

International Competition for S&E Students and Workers: An Evaluation of Trends and Policies in India and Southeast Asia

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- Introduction

INDIA

1. Indian Migration to the US: The 20th Century, Pre- 9/11 Trends
2. The Profile of Indian Diaspora in the United States
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INDIA (cont'd)

4. India's S&E Human Capital: Stocks By Qualification and Occupation
5. Enrolments in Indian Higher Education: The Semi-finished Human Capital in S&E
6. Analysis of Indian Demand for S&E Education in India vis-a-vis Abroad
7. Analysis of Forces behind Demand for S&E Professionals in India
8. Analysis of India's Diaspora Policy
9. Policy Changes in India and the World: Lessons to Be Learnt

SOUTHEAST ASIA

1. The Context
2. Flow of SEA Students to the US
3. Worker Immigration from SEA Countries in the US
4. Policies in SEA Countries

CONCLUSION

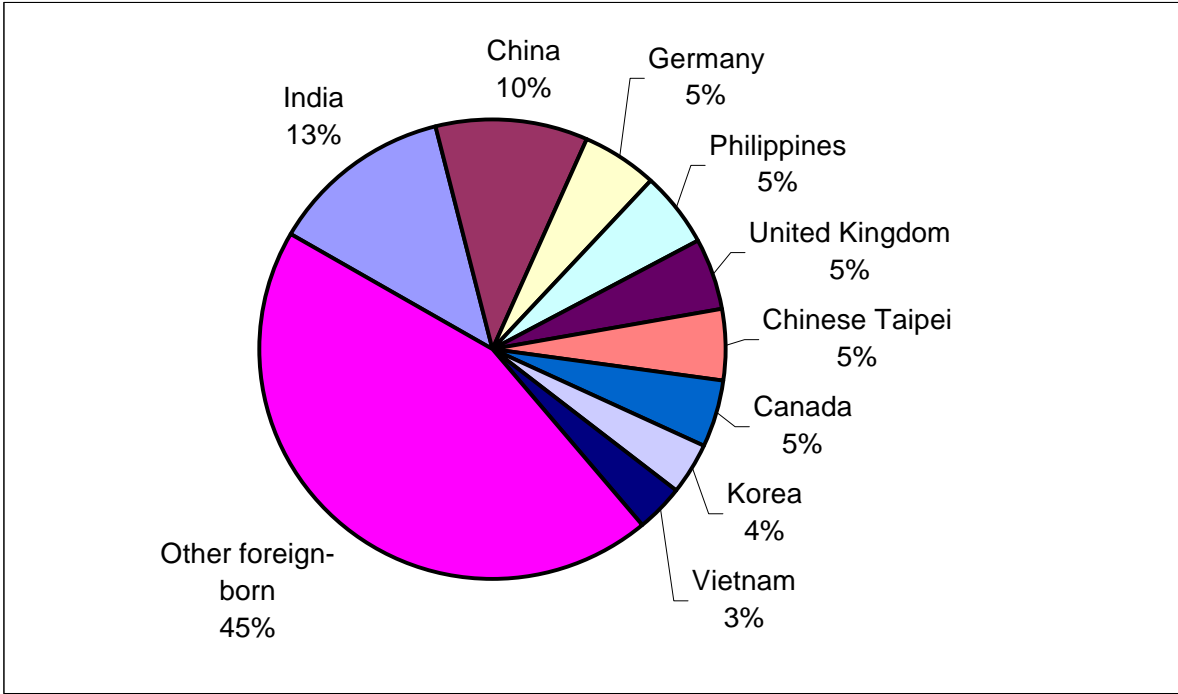
Courtesy of the Library of Congress.



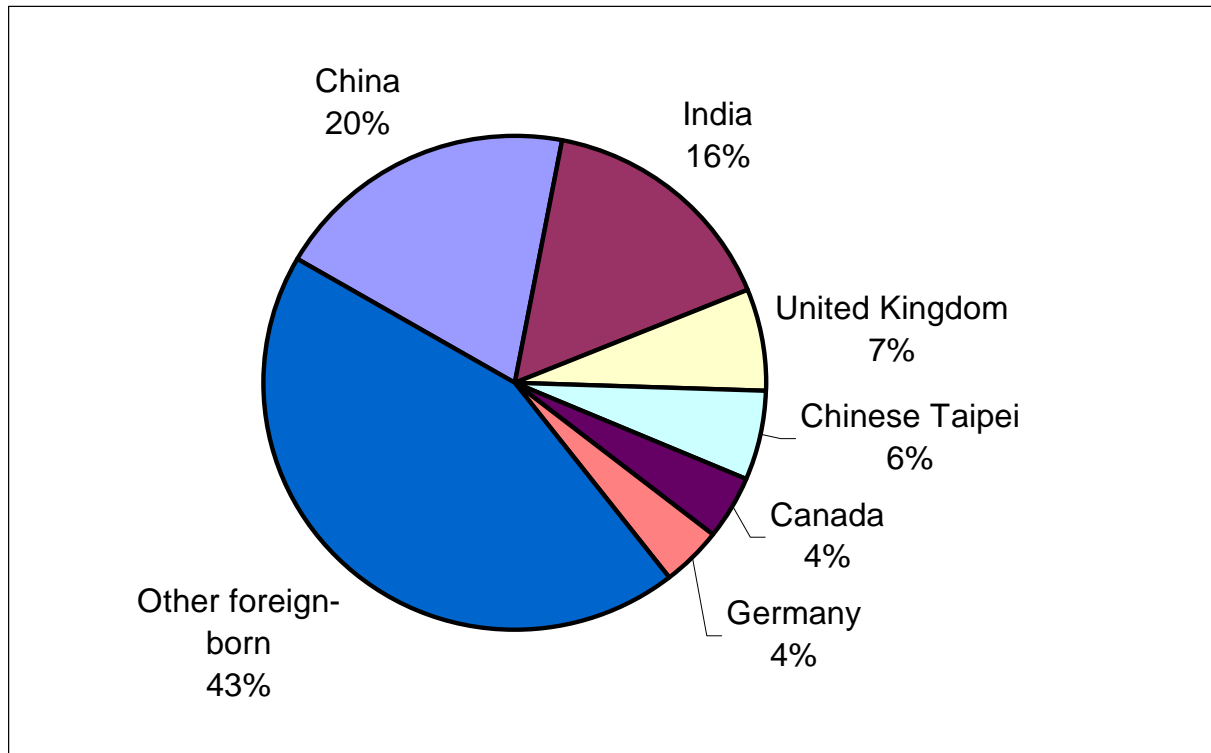
Indian immigrants' shares: Trend of Flows in US

| Pre-9/11 | 1999 (INS) | | | 2000 (INS) | | | 2001 (INS) | | |
|---------------|-------------------|------------|---------|-------------------|------------|---------|-------------------|------------|---------|
| | No. | %of Indian | %of all | No. | %of Indian | %of all | No. | %of Indian | %of all |
| All immig | 30237 | 100.0 | 4.7 | 42046 | 100.0 | 4.9 | 70290 | 100.0 | 6.6 |
| All occup | 8016 | 26.5 | 5.7 | 13724 | 32.7 | 7.2 | 27073 | 38.5 | 11.3 |
| Exec/adm/mgr | 1112 | 3.7 | 7.1 | 1644 | 3.9 | 7.9 | 3062 | 4.3 | 11.1 |
| Prfesnl/ tech | 3492 | 11.6 | 9.4 | 8632 | 20.6 | 14.7 | 19935 | 28.4 | 23.8 |
| Post 9/11 | 2002 (DHS) | | | 2003 (DHS) | | | 2004 (DHS) | | |
| All immig | 71105 | 100.0 | 6.7 | 50372 | 100.0 | 7.1 | 70116 | 100.0 | 7.4 |
| All occup | 42885 | 60.3 | 34.5 | 20560 | 40.8 | 25.0 | 38443 | 54.8 | 24.7 |
| Exec/adm/mgr | All World [29277] | | | All World [22295] | | | All World [31689] | | |
| Prfesnl/ tech | All World [79370] | | | All World [46495] | | | All World [73862] | | |

India-born US Residents holding S&E Degrees, 1999 Stock



India-born US Residents holding S&E Doctorate Degrees, 1999 Stock



The 20th Century Brain Drain of Graduates from Top Institutions of S&E Education in India

| Indicators | Indian Institute of Technology Bombay, Mumbai | Indian Institute of Technology Madras, Chennai | Indian Institute of Technology Delhi, New Delhi | All India Institute of Medical Sciences, New Delhi |
|---------------------------|--|---|--|---|
| Batches of graduates | 1973-77 | 1964-87 | 1980-90 | 1956-80 |
| Year contacted for survey | 1987 | 1989 | 1992 | 1997 |
| Magnitude of brain drain | 31% | 27% | 23% | 56% |

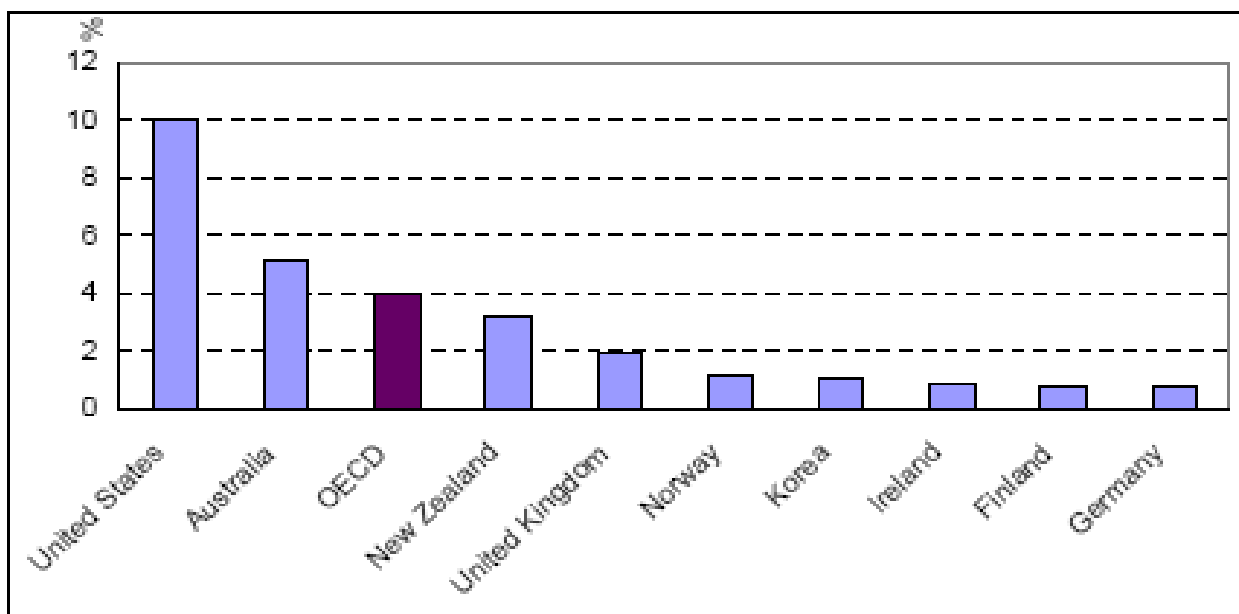
Source: author, using various institution-based surveys sponsored by Department of Science and Technology, Government of India, cited in Khadria (1999a).

**Number of Indian Citizens admitted as non-immigrant workers in the US, by
type of visa**

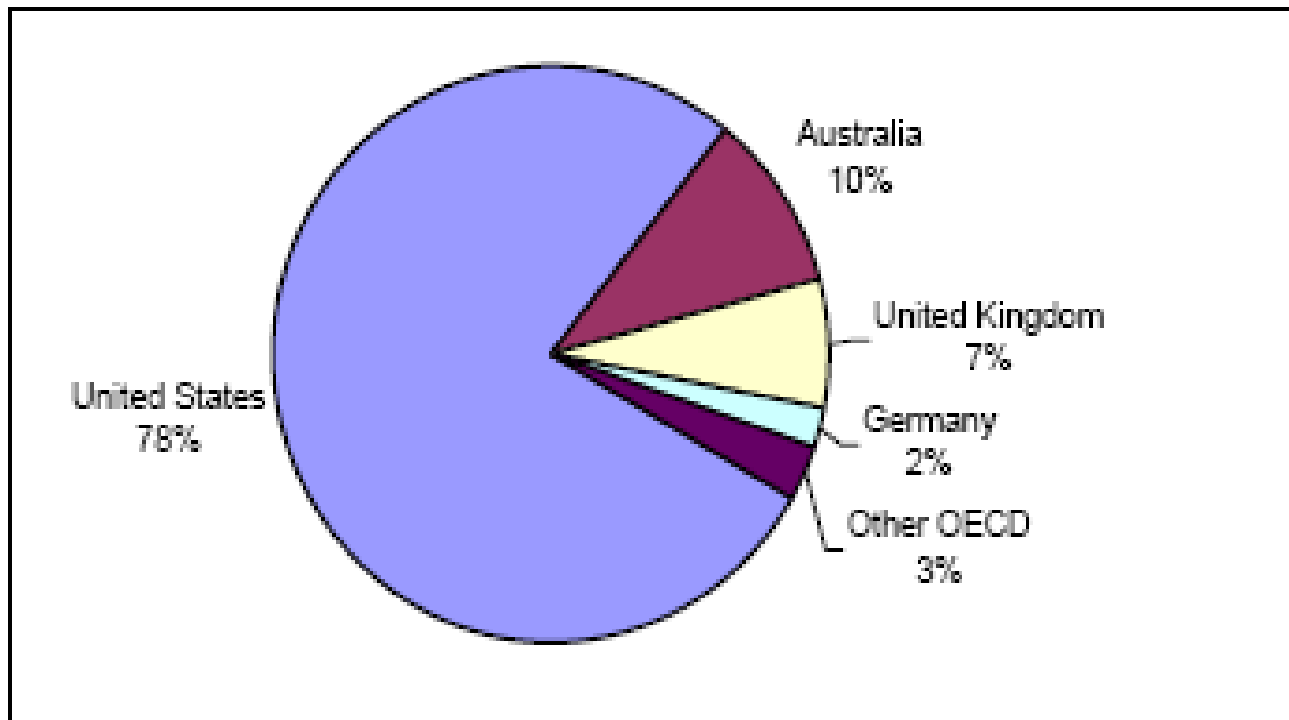
| Country of Citizenship | Registered nurses (H1A) | Workers with specialty occupations (H1B) | Industrial trainees (H3) | Exchange visitors (J1) | Intra- company transferees (L1) | Workers with extraordinary ability (O1) |
|-----------------------------------|--|---|---|---------------------------------------|--|--|
| India (2001) | 166 | 104,543 | 62 | 5,374 | 15,531 | 666 |
| India (2002) | 228 | 81,091 | 96 | 4,866 | 20,413 | 523 |
| India (2003) | 9 | 75,964 | 136 | 4,732 | 21,748 | 9 |

Source: 2003, 2002, 2001 Yearbooks of Immigration Statistics, Office of Immigration Statistics, DHS

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



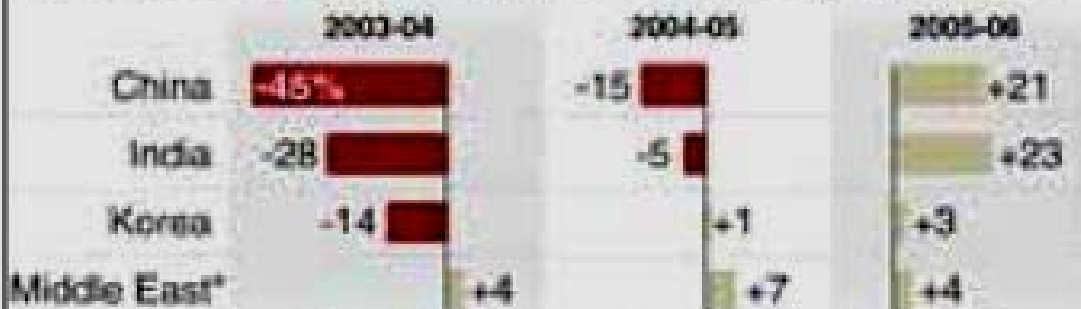
Distribution of Indian tertiary students in receiving OECD countries, 2001



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

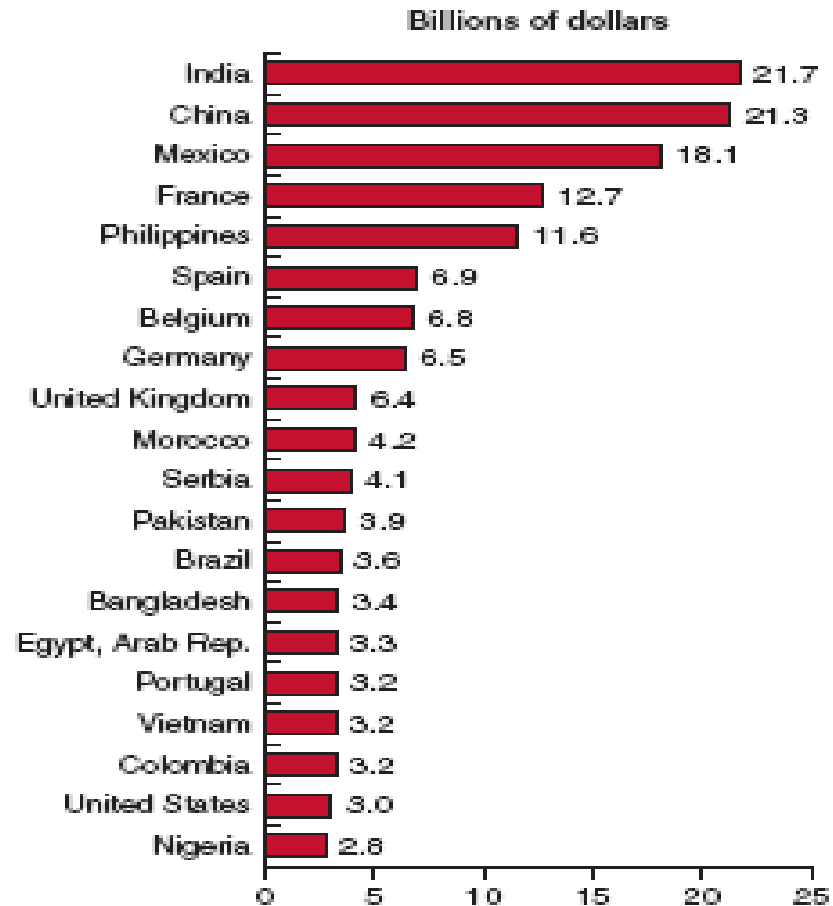


* Bahrain, Cyprus, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Palestinian Authority, Qatar, Saudi Arabia, Syria, Turkey, United Arab Emirates, Yemen

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

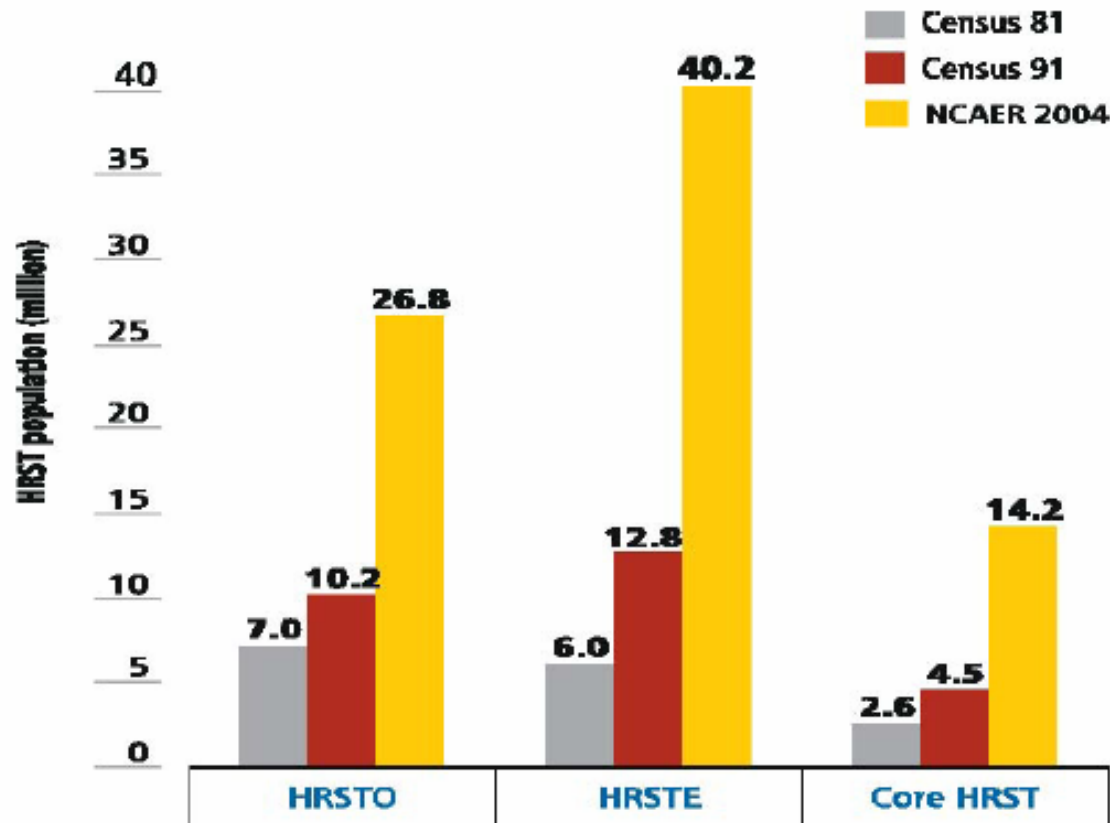
Top 20 remittance-recipient countries, 2004



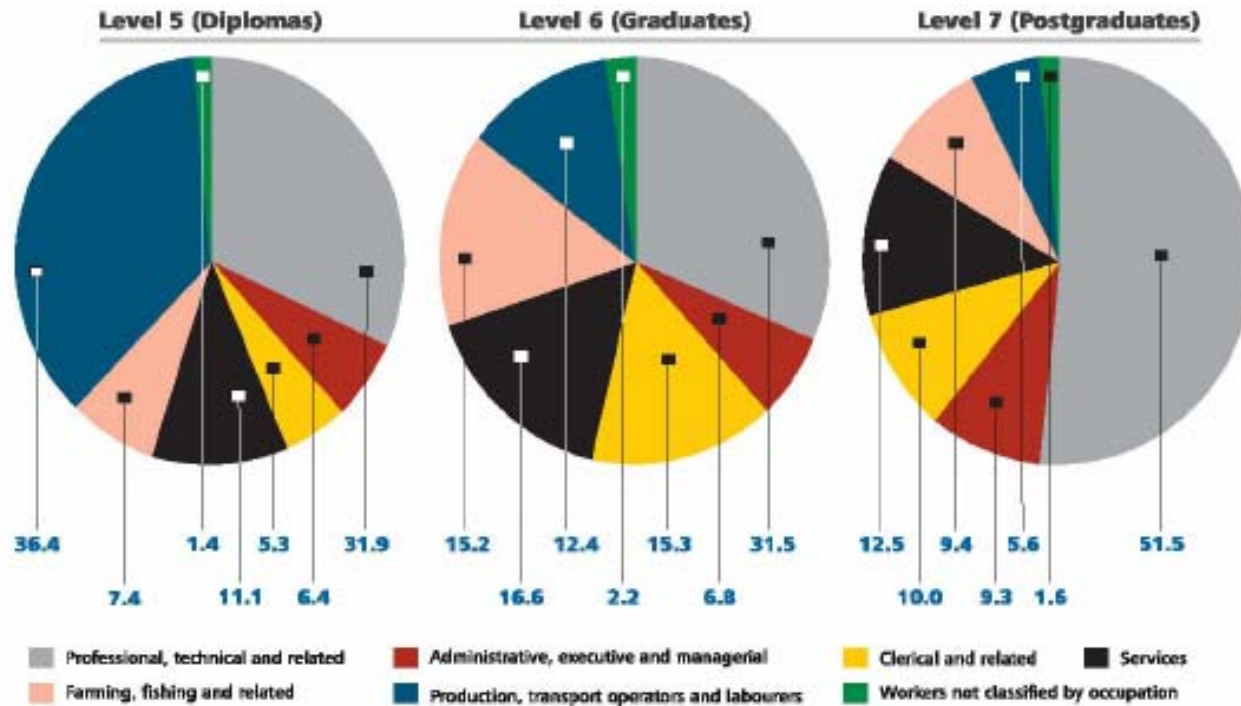
Number of workers, 1991-2001

| Worker category | Number of Workers('000s) | | |
|--------------------------------|---------------------------|---------------|-----------------------|
| | 2001 | 1991 | Increase/ Decrease |
| Main Workers | 310,247 | 285,932 | 24,315 |
| Agricultural sector | 175,804 | 191,341 | -15,536 |
| Non Agricultural Sector | 134,443 | 94,592 | 39,851 |
| Marginal Workers | 88,063 | 28,199 | 59,864 |
| Agricultural sector | 69,502 | 25,974 | 43,528 |
| Non Agricultural Sector | 18,560 | 2,225 | 16,336 |
| Total Workers | 398,310 | 314,131 | 84,179 |
| Agricultural sector | 245,307 | 217,315 | 27,992 |
| Non Agricultural Sector | 153,003 | 96,816 | 56,187 |

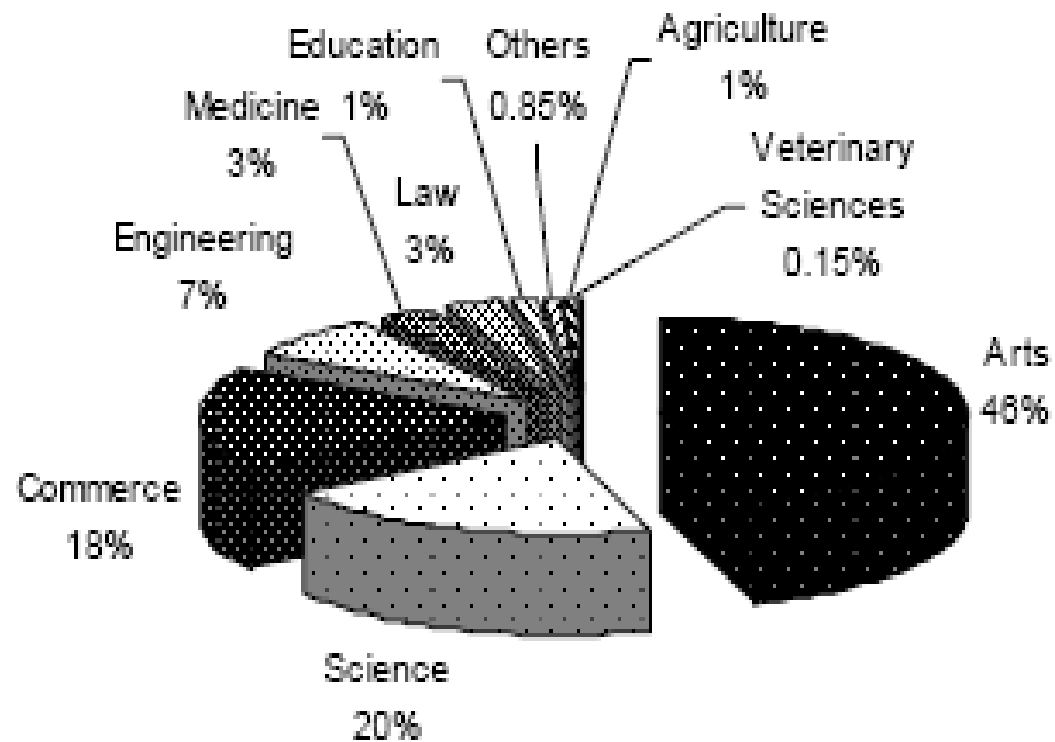
Growth in HRST from Census and NCAER-survey



Distribution of HRSTE population by level of education: 2004 (per cent)



Subject-wise enrolments 2004-2005



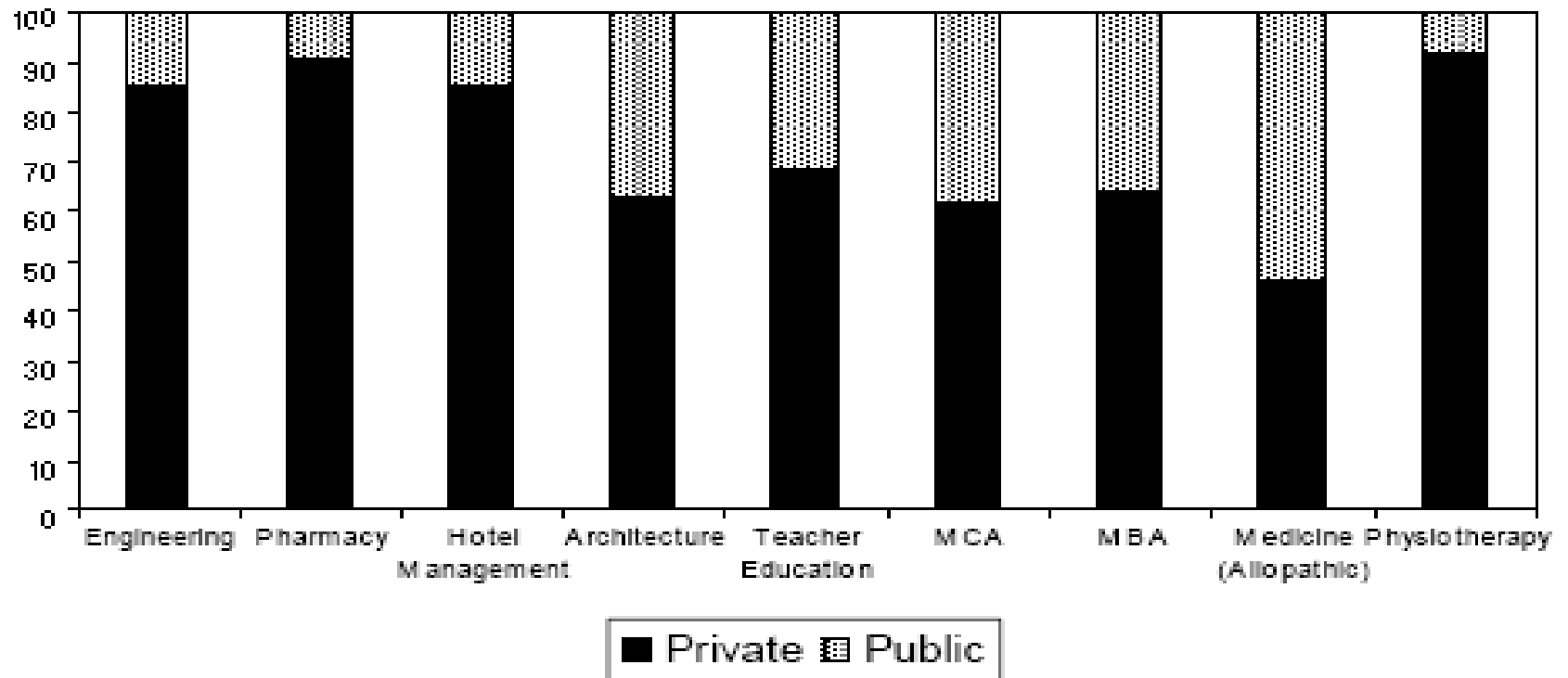
Indian's Graduate Pool in FY 2003-04

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

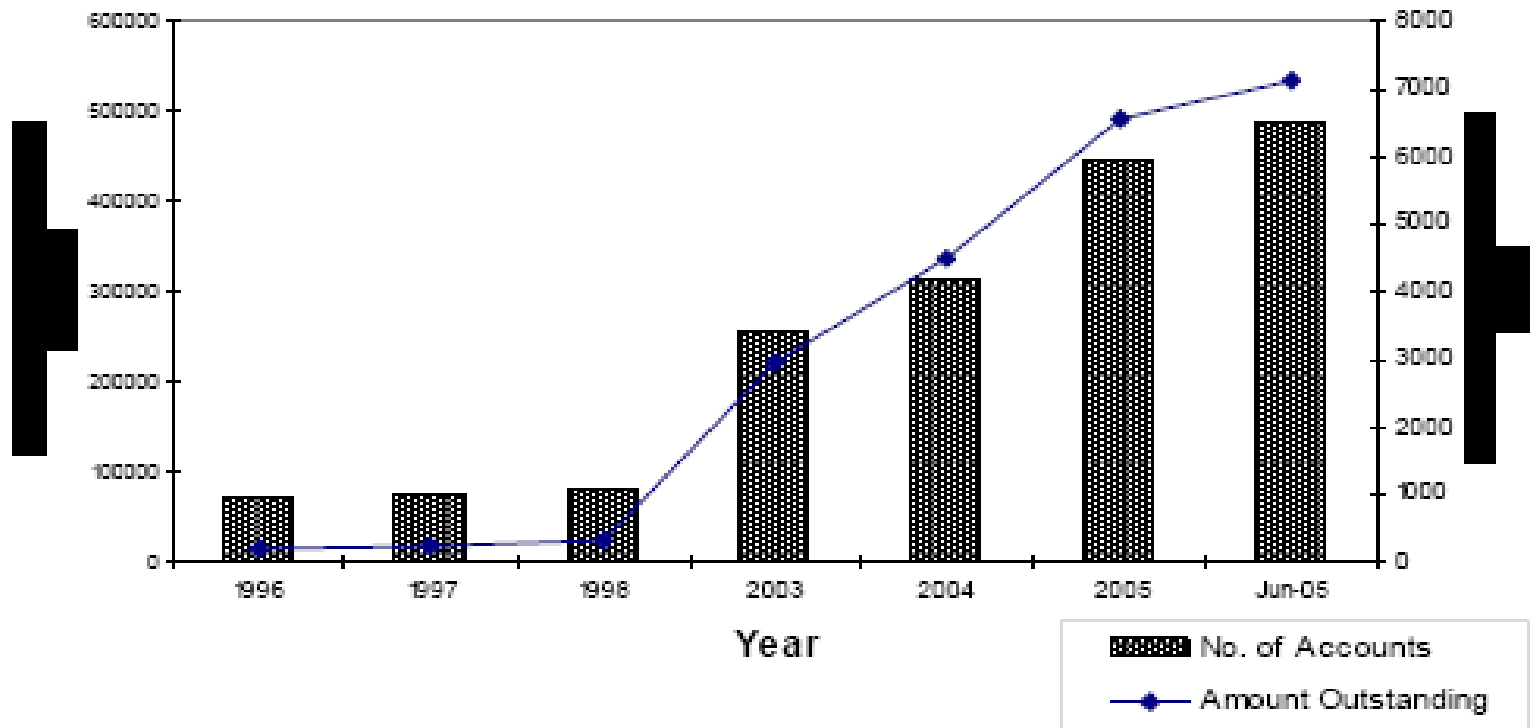
Ph. D. Degrees Awarded in India.

| 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 | 323 | 348 | 723 | 739 | 833 | 908 |

Relative Share of Private & Public Professional Education Institutions



Growth of Education Loan Portfolio in India



Indian Economy: Share of GDP and Employment (*Sector-Wise*)

| Sector | Share of GDP | Share of Employment |
|--------------------|--------------|---------------------|
| <i>Services</i> | 57.2 | 23.8 |
| <i>Industry</i> | 22.0 | 17.2 |
| <i>Agriculture</i> | 20.8 | 59.0 |

Flow of SEA, Asian and All Foreign Students admitted in the US (2001, 2002, and 2003)

| Region | 2001 | 2002 | 2003 |
|----------------------|---------|---------|---------|
| All SEA Students | 40,497 | 33,529 | 35,206 |
| All Asian Students | 395,511 | 364,753 | 346,672 |
| All Foreign Students | 698,595 | 646,016 | 624,917 |

Country-wise Number and Share of SEA Flow of Students to the US

| Country | 2001 | <i>% of 2001</i> | 2002 | <i>% of 2002</i> | 2003 | <i>% of 2003</i> |
|-------------|--------|----------------------|--------|----------------------|--------|----------------------|
| SEA Total | 40,497 | <i>100.00</i> | 33,529 | <i>100.00</i> | 35,206 | <i>100.00</i> |
| Thailand | 13,146 | <i>32.46</i> | 10,433 | <i>31.12</i> | 11,727 | <i>33.31</i> |
| Indonesia | 11,727 | <i>28.96</i> | 7,285 | <i>21.73</i> | 8,937 | <i>25.38</i> |
| Malaysia | 6,225 | <i>15.37</i> | 4,504 | <i>13.43</i> | 4,943 | <i>14.04</i> |
| Singapore | 5,299 | <i>13.08</i> | 4,995 | <i>14.90</i> | 5,163 | <i>14.67</i> |
| Philippines | 2,550 | <i>6.30</i> | 2,373 | <i>7.08</i> | 2,424 | <i>6.89</i> |
| Vietnam | 1,268 | <i>3.13</i> | 1,705 | <i>5.09</i> | 1,793 | <i>5.09</i> |
| Cambodia | 190 | <i>0.47</i> | 192 | <i>0.57</i> | 168 | <i>0.48</i> |
| Laos | 76 | <i>0.19</i> | 32 | <i>0.10</i> | 39 | <i>0.11</i> |
| Brunei | 16 | <i>0.04</i> | 8 | <i>0.02</i> | 12 | <i>0.03</i> |

Share of SEA Students in All Foreign Students Entering the US

| SEA country of citizenship of students | Year 2001 % of All Foreign (698,595) | Year 2002 % of All Foreign (646,016) | Year 2003 % of All Foreign (624,917) |
|---|---|---|---|
| SEA Total | 5.80 | 4.88 | 5.63 |
| Thailand | 1.88 | 1.61 | 1.88 |
| Indonesia | 1.68 | 1.13 | 1.43 |
| Malaysia | 0.89 | 0.70 | 0.79 |
| Singapore | 0.76 | 0.77 | 0.83 |
| Philippines | 0.37 | 0.37 | 0.39 |
| Vietnam | 0.18 | 0.26 | 0.29 |
| Cambodia | 0.03 | 0.03 | 0.03 |
| Laos | 0.01 | 0.00 | 0.01 |
| Brunei | 0.00 | 0.00 | 0.00 |

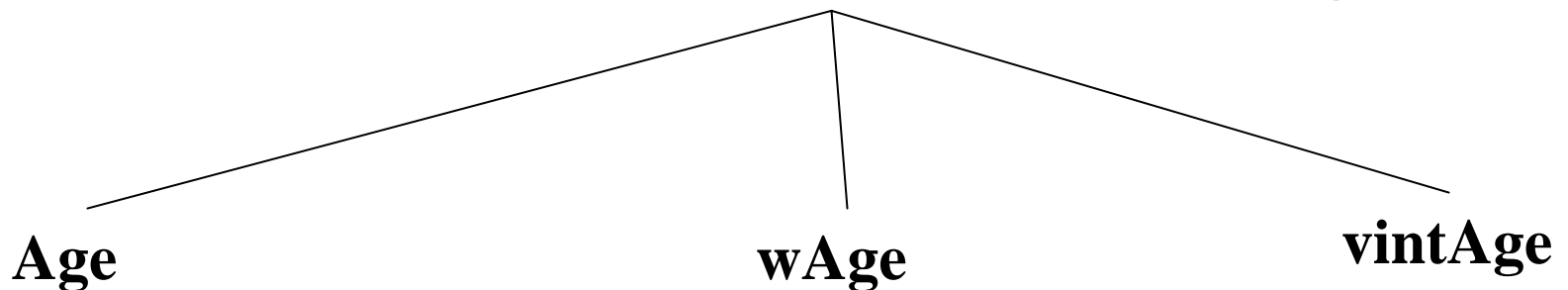
Share of SEA Students in All Asian Students Entering the US

| SEA country of citizenship of students | Year 2001 % of All Asian (395,511) | Year 2002 % of All Asian (364,753) | Year 2003 % of All Asian (346,672) |
|---|---|---|---|
| SEA Total | 10.24 | 8.64 | 10.16 |
| Thailand | 3.32 | 2.86 | 3.38 |
| Indonesia | 2.97 | 2.00 | 2.58 |
| Malaysia | 1.57 | 1.23 | 1.43 |
| Singapore | 1.34 | 1.37 | 1.49 |
| Philippines | 0.64 | 0.65 | 0.70 |
| Vietnam | 0.32 | 0.47 | 0.52 |
| Cambodia | 0.05 | 0.05 | 0.05 |
| Laos | 0.02 | 0.01 | 0.01 |
| Brunei | 0.00 | 0.00 | 0.00 |

**Nonimmigrants Admitted by SEA Country of Citizenship,
H1A, H1B, H3, J1, L1, O1 Visas: 2001-2003**

| SEA Country of Citizenship | Workers with specialty occupations H-1B Holders (2001) | Workers with specialty occupations H-1B Holders (2002) | Workers with specialty occupations H-1B Holders (2003) |
|-----------------------------------|---|---|---|
| SEA Total | 14,277 | 13,202 | 11,625 |
| Philippines | 5,556 | 5,509 | 5,247 |
| Malaysia | 3,004 | 2,479 | 1,854 |
| Indonesia | 2,136 | 1,488 | 895 |
| Singapore | 1,913 | 1,938 | 1,889 |
| Thailand | 1,556 | 1,671 | 1,541 |
| Vietnam | 83 | 96 | 91 |
| Brunei | 18 | 13 | - |
| Laos | 6 | 4 | - |
| Cambodia | 5 | 4 | - |
| Others* | - | - | 108 |

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 :



CHANDU



The Hindustan Times, New Delhi, Nov., 1989

Thank you