

Session 2:

Issues and options for enhancing the international mobility of researchers

In, Into, or Out of India?:

**The Mobility of the
Finished and Semi-finished
Human Capital**

By

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- Indians **'in'** India
- Indians **'out'** of India
- On Mobility **Back 'into'** India
- **Typologies and Trade-offs** in the **Return** of Researchers
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Size of HRSTO in India

- 7 million in 1981 –
3.1% of all workers
- 10 m a decade later in 1991 –
3.6%
- 27 m well into 21st century, in 2004 –
7.3%

Growth Rate of HRSTO

- 1981 – 1991: annual growth of 3.7 %
- 1991 – 2004: annual growth of 7.7%

However

- In 2004, only **one-third** (35.2 %) of HRSTE was pursuing an S&T occupation (considered as “**core-HRST**”)
- of which R is a tiny subset
- Thus, close to **two-thirds** of HRSTE are outside the domain of R.

On the Flip Side

- Only 35 % in HRST **jobholders** have S&T **edn**
- 1981: 43 % **HRSTE** were also **HRSTO**
(**core HRST**)
- 1991: this ratio fell to 34.8%
AND
- 2004: only marginal rise to 35.2 %

IN SHORT

- India's work force that does **not** have
 - either a diploma or a graduate degree, i.e., the **non-HRSTE** work force is currently

estimated at around **327 million**

- i.e., 89 % of the country's work force
 - has an educational qualification
 - of **only** high school **or below**.

Table 1: Indian's Graduate Pool, 2003-04

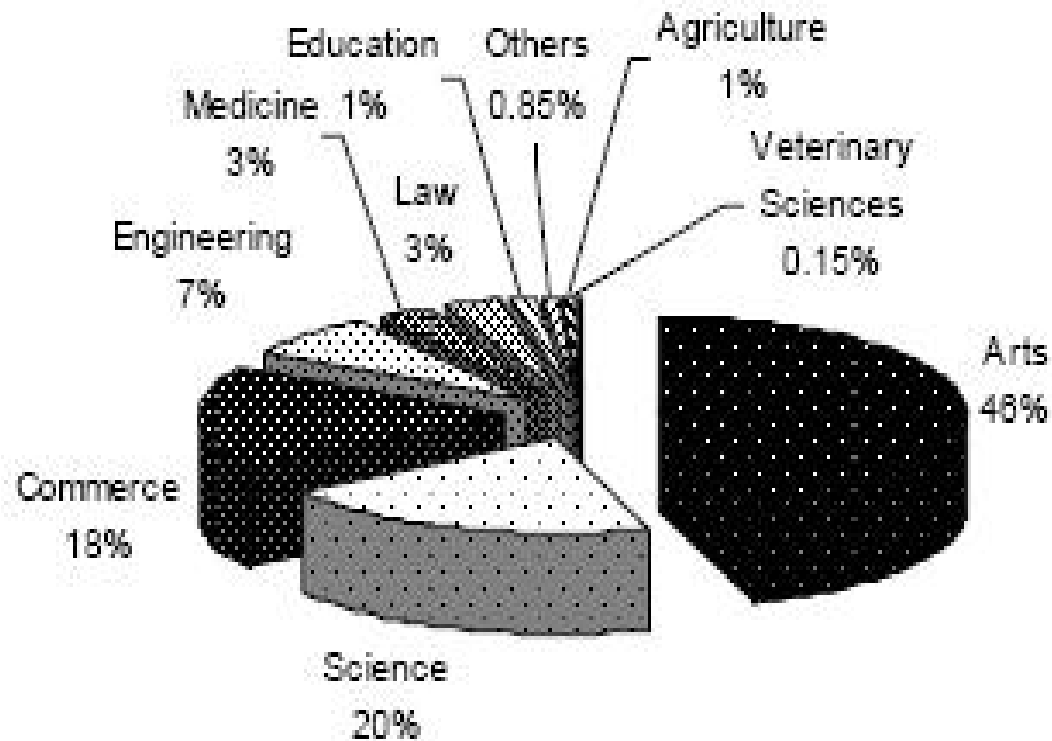
	Engineering Degree Holders	Engineering Diploma Holders	Arts Degree Holders	Science Degree Holders	Commerce Degree Holders	All Graduates
Stock 2003	1,200,000	1,750,000	11,500,000	4,985,000	5,933,000	21,986,000
Out-turn 2004 estimate	155,000	130,000	1,150,000	540,000	480,000	2,460,000

Table 2: Ph. D. Degrees Awarded in India.

Subject	1982-83	1988-89	1990-91	1991-92	1993-94	1999-2000	2000-01	2002-03	2003-04
<i>Science</i>	2,893	3,044	2,950	3,386	3,504	3,885	3,734	4,976	5,408
<i>Engineering</i>	511	586	620	620	348	723	739	833	908

Higher Education

Subject-wise enrolments 2004-2005



In India

- Unfortunately,
huge shortfall in trained manpower is expected,

particularly due to **non-suitability** of large proportion of the graduates for the jobs available.
- Thus, India faces a **paradox** –

high rate of **graduate unemployment**
Of the total unemployed population of 44.5 million, unemployed graduates are 4.8 million (Census of India, 2001).

co-existing with **huge skill shortages**.
Nearly 40% of the graduates are not productively employed.

NASSCOM (2005a, 2005b)

- NASSCOM estimate is that by 2010:

Two industries - IT and BPO - would need

1 million additional workforce

near five Tier-I cities, viz.,

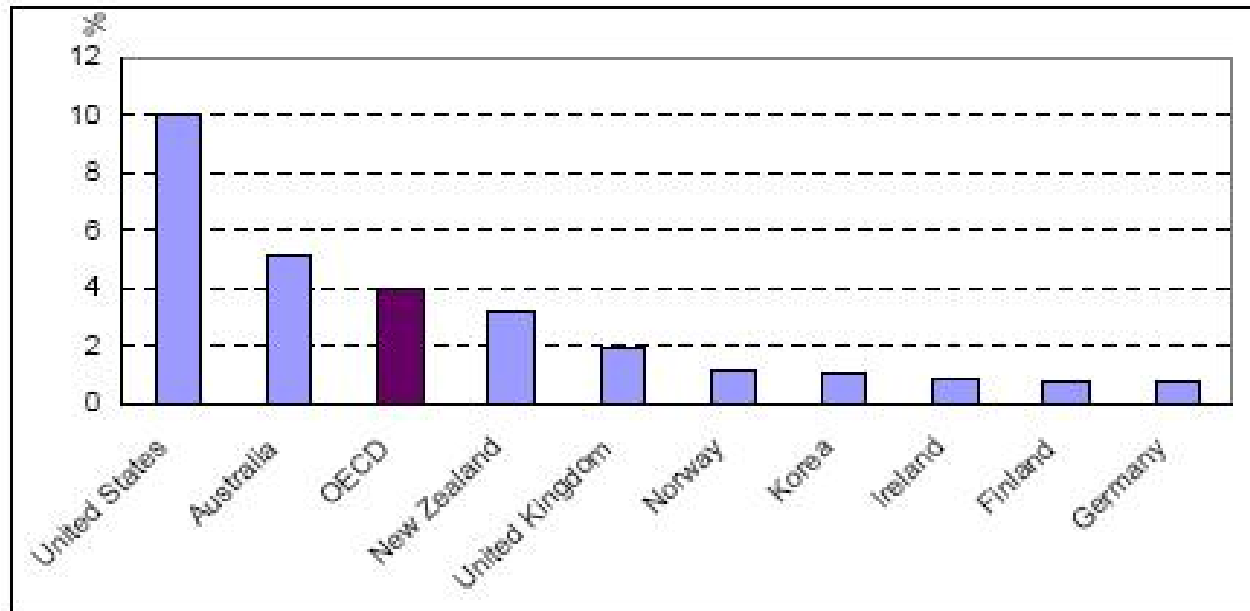
New Delhi, Bangalore, Hyderabad, Chennai and Mumbai,

and

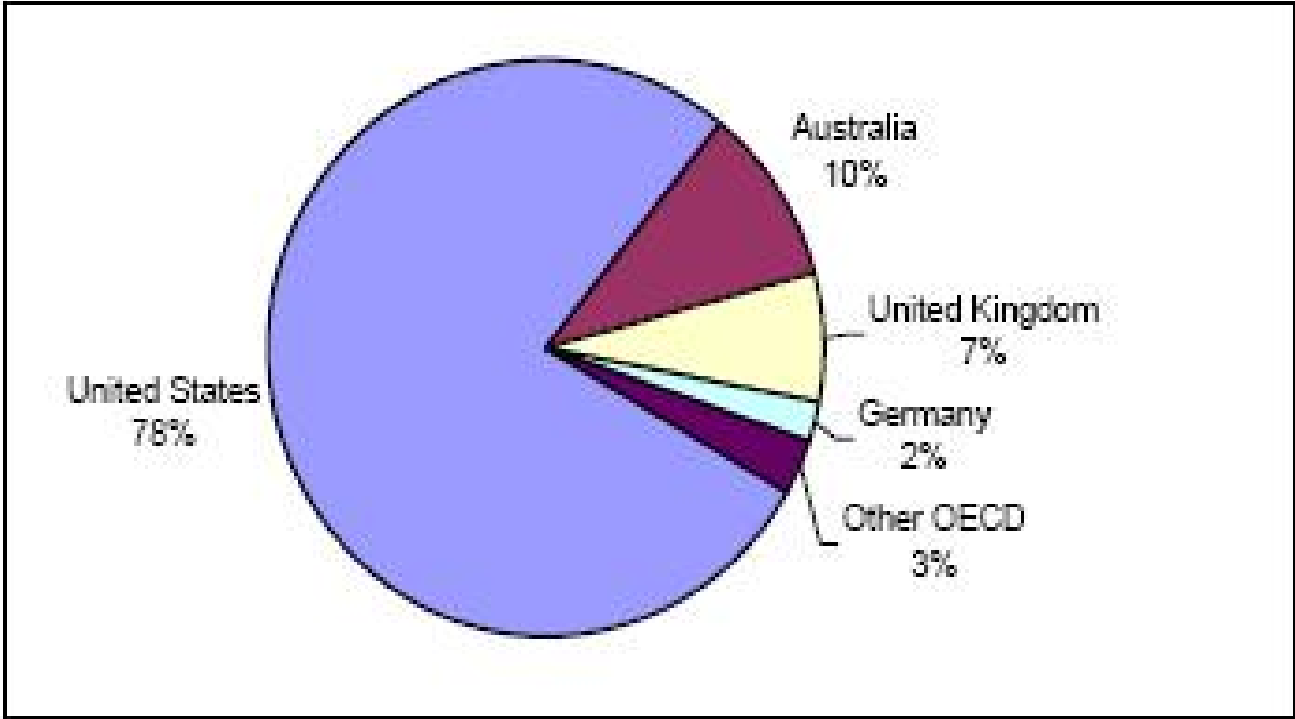
600,000 workers across other towns in India

(Economic Times 17 Dec, 2005).

Indian students as a percentage of all foreign students, by select OECD country, 2001



Distribution of Indian tertiary students in receiving OECD countries, 2001



Foreign graduate applicants up last fall

International applications to U.S. graduate schools significantly increased in India and China — the two top source countries for foreign graduate students.

Percentage change of international graduate applications



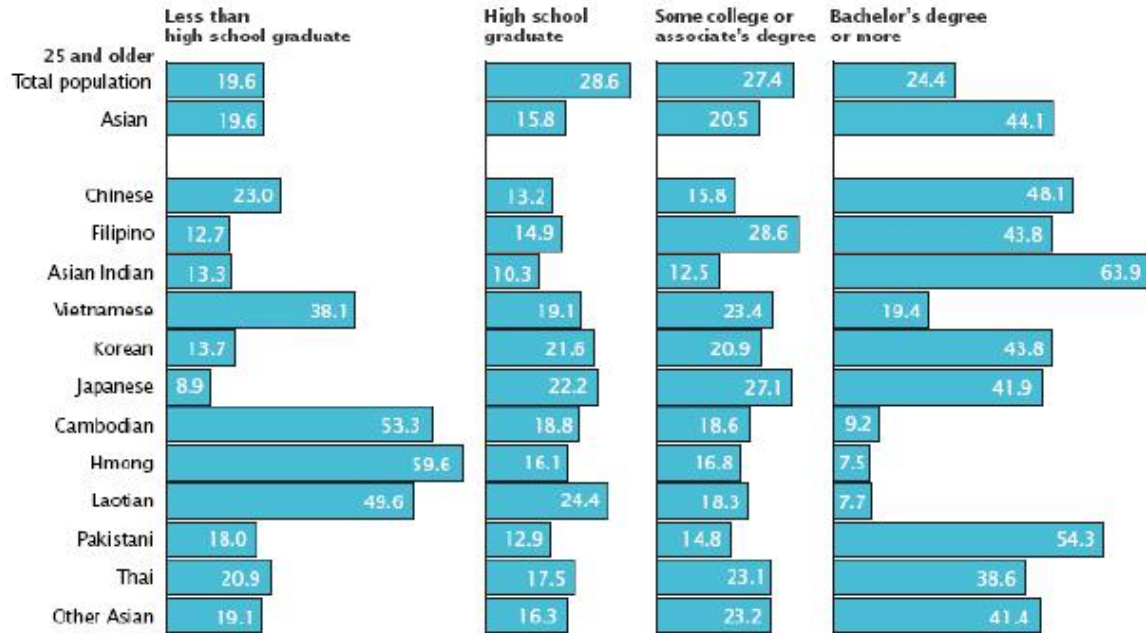
* Bahrain, Cyprus, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Palestinian Authority, Qatar, Saudi Arabia, Syria, Turkey, United Arab Emirates, Yemen

AP

Source: Hindustan Times, New Delhi, 26 March, 2006

Educational Attainment: 2000

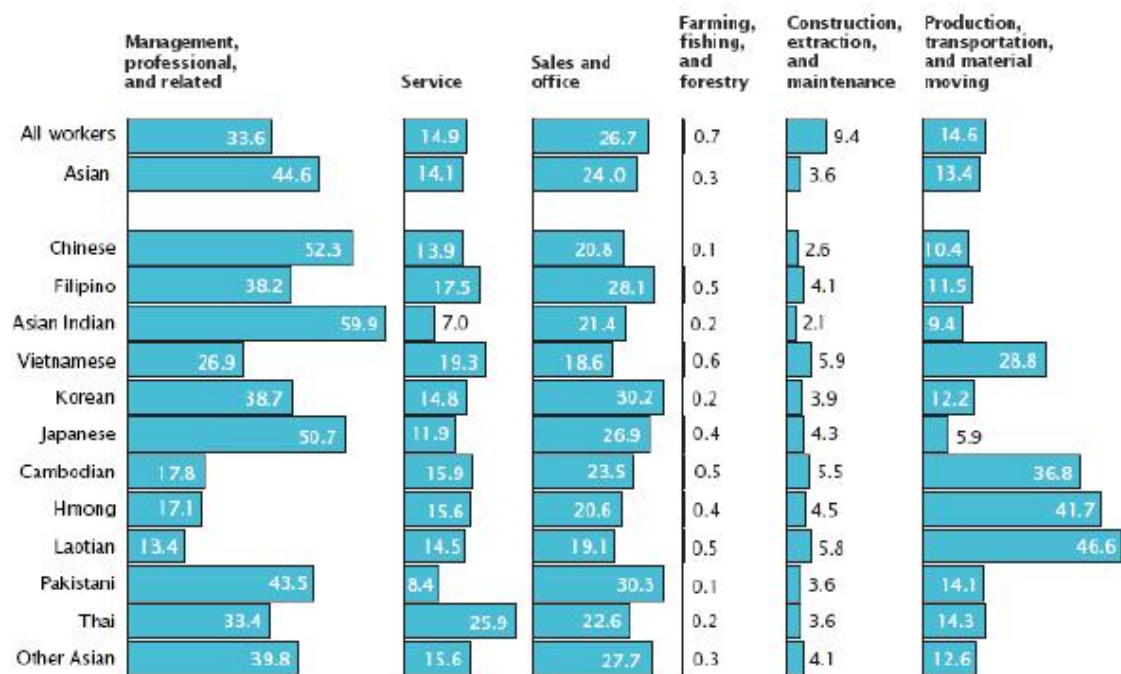
(Percent distribution of population 25 and older. Data based on sample. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see www.census.gov/prod/cen2000/doc/sf4.pdf)



Source: U.S. Census Bureau, Census 2000 special tabulation.

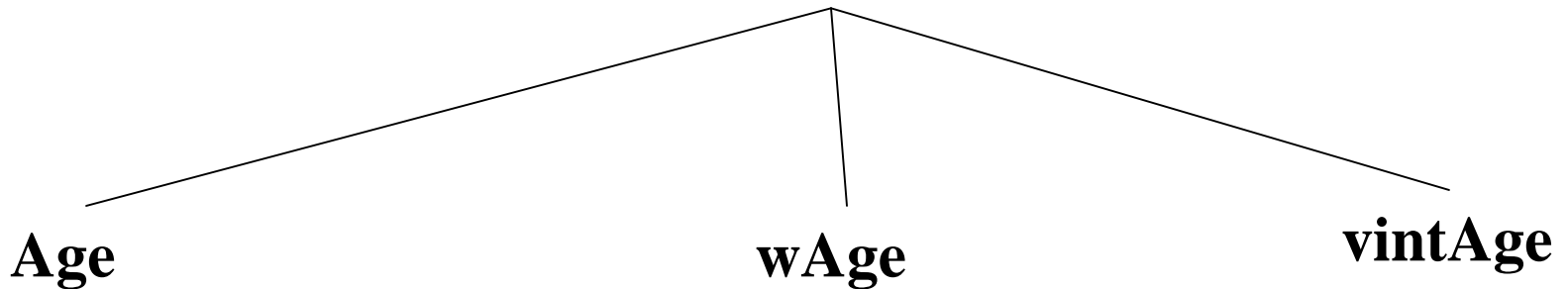
Occupation: 2000

(Percent distribution of employed civilian population 16 and older. Data based on sample. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see www.census.gov/prod/cen2000/doc/sf4.pdf)



Source: U.S. Census Bureau, Census 2000 special tabulation.

1. Temporary / circulatory / return migration replaces individual immigrants but **size of immigrant community grows.**
2. Individual immigrant families become nomadic due to “forced” circulatory migration. (**Painful**)
3. Receiving countries find it **Gainful** on two counts:
 - a. Safety-valve
 - b. Low-cost **labour replacement** for advantages of :



GHANDU



The Hindustan Times, New Delhi, Nov., 1989

India's brain drain is affecting space and defence research

Panel recommends raising retirement age to stem loss to private sector

NEW DELHI

INDIA'S best engineers are abandoning government space and defence research work for better salaries and projects in the private sector, sparking a

recruitment crisis, a report said.

"We are alarmed. We must find a solution," Mr C.N.R. Rao, the head of the prime minister's research panel, told the Hindustan Times newspaper.

Mr Rao said that eight of his doctorate students went to General Electric alone this year to accept offers that promised better access to cutting-edge research and higher salaries.

"The rate of attrition has hovered around 7 to 8 per

cent" for the past several years, said G. Madhavan Nair, chairman of the Indian Space Research Organisation, which plans to send an unmanned mission to the moon by the end of the decade.

The report published on Monday said young professionals with advanced software and engineering skills at private companies in India can easily earn more than double the US\$670 (S\$1,030) a month salary paid at top government-run research institutes.

The panel, which sent a report on the issue to Prime Minister Manmohan Singh this month, recommended raising the retirement age of 60 as a first step to stem the crisis.

"Highly qualified people, if they are physically and mentally fit, should not retire at 60," Mr Rao said.

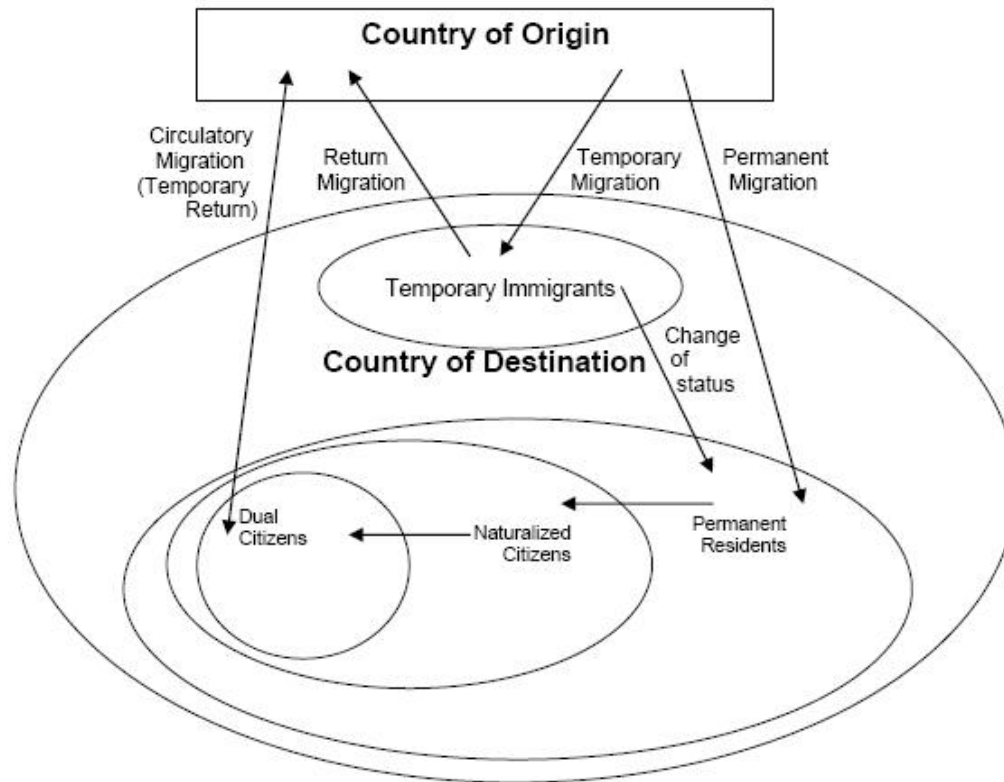
He noted that in Japan the retirement age was first raised to 65, and later to 75 years.

The problem has been aggravated by the ban on recruitment at science and technology centres, introduced in the late 1980s when the economy was in bad shape, which has led to a serious shortage of middle-level scientists, The Hindustan report said.

Overseas firms are forecast to spend as much as US\$225 billion to outsource engineering and software services to India by 2020, according to a report by the National Association of Software and Service Companies.

AGENCE FRANCE-PRESSE

**The Cycle of Migration for Development, by
Dual Citizenship-induced Circulatory Migration and Temporary Return**



Source: Conceived and drawn by the author.

Thank You