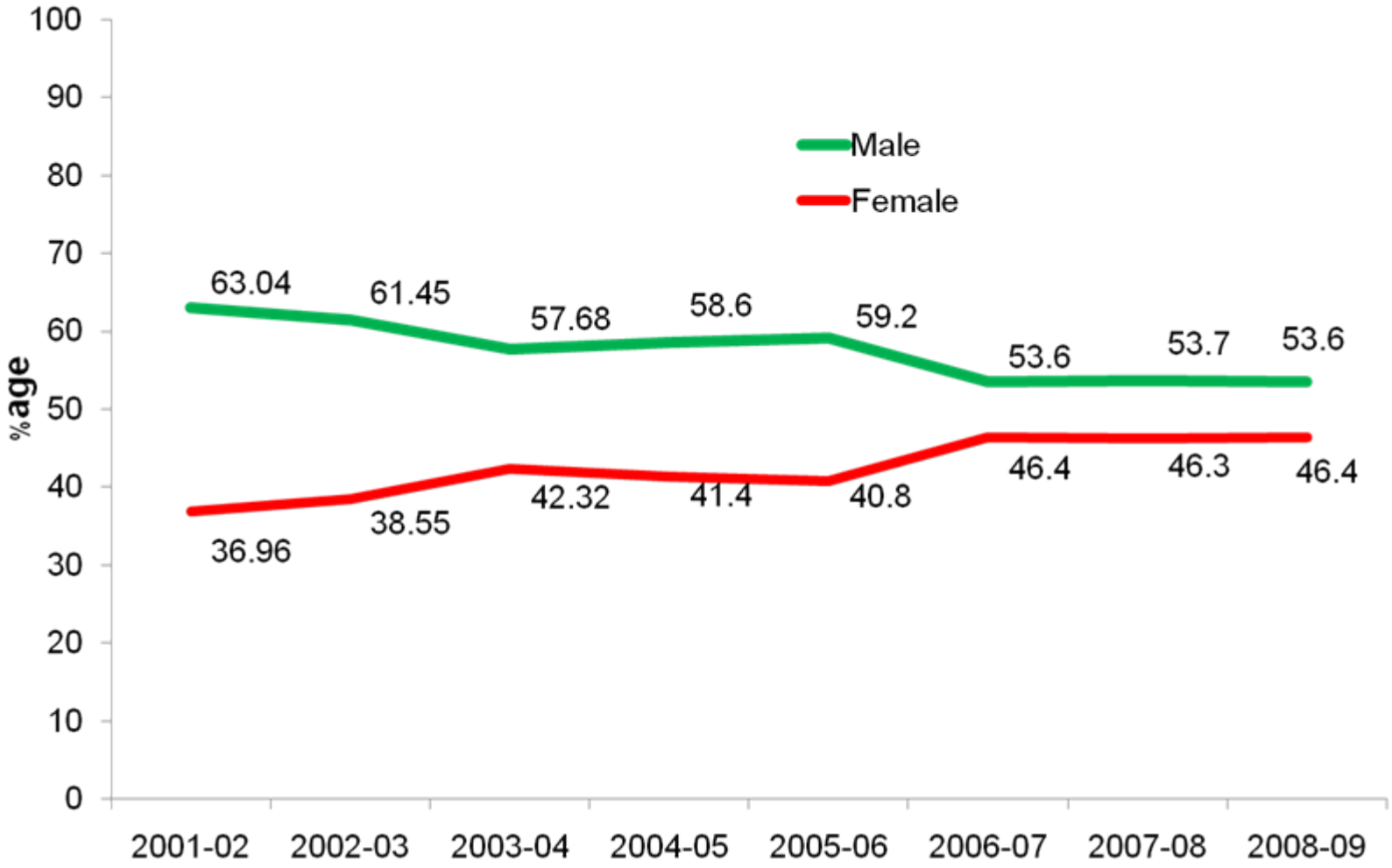
“A Silent Revolution” (World Bank)

- 1947-2003 : 270,000 university students
  2010 : 810,000 university students

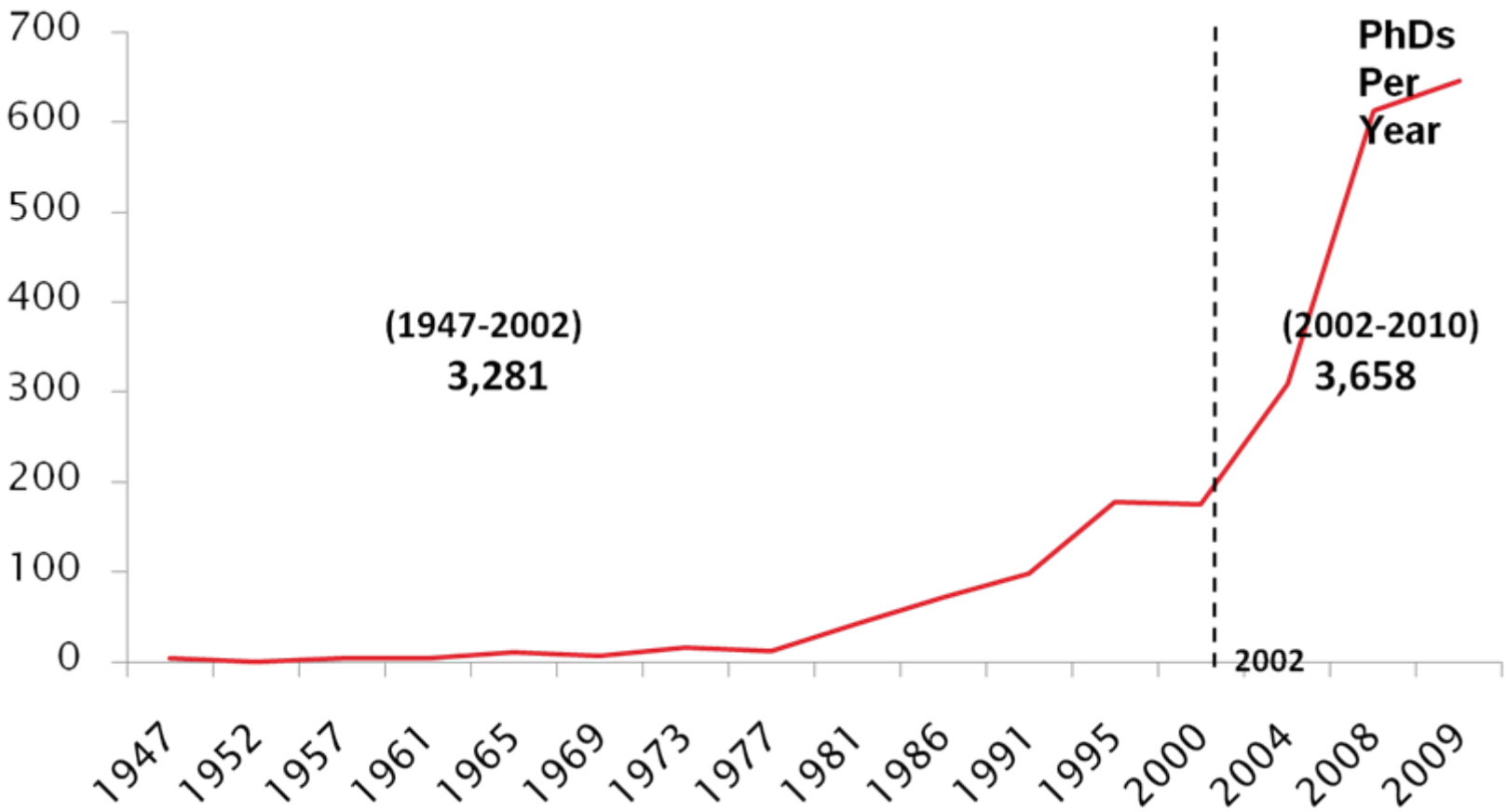
- No. of Public Sector Universities / Degree Awarding Institutes :
- 59 in 2000
- 137 in 2011

- **Higher Education Times, UK Rankings**
- **Several Pakistani universities ranked among the top 500 universities of the World -- In Natural Sciences**

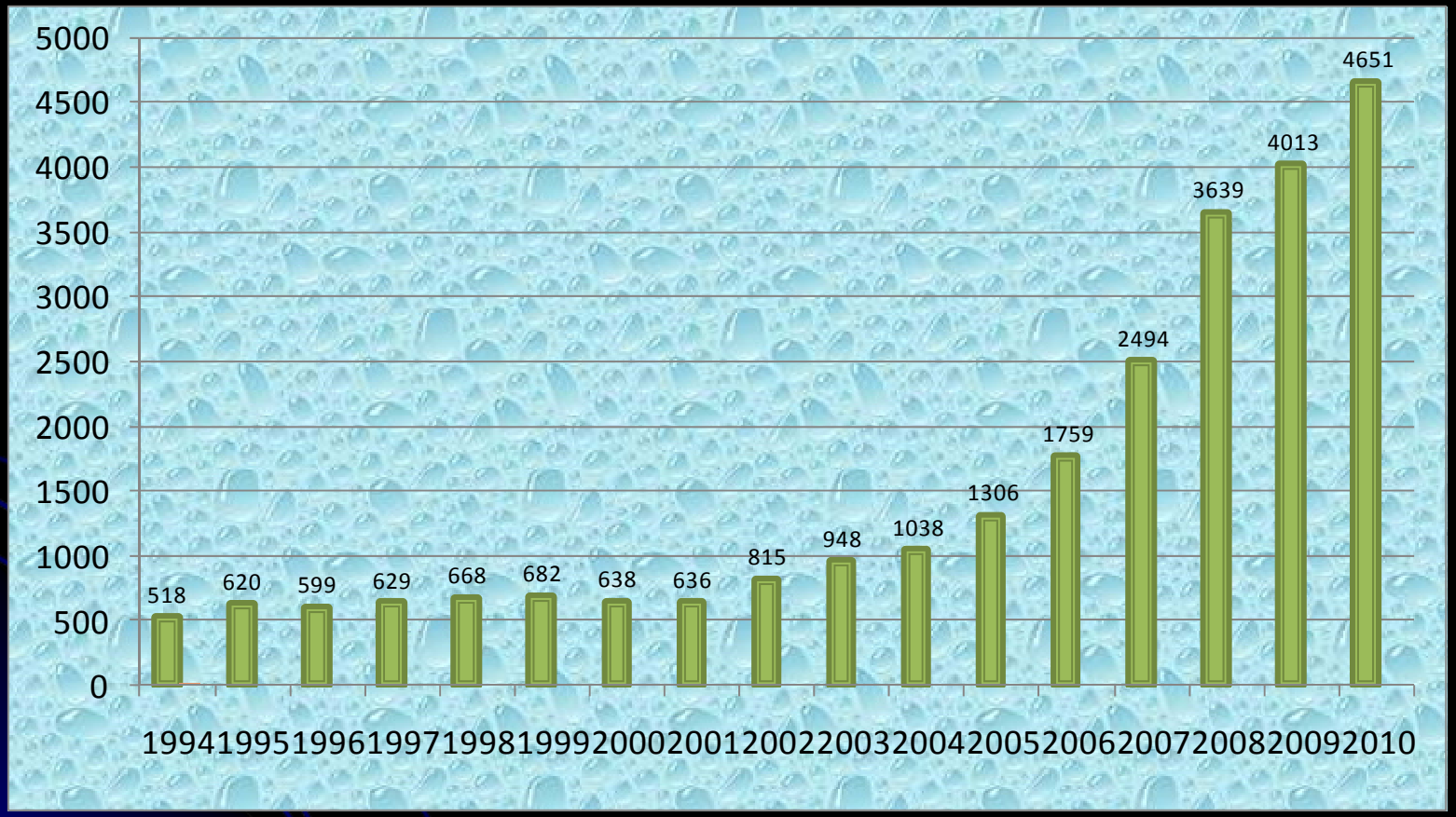
Gender-wise Enrollment in Higher Education Institutions



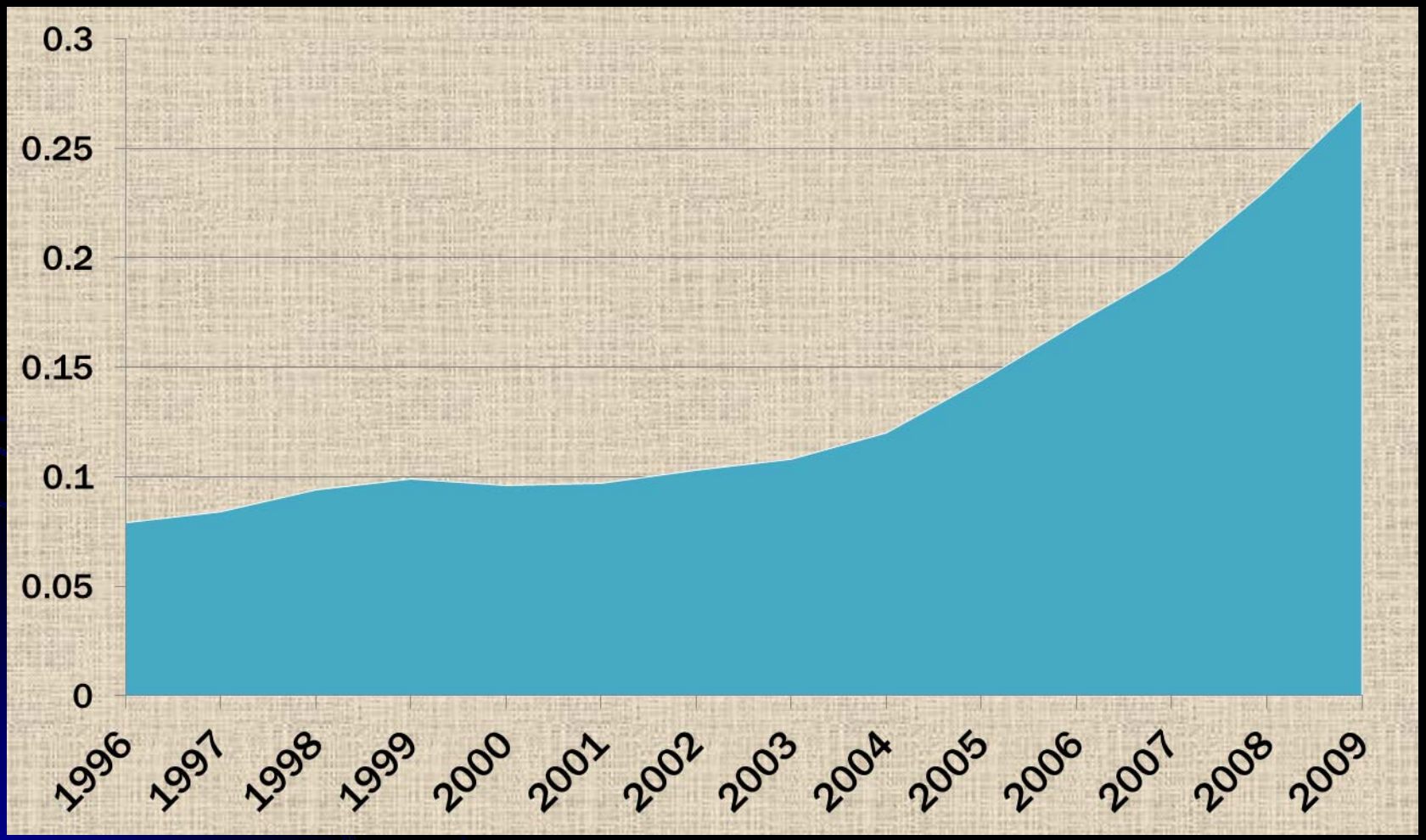
Year-wise PhDs Produced



Research (Impact factor journal) Output



Pakistan's Share of World Articles



Pakistan's Knowledge Economy Roadmap

Cabinet entrusted me to **"Prepare a comprehensive National Development Plan focusing on Medium and Long Term Measures aimed at boosting Agricultural and Industrial Production in the country." (19-11-2003)**

Detailed sector-wise Study undertaken

- **Roadmap Approved by Cabinet August 2007:**

  Links Higher Education with Development

Promoting Innovation/Entrepreneurship

- Offices of Research, Innovation, and Commercialization (10 established, 20 more under establishment

- Five B & T Incubators are currently established in 5 universities

- University-Industry Linkages

Glowing International Reviews--

- World Bank
- USAID
- British Council

- "*Nature*"--27th November 2007---- "The Paradox of Pakistan"
- "*Nature*" --28th August 2008--- "After Musharraf"
- "*Nature*"--- 3rd September 2009
- "*Nature*" --- 22nd September 2010

Indian Govt. Worried --- Presentation to Indian PM

"Pak threat to Indian science" --- Hindustan Times

Neha Mehta

New Delhi, July 23, 2006

"*Pakistan may soon join China in giving India serious competition in science."*

Unquote

Historic Meeting: Presidents of Pakistan and Indian Science Academies – Science building bridges