India Science Report

Science Education, Human Resources and Public Attitude towards Science and Technology

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NCAER National Council of Applied Economic Research

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FOREWORD

The health of a nation depends on, among other factors, the health of the state of its science & technology. The health of science & technology is measured quantitatively and monitored rigorously by many advanced nations. Unfortunately, such quantification of scientific progress has not been done systematically in India. It was the visionary leadership of Prof. M.S. Valiathan, from whom I have just taken over the reins of the Presidentship of Indian National Science Academy (INSA), that was responsible for taking the first steps towards creating such a quantitative basis. National Council of Applied Economic Research (NCAER) was entrusted with the task of making a systematic and comprehensive assessment of Indian S&T enterprise and its influence. It is a pleasure to see the first India Science Report.

The present report focuses on science education, human resources in science & technology and public understanding of science. These are, however, only the first steps. I hope this report will trigger other more comprehensive studies looking at diverse dimensions, which have been well summarised in the chapter 'Looking Ahead'.

This report is being brought out at an opportune time. India's prowess in Science & Technology was recognised just last month in a first ever cover page story on an Indian S&T by New Scientist. India's emergence as a nation to assume the role of knowledge superpower is being recognised all over the world. India is becoming a major global knowledge production hub with over 150 foreign companies setting up their R&D centres in India. The new patent regulations that ushered in this month will force Indian enterprises to move from the path of 'imitation to innovation'. Indian industry is gearing up to face the competition – with drugs and pharma companies getting into discovery research – and auto industry designing and manufacturing cars for export to the developed world. The first signs of reversal of brain-drain are visible. The demographic shifts around the world implies that S&T manpower in countries like India and China is going to be a valuable asset and it will be in a great demand across the world. India Science Report will help us in assessing our preparedness to face these challenges and seize these opportunities.

There are many individuals who deserve our heart-felt thanks and sincere congratulations. Our thanks go to Dr. Manmohan Singh, our Hon'ble Prime Minister, who suggested that INSA should approach NCAER for this study, when he was the Leader of the Opposition in Rajya Sabha. A Monitoring Committee chaired by Prof. P. Rama Rao guided the development of the India Science Report. We thank this committee. The pioneering effort of NCAER was led by Dr. Rajesh Shukla under the overall direction of Mr. Suman Bery. These leaders and their teams are to be congratulated for taking up this massive effort. We thank them most sincerely and applaud their efforts.

I also hope that this report will trigger a national debate, which will set up the future path for Indian S&T.

R.A. Mashelkar
President, INSA

PREFACE

Science and technology (S&T) drive economic and social development. But reliable data and statistics are needed to measure the impact of S&T on development. Data and statistics drive development agendas, and they should be at the heart of policy formulation and evaluation.

Prof. M.S. Valiathan, the then President of the Indian National Science Academy (INSA) approached the National Council of Applied Economic Research (NCAER) on behalf of his Board to initiate work on the first India Science Report, almost two years ago. I believe he came to us because he believed that it was important to engage an organisation with expertise in data and measurement. We accepted the task in all humility, and committed ourselves to mastering the international literature and practice in the area. We are grateful to INSA for allowing us to gain the necessary background expertise, as well as for the superb quality of the monitoring group, led by Professor P. Rama Rao whose perceptive comments represented an education in their own right.

As we progressed, it became apparent that the task facing us would not be easy. The existing S&T data were scattered across sources and institutions, and, inevitably, were inconsistent. We engaged in a series of wide-ranging interactions with the research community and policy makers. Through these seminars and workshops several issues came up which a first India Science Report might address. These included the achievements of Indian research institutions; human resource development; technology development; patent output; science education; public understanding of science; and socio-economic impact of S&T on environment, health, and energy. In agreement with the monitoring group, we decided to focus this first report on three issues – science education, human resources in science and technology, and public understanding of science. Given INSA's intention to continue this initiative with future India Science Reports, the other topics of critical importance will no doubt be taken up in those reports.

The topics chosen for this first report are critical for India's aspirations as a knowledge-based economy. They go to the core of how our existing scientific labour force is being utilised, and how the scientists (and teachers) of the future are being groomed and motivated. Indeed, to the extent that Indian demographic trends have a global impact, the survey results presented in this report make an important contribution to quantifying the current and future global supply of trained scientific manpower.

A custom-designed survey, the India Science Survey 2004, funded by INSA, was conducted by the NCAER to provide accurate, consistent data on these important issues. To our knowledge, this is the first such survey conducted in a developing country; in the industrial countries such surveys have been conducted for several decades. The NCAER team has made every effort to use international classifications and definitions to ensure comparability of these survey results with other international data. While the purpose of this report is to provide facts and analysis, there are obvious implications for policy that we trust will be taken up by the relevant authorities.

In conclusion, let me once again compliment INSA for their vision in this initiative, and thank them for entrusting this pioneering effort to the NCAER. Let me also thank the team of staff and consultants, led by Dr. Rajesh Shukla, and acknowledged elsewhere in this report, for their dedication in making INSA's vision a reality.

Suman Bery
Director General, NCAER

ACKNOWLEDGEMENTS

The National Council of Applied Economic Research (NCAER) extends its appreciation to the Indian National Science Academy (INSA), particularly its former President, Prof. M. S. Valiathan, for his initiative and entrusting NCAER to bring out the India Science Report.

The Monitoring Committee chaired by Prof. P. Rama Rao and consisting of members Prof. K.L. Chopra (Convener), Dr. Ashok Jain, Dr. V. Rao Aiyagari, Dr. S. Arunachalam and Dr. P.J. Lavakare, provided guidance and support throughout the preparation of the report. The members' generous contribution of time, efforts, and expertise under often stringent schedules are gratefully acknowledged. Prof. P. Rama Rao, Chairman of the Committee, deserves our special appreciation.

NCAER also extends its appreciation to the members of the Steering Committee (Feasibility Study) Prof. K.L. Chopra, Prof. V. Krishnan, Dr. I.P. Abrol, Prof. Surendra Prasad, Prof. K.B. Sinha, Prof. P.P. Majumdar, Dr. N.K. Ganguly, Dr. S. Arunachalam, Dr. R.P. Sharma, Prof. R.C. Mahajan, Dr. Mahtab Bamji, and Dr. S.S. Agrawal for their inputs.

Many researchers and policy makers have helped the NCAER research team in its efforts to bring out the India Science Report since its inception. We would like to express our gratitude specially to Dr. Sujit Bhattacharya, Mr. R.P. Mattoo, Dr. R. Saha, Mr. Rakesh Chetal, Mr. Praveen Arora, Dr. S. Mohan, Ms. Nirupa Sen, Dr. Bowonder and Dr. S. Ramakrishna for their useful technical inputs and guidance that made it possible to enrich the feasibility study.

Officials of the University Grants Commission (UGC), Institute of Applied Manpower Research (IAMR), Department of Science and Technology (DST), Registrar General of India, and Ministry of Human Resource Development (MoHRD) generously provided information to NCAER.

The NCAER research team deserves all credit for poring over reams of data and statistics and coming out with incisive analysis. Credit is also due to the NCAER field staff and State Networking Agencies who worked overtime to collect data from around the country and the NCAER support staff without whose help the report could not have seen the light of day.

Our special thanks also to INSA secretariat, particularly its Executive Secretary, Shri S.K. Sahni and Deputy Executive Secretary, Dr. Alok Moitra for their help rendered to us during the study.

Thanks are also due to Mr. Hasan Jawaid Khan of the National Institute of Science Communication And Information Resources (NISCAIR) for help in editing the report.

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EXECUTIVE SUMMARY

COUNTRIES WORLDWIDE MONITOR THE health of their scientific and technological activities through 'national science reports'. These country reports are an important component in reconstructing national S&T priorities and have played a large part in funding and monitoring S&T programmes in these countries. Unfortunately, no systematic and comprehensive empirical assessment of S&T efforts is available in the Indian context, resulting in a relatively chaotic and contradictory picture of the national efforts in S&T. An important factor contributing to such images of S&T efforts in the country is the paucity of reliable data in an accessible and timely manner.

Further, studies of the impact of Indian science on society and national development are often based on sporadic, outdated, and scattered Indian reports. A few studies, with specific purposes, have been undertaken at different points of time to evaluate the performance of institutions based on various S&T statistics, for example, in the context of restructuring scientific institutions, creating centralised facilities, cost cutting, and improving productivity. At the national level, no efforts have been made on a single platform to evaluate the overall scientific and technological achievements of the multi-layered S&T system in India. Often international data sources are consulted.

It was in this context and to address the empirical gaps that the Indian National Science Academy (INSA) commissioned a study to the National Council of Applied Economic Research (NCAER) to bring out the first India Science Report (ISR). The ISR is an ambitious project that is intended not as an event but as a process, of which this first report is the beginning. Given the potentially vast canvas of issues that could be addressed by the first ISR, and limited time and resources, it was only inevitable that prioritisation of issues and topics would be needed. Thus, to begin with, it was decided to concentrate on the three major issues, namely, status of science and engineering education, utilisation pattern of human resource and "public" attitude towards S&T through an altogether new approach i.e., primary survey based approach never before attempted in the country.

MAJOR FINDINGS

EDUCATION IN SCIENCE AND ENGINEERING

Educated stock

- The proportion of the population with a 10th (high school) and 12th (higher secondary) degree has increased significantly, from 8.2% (69.7 million) in 1991 to 23% (246.9 million) in 2004. Those with graduate degrees and above have risen from 2.4% (20.5 million) of the population in 1991 to around 4.5% (48.7 million) today.

- The proportion of diplomas has risen more than ten times and is currently around 0.4% (3.9 million) of the population.

- In 2004, about a fourth of those qualified to the level of graduate and above had a background of science education. There are 39.2 million graduates in all (22.3% of whom are from the science stream), 9.3 million postgraduates (19.4% of whom are from the science stream), and 0.3 million doctorates (one-third from the science stream).

Occupational pattern of educated stock

- Given their share in both the stocks (23.1%) as well as in enrolment (33.4%), science stream students are adequately represented in most types of jobs. In the case of 'professionals, technical and related' jobs, almost 29% of the total employed are educated in science. Also, a fourth of all unemployed are those with science education.

- Of those not working because they either have no job or are housewives, those who have studied science are in a much smaller proportion. As of 2004, of this population, 13% are illiterate and another 58.3% have studied only till class 12. Of the remainder, 8.4% have studied science, as compared to 20.4% who have studied non-science subjects.

- Of the graduates who are unemployed, 22.3% have studied science. The share of postgraduates with science background in the total unemployed postgraduates is significantly higher (62.8%).

Enrolment

- Annual enrolments at the graduate-plus level have risen from 6.6 million in 1995–96 to 9.84 million in 2004, including 0.34 million in diploma courses, and the proportion of those studying science within these has risen from 28.8% in 1995–96 to 34.6% in 2004.

- The proportion of those doing engineering has almost doubled, from 6.0% of the population studying at the graduate-plus level in 1995–96 to 11.2% in 2003–04. Indeed, engineering education shows the highest growth, from 8.2% per annum in 1995–2000 to 21.9% in 2000–04.

Expenditure on education

- While both the central government and the state governments spend around four per cent of GDP on education each year, there has been a sharp hike in private spending on education. Between 35% and 40% of government expenditure gets spent on elementary education, another fourth on secondary education while just a tenth goes to university and higher education.

- Though private spending is higher in the richer states, where government spending also tends to be high, private spending as a proportion of the total spending on education in the state tends to be higher in poorer areas. For instance, in Punjab, the government spent Rs 845 per person in 2000–01 and the state's citizens reciprocated by spending 30% less. In Bihar, where the government spent only Rs 44 per person in 2000–01, the average citizen spent Rs 168 in 2001–02 on education. Interestingly, it is states like West Bengal and Punjab, not Kerala, which emerge as states with the highest per capita expenditure on education.

Regional variations

- Uttar Pradesh accounts for the country's largest number of graduates and above — around 15.2% followed by Maharashtra (13.7%) and Andhra Pradesh (8.1%).

- At an all India level, six per cent of the country's population (above the age of 10) has at least a graduate degree. Delhi has the best-qualified population, and 16% of all Delhiites have at least a graduate degree.

- Of the 12.1 million science graduates and diploma holders in the country, 14% are to be found in Andhra Pradesh. Tamil Nadu is next with 12%, Maharashtra third with 11%, Uttar Pradesh fourth with 10% and Karnataka gets into the list next with 7.5%.

Students' attitude towards science education

- Mathematics remains the most preferred subject, with a third of students in classes six to eight rating it as number one, and over 21% still feeling the same way in classes 11 and 12.

- At the class six to eight level, 22% of the students said they would like to study pure science at higher levels of education. Yet, when it came to students in class 11 and 12, just 13.4% wanted to study pure science at the graduate/postgraduate level.

- The interest in all types of science education does not decline much — 60% of the students at the class six to eight level said they wanted to pursue some science education (pure science, engineering or medicine) at a higher level as compared to 57% students in classes 11 and 12.

- The number of students wanting to take up commerce at a higher level of education rises almost three-fold as one moves from classes six to eight to 11 and 12.

- A fourth of those in rural areas said they would like to complete their higher education in an arts subject as compared to 15% in urban areas.

- Over 40% of the students, whether in classes six to eight or 11 and 12, wanted to become either an engineer or a doctor.

- While close to two–thirds of students in classes six to eight are satisfied with the quality of science teaching, this falls to just 40% in classes 11 and 12.

- About 60–70% students are satisfied with the quality of teaching of most of the subjects except computer science where just 15% of the students in government schools are satisfied with the teaching as compared to 23% in private schools.

- A point worth keeping in mind is that not too many students are keeping away from science deeming it a costly subject to pursue. While ten per cent of the students cite this as the reason for not having taken up science at the plus–2 level, 45% state they are not pursuing science because they have no interest in science.

- Parents and teachers play an important role in the selection of courses as well as in deciding career choices.

- An encouraging sign is that while 35% of the students say they want to become at least a graduate, another 26% want to pursue a postgraduate degree. Even more interesting, as students go up to higher classes, more of them felt they needed to pursue postgraduate as well as doctoral degrees. A little less than 22% of those in class six to eight said they wanted to get a postgraduate degree, as compared to 30% of those in class 11 and 12. As compared to seven per cent of those in class six to eight, who plan to do a doctorate when they grow up, the figure is close to 11% in the case of those in class 11 and 12.

- The three most preferred professions for students turn out to be teacher, doctor and engineer.

Reasons for disinterest in science

- The study shows there is no decline in interest in the proportion of students who wish to study science. A third of the students said they did not study science as they did not feel motivated enough and another 40% said the number of students in a class were too many for them to understand what was being taught.

- Teachers gave quite different explanations for limited interest in science such as costly and difficult education apart from limited job opportunities. Half the teachers interviewed said that more computers/equipment were required for teaching science subjects since inadequate practical training was a serious issue. While 15% felt that teachers too required proper training, 11% felt the need for simplification of the course content.

Impact of socio-economic background

- Students who are not economically well off tend to be worse educated.

- While 61% of illiterate people have access to electricity, 95% of postgraduates have electricity access. Forty three per cent of the illiterates have separate kitchens in their houses as compared to 89% postgraduates. Fewer than five per cent of all illiterates had refrigerators in their houses as compared to around 50% graduates.

- While the desire to attain a graduate degree appears to have become a basic benchmark (35% of all students

wish to do this), children of parents who are salary earners or businessmen show a higher preference for postgraduate or higher degrees.

- Children of agriculturists tend to study arts courses a lot more than those whose parents are salary earners or businessmen. Those in rural areas also tend to go in more for arts than those living in urban areas.

- A fourth of students wish to become teachers when they grow up, though the proportion is much higher for those whose parents are agriculturists/wage earners.

- An equal number wish to become engineers, but the number is much lower for those whose parents are agriculturists/wage earners.

HUMAN RESOURCES IN SCIENCE & TECHNOLOGY

- Human Resources in Science and Technology, or HRST, comprises those (i) who are employed in a science and technology occupation (HRST by occupation—HRSTO) or (ii) those who have a diploma/graduation degree or above (HRST by education—HRSTE). Those who have a diploma/graduation degree and are employed in a science and technology occupation comprise the 'Core' HRST group.

- India has 52.6 million graduates, postgraduates, and diploma holders. However, if we remove the 12.2 million unemployed and housewives from this category, we get a total of 40.2 million (HRSTE). The number of HRSTE grew by 7.9% annually between 1981 and 1991 (from six million in 1981 to 12.8 million in 1991), and by a marginally less 6.9% between 1991 and 2004.

- In a National Classification of Occupations undertaken in 1968, there were 26.8 million people employed in HRST professions[1] (i.e., HRSTO). This rose by 3.7% during the 1981–91 period (seven million in 1981 and 10 million in 1991). The period between 1991 and 2004 saw a sharper rise of 7.7% annually.

- In 1981, 67% of HRST jobs were held by those who were not diploma holders or graduates (that is, people who were non-HRSTEs). This figure went down to 56% in 1991 and declined further to 47% in 2004.

- The percentage of HRSTE, as a proportion of the working population, rose from 2.7% in 1981, to 4.5% in 1991 and 10.9% in 2004.

- The percentage of core HRST among the working population, has risen from 1.1% (1981) to 1.6% (1991) and to a further 3.9% (2004).

- There are around 14.2 million Core HRST. This figure stood at 4.5 million in 1991 and 2.6 million in 1981 (showing an annual growth of 5.7%). Between 1991 and 2004 there was an annual growth of 9.3%. Core HRST remained at around 34%-35% of the total HRSTE between 1991 and 2004.

Regional variations

- Given its near-top position in terms of the country's stock of graduate-plus, it is not surprising that Maharashtra is number one as far as HRSTE is concerned and takes the second position, in tandem with Uttar Pradesh, with almost 15.5% of the country's Core HRST.

- While West Bengal takes the first position with regard to Core HRST, accounting for around 17.5% of the country's total, it also has the highest number of HRSTOs who are not academically qualified for the jobs they hold – the state accounts for a fourth of the country's total HRST professionals who are not adequately qualified by way of education.

1. Includes scientists, engineers, medical professionals, including nurses and health technicians, architects, mathematicians and statisticians, teachers, and professionals like chartered accountants and lawyers. It includes all those listed under the division of 'Professionals, technical & related workers' (Codes 0–1) in National Classification of Occupations, 1968 (NCO–68).

- Orissa and Madhya Pradesh lead in Core HRST as a proportion to HRSTE, with a ratio of 52%–53%. Richer states like Gujarat and Maharashtra have very poor utilization of their resources, and the proportion of Core HRST to HRSTE is between 20% and 30%.

- In terms of the share of core HRST in the total workforce, Delhi is the leading state.

PUBLIC ATTITUDE TOWARDS SCIENCE AND TECHNOLOGY

Does S&T benefit us

- Despite the poor interest in S&T programmes, most Indians have great faith in science, as a result of which just a fourth think the government is spending enough money in the area. Over three-fourths of the public feel S&T is important for education, 58% feel the same way about the economy, and 72% about agriculture.

- More than three-fourths feel S&T makes lives healthier and more comfortable. Overall, the perception is that the benefits of S&T are slightly higher (1.1 times) than its deleterious effects. The difference between various income quintiles on this issue is not too pronounced, with even the lowest income quintile of the view that S&T holds more promise than it does demerits.

- The degree of belief in the promise of S&T to benefit people is higher among the more educated (95% of graduates feel S&T makes life healthier, easier and more comfortable as compared to 56% of the illiterates). There is a difference in the attitude of people in different income classes on the issue, but the difference is not too dramatic. While 72% in the lowest income quintile feel S&T makes life easier and more comfortable, the figure shoots up to 87% in the top most quintile.

- Over 60% of the people feel that new technology makes work more interesting – while just a third of the illiterates feel this way, around 90% of the graduates/postgraduates feel this way. A little over half of those in the lowest income quintile feel this way as compared to 80% in the top-most income quintile.

- There is an even split between those who feel modern S&T will create better opportunities for the next generation, and while only 30% of the illiterates feel this way, over 80% of the graduates are in favour of this. Fewer than half of those in the lowest income quintile feel S&T will better things for their children as compared to over 70% for the top quintile.

- Less than 12% of the illiterates feel computers and factory automation create more jobs than they destroy while over half of the graduates and postgraduates feel this way.

Attitude towards mechanisation

- Overall, the positive perception towards mechanisation is low and just a fourth of all Indians are in favour of mechanisation.

- The level of knowledge or use of different techniques/technology is highest in the farm sector. Over 80% of the population in the farm sector has a moderate to very good awareness/usage of technologies, while the figure is around 60% for communication technologies and 80% for health. Urban scores are higher than those for rural areas and, in general, men score over women.

Public understanding of S&T issues

- On an average, the level of knowledge the population has about scientific concepts is very high – 57% of the people gave the correct answer to the question whether the centre of the earth was hot, and 86% on whether the oxygen we breathe comes from plants. Not surprisingly, given how women are blamed for not having a male child, just 38% know that the sex of the child depends upon the father.

- While the answers to science-related questions tend to be increasingly correct as the education levels of the respondents rise, the extent of the difference is quite high. Just 32% illiterates know that the centre of the earth is very hot, as compared to 85% of the graduates. But a sign that traditional knowledge is still alive is that 60% of the illiterates say one should not sleep under a dense tree at night and 75% say plants are living organisms.

Sources of information

- Television remains the primary source (57%) of information in the country, and is almost five times as popular as newspapers. Close to three-fourths of urban households rely on TV for information, as do half the rural households. Indeed, even educated people rely more on television than on any other medium. In the case of postgraduates, for instance, 65% rely on TV as the primary information source compared to just 27% for newspapers. Nor is there much variation between information source preferences of the various occupational groups. Weather news is the most popular S&T show watched on TV.

- While two–thirds of all people visit a cinema hall at least once a year, and a third visit a zoo at least once annually, less than 20% visit aquariums and fewer than 15% visit planetariums.

- Over three–fourths of the people have a great deal of confidence in the authenticity of the TV, and ironically it is the illiterate that have the least confidence – just 64% of all illiterates express confidence in TV information as opposed to 85% graduates/postgraduates.

- Close to two–thirds of the population gets its science-related information from the TV as compared to under eight per cent from newspapers.

- Entertainment is the highest ranked in terms of preference by individuals, and is closely followed by news. Cultural/religious news/coverage is ranked higher than sports or politics, and science and technology is ranked lowest.

Attentive versus interested public

- Around 70% of the population is interested in issues like agriculture, local school or issues pertaining to women. The level of interest in economic issues is lower (4%), as also for politics (3%) and scientific discoveries (30%).

- The proportion of people who (i) express a high level of interest, (ii) feel they are well informed about a subject or (iii) regularly read a newspaper/magazine relevant to the issue, however, make up a much smaller universe. This 'attentive' public comprises around 19% of the population. The 'interested' public (taken to mean those who claim to be interested but do not have much information about the subject) comprises another 11% of the population. Men are twice as 'attentive' as women and 60% of the postgraduates are 'attentive' as compared to 20% among those who have studied only till the class 12 standard. Just 12% of the people in the lowest income quintile can be considered 'attentive' as compared to 40% in the top income quintile.

International comparisons

- India's source of information, including that for science matters, is completely skewed in favour of television which is not so in the US. Just 12% of the Indians cite newspapers as their primary source of information as opposed to 29% for the US. Nearly, 65% of science news in India is got from TV as compared to seven per cent in the US. Over 44% of S&T information in the US is got from the Internet as compared to 0.2 per cent in India.

- Though India compares unfavourably with the US on parameters like the proportion of its population that understands certain scientific concepts, such as, are electrons smaller than atoms, or whether the centre of the earth is hot; it does reasonably well given its relatively

lower income and literacy levels. Indeed, when it comes to issues like 'attentive' public (that is, the part of the public that is not only interested in certain issues but also follows up with regular reading of newspapers/ magazines), India scores much higher than the US.

- Close to 19% of India's population can be considered 'attentive' compared to fewer than ten per cent for the US. While the figure is 23% for India versus six per cent for the US in the case of agriculture and farming, it is 18 versus 12 for economy and business conditions.
- India scores lower than the US on attitudes towards science and technology, but not much lower. Seventy seven per cent Indians feel S&T makes our lives healthier and easier as compared to 86% for the US. Sixty one per cent feel technology makes work interesting as compared to 89% in the US.
- In overall terms, Indians believe that the positive attributes of S&T outweigh the negative attributes by 1.1 times, a figure that is not too much lower than the US' 1.3. ■

Introduction

SCIENCE AND TECHNOLOGY HAVE BEEN central to India's development efforts since achieving independence. Jawaharlal Nehru, the first Prime Minister, was a firm believer in the crucial importance of science and technology for economic growth and social transformation, and helped lay a firm foundation of science and science education in the country. Along with a focus on industrialisation and rural growth, India's development plans over the subsequent six decades have channelled substantial resources to education, training and research in science and technology (S&T). The country today has a vast S&T infrastructure comprising national laboratories and institutes, more than 200 universities and over 12,000 colleges. With its flagship nuclear and space programs, high profile in information technology services and pharmaceuticals, and a growing emergence in the world economy, Indian science and technology has come a long way from its modest beginnings.

Yet any complacency would be inappropriate in an increasingly global and knowledge-driven economy. The knowledge society sets the pace at which new scientific and technological innovations take place and determines how quickly these innovations are converted into marketable products, processes, and services. New trade and patent regimes adopted recently also underscore the importance of intellectual property rights and their role in the New World order. Technological change and competition will only accelerate in the decades to come, posing an immense challenge if the country has to become a global leader in the 21st century. Meeting such a challenge will require fruitful partnership between the government, industry and the public as well as adequate resources that are well spent within a strategic framework and a long-term vision.

Most developed countries keep a tab on the health of their science and technological activities through periodic 'national science reports'. These country reports are an important component in reconstructing national S&T priorities and have played a large part in funding and monitoring S&T programmes in these countries. Likewise, the World Science Report has set the precedent for providing a global overview of scientific and technological activities covering detailed regional and national discussions after analysing a number of S&T indicators commonly used.

Unfortunately, no systematic and comprehensive empirical assessment of S&T efforts is available in the Indian context, resulting in a relatively chaotic and contradictory picture of the national efforts in S&T. This is most visibly manifest in a widely noted duality in the image of Indian science and technology achievements. On one hand, there are myriad stunning successes such as the Green Revolution, a growing space programme, including satellite launches, indigenously developed missiles and aircraft, mushrooming exports in biotechnology, pharmaceuticals and information technology services. At the same time, however, India routinely ranks quite low in international indices based on S&T indicators. For example, the World Bank's Knowledge Assessment Methodology and the World Economic Forum rank

India poorly in global terms. Although such rankings reflect genuine challenges to the successful growth of S&T achievements in India, several scholars have also questioned the ability of such indices to adequately, accurately and comparatively reflect underlying conditions.

An important factor contributing to the contradictory image of S&T efforts in the country is the paucity of reliable data in an accessible and timely manner. Even official sources sometimes give completely disparate numbers on important parameters such as, for example, the number of graduates the country has. The 1991 Census, for instance, says India had a total of 20.5 million graduates. Yet, two years later, the National Sample Survey (NSS) said there were 19.8 million graduates in 1993–94. For the same year, the Institute of Applied Manpower Research (IAMR), which collects data on enrolment from each institution as opposed to the Census and the NSS that collect data at the household level, put the number of graduates even lower, at 17.6 million. For 1991, the year in which the Census said there were 20.5 million graduates, IAMR put the figure at 15.6 million or nearly a fourth lower. Not surprisingly, more detailed information such as the number of students who have graduated in science subjects is a lot less reliable. In any case, sources like the NSS and the Census do not even attempt to capture such data, leaving it to institutions like IAMR and the University Grants Commission (UGC) to collect it from individual colleges/universities.

Further, studies of the impact of Indian science on society and national development are often based on sporadic, outdated and scattered Indian reports. A few studies, with specific purposes, have been undertaken at different points of time to evaluate the performance of institutions based on various S&T statistics, for example, in the context of restructuring scientific institutions, creating centralised facilities, cost cutting, and improving productivity. At the national level, no efforts have been made on a single platform to evaluate the overall scientific and technological achievements of the multi-layered S&T system in India. Often international data sources are consulted.

It was in this context and to address such empirical gaps that the Indian National Science Academy (INSA) commissioned a study to the National Council of Applied Economic Research (NCAER) to bring out the first India Science Report (ISR). The ISR is an ambitious project that is not an event but a process, of which this first report is only a beginning. The basic objectives of the ISR project over time are to quantify and analyse the impacts of S&T on various sectors like basic scientific research, agriculture and allied fields, strategic science in defence research, space and atomic energy programmes, services (education, health, climate change, biodiversity, etc.), industrial research, and lifestyle of the common man. Data available from different secondary sources suffer from lack of uniformity, consistency, updating, and easy international comparability. Collecting, collating and interpreting these data is a mammoth exercise that can only be addressed collectively over a period.

SCOPE OF THE REPORT

Given the potentially vast canvas of issues that could be addressed by the first ISR, and limited time and resources, it was only inevitable that prioritisation of issues and topics would be needed. On the basis of the interactions with national and international experts, and viewing this first report as the beginning of a process, it was decided to concentrate on the following three major issues, which included an altogether new approach i.e., primary survey based approach never before attempted in the country.

- **Status of science and engineering education:** Science and technology are the drivers of economic growth and science education the backbone of all S&T efforts in any country. It is being realised that further improvement in the nation's competitiveness is possible by having a better-educated population. Thus, the report aims at assessing the actual stock of educated manpower, particularly scientific manpower, in the country and variations across states/regions. The attitude of students towards science education is also discussed. The report also examines to what extent parents' education/occupation play a role in this, as well as how differences shape up even due to the demographic stratum in which families lie.

- **Information on education levels in India's work force:** Within the broad umbrella of human capital, the role of scientific manpower is critical, and there is a close relationship between human resource in science and technology and economic growth. For better socio-economic growth, it is important to know how this pool of skilled manpower is being utilized. This report evaluates changes in education levels over a period of time, kinds of jobs being taken up by the country's educated stock, and how much of this stock is not directly contributing by virtue of being either unemployed or working as housewives. It examines regional variations to see which states have the highest proportion of graduate workers. After critically reviewing all possible major secondary sources, it was observed that only Census data was available and that too provided for only partial assessment of HRST. Thus, in such a scenario, the attempt to generate state-wise data on education and occupation might be considered one of the major contributions of the India Science Report.
- **Public attitudes towards science and technology:** For an individual to survive and lead a meaningful life a minimum understanding of science is imperative – this is termed as scientific temper. S&T advances have made their presence felt in all endeavours of day-to-day life. Therefore, a good degree of scientific knowledge is required to be picked up by all, not only in order to successfully perform day-to-day tasks but also to improve efficiency. Attempts have been made in this report to gather perceptions of the public about utility of S&T, awareness of S&T issues, and breakup the population in terms of 'attentive' and 'non-attentive' segments, on the basis of their interest in various issues and their actual ability to follow up on this through newspaper reading. It also attempts to analyse whether income levels, by levels of education or even parental occupations, shape such attitudes.

CHAPTER PLAN

The report is divided into five chapters. The second chapter discusses changes in the country's education sector, the actual stock of educated manpower in the country, and the variations across states/regions. The chapter then discusses the

Box 1.1: Data sources

The results presented in this report are primarily based on information collected through an all India field survey called the "National Science Survey–2004" undertaken by the National Council of Applied Economic Research. Sample respondents, individuals over 10 years of age, were selected by adopting a multistage stratified random sampling design from a wide cross-section of people (age, education, and sex) in the country. In view of India's diversity in terms of languages and locations, the sample size and selection procedure were designed to provide state level estimates. Respondents were selected from the entire country by covering both rural and urban areas, with the objective of enhancing the precision of the estimates.

The rural sample was selected from a representative number of districts from across the country, while the urban sample sampled from big metropolitan cities to small towns with populations below 5,000. A total of about 347,000 individuals (115,000 rural and 232,000 urban) were listed covering 553 villages in 152 districts as rural and 1128 urban blocks in 213 towns as urban. Over 30,000 individuals were selected from the listed individuals to collect detailed information through a questionnaire approach involving face-to-face interviews.

The perception of students and teachers was sought by probing them on important aspects such as learning environment of science at schools as well as at home, teaching quality, liking for science subjects, preferred higher degrees, preferred stream, preferred occupation, etc. A separate set of questionnaires for students (6,722) and teachers (1,681) were independently canvassed during the survey. The detailed survey methodology is given in Appendix III.

Findings based on primary data collected through the National Science Survey-2004 were suitably supplemented by information available from various reliable secondary sources such as the Census 1981, 1991 & 2001, National Sample Survey (NSS–1993–94 and 2000-01), Department of Science and Technology (DST), University Grants Commission (UGC), and Institute of Applied Manpower Research (IAMR). However, it needs to be mentioned that there is a great deal of variation in the method of collection, estimation, and classification of data followed by these agencies. Hence, while presenting the data in this report all possible precautionary measures have been taken to prevent any type of bias in the estimates.

attitudes of students towards science education and examines to what extent their parents' education/occupation play a role in this, as well as how differences shape up even due to the income stratum in which families lie. With the caveat about the reliability of official data and the large differences between various official sources, the chapter discusses the growth in education enrolments/stock at various levels of education.

Chapter three deals with education levels in India's work force and evaluates whether these have changed over a period of time. It also evaluates the kind of jobs being undertaken by the country's educated stock as also how much of this stock is not directly contributing by virtue of being either unemployed or working as housewives. The chapter examines regional variations to see which states have the highest proportion of graduate workers.

Chapter four deals with public perceptions of science and technology issues. Would science and technology help make lives better, improve productivity, and so on. It attempts to analyse whether such attitudes are shaped by income levels, by levels of education or by parental occupations. It analyses just how well-informed the population is about various science and technology concepts and attempts to break up the population in terms of 'attentive' and 'non-attentive' segments, essentially on the basis of their interest in various issues and their actual ability to follow up on this through reading newspapers. A comparison is made with other countries, an overall score of the country's receptiveness to new technology is arrived at, and compared again with global averages.

Chapter five seeks to summarise the findings of the India Science Report in a broader context of the S&T progress achieved by the country on issues covered in this report and the possible future directions and policy implications the report throws up.

The Methodology followed for the report has been included in Appendix III. The Methodology explains how the National Science Survey–2004 accurately captures happenings in the country's education sector as well as what goes into shaping the country's attitude towards science and technology — its scientific temper. ■

Education in Science and Engineering

Science and technology are the drivers of economic growth and science education forms the backbone of all S&T efforts in any country. Today it is being increasingly realised that the only way to improve the nation's competitiveness is through better science and technical education. The National Science Survey–2004 has found that concerns about falling science enrolment in the country are misplaced, on the contrary annual enrolment of those studying science has risen. But the lower follow-through to higher levels, particularly doctorates, could lead to a critical shortage of technically qualified teachers. This could be an area of concern because with greater outsourcing of IT and R&D jobs the requirement of good quality scientific manpower is bound to increase. At the school level too there is ample scope for improvement in science education as far as teaching methods, provision of scientific equipment, and contemporariness of syllabi is concerned.

EDUCATION AND TRAINING IN PURE AND applied sciences has had a flourishing tradition in India dating back to over 2,600 years. The development of modern science education can be credited to the British although during that time the role of science education was rather limited, and as with education per se, the only aim was to turn out men competent to serve the civilian administration. It was only in 1857 that the universities of Bombay, Calcutta, and Madras were established and the foundations for basic sciences were laid. Some of the most well known scientists who engaged in globally competitive research belong to this era. Scientists like M.N. Saha, C.V. Raman, Birbal Sahni, J.C. Bose, P.C. Mahalanobis, S.N. Bose, P.C. Ray and S. Ramanujan inspired an entire generation of students.

After independence, science education in India received a fillip with Jawaharlal Nehru's vision of a resurgent India rising on the wings of science. Nehru's vision was translated into working plans through a policy frame that has evolved over the years. Science education in schools as well as higher science education received great emphasis and the pragmatic policies followed over the years ensured that the country came to possess one of the largest and one of the most diverse science education infrastructure. To impart science education and training there came up several national institutes, the Indian Institutes of Technology (IITs), more than 200 universities, and over 12,000 colleges. This infrastructure has successfully produced one of the largest scientific manpower in the world.

But today, while in the emerging global scenario it is being realised that the only way to improve the nation's competitiveness is through better science and technical

India has 48.7 million people who have at least a graduate degree and about a fourth of these have a background of science education

education, it is also being felt that the science education system, as it stands today, needs a drastic makeover for the nation to really derive any competitive advantage in the years to come. It is being increasingly recognised that knowledge is central to a country's productivity growth, whether in manufacturing, agriculture, or services, and is becoming the key differentiating factor between economies that are positioned to grow rapidly and those that are not.

DATA SOURCES

The development of plans and programmes based on a science policy requires a regular flow of up-to-date, reliable, and comprehensive data on a country's scientific and technological potential. Several research agencies/institutions, at the central as well as the state levels, play a significant role in the process of generation of such data covering diverse areas. Indian data on education available from different secondary sources suffer from lack of uniformity, consistency, updating, and easy international comparability. While data on education and occupation levels from the Census 2001 have still not been made available, data from the 1991 Census show major differences with data collected from other official sources.

This report is concerned more with education at the school and tertiary levels, especially in the field of science, and with the factors that determine this. While data for previous years has been taken from the 1991 Census, the National Sample Survey (NSS), the University Grants Commission (UGC), and the Institute of Applied Manpower Research (IAMR), the chapter uses primary data generated through the National Science Survey–2004 covering about 347,000 individuals (from whom limited information was sought) and 30,000 individuals (from whom detailed information was sought). Another 6,722 students were selected and 1,687 teachers were chosen for detailed questioning as well[1].

EDUCATED STOCK

There has been an impressive increase in India's literacy levels, from 42.4% of the population in 1991 to 64.8% in 2001. The NCAER's National Science Survey–2004 reports a literacy level of 59.7% in the states covered for population over 10 years of age[2].

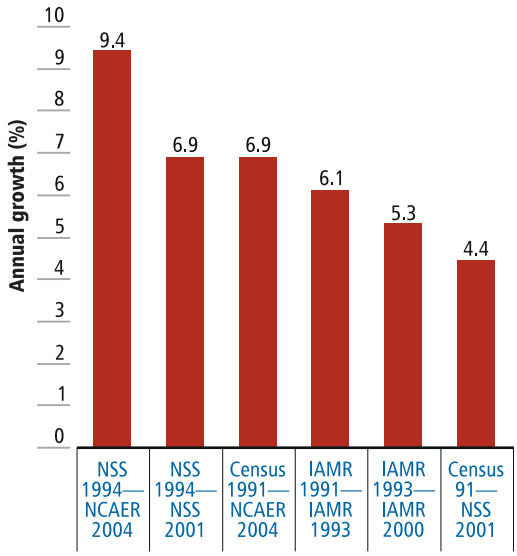
The proportion of those with primary schooling has increased marginally from 12.2% in 1991 to 13.1% in 2004. The proportion of the population with a 10th (high school) and 12th (higher secondary) degree has increased significantly from 8.2% in 1991 to 23% in 2004. Those with graduate degrees and above have risen from 2.4% of the population in 1991 to around 4.5% today.

There is very little consistency in the numbers provided by most major sources that monitor the level of education in the country. The 1991 Census, for instance, says there were 487 million illiterate people in the country, and of the literate, there were 20.5 million graduates. The National Sample Survey (NSS) of 1993–94, puts the number of illiterates at 494 million and the number of graduates and above at 19.8 million – that is, the number of graduates in 1993–94 was lower than what the Census provided for in 1991. The Institute of Applied Manpower Research (IAMR) has even lower estimates and says there were just 15.6 million graduates and above in the country in 1991. Indeed, even in 1993–94, the IAMR estimate of graduates is 17.6 million, lower than the estimates of both the Census and the NSS (Table 2.1).

No matter which data set is used, however, most show high growth in the number of graduates. Taking into account the IAMR figures for 1993 and 2000, it registered a growth of 5.3%, and the figure rises to 6.9%, if the NSS data for 1993–94 and 2000–01 is considered (Fig. 2.1).

1. See Appendix III on Survey Methodology for more details.
2. NCAER's National Science Survey–2004 considers population 10 years and above age. This implies that it underestimates the below primary population.

Fig. 2.1: Annual growth in stock of graduates and above



Source: NCAER's National Science Survey–2004.

Fig. 2.2: Share of science stock to total literate (12th+):2004

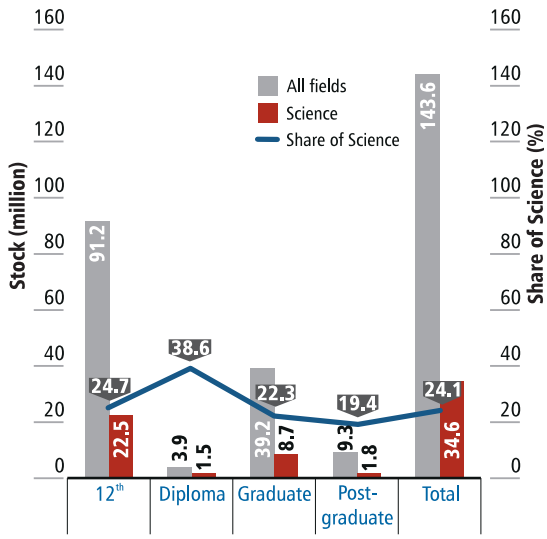


Table 2.1: Stock of graduates and above

	1991	1993–94	2000–01	2003–04
Total number of graduates and above (million)				
Census #	20.5	—	—	—
NSS	—	19.8*	31.6**	—
IAMR##	15.6	17.6	25.2	—
NCAER@	—	—	—	48.7
Share of graduates and above in total population (%)				
Census	2.4	—	—	—
NSS	—	2.3	3.4	—
IAMR	1.8	2.0	2.7	—
NCAER	—	—	—	4.5
Share of graduates and above in literate population (%)				
Census	5.7	—	—	—
NSS	—	5.1	6.0	—
IAMR	4.3	4.5	4.8	—
NCAER	—	—	—	7.6

Source: # Registrar General of India, 1991 census.
* Employment and unemployment in India (NSS–50th round, July 1993–June 1994, report no. 409), National Sample Survey, Ministry of Statistics and Programme Implementation, Government of India.
** Household Consumer Expenditure and Employment-Unemployment Situation in India (NSS–56th round, July 2000–June 2001, report no. 476), National Sample Survey, Ministry of Statistics and Programme Implementation, Government of India.
Manpower Profile in India (Yearbook), 1991–92, 1993–94 and 2001–02, Institute of Applied Manpower Research (IAMR), Government of India.
@ NCAER's National Science Survey–2004.

India has 48.7 million graduates and above (excluding diploma holders), and about a fourth of these have a background of science education. There are 39.2 million graduates in all (22.3% of whom are from the science stream), 9.3 million postgraduates (19.4% of whom are from the science stream), and 0.3 million doctorates (one-third from the science stream) (Fig. 2.2).

This increase in the number of graduate-plus represents a quantum jump from the 20.5 million as enumerated in the 1991 Census (data from the 2001 Census has not yet been collated released) and the 31.6 million as enumerated in the larger sample by NSS in 2000–01 (Table 2.2). While 2.4% of the population had at least a graduate degree in 1991, this went up to around 4.5% as per NCAER's National Science Survey–2004. In addition, another half per cent or so of the population has a diploma.

From 42.4 per cent of the population in 1991 to 59.7 per cent in 2004, there has been an impressive increase in the country's literacy levels

ENROLMENT

As compared to a stock of 48.7 million graduate-plus people, there are 9.84 million people registered in various higher education courses, including 0.34 million enrolled in various diploma courses. Of these,

Table 2.2: Distribution of literate population

Level of education	People (million)				% of total population			
	Census 1991#	NSS 1993–94*	NSS 2000–01**	NCAER 2003–04@	Census 1991	NSS 1993–94	NSS 2000–01	NCAER 2003–04
Below primary	90.5	136.6	154.5	65.7	10.7	15.5	16.8	6.1
Primary	103.1	89.8	120.7	140.6	12.2	10.2	13.1	13.1
Middle	75.1	74.2	121.0	133.8	8.9	8.4	13.1	12.5
10th	69.7	43.4	63.9	155.7	8.2	4.9	6.9	14.5
12th	—	21.9	33.2	91.2	—	2.5	3.6	8.5
Diploma	NA	0.4	4.4	3.9	NA	0.04	0.5	0.4
Graduate and above	20.5	19.8	31.6	48.7	2.4	2.3	3.4	4.5
Total literate	359.0	386.1	529.2	639.6	42.4	43.8	57.5	59.7
Total Population	**846.3**	**880.5**	**920.3**	**1072.0**				

Source: # Registrar General of India, 1991 census (10th and 12th number shown together).
* Employment and unemployment in India (NSS–50th round, July 1993–June 1994, report no. 409), National Sample Survey, Ministry of Statistics and Programme Implementation, Government of India.
** Household Consumer Expenditure and Employment-Unemployment Situation in India (NSS–56th round, July 2000–June 2001, report no. 476), National Sample Survey, Ministry of Statistics and Programme Implementation, Government of India.
@ NCAER's National Science Survey–2004. NCAER's 'below primary' level considers 10 years and above.

around a third have completed their graduation (or a higher degree) in a science course. Since there is no NSS/Census information on enrolments in the past, data was compiled from UGC, which showed that the proportion of those enrolled in science courses has gone up from 28.8% of the population in 1995–96 to 34.6% in 2003–04 (Table 2.3). And within this, the proportion of those doing engineering has almost doubled, from 6.0% of the population studying at the graduate–plus level in 1995–96 to 11.2% in 2003–04. Indeed, engineering education shows the highest growth, from 8.2% per annum in 1995–2000 to 21.9% in 2000–04. By way of comparison, enrolments for the arts grew from four per cent to 6.2% annually, and overall growth for all subjects actually fell.

Even more impressive than the growth at the overall level are the changes at the postgraduate level: the number of students has risen almost 2.5 times between 1995–96 and 2003–04, from 0.7 million to 1.7 million (Table 2.4). So, while the gross enrolment for graduates rose by only 1.3% annually between 2000–01 and 2003–04 (down from 4.9% in 1995–2000), it rose 23.6% for postgraduates (up from 5.2% in the period 1995–2000). Within the postgraduate enrolments, the numbers enrolled in science rose by around 2.7 times, and those in engineering more than 10 times.

As a result, while the proportion of postgraduates studying science rose from 36.5% of the total in 1995–96 to 41.4% in 2003–04, the

Table 2.3: Gross enrolment in higher education (Graduate+)

Fields of study	Enrolments (million)			Percentage distribution			Annual growth (%)	
	UGC* 1995–96	UGC 2000–01	NCAER** 2003–04	UGC 1995–96	UGC 2000–01	NCAER 2003–04	1995–2000	2000–2003
Science	1.91	2.62	3.29	28.8	31.1	34.6	6.5	7.9
Natural science	1.26	1.69	1.78	18.9	20.1	18.7	6.1	1.6
Engineering	0.40	0.59	1.07	6.0	7.0	11.2	8.2	21.9
Medicine	0.20	0.27	0.36	3.0	3.2	3.7	5.8	10.1
Agriculture/Veterinary	0.06	0.07	0.09	0.9	0.9	1.0	4.7	7.9
Arts	3.18	3.88	4.65	47.9	45.9	49.0	4.0	6.2
Commerce	1.13	1.51	1.20	16.9	17.8	12.6	6.0	-7.3
Others	0.43	0.44	0.36	6.4	5.2	3.8	0.5	-6.5
Total	**6.65**	**8.44**	**9.49**	**100.0**	**100.0**	**100.0**	**4.9**	**4.0**

Source: * University development in India, basic facts & figures (1995–96 to 2000–01), University Grants Commission, Government of India.
** NCAER's National Science Survey–2004.

Table 2.4: Enrolment in higher education (Graduate+) by level of education (per cent)

Fields of study	Graduate			Postgraduate			Total enrolments		
	UGC* 1995–96	UGC 2000–01	NCAER** 2003–04	UGC 1995–96	UGC 2000–01	NCAER 2003–04	UGC 1995–96	UGC 2000–01	NCAER 2003–04
Science	27.9	30.2	33.1	36.5	38.3	41.4	28.7	31.0	34.6
Natural science	18.4	19.2	20.3	23.0	26.6	11.5	18.9	20.0	18.7
Engineering	5.9	7.3	7.9	5.4	4.3	26.4	6.0	7.0	11.3
Medicine	2.9	3.1	4.1	5.4	4.3	2.3	3.0	3.2	3.8
Agriculture/Veterinary	0.7	0.7	0.9	2.7	2.1	1.1	0.9	0.8	0.9
Arts	47.9	45.9	49.9	47.3	45.7	44.3	47.7	45.9	48.9
Commerce	17.4	18.4	14.2	12.2	13.8	5.7	17.0	17.9	12.6
Others	6.8	5.5	2.7	4.1	3.2	8.6	6.5	5.2	3.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number (million)	5.91	7.50	7.76	0.74	0.94	1.73	6.65	8.44	9.49

Source: * University development in India, basic facts & figures (1995–96 to 2000–01), University Grants Commission, Government of India.
** NCAER's National Science Survey–2004.

proportion doing engineering rose from 5.4% to 26.4%. The proportion of science doctorates has also risen steadily, and these comprised around half the total in 2000–01.

Of the 31% students enrolled in science subjects at the graduate-plus level in 2000–01 (and 34.6% in 2004), the number of those who are going in for further research is relatively small. In 2000–01, of the total of 8.44 million students enrolled at the graduate/postgraduate level, only a little over one per cent enrolled for Ph.D. Indeed, according to Khadria[3], there were just around 101,000 Ph.D. holders in the country in 1999, and their number rose by just around 10,000 –11,000 each year during the second half of the '90s. In 1998–99, of the 10,951 doctorates awarded, 3,836 were in the natural sciences as compared to 4,189 for the humanities and there were 696 for engineering, 190 for medicine, 785 for agriculture sciences, and 101 for veterinary sciences.

So, while the increased proportion of students opting for science courses at the graduate level is good news, the lower follow through to higher levels, particularly doctorates, is a matter of concern.

OCCUPATIONAL PATTERN OF EDUCATED STOCK

Such a huge increase in enrolment, from 6.7 million a year in 1995–96 to 9.49 million (of whom 34.6% were in the science field) in 2004, has led to a quantum leap in the total stock of educated people in the country, and the number of those who are at least graduates has risen from 20.5 million in 1991 (Census 1991) to 48.7 million in 2004, which is a compound annual growth of just under seven per cent.

Though the number of science students is high, both as a proportion of the annual enrolment (33.4%) as well as that of the total stock (23.1%), the limited utilisation of this stock so far offers scope for improvement in the future. According to the National Science Survey–2004, almost 30% of those who have finished at least class 12 in science are not working (being either unemployed or having become housewives). For graduates in the science field, this proportion is over a fifth of the total stock, and in the case of Ph.Ds it is almost 14% (Table 2.5). For those who have passed their class 12 examinations, the figure is over 37%.

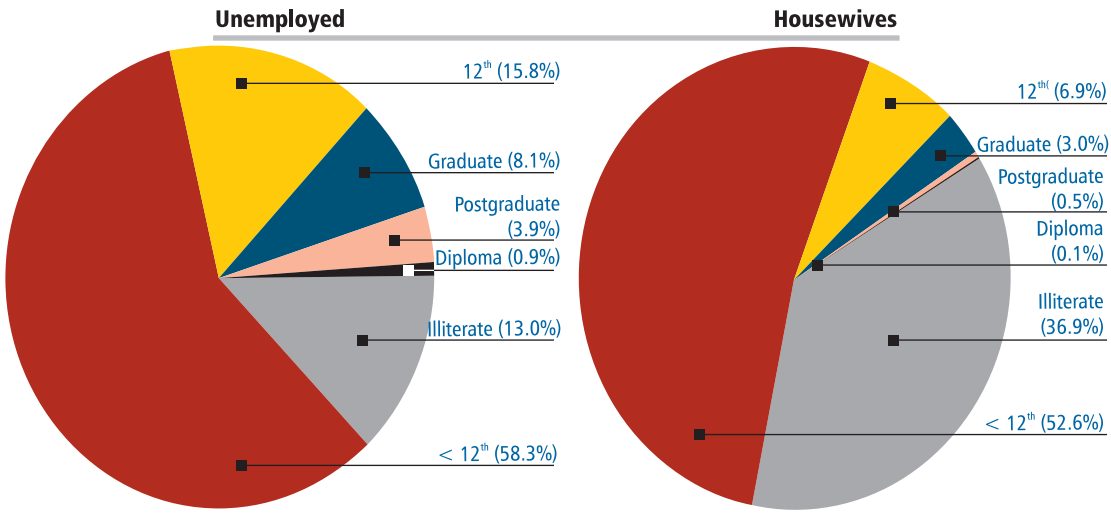
3. Human resources in science and technology in India and the international mobility of highly skilled Indians, Binod Khadria, OECD, DSTI/DOC (2004)/7, May 27, 2004.

Table 2.5: Distribution of science educated persons by occupation: 2004 (per cent)

Occupation categories	Level of education					Total
	12th	Diploma	Graduate	Postgraduate	Ph.D.	
Professional, technical, and related	9.5	14.0	34.3	51.9	48.5	20.9
Administrative, executive, and managerial	3.7	3.6	7.3	8.8	14.1	5.2
Clerical and related	5.4	7.0	10.9	7.8	1.6	7.4
Services	6.5	5.3	6.2	6.5	5.7	6.4
Farming, fishing, and related	14.1	5.9	4.7	1.5	0.0	9.6
Production, transport operators and labourers	5.9	31.9	3.7	1.9	1.7	6.4
Non-agricultural workers	2.9	3.9	0.4	0.2	0.0	1.9
Workers not classified by occupation	14.5	8.8	11.0	7.8	14.5	12.5
Housewives	23.9	2.4	9.9	7.3	9.1	17.0
Unemployed	13.6	17.2	11.6	6.3	4.8	12.6
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: NCAER's National Science Survey–2004.

Fig. 2.3: Distribution of unemployed and housewives by level of education: 2004



Source: NCAER's National Science Survey–2004.

Of the total science graduates, around 34% were employed as 'professional and technical' and just seven per cent of the science graduates were employed in 'administrative, executive, and managerial' jobs.

For those with a non-science background, however, the figures are worse (Table 2.6). Over 35% of those who have passed at least the class 12 examinations are either unemployed (10.1%) or have got married and are housewives (25.2%). In the case of Ph.Ds, however, the proportion of not working/housewives is lower – 6.6% of the Ph.Ds are housewives and four per cent of the non-science Ph.Ds are unemployed.

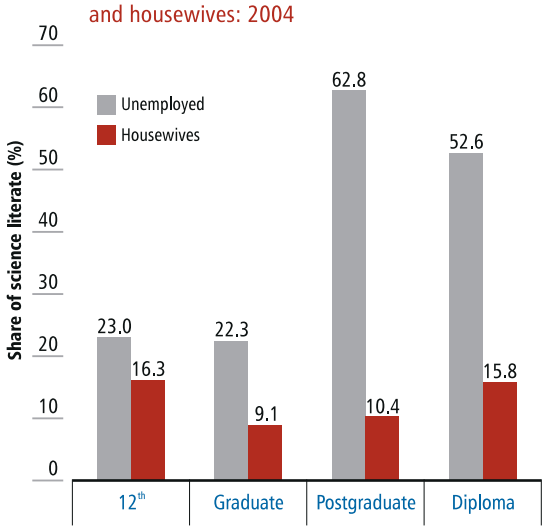
Not surprisingly, given their share in both the stocks (23.1%) as well as in enrolment (33.4%), science stream students are adequately represented in most types of jobs (Table 2.7). In the case of 'professionals, technical and related' jobs, almost 29% of the total employed are educated in

Table 2.6: Distribution of non-science educated persons by occupation: 2004 (per cent)

Occupation categories	Level of education					Total
	12th	Diploma	Graduate	Postgraduate	Ph.D.	
Professional, technical, and related	7.8	38.8	17.7	35.5	54.1	13.9
Administrative, executive, and managerial	1.7	7.9	3.9	6.5	6.9	2.9
Clerical and related	6.9	4.5	10.3	7.9	1.3	8.0
Services	6.7	4.8	5.3	4.2	6.1	6.1
Farming, fishing and related	14.7	4.9	8.7	6.3	3.1	11.9
Production, transport operators, and labourers	6.2	8.3	3.7	2.0	0.6	5.1
Non-agricultural workers	3.4	1.9	1.1	0.3	0.2	2.4
Workers not classified by occupation	14.3	11.8	15.2	12.4	17.1	14.4
Housewives	27.9	8.2	24.1	15.9	6.6	25.2
Unemployed	10.4	8.9	9.9	9.0	4.0	10.1
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: NCAER's National Science Survey–2004.

Fig. 2.4: Share of science literate to unemployed and housewives: 2004



Source: NCAER's National Science Survey–2004.

Table 2.7: Share of science educated persons in total by occupation: 2004

Occupation categories	Share of science literate (%)
Professional, technical, and related	28.8
Administrative, executive, and managerial	28.9
Clerical and related	21.3
Services	24.0
Farming, fishing and related	12.2
Production, transport operators, and labourers	33.5
Non-agricultural workers	17.8
Workers not classified by occupation	15.5
Housewives	9.4
Unemployed	23.6
All categories	**23.1**

Source: NCAER's National Science Survey–2004.

science. A fourth of all unemployed, again not surprisingly, are those with science education.

Interestingly, of those not working because they either have no job or are housewives, those who have studied science are in a much smaller proportion. In the survey, the unemployed included those who declared themselves as being unemployed on being queried about their occupation. Based on such responses the estimated population of the umeployed is around 40 million. As of 2004, of this population, 13% are illiterate and another 58.3% have studied only till class 12. Of the remainder, 8.4% have studied science, as compared to 20.4% who have studied non-science subjects (Fig. 2.3).

Of the graduates who are unemployed, 22.3% have studied science (Fig. 2.4). The share of postgraduates with science background in the total unemployed postgraduates is significantly higher (62.8%). This is a

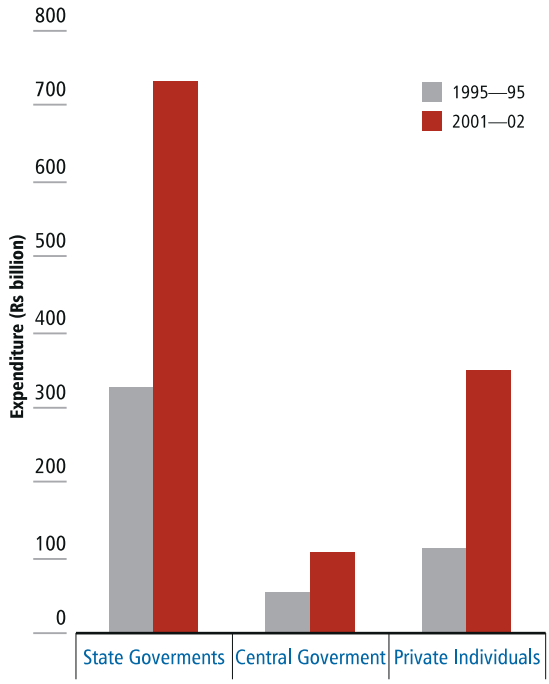
matter of great concern. This could be one reason for students not opting for science courses at higher levels or changing the stream after 12th and graduation to pursue technical education or management courses.

Similarly, in the case of housewives, the majority is either illiterate (36.9%) or has studied only up to class 12 (52.6%). Of the remainder, 1.5% are from the science field as compared to 9% who have studied either arts or commerce. In terms of graduate and postgraduate housewives, there are only 9.3% who have studied science subjects.

EXPENDITURE ON EDUCATION

While the proportion of government expenditure on education has risen marginally over the last decade, from 3.6% of the GDP in 1995–96 to 3.9 in 2002–03, there has been an impressive growth in private expenditure on education.

Fig. 2.5: Expenditure on education (Rs billion)



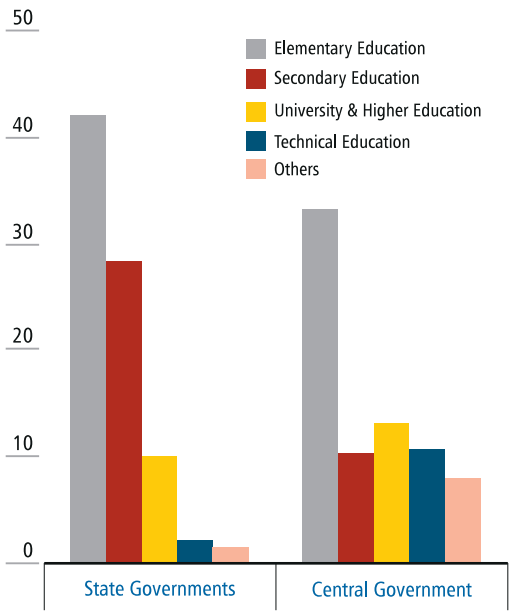
Source: Analysis of Budgeted Expenditure on Education (1995–96 and 2001–02), Ministry of Human Resource Development, Government of India.

Table 2.8: Relative expenditure on education by major states

Major states/UTs	Share of state population to total population (%) 2001*	Share of state spending to total government spending on education (%) 2002–03**	Education expenditure as percentage of NSDP** (2002–03)	Per capita expenditure on education (Rs per annum)	
				Private# (2001–02)	Government (2000–01)
Andhra Pradesh	7.4	5.6	3.5	368	527
Assam	2.6	3.4	9.6	153	778
Bihar	10.7	3.6	6.2	168	44
Delhi	1.3	1.5	2.0	693	809
Gujarat	4.9	4.7	3.7	272	812
Haryana	2.1	2.1	3.2	609	737
Karnataka	5.1	4.6	4.0	245	674
Kerala	3.1	3.7	4.3	434	902
Madhya Pradesh	7.9	5.6	7.0	210	838
Maharashtra	9.4	10.4	3.5	323	1070
Orissa	3.6	2.3	5.4	182	515
Punjab	2.4	2.8	3.7	604	845
Rajasthan	5.5	4.3	5.0	225	591
Tamil Nadu	6.1	6.3	4.1	364	784
Uttar Pradesh	17.0	7.5	3.9	291	387
West Bengal	7.8	6.8	3.9	354	1749

Source: * Registrar General of India, 2001 Census. ** Education Expenditure from 'Analysis of budgeted expenditure on education (2002–03), Ministry of Human Resource' and National State Domestic Product (NSDP) from 'National Accounts Division, Ministry of Statistics and Programme Implementation, Government of India.
Household Consumer Expenditure and Employment–Unemployment Situation in India (NSS–58th Round, July–December 2002, Report No. 484), National Sample Survey, Ministry of Statistics and Programme Implementation, Government of India.

Fig. 2.6: Distribution of education expenditure: 2002–03



Source: Analysis of budgeted expenditure on education (1995–96 and 2001–02), Ministry of Human Resource Development, Government of India.

Over 40% of the total expenditure by the government goes towards elementary education, a fourth to secondary schooling and just a tenth or so to university and higher education (Fig. 2.6). Not surprisingly, within this, the states tend to spend a lot more than the centre (85% of total government spending is by the states). States also spend a lot more on elementary level education as compared to the centre – around 42–43% of their budget, as compared to 28% for secondary education and a tenth for university education. By contrast, the centre spends around 33% on elementary education (the figure was a much lower 22% in 1995–96).

Maharashtra and Uttar Pradesh have the highest spending among the states and account for 10.4% and 7.5% of all government spending in the country, respectively (Table 2.8). This is however due to the higher population of these states; the expenditure on education needs to be normalized to a per capita basis. Once that is done, rankings change quite dramatically. Uttar Pradesh now moves towards the bottom of the table with government expenditure on education just under Rs 400 per annum as compared to West Bengal that tops the per capita government expenditure at almost Rs 1,750 per annum. Maharashtra is number two on the list.

Not surprisingly, states that have a high government spending are generally those with a high per capita income; private spending tends to be low where government spending is high. In Punjab, the government spent Rs 845 per person in 2000–01 and the state's citizens reciprocated by spending 30% less. In Bihar, where the government spent only Rs 44 per person in 2000–01, the average citizen spent Rs 168 in 2001–02 on education. Interestingly, it is states like West Bengal and Punjab, not Kerala, which emerge as states with the highest per capita expenditure on education.

REGIONAL VARIATIONS

While there is a huge variation in the education expenditures across different states as has just been seen in the previous section, there is also a large difference in the enrolment and other patterns, as well as in the number of educational institutes in the states. Indeed, what matters is not so much the amount spent by various state governments on education but the effectiveness of this, and that is judged by literacy rates and enrolment ratios. The per capita spend of West Bengal and Punjab is higher than Kerala's, but it is Kerala that topped the literacy charts in the country in 2001.

Over 40% of the total expenditure by the government goes towards elementary education, a fourth to secondary schooling and just a tenth to university and higher education

Given its huge geographic area, not surprisingly, Uttar Pradesh has the largest number of universities, though it is Maharashtra that has the most colleges in the country. Uttar Pradesh also has the highest number of schools that offer higher secondary courses.

Uttar Pradesh accounts for the country's largest number of graduates and above—around 15.2% and followed by Maharashtra (13.7%) and Andhra Pradesh (8.1%) (Table 2.9).

Table 2.9: Relative ranking of states by share of literate persons: 2004 (Top ten states)

Ranks	Level of education				
	Class 10th	Class 12th	Diploma	Graduate and above	Total population
1	Maharashtra **(11.5)**	Uttar Pradesh **(14.1)**	Tamil Nadu **(21.0)**	Uttar Pradesh **(15.2)**	Uttar Pradesh **(16.2)**
2	Uttar Pradesh **(10.6)**	Maharashtra **(11.7)**	Maharashtra **(17.6)**	Maharashtra **(13.7)**	Maharashtra **(10.1)**
3	Bihar **(9.2)**	Bihar **(8.4)**	Karnataka **(15.3)**	Andhra Pradesh **(8.1)**	West Bengal **(8.0)**
4	Tamil Nadu **(8.4)**	Andhra Pradesh **(7.9)**	Gujarat **(9.7)**	West Bengal **(7.8)**	Bihar **(7.8)**
5	Andhra Pradesh **(8.0)**	West Bengal **(6.8)**	Kerala **(8.9)**	Gujarat **(5.9)**	Andhra Pradesh **(7.6)**
6	West Bengal **(6.9)**	Tamil Nadu **(6.8)**	Andhra Pradesh **(6.2)**	Tamil Nadu **(5.7)**	Tamil Nadu **(6.5)**
7	Karnataka **(6.5)**	Karnataka **(5.5)**	West Bengal **(5.7)**	Bihar **(5.5)**	Madhya Pradesh **(5.7)**
8	Kerala **(5.3)**	Madhya Pradesh **(5.1)**	Orissa **(3.7)**	Karnataka **(5.4)**	Rajasthan **(5.5)**
9	Gujarat **(5.2)**	Gujarat **(4.8)**	Bihar **(2.8)**	Rajasthan **(4.0)**	Karnataka **(5.3)**
10	Rajasthan **(4.6)**	Kerala **(4.6)**	Uttar Pradesh **(2.6)**	Kerala **(3.9)**	Gujarat **(5.3)**

Note: Figures in () refer to percentage of persons accounted for by state for specific level of education as a proportion of the all India level.
Source: NCAER's National Science Survey–2004.

Table 2.10: Relative ranking by share of graduates in science, art and commerce: 2004 (Top ten states)

Ranks	Science	Art	Commerce
1	Andhra Pradesh **(14.0)**	Uttar Pradesh **(18.9)**	Maharashtra **(22.0)**
2	Tamil Nadu **(11.9)**	Maharashtra **(12.3)**	Gujarat **(13.8)**
3	Maharashtra **(11.1)**	West Bengal **(7.9)**	Andhra Pradesh **(12.2)**
4	Uttar Pradesh **(10.2)**	Bihar **(6.8)**	West Bengal **(9.8)**
5	Karnataka **(7.5)**	Andhra Pradesh **(5.0)**	Karnataka **(6.4)**
6	Kerala **(6.9)**	Rajasthan **(4.9)**	Uttar Pradesh **(6.3)**
7	Gujarat **(6.6)**	Orissa **(4.8)**	Tamil Nadu **(6.0)**
8	West Bengal **(6.4)**	Assam **(4.5)**	Kerala **(4.6)**
9	Bihar **(5.2)**	Karnataka **(4.4)**	Delhi **(3.6)**
10	Assam **(3.4)**	Tamil Nadu **(3.7)**	Madhya Pradesh **(2.6)**

Note: Figures in () refer to percentage of persons accounted for by state for specialisation at graduate level as compared to the all India figures.
Source: NCAER's National Science Survey–2004.

Delhi has the best-qualified population, and 16% of all Delhiites have at least a graduate degree. At an all-India level, six per cent of the country's population (above the age of 10) is at least graduate and above, and another 12% has passed class 12 and/or has a diploma.

Though Karnataka is considered to be the country's knowledge centre, it is Andhra Pradesh that has the highest proportion of science graduates in the country (Table 2.10). Of the 12.1 million science graduates and diploma holders in the country, 14% are to be found in Andhra Pradesh. Tamil Nadu is next with 11.9%, Maharashtra third with 11.1%, Uttar Pradesh fourth with 10.2% and Karnataka gets into the list next with 7.5%.

Not surprisingly, Maharashtra leads in terms of the stock of commerce graduates (22%). In terms of those enrolled in commerce at the graduate and above level in the country, 16% are to be found in this state.

Gujarat, again expectedly, ranks second with a 13.8% share in the stock of commerce graduates+. Indeed, over 30% of all Gujaratis who are either graduates or diploma holders have studied commerce for their degrees. Of those who have enrolled in 2004, a third are studying commerce.

EDUCATIONAL MIGRATION

While various states have a large proportion of students, where they study depends upon the level of educational infrastructure available in the state. Needless to say, if a large number of students of a state are studying in other states, there is a good case for

building more educational infrastructure in that state. One is led to this inference by comparing the figures obtained in the NCAER National Science Survey–2004 with figures for student enrolment provided by the University Grants Commission (UGC).

The National Science Survey–2004 data pertains to students whose parents live in a particular state while the UGC numbers pertain to actual enrolment in a state, regardless of which states the students really originate from. Thus, for instance, the NCAER survey showed that there were 2.6 lakh students from families residing in Andhra Pradesh that were studying engineering in 2004. The UGC figures show that the actual enrolment for engineering in Andhra Pradesh was only 56,000.

Since the NCAER data pertains to 2003–04 while the UGC enrolments pertain to 2000–01, we have sought to make the data comparable by simply focusing on the percentage distribution. To return to the Andhra Pradesh example, figures suggest that 14.6% of all students from Andhra Pradesh studying engineering do so outside the state (Table 2.11). Similarly, in the case of Karnataka, 11.1% of students enrolled in the state for medicine are from outside the state (Table 2.12).

Table 2.11: Students migrating for higher education in science: 2004 (Top five states)

Ranks	Natural Science	Engineering	Medicine
1	Andhra Pradesh **(8.8)**	Andhra Pradesh **(14.6)**	Maharashtra **(8.4)**
2	Uttar Pradesh **(4.6)**	Orissa **(4.5)**	Rajasthan **(5.9)**
3	Assam **(3.6)**	Bihar **(2.9)**	Orissa **(5.0)**
4	Kerala **(3.6)**	Gujarat **(2.0)**	Assam **(1.8)**
5	Chattisgarh **(0.6)**	Rajasthan **(1.5)**	Haryana **(1.4)**

Note: Figures in () refer to percentage of students migrating from state for specific science subjects.
Source: NCAER's National Science Survey–2004.

Table 2.12: Students immigrating for higher education in science: 2004 (Top five states)

Ranks	Natural Science	Engineering	Medicine
1	Tamil Nadu **(7.4)**	Tamil Nadu **(10.3)**	Karnataka **(11.1)**
2	Madhya Pradesh **(4.2)**	Maharashtra **(8.7)**	Tamil Nadu **(8.5)**
3	West Bengal **(2.3)**	Madhya Pradesh **(2.1)**	Punjab **(1.8)**
4	Rajasthan **(1.1)**	West Bengal **(1.3)**	Uttar Pradesh **(1.6)**
5	Orissa **(0.6)**	Haryana **(1.2)**	Delhi **(0.6)**

Note: Figures in () refer to percentage of students immigrating from state for specific science subjects.
Source: NCAER's National Science Survey–2004.

STUDENTS' ATTITUDE TOWARDS SCIENCE

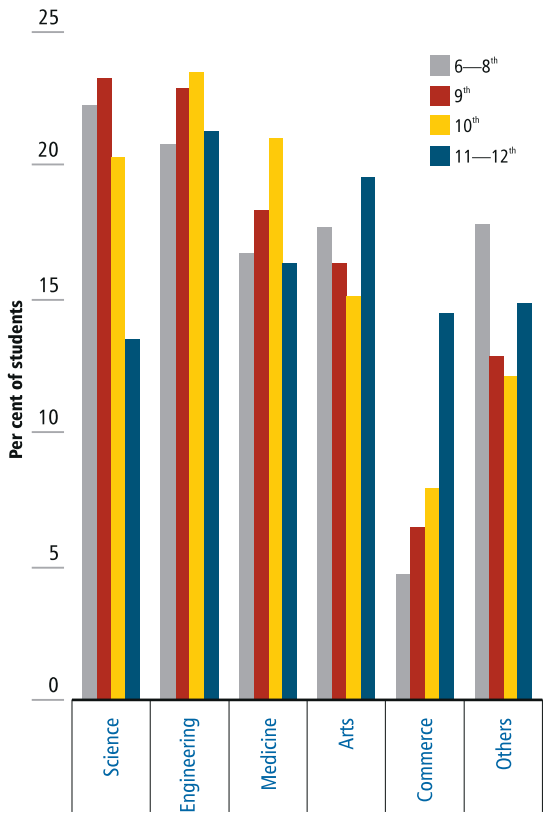
With an increased number as well as proportion of students enrolling for science education—28% of all enrolments at the graduate+ level were in the science field in 1995–96 and this went up to 31% in 2004 — it is difficult to believe there is any sense of crisis in the science education scene in the country. Indeed, over three-fourths of teachers polled in the National Science Survey–2004 were of the view that science education is growing.

Mathematics remains the most preferred subject, with a third of students in classes six to eight rating it as number one, and over 21% still feeling the same way in classes 11 and 12 (Table 2.13). Close to 30% of the students rate subjects like Physics, Chemistry, and Biology as the top subjects in classes 11 and 12, a figure which is triple that for students in classes six to eight—that is, the attraction for science subjects increases dramatically in the higher classes in school.

The worrying news is that students interested in taking up science in the higher classes while at school appear a lot less interested in pursuing pure science when it comes to a higher degree, whether graduation or postgraduation. At the class six to eight level, 22% of the students said they would like to study pure science at a higher level of education. Yet, when it came to students in class 11 and 12, just 13.4% wanted to study pure science at the graduate/postgraduate level (Fig. 2.7).

In overall terms, however, the interest in all types of science education doesn't decline much—60% of the students at the class six to eighth level

Fig. 2.7: Preferred subjects for higher education by level of students: 2004



Source: NCAER's National Science Survey–2004.

Engineering was the favourite subject, medicine came next and the pure sciences were just marginally lower

said they wanted to pursue some science education (pure science, engineering or medicine) at a higher level as compared to 57% students in classes 11and 12. Over 40% of the students, whether in classes six to eight or 11 and 12, wanted to become either an engineer or a doctor. Interestingly, there is almost a three-fold hike in the proportion of students who wish to take up a career in commerce as you move from class six to eight (4.7%) to class 11 and 12 (14.5%).

Not surprisingly, engineering was the favourite subject chosen by the maximum number of students (22%) as the one in which they would like to complete their higher education, whether for a bachelors, a masters, or a Ph.D. degree (Fig. 2.7). Medicine came next (18%) and the pure sciences were just marginally lower.

A lot more students in rural areas, though, prefer to go into arts subjects as compared to those in urban areas. A fourth of those in rural areas said they would like to complete their higher education in an arts subject as compared to 15% in urban areas. With nearly 13% of the student population wanting to study commerce at the higher level in urban areas, this was more than double that for rural areas.

SATISFACTION WITH TEACHING

One of the reasons for the declining trend in pursuing science education at the higher levels is the increasing dissatisfaction of students with teaching of science in the higher classes in school. Close to two-thirds of students in classes six to eight are satisfied with the quality of science teaching (it was 84% for Mathematics), but this figure declines in the higher classes (Table 2.14). Just 40% of those in class 11 and 12 express satisfaction with the teaching of biology, for instance.

In general, the level of satisfaction with teaching is higher in private schools, and the quantum difference is highest in subjects like computer science. Fifty eight per cent of the students in government schools said they were satisfied with the quality of teaching of physics, as compared to 62% for those in private schools. Over 61% of those in government schools are satisfied with the quality of teaching of mathematics as compared to nearly 69% for those in private schools. In the case of computer sciences, just 15% of the students in government schools are satisfied with the teaching as compared to 23% in private schools. This trend is reflected across all levels and needs to be looked into especially keeping in view that the country requires trained scientific manpower in such areas to meet the requirements of the outsourcing and BPO opportunities coming the country's way.

PURSUING SCIENCE

A point worth keeping in mind is that not too many students are keeping away from science deeming it a costly subject to pursue. While ten per cent of the students cite this as the reason for not having taken up science at the plus-2 level, 45% state they are not pursuing science because they have no interest in science (Table 2.16). Another 20% say they have taken up arts/commerce because science is a difficult subject. Of those who have taken up science, over two–thirds have done so because they are interested, and not because of better job opportunities (Table 2.15). Only a fifth of the students say they have taken up science because of better career prospects. And a mere three per cent say they are studying science because their parents wish them to.

SOURCING SCIENCE

Television appears to be the greatest source of information for most households (Table 2.17). This is an indication that needs careful evaluation in terms of the fact that television could be used as an important source of disseminating S&T information and developments. However, most students say they get their information about competitive examinations or job opportunities from newspapers. Science teachers are cited as the next best source of information. There is not too much difference on this count between rural and urban students. This is perhaps a good sign and an area that needs to be strengthened further through training and motivation of teachers.

However, one source of global information that really needs to be promoted is the Internet. Currently it ranks low among the sources of information. But the situation needs to be changed by improving Internet penetration.

Another area that needs to be looked into is the fact that parents and teachers play an important role in the selection of courses as well as in deciding career choices. Perhaps there has to be a concerted

Table 2.13: Favourite subjects by level of education: 2004 (% of students)

Subjects	Level of education				
	6–8th	9th	10th	11–12th	Total
Physics	2.0	1.8	3.1	10.1	6.3
Chemistry	1.0	2.1	1.3	7.1	4.3
Mathematics	32.6	31.8	34.8	21.1	27.2
Biology	7.2	6.3	8.4	12.3	10.0
Humanities and Social Science	17.8	16.8	13.9	17.1	16.4
Computer Science	0.5	0.4	0.6	1.0	0.8
Other subjects	29.3	28.4	26.0	28.1	27.8
None	9.5	12.4	12.1	3.2	7.3
Total	100.0	100.0	100.0	100.0	100.0

Source: NCAER's National Science Survey–2004.

Table 2.14: Proportion of students satisfied with teaching by subjects: 2004 (% of students)

Subjects	Level of education				Type of school		Total
	6–8th	9th	10th	11–12th	Government	Private	
Physics	64.7	70.1	72.9	50.6	57.7	62.3	60.2
Chemistry	59.3	67.2	67.7	48.6	54.2	59.0	56.8
Mathematics	83.5	84.4	82.2	47.9	61.2	68.9	65.4
Biology	65.0	71.9	71.9	40.2	53.2	56.4	55.0
Humanities and Social Science	65.7	70.6	66.1	30.8	47.7	49.8	48.8
Computer Science	17.8	24.8	21.2	17.2	14.9	23.0	19.1
Other subjects	53.2	24.8	53.2	56.0	52.2	57.3	51.1

Source: NCAER's National Science Survey–2004.

Table 2.15: Reason for taking admission in science: 2004

Reasons	% of science students (Class 11 & 12)
Interested in science subjects	66.6
Better job opportunities	20.4
Parents' desire	3.3
Interested in doing research in science	1.8
Influenced by the work of scientists	1.3
Quality of science teachers is very good	0.8
Influence of peer group	0.7
Intend to go abroad	0.2
Others	4.8

Source: NCAER's National Science Survey–2004.

Table 2.16: Reasons for not taking admission in science: 2004

Reasons	% of non-science students (Class 11 & 12)
Not interested in science subjects	44.5
Difficult subject	20.4
Higher studies are costly	9.9
Interested in commerce	5.4
Like arts subjects	4.8
No future opportunities	2.1
No science college nearby	2.0
Difficult to get through competitive examination	1.1
Poor quality of teaching at school	1.1
Others	8.9

Source: NCAER's National Science Survey–2004.

22 per cent of students in class 6–8 wanted to pursue pure science at a higher level of education but when it came to class 11 and 12, just 13.4 per cent wanted to do this

effort to address this segment and ensure that comprehensive and correct information reaches the parents and teachers.

EDUCATIONAL ASPIRATIONS

An encouraging sign is that while 35% of the students say they want to become at least a graduate, another 26% want to pursue a postgraduate degree (Table 2.18). Even more interesting, as students go up to higher classes, more of them felt they needed to pursue postgraduate as well as doctoral degrees. A little less than 22% of those in class six to eight said they wanted to get a postgraduate degree, as compared to 30% of those in class 11 and 12. As compared to seven per cent of those in class six to eight who plan to do a doctorate when they grow up, the figure is close to 11% in the case of those in class 11 and 12.

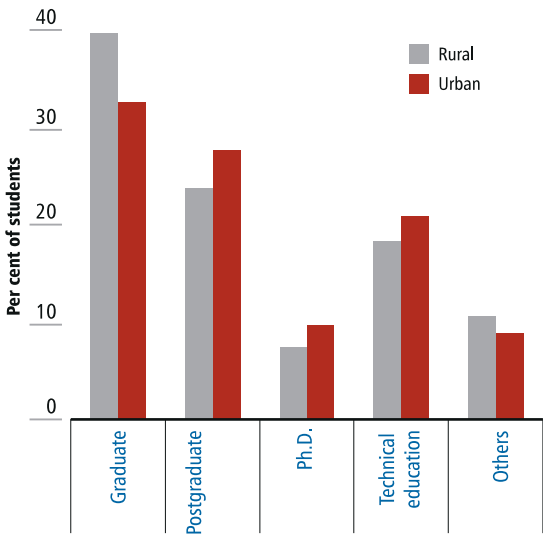
While a graduate degree appears to have become a minimally acceptable norm, there is a considerable difference between rural and urban areas. While 40% of the rural students wished to complete a graduate degree, the figure stands lower at 33% for urban areas (Fig. 2.8). Instead, 28% of

Table 2.17: Major source of information for students: 2004 (% of students)

Type of information	Television	Internet	Newspaper	Parents	Friends	Science teacher	Senior student	Others	Total
Competitive examination for admission and jobs	10.0	2.1	33.2	15.8	8.6	19.0	4.9	6.5	100.0
Job opportunities	3.7	2.0	42.4	25.9	6.3	9.5	2.8	7.6	100.0
Current events in S&T	29.3	2.7	22.4	7.6	4.5	24.7	1.8	6.9	100.0
Selection of courses	1.8	0.9	6.9	32.2	13.9	20.8	12.6	10.8	100.0
Career plan	5.2	1.9	19.8	37.8	9.2	13.5	5.1	7.6	100.0
Study abroad	5.1	3.5	11.8	34.0	5.4	14.4	4.4	21.3	100.0
Higher studies	4.0	1.6	12.0	41.1	6.8	17.9	9.2	7.2	100.0
Fellowships	2.8	1.3	6.6	14.5	7.7	29.6	7.2	30.3	100.0

Source: NCAER's National Science Survey–2004.

Fig. 2.8: Higher education planned by location: 2004



Source: NCAER's National Science Survey–2004.

urban students want to do postgraduation as compared to 24% for rural areas. The proportion of students wanting to complete a Ph.D. is also higher in urban areas, though only moderately so.

PREFERRED PROFESSION

While at school, the highest number of students wishes to become teachers (32% in rural areas and 20% in urban areas), but this desire reduces over the years (Table 2.19). In classes six to eight, for instance, 30% of the students said they wished to become teachers and this falls to 23% among students in classes 11 and 12. The proportion that wanted to become doctors remained more or less the same at all classes in school (around 20%) while the proportion that wanted to become engineers rose marginally (to around 23%). Thus, the three most preferred professions turn out to be teacher, doctor and engineer.

However, despite the government's exhortations to educated and informed youth to aim at becoming bureaucrats, technocrats, and entering professions such as politics so as to bring in better governance the trend is not indicative of this fact.

Table 2.18: Higher education planned by level of education: 2004 (% of students)

Level of education	Level of education				
	6–8th	9th	10th	11–12th	Total
Graduate	35.8	39.9	39.4	31.2	34.8
Postgraduate	21.9	22.1	24.7	29.6	26.4
Ph.D.	7.0	7.5	7.4	10.6	9.0
Technical education	22.6	22.7	21.5	18.0	20.1
Others	12.7	7.8	7.0	10.5	9.7

Source: NCAER's National Science Survey–2004.

REASONS FOR DISINTEREST IN SCIENCE

Though the National Science Survey–2004 clearly shows there is no decline in interest in the proportion of students who wish to study science, there are areas that need attention. A third of the students said they did not study science as they did not feel motivated enough, another 40% said the number of students in a class were too many for them to understand what was being taught, and around 45% said the computers/equipment used to teach science were either inadequate or obsolete (Table 2.20).

Teachers gave quite different explanations for limited interest in science such as costly and difficult education apart from limited job opportunities (Table 2.21). Half the teachers interviewed for the National Science Survey–2004 said that more computers/equipment were required for teaching science subjects since inadequate practical training was a serious issue (Table 2.22). While 15% felt that teachers too required proper training, 11% felt the need for simplification of the course content.

IMPACT OF PARENTS' BACKGROUND

The occupation of the head of the family plays a major role in determining the subjects in which the children plan to complete their higher education. Over 42% of the students whose fathers are agriculturists, want to complete a graduate degree as compared to 24%

Table 2.19: Preferred profession: 2004 (% of students)

Profession	Level of education 6–8th	9th	10th	11–12th	Total
Scientist	4.2	4.7	3.6	3.1	3.6
Teacher	29.5	24.9	22.6	23.2	24.2
Lawyer	5.3	5.5	6.4	9.6	7.8
Doctor	19.5	21.1	23.3	17.6	19.7
Engineer	21.5	23.7	25.3	22.3	23.1
Bureaucrat	1.6	1.1	1.7	2.8	2.2
Technocrat	2.5	2.2	1.7	1.9	1.9
Politician	1.7	1.7	1.2	1.8	1.7
Others	14.2	15.1	14.0	17.6	16.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: NCAER's National Science Survey–2004.

Table 2.20: Students' reasons for low science learning: 2004 (% of students)

Reasons	To a great extent	Little	Not at all
Inadequate student motivation	35.0	26.3	38.8
Large class size	39.1	22.5	38.3
Inadequate time to complete syllabus	42.8	22.9	34.3
Lack of/or obsolete computers	46.5	13.3	40.2
Lack of scientific equipment	45.7	15.8	38.6
Inadequate physical infrastructure	36.6	18.9	44.5
Lack of good teachers	45.3	16.2	38.5

Source: NCAER's National Science Survey–2004.

Table 2.21: Teachers' explanations for poor science education: 2004

Reasons for decline	Percent of teachers
Costly education	37
Difficult subject	27
Limited job opportunities	18
Tough competition	7
Less awareness	3
Others	8

Source: NCAER's National Science Survey–2004.

Table 2.22: Suggestions for improvement in science education: 2004

Suggestions	Percent of teachers
More practical than theoretical	49
Proper training to teachers	15
Modernisation of teaching system	13
Simplification of course content	11
Enhance job opportunities	5
Provide cheaper science education	4
Easy admission process	3

Source: NCAER's National Science Survey–2004.

Fig. 2.9: Student's preferred degrees by father's occupation: 2004

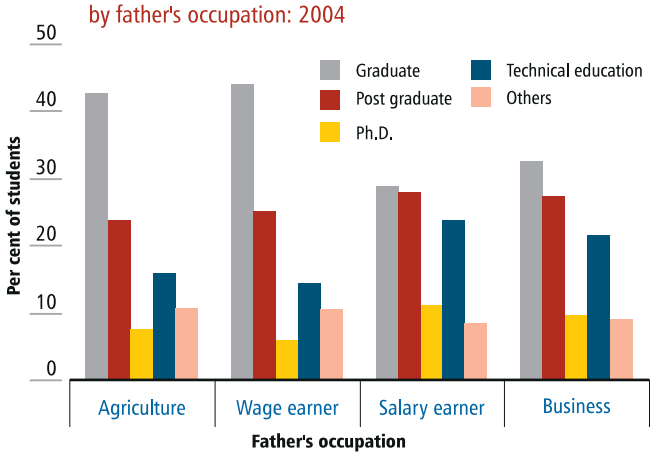
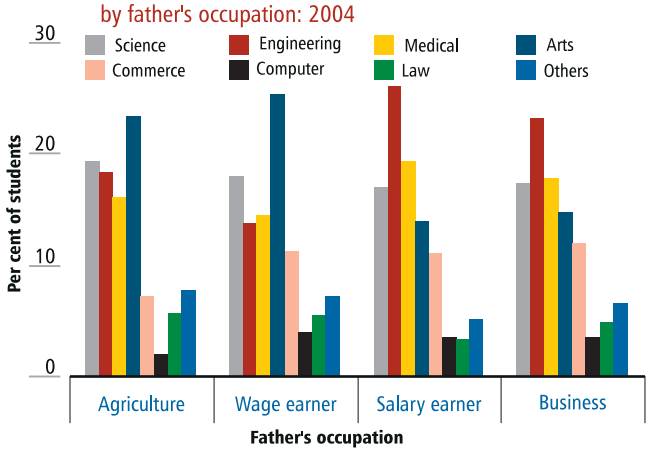


Fig. 2.10: Student's preferred subjects by father's occupation: 2004



Source: NCAER's National Science Survey–2004.

who plan to do a postgraduate degree (Fig. 2.9). A mere 31% of the children of the salaried class wish to pursue a graduate degree, 26% a postgraduate degree and 25% wish to go in for technical education. Over half the students who planned to become graduates are those whose parents were graduates. In the case of students whose parents were businessmen, 37% wished to be graduates, a fourth wanted to pursue a postgraduate degree and around 22% a technical degree.

The occupation of the father also has a bearing on the choice of subjects the child wishes to study (Fig. 2.10). The most preferred subject for children of agriculturists and wage earners is arts, while in case of salary earners and businessmen these subjects were enginering and medical. While children of agriculturists form the largest proportion that wish to study pure science (19%) as compared to any other group (corresponding figures are 17% for children of salary earners), a lot less wish to study engineering, something that may be related to the cost of such studies as well. A little over 18% of the children of agriculturists say they wish to study engineering as compared to 26% in the case of children of salary earners. Around 16% of agriculturists' children say they wish to study medicine as compared to 19% for salary earners. This indicates that the parent's occupation does not come in the way of the children's interest in science and engineering education but there might be certain factors such as financial status that prove to be a hindrance in eventually taking up science.

In the case of parents who have passed high school, close to a third of the students want to become teachers; whereas among those whose parents are postgraduates, about 14% want to become teachers. Indeed, close to 40% of the children of postgraduate parents want to become doctors and another fourth engineers. The level of education of parents also influences the choices their children make. A third of children whose parents are graduates want to be

Box 2.1: Academic qualification framework—India

Literacy: According to census any person who can both read and write with understanding in any language is to be taken as literate.

STAGES OF SCHOOL EDUCATION

Primary Education: Consists of classes I–V in almost all the states of India.

Middle Education: This stage comprises of classes VI–VIII.

Secondary Education: Consists of classes IX–X.

Higher Secondary Education: This stage is also known as the senior secondary stage and comprises of classes XI–XII (10+2 pattern) and after passing out from this students can directly get admitted to degree classes in colleges/universities.

PRINCIPAL LEVELS OF QUALIFICATION WITHIN THE HIGHER EDUCATION SYSTEM

There are three principal levels of qualification within the higher education system in India. These are:

- Bachelor/undergraduate level
- Master's/postgraduate level
- Doctoral/pre-doctoral level

Bachelor's degrees: Students in bachelor level education are admitted after 12 years of school education. Bachelors degrees in arts, commerce and sciences require three years of education. In some places there are honours and special courses available. These are not necessarily longer in duration but indicate greater depth of study. Bachelor degrees in the professional fields of study of agriculture, dentistry, engineering, pharmacy, technology, and veterinary medicine generally take four years, while architecture and medicine take five and five-and-a-half years respectively. Other bachelor degrees—in education, journalism and librarianship—are second degrees. A bachelor's degree in law can either be taken as an integrated degree lasting five years or as a three-year course as a second degree.

Master's degree: Masters degree is normally of two years duration. It is either based on course-work without a thesis or based on research alone.

Master of Philosophy (M.Phil.): This is a pre-doctoral programme, which is taken after completion of the Master's degree. This can either be completely research based or can include course work as well. Ph.Ds are awarded two years after the M.Phil. or three years after the Master's degree (although it generally takes longer). Students are expected to write a substantial thesis based on original research.

Diploma courses: These are also available at the undergraduate and postgraduate level. At the undergraduate level, the length of these courses varies between one and three years, while postgraduate diplomas are normally awarded after one year's study.

BOX 2.2: EDUCATION SYSTEM IN INDIA

Higher Education in India has evolved in divergent and distinct streams with each stream monitored by an apex body, indirectly controlled by the Ministry of Human Resource Development. The state governments mostly fund the universities. However, there are 18 universities called the Central universities (as on 31st March 2002), which are maintained by the Union Government and because of relatively large funding, they have an economic edge over the others.

The engineering colleges and business schools in the country are monitored and accredited by the All India Council for Technical Education (AICTE) while medical colleges are monitored and accredited by the Medical Council of India (MCI). The National Council for Teacher Education (NCTE) was constituted a couple of years ago to monitor, organise and accredit all the teacher-training institutions in the country and this apex body has started making its presence felt. Apart from these, the country has some ace engineering, management and medical education institutions that are directly funded by the Union Government

Professional Councils are responsible for recognition of courses, promotion of professional institutions and providing grants to undergraduate programmes and various awards. The statutory professional councils are All India Council for Technical Education (AICTE), Distance Education Council (DEC), Indian Council for Agriculture Research (ICAR), Bar Council of India (BCI), National Council for Teacher Education (NCTE), Rehabilitation Council of India (RCI), Medical Council of India (MCI), Pharmacy Council of India (PCI), Indian Nursing Council (INC), Dentist Council of India (DCI), Central Council of Homoeopathy (CCH) and Central Council of Indian Medicine (CCIM).

The Central Government is responsible for major policies relating to higher education in the country. It provides grants to the UGC and establishes central universities in the country. The Central Government is also responsible for declaration of Educational Institutions as 'Deemed to be University' on the recommendation of the UGC.

UNIVERSITY EDUCATION

The University Grants Commission (UGC) is the apex body of the university system in the country and was established by an Act of Parliament in 1956. Its function is to fund, co-ordinate, monitor, and maintain the Constitutional mandate of co-ordination, determination, and maintenance of standards of teaching, examination, and research in the field of University and Higher Education. UGC serves as a vital link between the Union and State Governments and the institutions of higher learning. The Central Universities are completely funded by the University Grants Commission, while the state universities are funded partly by it. The major funds for the state university come from the respective state government to which it belongs.

EDUCATIONAL POLICY

So far two national educational policies (NPE) have been formulated by the Central Government—one in 1968 and the other in 1986. NPE 1986 was further modified in 1992. In NPE 1968, the stress was on quality improvement, a planned, more equitable expansion of educational facilities, and the need to focus on the education of girls. The NPE 1986 provides for a comprehensive policy framework for the development of education up to the end of the century and a Plan of Action (PoA) 1992, assigning specific responsibilities for organising, implementing, and financing its proposals.

The National Assessment & Accreditation Council (NAAC) has been set up to assess their performance vis-a-vis set parameters. NAAC is a rating agency for academic excellence across India, and the country's first such effort.

SYSTEM OF GOVERNANCE OF HIGHER EDUCATION INSTITUTIONS

The Universities are of various kinds: single faculty or multi-faculty; teaching or affiliating, or teaching-cum-affiliating; single campus or multiple campus, and so on. Most Universities are affiliating universities, which prescribe to the affiliated colleges the course of study, hold examinations and award degrees, while undergraduate and to some extent post the colleges affiliated to them impart graduate instruction. Many of the universities along with their affiliated colleges have grown rapidly to the extent of becoming unmanageable. Therefore, as per National Policy on Education, 1986, a scheme of autonomous colleges was promoted. In the autonomous colleges, whereas the degree continues to be awarded by the University, the name of the college is also included. The colleges develop and propose new courses of study to the university for approval. They are also fully responsible for conduct of examination. There are at present 126 autonomous colleges in the country.

Fig. 2.11: Student's preferred degrees by parent's education: 2004

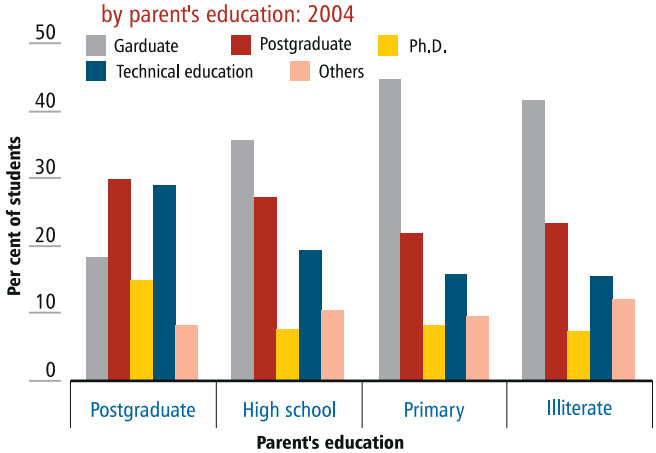


Fig. 2.12: Student's preferred subjects by parent's education: 2004

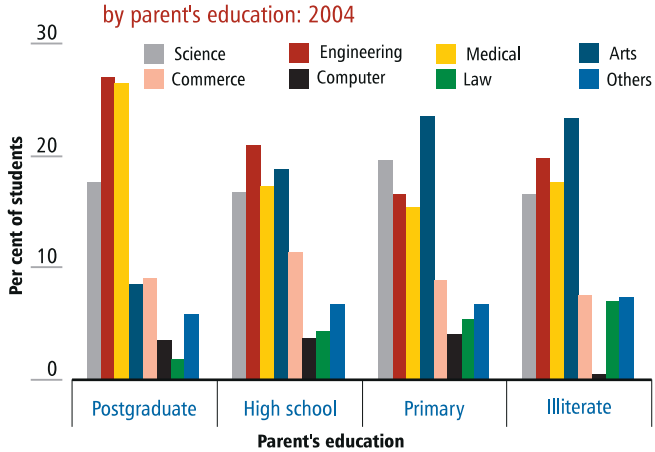
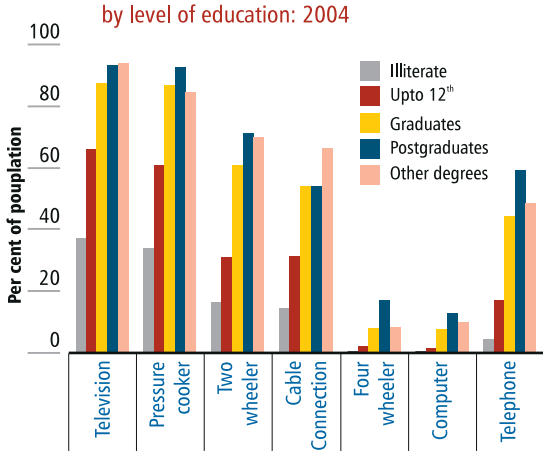


Fig. 2.13: Ownership of select durable goods by level of education: 2004



Source: NCAER's National Science Survey–2004.

graduates as well—only a fourth want to do a postgraduate degree and another fourth a technical degree (Fig. 2.11). While there are differences depending upon the level of education of parents, a graduate degree appears to be a very basic degree with 40% of all children wanting to become graduates—indeed, 45% of children whose parents are illiterate want to become graduates.

Generally speaking, children of illiterate parents or those who have studied till only the primary level seem to wish to study arts the most (23% of such children indicate this in both cases)— in comparison, only nine per cent of the children of parents who have studied at the postgraduate level wish to study arts (Fig. 2.12). Around 27% of the children of postgraduate parents wish to study engineering and an equal number wish to study medicine as compared to 20% and 18% in the case of children whose parents are illiterate.

IMPACT OF AMENITIES ON EDUCATION

While it is unclear as to whether education or income is the driving force, individuals with poor amenities tend to be worse educated than those with higher level of amenities. While 61% of the illiterate people have access to electricity, 95% of the postgraduates have electricity access. Forty-three per cent of those who are illiterate have separate kitchens in their homes as compared to 85% in the case of graduates and 89% in the case of postgraduates. Similarly, when it comes to gadgets, fewer than five per cent of all illiterates have refrigerators at home compared to around 50% in the case of graduates (Fig. 2.13). Just 0.4% of illiterates own a computer as compared to 13% in the case of postgraduates. ■

Human Resources in Science and Technology

Within the broad umbrella of human capital, the role of scientific manpower is critical, and there is a close relationship between human resource in science and technology and economic growth. NCAER's National Science Survey–2004 found that while the number of human resource in S&T by education has grown considerably, the issue that looks a bit worrying is the poor utilisation of these persons. Only a third of such persons were pursuing an occupation that was related to their educational qualification. That is, close to two-thirds of such persons were not being utilised properly. The report also found that a substantial percentage of those holding HRST jobs were educationally not qualified, and had only a 12th standard degree or less. If the country has to make the most of the outsourcing and R&D opportunities coming its way from foreign shores, it will have to look closely at the quality of scientific and technical manpower it is churning out.

THE ORGANIZATION FOR ECONOMIC Co-operation and Development (OECD) defines highly skilled human resources as "essential for the development and diffusion of knowledge..." and notes that they "constitute the crucial link between technological progress and economic growth, social development, and environmental well-being. An important subset of human capital is that part which is involved in technological progress or knowledge development."[1]

Indeed, unlike other forms of capital, either physical or financial, human capital has a dual role in that it is both a creator as well as disseminator of new knowledge into the wider economy. It is defined as, "the knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal, social, and economic well-being."[2] Human capital is the only form of capital that has the ability to modify itself and other inputs, and therefore, possesses the capacity to create new and improved production processes. Indeed, most economies that experienced a parallel rise in education levels among the employed and the working-age population at large were those that successfully raised trend growth of GDP per capita over the 1990s.

Within the broad umbrella of human capital, the role of scientific manpower or what could be called Human Resource in Science and Technology (HRST) is critical, and there is a close relationship between HRST and economic growth.

This chapter examines the levels of human resource

1. The measurement of scientific and technological activities: manual on the measurement of human resources devoted to S&T (Canberra Manual).
2. OECD: The well-being of nations: The role of human and social capital and sustained growth and development; DEELSA/ELSA/ED/CERI/CD (2000) 3REV2; February 2001.

development in India, the stock and evolution of its skilled manpower, with special emphasis on the HRST manpower. An attempt is made to analyse just how this pool of HRST talent is being utilised (how many scientists are unemployed or working in jobs that do not utilise their particular education, for instance). The chapter uses primary data generated through the National Science Survey–2004 covering about 347,000 individuals from whom information on education qualification and occupational categories was sought[3]. Finally, all primary survey information has been supplemented by secondary sources, both national and international, to understand what comprises HRST by international standards, and to try and fit India's manpower into this analytical framework.

CONCEPT OF HRST

Various studies define HRST in different ways (highly skilled workers, scientists and engineers, ICT workers, and so on) and most empirical works use proxies like education and occupation for this – education itself is normally categorised by the highest degree obtained and occupation involves scientific and skilled works. The Canberra Manual is the fifth in the "Frascati family" of manuals prepared jointly by the OECD and the European Commission, and is used internationally to measure HRST.

The Canberra Manual defines HRST as comprising those who fulfil one of the two conditions: (a) successful completion of education at the tertiary level[4] in any S&T[5] field, or (b) not formally qualified as (a), but employed in an S&T occupation where the qualification cited in (a) is normally required. The advantage of the double educational/occupational classification is that it allows an analysis of both the supply side of HRST, in terms of qualification (HRSTE), and the demand side, in terms of occupation (HRSTO). Its drawback is that, by definition, it does not allow for homogeneous measurement because the two classifications are based on different premises and it is too broad to meet specific analytical needs.

The demand for HRST, or the number of people who are actually required in S&T activities at a certain level, is covered when it considers all people working in an 'HRST–occupation' (HRSTO). The supply of HRST is estimated by counting all HRSTEs.

As per the manual, tertiary-level education comprises two major categories, university-level HRST and technician-level HRST. The split between the two is related to skill levels and thus mainly to education. Successful completion of either a bachelors degree or a postgraduate university degree (or equivalent) is the main criterion for university-level HRST whereas an award lower than a first university degree is the criterion for technician-level HRST. People without qualifications may enter these categories by virtue of occupation. But there is always core coverage of HRSTE comprising people with university-level qualifications in natural sciences, engineering, and the medical and agricultural sciences only; other types of coverage (for instance, social sciences and humanities) are more comprehensive or less disaggregated and used as extended forms in the manual.

There are a number of reasons why these levels or fields are included in the core coverage for measuring HRSTE. Firstly, university-level HRST is more central to S&T activities and policies than technician-level HRST. Secondly, international comparisons of data based on ISCED level 5 may be misleading because they are particularly affected

3. See Appendix III on methodology for more details.
4. UNESCO's International Standard Classification of Education (ISCED) categories have been based upon two principal educational criteria: the level of education and the subject-matter content or the fields of the study. ISCED level 5: "Education at the tertiary level, first stage, of the type that leads to an award not equivalent to a first university degree." ISCED level 6: "Education at the tertiary level, first stage, of the type that leads to a first university degree or equivalent." ISCED level 7: "Education at the tertiary level, second stage, of the type that leads to a postgraduate university degree or equivalent."
5. S&T fields cover all fields of education and occupation, including social sciences and humanities. In terms of fields of study, some fields like the natural sciences or engineering and technology, are often considered to be more directly relevant to S&T activities than the social sciences, humanities or other fields.

by differences in national education systems.[6] Third, lead times to train and develop university-level HRST are in general longer and the costs involved higher than that for technician-level HRST.

Over the years, many countries have attempted to define and measure HRST along lines of the Canberra Manual with the benefit of an internationally agreed upon methodology[7] by using data on education, labour markets, and scientific activity. For example, the study conducted by New Zealand in 1998 attempted for the first time to assess the stocks and flows of HRST. It defined HRST as all persons who completed a tertiary qualification (from university, polytechnic, college) with at least an intermediate vocational qualification, or persons who work in the New Zealand Standard Classification of Occupation (NZSCO–95) groups 2 and 3. Some managerial occupations, which were proposed to be S&T occupations in the Canberra Manual, were not included in the report both for New Zealand and a few OECD member countries.

Around 11 per cent of the work force can be classified as 'scientific' by way of education and 7.3 per cent by way of its occupation

Similarly, most of the data for measuring HRST in European countries includes all persons employed in occupations which are classified under the International Standard of Occupations' (ISCO) ISCO–88's 'major' groups 2 (professionals) or 3 (technicians and associate professionals), as those considered to be employed in an S&T occupation. Also, certain categories of managers who have completed tertiary-level education, and are classified as legislators, senior officials, and managers are included in HRST. Scientists and engineers fall under the following two categories: physical, mathematical and engineering science professionals (ISCO–21), and life science and health professionals (ISCO–22).

It can be seen therefore that adopting the Canberra methodology requires adaptation of existing national statistics on education and occupation, a step that leads to a compromise between compliance with international standards and affordability. Thus, for instance, some managerial occupations that were included by the Canberra Manual as S&T occupations were excluded while measuring HRST in New Zealand.

MEASURING HRST IN INDIA

This chapter tries to measure India's HRST pool by utilizing the available information on education and occupation by following the Canberra Manual to a large extent, but the fit is not perfect. Box 3.1 gives a comparative structure of Indian and ISCED (followed by the Canberra Manual) levels of the tertiary education system.

While referring to HRST in Indian context, some broad observations can be made. Firstly, the whole range of education is divided into (i) general education with faculties of arts, science, and commerce falling under this, and (ii) professional education, comprising engineering and technology, medicine, agriculture, veterinary science, education, law and others[8]. Further, in the breakdown of the Indian educational data in terms of qualification, a distinction can be made between university levels (or ISCED 6 or 7) whereas technician-level HRST is more complex and difficult to compare with the lower ISCED level 5. The Indian standard includes all three levels of diploma/certificates, i.e., undergraduate, graduate, and postgraduate diplomas under level 5 because of the different nature of awarding degrees in India to that of international standards. Therefore, while presenting data on level 5 with regard to the Indian standard, all three levels of diploma/certificates were counted and hence are not comparable with ISCED 5. Also, a more detailed[9]

6. For instance, in the Indian system, ISCED level 5 also includes diploma at graduate and postgraduate levels.
7. The framework is detailed in the OECD manual. The Measurement of Scientific and Technological Activities: Manual on the Measurement of Human Resources Devoted to S&T (Canberra Manual).
8. Human resources in science and technology in India and the international mobility of highly skilled Indians, Binod Khadria, OECD, DSTI/DOC (2004)/7, May 27, 2004
9. Under the new ISCED classification after 1998, HRST consists of those persons that belong in categories 5b, 5a. ISCED 5b refers to programmes that are practical/ technical/ occupationally specific; 5a refers to programmes that are largely theoretically based/research preparatory or which provide access to professions with high skill requirement.

statistical breakdown of the Indian HRST level 5 cannot be obtained. This means that it can only be divided into the broad classes the Canberra Manual suggests, that is, ISCED 6 and 7.

Secondly, in the absence of detailed information on the labour force, the data on S&T manpower by profession has been computed by utilising information from Census 1991 and primary data collected through National Science Survey–2004. In the census of India, the occupations are classified both by industrial (National Industrial Classification NIC–1978) and occupational groups (National Classification of Occupations 1968–NCO–68). The National Classification of Occupations (NCO–68) is close to ISCO–68. The major group "professionals" (ISCO major group 2) is defined as occupations that mostly require skills at the fourth ISCO level, which is considered equivalent to ISCED '76 categories 6 or 7, i.e., university level HRST. Similarly, ISCO 3 ("technicians") is defined as requiring skills that correspond to ISCED '76 level 5. There are certain managerial occupations like production and operations department managers (code 122), other department managers (code 123), and general managers (code 131), which are part of division 2, i.e., professionals as well as parts of the other divisions (like 1 in ISCO–68). It is, thus, not possible to club all these together while talking about Indian HRSTO. Therefore, keeping in mind the Indian data sets these were excluded from the study. Reference has been made only to 'professionals, technicians and related workers'[10] (group 0 –1 in NCO–68), which correspond to the major groups of 2 and 3 in ISCO–88 (professionals, technicians, and associate professionals).

The data on HRSTO given in the census in the above categories covers those who worked for 183 days or more in any economically productive work (i) physically or mentally (main workers), and (ii) those who worked less than 183 days in the same

Box 3.1: Tertiary education system: a comparative structure

India's Higher Educational Qualifications Structure	ISCED Definition of Tertiary-level Education (Canberra Manual)	Remarks
LEVELS OF STUDY		
• Diploma/certificate-diploma courses at the undergraduate, post-secondary level, graduate and postgraduate levels. • Holders of a first class university degree less than postgraduation levels-bachelor/undergraduate level. • Holders of university degree at Masters/ Postgraduate level, Pre-doctoral and doctoral level.	• Level 5—education at the tertiary level, first stage, of the type that leads to an award not equivalent to a first university degree, i.e., at undergraduate levels. • Level 6—education at the tertiary level, first stage, of the type that leads to a first university degree or equivalent. • Level 7—education at the tertiary level, second stage, of the type that leads to a postgraduate university degree or equivalent.	• An ISCED comparison of level 5 is difficult to make by taking Indian data sets because a diploma can be obtained at all the three levels and is not always technical-level HRST. • ISCED level 6+7 are well compared with Indian structure.
FIELDS OF STUDY		
• Science • Engineering and technology • Medical science • Agriculture • Veterinary science **Extended Group** • Social and behavioural science.	• Natural science • Mathematics and computer science • Engineering • Architecture and town planning • Medical science and health related • Agricultural, forestry and fishery programmes **Extended Group** • Social and behavioural science • Humanities, religion and theology • Education science and teacher training.	• The Indian data sets maintained information for limited fields. • In India, social and behavioural subjects like economics, demography, political science, sociology, anthropology, psychology, and geography fall under Arts and Science streams depending upon university curriculum. Mathematics and Military Science are also treated in the same fashion.

10. Under the division of 'Professionals, technical and related workers (0–1)' in the Census of India, there are several sub-divisions at 2–digit levels, like physical–00, physical science technicians–01, architects, engineers, technologists and surveyors–02, engineering technicians–03, aircraft and ship officers–04; life scientists–05, life science technicians–06, physicians and surgeons–07, nursing and other medical health technicians–08, other scientific, medical and technical persons–09, mathematicians, statisticians–10, economists and related workers–11, accountants, auditors–12, social scientist and related workers–13, judges–14, teachers–15, poets, authors, journalists and related workers–16; sculptors, painters, photographers and related creative artists–17; composers and performing artists–18 and professional workers n.e.c.

Box 3.2: ISCO & NCO classification of occupations

Occupations in India are classified according to the National Classification of Occupations 1968 (NCO–68), which is close to ISCO–68. NCO–68 group 0–1, i.e., 'Professional, technical and related workers' is very close to the major group 2 (Professional) and group 3 (Technicians and Associated Professionals) of ISCO–68. However, HRSTO also includes certain managerial occupations like production and operations department managers (code 122), other department managers (code 123) and general managers (code 131), which have been defined in ISCO–88, but for which there is no direct conversion to ISCO–68. These occupations are part of division 2, i.e., professionals, as they also fall under other divisions in ISCO–68.

way (marginal workers). There is also a third category known as non-workers (workers seeking employment) with S&T qualification who had not done any work at any time.

Only 53 per cent of those holding 'science-related' or HRST jobs are educationally qualified — the rest either had a 12th standard degree or less

Persons engaged in professions cited in Box 3.2 (except a few professions), along with their successful completion of either a first class graduate/postgraduate university degree or equivalent represent 'core HRST' in India, thus corresponding to the core coverage proposed in the Canberra Manual (people formally qualified at third level in an S&T field of study and working in an S&T occupation).

Thirdly, for measuring purposes, both HRST with qualifications at ISCED level 6 and 7 (which, cross-classified with occupation criteria, correspond to the ISCO–88 class 'professional') and HRST qualified at ISCED level 5 (Indian higher educational standard) which correspond to the ISCO class 'technicians and associated professionals' were mainly taken into account.

DATA SOURCES

After critically reviewing all possible major secondary sources, it was observed that only Census data was available and that too provided for only partial assessment of HRST. Thus, in such a scenario, the attempt to generate state-wise data on education and occupation might be considered one of the major contributions of the India Science Report. This chapter therefore uses primary data generated through NCAER's National Science Survey for the measurement of HRST and to try and fit India's manpower into this analytical framework. Finally, primary survey information has been compared with data available from Census 81 and 91 to understand the pattern of change in the composition of HRST by international standards.

INDIA'S HRST POPULATION

The National Science Survey–2004 found a 376 million strong workforce in the covered states of India, of which 40.2 million (11.0%) could be classified as HRST because of their qualification (HRSTE) and 26.8 million (7.3%) because of their occupation (HRSTO). The overlap between these categories is called core HRST, which amounted to 14.2 million (3.9%) of the workforce. The number of HRSTE has grown by 9.2% annually between 1991 and 2004, and was 6 million in 1981 and 12.8 in the 1991 census (Fig. 3.1, Tables 3.1 & 3.2).

As in the case of India's educated classes, the issue that looks a bit worrying is the poor utilisation of HRST–educated persons. In 2004, a third (35.2%) of the total HRSTE were pursuing an occupation that could be considered core HRST. That is, close to two-thirds HRSTE were not utilised properly. Looking at it in another way, around 53% of those holding HRST jobs were educationally qualified, the rest were not, and had only a 12th standard degree or less.

Indeed, this ratio has got worse with the passage of time. In 1981, around 43% of those who were HRSTE were employed in HRST professions (i.e., were core HRST). By 1991, this ratio fell to 34.8 and in 2004 this remained at more or less the same level (35.2%).

DISTRIBUTION OF INDIA'S HRST POPULATION BY EDUCATION (HRSTE)

While India had six million HRSTE[11] in 1981, this rose to 12.8 million in 1991, and further to 40.2 million in 2004 according to the NCAER's National Science Survey–2004.

While the total number of HRSTE, or the diploma/graduates who are working, rose by 7.9% annually between 1981 and 1991, the figure rose faster by 9.2% between 1991 and 2004. As a result, while HRST–educated persons comprised 2.7% of the total workforce in 1981, this went up to 4.5% in 1991 and further to 11.0% in 2004 (Table 3.2).

The distribution of the total HRSTE estimated for 2004 among three levels of education reveals that about 73% are level 6 or graduates, 18% are level 7 or postgraduates and the remaining 9% are diploma holders (Fig. 3.2). The majority (51.5%) of postgraduates (level 7) are engaged in professional, technical and related activies followed by services (12.5%) and clerical related occupations. While 32% of the graduates (level 6) are engaged in professional, technical and related occupations, the remaining are almost equally represented in other occupational categories. The two major

Fig. 3.1: Estimated HRST from census and NCAER's National Science Survey

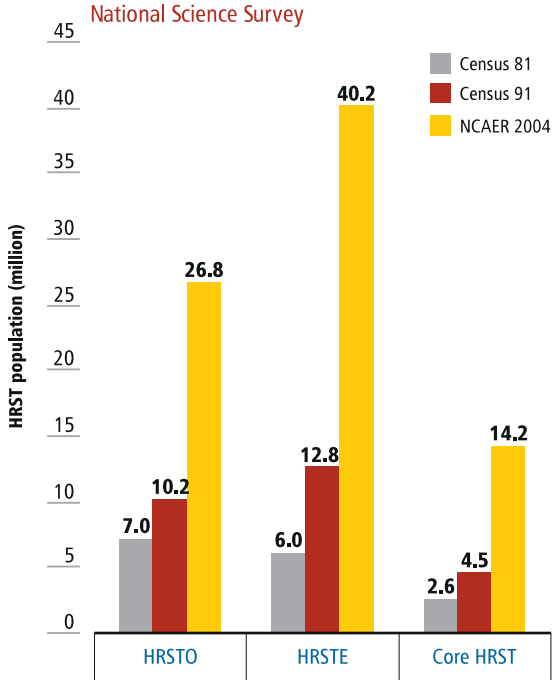


TABLE 3.1: Growth in HRST from census and NCAER survey

	Percentage of workforce			Annual growth (%)	
	Census 81	Census 91	NCAER 2004	Census 81–Census 91	Census 91–NCAER 2004
HRSTO	3.2	3.6	7.3	3.7	7.7
HRSTE	2.7	4.5	11.0	7.9	9.2
Core HRST	1.1	1.6	3.9	5.7	9.3

Table 3.2: Distribution of HRST workforce by occupation: 2004 (million)

Type of occupation (NCO–68)	HRSTE			Total HRSTE	Non–HRSTE	Total
	Graduates (Level 6)	Postgraduates (Level 7)	Diplomas (Level 5)			
HRSTO: professional, technical, and related	9.2	3.8	1.2	14.2	12.6	26.8
Administrative, executive, and managerial	2.0	0.7	0.2	2.9	4.7	7.6
Clerical and related	4.5	0.7	0.2	5.4	12.2	17.6
Services	4.9	0.9	0.4	6.2	26.8	32.9
Farming, fishing, and related	4.5	0.7	0.3	5.4	209.4	214.8
Production, transport operators, and labourers	3.6	0.4	1.3	5.4	49.3	54.7
Workers not classified by occupation	0.6	0.1	0.1	0.8	12.1	12.9
All Categories	**29.2**	**7.4**	**3.6**	**40.2**	**327.0**	**367.2**

Source: NCAER's National Science Survey–2004.

11. Estimates for Census are based on information available for the main workers; however, NCAER's figures are based on total workforce estimated from National Science Survey–2004.

Table 3.3: Growth in HRSTE population

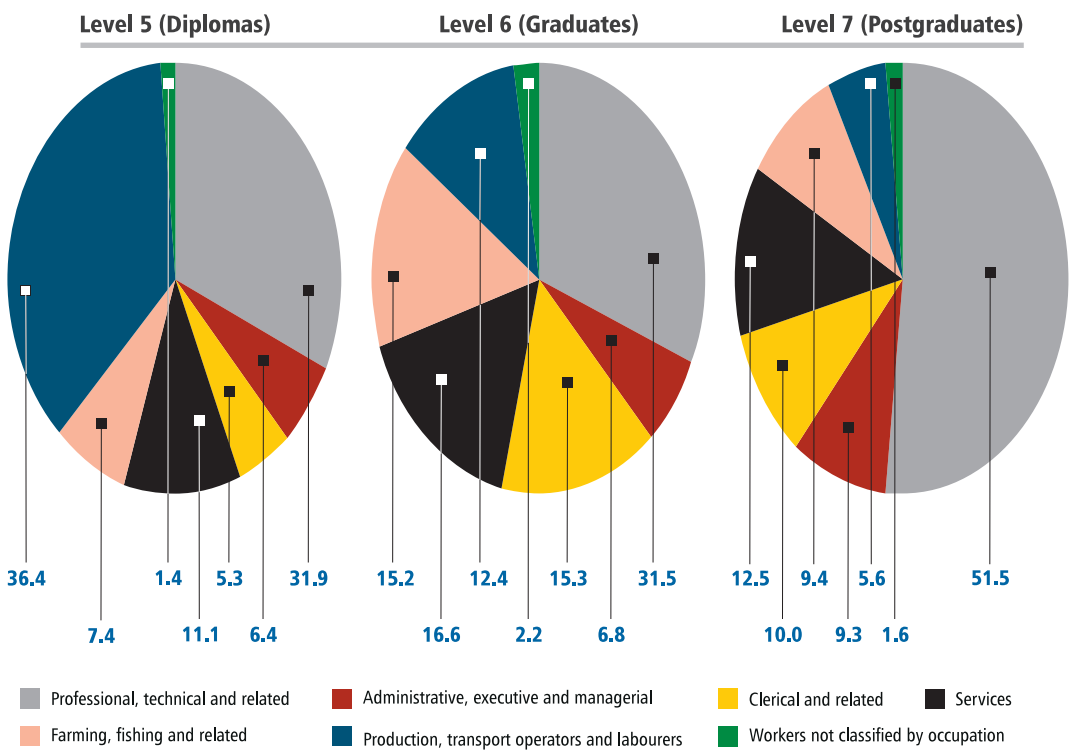
Type of occupation (NCO–68)	HRSTE population (million)			Annual growth (%)	
	Census 81	Census 91	NCAER 2004	1981–91	1991–2004
HRSTO: professional, technical, and related	2.6	4.5	14.2	5.7	9.3
Administrative, executive, and managerial	0.6	1.1	2.9	6.9	7.6
Clerical and related	1.6	3.0	5.4	6.8	4.6
Services	0.5	1.6	6.2	12.5	11.1
Farming, fishing, and related	0.4	1.3	5.4	13.0	11.6
Production, transport operators, and labourers	0.3	1.1	5.4	13.2	13.1
Workers not classified by occupation	0.1	0.2	0.8	8.7	9.7
Total	**6.0**	**12.8**	**40.2**	**7.9**	**9.2**

occupational categories where diploma holders find representation are `production, transport and labourer' and `professional, technical and related'.

Not surprisingly, given its dominance in the country's stock of 48.7 million graduates, Maharashtra is the top-ranked state in terms of the number of HRSTE persons in the country (Fig. 3.3). In 2004, the state had 6.3 million persons who had at least either a diploma or a graduate degree out of the country's total of 40.2 million. That is, the state accounted for 15.8% of the country's total HRSTE. Uttar Pradesh followed at the second place accounting for 13.2%.

The picture does change considerably when these figures are 'normalised' or deflated by an

Fig. 3.2: Distribution of HRSTE population by level of education: 2004 (per cent)



Source: NCAER's National Science Survey–2004.

Fig. 3.3: Regional distribution of HRSTE personnel, workforce and population :2004 (% of all India)

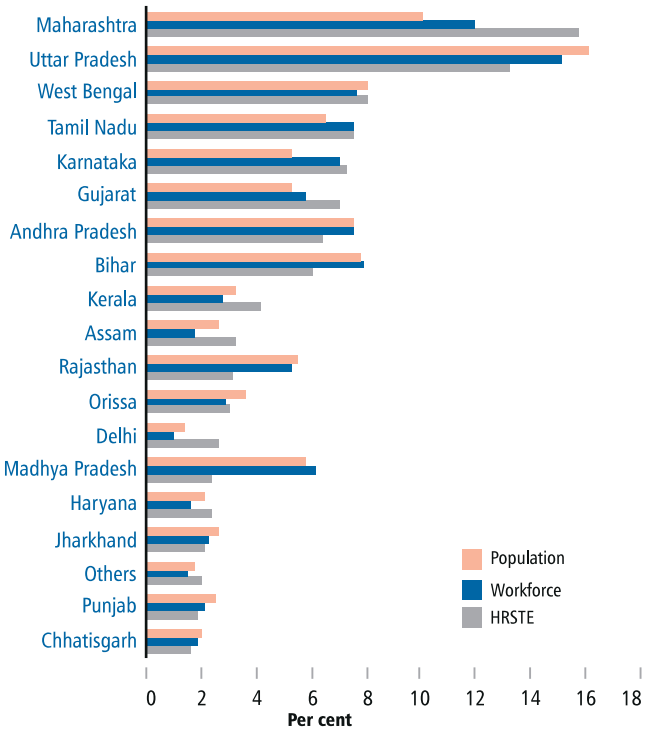
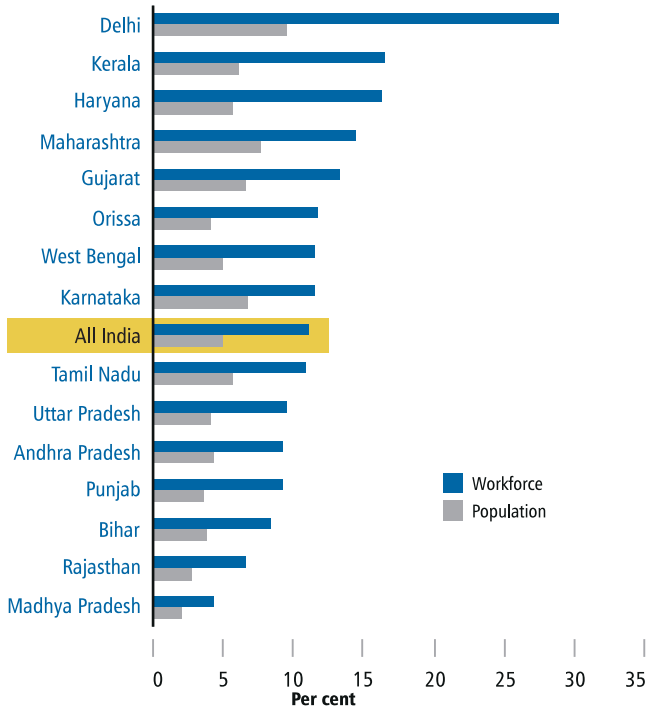


Fig. 3.4: Education intensity of workforce/population: 2004 (HRSTE as % of state workforce and state population above 10 years of age)



Source: NCAER's National Science Survey–2004.

appropriate index. If looked at from the point of view of HRSTE personnel (or, simply persons who are working and have diplomas/graduate degrees at least), Delhi has the highest number as a proportion to its workforce. Around 29% of Delhi's workforce is either a diploma holder/graduate (Fig. 3.4). Kerala is next with around 16% of its workforce holding at least a diploma/graduation degree and Haryana comes a very close third.

When the same exercise is done on the total population of various states, there is only a marginal difference in the relative rankings, and Delhi once again emerges on top followed by Maharashtra, Karnataka, and Gujarat.

DISTRIBUTION OF INDIA'S HRST POPULATION BY WAY OF OCCUPATION (HRSTO)

While India had a total of seven million workers who were in 'professional, technical and related' fields and could be classified as HRST professionals in 1981, this rose to 10.2 million a decade later and has been estimated at 26.8 million in 2004. As a proportion of the country's total workforce, this rose from 3.1% in 1981 to 3.6% in 1991 and to 7.3% in 2004. The number of such HRSTO rose by 3.7% annually between 1981 and 1991 and by 7.7% between 1991 and 2004 (Table 3.1).

Surprisingly, given a lower level of industrial development and total GDP, it is West Bengal that ranks at the top as far as HRSTO in the country is concerned and accounted for around 17.5% of the total in 2004 (Fig. 3.5). Maharashtra, thanks to its significant manufacturing GDP, comes next and accounts for almost 15.5% of the country's HRSTO.

The picture changes when the figures are deflated by using the total workforce or the total population in each state. West Bengal continues to have the highest proportion of HRSTO to the total workforce in the state, Delhi comes in as number two with 12.1%, Maharashtra slips to the third position,

Fig. 3.5: Regional distribution of HRSTO personnel, workforce and population: 2004 (% of all India)

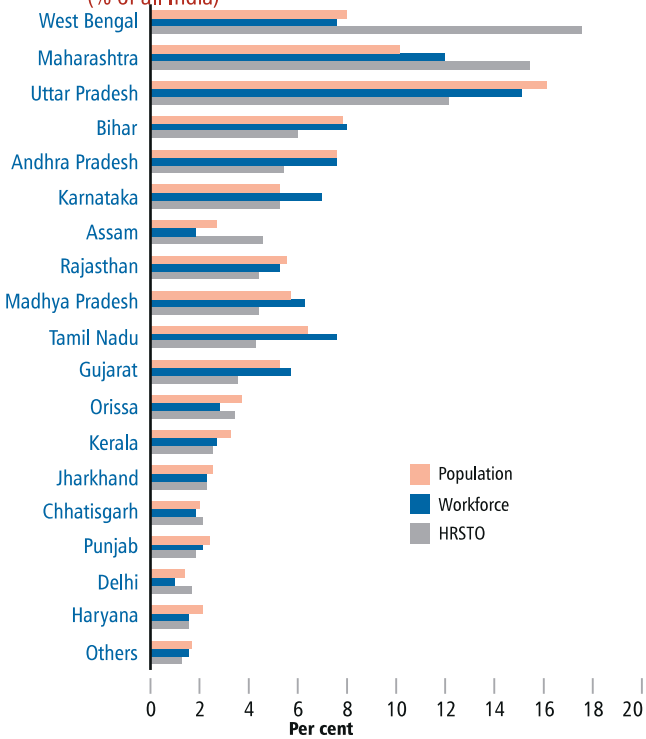
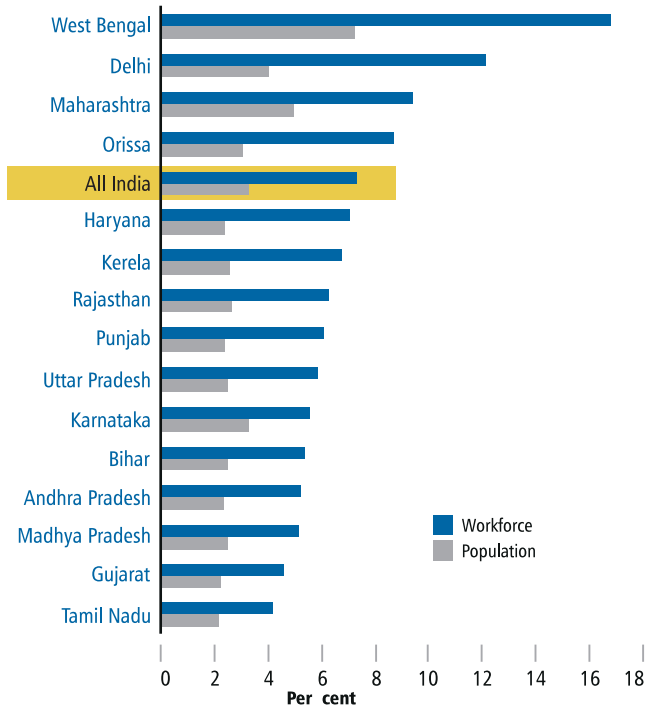


Fig. 3.6: Intensity of HRSTO personnel: 2004 (HRSTO as % of state workforce and state population above 10 years of age)



Source: NCAER's National Science Survey–2004.

and Uttar Pradesh slips from the third position, when overall figures are considered, to the eighth position when the HRSTO numbers are deflated by the number of workers in each state (Fig. 3.6).

When the total population deflates the overall figures for HRSTO, West Bengal continues to lead. The HRSTO, or those employed as 'professional and technical', in West Bengal are the highest in the country and account for 7.2% of the state's population. Maharashtra is next with 5%, Delhi third with 4% and Karnataka fourth with 3.3%.

DISTRIBUTION OF INDIA'S HRST POPULATION BY WAY OF BOTH EDUCATION AND OCCUPATION (CORE HRST)

While the number, as well as the proportion, of HRSTO as well as HRSTE has gone up steadily since 1981, the same cannot be said about the utilization of these resources. In 1981, according to Khadria[14], six million workers were at least diploma holders/graduates (HRSTE) and of these just around 2.6 million were core HRST. That is, only 43% of the trained professionals were working in HRST jobs. In that year, around 1.6 million diploma holders/graduates were working in 'clerical and related' jobs. Though this in itself may not be a bad thing considering a diploma/graduate is regarded as a very basic level of education now-a-days, what is worrying is that of the total seven million HRSTO in 1981, only 2.6 million were educationally qualified for their jobs – the rest, 64%, had only a high school degree or less. This overlap of HRST professionals with the HRST educated is defined as the 'core' HRST.

In 1991, the situation got worse. While the number of HRSTO rose to 10.2 million and the

14. Human resources in science and technology in India and the international mobility of highly skilled Indians, Binod Khadria, OECD, DSTI/DOC(2004)/7, May 27, 2004.

Table 3.4: Distribution of HRSTE and non-HRSTE personnel (per cent)

Type of Occupation (NCO—68)	Census 81			Census 91			NCAER (2004)		
	HRSTE	Non–HRSTE	Total	HRSTE	Non–HRSTE	Total	HRSTE	Non–HRSTE	Total
HRSTO: Professional, technical, and related	42.7	2.1	3.2	34.8	2.1	3.6	35.2	3.9	7.3
Administrative, executive, and managerial	9.7	0.8	1.1	8.8	0.7	1.0	7.2	1.4	2.1
Clerical and related	26.1	2.7	3.3	23.5	2.5	3.4	13.4	3.7	4.8
Services	8.1	7.6	7.6	12.4	8.5	8.7	15.4	8.2	9.0
Farming, fishing, and related	6.4	70.4	68.7	10.2	69.2	66.6	13.5	64.0	58.5
Production, transport operators, and labourers	5.2	15.4	15.1	8.4	15.9	15.5	13.4	15.1	14.9
Workers not classified by occupation	1.8	1.0	1.0	1.9	1.1	1.2	2.0	3.7	3.5
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total workforce (Million)	**6.0**	**216.5**	**222.5**	**12.8**	**273.1**	**285.9**	**40.2**	**327.0**	**367.2**

Fig. 3.7: Regional distribution of core HRST personnel, workforce and population: 2004 (% of all India)

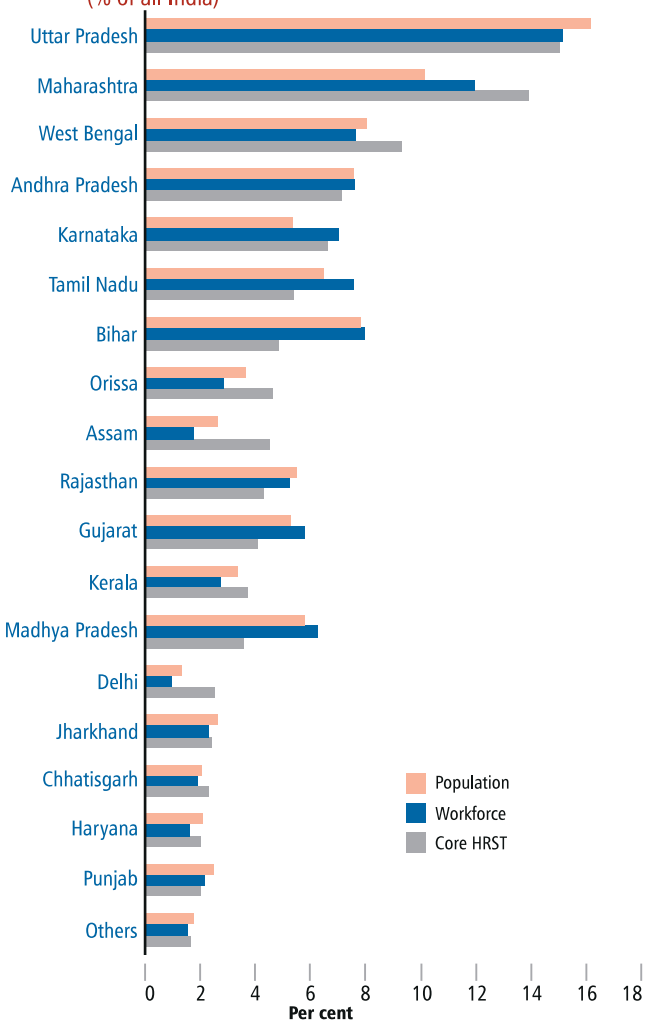
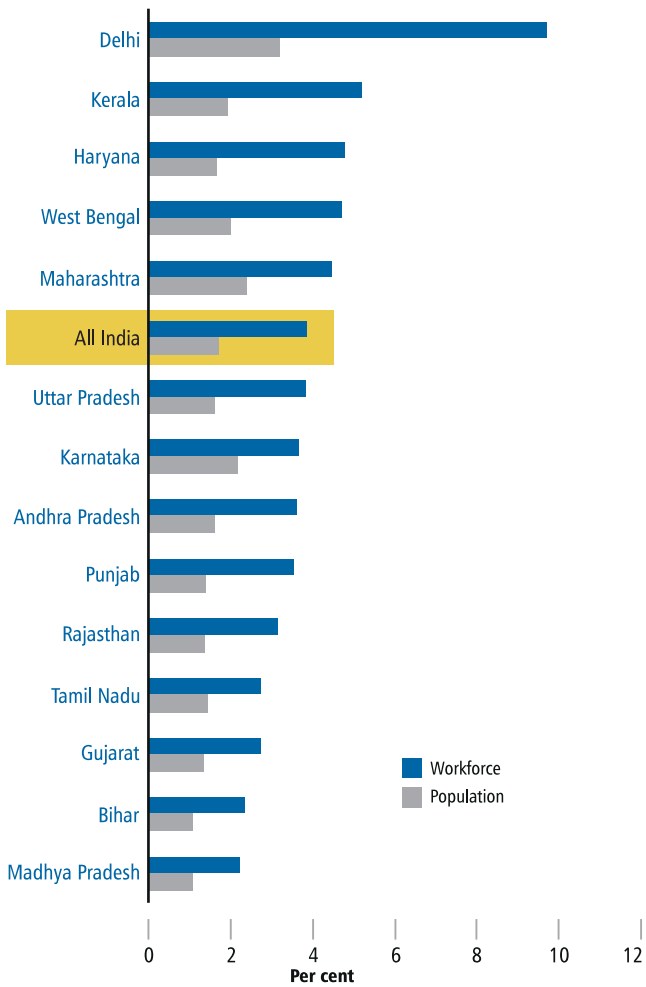
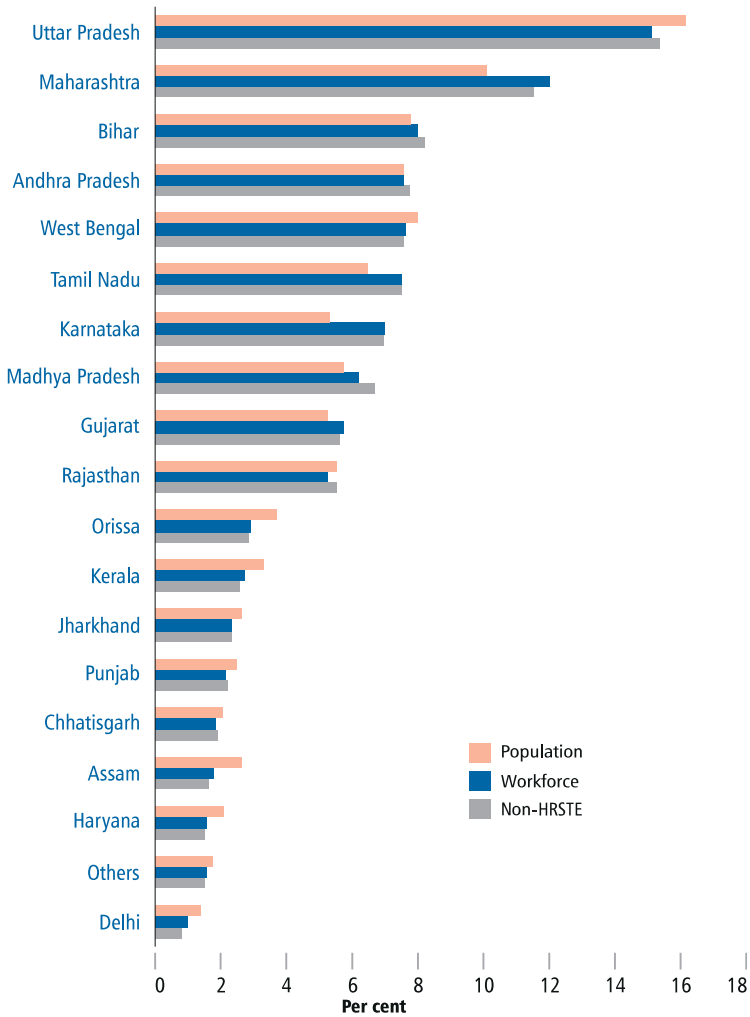


Fig. 3.8: Intensity of core HRST personnel: 2004 (Core HRST as % of state workforce and state population above 10 years of age)



Source: NCAER's National Science Survey–2004.

Fig. 3.9: Regional distribution of non-HRSTE personnel, workforce and population: 2004 (% of all India)



Source: NCAER's National Science Survey–2004.

HRSTE more than doubled to 12.8 million, the utilization level fell. Just 35% of the HRST educated were employed in HRST professions in this year, down from 43% in 1981. The number of 'clerical and related' workers rose to three million– indeed, 30% of all clerical jobs in 1991 were held by those who were HRST by way of education, that is, those who held at least diploma/graduate degrees. This figure was a lower 22% in 1981.

Looked at another way, however, things improved with a lot more HRST professionals now better qualified. Of the total 10.2 million HRSTO, 4.5 million or 44% were professionally qualified and had at least a diploma/graduate degree.

Things got a lot better in 2004. While both the number of HRSTE and HRSTO has gone up significantly since 1991, the utilization has also improved (Table 3.4). The share of HRSTE in HRSTO (or the core HRST) is still around 35% (the same as in 1991), but the share of qualified people in HRST jobs has gone up. It was 37% in 1981, went up to 44% in 1991 and was 53% in 2004.

Uttar Pradesh leads the country when it comes to the number of core HRST workers (Fig. 3.7). It had a total of 2.1 million such workers in 2004, a figure that is around 1.6 lakh higher than for industrially advanced Maharashtra. While Uttar Pradesh accounts for over 15% of the country's core HRST, Maharashtra accounts for a little fewer than 14%.

When deflated by the workforce in each state, it is Delhi that emerges as the country's best, followed by Kerala and Haryana (Fig. 3.8). At the all-India level, around four per cent of the workforce is 'core' HRST. The figure is 9.7% for Delhi, 5.2% for Kerala, and 4.8% for Haryana.

There is a slight change in ranking when population instead of the workforce deflates the core HRST figures. Delhi remains at the top slot but Maharashtra replaces Kerala at the number two slot, Haryana is replaced by Karnataka at the number three slot, but West Bengal remains at the number four slot.

DISTRIBUTION OF INDIA'S NON–HRSTE WORKFORCE

India's work force that does not have either at least a diploma or a graduate degree, that is the non–HRSTE work force, is currently estimated at around 327 million – in other words, around 89% of the country's work force has an educational qualification of only high school or below. The good thing, however, is that the growth rate of this work

Fig. 3.10: Intensity of non-HRSTE personnel: 2004 (non-qualified HRSTE as % of workforce and state population above 10 years of age)

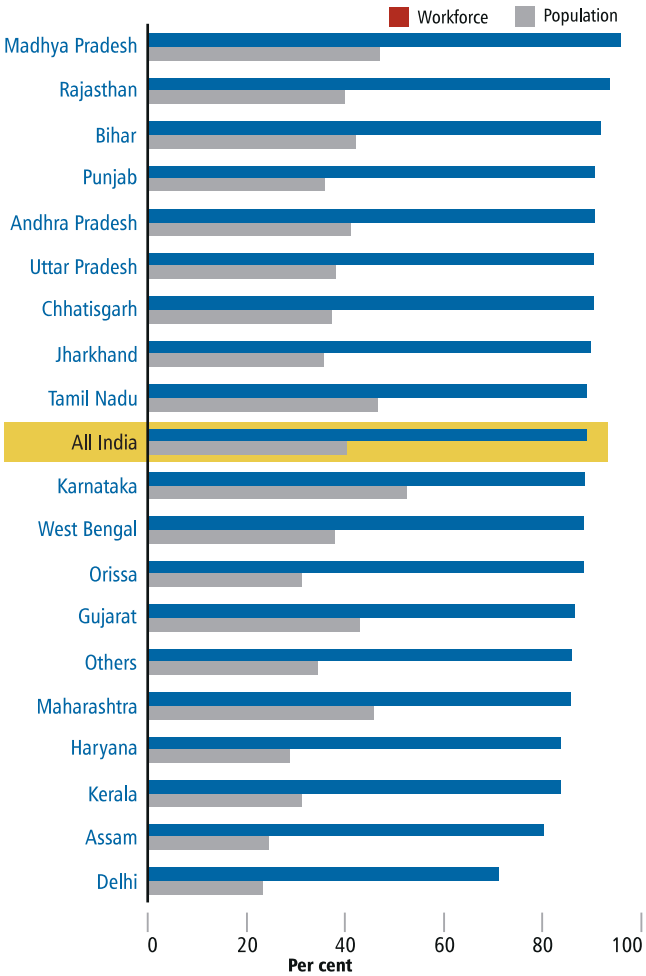
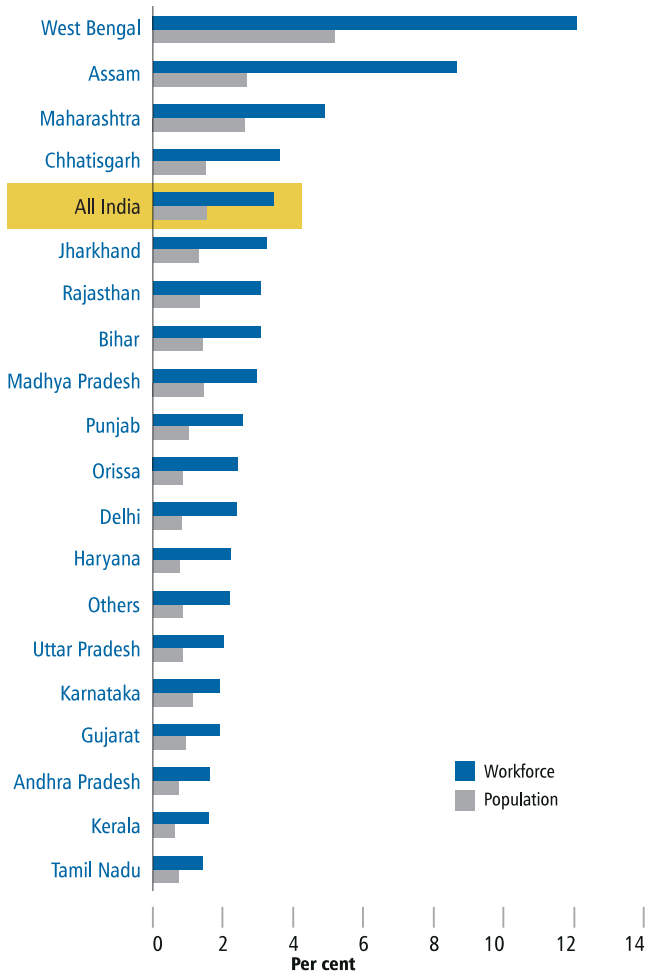


Fig. 3.11: Intensity of non-HRSTE professionals: 2004 (non-HRSTE professionals as % of workforce and state population above 10 years of age)



Source: NCAER's National Science Survey–2004.

force is declining – while the non–HRSTE work force rose by 2.3% annually in the '80s, it rose by a much lower 1.4% in the '90s (Table 3.5). While some part of this is, no doubt, due to the slowing down of the overall work force, a large part is due to the fact that the work force is getting more educated. In 1981, for instance, around 97% of the country's work force could be considered non–HRSTE and this fell only marginally to 96% in 1991.

While just a little over two per cent of this non–HRSTE work force was employed in what could be called science and technology professions (that is, as scientists, engineers, nurses, architects, teachers, and chartered accountants, among others), this rose to nearly four per cent in 2004, mostly due to the fact that the growth in this employment segment has risen amongst the fastest in the 1990s.

Not surprisingly given its share in the country's work force and population, Uttar Pradesh has the country's highest number of non–HRSTE (Fig. 3.9). While Uttar Pradesh accounts for 16.2% of the country's population and 15.1% of its work force, it accounts for 15.4% of its total non–HRSTE work force. While the proportion of non–HRSTE workforce is quite similar to the proportion of population for most states, it differs for the better educated states.

Table 3.5: Distribution of non-HRSTE workers

Type of occupation (NCO–68)	Non–HRSTE population (million)			Annual growth (%)	
	Census 81	Census 91	NCAER 2004	1981–91	1991–2004
HRSTO: professional, technical, and related	4.5	5.7	12.6	2.4	6.3
Administrative, executive, and managerial	1.8	1.8	4.7	0.1	7.7
Clerical and related	5.8	6.8	12.2	1.6	4.6
Services	16.5	23.3	26.8	3.5	1.1
Farming, fishing, and related	152.4	189.1	209.4	2.2	0.8
Production, transport operators, and labourers	33.4	43.3	49.3	2.6	1.0
Workers not classified by occupation	2.2	3.1	12.1	3.5	11.0
Total	**216.5**	**273.1**	**327.0**	**2.3**	**1.4**

Source: NCAER's National Science Survey–2004.

Kerala has 3.3% of the country's population, 2.8% of its work force and just 2.6% of its non–HRSTE work force. At the other extreme, Bihar has 7.8% of the country's population, 8% of its work force, and 8.2% of its non–HRSTE work force, or that part of the work force that has at the most a high–school degree by way of education. In general, the so–called BIMARU states (Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh) have a higher share of the country's non–HRSTE work force as compared to their share in the country's work force– this is something to be expected given their generally lower levels of education in comparison with the rest of the country.

As a proportion of the total work force, states like Madhya Pradesh and Rajasthan have the highest proportion of non–qualified workers as a proportion of their total work force (Fig. 3.10). Over 95% of MP's workers are only high–school pass or below, the ratio is nearly 94% for Rajasthan and 92% for Bihar as compared to the all India average of 89%. Delhi has the lowest share of non–qualified workers at 71%, followed by Assam with 80% and Kerala with 84%.

West Bengal has India's largest number of non–qualified HRSTOs, or those people working in HRSTO jobs but who do not have either a diploma or a graduate degree and have studied only till the 12th standard or below (Fig. 3.11). The state accounts for well over a fourth of the country's total under–qualified HRST professionals. Maharashtra is second to West Bengal and accounts for around 17% of the country's total.

Of West Bengal's total work force of around 28 million, roughly 3.4 million comprise of people working in HRSTO jobs but who are not educationally qualified – as a proportion, this works out to over 12%. Assam is the next on the list with this proportion crossing 8.5% while Tamil Nadu is at the bottom rung in the country with a mere 1.4% workers falling in this category. At the all India level 3.4% of the workers fall in this category. ■

Public Attitude towards Science and Technology

The growth of any nation not only depends on the impact of its S&T efforts on technology exports but also on the lives of the common man. Further, it also depends on the degree of awareness about scientific issues among the country's populace so that they are better able to adapt to the many changes that S&T developments bring about. NCAER's National Science Survey–2004 found that despite the poor interest in science and technology (S&T) programmes, most Indians have great faith in science; over three fourths feel S&T is important for education, 58% feel the same way about the economy, and 72% about agriculture. The report also found that the level of knowledge the population has about scientific concepts is very high. India scores slightly lower than the US on attitudes towards science and technology. Overall, the perception is that the benefits of S&T are higher than its deleterious effects. This is a positive trend in a country that is poised to make a mark for itself in the field of science and technology in the next century.

SCIENCE HAS BEEN MAN'S GREATEST ally since the dawn of civilisation. It has created innumerable pathways to progress that have taken man from his primitive cave habitat to the moon, indeed a very long journey in terms of both space and time. The scientific and technological breakthroughs, along with the changing attitudes of the Indian society towards scientific thinking, have led to a change in every walk of life.

Governments and other concerned bodies have heightened their efforts to inform the public about the nature and role of S&T, so as to make citizens better informed and better able to adapt to the many changes that it has brought, and will continue to bring in its wake. Technological development in most developing countries is still at a stage where they are learning and mastering advanced achievements made elsewhere in the world. In this context, therefore, education efforts and scientific activities which enable the masses to manipulate and assimilate advanced technologies are perhaps more important than purely academic research. Despite these efforts, many citizens remain ill informed about scientific advances, about how science pushes back the frontiers of knowledge, and precisely how technology affects their lives. As a result, most members of the public are unable to arrive at substantiated judgments about matters involving science and technology, particularly in the area of policy.

It is essential that today's leaders and policymakers find ways to improve public understanding of science and technology. Although different agencies and departments are taking up various programmes for socio-economic development of the country, what is really important now is to develop an integrated holistic approach so that inputs of

modern S&T can be brought together into the routine life of people.

So far, public understanding and perception about S&T has been a relatively unexplored area of study in India. The existing surveys carried out on the subject are only indicative but not representative in nature. The aim of this chapter is to understand people's perception about scientific and technological issues, awareness about these issues, and how closely the masses follow such issues. The results and discussion in this chapter are primarily based on the analysis of primary data collected through the National Science Survey for the year 2003–04.

CONCEPTUAL FRAMEWORK[1]

The term 'Public Understanding of Science and Technology (PUST)' is used to express the notion that scientific culture varies across countries, groups, and individuals. Despite the varieties of definitions of scientific culture, what is common to all of them is the idea of appropriation. Individuals undergo a period of training, within the family, at school, in the college or university, at work and, less formally, through reading and leisure. This increasingly life-long process allows an individual to acquire knowledge and abilities, to construct an image of science, technology, and the professions associated with them, and to develop values and attitudes towards them. The degree to which these elements are mastered varies among individuals and groups, and also in relation to the social role these individuals and groups have. Thus, S&T reaches each individual differently, depending on his or her social role and position, which in turn explains why S&T culture varies for each individual.

57 per cent of those interviewed in the National Science Survey gave correct answers to questions such as whether the centre of the earth is hot and 86 per cent on whether the oxygen we breathe comes from plants

For government officials, S&T culture might lie in the ability to design and carry out relevant science policies. For industrial executives and managers, it could be the capacity to invest wisely in research, and so evaluate and select from a group of new technologies, as well as provide for adequate employee training and proper equipment maintenance. For the worker, it could consist in possessing the skills to understand and use a technology to accomplish a given task. For teachers, it could mean proper transmission to students of necessary abilities and knowledge; for parents it could mean the capacity to awaken their children's interest in S&T and to transmit the tacit knowledge of mundane social and technological interactions. For ordinary citizens, S&T culture could mean keeping abreast of current information in order to participate critically in the social debates involving science and to develop awareness in the everyday use of technologies.

There are many reasons to value PUST. Some experts emphasise its value in terms of the cultural development of citizens; some see it as a prerequisite for economic development and innovation; while others believe that it enables people to understand the scientific basis of modern society so they can play an active role in social debates. Thus, acceptable PUST extends from a minimum amount of scientific knowledge, which any individual should ideally possess, to a more global view of social mastery of scientific and technological developments. In between, the more practical view of PUST is as an asset for economic development.

DOES S&T BENEFIT US

Though they spend very little time following science and technology news, and the usage of technology is low, Indians are very open to the benefits of S&T, and the level of knowledge of certain core science and technology concepts is quite clear. Fifty seven per cent people have given correct answers to basic S&T questions such as whether the centre of the earth is hot and 86% on whether the oxygen we breathe comes from plants. And while the proportion

1. Godin, B and Gingras, Y (2000) What is scientific and technological culture and how it is measured? A multinational model, Public Understand. Sci.9 (2000), 43–58).

Fig. 4.1: Public attitudes about benefits of S&T on selected issues: 2004 (% of public who feel it is significant)

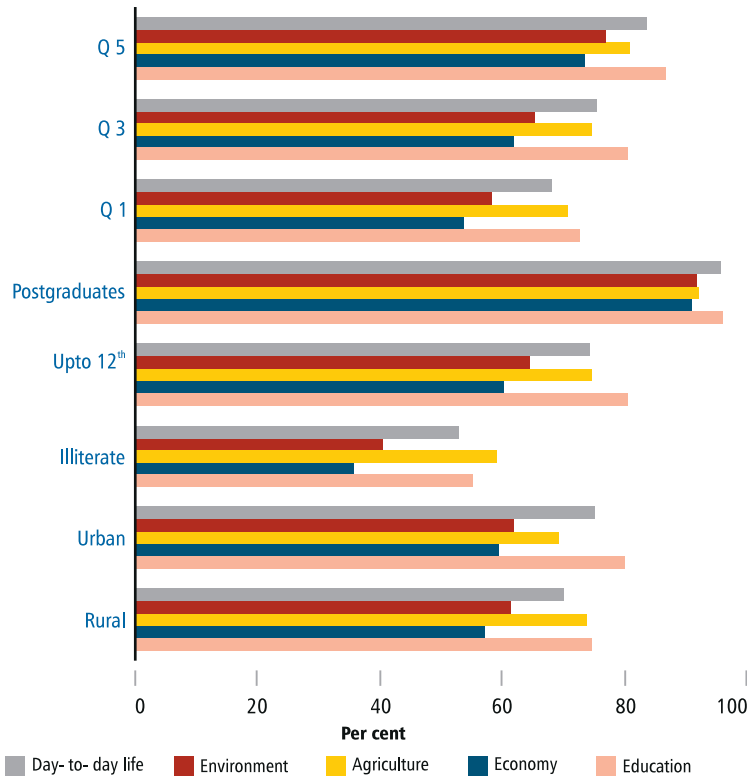
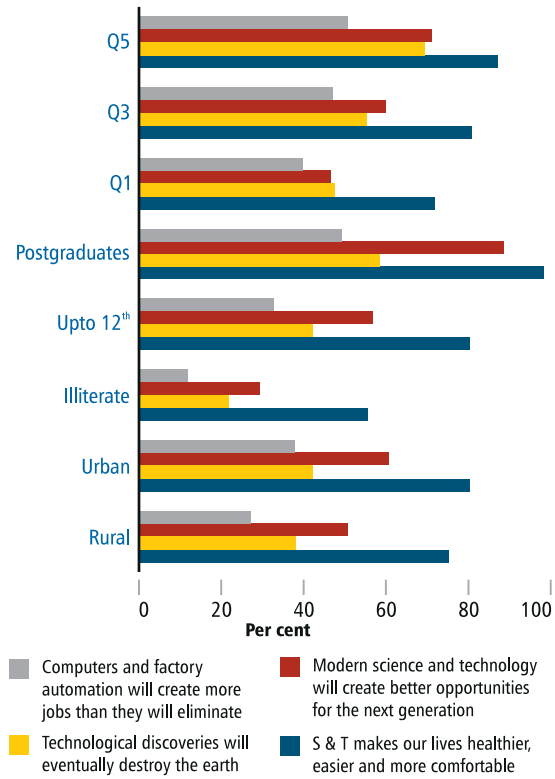


Fig. 4.2: Public attitudes towards S&T: 2004 (% of public who agree)



Source: NCAER's National Science Survey–2004 (see Appendix Tables 17 and 14).

of illiterates giving the correct answer to whether the centre of the earth is hot is low (32% as compared to 85% in the case of graduates), their knowledge of other basic scientific concepts is quite high. Sixty per cent of those who are illiterate, for instance, say you should not sleep under a dense tree at night and 76% say that plants are living organisms.

Most Indians have great faith in science, as a result of which just a fourth think the government is spending enough money in the area. Over three-fourths of Indians feel S&T is important for education, 58% feel the same way for the economy and 73% for agriculture (Fig. 4.1).

While there is a large difference in the attitudes of people towards this depending upon their education, the difference due to income groups is a lot less pronounced. A little over 36% of the illiterates, for instance, are of the view that S&T has a significant impact on the economy as compared to 91% postgraduates. Yet, when looked at from the point of view of people in different income groups, the jump is only from 54% for those in the bottom-most income quintile (Q1) to 73% in the top-most income quintile (Q5).

More than three-fourths feel that S&T makes lives healthier and more comfortable. On the whole, people feel that the benefits of science and technology outweigh (by 1.1 times) the perceived harmful effects (Fig. 4.2). The differences in perception are more pronounced depending on education classes in comparison with income classes. Just 56% of the illiterates feel that S&T makes lives easier and more comfortable as compared to 98% post-graduates—that is, there is a 77% increase as we move from illiterates to postgraduates. Yet, when

we look at people in the bottom-most quintile, 72% feel S&T makes lives easier and more comfortable and this goes up to 87% in the top-most quintile. In other words, there is an increase of just 21% from the bottom to the top quintile.

While 68% of the illiterates could not say whether computers and factory automation will create more jobs than eliminate, 12% feel this is correct and 20% say the opposite is true—that is, computers and office automation will eliminate more jobs than create. In the case of graduates, 54% agree with the premise, 35% disagree and 11% do not know. In terms of income groups, an equal number (24%) of the bottom-most quintile is of the view that job losses would be as great as jobs gained. Forty one per cent of the top quintile feels more jobs will be created and 38% feel more jobs will be lost.

On the whole, people feel that the benefits of science and technology outweigh (by 1.1 times) the perceived harmful effects

In other words, while there is an increased acceptance of the benefits of computerisation and office automation as individuals get more educated, matters remain undecided even as one moves up the income ladder. When an overall tally is done taking all factors into account, however, the balance of opinion is that S&T benefits the country, and this remains true for all sets of people, ranging from the illiterate to postgraduates and from the bottom-most income quintile to the top-most income quintile.

Over three-fourths people in rural India also, for instance, feel that S&T makes life healthier and easier (against 80% for urban areas) and 57% feel that new technology makes work more interesting (68% for urban areas).

Four sets of statements have been taken to represent the pros and cons of S&T and people were asked to either agree or disagree with these positions. The results have been added up to give the 'promise' index (PI) and the 'reservation' index (RI).

Statements used to arrive at the PI:

- S&T makes our life healthier, easier and more comfortable.
- Scientists work on things to make our lives better.
- The application of S&T makes work more interesting.
- S&T will create more opportunities for the next generation.

Statements used to arrive at the RI:

- We depend too much on science and technology.
- Technology creates an artificial and inhuman way of living.
- Science makes our life change too fast.
- Computers and factory automation will eliminate more jobs than create.

Interestingly, while the actual values of the indices of 'promise' and 'reservation' differ for urban and rural areas, the promise to reservation ratio (PI/RI ratio), which can be interpreted as the willingness to accept new technology, is the same for both rural and urban areas. The PI is 56.4 for rural areas and the RI is 53.4, giving a PI/RI of 1.1. For urban areas, the PI is a higher 64.1 but so is the RI at 60.5— the PI/RI for urban areas, however, is the same 1.1 as for rural areas.

ATTITUDE TOWARDS MECHANISATION

The increasing rate of technological advancement in developing countries is likely to create opportunities for more persons to participate in new developments. This opportunity may possibly, with time, reduce resistance to technological change, particularly with constant interaction between people and technology systems. But a decrease in the opportunity for people to interact with one another in such a society is likely to push the frontiers of the man-machine interface.

In an attempt to determine the level of people's perception of mechanisation, some issues (nine) on mechanisation were put before the respondents and they were asked to affirm or reject the response option chosen during the National Science

Survey–2004. The options are "True", "False", and "Don't know". Given this pattern of perception, the manner in which respondents react to mechanisation has been determined based on the pattern of perception. "Reaction issues[2]" have also been limited to nine, requiring the same response options, so as to match the former to "perception issues[3]", with a view to establishing a relationship pattern between perception and reaction to mechanisation.

It was found that just 24% of the respondents are in favour of mechanisation. The illiterate are the least in favour of mechanisation (15%) while just a third of the graduates/postgraduates are in favour of mechanisation. Only a fifth of those in the lowest income quintile favour mechanisation and the figure rises to 32% in the top quintile. Professionals are more in favour of mechanisation than, say, clerical workers, but the difference is marginal (31% of professionals feel mechanisation is a good thing as compared to 28% for clerical workers).

Further, an attempt was made to examine whether or not mechanisation has in any way motivated people positively or negatively, and to offer possible explanations for any change in behaviour as a result of the enhanced mechanisation. Based on this, a linear regression model (equation Y = a + bX, where Y is the negative reaction and X the negative perception.) has been fitted to data. While the results of the model are statistically acceptable, they are revealing and give an indication of the kind of results that can be expected from education campaigns to correct misconceptions among different groups of people.

It was observed that mechanisation determines the perception-reaction behaviour of Indian people in the linear function of Y= -4.1+1.1X for attributes. The values of the constant 'a' (which is -4.1) actually ranges from -17.1 to 20.2 across different education groups and income classes while the value of the coefficient 'b' varies from 0.74 to 1.21 (Table 4.1). Therefore, the predictive level of reaction (Y) due to the level of perception (X) varies from the actual by about ± (0.76 to 1.63) in the value (%) for respective attributes. For example, for rural areas Y = 3.9 + 0.98 (X), the predictive level of reaction due to the level of perception will vary from the actual by about ± 1.18 in value (%). Thus, to reduce the negative reaction, the extent to which the negative perception should be checked is suggested by fitting the regression equation.

Such exercises would yield better results in urban areas as compared to rural areas, they would do better among men than women, and would be more effective among the more educated vis-a-vis the illiterates.

Table 4.1: The relationship between perception of and reaction to mechanisation in people's behaviour: 2004

	Constant	Regression coefficients (b)	Standard error of 'b'	Standard error of 'Y'	Coefficient of determination (R^2)
LOCATION					
Rural	3.9	0.98	0.35	1.18	0.53
Urban	-7.8	1.16	0.37	1.17	0.58
EDUCATION					
Illiterate	20.2	0.74	0.37	1.50	0.36
Up to class 12	-17.1	1.21	0.43	0.87	0.53
Postgraduates	-7.3	1.07	0.62	1.63	0.30
INCOME QUINTILE (Q)					
Q1	-5.6	1.05	0.50	0.76	0.39
Q3	-6.7	1.08	0.40	1.00	0.48
Q5	-6.9	1.09	0.40	1.10	0.56
ALL INDIA	**-4.1**	**1.10**	**0.36**	**1.15**	**0.57**

Source: NCAER's National Science Survey–2004.

2. REACTION ISSUES (9): The questions to which responses were invited to gauge the reaction: effect of mechanisation on threat to job; reduction of creativity; no skills improvement; job design inappropriate with worker's needs; work processes inappropriate to development level; alienation from work; threat to life; deterioration of work relations; accepted work purely for instrumental reasons; and organisational design based on western norm.

3. PERCEPTION ISSUES (9): Machines substitute for worker; Machine work is programmed (monotony); Machines do not improve productivity/product quality; Machine's work take much time and effort to understand; Machines do not improve work process; Machines do almost everything (boredom); Machines increase accidents and costs; Machines mechanise the worker (dehumanisation); Machines cause stress and strain; and Machines dictate work pace (loss of control).

MAJOR SOURCES OF INFORMATION AND THE UTILISATION PATTERN

Communication is a valuable means of generating interest among people. It influences attitudes, opinions, and behaviour in favour of various programmes and policies. Information on access to media and people's perception helps in understanding the comparative advantage of various media alternates. The National Science Survey–2004 collected information from people aged 10 years and above regarding exposure to various media sources like television, newspaper/magazines, Internet/e-mail etc. and evaluated trends and differentials in the exposure to media sources.

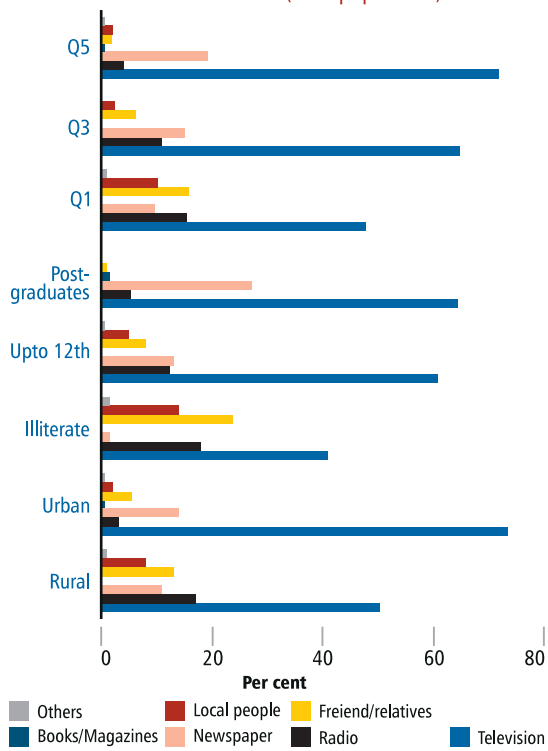
Even the literate rely on TV far more than they do on the written word — indeed while 41 per cent of illiterates rely on TV as their main source of information, the figure is 65 per cent for graduates

Television remains the primary source (57%) of all information in the country, and is almost five times as popular as newspapers (Fig. 4.3). Not surprisingly, given the availability of television, close to three-fourths of urban households rely on this as compared to half the rural households. What is surprising, though, is that even the literate rely on TV far more than they do on the written word—indeed, while 41% of illiterates rely on TV as their main source of information, the figure is 65% for graduates. Forty eight per cent of Indians who watch TV do so on a daily basis (87% for urban areas and 31% for rural), but just 32% read the newspapers every day.

While even the literate rely more on TV for their information, the same remains true of each income class as well. A little less than 48% of the bottom-most quintile families rely on TV as their main source of information for current events while the figure goes up to as high as 72% in the top-most quintile.

A similar pattern is to be seen in most regions with households placing around five times more reliance on television in relation to newspapers for their primary information, though the difference is the least in the east (where the TV to newspaper ratio is 4.4) as compared to the south (where the TV to newspaper ratio is 5.8).

Fig. 4.3: Distribution of population by major source of information: 2004 (% of population)



Source: NCAER's National Science Survey–2004 (see Appendix Table 1).

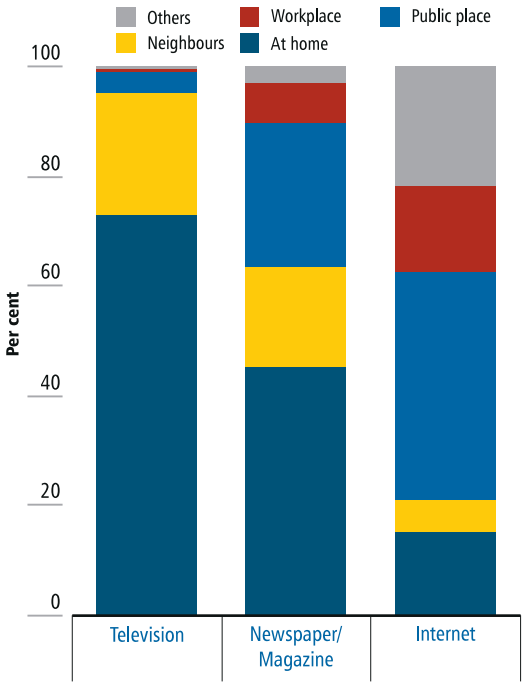
Kerala emerges as the state with the highest proportion of newspaper readers, both in rural as well as urban areas. Over 31% of rural Keralites get their major news from newspapers (64% get it from TV though), as do 40% of the urban Keralites (58% list TV as their major source of news).

PLACE OF EXPOSURE TO SELECTED INFORMATION SOURCES

The Internet as a source of information is very minuscule and falls in the category of 'others', which account for less than one per cent of all information sources. A little over 15% of people who access the Internet for information do so at home, while the bulk do so either at cyber cafes and other such public places (41.5%), or at their work place (15.7%) (Fig. 4.4).

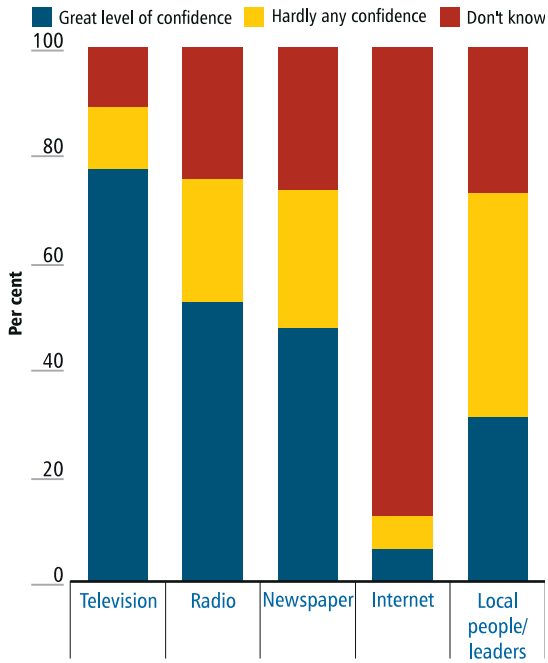
By way of comparison, close to three-fourths of the people who access TV do so at home. Over 45% of people get their newspapers at home, while around 18% read them at neighbours' houses and

Fig. 4.4: Place of exposure: 2004 (% of population)



Source: NCAER's National Science Survey–2004 (see Appendix Tables 2&5).

Fig. 4.5: Level of confidence in information sources: 2004 (% of population)

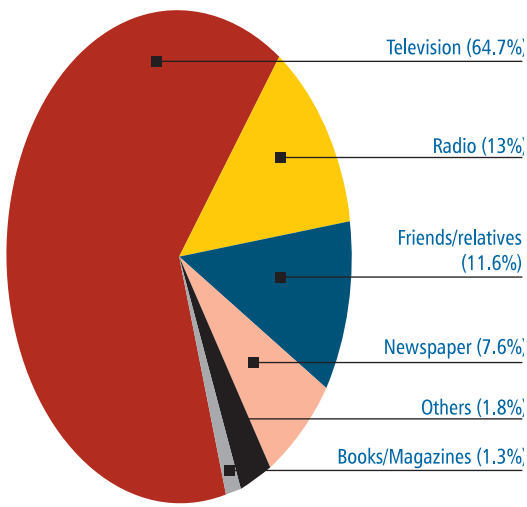


another fourth do so at public places. Not surprisingly, while just a tenth of the people feel TV access is poor/not available, the figure is 20% for newspapers and over 55% for the Internet. While over 95% of people have never used the Internet, just 0.5% use it on a daily basis.

LEVEL OF CONFIDENCE IN INFORMATION SOURCES

Over three fourths of the people have a great deal of confidence in the authenticity of the TV, and ironically it is the illiterate that have the least confidence—just 64% of all illiterates express confidence in TV information as opposed to 85% graduates/postgraduates (Fig. 4.5). As compared to 42% of people who have very little confidence in the information provided by local leaders, around 31% express confidence—the illiterate have the greatest confidence in local leaders (50%) while the more educated have the least faith (six per cent of post-graduates have faith in local leaders as a source of information).

Fig. 4.6: Leading source of information for S&T: 2004



Source: NCAER's National Science Survey–2004 (see Appendix Table 8).

Over three fourths of people have a great deal of confidence in the authenticity of TV, and ironically it is the illiterate that have the least confidence

WHERE DO INDIANS GET INFORMATION ON S&T

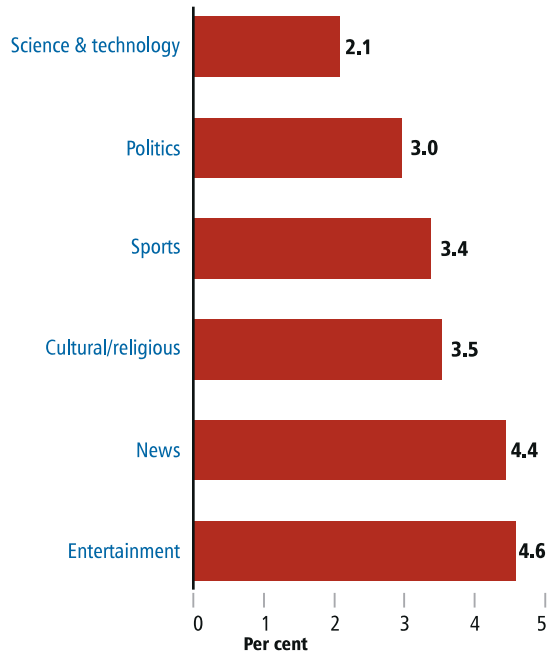
Close to two-thirds of the population gets its science-related information from the TV as compared to under eight per cent from newspapers (Fig. 4.6). Of all the programmes related to science and tech-

Table 4.2: Preference for information by demographic characteristics: 2004

	News	Politics	Entertainment	Sports	Cultural/religious	S&T
LOCATION						
Rural	II	V	I	IV	III	VI
Urban	II	V	I	III	IV	VI
SEX						
Male	I	V	II	III	IV	VI
Female	II	V	I	IV	III	VI
AGE GROUP (YEARS)						
10–30	II	V	I	III	IV	VI
31–45	I	V	II	IV	III	VI
Over 45	I	IV	II	V	III	VI
LEVEL OF EDUCATION						
Illiterate	II	IV	I	V	III	VI
Up to 12th	II	V	I	IV	III	VI
Post-graduates	I	V	II	III	IV	VI
INCOME QUINTILE (Q)						
Q 1	II	V	I	IV	III	VI
Q 3	II	V	I	IV	III	VI
Q 5	I	V	II	III	IV	VI
ALL INDIA	**II**	**V**	**I**	**IV**	**III**	**VI**

Note: Ranks are based on mean score on a six-point scale of six items.
Source: NCAER's National Science Survey–2004 (see Appendix Table 10).

Fig. 4.7: All India preference for information: 2004
(Mean score on a six-point scale of six items)



Source: NCAER's National Science Survey–2004 (see Appendix Table 10).

nology, weather remains the most popular (60% of people watch these), followed by health programmes (36%), and scientific discoveries (25%). Kerala has the highest proportion of people who get science-related information from newspapers. The figure falls to 18% for rural areas, but here too, 72% of the people get their science-related news primarily from television. Rural Andhra Pradesh has the highest usage of the Internet as the primary source of science-related news (0.6% of the population gets news in this manner).

PREFERENCE FOR INFORMATION

Entertainment is the highest ranked in terms of preference by individuals, and is closely followed by news (Fig. 4.7). Cultural/religious news/coverage is ranked higher than sports or politics, and science and technology is ranked lowest. Both the richer groups as well as the more educated have a higher interest in science and technology news, though the ranking remains the same as it does for others – last.

There is not much of a difference between rural and urban areas as far as ranking of programmes is concerned and entertainment followed by news remains the preferred ranking in both regions (Table 4.2). Urban areas rank sports ahead of cultural/religious events while rural areas do the opposite.

Interesting exceptions are states like Bihar (where politics is at the top in rural areas). Rural Karnataka ranks news as the top priority, as do rural Madhya Pradesh and Rajasthan. Among urban areas, those that rank news at the top are Rajasthan, Andhra Pradesh, Assam, Madhya Pradesh, and Uttar Pradesh.

EXPOSURE TO PUBLIC PLACES

While 32% of Indians have never visited a cinema hall or seen a video, the figure is around two-thirds for places such as a science institute/park/museums/

Table 4.3: Exposure to public places: 2004 (% of population)

Places	At least once in a year	Never	Not aware
Scientific institutes	10.6	66.3	23.1
Science parks	12.3	64.2	23.5
Museums	22.3	64.0	13.7
Zoo	34.6	58.7	6.7
Aquarium	18.9	66.2	14.9
Planetarium	14.0	65.4	20.6
Libraries	26.5	64.3	9.2
Exhibitions	34.0	56.0	10.0
Science fairs	17.2	67.8	15.0
Cinema/ videos	65.4	31.7	2.9
Other places of S&T interest	8.2	69.3	22.5

Source: NCAER's National Science Survey–2004 (see Appendix Table 6).

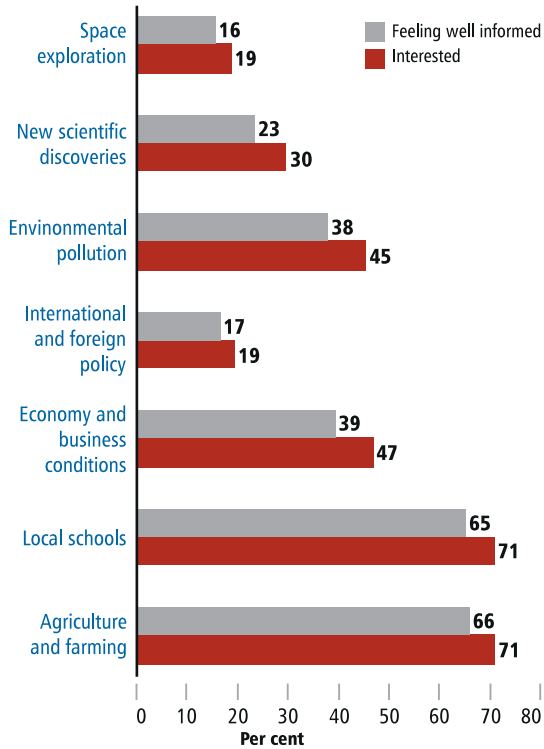
planetarium and zoos/aquariums (Table 4.3). Under three per cent of the families (5.7% in urban areas and 1.7% in rural ones) have visited a science institute once while around 12% have visited a museum once, a fifth have been to a zoo, and just eight per cent to a library.

There is a large difference between the illiterate and the educated, as well as between the poor and the rich, as far as visits to places of scientific interest are concerned. While just 1.8% of those in the bottom, most quintile have visited a science park once in the last one year, the figure is 9.2% for people in the top most quintile, and is seven per cent and 22%, respectively for museums. Professionals visit science parks/museums a lot more than workers.

PUBLIC INTEREST AND AWARENESS

The high levels of illiteracy and low levels of income in the country have not prevented Indians from having very high levels of interest in a whole range of social issues as well as a reasonably good knowledge of scientific and other events. The fact

Fig. 4.8: Public interest in and feeling well informed about public policy issues: 2004 (% of population)



Source: NCAER's National Science Survey–2004 (see Appendix Tables 11&12).

that even the illiterate are reasonably aware of various natural phenomena is a testimony to the fact that traditional knowledge is still alive. Indeed, in several of these parameters, India scores higher than even countries like the US.

Indians profess to be the most interested in issues of poverty (77%), followed by those concerning old people (75%), women (74%), local school (71) and agriculture issues (71) (Fig. 4.8). Only 47% of those surveyed were interested in economic issues other than employment (where 66% were interested). Only 19% and 37% of the people were interested in foreign policy and political issues.

With a few exceptions, in most cases, the proportion of people who regard themselves as 'informed' is about 3–5% lower than the number who are 'interested' in various issues. As is to be

While 31 per cent of Indians have never visited a cinema hall or seen a video, the figure is two thirds for places like science parks and museums

Fig. 4.9: Share of attentive public: 2004 (% of population)

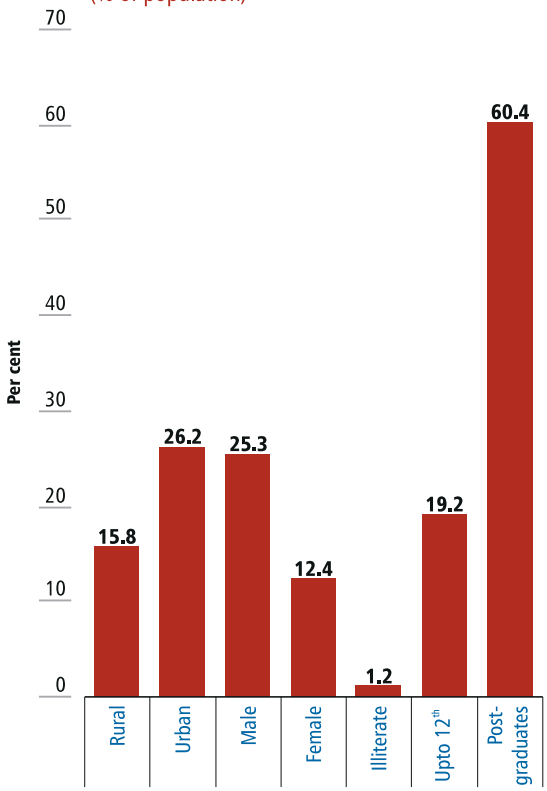
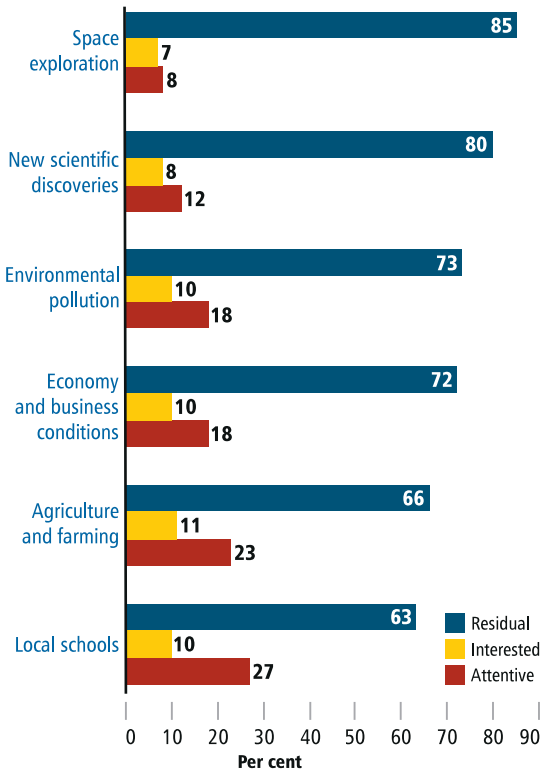


Fig. 4.10: Distribution of public for general and scientific issues:2004 (% of population)



Source: NCAER's National Science Survey–2004 (see Appendix Table 13).

expected, there is a difference between the levels of interest as well as the degree to which people feel they are informed depending upon education as well as the income categories. The degree of difference, however, differs from issue to issue. In the case of agriculture, for instance, there is not too much difference between the 'interest' or `feeling informed' levels of the illiterate vis-a-vis graduates, but there is a sharp difference in the case of issues like employment and economic issues. The starkest difference is in the case of scientific discoveries. Fewer than 11% of illiterates are interested in scientific discoveries, for instance, as compared to nearly 77% in the case of post-graduates. Under a fourth of all people in the lowest income quintile are interested in such scientific discoveries as compared to 57% of people in the top most income quintile.

On an average, 19 per cent of Indians can be classified as 'attentive' and another 11 per cent as 'interested', and the figures vary according to both literacy and income levels

CLASSIFYING THE PUBLIC AS ATTENTIVE, INTERESTED, OR RESIDUAL

While those surveyed were asked if they were interested in various subjects and whether they felt they knew enough (were informed) about the subject, this query was subjected to one more test—did the surveyed individuals read a newspaper/magazine regularly on subjects of interest. Those who passed this last test were categorised as 'attentive' public.

On an average, 19% of Indians can be classified as 'attentive', and another 11% as interested. The degree of 'attentiveness' varies dramatically from rural to urban areas (16% of rural India is attentive as compared to 26% for urban areas), between illiterates and postgraduates (from 1.2% to 60.4%), and between different income groups (12% for the lowest quintile and 39% for the top one) (Fig. 4.9).

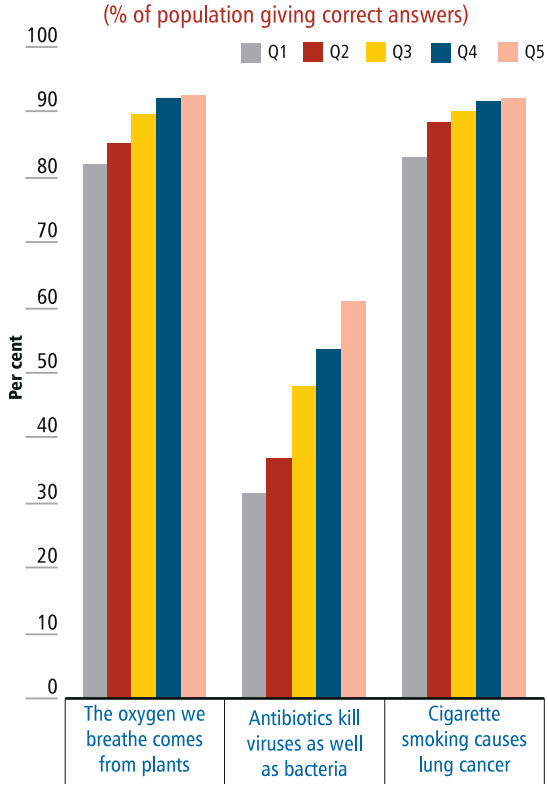
As regards the age group, the percentage of attentive individuals is highest for the 31–45 year age group followed by 19.5% for 10–30 years and 16.4% for more than 45 years. Amongst the educated groups, the percentage of attentive individuals is naturally at a minimum among the illiterate (1.2%) and maximum among postgraduates (60.4%). A positive correlation exists between attentive individuals to various issues and the level of formal education. Only 19.2% individuals up to class 12 are categorised as attentive individuals whereas 49% graduates are categorised as attentive individuals. Occupational data indicate that maximum percentage of attentive individuals are professionals (48.6%) followed by clerical workers (46.3%), administrative workers (45.7%), service workers (34.2%), production workers (24.4%), and other workers (15.9%).

Between 20–25% individuals are classified as 'attentive' for issues relating to agriculture, local issues, employment, poor people, old people, women, and rural/urban development (Fig. 4.10). Between 10–20% individuals are considered attentive for issues relating to handicapped people, economic affairs, politics, environment, and S&T discoveries. Less than 10% individuals are attentive for issues pertaining to foreign policy and space exploration.

Between 10–15% individuals are categorised as 'interested' in issues relating to agriculture, local school, employment, poor people, old people, women, handicapped people, rural/urban development, and economic affairs. Less than 10% people are interested in issues relating to politics, foreign policy, environment, S&T discoveries and space exploration. Between 60–86% individuals are residual for all issues under reference.

Over 27% of Indians fall in the 'attentive' category as far as local school issues are concerned, 23% do so over agriculture issues, and 18% for economy/business issues. Not too many Indians are interested in foreign policy issue (nine per cent) or space exploration (eight per cent).

Fig. 4.11: Level of understanding of S&T issues by level of income: 2004 (% of population giving correct answers)



Source: NCAER's National Science Survey–2004 (see Appendix Table 18).

PUBLIC UNDERSTANDING OF S&T ISSUES

On an average, the level of knowledge the population has about scientific concepts is very high—57% of people answered correctly that the centre of the earth is hot, 86% that the oxygen we breathe comes from plants (Fig. 4.11). Not surprisingly, given how women are blamed for not having a male child, just 38% know that the sex of the child depends on the father!

While the answers to science-related questions tend to be increasingly correct as the education levels of the respondents rise, the extent of the difference was quite high. Just 32% of the illiterates know that the centre of the earth is very hot, as compared to 85% graduates. But an indication of an understanding of traditional knowledge came from the fact that 60% of illiterates said one should not sleep under a dense tree at night and 75% said plants are living organisms.

The degree of 'attentive' public rises with education. A little over 19 per cent individuals who've passed class 12 were 'attentive' as compared to 49 per cent in the case of graduates

Fig. 4.12: Level of understanding of S&T issues by level of education: 2004 (% of population giving correct answers)

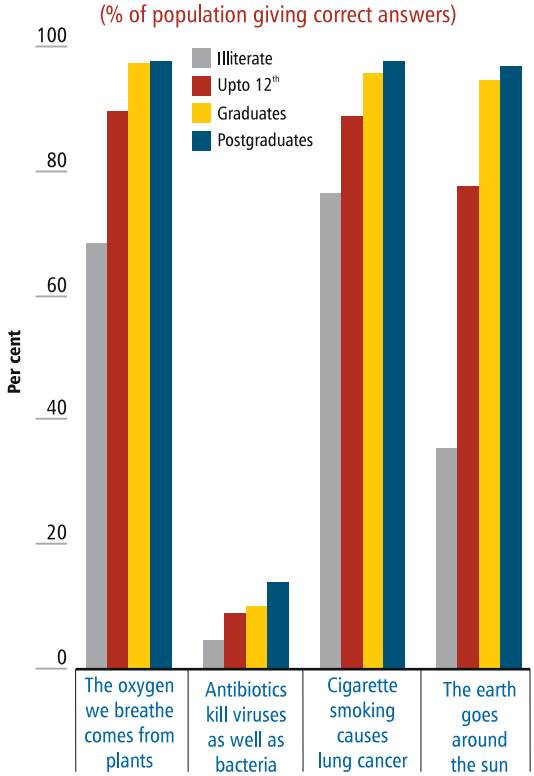
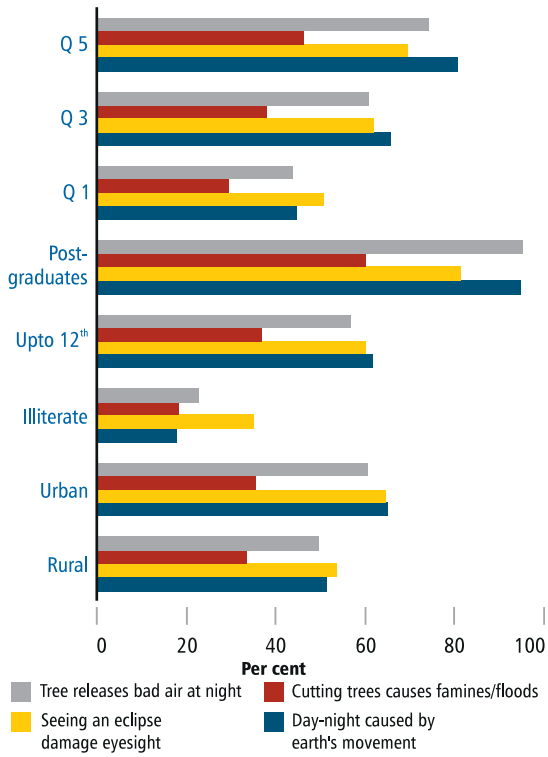


Fig. 4.13: Explanations for natural phenomena: 2004 (% of population who agree)



Source: NCAER's National Science Survey–2004 (see Appendix Tables 18 & 20).

60 per cent of illiterates said one should not sleep under a dense tree and 75 per cent said plants were living organisms — a sign that traditional knowledge is still alive and kicking

Indeed, the same difference can be seen in different income groups as well. There is, as in the case of the question of whether the centre of the earth is hot, a huge difference in the answers given by people in different income groups. Less than half of those in the lowest quintile have got the answer right, unlike the over three-fourths in the top quintile.

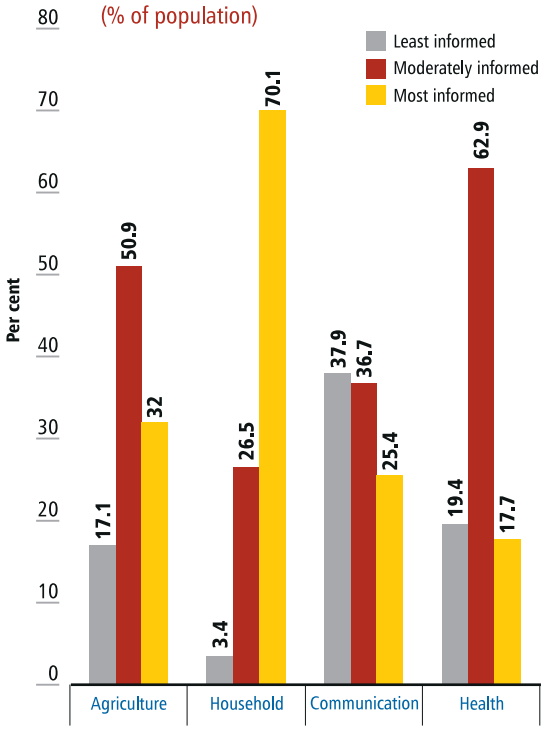
Yet, in the case of the question as to whether the oxygen we breathe comes from plants (which concerns traditional knowledge), there is not too much of a difference in the answers given by those in different quintiles. Eighty-two per cent of those in the lowest quintile have got it right as compared to 93% in the topmost. As for the response to the question whether plants are living organisms, there is very little difference between the quintiles.

Given the low levels of literacy (especially when it comes to higher education) the degree of knowledge of more complex S&T questions is low. Just 30% of the people know that electrons are smaller than atoms (six per cent of the illiterate have got it right as compared to 78% of the post-graduates), and only eight per cent of the people know that antibodies kill viruses as well as bacteria. Almost 70% know that vaccines must be administered prior to infections (Fig. 4.12).

ATTITUDES TOWARDS NATURAL PHENOMENA

Attitudes towards natural phenomena also tend to vary widely depending upon the level of education as well as income. Just 18% of the illiterates, for instance, know how day and night occur as compared to 95% of the postgraduates

Fig. 4.14: Distribution of public by awareness of technology and processes related to selected sectors (agriculture, household, communication and health): 2004 (% of population)



Source: NCAER's National Science Survey–2004 (see Appendix Table 19).

(Fig. 4.13). The figure falls to 45% in the lowest income quintile and is 81% for the top most one. Similarly, only 35% of the illiterates say that seeing an eclipse directly could hurt the eye as compared to 81% in the case of postgraduates.

AWARENESS ABOUT TECHNOLOGIES AND SCIENTIFIC PROCESSES

Not surprisingly, in a country dominated by agriculture and with 70% of its population living in rural areas, the knowledge of home/farm technologies is the highest. Respondents were asked to answer a set of questions designed for agriculture, household, communication, and health techniques/technologies. For agriculture, some of the techniques/technologies included the use of manure/fertiliser, the use of water harvesting or green manuring. In the case of households, techniques/technologies were quite different and revolved around the use of durables like washing machines and water purifiers. In the case of health, it was the awareness about X-rays, CAT Scans and ECGs that was sought to be determined. The population was divided into the three groups, namely 'least', 'moderately' and 'most' informed in science (Table 4.4) based on the number of questions answered correctly.

While almost 40% use more than four of the techniques/technologies for agriculture, the figure is, not surprisingly, 60% in the case of households (Fig. 4.14). The figure is, however, a mere 1.5% in the case of communication technologies (3.9 for urban areas) and 5.7 in the case of health technologies. In order to standardise the comparison, respondents have been broken up into three categories ranging from 'least informed' to 'most informed'. Those who use up to three techniques/technologies in agriculture/households are categorised as 'least informed', those who use between four and nine technologies are called 'moderately informed' and those above ten are 'most informed'. In the case of communications/health, anyone using under two types of technologies is categorised as 'least informed'. While those using between three and four are classified as 'moderately informed' in the case of communications, those using between three and six technologies in the case of the health sector are categorised as 'moderately informed'.

Table 4.4: Criteria for grouping of population

Subject area	Number of questions posed to respondents	Number of questions answered correctly		
		Least informed	Moderately informed	Most informed
Agriculture	12	≤3	4 to 9	≥10
Household	14	≤3	4 to 9	≥10
Communication	6	≤2	3 to 4	≥5
Health & hygine	8	≤2	3 to 6	≥6

While just a fourth of those in the lowest income quintile are 'most informed' about agriculture, this rises to 40 per cent in the top most quintile

Table 4.5: 'Attentive' public: India versus the US (% of population)

Public policy issues	Attentive public		Interested public		Residual public	
	India (2004)	U.S.A. (2001)	India (2004)	U.S.A. (2001)	India (2004)	U.S.A. (2001)
Agriculture and farming	23	6	11	23	66	71
Local schools	27	31	10	28	63	41
Economy and business conditions	18	12	10	33	72	55
International and foreign policy	9	5	6	23	86	72
Environmental pollution	18	10	10	38	73	52
New scientific discoveries	12	7	8	39	80	54
Space exploration	8	5	7	21	85	74

Source: India: NCAER's National Science Survey–2004; U.S.A: Science and Engineering Indicators–2002.

Not surprisingly, urban usage is much higher (except for agriculture); men score higher than women (surprisingly even in the case of household technologies). Youth have done better than older people in the case of household technologies as well as in terms of use of communication technologies. Older people, in the 45-plus age group, are at the top in the use of farm technology. Except in the case of agriculture, where they scored quite well, illiterates scored very poorly on knowledge about various techniques/technology–just 0.1% of illiterates have used more than five communication technologies/techniques as compared to 0.6% for those who have passed the class 12 and 16% for postgraduates (Fig. 4.15).

While just a fourth of those in the lowest income quintile are 'most informed' about agricultural techniques/technology, this rises to 40% in the top most quintile. This knowledge rises from 60 to 91% in the case of the household sector techniques/technologies. It is in the case of health techniques/technologies and those pertaining to communications, however, that the difference is the greatest between different income quintiles. Just 12% of those in the lowest income quintile are considered 'most informed' in the health sector as compared to 44% in the top most income quintile. In the communication sector, by way of contrast, the jump is from 16% to 59%.

Table 4.6: Level of scientific knowledge (% of population who gave correct response)

Y/N Queries on scientific terms and concepts	India (2004)	U.S.A. (2001)
The centre of the earth is very hot	57	80
The oxygen we breathe comes from plants	86	87
Whether a new born is a boy or girl depends upon the father	38	65
Electrons are smaller than atoms	30	48
Antibiotics kill viruses as well as bacteria	8	51
The universe began with a huge explosion	34	33
The continent on which we live have been moving for million years	32	79
Human beings developed from an earlier species of animals	56	53
Cigarette smoking causes lung cancer	87	94
Which travels faster— light or sound	60	76
Does earth go round the sun or the sun round the earth	70	75
How long does earth takes to go round the sun	41	58

Source: India: NCAER's National Science Survey–2004; U.S.A: Science and Engineering Indicators–2002.

Table 4.7: Attitude towards the social impact of S&T (% of population who agreed)

Social impacts	India (2004)	U.S.A. (2001)
S&T makes our lives healthier, easier and more comfortable	77	86
We depend too much on science	74	51
Science changes our life fast	75	38
New technology makes work interesting	61	89
S&T will create better opportunities for the next generation	54	85
Technological discoveries will eventually destroy the earth	39	29
S&T offers us a simpler life	44	44
S&T offers an artificial and inhuman way of living	42	30

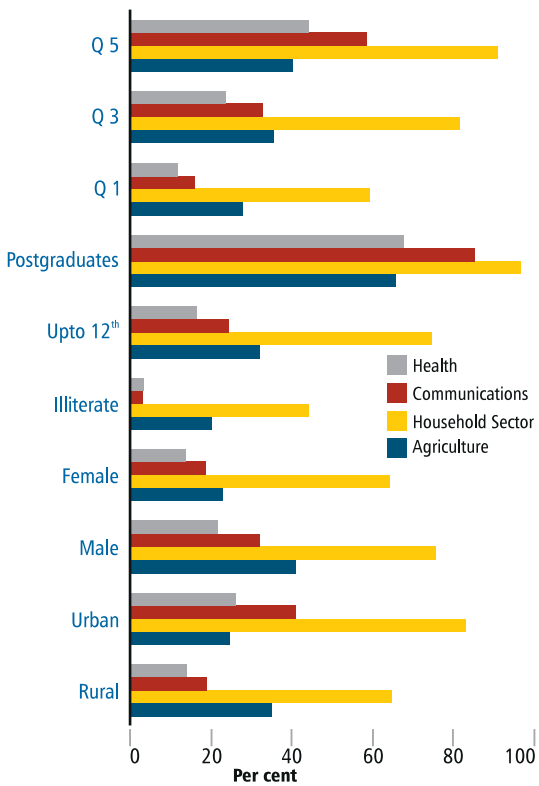
Source: India: NCAER's National Science Survey–2004; U.S.A: Science and Engineering Indicators–2002.

INTERNATIONAL COMPARISON OF OPINIONS REGARDING SCIENCE AND TECHNOLOGY

Science and technology is forming an ever-closer relationship with industry and society, and expanding its influence on our everyday lives. This, coupled with the growing impact of socio-economic globalisation, has caused people to experience a rising interest in S&T, not just at a domestic level, but at the international level as well. Against this background, some of the indicators generated through the National Science Survey–2004 have been compared with similar indicators from the most recent Science and Engineering Indicators–2002 of the National Science Foundation.

Though India compares unfavourably with the US on parameters like the proportion of its population that understands certain scientific concepts, such as, are electrons smaller than atoms, or whether the centre of the earth is hot; it does reasonably well given its relatively lower income and literacy levels. Indeed, when it comes to issues like an 'attentive' public (that is, the part of the public that is not only interested in certain issues but also follows up with regular reading of newspapers/magazines), India scores much higher than the US.

Fig. 4.15: Distribution of most-informed persons: 2004 (% of population)



Source: NCAER's National Science Survey–2004 (see Appendix Table 19).

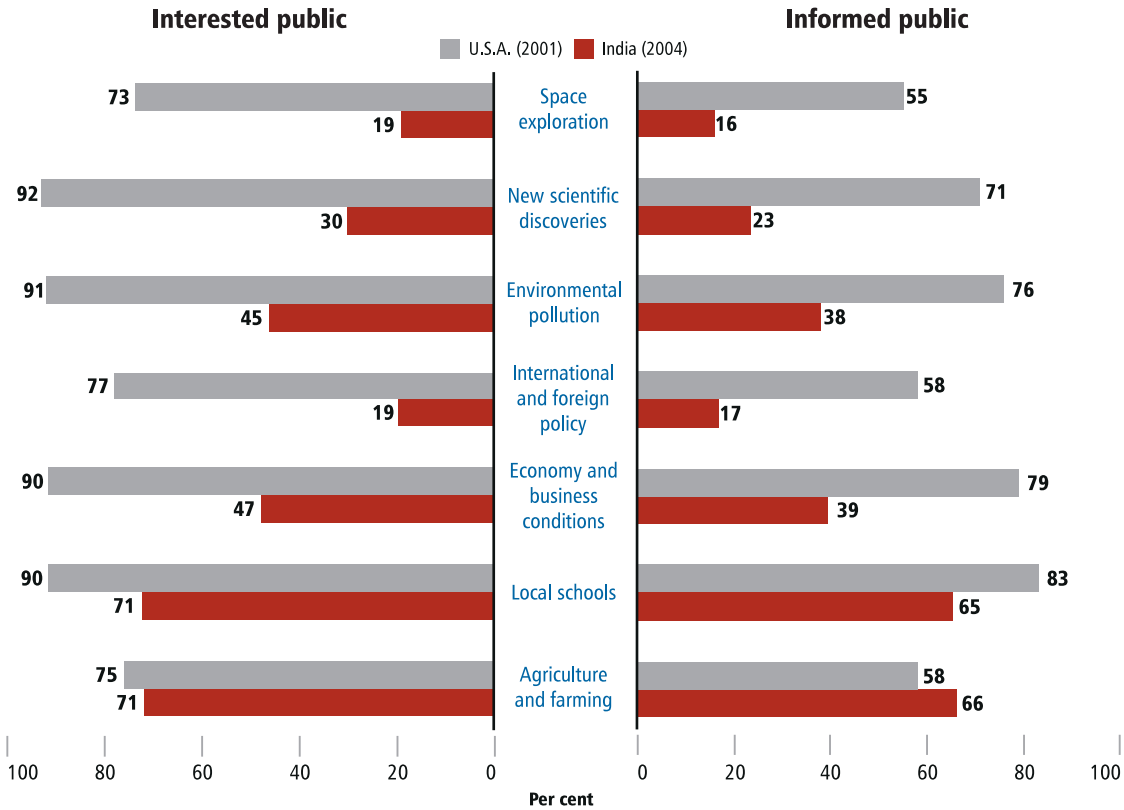
While India obviously scores over the US when it comes to the proportion of 'attentive' public in agriculture (given the relatively large size of the sector in this country), it also scores better on issues like economy and business conditions where 18% of its population is 'attentive' as compared to 12% in the US. India also has a larger proportion of people who are well informed in new scientific discoveries and tracking them regularly in newspapers/magazines (Table 4.5).

Despite the low levels of literacy and spread of higher education, India doesn't fare too badly vis-a-vis high-income countries like the US. India scores lower than the US on attitudes towards science and technology, but not much lower. Seventy-seven per cent of Indians feel S&T makes our lives healthier and easier as compared to 86% for the US. Sixty-one per cent feel technology makes work interesting as compared to 89% for the US (Table 4.7). Indians gave fewer correct answers than Americans to queries on scientific concepts. Just 57% of the Indians know that the centre of the earth is very hot as compared to 80% Americans, 38% versus 65% for the question that the sex of a newborn baby depends upon the father, and eight per cent versus 51% on the question whether antibiotics kill viruses as well as bacteria (Table 4.6). It runs pretty close (around 86%) on the question whether the oxygen we breathe comes from plants, or whether the universe began with a big bang or not (around 34%) and whether cigarette smoking causes cancer (87% for India versus 94% for the US).

77 per cent of Indians feel science and technology makes their lives healthier and easier as compared to 86 per cent for the US

Despite this, India has a higher proportion of 'attentive' population (people who are in a subject and follow up by reading about it

Fig. 4.16: Share of interested and informed public in the selected issues (% of population)



Source: India: NCAER's National Science Survey–2004; U.S.A: Science and Engineering Indicators–2002.

regularly in newspapers/magazines) as compared to the US. While the figure was 23% for India versus six per cent for the US in the case of agriculture and farming, it was 18 versus 12 for economy and business conditions (Table 4.5). While 26% of urban Indians can be considered 'attentive', the figure is almost 16% in rural areas.

In overall terms, of course, what matters most is the country's attitude on whether science and technology helps the country or not, and here India scores positive. Indians believe that the positive attributes of S&T outweigh the negative attributes by 1.1 times, a figure that is not too much lower than the US' 1.3 (Table 4.8).

Table 4.8: Promise and reservation index

Indices	India (2004)	U.S.A. (2001)
Promise index (%)	59	60
Reserve index (%)	56	47
Ratio of promise index to reservation index	1.1	1.3

Source: India: NCAER's National Science Survey–2004; U.S.A: Science and Engineering Indicators–2002.

Indians have an exalted view of the work scientists do and their contribution to society, but since they view scientists almost as ascetics, this also discourages people from wanting to become scientists when they grow up. Close to two-thirds Indians agree that scientists work for the good of humanity (86% for the US in 2001), yet over a third of Indians feel that scientists usually work alone as compared to just 17% in the US (Table 4.9). Over 45% of Indians feel scientists do not enjoy themselves as much as others do; just 19% feel this way in the US. And 42% of Indians feel that scientists are peculiar people as compared to 26% in the US.

To the statement, scientific researchers work for the good of humanity', a majority of Indians

Fig. 4.17: Leading source of current news and events

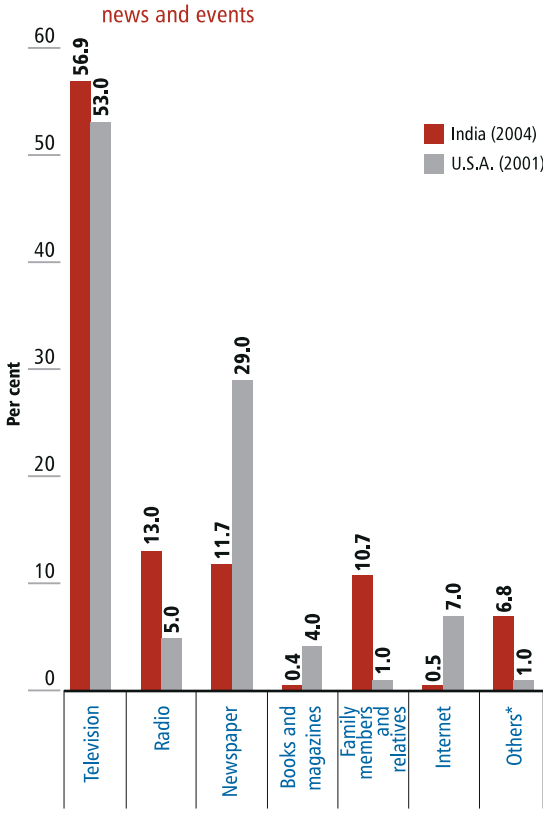
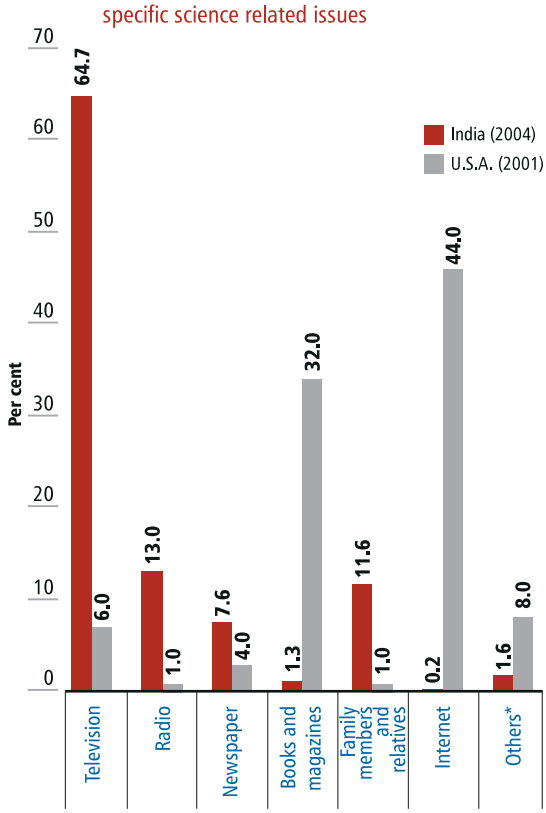


Fig. 4.18: Leading source of information for specific science related issues



Source: NCAER's National Science Survey–2004; USA: Science and Engineering Indicators–2002.

(64%) and Americans (86%) are in agreement. Although there is a difference between the two countries in the view that scientists are conducting research aimed at improving people's lives, it can be said that unlike the Americans, Indians are somewhat relatively less 'in agreement' irrespective of statements posed to respondents.

The biggest difference, of course, between India and the US is the source of information for citizens, especially for S&T related news. While the TV is the biggest source of all information for Indians, which is the same for the US, the US has a much larger readership of newspapers and usage of the Internet (Fig. 4.17).

Indeed, 44% of all US news on S&T issues is got from the Internet as compared to a mere 0.2% for India (Fig. 4.18). Another 32% of US S&T news is got from books and magazines as compared to a mere 1.3% for India. In other words, owing to its higher literacy levels and greater spread (and lower cost) of the Internet, the average US citizen's knowledgebase is not as restricted to just television programming as it is in India. ■

Just 57 per cent of Indians know the centre of the earth is very hot as compared to 80 per cent in the case of the US; the figures are 8 per cent versus 51 per cent on whether antibiotics kill viruses as well as bacteria

Table 4.9: Attitudes towards scientists and scientific works (% of population who agree)

Statements	India (2004)	U.S.A. (2001)
A scientist usually works alone	36	17
Scientific work is harmful	37	53
Scientific researchers work for the good of humanity	64	86
Scientists don't enjoy themselves as much as other people do	45	19
Scientists help in solving problems	64	96
Scientists are peculiar	42	25
Scientists are not likely to be religious minded	33	30

Source: India: NCAER's National Science Survey–2004; U.S.A: Science and Engineering Indicators–2002.

Looking Ahead…

THIS FIRST INDIA SCIENCE REPORT marks a pioneering attempt at seeking to inject new dynamism in the country's database and statistical system related to science and technology. Such efforts are consistent with India's growing emergence in the global economy as well as her attempts at becoming a substantial player in the new knowledge-based services and products. Enhancement of the nation's science and technology statistical system will also contribute to better and more informed policy making and development of strategic vision for the longer term.

This is an ambitious task and will only be achieved over a period of time through several, complementary initiatives. The first ISR has focused on a limited set of issues, and is characterized by a first-ever primary data household survey related to attitudes of students, teachers as well as general public about issues related to science education, role and contribution of technology. These findings are unique in that no comparable data exist for the country prior to the first ISR. In addition, the ISR highlights several important issues, both positive and otherwise, related to science and technology efforts in the country that would be of interest to policy making.

While concerns have been expressed about falling science enrolment in the country, the report shows that the proportion of those enrolled in science courses has gone up from 28.8% of the population in 1995–96 to 34.6% in 2003–04. And within this, the proportion of those doing engineering has almost doubled, from 6.0% of the population studying at the graduate-plus level in 1995–96 to 11.2% in 2003–04. Indeed, engineering education shows the highest growth, from 8.2% per annum in 1995–2000 to 21.9% in 2000–04. Given their share in both the stock (23.1%) as well as in enrolment (33.4%), science stream students are adequately represented in most types of jobs.

This study also gives clear indications that the country's scientific stock is rising. Among the working population, the share of those who have a scientific qualification and are employed in an S&T activity, also called 'Core' HRST, has risen from 1.1 % in 1981 to 1.6% in 1991 and further to 3.9% in 2004. Between 1991 and 2004 it grew by 9.3% annually against 5.7% from 1981 to 1991.

The proportion of the population with a 10^{th} (high school) and 12^{th} (higher secondary) degree has increased significantly, from 8.2% in 1991 to 23% in 2004. Those with graduate degrees and above have risen from 2.4% of the population in 1991 to around 4.5% today.

Students at lower classes have shown interest in science education — 60% of the students at the class 6^{th} to 8^{th} level said they wanted to pursue science education (pure science, engineering or medicine) as compared to 57% students in classes 11 and 12. Over 40% of the students, whether in classes 6 to 8 or 11 and 12, wanted to become engineers or doctors.

In fact, when asked, over three-fourths of teachers polled in the National Science Survey-2004 were also of the view that science education is growing.

The growth of any nation not only depends on the impact of its S&T efforts on technology exports but also on

the lives of the common man. Further, it also depends on the degree of awareness about scientific issues among the country's populace so that they are better able to adapt to the many changes that S&T developments bring about.

Despite the low levels of literacy and spread of higher education, India doesn't fare too badly vis-a-vis high-income countries like the US. India scores lower than the US on attitudes towards science and technology, but not much lower. Seventy-seven per cent Indians feel S&T makes our lives healthier and easier as compared to 86% for the US. India compares unfavourably with the US on parameters like the proportion of its population that understands certain scientific concepts, such as, are electrons smaller than atoms, or whether the centre of the earth is hot; it does reasonably well given its relatively lower income and literacy levels.

However, when it comes to issues like 'attentive' public (that is, the part of the public that is not only interested in certain issues but also follows up with regular reading of newspapers/magazines), India scores much higher than the US. Close to 19% of India's population can be considered 'attentive' compared to fewer than ten per cent for the US. While the figure is 23% for India versus 6% for the US in the case of agriculture and farming, it is 18% (US) versus 12% (India) for economy and business areas.

It is also a good sign that most Indians have faith in science, as the study found, and feel that S&T can contribute to education, agriculture, economic growth and in general making their lives better. Such faith in science and technology gives the hope that the country's populace is ready to adapt to new technologies. This fact augurs well for the country as it prepares for a technological push into the future.

At the same time, there is a need to avoid complacency and urgently address several areas of concern emerging in the findings of this report. For instance, in the study, about a third of the students said they did not study science as they did not feel motivated enough. This is where the role of science teachers becomes crucial. Since every generation of top quality scientific manpower starts at the school level, a lot also depends on the way science is taught at school levels. The study found that while close to two thirds of the students in classes six to eight are satisfied with the quality of science teaching, this falls to just 40% in classes 11 and 12, clearly indicating a lack of availability of good and motivated teachers at higher levels. Teaching of computer science among other courses is considerably discouraging with just 15% of the students in government schools and 23% in private schools satisfied with teaching.

Teachers gave quite different explanations for the limited interest in science such as costly and difficult education apart from limited job opportunities. Half the teachers interviewed also claimed that lack of practical training in science subjects, due to inadequate computers/scientific equipment in schools, was to blame for lack of motivation among the students.

The findings also indicate that the initial urge to study science cuts across all sections of the society. However, for the sections in the lower socio-economic stratum, this does not often translate into fact at later stages due to several factors such as lack of affordability, lack of infrastructure, paucity of information about scope and future opportunities.

The report found that those in rural areas tend to go in more for arts than those living in urban areas. This could be due to a paucity of trained science teachers in rural areas, and hence, needs to be attended to. This is because the rural areas of the country still hold immense potential to add to the growing stock of scientific manpower in the days to come.

The report also points to the imbalance in terms of educational institutions in various states of the country. Such a situation leads to migration of students for various specific courses. This makes education costlier and also inequitable-those who can afford it only can go for it. Is this an optimal model for the educational setup in a country like India? This needs to be looked into.

Overall, the report clearly indicates that science education needs to be strengthened in terms of methods of teaching, teacher quality, and infrastructure. This observation has been found valid for all regions of the country.

Although it is a good sign that the scientific stock is rising, is this scientific stock sufficient to meet the requirements in various priority areas, or is there an

imbalance? The report finds that despite being a predominantly agricultural economy, not many are taking interest in pursuing agricultural education. The same is true for health education as well. The study found a drop in the enrolment in medical courses. Such trends need to be carefully monitored and corrective steps initiated.

The report also finds that of the total educated population, as we move towards higher education, the share of unemployed science literates increases significantly. For instance, of the postgraduates who are unemployed, about 63% have studied science. This is also true in the case of science diploma holders: 53% unemployed belong to the science stream. The report also finds that almost 30% of those who have finished at least their 12th class degree in science are not working, being either unemployed or housewives. It is the same with a fifth of the total science graduates and almost 14% in the case of Ph.Ds. For those who have passed their class 12 examinations with science, the figure is over 37%. There is a need to carefully examine this scenario and ensure that science literates are gainfully employed and contribute to the scientific development of the country.

The growing scientific stock could be further maximized if efforts are made to ensure that those pursuing science take up science-centred jobs. The report has found that many people with scientific qualifications are not engaged in S&T jobs. However, what is more a matter of concern is that many people employed in science-centred jobs are not sufficiently qualified, which leads us to a situation where optimal efficiency gets compromised. Therefore, corrective measures are required to ensure optimal utilization of the scientific stock.

As expected, the report finds that television is the most popular source of information for most people. But this also calls for a conscious action on the part of all concerned to generate quality S&T programmes for television. Quality S&T TV programmes are few and far between. This source of dissemination of scientific information needs to be exploited fully.

But what is of concern is the extremely low percentage of people visiting science museums, planetaria, aquaria, science fairs, etc. Is this due to less awareness or less motivation? This needs to be ascertained, for, these are places that document scientific and technological developments and could be a great source of scientific information as well as inspiration for children.

Another important point the report makes is that over 44% of S&T information in the United States is obtained from the Internet as compared to 0.2 per cent in India. There is a vast potential still waiting to be tapped in India. Modern channels of information need to be harnessed to the fullest potential. ICT penetration is an issue that needs to be looked into to maximize the scientific returns from the vast cyber source of knowledge. There is also perhaps a need to ensure greater penetrability of Internet and other ICT tools at the school level as also in rural and remote areas so that access to reliable and updated information is considerably improved.

It needs to be realized that meaningful policies cannot be formulated in the absence of authentic data. Therefore, the necessity of collecting, collating, and analyzing reliable data to arrive at meaningful conclusions cannot be overemphasized. The National Science Survey–2004 was the first such attempt in this direction. However, much still needs to be done. There are several critical areas of national importance that have not been objectively addressed due to either incomplete and outdated data or even due to non-existence of reliable data/information in a few cases.

The report needs to be seen as an effort towards strengthening the S&T statistical network within the country. The results presented in this report, we believe, will essentially be an important input for the entire scientific community, educationists, academicians and policy makers to set achievable goals and work out action plans towards forging a knowledge economy and transforming India into a developed nation. We also believe that this report will spawn more such attempts at collecting reliable data related to different areas so that this activity gets further refined over successive reports and the country is able to develop a resource pool of reliable and authentic data. ■

Appendix

ACRONYMS AND ABBREVIATIONS

AICTE	All India Council for Technical Education
BCI	Bar Council of India
BIMARU	Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh
CCH	Central Council of Homoeopathy
CCIM	Central Council of Indian Medicine
CMIE	Centre for Monitoring Indian Economy
CSIR	Council of Scientific and Industrial Research
DCI	Dentist Council of India
DEC	Distance Education Council
DST	Department of Science and Technology
GDP	Gross Domestic Product
GIAN	Grassroots Innovations Augmentation Network
HBS	Household Budget Survey
HRST	Human Resource in Science and Technology
HRSTE	Human Resource in Science and Technology by Education
HRSTO	Human Resource in Science and Technology by Occupation
IAMR	Institute of Applied Manpower Research
ICAR	Indian Council for Agriculture Research
ICT	Information and Communication Technology
IDI	Infrastructure Development Index
IIT	Indian Institute of Technology
INC	Indian Nursing Council
INSA	Indian National Science Academy
ISCED	International Standard Classification of Education
ISCO	International Standard Classification of Occupation
MCI	Medical Council of India
MNCs	Multi National Companies
NAAC	National Assessment and Accreditation Council
NCAER	National Council of Applied Economic Research
NCO	National Classification of Occupation
NCTE	National Council for Teachers Education
NSDL	National Securities Depository Limited
NSDP	National State Domestic Product
NSS	National Sample Survey
NSSO	National Sample Survey Organisation
NZSCO	New Zealand Standard Classification of Occupation
OECD	Organisation for Economic Co-operation and Development
PCI	Per Capita Income
PhD	Doctorate in Philosophy
PoA	Plan of Action
PUST	Public Understanding of Science and Technology
R&D	Research and Development
RCI	Rehabilitation Council of India
S&T	Science and Technology
UFS Block Maps	Urban Frame Survey Block Maps
UGC	University Grants Commission
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WEF	World Economic Forum

GLOSSARY

Education: UNESCO defines it as, "organised and sustained communication designed to bring about learning". Successfully completed education at given levels leads to formal qualification.

Education expenditure: According to IAMR, it is plan-wise expenditure by government both central and state on various sectors of education like elementary, secondary, adult, higher, technical and other education.

Gross Enrolment Ratio: It is the ratio of total enrolment (regardless of age) to the population of the age group that officially corresponds to the level of education shown thus indicates capacity of each level of education.

HRST: The Canberra Manual (OECD, 1995) defines HRST as people who fulfil one or the other of the following conditions:

- They have successfully completed education at the tertiary level in an S&T field of study;
- They are not formally qualified as above, but are employed in an S&T occupation where the above qualifications are normally required.

Human Resources in Science and Technology, or HRST, comprises those (i) who are employed in a science and technology occupation (HRST by occupation-HRSTO) or (ii) those who have a diploma/graduation degree or above (HRST by education-HRSTE). Those who have a diploma/graduation degree and are employed in a science and technology occupation comprise the 'Core' HRST group.

Infrastructure Development Index (IDI): It is developed by CMIE for all states and districts in India. This is the method to compute a composite measure of infrastructure development and in order to measure infrastructure development the CMIE has chosen the following 11 development indicators relating to the seven major infrastructures to form composite development index (CDI).

These 11 indicators are: (i) surfaced roads per 100 sq. km. area; (ii) unsurfaced roads per 100 sq. km. area; (iii) railway route length per 100 sq. km. area; (iv) percentage of villages electrified; (v) gross cropped area; (vi) bank branches per lakh population; (vii) post offices per lakh population; (viii) telephone lines per 100 persons; (ix) primary schools per lakh population; (x) primary health centres per lakh population; and (xi) hospital beds per lakh population.

Seven major infrastructures are: (i) Transport facilities–26; (ii) Energy–24; (iii) Irrigation–20; (iv) Banking facilities–12; (v) Communication facilities–6; (vi) Education facilities–6; and (vii) Health facilities–6.

Main and marginal workers: According to Census of India, workers are defined as persons whose main activity involves participation in any economically productive work by his/her physical or mental activity. It not only includes actual work but also effective supervision and direction of work.

Main worker is defined as a person whose main activity involves participation in any economically productive work by his physical and mental activities and who had worked for 183 days or more.

Marginal worker is defined as a person whose main activity involves participation in any economically productive work by his physical or mental activity for less than 183 days.

Non-worker is a person who had never worked at any time.

Promise and Reservation Index: This index is based on the strong belief of people in the promise of science and technology to improve the quality of life and have relatively low levels of reservation about possible harms. The ratio between the two indices may show the relative strength of positive and negative attitudes toward science and technology, both operate simultaneously in most individuals.

Pupil Teachers Ratio: According to Ministry of HRD, pupil teachers ratio is defined as average number of students per teacher.

Science & Technology (S&T): Science and Technology is understood in a very broad sense as per Canberra manual, covering all fields of education and occupation, including social sciences and humanities.

Although many authors never explicitly state what they mean by "science" be science is here understood as being characterized by two aspects: (1) as a corpus of conceptual and experimental methods that allows the investigation of objects pertaining to the natural or social worlds; and (2) as the body of knowledge derived from these investigations. Technology in turn is defined as the set of tools and machinery, in short the artefacts, as well as the knowledge pertaining to their functioning and use.

[Godin, B and Gingras, Y (2000). What is scientific and technological culture and how is it measured? A multidimensional model, *Public Understand*. Sci. 9 (2000), 43–58)].

S&T Personnel: Include selected professional graduates in medical, agricultural and veterinary sciences, degree and diploma holders in engineering, and graduates and postgraduates in general sciences.

Numerical Units:

Lakh	=	100,000
Million	=	10 lakh
Billion	=	1000 million
Crore	=	10 million

Urban and Rural Areas: Urban areas taken in the study are the same as taken by Census 2001 and include:

- All places with municipality/corporations, cantonment board or a notified town area;
- All places satisfying the following criteria:
  - Minimum population of 5000
  - Atleast 75% of male work force undertakes non-agricultural pursuits;
  - A population density of over 400 per sq. km.

All those areas that are not covered in urban areas as per census 2001 are included in rural areas.

SURVEY METHODOLOGY: NATIONAL SCIENCE SURVEY – 2004

MAIN FEATURE OF SAMPLE DESIGN

The First India Science Report was aimed to focus on three major issues, namely, science and engineering education, utilisation pattern of human resources and public attitude towards science and technology. To achieve this goal a nation-wide survey called 'National Science Survey- 2004' was undertaken to generate a statistically appropriate database and reliable estimates of various parameters related to these important issues. Although this was a household survey, the ultimate unit of selection and collection of primary information was the individual over ten years of age as he/she belongs to a society that is diverse in culture and socio-economic development.

In any sample survey, the first prerequisite is the availability of sampling frame, the list of individual in this case, for selecting the representative sample from whom the desired information is to be collected. The sampling frame had to be up-to-date and free from errors of omission and duplication. In developing countries like India, such a sampling frame is neither readily available nor can it be easily prepared for entire population since developing new frames is an expensive proposition and time consuming. Therefore, a three-stage stratified random sampling design was adopted in which a ready-made information available from Census 1991 and 2001was used for the first two stages for stratification and selection, and a sampling frame of individuals was developed in the last stage.

India is a second most populous country in the world with varying regional disparity with respect to culture, habits, preferences, and consequently necessities. Over 70% of people live in the over 600,000 villages and remaining little less than 30% lives in over 5,000 towns/cities. Thus, as in the case of household survey more than the total sample size, it is the nation's geographical spread that is important with regard to the statistical efficiency of estimates. This applies perhaps even more so for characteristics such as attainment of education levels, employment pattern and public attitudes towards S&T, the distribution across the population of which is likely to show a large degree of heterogeneity. Consequently, a notable feature of the survey design is that the sample of individual respondents has been selected from a wide cross-section of individuals (households) in the country, covering both rural and urban areas, with the objective of enhancing the precision of the estimates. The rural sample has been selected from a representative number of districts from across the country, while the urban sample covers a range from big metropolitan cities to small towns with population below 5,000.

A listing of individuals of over 10 years of age in the selected sampling area (villages in rural areas and urban blocks in urban areas) was done. All listed individuals were then stratified into 18 strata using sex, age and education level of individuals. From each effective stratum the desired number of individuals were then selected at random. Developing the sampling frame at the third - individual respondent selection - stage did add some costs to the survey, but it was deemed as highly desirable. Given the skewed distribution and to ensure statistically adequate representation of various categories of public in the sample, adoption of a sample design (through listing in this case) was very crucial.

Thus, National Science Survey resulted in a dual set of data. First, a large data set of around 347,000 individuals emerged directly from the listing operation. Besides the identification particulars, age, and sex for each individual, this data set contained exhaustive information on the individual's level of education and occupation. Second, small data set, over 30,000 individuals, with detailed information on public attitude towards S&T along with the demographic particulars emerged from a sub-sample of individuals from the first.

COVERAGE

All major Indian states were covered with the exception of Arunachal Pradesh, Manipur, Mizoram, Nagaland, Sikkim, Tripura, Jammu & Kashmir, Andaman & Nicobar, Goa,

Dadra & Nagar Haveli and Lakshadweep due to logistical constraints. However, these represent an extremely small fraction of the total population of the country and the national estimates provided in the report refer to all of India.

SAMPLE DESIGN FOR RURAL AREAS

Over 70 per cent of India's population live in about 600,000 villages spread over 550 districts in 32 states and UTs. To provide adequate geographical coverage of individual respondents within a state, the districts were cross-classified by rural female literacy (Census 91), and by the Infrastructure Development Index (IDI[1]) to form homogeneous strata. The number of such strata in a state was determined on considerations of the range of the stratification variables

Stratification of individuals

Stratum No.	Gender	Age (in years)	Education
1	Male	10–30	Up to 5th
2	Male	10–30	5th to 12th
3	Male	10–30	Above 12th
4	Male	30–45	Up to 5th
5	Male	30–45	5th to 12th
6	Male	30–45	Above 12th
7	Male	Over 45	Up to 5th
8	Male	Over 45	5th to 12th
9	Male	Over 45	Above 12th

10–18 corresponds to female with similar age and education groups as male.

Stratum–wise sample profile for National Science Survey–2004

Stratum	Sex	Age (years)	Level of education	Rural		Urban		All India	
				Individuals listed	Number of respondents	Individuals listed	Number of respondents	Individuals listed	Number of respondents
1	Male	10–30	Up to 5th	11,677	574	17,530	1,125	29,207	1,699
2	Male		6th–12th	18,185	621	35,796	1,203	53,981	1,824
3	Male		Above 12th	3,130	542	11,298	1,132	14,428	1,674
4	Male	31–45	Up to 5th	6,189	569	6,965	1,093	13,154	1,662
5	Male		6th–12th	6,552	562	14,714	1,144	21,266	1,706
6	Male		Above 12th	2,125	533	9,587	1,126	11,712	1,659
7	Male	Over 45	Up to 5th	7,896	574	8,307	1,117	16,203	1,691
8	Male		6th–12th	4,210	545	11,136	1,136	15,346	1,681
9	Male		Above 12th	1,490	501	7,155	1,110	8,645	1,611
10	Female	10–30	Up to 5th	14,420	601	17,861	1,136	32,281	1,737
11	Female		6th–12th	12,441	597	30,250	1,173	42,691	1,770
12	Female		Above 12th	1,535	520	8,986	1,121	10,521	1,641
13	Female	31-45	Up to 5th	9,662	591	12,205	1,132	21,867	1,723
14	Female		6th–12th	3,657	551	12,603	1,137	16,260	1,688
15	Female		Above 12th	759	492	5,389	1,098	6,148	1,590
16	Female	Over 45	Up to 5th	9,296	595	13,155	1,154	22,451	1,749
17	Female		6th–12th	1,318	516	6,258	1,113	7,576	1,629
18	Female		Above 12th	532	468	2,646	1,053	3,178	1,521
	Total sample size			**115,074**	**9,952**	**231,841**	**20,303**	**346,915**	**30,255**

1. The Infrastructure Development Index (IDI) in relation to all India (100) has been worked out by CMIE for all states and all the districts in the states. These are published in "Profile of Districts—November, 2000 CMIE". While computing this indicator, factors such as population growth & density, urbanisation, literacy, distribution of work force, per capita foodgrain production, and infrastructure among other characteristics have been taken into account.

BOX: Survey concepts and definitions

REGIONS: All covered states are grouped into following four regions in the country.

North: Haryana, Himachal Pradesh, Madhya Pradesh, Punjab, Uttar Pradesh, Uttaranchal, Delhi and Chandigarh.

South: Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and Pondicherry.

East: Assam, Bihar, Jharkhand, Meghalaya, Orissa and West Bengal.

West: Gujarat, Maharashtra and Rajasthan.

URBAN AREAS: The definition of urban areas adopted for this study is the same as used in the 2001 Census. Accordingly, urban areas include:

- All places with a municipality/corporation, cantonment board or a notified town area;
- All other places satisfying the following criteria:
  - Minimum population of 5,000
  - At least 75 per cent of the male work force undertakes non-agricultural pursuits
  - A population density of over 400 per sq. km.

SIZE OF CITY/TOWN: Cities/towns are classified by their 2001 Census population into the following groups.

(i) Over 50 lakhs
(ii) 10 to 50 lakhs
(iii) 5 to 10 lakhs
(iv) 2 to 5 lakhs
(v) 1 to 2 lakhs
(vi) 50,000 to 1 lakh
(vii) 20,000 to 50,000
(viii) Below 20,000

HOUSEHOLD: A household is defined as a person or a group of persons, related by blood, marriage or adoption, sharing the same kitchen. Servants, permanent labourers and unrelated members are treated as members of the household in case they take their meals regularly from the same kitchen.

REFERENCE PERIOD: The reference period for the survey was April 1, 2003 to March 31, 2004, while primary data were collected during May–July 2004.

and the resulting frequency in each stratum. From each effective stratum a pre-assigned number of districts, depending on the size of the stratum, were selected through a probability proportional to the rural population of districts. A total number of 152 districts were selected in the first stage and the distribution of the number of sample districts among various states was done in proportion to the rural population of the state as per Census 2001.

Villages formed the second stage of selection procedure. District-wise lists of villages are available from Census 91 records (village-wise information is not yet available from Census 2001) along with population. About 2 to 6 villages were selected independently from each sample district by adopting a probability proportional to the population of the village. A total of about 553 villages were covered for the study.

In each selected village, approximately 200 individuals above ten years of age were randomly listed through a specially designed proforma. Besides others, the listing proforma sought an individual's particulars such as age, sex, education, and occupation. After completing the listing operation, individuals were classified into one of the strata, based on sex, age and educational qualification in the order given in the Table *Stratification of individuals*.

The stratification of individuals ensured the representation of all types of individuals. A required number of individuals was selected from each effective stratum to ensure that each listed individual in the stratum had an equal probability of selection. It was also observed, in a few of the sample places, that some strata were empty. In such a situation, the required sample individual was allocated in the preceding or succeeding effective stratum within the same gender. In addition, care was taken to avoid the representation of more than one individual from a household irrespective of age and educational qualification.

A total of over 115,074 individuals were listed and then 9,952 were selected as rural sample for collection of the primary information. Detailed distribution of the sample is

Stratum–wise sample profile for National Science Survey–2004

States	Rural		Urban		Rural		Urban		All India		Number of sample students	Number of sample teachers
	Sample districts	Sample villages	Sample towns	Sample urban blocks	Individuals listed	Number of respondents	Individuals listed	Number of respondents	Individuals listed	Number of respondents		
Andhra Pradesh	8	37	18	106	7,610	666	21,673	1,908	29,283	2,574	571	143
Assam	6	19	5	19	3,966	342	3,861	342	7,827	684	152	38
Bihar	12	58	9	40	11,761	1,044	8,120	720	19,881	1,764	392	98
Chandigarh	—	—	1	10	—	—	2,034	180	2,034	180	40	10
Chattisgarh	6	21	6	25	4,436	378	5,181	450	9,617	828	184	46
Delhi	—	—	1	40	—	—	8,170	720	8,170	720	160	40
Gujarat	8	30	17	83	6,127	540	16,891	1,494	23,018	2,034	452	113
Haryana	6	19	7	35	3,833	342	7,109	630	10,942	972	216	54
Himachal Pradesh	4	9	4	11	1,832	162	2,211	198	4,043	360	80	20
Jharkhand	6	21	6	32	4,518	378	6,699	576	11,217	954	212	53
Karnataka	8	29	11	62	5,927	520	12,641	1,116	18,568	1,636	364	91
Kerala	4	20	10	44	4,166	360	9,075	792	13,241	1,152	256	64
Madhya Pradesh	14	47	16	68	10,180	846	14,202	1,224	24,382	2,070	460	115
Maharashtra	12	54	20	122	11,247	972	25,092	2,195	36,339	3,167	704	176
Meghalaya	2	4	2	8	802	72	1,638	144	2,440	216	48	12
Orissa	8	26	8	34	5,360	468	6,923	612	12,283	1,080	240	60
Pondicherry	—	—	1	10	—	—	2,021	180	2,021	180	40	10
Punjab	4	13	10	44	2,618	234	8,822	792	11,440	1,026	228	57
Rajasthan	8	32	11	46	6,470	576	9,245	828	15,715	1,404	312	78
Tamil Nadu	8	23	17	91	4,621	414	18,547	1,638	23,168	2,052	456	114
Uttar Pradesh	18	56	19	114	12,240	1,008	24,502	2,052	36,742	3,060	679	170
Uttaranchal	4	8	4	17	1,767	144	3,468	306	5,235	450	100	25
West Bengal	6	27	10	67	5,593	486	13,716	1,206	19,309	1,692	376	94
All India	**152**	**553**	**213**	**1128**	**115,074**	**9,952**	**231,841**	**20,303**	**346,915**	**30,255**	**6,722**	**1,681**

given in the Tables *Stratum–wise sample profile for National Science Survey– 2004* and *State-wise sample profile for National Science Survey–2004*.

SAMPLE DESIGN FOR URBAN AREAS

The process of sample selection in urban areas was more or less similar to that in rural areas. According to the 2001 Census, there were about 4,850 cities/towns in the states/Union Territories (excluding Jammu & Kashmir). The population of cities/towns in India varies from less than 5000 to over 10 million.

All the cities with population over a million in 2001 were selected with a probability of one. The remaining cities/towns were grouped into seven strata on the basis of their population size and from each stratum a sample of towns was selected independently.

A progressively increasing sampling fraction with increasing town population class was used for determining the number of towns to be selected from each stratum. The sampling fraction was used at the state level. In all, 213 cities/towns thus selected constituted the first stage of sample for urban areas. These accounted for over four per cent of the total cities/towns of the country but what is more important, covered a major part of the urban population.

The NSSO Urban Frame Survey (UFS) block maps were

used to select urban blocks. A sample of such blocks was selected independently from each sample city/town and constituted the second stage unit for the urban sample. The number of blocks from each city/town thus selected varied between two and 40, depending upon the population of sample city/town and the total number of such blocks.

As in the case of the selected villages, 200 individuals over 10 years of age in the selected urban blocks were listed, stratified and then a sample of individuals was selected from each effective stratum.

A total of over 231,841 individuals were listed and then over 20,303 individuals were selected from 1,128 UFS blocks as urban sample to collect primary information.

SURVEY OF STUDENTS AND TEACHERS

To understand the current status of school education in general and science education in particular, detailed information was collected from 6,722 students and 1,681 teachers through well-structured questionnaires.

In each sample place (villages in rural areas and urban blocks in urban areas) four students (two from classes six to 10, and one science and one non-science student each from classes 11 and 12) and one school teacher, preferably teaching science subjects in a nearby school, were selected.

Among the sampled students, 50% interviewed were in classes 11 and 12 with 36% studying in class nine and 10 combined and the remaining 14% in classes six to eight. Also, among the total sample students 33% were female. This purposive selection of students studying at different levels gave a clear understanding and perception about science education across various levels of maturity.

Perception of students and teachers was sought by probing them on some of the important aspects such as learning environment of science at schools as well as at home, teaching quality, liking for science subjects, preferred higher degrees (a Bachelors or a Masters, for instance), preferred stream and subjects for higher studies, preferred occupation, etc. It certainly provided valuable inputs in helping to understand the mindset of students and teachers – the major players in setting the tone for the future of science education and overall development of the country. It also provided plausible explanations and an understanding of the impact of socio-economic and demographic factors on the above mentioned education related issues.

DATA COLLECTION PROCEDURES

In this study, a listing proforma and three sets of detailed questionnaires, namely, individual, student, and teacher were used to collect primary information. These questionnaires were pre-tested with a small number of respondents and accordingly desired changes were made in the content, wording of the questions, and ordering of questions. Locally recruited postgraduate interviewers were engaged for the collection of primary data by conducting face-to-face interviews of respondents.

Rigorous training of the field investigators who would canvass the survey schedules was accorded one of the highest priorities in the survey. The main objective of the training was to ensure that not only were the investigators thoroughly comfortable with the schedules and the underlying concepts but, perhaps more importantly, they could convey the same to respondents who even if cooperative might be uninformed and also in many cases illiterate. The training consisted of two parts, namely, training of the supervisors, and another round of "on-site" training, in different parts of the country, of the actual investigators who would canvass the survey schedules under supervision. Interviews were conducted during the period May 1, 2004 through July 7, 2004.

WEIGHTING AND ANALYSIS

The interviewed sample information collected through listing proforma and individual questionnaire was weighted to match national demographic parameters (such as sex, age, location, etc.). These parameters came from Census 2001 and other surveys conducted by NCAER in the recent past. Weights were trimmed to prevent individual interviews from having too much influence on the final results. The use of these weights in statistical analysis ensures that the demographic characteristics of the sample closely approximate the demographic characteristics of the national population. ■

List of Appendix Tables

Appendix Table 1:
Distribution of persons by major source of information
(All India, percentages) Year: 2003–04

Characteristic	Television	Radio	Newspaper	Books/ Magazines	Family members/ relatives	Friends	Local people/ leaders	Others	Total
LOCATION									
Rural	50.1	17.0	10.8	0.3	10.8	2.1	8.2	0.8	100.0
Urban	73.6	3.2	14.1	0.6	4.4	1.3	2.1	0.6	100.0
SEX									
Male	54.2	14.1	17.2	0.4	4.3	2.2	6.9	0.7	100.0
Female	59.6	12.0	6.3	0.4	13.6	1.5	5.8	0.8	100.0
AGE GROUPS (YEARS)									
10–30	59.1	12.5	12.2	0.5	7.8	1.9	5.2	0.8	100.0
31–45	55.0	14.2	12.3	0.3	8.3	1.9	7.3	0.7	100.0
Over 45	54.3	12.8	10.2	0.3	12.1	1.6	8.1	0.7	100.0
FORMAL EDUCATION									
Illiterate	40.9	17.9	1.5	0.4	20.1	3.9	13.9	1.5	100.0
Upto 12th	60.8	12.4	12.9	0.3	6.6	1.4	4.9	0.6	100.0
Graduate degree	65.0	7.7	24.4	1.0	0.9	0.2	0.3	0.5	100.0
Postgraduate degree	64.5	5.3	27.3	1.6	0.6	0.2	0.2	0.3	100.0
Other degrees	71.1	0.5	25.0	2.0	0.0	0.0	0.0	1.3	100.0
FORMAL OCCUPATION									
Professionals	59.2	8.1	24.3	0.9	2.2	1.5	3.6	0.2	100.0
Administrative workers	62.3	2.4	33.3	0.9	0.6	0.3	0.0	0.0	100.0
Clerical workers	62.4	2.7	31.1	0.7	0.8	0.9	0.8	0.6	100.0
Service workers	62.9	9.6	18.8	0.5	3.2	1.4	3.4	0.1	100.0
Productive workers	58.4	11.4	17.1	0.1	3.3	2.7	4.3	2.6	100.0
Others	56.4	13.7	10.0	0.4	10.0	1.9	6.9	0.7	100.0
INCOME QUANTILE (Q)									
Q 1	47.7	15.4	9.5	0.4	13.0	2.7	10.3	1.0	100.0
Q 2	59.6	15.4	9.2	0.2	8.0	1.8	5.1	0.6	100.0
Q 3	64.7	10.9	15.3	0.3	5.1	1.0	2.4	0.3	100.0
Q 4	69.0	5.7	17.4	0.8	4.0	0.5	1.9	0.8	100.0
Q 5	71.8	4.0	19.2	0.5	1.5	0.3	2.2	0.5	100.0
REGIONS									
North	50.2	16.5	10.9	0.2	12.1	3.5	5.6	1.1	100.0
South	76.1	3.3	13.2	0.9	2.4	0.7	2.7	0.6	100.0
East	42.1	24.9	9.6	0.3	10.1	1.6	10.4	0.8	100.0
West	60.3	7.3	13.2	0.2	10.5	1.6	6.4	0.6	100.0
ALL INDIA	**56.9**	**13.0**	**11.7**	**0.4**	**8.9**	**1.8**	**6.4**	**0.8**	**100.0**

Note: Responses are to the statement: "What is your major source of current news/events: television, radio, newspaper/magazine, family members/relatives, friends, local people/leaders?"

Appendix Table 2:
Distribution of persons by place of exposure of information sources
(All India, percentages) Year: 2003–04

Characteristic	Television					
	At home	Neighbours	Public place	Work place	Others	Total
LOCATION						
Rural	63.8	29.8	5.1	0.5	0.8	100.0
Urban	92.1	6.3	1.4	0.2	0.1	100.0
SEX						
Male	71.8	21.2	5.9	0.6	0.4	100.0
Female	74.4	23.1	1.7	0.1	0.7	100.0
AGE GROUPS (YEARS)						
10–30	71.7	23.4	3.9	0.4	0.7	100.0
31–45	73.3	21.9	3.9	0.5	0.5	100.0
Over 45	76.4	19.3	3.7	0.3	0.4	100.0
FORMAL EDUCATION						
Illiterate	53.9	37.5	7.6	0.2	0.7	100.0
Upto 12th	74.5	21.1	3.4	0.4	0.6	100.0
Graduate degree	90.9	6.5	1.5	0.7	0.4	100.0
Postgraduate degree	94.8	4.3	0.9	0.0	0.0	100.0
Other degrees	94.5	4.7	0.5	0.2	0.1	100.0
FORMAL OCCUPATION						
Professionals	88.0	7.2	3.0	1.5	0.3	100.0
Administrative workers	96.8	2.9	0.1	0.1	0.0	100.0
Clerical workers	95.1	3.6	0.7	0.6	0.1	100.0
Service workers	81.0	10.8	4.8	3.4	0.0	100.0
Productive workers	78.3	19.2	2.1	0.4	0.0	100.0
Others	71.0	24.1	4.1	0.2	0.7	100.0
INCOME QUANTILE (Q)						
Q 1	57.1	35.5	5.9	0.6	0.9	100.0
Q 2	75.9	20.0	3.3	0.4	0.5	100.0
Q 3	86.2	11.5	1.9	0.2	0.2	100.0
Q 4	91.9	5.7	1.9	0.2	0.3	100.0
Q 5	90.4	7.1	2.3	0.0	0.1	100.0
REGIONS						
North	65.1	28.7	5.2	0.3	0.6	100.0
South	83.0	14.8	1.9	0.1	0.2	100.0
East	65.0	26.5	6.3	0.8	1.4	100.0
West	76.8	19.9	2.7	0.3	0.3	100.0
ALL INDIA	**73.1**	**22.1**	**3.9**	**0.4**	**0.6**	**100.0**

Note: Responses are to the statement: "At which place are you exposed to the following mass media (television, newspaper/magazine and Internet/e–mail): at home, neighbours'/friends' house, public place or workplace."

(Cont...)

Appendix Table 2:
Distribution of persons by place of exposure of information sources
(All India, percentages) Year: 2003–04

Characteristic	Newspaper/Magazine					
	At home	Neighbours	Public place	Work place	Others	Total
LOCATION						
Rural	36.2	19.9	32.8	7.5	3.6	100.0
Urban	61.5	15.2	14.4	7.6	1.3	100.0
SEX						
Male	39.1	12.2	36.4	9.8	2.4	100.0
Female	54.7	27.1	10.8	4.1	3.4	100.0
AGE GROUPS (YEARS)						
10–30	42.9	21.3	26.3	6.5	3.0	100.0
31–45	46.1	14.9	26.0	10.2	2.8	100.0
Over 45	52.0	13.1	25.7	7.0	2.2	100.0
FORMAL EDUCATION						
Illiterate	28.6	15.0	35.3	12.7	8.4	100.0
Upto 12th	40.6	20.8	28.5	7.2	2.9	100.0
Graduate degree	67.3	8.3	15.0	8.0	1.4	100.0
Postgraduate degree	76.1	4.9	10.9	7.1	1.0	100.0
Other degrees	64.9	5.8	18.3	9.5	1.4	100.0
FORMAL OCCUPATION						
Professionals	58.8	6.0	14.1	18.7	2.5	100.0
Administrative workers	73.0	4.8	12.2	9.8	0.2	100.0
Clerical workers	58.6	5.3	14.7	21.3	0.2	100.0
Service workers	45.2	5.7	30.3	18.6	0.2	100.0
Productive workers	37.3	12.9	35.7	12.7	1.4	100.0
Others	43.9	20.7	26.9	5.3	3.1	100.0
INCOME QUANTILE (Q)						
Q 1	29.1	23.5	36.0	7.6	3.8	100.0
Q 2	37.3	21.3	29.8	7.8	3.8	100.0
Q 3	52.8	15.8	21.9	7.5	2.0	100.0
Q 4	70.2	10.0	12.0	6.7	1.1	100.0
Q 5	76.9	6.0	8.3	8.1	0.8	100.0
REGIONS						
North	39.6	18.0	30.1	8.0	4.3	100.0
South	46.1	19.8	26.5	6.1	1.6	100.0
East	51.5	14.2	21.9	9.1	3.2	100.0
West	44.5	19.9	26.0	7.2	2.3	100.0
ALL INDIA	**45.4**	**18.2**	**26.1**	**7.5**	**2.8**	**100.0**

Note: Responses are to the statement: "At which place are you exposed to the following mass media (television, newspaper/magazine and Internet/e–mail): at home, neighbours'/friends' house, public place or workplace."

(Cont...)

Appendix Table 2:
Distribution of persons by place of exposure of information sources
(All India, percentages) Year: 2003–04

Characteristic	At home	Neighbours	Internet: Public place	Work place	Others	Total
LOCATION						
Rural	7.0	6.5	36.6	13.3	36.6	100.0
Urban	20.2	5.0	44.2	17.0	13.5	100.0
SEX						
Male	15.9	3.0	43.2	19.9	18.1	100.0
Female	14.7	9.8	38.7	8.8	28.0	100.0
AGE GROUPS (YEARS)						
10–30	12.8	5.2	46.2	12.5	23.4	100.0
31–45	16.5	6.6	36.4	21.9	18.6	100.0
Over 45	26.4	5.4	28.0	20.1	20.1	100.0
FORMAL EDUCATION						
Illiterate	12.3	29.5	8.0	13.7	36.5	100.0
Upto 12th	11.7	4.4	40.9	11.9	31.1	100.0
Graduate degree	16.7	6.9	47.0	18.1	11.3	100.0
Postgraduate degree	25.3	2.4	36.1	23.2	12.9	100.0
Other degrees	31.1	2.1	18.2	22.7	25.9	100.0
FORMAL OCCUPATION						
Professionals	18.1	5.2	38.6	25.5	12.7	100.0
Administrative workers	19.0	4.9	33.2	39.4	3.5	100.0
Clerical workers	12.7	1.8	27.8	41.7	16.1	100.0
Service workers	13.8	1.8	54.6	20.0	9.8	100.0
Productive workers	10.0	3.4	48.4	25.7	12.5	100.0
Others	15.4	6.3	42.6	9.4	26.3	100.0
INCOME QUANTILE (Q)						
Q 1	10.9	7.3	33.8	11.0	37.0	100.0
Q 2	11.1	7.4	40.4	6.4	34.8	100.0
Q 3	9.0	6.1	46.0	13.3	25.5	100.0
Q 4	14.9	5.9	44.5	20.2	14.6	100.0
Q 5	31.6	1.5	37.8	21.6	7.5	100.0
REGIONS						
North	28.1	1.5	28.3	15.7	26.3	100.0
South	11.8	8.0	46.7	10.6	22.8	100.0
East	8.6	4.2	49.5	10.3	27.5	100.0
West	15.5	5.8	39.0	25.5	14.3	100.0
ALL INDIA	**15.4**	**5.6**	**41.5**	**15.7**	**21.8**	**100.0**

Note: Responses are to the statement: "At which place are you exposed to the following mass media (television, newspaper/magazine and Internet/e–mail): at home, neighbours'/friends' house, public place or workplace."

Appendix Table 3:
Distribution of persons by accessibility of information sources
(All India, percentages) Year: 2003–04

Characteristic	Television				
	Very good	Good	Poor	Not at all	Total
LOCATION					
Rural	46.0	39.9	10.2	3.9	100.0
Urban	67.0	29.5	3.1	0.4	100.0
SEX					
Male	52.0	37.1	8.3	2.6	100.0
Female	53.4	36.1	7.6	2.9	100.0
AGE GROUPS (YEARS)					
10–30	53.0	37.3	7.5	2.2	100.0
31–45	51.9	36.5	8.4	3.2	100.0
Over 45	53.0	35.0	8.5	3.6	100.0
FORMAL EDUCATION					
Illiterate	35.7	43.3	14.6	6.4	100.0
Upto 12th	54.2	36.6	7.1	2.1	100.0
Graduate degree	68.8	27.1	2.9	1.2	100.0
Postgraduate degree	71.9	25.8	2.1	0.2	100.0
Other degrees	65.8	30.8	3.4	0.0	100.0
FORMAL OCCUPATION					
Professionals	59.6	32.8	6.4	1.2	100.0
Administrative workers	70.6	28.2	1.2	0.0	100.0
Clerical workers	71.0	27.0	1.5	0.5	100.0
Service workers	57.7	34.2	7.2	1.0	100.0
Productive workers	60.9	31.1	7.3	0.8	100.0
Others	51.1	37.5	8.3	3.1	100.0
INCOME QUANTILE (Q)					
Q 1	42.5	40.9	12.3	4.4	100.0
Q 2	51.3	38.6	7.1	3.0	100.0
Q 3	63.0	31.9	4.0	1.0	100.0
Q 4	67.3	28.6	3.5	0.6	100.0
Q 5	68.5	28.9	2.5	0.0	100.0
REGIONS					
North	47.8	38.2	13.1	0.9	100.0
South	64.3	32.4	3.0	0.3	100.0
East	43.5	39.6	7.5	9.4	100.0
West	54.0	36.4	8.6	1.0	100.0
ALL INDIA	**52.7**	**36.6**	**8.0**	**2.7**	**100.0**

Note: Responses are to the statement: "How is the availability/accessibility to mass media (television, newspaper/magazine and Internet/e–mail): very good, good, not at all or not applicable?"

(Cont...)

Appendix Table 3:
Distribution of persons by accessibility of information sources
(All India, percentages) Year: 2003–04

Characteristic	Newspaper/Magazine				
	Very good	Good	Poor	Not at all	Total
LOCATION					
Rural	28.0	47.5	14.8	9.7	100.0
Urban	42.0	46.5	8.4	3.1	100.0
SEX					
Male	33.7	49.5	11.6	5.1	100.0
Female	31.6	43.9	13.9	10.6	100.0
AGE GROUPS (YEARS)					
10–30	31.6	49.1	12.8	6.5	100.0
31–45	34.2	45.2	12.8	7.8	100.0
Over 45	34.7	44.1	11.6	9.6	100.0
FORMAL EDUCATION					
Illiterate	15.9	28.4	16.4	39.3	100.0
Upto 12th	29.7	49.7	14.1	6.5	100.0
Graduate degree	51.1	42.7	4.4	1.8	100.0
Postgraduate degree	60.7	34.4	4.3	0.6	100.0
Other degrees	37.6	61.1	1.1	0.2	100.0
FORMAL OCCUPATION					
Professionals	49.3	42.7	5.4	2.5	100.0
Administrative workers	60.5	37.6	1.3	0.6	100.0
Clerical workers	47.8	46.1	5.8	0.3	100.0
Service workers	35.9	49.7	10.2	4.2	100.0
Productive workers	38.1	47.1	12.8	2.0	100.0
Others	30.3	47.5	13.6	8.6	100.0
INCOME QUANTILE (Q)					
Q 1	23.4	47.0	18.5	11.1	100.0
Q 2	29.4	47.6	13.9	9.1	100.0
Q 3	37.1	50.3	8.4	4.2	100.0
Q 4	47.9	44.2	5.2	2.7	100.0
Q 5	50.7	42.4	4.7	2.2	100.0
REGIONS					
North	29.1	47.5	19.5	3.8	100.0
South	37.5	53.5	6.9	2.2	100.0
East	30.1	41.1	9.6	19.1	100.0
West	34.1	46.8	14.7	4.4	100.0
ALL INDIA	**32.9**	**47.1**	**12.6**	**7.4**	**100.0**

Note: Responses are to the statement: "How is the availability/accessibility to mass media (television, newspaper/magazine and Internet/e–mail): very good, good, not at all or not applicable?"

(Cont...)

Appendix Table 3:
Distribution of persons by accessibility of information sources
(All India, percentages) Year: 2003–04

Characteristic	Internet				
	Very good	Good	Poor	Not at all	Total
LOCATION					
Rural	11.6	14.9	43.5	30.0	100.0
Urban	25.9	35.8	23.4	14.9	100.0
SEX					
Male	20.3	28.8	31.3	19.6	100.0
Female	17.3	21.7	35.3	25.7	100.0
AGE GROUPS (YEARS)					
10–30	19.8	27.1	31.9	21.2	100.0
31–45	19.5	24.2	36.6	19.8	100.0
Over 45	15.9	23.4	31.7	28.9	100.0
FORMAL EDUCATION					
Illiterate	2.8	10.5	47.6	39.1	100.0
Upto 12th	12.9	18.5	41.2	27.4	100.0
Graduate degree	31.6	41.6	16.5	10.4	100.0
Postgraduate degree	34.1	42.0	15.1	8.7	100.0
Other degrees	46.6	29.6	18.5	5.3	100.0
FORMAL OCCUPATION					
Professionals	30.9	37.0	20.5	11.6	100.0
Administrative workers	46.3	39.9	8.0	5.8	100.0
Clerical workers	38.6	25.4	25.6	10.4	100.0
Service workers	22.7	40.5	9.8	27.0	100.0
Productive workers	18.7	29.4	36.2	15.7	100.0
Others	15.3	23.2	36.6	24.8	100.0
INCOME QUANTILE (Q)					
Q 1	8.3	10.4	46.4	34.9	100.0
Q 2	12.8	17.3	40.3	29.5	100.0
Q 3	21.7	29.2	32.7	16.3	100.0
Q 4	27.9	41.1	19.2	11.8	100.0
Q 5	32.6	40.9	16.7	9.8	100.0
REGIONS					
North	14.2	27.8	35.0	23.0	100.0
South	29.2	31.8	31.4	7.5	100.0
East	6.9	15.7	39.1	38.3	100.0
West	19.1	25.0	29.4	26.4	100.0
ALL INDIA	**19.1**	**25.8**	**33.0**	**22.1**	**100.0**

Note: Responses are to the statement: "How is the availability/accessibility to mass media (television, newspaper/magazine and Internet/e–mail): very good, good, not at all or not applicable?"

Appendix Table 4:
Distribution of persons by utilisation pattern of information sources
(All India, percentages) Year: 2003–04

Characteristic	Television								
	Daily	Once a week	Twice a week	Thrice a week	Once in a fortnight	Once a month	Infrequent	Never	Total
LOCATION									
Rural	31.3	8.4	4.3	3.9	0.7	2.3	11.0	38.2	100.0
Urban	87.0	3.0	1.8	1.2	0.3	0.6	2.6	3.6	100.0
SEX									
Male	47.8	7.5	3.8	3.4	0.5	1.9	8.7	26.6	100.0
Female	47.3	6.2	3.4	2.9	0.6	1.7	8.4	29.6	100.0
AGE GROUPS (YEARS)									
10–30	48.9	7.6	3.7	3.7	0.6	1.7	8.4	25.4	100.0
31–45	47.0	6.0	3.7	2.6	0.7	2.1	8.2	29.7	100.0
Over 45	45.2	6.0	3.0	2.4	0.4	1.5	9.1	32.5	100.0
FORMAL EDUCATION									
Illiterate	28.0	8.2	5.5	2.7	0.8	2.8	12.9	39.2	100.0
Upto 12th	50.7	7.0	3.3	3.5	0.6	1.6	8.0	25.3	100.0
Graduate degree	66.8	2.8	1.4	1.4	0.2	0.6	3.4	23.4	100.0
Postgraduate degree	68.3	4.0	1.5	2.3	0.0	0.8	1.3	21.7	100.0
Other degrees	73.8	0.8	0.3	1.3	0.0	0.0	1.5	22.4	100.0
FORMAL OCCUPATION									
Professionals	59.7	5.2	2.9	2.9	0.1	0.5	4.4	24.3	100.0
Administrative workers	72.3	2.7	0.3	0.6	0.0	0.0	1.0	23.1	100.0
Clerical workers	68.3	4.1	0.6	0.8	0.2	0.4	2.4	23.2	100.0
Service workers	58.0	4.6	4.0	5.9	0.2	0.7	4.7	21.8	100.0
Productive workers	54.8	6.2	2.9	1.2	1.2	2.1	5.1	26.4	100.0
Others	45.6	7.1	3.7	3.2	0.6	1.9	9.2	28.7	100.0
INCOME QUANTILE (Q)									
Q 1	45.0	9.2	5.4	4.4	0.9	2.3	12.2	20.5	100.0
Q 2	63.0	7.6	3.2	2.7	0.2	1.7	7.9	13.7	100.0
Q 3	78.2	3.7	1.9	2.0	0.3	1.3	5.0	7.7	100.0
Q 4	86.6	2.9	1.1	0.9	0.3	1.1	3.1	3.9	100.0
Q 5	88.9	1.3	0.5	2.5	0.8	0.3	3.5	2.2	100.0
REGIONS									
North	49.4	9.5	5.5	4.1	0.9	5.2	10.9	14.6	100.0
South	84.8	5.6	1.8	2.6	0.3	0.1	2.2	2.6	100.0
East	45.1	5.4	4.8	3.0	0.8	1.2	13.6	25.9	100.0
West	68.1	6.8	2.3	2.8	0.3	0.8	7.0	11.9	100.0
ALL INDIA	**47.6**	**6.8**	**3.6**	**3.1**	**0.6**	**1.8**	**8.5**	**28.1**	**100.0**

Note: Responses are to the statement: "How frequently are you exposed to mass media (television, newspaper/magazine and Internet/e–mail): daily, once a week, twice a week, thrice a week or once in a fortnight?"

(Cont...)

Appendix Table 4:
Distribution of persons by utilisation pattern of information sources
(All India, percentages) Year: 2003–04

Characteristic	Newspaper/Magazine								
	Daily	Once a week	Twice a week	Thrice a week	Once in a fortnight	Once a month	Infrequent	Never	Total
LOCATION									
Rural	25.2	6.1	4.3	3.1	0.9	1.8	11.4	47.1	100.0
Urban	49.7	6.4	3.9	3.7	0.6	0.8	7.8	27.1	100.0
SEX									
Male	40.9	7.3	5.3	4.0	1.0	1.5	10.3	29.7	100.0
Female	23.7	5.2	3.1	2.5	0.6	1.6	10.4	52.8	100.0
AGE GROUPS (YEARS)									
10–30	34.0	7.4	5.0	3.9	0.9	1.9	11.4	35.5	100.0
31–45	32.8	5.8	3.7	3.0	0.7	1.3	10.5	42.2	100.0
Over 45	28.1	4.0	3.1	2.1	0.8	1.0	7.7	53.1	100.0
FORMAL EDUCATION									
Illiterate	3.4	0.7	0.6	0.2	0.1	0.3	3.3	91.3	100.0
Upto 12th	34.0	8.1	5.6	4.4	1.1	1.9	13.5	31.3	100.0
Graduate degree	76.7	6.3	3.4	3.0	0.3	1.8	4.9	3.6	100.0
Postgraduate degree	86.3	2.7	1.5	1.8	0.5	0.8	5.1	1.3	100.0
Other degrees	91.7	1.1	0.6	3.3	0.0	0.0	2.3	1.1	100.0
FORMAL OCCUPATION									
Professionals	70.9	4.2	4.9	3.7	0.2	0.9	5.3	9.8	100.0
Administrative workers	84.6	2.7	2.1	1.0	0.0	0.2	1.9	7.4	100.0
Clerical workers	80.0	3.8	2.3	3.2	0.6	0.3	5.0	4.9	100.0
Service workers	57.6	4.9	3.8	4.1	0.7	1.3	8.2	19.5	100.0
Productive workers	47.2	6.8	4.0	3.9	0.6	1.6	9.5	26.4	100.0
Others	27.5	6.4	4.3	3.2	0.9	1.6	10.9	45.2	100.0
INCOME QUANTILE (Q)									
Q 1	18.3	6.9	4.6	2.8	1.1	1.8	10.6	54.0	100.0
Q 2	29.0	6.2	4.3	4.0	0.7	1.8	11.9	42.0	100.0
Q 3	44.2	6.5	4.0	4.1	0.5	1.4	9.7	29.6	100.0
Q 4	60.6	4.6	3.5	2.7	0.6	0.6	7.7	19.6	100.0
Q 5	68.4	2.7	3.3	2.3	0.4	0.3	8.9	13.7	100.0
REGIONS									
North	25.6	6.5	5.3	2.8	1.0	2.8	11.7	44.3	100.0
South	43.9	7.6	3.5	4.2	1.0	0.6	5.2	34.1	100.0
East	25.9	4.8	4.0	1.9	0.6	2.1	12.9	47.7	100.0
West	34.3	6.2	4.1	4.1	0.7	0.8	11.1	38.7	100.0
ALL INDIA	**32.3**	**6.2**	**4.2**	**3.3**	**0.8**	**1.6**	**10.3**	**41.2**	**100.0**

Note: Responses are to the statement: ": How frequently you are exposed to mass media (television, newspaper/magazine and Internet/e–mail): daily, once a week, twice a week, thrice a week or once in a fortnight?"

(Cont...)

Appendix Table 4:
Distribution of persons by utilisation pattern of information sources
(All India, percentages) Year: 2003–04

Characteristic	Internet								
	Daily	Once a week	Twice a week	Thrice a week	Once in a fortnight	Once a month	Infrequent	Never	Total
LOCATION									
Rural	0.1	0.1	0.0	0.1	0.0	0.1	1.7	97.7	100.0
Urban	1.5	1.2	0.8	0.7	0.8	0.8	4.0	90.2	100.0
SEX									
Male	0.8	0.6	0.3	0.3	0.3	0.4	2.9	94.4	100.0
Female	0.3	0.2	0.2	0.3	0.2	0.2	1.9	96.6	100.0
AGE GROUPS (YEARS)									
10–30	0.5	0.6	0.3	0.5	0.2	0.4	2.9	94.5	100.0
31–45	0.6	0.3	0.2	0.2	0.3	0.2	2.2	95.9	100.0
Over 45	0.5	0.2	0.1	0.1	0.2	0.1	1.4	97.4	100.0
FORMAL EDUCATION									
Illiterate	0.0	0.0	0.0	0.0	0.0	0.1	0.3	99.6	100.0
Upto 12th	0.3	0.2	0.2	0.2	0.1	0.2	2.0	96.8	100.0
Graduate degree	3.0	2.0	1.2	1.4	1.2	1.5	8.3	81.4	100.0
Postgraduate degree	4.5	4.3	1.3	1.3	1.0	2.1	10.9	74.5	100.0
Other degrees	4.1	4.3	2.6	0.7	1.3	0.5	7.9	78.6	100.0
FORMAL OCCUPATION									
Professionals	2.5	1.4	1.0	0.5	1.0	0.7	5.6	87.2	100.0
Administrative workers	5.6	2.4	1.5	0.4	0.9	0.9	11.7	76.5	100.0
Clerical workers	3.1	1.1	0.7	0.7	1.1	0.7	6.5	86.2	100.0
Service workers	0.8	0.5	0.3	0.2	0.4	0.7	4.0	93.1	100.0
Productive workers	0.5	0.5	0.2	0.4	0.1	0.3	2.3	95.6	100.0
Others	0.3	0.4	0.2	0.3	0.2	0.3	2.0	96.4	100.0
INCOME QUANTILE (Q)									
Q 1	0.1	0.1	0.0	0.1	0.1	0.1	1.0	98.4	100.0
Q 2	0.1	0.3	0.1	0.1	0.1	0.1	1.7	97.5	100.0
Q 3	0.7	0.5	0.3	0.7	0.3	0.4	2.9	94.2	100.0
Q 4	1.4	1.2	0.8	0.9	0.7	0.9	6.0	88.2	100.0
Q 5	4.5	2.8	1.6	0.7	1.6	1.0	8.4	79.4	100.0
REGIONS									
North	0.7	0.6	0.3	0.1	0.2	0.3	1.5	96.4	100.0
South	0.7	0.8	0.5	0.9	0.4	0.5	3.5	92.6	100.0
East	0.2	0.2	0.0	0.1	0.1	0.2	1.9	97.2	100.0
West	0.6	0.3	0.2	0.1	0.3	0.2	2.7	95.6	100.0
ALL INDIA	**0.5**	**0.4**	**0.3**	**0.3**	**0.2**	**0.3**	**2.4**	**95.5**	**100.0**

Note: Responses are to the statement: ": How frequently are you exposed to mass media (television, newspaper/magazine and Internet/e–mail): daily, once a week, twice a week, thrice a week or once in a fortnight?"

Appendix Table 5:
Distribution of persons by level of confidence in information sources
(All India, percentages) Year: 2003–04

Characteristic	Television				Radio			
	Great level of confidence	Hardly any confidence	do not know	Total	Great level of confidence	Hardly any confidence	do not know	Total
LOCATION								
Rural	72.8	13.0	14.2	100.0	58.5	19.1	22.4	100.0
Urban	86.5	9.6	3.8	100.0	37.8	32.4	29.7	100.0
SEX								
Male	76.7	12.1	11.2	100.0	52.4	22.7	24.9	100.0
Female	77.5	11.8	10.7	100.0	53.1	22.9	24.0	100.0
AGE GROUPS (YEARS)								
10–30	78.5	11.7	9.8	100.0	52.6	22.8	24.6	100.0
31–45	76.6	11.7	11.7	100.0	52.9	22.9	24.2	100.0
Over 45	74.4	12.7	12.9	100.0	53.0	22.7	24.3	100.0
FORMAL EDUCATION								
Illiterate	64.1	13.7	22.2	100.0	60.0	17.1	22.8	100.0
Upto 12th	79.3	11.8	8.9	100.0	51.9	24.1	24.1	100.0
Graduate degree	85.1	10.5	4.4	100.0	45.8	25.6	28.7	100.0
Postgraduate degree	85.0	8.6	6.4	100.0	41.3	23.3	35.4	100.0
Other degrees	90.9	8.8	0.3	100.0	43.1	39.9	17.0	100.0
FORMAL OCCUPATION								
Professionals	82.6	12.6	4.8	100.0	43.2	30.2	26.6	100.0
Administrative workers	85.7	13.2	1.1	100.0	53.2	31.6	15.3	100.0
Clerical workers	80.1	18.0	1.9	100.0	35.3	34.8	29.9	100.0
Service workers	83.4	10.4	6.2	100.0	48.1	26.8	25.0	100.0
Productive workers	78.5	12.7	8.8	100.0	46.8	21.6	31.6	100.0
Others	76.4	11.7	11.8	100.0	54.1	22.0	23.9	100.0
INCOME QUANTILE (Q)								
Q 1	71.0	15.0	14.1	100.0	57.5	23.2	19.3	100.0
Q 2	76.4	10.9	12.7	100.0	55.1	22.1	22.8	100.0
Q 3	82.3	9.2	8.5	100.0	46.8	23.4	29.9	100.0
Q 4	86.4	9.7	3.9	100.0	43.6	22.7	33.8	100.0
Q 5	88.8	7.4	3.8	100.0	44.8	20.9	34.3	100.0
REGIONS								
North	68.7	5.6	25.7	100.0	47.0	10.8	42.2	100.0
South	82.4	15.5	2.1	100.0	43.1	33.1	23.8	100.0
East	69.3	18.7	12.0	100.0	67.1	28.1	4.8	100.0
West	86.4	9.0	4.6	100.0	53.2	18.5	28.3	100.0
ALL INDIA	**77.1**	**11.9**	**11.0**	**100.0**	**52.8**	**22.8**	**24.4**	**100.0**

Note: Responses are to the statement: "Indicate your level of confidence in the information (television, radio, newspaper/magazine, Internet and local people/leaders): great deal of confidence, hardly any confidence or do not know."

(Cont...)

Appendix Table 5:
Distribution of persons by level of confidence in information sources
(All India, percentages) Year: 2003–04

Characteristic	Newspaper/Magazines				Local people/Leaders			
	Great level of confidence	Hardly any confidence	do not know	Total	Great level of confidence	Hardly any confidence	do not know	Total
LOCATION								
Rural	44.4	25.0	30.6	100.0	35.2	40.9	23.9	100.0
Urban	54.2	27.9	17.9	100.0	18.1	44.9	37.0	100.0
SEX								
Male	54.4	25.4	20.2	100.0	28.2	41.8	30.0	100.0
Female	39.4	26.6	34.0	100.0	33.5	42.0	24.5	100.0
AGE GROUPS (YEARS)								
10–30	48.6	27.3	24.1	100.0	28.8	41.9	29.3	100.0
31–45	49.0	25.2	25.8	100.0	31.1	42.2	26.8	100.0
Over 45	43.4	23.3	33.3	100.0	35.1	41.6	23.3	100.0
FORMAL EDUCATION								
Illiterate	10.5	18.3	71.2	100.0	50.2	38.1	11.6	100.0
Upto 12th	51.3	27.7	21.0	100.0	26.8	42.7	30.5	100.0
Graduate degree	66.6	25.5	7.9	100.0	9.5	46.8	43.7	100.0
Postgraduate degree	70.6	23.0	6.4	100.0	6.4	41.9	51.7	100.0
Other degrees	67.9	27.6	4.5	100.0	21.1	54.0	24.9	100.0
FORMAL OCCUPATION								
Professionals	69.5	21.9	8.6	100.0	14.4	49.0	36.6	100.0
Administrative workers	74.7	22.0	3.4	100.0	16.7	55.0	28.3	100.0
Clerical workers	66.2	29.1	4.7	100.0	13.2	49.4	37.4	100.0
Service workers	60.0	27.7	12.3	100.0	18.0	49.1	32.8	100.0
Productive workers	52.8	26.2	21.0	100.0	32.2	38.7	29.1	100.0
Others	44.6	26.1	29.3	100.0	32.3	41.3	26.4	100.0
INCOME QUANTILE (Q)								
Q 1	44.5	23.0	32.5	100.0	37.8	42.5	19.7	100.0
Q 2	40.8	27.9	31.3	100.0	30.4	40.5	29.1	100.0
Q 3	50.9	27.5	21.6	100.0	23.9	42.3	33.8	100.0
Q 4	58.5	27.2	14.3	100.0	19.5	41.5	38.9	100.0
Q 5	59.4	28.9	11.6	100.0	14.3	44.0	41.7	100.0
REGIONS								
North	36.9	15.7	47.4	100.0	38.8	20.3	40.9	100.0
South	51.6	33.8	14.6	100.0	26.5	50.7	22.8	100.0
East	49.9	28.4	21.7	100.0	21.2	56.8	22.0	100.0
West	52.6	26.7	20.7	100.0	36.8	39.6	23.6	100.0
ALL INDIA	**47.6**	**25.9**	**26.5**	**100.0**	**30.9**	**41.9**	**27.2**	**100.0**

Note: Responses are to the statement: "Indicate your level of confidence in the information (television, radio, newspaper/magazine, Internet and local people/leaders): great deal of confidence, hardly any confidence or do not know."

Appendix Table 6:
Distribution of persons by frequency of public place visited
(All India, percentages) Year: 2003–04

Characteristic	Scientific institutes: Once	Twice	More than twice	Infrequent	Never	Not aware	Total
LOCATION							
Rural	1.7	0.5	0.4	2.5	65.8	29.1	100.0
Urban	5.7	0.9	0.8	2.2	67.4	23.0	100.0
SEX							
Male	3.7	0.7	0.6	2.7	68.4	23.9	100.0
Female	2.0	0.5	0.4	2.2	64.1	30.8	100.0
AGE GROUPS (YEARS)							
10–30	3.4	0.6	0.6	2.7	67.9	24.7	100.0
31–45	2.6	0.6	0.4	2.1	66.0	28.3	100.0
Over 45	1.9	0.5	0.3	2.0	62.9	32.2	100.0
FORMAL EDUCATION							
Illiterate	0.1	0.2	0.3	0.8	57.0	41.6	100.0
Upto 12th	2.3	0.5	0.4	2.4	68.8	25.6	100.0
Graduate degree	10.1	1.8	1.3	5.6	70.6	10.6	100.0
Postgraduate degree	17.1	2.7	3.3	5.3	63.8	7.8	100.0
Other degrees	12.6	1.9	0.7	10.6	68.3	5.8	100.0
FORMAL OCCUPATION							
Professionals	10.1	1.2	1.6	5.0	68.8	13.3	100.0
Administrative workers	6.3	1.5	1.5	5.5	73.6	11.5	100.0
Clerical workers	6.8	0.7	0.6	3.6	73.8	14.5	100.0
Service workers	3.7	0.6	0.8	3.5	71.7	19.8	100.0
Productive workers	3.3	0.2	0.3	1.6	65.0	29.6	100.0
Others	2.4	0.6	0.4	2.3	65.8	28.6	100.0
INCOME QUANTILE (Q)							
Q 1	1.4	0.5	0.4	1.9	62.9	32.9	100.0
Q 2	2.0	0.6	0.3	2.2	69.0	25.9	100.0
Q 3	3.7	0.4	0.6	2.6	71.1	21.6	100.0
Q 4	6.5	0.9	0.6	4.0	65.7	22.3	100.0
Q 5	9.3	1.5	2.2	3.3	67.6	16.0	100.0
REGIONS							
North	2.1	0.6	0.4	0.6	76.8	19.5	100.0
South	3.1	0.7	0.8	4.2	72.3	18.8	100.0
East	3.2	0.8	0.5	4.3	63.6	27.6	100.0
West	2.9	0.3	0.3	0.8	55.1	40.6	100.0
ALL INDIA	**2.9**	**0.6**	**0.5**	**2.4**	**66.3**	**27.4**	**100.0**

Note: Responses are to the statement: "How frequently did you visit following during last twelve months (scientific institutes, museum, science parks, zoo, aquarium, planetarium, libraries, exhibition, science fairs, cinema/video): once, twice, more than twice, infrequent/rare, never, not applicable or not aware?"

(Cont...)

Appendix Table 6:
Distribution of persons by frequency of public place visited
(All India, percentages) Year: 2003–04

Characteristic	Science Parks						
	Once	Twice	More than twice	Infrequent	Never	Not aware	Total
LOCATION							
Rural	2.2	0.6	0.4	2.5	63.1	25.3	100.0
Urban	6.1	1.1	0.8	2.4	66.9	18.9	100.0
SEX							
Male	3.8	0.9	0.7	2.7	66.4	20.5	100.0
Female	3.0	0.6	0.4	2.3	61.9	26.4	100.0
AGE GROUPS (YEARS)							
10–30	4.1	0.8	0.6	2.8	65.1	21.9	100.0
31–45	2.7	0.9	0.5	2.3	64.6	24.0	100.0
Over 45	2.4	0.5	0.4	1.9	61.6	26.5	100.0
FORMAL EDUCATION							
Illiterate	0.2	0.1	0.3	0.8	56.3	36.2	100.0
Upto 12th	3.0	0.6	0.4	2.5	66.3	22.0	100.0
Graduate degree	11.3	2.2	1.9	5.3	66.7	7.8	100.0
Postgraduate degree	14.7	3.1	2.4	5.2	65.9	6.1	100.0
Other degrees	10.6	4.3	1.0	8.4	69.6	4.8	100.0
FORMAL OCCUPATION							
Professionals	10.3	2.2	1.7	4.6	67.8	10.4	100.0
Administrative workers	5.0	0.9	2.1	6.8	72.3	7.2	100.0
Clerical workers	7.3	2.0	1.8	4.5	69.0	12.0	100.0
Service workers	4.6	1.1	0.4	2.8	70.4	16.4	100.0
Productive workers	4.1	0.6	0.2	2.1	64.5	25.5	100.0
Others	2.9	0.6	0.5	2.3	63.6	24.6	100.0
INCOME QUANTILE (Q)							
Q 1	1.8	0.5	0.4	1.5	61.6	27.7	100.0
Q 2	2.6	0.6	0.4	2.1	67.0	23.4	100.0
Q 3	4.6	0.5	0.6	2.8	67.2	19.8	100.0
Q 4	6.7	1.2	0.9	5.4	63.1	16.8	100.0
Q 5	9.2	3.0	1.4	4.6	65.4	14.0	100.0
REGIONS							
North	1.3	0.5	0.2	0.6	77.7	16.1	100.0
South	3.0	1.2	0.6	4.7	68.7	17.0	100.0
East	5.1	0.9	0.7	3.7	58.5	22.7	100.0
West	3.9	0.4	0.6	1.2	54.3	35.4	100.0
ALL INDIA	**3.4**	**0.7**	**0.5**	**2.5**	**64.2**	**23.5**	**100.0**

Note: Responses are to the statement: "How frequently did you visit following during last twelve months (scientific institutes, museum, science parks, zoo, aquarium, planetarium, libraries, exhibition, science fairs, cinema/video): once, twice, more than twice, infrequent/rare, never, not applicable or not aware?"

(Cont...)

Appendix Table 6:
Distribution of persons by frequency of public place visited
(All India, percentages) Year: 2003–04

Characteristic	Museums						
	Once	Twice	More than twice	Infrequent	Never	Not aware	Total
LOCATION							
Rural	8.7	1.1	0.7	3.2	65.9	16.1	100.0
Urban	19.0	4.1	2.0	4.0	59.6	7.8	100.0
SEX							
Male	13.2	2.5	1.2	3.9	64.4	11.0	100.0
Female	10.2	1.5	1.0	3.0	63.6	16.4	100.0
AGE GROUPS (YEARS)							
10–30	13.5	2.3	1.2	3.9	63.3	12.2	100.0
31–45	11.2	1.9	1.0	3.4	64.9	13.7	100.0
Over 45	8.2	1.3	0.9	2.4	64.8	17.0	100.0
FORMAL EDUCATION							
Illiterate	3.4	0.5	0.2	1.0	63.3	26.3	100.0
Upto 12th	12.0	1.7	1.0	3.6	66.3	11.6	100.0
Graduate degree	25.3	5.7	2.9	7.2	53.1	1.9	100.0
Postgraduate degree	28.0	10.2	4.9	6.6	47.5	1.0	100.0
Other degrees	26.9	7.4	3.2	8.2	52.3	0.8	100.0
FORMAL OCCUPATION							
Professionals	22.6	5.7	3.8	6.0	53.9	6.0	100.0
Administrative workers	26.1	4.5	1.5	7.0	55.2	2.0	100.0
Clerical workers	21.3	5.4	1.9	7.7	56.0	5.6	100.0
Service workers	15.0	4.5	2.6	5.3	63.8	5.3	100.0
Productive workers	14.4	3.5	1.3	4.2	60.5	13.9	100.0
Others	10.6	1.6	0.9	3.1	65.0	14.5	100.0
INCOME QUANTILE (Q)							
Q 1	7.2	1.1	0.7	2.0	65.6	18.5	100.0
Q 2	11.1	1.5	0.7	2.8	67.8	12.8	100.0
Q 3	15.8	2.2	1.3	4.5	63.7	8.8	100.0
Q 4	19.9	4.2	1.7	6.4	56.0	7.6	100.0
Q 5	21.8	6.5	3.6	8.8	50.6	5.5	100.0
REGIONS							
North	5.0	1.4	0.9	0.8	78.2	9.4	100.0
South	14.9	3.1	1.6	5.1	64.6	7.7	100.0
East	9.4	1.4	1.0	4.9	62.3	15.4	100.0
West	16.7	2.1	0.8	3.0	53.4	20.5	100.0
ALL INDIA	**11.7**	**2.0**	**1.1**	**3.4**	**64.0**	**13.7**	**100.0**

Note: Responses are to the statement: "How frequently did you visit following during last twelve months (scientific institutes, museum, science parks, zoo, aquarium, planetarium, libraries, exhibition, science fairs, cinema/video): once, twice, more than twice, infrequent/rare, never, not applicable or not aware?"

(Cont...)

Appendix Table 6:
Distribution of persons by frequency of public place visited
(All India, percentages) Year: 2003–04

Characteristic	Zoo						
	Once	Twice	More than twice	Infrequent	Never	Not aware	Total
LOCATION							
Rural	17.2	2.8	1.6	4.7	62.2	8.0	100.0
Urban	26.8	6.8	4.3	6.0	50.2	3.4	100.0
SEX							
Male	21.7	4.9	2.9	5.6	56.5	5.6	100.0
Female	18.2	3.1	1.8	4.6	61.0	7.7	100.0
AGE GROUPS (YEARS)							
10–30	22.7	4.3	2.8	5.5	56.8	5.3	100.0
31–45	19.8	4.0	2.1	5.0	58.5	7.5	100.0
Over 45	14.0	3.2	1.7	4.3	63.3	8.8	100.0
FORMAL EDUCATION							
Illiterate	9.7	1.4	0.5	2.4	67.8	13.2	100.0
Upto 12th	21.0	4.0	2.4	5.7	58.9	5.5	100.0
Graduate degree	33.8	9.0	5.5	7.0	40.9	1.1	100.0
Postgraduate degree	35.0	10.8	8.5	6.8	36.1	1.0	100.0
Other degrees	38.7	8.7	4.0	6.9	39.8	1.3	100.0
FORMAL OCCUPATION							
Professionals	28.7	8.7	5.3	7.6	44.6	3.8	100.0
Administrative workers	32.5	7.2	1.7	9.5	44.3	1.7	100.0
Clerical workers	29.2	6.4	4.2	9.9	46.4	2.4	100.0
Service workers	27.2	6.8	3.9	7.7	46.8	3.3	100.0
Productive workers	21.9	4.9	1.7	5.9	57.5	6.2	100.0
Others	19.0	3.6	2.2	4.7	60.2	7.1	100.0
INCOME QUANTILE (Q)							
Q 1	14.6	2.4	1.6	4.0	64.2	9.5	100.0
Q 2	20.2	3.1	1.5	5.4	60.7	6.0	100.0
Q 3	23.9	5.2	3.0	5.5	55.3	4.5	100.0
Q 4	30.3	7.9	4.4	7.1	45.0	2.6	100.0
Q 5	28.6	9.5	6.8	7.4	42.7	1.8	100.0
REGIONS							
North	12.2	3.0	1.6	0.7	74.6	4.8	100.0
South	22.2	3.3	2.4	5.6	59.6	4.7	100.0
East	18.1	4.2	3.3	5.9	55.9	8.1	100.0
West	26.3	5.3	2.1	7.7	47.3	8.4	100.0
ALL INDIA	**20.0**	**4.0**	**2.4**	**5.1**	**58.7**	**6.7**	**100.0**

Note: Responses are to the statement: "How frequently did you visit following during last twelve months (scientific institutes, museum, science parks, zoo, aquarium, planetarium, libraries, exhibition, science fairs, cinema/video): once, twice, more than twice, infrequent/rare, never, not applicable or not aware?"

(Cont...)

Appendix Table 6:
Distribution of persons by frequency of public place visited
(All India, percentages) Year: 2003–04

Characteristic	Aquarium						
	Once	Twice	More than twice	Infrequent	Never	Not aware	Total
LOCATION							
Rural	7.1	1.6	1.1	2.5	66.7	16.6	100.0
Urban	12.8	2.5	1.6	3.6	65.0	10.7	100.0
SEX							
Male	10.4	2.5	1.6	3.1	66.0	12.5	100.0
Female	7.1	1.2	0.9	2.6	66.4	17.2	100.0
AGE GROUPS (YEARS)							
10–30	9.5	2.1	1.4	3.2	67.2	13.1	100.0
31–45	8.6	1.6	1.1	2.7	65.8	15.8	100.0
Over 45	7.2	1.6	1.1	2.2	64.5	17.8	100.0
FORMAL EDUCATION							
Illiterate	3.0	0.7	0.8	0.9	64.2	24.7	100.0
Upto 12th	8.6	1.9	1.1	3.1	67.9	13.5	100.0
Graduate degree	20.3	3.4	2.7	5.1	60.3	4.2	100.0
Postgraduate degree	23.8	5.4	3.4	5.5	56.7	2.8	100.0
Other degrees	21.7	6.3	1.7	4.0	60.2	4.1	100.0
FORMAL OCCUPATION							
Professionals	16.5	4.5	3.0	4.0	62.2	6.7	100.0
Administrative workers	22.8	1.4	2.3	5.6	57.6	5.5	100.0
Clerical workers	19.3	3.0	1.1	6.8	60.7	5.8	100.0
Service workers	14.0	4.2	1.5	2.9	60.0	12.3	100.0
Productive workers	10.9	1.7	1.1	2.1	67.7	13.9	100.0
Others	7.7	1.7	1.2	2.7	66.7	15.7	100.0
INCOME QUANTILE (Q)							
Q 1	6.1	1.3	1.1	2.3	65.9	18.7	100.0
Q 2	8.3	1.7	1.0	2.3	68.2	14.9	100.0
Q 3	9.8	1.9	1.6	3.2	68.1	11.5	100.0
Q 4	15.2	3.6	1.7	3.8	62.2	8.6	100.0
Q 5	15.4	2.8	2.3	7.8	61.2	6.5	100.0
REGIONS							
North	5.2	2.1	1.5	0.9	77.4	9.5	100.0
South	9.5	1.8	1.3	4.1	68.3	11.8	100.0
East	10.9	2.5	1.5	4.2	56.2	19.9	100.0
West	9.2	1.1	0.8	2.2	64.0	17.4	100.0
ALL INDIA	**8.7**	**1.9**	**1.2**	**2.8**	**66.2**	**14.9**	**100.0**

Note: Responses are to the statement: "How frequently did you visit following during last twelve months (scientific institutes, museum, science parks, zoo, aquarium, planetarium, libraries, exhibition, science fairs, cinema/video): once, twice, more than twice, infrequent/rare, never, not applicable or not aware?"

(Cont...)

Appendix Table 6:
Distribution of persons by frequency of public place visited
(All India, percentages) Year: 2003–04

Characteristic	Planetarium						
	Once	Twice	More than twice	Infrequent	Never	Not aware	Total
LOCATION							
Rural	4.1	0.7	0.6	1.8	65.2	22.4	100.0
Urban	7.9	2.1	1.3	2.5	65.9	16.0	100.0
SEX							
Male	6.1	1.3	1.0	2.3	66.3	18.1	100.0
Female	4.4	0.8	0.6	1.7	64.6	23.0	100.0
AGE GROUPS (YEARS)							
10–30	5.7	1.3	1.0	2.1	66.7	19.0	100.0
31–45	5.0	1.0	0.7	2.2	64.9	21.2	100.0
Over 45	4.5	0.7	0.5	1.6	63.0	23.3	100.0
FORMAL EDUCATION							
Illiterate	1.1	0.1	0.4	0.5	60.2	32.2	100.0
Upto 12th	4.9	1.0	0.8	2.0	67.5	19.0	100.0
Graduate degree	13.8	3.2	1.8	4.8	63.8	7.2	100.0
Postgraduate degree	19.1	4.2	1.5	4.3	61.6	6.0	100.0
Other degrees	23.1	3.3	1.1	5.1	61.1	4.0	100.0
FORMAL OCCUPATION							
Professionals	13.3	2.2	1.5	4.2	65.8	9.9	100.0
Administrative workers	16.0	2.1	2.3	4.6	63.6	7.5	100.0
Clerical workers	12.0	3.6	1.1	3.8	65.2	9.2	100.0
Service workers	7.1	1.6	1.2	2.3	65.4	15.4	100.0
Productive workers	5.0	0.7	1.4	1.6	67.1	21.5	100.0
Others	4.5	1.0	0.7	1.8	65.3	21.5	100.0
INCOME QUANTILE (Q)							
Q 1	3.4	0.5	0.8	1.2	64.6	24.4	100.0
Q 2	4.2	0.8	0.3	1.8	68.0	20.3	100.0
Q 3	6.9	1.3	1.2	2.2	66.6	16.9	100.0
Q 4	9.1	2.3	0.9	4.1	63.0	15.1	100.0
Q 5	12.1	4.5	1.5	4.1	60.4	12.7	100.0
REGIONS							
North	2.7	0.8	0.2	0.3	77.1	14.4	100.0
South	8.8	1.3	0.8	3.6	59.2	20.3	100.0
East	6.3	1.4	2.1	3.2	70.6	13.0	100.0
West	3.3	0.8	0.2	1.0	57.1	32.0	100.0
ALL INDIA	**5.2**	**1.1**	**0.8**	**2.0**	**65.4**	**20.6**	**100.0**

Note: Responses are to the statement: "How frequently did you visit following during last twelve months (scientific institutes, museum, science parks, zoo, aquarium, planetarium, libraries, exhibition, science fairs, cinema/video): once, twice, more than twice, infrequent/rare, never, not applicable or not aware?"

(Cont...)

Appendix Table 6:
Distribution of persons by frequency of public place visited
(All India, percentages) Year: 2003–04

Characteristic	Libraries						
	Once	Twice	More than twice	Infrequent	Never	Not aware	Total
LOCATION							
Rural	6.7	2.8	5.3	3.6	66.0	10.7	100.0
Urban	9.4	5.1	11.3	4.7	60.2	5.5	100.0
SEX							
Male	9.0	4.6	8.8	4.9	61.3	7.4	100.0
Female	6.0	2.4	5.2	3.0	67.3	11.0	100.0
AGE GROUPS (YEARS)							
10–30	8.8	4.1	9.5	4.6	62.0	7.5	100.0
31–45	6.4	3.1	5.0	3.5	67.6	9.6	100.0
Over 45	5.9	2.5	3.6	2.9	65.9	12.6	100.0
FORMAL EDUCATION							
Illiterate	1.5	0.3	0.4	0.4	69.6	19.9	100.0
Upto 12th	8.0	3.3	6.5	4.5	66.8	7.1	100.0
Graduate degree	16.8	10.9	20.7	7.3	40.9	1.2	100.0
Postgraduate degree	15.9	9.6	33.2	6.3	32.5	1.0	100.0
Other degrees	13.6	10.7	22.9	12.5	38.1	1.7	100.0
FORMAL OCCUPATION							
Professionals	14.3	8.9	20.6	5.8	45.4	3.7	100.0
Administrative workers	17.4	5.4	12.9	10.1	47.8	1.7	100.0
Clerical workers	13.1	8.2	13.2	6.5	52.7	4.2	100.0
Service workers	10.0	5.0	6.1	6.2	63.7	5.4	100.0
Productive workers	10.4	3.4	5.2	5.5	63.2	9.9	100.0
Others	6.8	3.1	6.3	3.6	65.7	9.7	100.0
INCOME QUANTILE (Q)							
Q 1	5.7	2.2	4.4	2.7	66.4	13.0	100.0
Q 2	7.5	2.7	5.2	3.5	69.2	8.5	100.0
Q 3	8.9	4.9	9.0	4.9	63.0	5.0	100.0
Q 4	11.7	6.0	12.8	6.8	54.2	4.7	100.0
Q 5	9.0	8.5	20.8	7.3	47.7	3.9	100.0
REGIONS							
North	5.6	2.8	7.0	1.4	72.1	6.7	100.0
South	7.9	4.2	8.6	6.3	63.3	6.5	100.0
East	8.4	3.3	5.2	4.3	60.9	11.9	100.0
West	8.0	3.7	7.4	3.8	61.7	11.1	100.0
ALL INDIA	**7.5**	**3.5**	**7.0**	**3.9**	**64.3**	**9.2**	**100.0**

Note: Responses are to the statement: "How frequently did you visit following during last twelve months (scientific institutes, museum, science parks, zoo, aquarium, planetarium, libraries, exhibition, science fairs, cinema/video): once, twice, more than twice, infrequent/rare, never, not applicable or not aware?"

(Cont...)

Appendix Table 6:
Distribution of persons by frequency of public place visited
(All India, percentages) Year: 2003–04

Characteristic	Exhibition						
	Once	Twice	More than twice	Infrequent	Never	Not aware	Total
LOCATION							
Rural	17.0	3.8	2.2	3.2	58.4	11.6	100.0
Urban	22.8	8.1	4.9	4.9	50.2	5.9	100.0
SEX							
Male	20.6	6.1	3.6	4.2	54.0	8.4	100.0
Female	16.8	4.0	2.4	3.1	58.1	11.5	100.0
AGE GROUPS (YEARS)							
10–30	20.1	5.8	3.6	3.9	54.5	9.1	100.0
31–45	18.6	4.8	2.7	3.7	56.4	10.0	100.0
Over 45	15.5	3.7	1.9	3.1	59.2	11.9	100.0
FORMAL EDUCATION							
Illiterate	10.5	1.3	0.8	1.2	63.0	18.3	100.0
Upto 12th	19.3	5.2	2.9	4.0	56.8	8.5	100.0
Graduate degree	30.9	11.2	7.4	5.8	39.0	2.7	100.0
Postgraduate degree	32.5	14.0	10.7	7.0	32.3	2.2	100.0
Other degrees	32.1	11.3	5.2	7.5	42.5	1.1	100.0
FORMAL OCCUPATION							
Professionals	26.0	10.5	7.7	5.6	43.7	4.6	100.0
Administrative workers	30.4	9.1	4.0	6.1	43.1	3.1	100.0
Clerical workers	26.2	9.5	4.6	7.6	43.9	6.1	100.0
Service workers	20.2	7.4	3.8	4.8	52.1	5.7	100.0
Productive workers	23.8	5.5	4.4	4.6	49.1	10.5	100.0
Others	17.7	4.6	2.6	3.4	57.5	10.4	100.0
INCOME QUANTILE (Q)							
Q 1	14.3	3.4	2.1	2.6	59.7	13.6	100.0
Q 2	19.4	5.0	2.3	2.9	58.5	9.1	100.0
Q 3	22.1	6.5	3.3	4.4	54.9	5.9	100.0
Q 4	26.2	7.5	5.3	6.5	44.6	5.9	100.0
Q 5	25.3	10.7	8.4	7.4	40.9	5.1	100.0
REGIONS							
North	14.5	3.7	2.2	1.7	67.2	8.0	100.0
South	23.4	6.0	3.6	5.1	53.0	5.9	100.0
East	16.8	4.7	3.3	3.7	53.4	12.5	100.0
West	20.0	5.7	2.9	4.1	51.5	12.7	100.0
ALL INDIA	**18.7**	**5.1**	**3.0**	**3.6**	**56.0**	**10.0**	**100.0**

Note: Responses are to the statement: "How frequently did you visit following during last twelve months (scientific institutes, museum, science parks, zoo, aquarium, planetarium, libraries, exhibition, science fairs, cinema/video): once, twice, more than twice, infrequent/rare, never, not applicable or not aware?"

(Cont...)

Appendix Table 6:
Distribution of persons by frequency of public place visited
(All India, percentages) Year: 2003–04

Characteristic	Science fairs						
	Once	Twice	More than twice	Infrequent	Never	Not aware	Total
LOCATION							
Rural	5.3	1.3	1.0	2.7	67.9	16.8	100.0
Urban	9.6	2.4	2.0	3.9	67.6	10.6	100.0
SEX							
Male	8.1	2.0	1.5	3.4	67.2	13.1	100.0
Female	5.0	1.2	1.0	2.6	68.3	16.9	100.0
AGE GROUPS (YEARS)							
10–30	7.7	2.1	1.5	3.4	67.9	13.2	100.0
31–45	6.2	1.1	1.1	2.9	67.9	16.2	100.0
Over 45	4.6	1.0	0.9	2.4	67.3	17.7	100.0
FORMAL EDUCATION							
Illiterate	1.0	0.4	0.5	0.7	64.1	27.5	100.0
Upto 12th	6.6	1.5	1.1	3.3	70.2	12.6	100.0
Graduate degree	16.2	3.7	3.4	5.9	61.8	4.9	100.0
Postgraduate degree	23.0	7.3	4.7	5.7	52.7	3.8	100.0
Other degrees	12.7	5.2	2.6	9.9	65.7	2.0	100.0
FORMAL OCCUPATION							
Professionals	15.9	5.0	3.0	5.3	61.4	7.3	100.0
Administrative workers	17.5	2.3	1.5	4.1	62.7	6.5	100.0
Clerical workers	11.5	2.3	1.6	6.1	68.3	5.8	100.0
Service workers	9.8	2.4	1.6	4.0	66.9	9.6	100.0
Productive workers	5.9	1.2	1.4	5.2	68.1	15.3	100.0
Others	5.9	1.4	1.1	2.7	68.1	15.8	100.0
INCOME QUANTILE (Q)							
Q 1	4.5	1.1	0.8	2.2	67.2	18.8	100.0
Q 2	5.3	1.5	0.8	2.7	71.1	14.6	100.0
Q 3	8.2	1.8	1.5	3.8	69.1	11.1	100.0
Q 4	11.9	2.5	2.2	5.0	64.4	9.4	100.0
Q 5	13.7	4.0	5.3	4.9	58.7	9.8	100.0
REGIONS							
North	5.0	1.0	0.7	0.7	78.7	10.1	100.0
South	4.6	1.5	1.7	4.7	72.4	11.3	100.0
East	6.7	2.3	1.6	3.5	60.8	17.5	100.0
West	9.3	1.6	1.1	3.2	61.2	19.8	100.0
ALL INDIA	**6.6**	**1.6**	**1.2**	**3.0**	**67.8**	**15.0**	**100.0**

Note: Responses are to the statement: "How frequently did you visit following during last twelve months (scientific institutes, museum, science parks, zoo, aquarium, planetarium, libraries, exhibition, science fairs, cinema/video): once, twice, more than twice, infrequent/rare, never, not applicable or not aware?"

(Cont...)

Appendix Table 6:
Distribution of persons by frequency of public place visited
(All India, percentages) Year: 2003–04

Characteristic	Cinema/ videos: Once	Twice	More than twice	Infrequent	Never	Not aware	Total
LOCATION							
Rural	15.1	13.3	24.3	9.1	33.4	3.4	100.0
Urban	13.3	13.9	33.1	8.5	27.6	1.8	100.0
SEX							
Male	13.3	14.2	31.1	9.3	28.7	2.2	100.0
Female	15.9	12.7	22.7	8.5	34.8	3.6	100.0
AGE GROUPS (YEARS)							
10–30	15.4	14.8	33.4	8.9	24.4	2.1	100.0
31–45	15.1	13.3	23.7	9.3	33.7	3.1	100.0
Over 45	12.1	10.6	15.6	8.5	46.1	4.4	100.0
FORMAL EDUCATION							
Illiterate	13.8	10.5	15.1	7.5	44.2	6.3	100.0
Upto 12th	14.9	14.2	28.7	9.4	29.3	2.1	100.0
Graduate degree	14.3	15.4	38.9	7.9	21.5	0.8	100.0
Postgraduate degree	13.6	13.4	38.5	10.1	23.3	0.3	100.0
Other degrees	15.5	12.6	37.8	15.7	17.6	0.7	100.0
FORMAL OCCUPATION							
Professionals	13.6	12.3	29.5	8.8	31.7	2.6	100.0
Administrative workers	14.5	10.8	46.9	8.3	18.0	0.4	100.0
Clerical workers	17.2	16.1	29.1	10.2	25.0	1.5	100.0
Service workers	11.8	15.2	34.8	9.4	26.5	1.2	100.0
Productive workers	13.6	12.8	39.0	10.0	21.9	1.4	100.0
Others	14.7	13.5	25.7	8.8	32.7	3.1	100.0
INCOME QUANTILE (Q)							
Q 1	14.0	11.4	23.2	10.3	35.1	4.0	100.0
Q 2	15.5	14.9	26.6	7.7	31.3	3.0	100.0
Q 3	16.6	14.1	30.6	7.4	28.3	1.7	100.0
Q 4	12.7	17.0	32.8	8.6	27.1	0.8	100.0
Q 5	12.6	14.2	34.3	8.5	26.7	2.4	100.0
REGIONS							
North	12.6	10.5	25.1	4.0	44.9	1.8	100.0
South	16.6	15.0	38.5	12.1	14.6	2.1	100.0
East	13.5	13.7	22.5	11.9	32.3	3.7	100.0
West	15.7	14.4	22.9	7.9	34.0	3.8	100.0
ALL INDIA	**14.6**	**13.4**	**26.9**	**8.9**	**31.7**	**2.9**	**100.0**

Note: Responses are to the statement: "How frequently did you visit following during last twelve months (scientific institutes, museum, science parks, zoo, aquarium, planetarium, libraries, exhibition, science fairs, cinema/video): once, twice, more than twice, infrequent/rare, never, not applicable or not aware?"

(Cont...)

Appendix Table 6:
Distribution of persons by frequency of public place visited
(All India, percentages) Year: 2003–04

Characteristic	Other scientific places						
	Once	Twice	More than twice	Infrequent	Never	Not aware	Total
LOCATION							
Rural	1.2	0.8	0.4	1.2	68.8	23.8	100.0
Urban	1.8	0.8	0.8	1.3	70.6	19.3	100.0
SEX							
Male	1.5	0.9	0.7	1.4	69.8	21.5	100.0
Female	1.3	0.8	0.4	1.1	68.9	23.5	100.0
AGE GROUPS (YEARS)							
10–30	1.4	1.0	0.5	1.5	69.6	22.1	100.0
31–45	1.4	0.6	0.8	1.1	68.9	22.9	100.0
Over 45	1.2	0.6	0.4	0.9	69.2	22.9	100.0
FORMAL EDUCATION							
Illiterate	0.9	0.6	0.4	0.2	60.6	32.5	100.0
Upto 12th	1.2	0.8	0.5	1.4	71.8	20.4	100.0
Graduate degree	3.1	1.1	1.0	2.7	71.4	15.8	100.0
Postgraduate degree	3.3	1.1	1.2	2.4	72.1	15.1	100.0
Other degrees	2.7	1.3	0.9	3.0	81.8	8.6	100.0
FORMAL OCCUPATION							
Professionals	3.4	0.9	0.9	2.6	73.5	15.0	100.0
Administrative workers	1.3	0.4	2.9	2.6	75.7	10.7	100.0
Clerical workers	3.8	1.6	0.6	1.8	71.9	16.5	100.0
Service workers	1.3	0.6	0.4	3.0	71.2	19.6	100.0
Productive workers	2.2	0.7	0.4	0.9	64.8	24.9	100.0
Others	1.2	0.8	0.5	1.1	69.2	23.0	100.0
INCOME QUANTILE (Q)							
Q 1	1.3	0.9	0.6	0.7	69.1	22.7	100.0
Q 2	1.1	0.6	0.4	1.1	70.8	22.8	100.0
Q 3	1.3	1.0	0.6	1.3	69.7	22.5	100.0
Q 4	2.2	0.5	0.7	2.8	66.9	22.2	100.0
Q 5	1.7	1.1	0.5	3.2	69.7	18.8	100.0
REGIONS							
North	0.4	0.5	0.2	0.2	69.7	25.4	100.0
South	3.0	1.8	1.0	1.8	67.5	20.0	100.0
East	0.8	0.5	0.4	2.2	80.5	11.5	100.0
West	1.4	0.6	0.6	0.8	60.7	31.8	100.0
ALL INDIA	**1.4**	**0.8**	**0.5**	**1.2**	**69.3**	**22.5**	**100.0**

Note: Responses are to the statement: "How frequently did you visit following during last twelve months (scientific institutes, museum, science parks, zoo, aquarium, planetarium, libraries, exhibition, science fairs, cinema/video): once, twice, more than twice, infrequent/rare, never, not applicable or not aware?"

Appendix Table 7:
Distribution of persons by the S&T shows watched
(All India, percentages) Year: 2003–04

Characteristic	Persons' watched	Distribution by Type of Programmes: Scientific discoveries	Weather news	Earth report	Science quiz	Health programmes	Any other	Total
LOCATION								
Rural	29.0	19.5	58.2	20.7	10.4	35.9	5.4	100
Urban	47.4	34.3	62.1	25.3	17.2	36.3	6.9	100
SEX								
Male	38.7	26.5	62.9	23.5	12.2	35.2	5.6	100
Female	30.0	24.0	55.7	21.3	14.3	37.1	6.5	100
AGE GROUPS (YEARS)								
10–30	38.9	27.8	56.1	22.3	15.4	34.8	6.6	100
31–45	31.9	22.2	63.7	22.6	10.3	36.9	5.5	100
Over 45	26.8	22.1	66.6	23.4	9.5	38.9	4.9	100
FORMAL EDUCATION								
Illiterate	9.0	5.5	42.9	12.7	4.2	24.1	6.4	100
Upto 12th	36.7	22.4	57.1	20.6	11.1	33.4	5.7	100
Graduate degree	67.7	39.6	72.7	31.7	21.8	47.8	7.1	100
Postgraduate degree	78.2	42.7	70.9	29.9	22.7	47.5	5.4	100
Other degrees	75.4	34.8	69.6	25.6	19.2	42.1	8.1	100
FORMAL OCCUPATION								
Professionals	60.7	42.2	74.5	32.3	19.5	47.2	6.9	100
Administrative workers	59.8	35.8	76.5	35.3	12.9	35.9	4.6	100
Clerical workers	62.0	34.8	73.7	30.8	18.0	47.9	8.7	100
Service workers	44.8	25.8	61.0	15.2	8.1	32.2	4.7	100
Productive workers	34.7	29.5	70.2	28.5	9.7	36.9	6.6	100
Others	32.0	23.1	56.9	21.1	12.7	34.7	5.9	100
INCOME QUANTILE (Q)								
Q 1	25.3	18.1	56.6	18.4	9.8	30.5	7.1	100
Q 2	30.4	21.2	58.2	20.0	11.2	34.7	5.9	100
Q 3	42.5	27.6	62.0	25.6	12.9	39.2	5.3	100
Q 4	53.5	34.4	63.5	26.9	18.8	41.0	5.4	100
Q 5	63.4	40.6	61.2	28.3	18.9	42.4	5.3	100
REGIONS								
North	30.4	25.7	54.0	17.7	9.1	35.3	1.2	100
South	41.9	26.2	69.8	35.4	17.1	33.3	14.3	100
East	27.6	25.9	64.0	17.7	15.4	31.6	4.7	100
West	38.0	24.3	52.8	18.6	11.2	41.6	3.4	100
ALL INDIA	**34.4**	**25.4**	**59.7**	**22.6**	**13.1**	**36.1**	**6.0**	**100**

Note: Responses are to the statement: "Do you watch television shows that focus primarily on science and technology? If yes, how frequently do you watch each of the following programmes (scientific discoveries, weather news, earth report, science quiz, health programme, any other science related programme): regularly, most of the time, occasionally or not at all?"

Appendix Table 8:
Distribution of persons by their source of information to S&T related issues/policies
(All India, percentages) Year: 2003–04

Characteristic	Television	Radio	Newspaper	Books/ Magazines	Internet	Family members/ Friends	Local leaders	Others	Total
LOCATION									
Rural	58.7	16.8	7.3	1.2	0.2	13.9	1.7	0.3	100.0
Urban	79.3	3.7	8.3	1.6	0.4	6.1	0.5	0.1	100.0
SEX									
Male	63.5	13.7	10.9	1.4	0.2	8.3	1.8	0.2	100.0
Female	66.0	12.2	4.2	1.2	0.3	15.0	0.9	0.3	100.0
AGE GROUPS (YEARS)									
10–30	67.2	12.1	7.6	1.6	0.3	10.1	1.0	0.0	100.0
31–45	63.6	14.0	7.9	1.3	0.2	11.3	1.3	0.4	100.0
Over 45	60.4	13.9	7.2	0.8	0.2	15.3	2.0	0.4	100.0
FORMAL EDUCATION									
Illiterate	48.8	18.3	0.9	0.2	0.1	28.2	2.9	0.7	100.0
Upto 12th	68.0	12.4	8.7	1.4	0.2	8.1	1.0	0.1	100.0
Graduate degree	74.2	7.2	13.6	2.9	0.7	1.4	0.0	0.0	100.0
Postgraduate degree	78.7	5.0	11.9	2.8	1.1	0.4	0.0	0.0	100.0
Other degrees	73.7	1.3	10.3	12.6	2.0	0.1	0.0	0.0	100.0
FORMAL OCCUPATION									
Professionals	64.8	10.2	15.6	4.4	0.4	4.0	0.5	0.0	100.0
Administrative workers	74.4	3.3	15.0	5.7	0.7	0.9	0.0	0.0	100.0
Clerical workers	75.2	2.6	17.9	2.0	0.6	1.6	0.2	0.0	100.0
Service workers	72.8	5.1	14.3	0.3	0.3	6.7	0.4	0.0	100.0
Productive workers	70.3	11.0	10.0	1.4	0.1	6.6	0.5	0.0	100.0
Others	63.9	13.8	6.6	1.1	0.2	12.7	1.5	0.2	100.0
INCOME QUANTILE (Q)									
Q 1	56.5	15.8	7.2	1.1	0.1	16.7	2.2	0.4	100.0
Q 2	66.1	16.3	5.3	1.3	0.1	10.0	0.9	0.1	100.0
Q 3	73.4	8.5	8.9	1.0	0.3	7.1	0.5	0.1	100.0
Q 4	74.9	6.5	9.5	2.2	0.4	6.0	0.6	0.0	100.0
Q 5	75.0	3.1	13.3	2.5	1.5	3.8	0.7	0.0	100.0
REGIONS									
North	62.2	13.7	5.0	1.4	0.2	16.4	0.8	0.2	100.0
South	77.8	3.7	9.9	2.0	0.3	6.0	0.3	0.0	100.0
East	52.5	26.0	7.6	1.4	0.2	9.7	2.1	0.5	100.0
West	66.9	8.8	7.9	0.6	0.3	13.6	1.9	0.1	100.0
ALL INDIA	**64.7**	**13.0**	**7.6**	**1.3**	**0.2**	**11.6**	**1.3**	**0.2**	**100.0**

Note: Responses are to the statement: "Where do you get most of your information related to scientific issues/policies: television, radio, newspaper, books/magazines, Internet, family members/relatives, friends or local leaders?"

Appendix Table 9:
Distribution of households by ownership of select consumer goods
(All India, percentages) Year: 2003–04

Characteristic	Television	Refrigerator	Radio	Cable Connection	Computer	Telephone	Cell phone
LOCATION							
Rural	31.3	10.0	57.9	17.4	0.7	12.2	2.3
Urban	89.2	41.8	58.0	61.2	5.3	30.2	15.1
SEX							
Male	48.9	19.3	59.1	30.5	2.2	17.9	6.3
Female	48.8	19.3	56.7	29.8	1.9	17.0	5.8
AGE GROUPS (YEARS)							
10–30	49.1	18.7	58.7	30.3	1.9	16.2	6.2
31–45	48.1	19.4	57.1	30.1	2.0	17.5	5.8
Over 45	49.0	20.4	57.2	29.8	2.4	20.3	5.9
FORMAL EDUCATION							
Illiterate	29.3	4.6	47.0	14.4	0.4	4.3	0.8
Upto 12th	51.7	19.0	59.6	31.2	1.5	16.8	5.3
Graduate degree	68.8	47.3	69.4	54.1	7.6	44.5	18.5
Postgraduate degree	73.3	59.4	70.8	54.3	12.9	59.1	32.0
Other degrees	73.7	50.3	61.0	66.2	10.2	48.5	19.9
FORMAL OCCUPATION							
Professionals	64.0	38.7	66.3	44.2	5.9	38.0	14.6
Administrative workers	75.1	51.2	70.1	75.3	11.0	55.1	28.8
Clerical workers	72.5	46.3	60.7	57.1	3.9	36.1	11.8
Service workers	60.3	27.6	62.5	37.8	2.8	20.1	8.1
Productive workers	56.3	20.2	55.2	39.8	1.6	13.7	5.4
Others	46.7	17.2	57.4	27.7	1.7	15.8	5.3
INCOME QUANTILE (Q)							
Q 1	34.5	6.8	50.3	17.2	0.7	7.3	1.9
Q 2	50.6	13.6	61.1	28.6	1.3	12.9	3.6
Q 3	63.0	28.4	62.9	41.2	1.9	23.3	7.6
Q 4	69.9	47.7	68.0	53.6	4.4	41.9	14.8
Q 5	70.3	63.8	70.8	62.1	15.6	57.2	33.6
REGIONS							
North	43.8	25.8	50.9	16.2	2.7	19.3	9.9
South	63.7	17.9	56.6	65.4	2.7	21.2	6.0
East	35.4	8.9	65.7	14.9	0.9	13.5	3.2
West	53.1	24.1	58.0	27.1	2.0	16.4	5.4
ALL INDIA	**48.9**	**19.3**	**57.9**	**30.2**	**2.0**	**17.5**	**6.1**

Note: Responses are to the statement: "Does the household have the following, please tick: television, radio, cable connection, computer, telephone, refrigerator, pressure cooker, thermometer, mixer/grinder, cell phone, tractor, two wheeler, four wheeler, biogas, pump–set?"

(Cont...)

Appendix Table 9:
Distribution of households by ownership of select consumer goods
(All India, percentages) Year: 2003–04

Characteristic	Pressure cooker	Mixer/ grinder	Thermometer	Two wheeler	Four wheeler	Tractor	Pumpset
LOCATION							
Rural	47.4	20.3	7.4	25.3	1.5	5.6	17.8
Urban	84.0	58.5	14.7	46.5	5.3	1.3	7.5
SEX							
Male	57.8	31.4	9.6	32.9	3.0	4.6	15.7
Female	58.3	31.6	9.4	30.1	2.2	4.1	13.9
AGE GROUPS (YEARS)							
10–30	58.0	31.0	8.9	30.3	2.6	4.5	15.3
31–45	57.8	31.7	9.6	32.8	2.2	3.9	13.0
Over 45	58.4	32.2	10.8	32.7	3.1	4.6	15.6
FORMAL EDUCATION							
Illiterate	34.0	10.8	2.7	16.6	0.4	3.0	11.3
Upto 12th	61.0	33.2	8.8	31.0	2.2	4.5	15.1
Graduate degree	86.8	59.3	25.7	61.1	8.0	5.9	19.6
Postgraduate degree	92.5	68.7	35.6	71.5	17.0	7.9	23.2
Other degrees	84.5	73.9	9.6	69.9	8.3	2.4	20.1
FORMAL OCCUPATION							
Professionals	79.3	50.1	25.5	56.1	5.6	5.3	14.6
Administrative workers	88.2	82.2	16.2	62.3	10.3	3.4	17.9
Clerical workers	89.3	62.1	17.7	56.4	3.0	4.1	9.6
Service workers	77.4	44.1	14.0	41.9	3.4	2.1	12.9
Productive workers	62.0	37.0	5.8	30.7	1.8	2.2	9.4
Others	55.3	28.8	8.6	29.2	2.4	4.5	15.2
INCOME QUANTILE (Q)							
Q 1	38.8	15.4	5.0	16.7	0.8	2.3	12.0
Q 2	60.6	30.1	8.4	27.8	1.3	4.4	13.9
Q 3	75.7	44.9	11.2	44.0	2.9	6.8	18.1
Q 4	86.8	61.0	18.3	62.4	6.1	7.2	20.3
Q 5	90.3	68.2	31.3	67.7	18.4	7.8	19.8
REGIONS							
North	60.5	21.0	12.4	26.1	4.4	7.3	15.3
South	54.9	53.9	2.3	30.6	2.1	1.9	17.6
East	50.4	10.6	19.8	23.3	1.5	2.0	13.5
West	65.3	40.7	3.7	43.9	2.5	6.0	13.3
ALL INDIA	**58.1**	**31.5**	**9.5**	**31.5**	**2.6**	**4.4**	**14.8**

Note: Responses are to the statement: "Does the household have the following, please tick: television, radio, cable connection, computer, telephone, refrigerator, pressure cooker, thermometer, mixer/grinder, cell phone, tractor, two wheeler, four wheeler, biogas, pump–set?"

Appendix Table 10:
Preference for information
(All India, Mean score) Year: 2003–04

Characteristic	News	Politics	Entertainment	Sports	Cultural/ religious	Science & technology
LOCATION						
Rural	4.40	3.05	4.56	3.35	3.58	2.04
Urban	4.52	2.81	4.60	3.46	3.44	2.15
SEX						
Male	4.62	3.19	4.29	3.60	3.19	2.07
Female	4.24	2.73	4.89	3.14	3.90	2.09
AGE GROUPS (YEARS)						
10–30	4.28	2.78	4.72	3.67	3.34	2.19
31–45	4.62	3.17	4.42	3.17	3.62	1.96
Over 45	4.61	3.20	4.40	2.93	3.91	1.93
FORMAL EDUCATION						
Illiterate	4.18	3.20	4.73	3.03	4.05	1.79
Upto 12th	4.43	2.91	4.65	3.44	3.51	2.04
Graduate degree	4.76	3.00	4.04	3.55	3.04	2.57
Postgraduate degree	4.89	2.99	3.81	3.35	3.08	2.79
Other degrees	5.16	2.88	4.27	3.44	2.79	2.39
FORMAL OCCUPATION						
Professionals	4.89	3.15	3.77	3.40	3.32	2.44
Administrative workers	4.83	3.31	4.26	3.59	2.87	2.11
Clerical workers	4.90	3.18	3.98	3.38	3.25	2.29
Service workers	4.89	3.31	4.28	3.50	3.11	1.90
Productive workers	4.69	3.14	4.60	3.44	3.21	1.90
Others	4.37	2.93	4.65	3.37	3.59	2.07
INCOME QUANTILE (Q)						
Q 1	4.38	3.02	4.64	3.33	3.65	1.96
Q 2	4.38	3.02	4.63	3.40	3.59	1.95
Q 3	4.51	2.94	4.55	3.36	3.44	2.19
Q 4	4.54	2.84	4.47	3.54	3.29	2.28
Q 5	4.61	2.75	4.20	3.40	3.34	2.67
REGIONS						
North	4.13	2.85	4.35	3.30	3.80	2.56
South	4.33	2.96	4.28	3.62	3.55	2.25
East	4.74	3.30	4.79	3.25	3.04	1.84
West	4.38	2.67	4.69	3.37	3.92	1.93
ALL INDIA	**4.44**	**2.97**	**4.58**	**3.38**	**3.53**	**2.08**

Note: Responses are to the statement: "Rank (1 to 6) the following information according to your preference: news, politics, entertainment, sports, cultural/ religious, science & technology." Mean score was calculated on a six–point scale of six items.

Appendix Table 11:
Distribution of persons by level of interest in public issues
(All India, percentages) Year: 2003–04

Characteristic	Agriculture			Local school			Employment		
	Interested	Not interested	No opinion	Interested	Not interested	No opinion	Interested	Not interested	No opinion
LOCATION									
Rural	78.9	16.0	5.1	71.7	20.9	7.4	64.7	24.9	10.4
Urban	51.8	39.0	9.3	69.7	22.5	7.8	69.7	21.2	9.1
SEX									
Male	77.6	17.7	4.7	75.8	18.4	5.8	72.6	20.1	7.3
Female	64.4	27.7	7.9	66.3	24.3	9.3	59.8	27.5	12.7
AGE GROUPS (YEARS)									
10–30	67.7	25.8	6.5	74.1	19.2	6.7	68.3	22.4	9.3
31–45	73.9	20.4	5.8	72.1	20.7	7.1	68.0	23.0	9.0
Over 45	75.1	18.3	6.6	63.2	27.0	9.8	59.3	28.0	12.7
FORMAL EDUCATION									
Illiterate	71.4	18.6	10.1	53.3	30.4	16.3	49.8	30.5	19.8
Upto 12th	70.5	23.9	5.5	74.2	20.2	5.6	67.7	24.2	8.1
Graduate degree	72.6	23.6	3.9	86.0	11.4	2.6	88.4	9.3	2.4
Postgraduate degree	73.0	23.4	3.5	89.2	9.0	1.8	91.8	6.8	1.4
Other degrees	81.0	18.1	0.8	89.1	9.1	1.8	89.3	10.1	0.6
FORMAL OCCUPATION									
Professionals	78.9	18.6	2.5	89.3	8.5	2.3	84.5	12.4	3.1
Administrative workers	72.0	19.3	8.7	74.1	17.7	8.2	80.0	13.7	6.3
Clerical workers	72.0	22.7	5.2	84.1	12.1	3.9	81.9	14.1	3.9
Service workers	69.5	26.5	4.1	79.1	18.1	2.8	79.5	15.9	4.7
Productive workers	68.8	25.7	5.5	74.9	20.2	4.9	75.3	18.0	6.8
Others	70.8	22.7	6.6	69.5	22.4	8.1	64.0	25.2	10.8
INCOME QUANTILE (Q)									
Q 1	73.0	19.7	7.3	68.8	21.8	9.3	61.0	25.7	13.3
Q 2	72.0	22.5	5.5	70.6	22.9	6.5	68.2	23.8	8.0
Q 3	69.3	25.2	5.5	73.3	20.3	6.4	69.8	22.1	8.1
Q 4	66.4	27.9	5.7	76.0	18.7	5.3	73.2	20.7	6.1
Q 5	64.7	29.7	5.7	74.1	20.1	5.7	74.0	19.9	6.1
REGIONS									
North	68.7	25.3	6.0	70.7	21.0	8.3	71.6	19.2	9.2
South	68.2	24.8	7.0	72.8	20.6	6.5	63.6	28.1	8.3
East	75.6	20.3	4.1	72.9	22.2	4.9	64.5	25.2	10.4
West	71.7	20.6	7.7	68.5	21.7	9.9	65.3	22.8	11.9
ALL INDIA	**71.0**	**22.7**	**6.3**	**71.1**	**21.4**	**7.5**	**66.2**	**23.8**	**10.0**

Note: Responses are to the statement: "How interested are you regarding each issue: interested, not interested or no opinion?"

(Cont...)

Appendix Table 11:
Distribution of persons by level of interest in public issues
(All India, percentages) Year: 2003–04

Characteristic	Poor people			Old people			Women		
	Interested	Not interested	No opinion	Interested	Not interested	No opinion	Interested	Not interested	No opinion
LOCATION									
Rural	78.0	14.8	7.2	75.8	16.0	8.3	74.4	17.2	8.4
Urban	75.3	17.0	7.8	72.2	19.4	8.4	74.3	17.6	8.1
SEX									
Male	81.1	13.3	5.6	78.5	15.2	6.3	72.7	20.0	7.3
Female	73.2	17.6	9.2	71.0	18.7	10.3	76.0	14.6	9.4
AGE GROUPS (YEARS)									
10–30	76.7	15.6	7.7	73.7	17.8	8.5	73.6	18.0	8.4
31–45	79.1	14.3	6.5	76.2	16.0	7.8	76.9	15.0	8.1
Over 45	76.2	16.1	7.6	75.4	16.3	8.3	73.2	18.3	8.5
FORMAL EDUCATION									
Illiterate	70.4	16.6	12.9	68.8	17.3	13.9	68.0	17.9	14.1
Upto 12th	77.6	16.1	6.3	75.0	17.8	7.3	74.7	18.1	7.2
Graduate degree	87.6	9.3	3.1	83.9	12.4	3.7	84.3	11.8	4.0
Postgraduate degree	89.5	8.6	1.8	88.6	9.5	1.9	87.4	10.6	2.1
Other degrees	93.1	5.9	1.0	88.1	9.3	2.6	84.2	10.6	5.2
FORMAL OCCUPATION									
Professionals	88.7	8.4	2.8	86.9	10.3	2.8	87.2	10.2	2.5
Administrative workers	80.1	13.6	6.3	75.0	18.7	6.2	73.2	20.1	6.8
Clerical workers	84.8	11.5	3.8	77.0	19.2	3.8	78.7	15.6	5.7
Service workers	83.7	12.2	4.1	78.7	17.2	4.0	77.7	18.0	4.3
Productive workers	82.2	14.0	3.8	77.8	17.4	4.7	74.4	19.2	6.4
Others	76.0	16.0	8.0	73.9	17.2	9.0	73.6	17.5	8.9
INCOME QUANTILE (Q)									
Q 1	76.7	14.7	8.6	74.7	15.8	9.5	72.8	17.4	9.7
Q 2	76.3	16.8	7.0	74.5	17.6	7.9	74.3	18.2	7.6
Q 3	78.3	15.8	5.9	74.3	18.7	7.0	76.0	17.1	6.9
Q 4	78.8	14.5	6.7	75.1	17.7	7.2	76.6	16.4	7.0
Q 5	78.2	16.5	5.3	77.7	16.8	5.5	77.7	14.6	7.7
REGIONS									
North	80.5	12.0	7.5	80.9	11.5	7.6	78.8	13.8	7.4
South	75.9	16.8	7.3	72.6	18.2	9.2	70.9	19.6	9.5
East	79.7	16.6	3.7	76.9	19.1	4.0	77.0	17.8	5.3
West	73.5	16.2	10.3	69.7	18.8	11.5	71.6	17.9	10.5
ALL INDIA	**77.2**	**15.4**	**7.4**	**74.7**	**17.0**	**8.3**	**74.4**	**17.3**	**8.3**

Note: Responses are to the statement: "How interested are you regarding each issue: interested, not interested or no opinion?"

(Cont...)

Appendix Table 11:
Distribution of persons by level of interest in public issues
(All India, percentages) Year: 2003–04

Characteristic	Handicapped people			Rural development			Economic		
	Interested	Not interested	No opinion	Interested	Not interested	No opinion	Interested	Not interested	No opinion
LOCATION									
Rural	36.7	15.1	48.1	66.5	21.1	12.4	47.0	32.4	20.7
Urban	46.5	19.0	34.5	60.6	27.4	12.0	47.3	34.3	18.4
SEX									
Male	42.2	14.5	43.3	72.6	17.9	9.5	54.5	29.1	16.4
Female	37.0	18.0	45.0	56.9	28.0	15.1	39.6	36.7	23.6
AGE GROUPS (YEARS)									
10–30	40.2	16.2	43.5	65.1	22.9	12.0	48.6	32.2	19.3
31–45	40.8	15.3	43.9	67.0	21.3	11.8	48.2	31.9	19.9
Over 45	36.8	17.4	45.8	61.6	24.8	13.5	42.4	35.7	21.9
FORMAL EDUCATION									
Illiterate	26.5	14.6	58.8	52.9	26.0	21.1	30.6	35.4	34.0
Upto 12th	41.7	17.9	40.4	65.8	23.5	10.8	47.8	34.5	17.7
Graduate degree	52.8	10.2	37.0	81.1	14.3	4.6	72.6	19.8	7.6
Postgraduate degree	45.7	7.1	47.2	84.9	12.1	3.0	82.5	13.8	3.7
Other degrees	77.7	9.4	12.9	83.3	14.1	2.6	75.4	20.8	3.8
FORMAL OCCUPATION									
Professionals	55.0	9.2	35.9	85.0	11.8	3.1	75.2	18.1	6.7
Administrative workers	58.0	22.9	19.1	71.9	22.2	5.9	66.0	25.8	8.2
Clerical workers	55.5	16.2	28.3	76.4	18.4	5.2	63.6	28.2	8.2
Service workers	46.8	15.6	37.6	72.1	19.4	8.4	60.5	25.5	13.9
Productive workers	46.2	18.6	35.2	69.6	23.5	6.9	52.2	34.4	13.4
Others	37.8	16.4	45.8	63.1	23.6	13.3	44.6	33.9	21.5
INCOME QUANTILE (Q)									
Q 1	39.5	14.6	45.9	62.7	22.5	14.8	42.9	33.4	23.7
Q 2	35.4	18.3	46.4	65.0	24.0	11.0	46.3	34.2	19.5
Q 3	41.2	17.8	41.1	65.9	23.8	10.3	50.5	33.1	16.4
Q 4	45.3	16.7	38.0	67.9	21.8	10.3	53.7	30.8	15.4
Q 5	42.1	14.5	43.3	71.6	20.8	7.6	61.4	25.9	12.7
REGIONS									
North	9.9	4.5	85.6	70.8	18.3	10.9	57.5	25.8	16.7
South	35.7	16.6	47.7	67.2	20.1	12.7	45.2	34.1	20.6
East	68.0	23.8	8.2	63.6	26.9	9.5	45.9	37.6	16.4
West	45.0	19.8	35.2	58.5	26.1	15.4	40.8	34.1	25.1
ALL INDIA	**39.6**	**16.3**	**44.1**	**64.8**	**23.0**	**12.3**	**47.1**	**32.9**	**20.0**

Note: Responses are to the statement: "How interested are you regarding each issue: interested, not interested or no opinion?"

(Cont...)

Appendix Table 11:
Distribution of persons by level of interest in public issues
(All India, percentages) Year: 2003–04

Characteristic	Politics			Foreign policy			Environment		
	Interested	Not interested	No opinion	Interested	Not interested	No opinion	Interested	Not interested	No opinion
LOCATION									
Rural	35.6	45.9	18.4	17.2	51.4	31.4	43.1	32.3	24.6
Urban	39.0	44.8	16.3	24.5	50.8	24.7	50.9	31.1	18.0
SEX									
Male	49.3	37.2	13.5	25.2	49.3	25.5	51.8	29.5	18.7
Female	23.8	54.0	22.2	13.4	53.1	33.4	39.0	34.4	26.6
AGE GROUPS (YEARS)									
10–30	36.1	46.4	17.5	19.5	51.7	28.9	47.2	31.2	21.5
31–45	39.0	43.8	17.2	20.3	50.7	29.0	45.7	31.4	22.8
Over 45	35.1	45.7	19.3	18.0	50.8	31.3	40.8	34.1	25.0
FORMAL EDUCATION									
Illiterate	18.4	51.1	30.5	5.6	48.2	46.2	27.3	35.1	37.6
Upto 12th	38.5	46.1	15.4	18.8	54.3	26.8	46.7	33.2	20.1
Graduate degree	59.4	32.4	8.2	45.7	40.7	13.5	70.6	19.4	10.0
Postgraduate degree	66.4	28.7	4.9	62.1	29.2	8.7	83.5	12.3	4.2
Other degrees	61.8	33.6	4.6	54.7	35.4	9.9	77.6	14.0	8.4
FORMAL OCCUPATION									
Professionals	59.0	35.3	5.7	46.3	41.1	12.7	71.4	20.6	8.1
Administrative workers	63.1	30.9	6.0	36.4	47.6	16.0	52.9	33.5	13.6
Clerical workers	59.0	34.7	6.4	41.5	45.6	13.0	65.3	25.3	9.3
Service workers	51.9	37.3	10.8	27.0	46.8	26.2	53.2	29.5	17.3
Productive workers	45.5	42.8	11.7	20.5	54.0	25.5	51.8	34.3	13.9
Others	33.9	46.8	19.3	17.1	51.8	31.0	43.1	32.5	24.3
INCOME QUANTILE (Q)									
Q 1	32.4	46.0	21.6	15.1	50.5	34.4	40.7	32.4	26.9
Q 2	37.2	46.3	16.5	17.7	52.8	29.5	43.7	34.1	22.3
Q 3	38.9	46.4	14.7	22.0	53.9	24.1	49.4	31.9	18.7
Q 4	42.9	43.8	13.4	27.8	49.3	22.9	53.7	29.6	16.7
Q 5	50.0	39.0	11.1	38.6	43.6	17.7	64.8	21.3	13.9
REGIONS									
North	40.1	42.4	17.6	23.8	50.7	25.5	57.4	24.3	18.3
South	33.3	45.1	21.6	15.9	51.8	32.3	32.8	38.7	28.5
East	37.9	50.6	11.5	21.2	56.1	22.7	46.0	38.7	15.3
West	35.5	44.7	19.8	17.1	47.2	35.7	46.1	26.9	27.0
ALL INDIA	**36.6**	**45.6**	**17.8**	**19.3**	**51.2**	**29.5**	**45.4**	**31.9**	**22.7**

Note: Responses are to the statement: "How interested are you regarding each issue: interested, not interested or no opinion?"

(Cont...)

Appendix Table 11:
Distribution of persons by level of interest in public issues
(All India, percentages) Year: 2003–04

Characteristic	Scientific discoveries			Space exploration		
	Interested	Not interested	No opinion	Interested	Not interested	No opinion
LOCATION						
Rural	26.0	41.4	32.6	16.8	47.1	36.0
Urban	38.3	37.9	23.7	30.4	42.1	27.4
SEX						
Male	35.2	38.6	26.2	26.1	44.0	29.9
Female	24.0	42.2	33.7	15.5	47.3	37.2
AGE GROUPS (YEARS)						
10–30	32.5	39.0	28.5	22.9	45.2	31.8
31–45	28.8	41.5	29.7	20.0	46.2	33.8
Over 45	24.0	42.4	33.5	16.9	46.1	37.0
FORMAL EDUCATION						
Illiterate	10.9	41.8	47.3	4.1	44.9	50.9
Upto 12th	29.9	42.7	27.4	21.0	48.0	31.0
Graduate degree	61.2	26.0	12.8	48.7	35.1	16.2
Postgraduate degree	76.9	16.1	7.0	66.1	24.0	9.9
Other degrees	66.6	20.8	12.6	54.0	32.0	14.0
FORMAL OCCUPATION						
Professionals	59.2	28.8	12.0	50.7	34.6	14.7
Administrative workers	50.6	32.5	16.9	41.0	39.3	19.6
Clerical workers	52.0	32.7	15.2	40.3	42.4	17.2
Service workers	37.2	41.2	21.6	33.0	43.8	23.2
Productive workers	32.2	44.8	22.9	21.3	53.5	25.3
Others	27.2	40.9	31.9	16.3	47.0	36.7
INCOME QUANTILE (Q)						
Q 1	24.0	41.1	34.8	13.4	46.8	39.8
Q 2	25.8	43.2	31.0	16.9	48.4	34.6
Q 3	33.5	41.8	24.8	22.2	48.2	29.6
Q 4	42.8	34.8	22.3	30.6	42.5	26.9
Q 5	56.7	26.5	16.8	40.5	38.2	21.3
REGIONS						
North	41.8	32.3	25.9	24.4	41.8	33.9
South	21.2	45.5	33.3	14.5	51.1	34.4
East	27.2	50.8	22.0	17.2	56.3	26.5
West	28.8	34.4	36.8	19.4	38.8	41.9
ALL INDIA	**29.6**	**40.4**	**30.0**	**18.8**	**46.6**	**34.6**

Note: Responses are to the statement: "How interested are you regarding each issue: interested, not interested or no opinion?"

Appendix Table 12:
Distribution of persons feeling informed about public issues
(All India, percentages) Year: 2003–04

Characteristic	Agriculture			Local school			Employment		
	Informed	Not informed	No opinion	Informed	Not informed	No opinion	Informed	Not informed	No opinion
LOCATION									
Rural	73.5	20.7	5.9	66.0	25.1	8.8	55.3	31.8	12.9
Urban	48.3	38.9	12.8	63.2	27.8	9.1	57.9	31.6	10.6
SEX									
Male	72.6	21.4	6.1	70.4	22.5	7.2	63.1	27.7	9.1
Female	59.9	30.4	9.7	60.0	29.3	10.7	49.0	35.8	15.3
AGE GROUPS (YEARS)									
10–30	63.6	28.3	8.2	68.0	23.8	8.1	56.8	31.1	12.0
31–45	68.5	24.4	7.1	65.2	26.2	8.6	58.5	31.2	10.3
Over 45	69.8	22.3	7.9	58.7	30.3	11.0	51.7	33.8	14.6
FORMAL EDUCATION									
Illiterate	63.7	25.4	10.9	45.3	37.3	17.5	40.6	37.0	22.4
Upto 12th	66.1	26.7	7.2	68.8	24.1	7.1	56.6	33.1	10.4
Graduate degree	71.7	22.7	5.6	82.0	14.9	3.1	82.5	14.2	3.4
Postgraduate degree	74.2	18.6	7.2	85.9	11.5	2.5	86.9	10.8	2.3
Other degrees	71.3	23.5	5.2	73.7	20.6	5.7	73.3	20.3	6.4
FORMAL OCCUPATION									
Professionals	78.7	16.5	4.8	86.0	11.0	3.0	78.4	17.2	4.4
Administrative workers	63.2	26.5	10.3	70.9	20.9	8.3	75.7	17.5	6.7
Clerical workers	71.1	22.6	6.4	79.3	16.8	3.9	78.4	17.8	3.7
Service workers	64.7	28.0	7.3	74.6	21.1	4.3	70.0	23.9	6.2
Productive workers	60.7	33.4	5.9	66.8	26.9	6.3	56.9	34.4	8.7
Others	65.9	25.9	8.1	63.5	26.9	9.6	53.9	33.0	13.2
INCOME QUANTILE (Q)									
Q 1	65.4	26.5	8.2	60.1	29.0	10.9	49.0	35.5	15.5
Q 2	68.1	25.1	6.8	66.4	25.7	7.9	59.1	30.2	10.7
Q 3	67.3	25.4	7.3	69.0	23.9	7.1	60.0	30.1	9.9
Q 4	65.4	25.7	8.9	73.4	19.8	6.8	65.3	26.7	7.9
Q 5	62.8	27.3	9.9	72.8	19.8	7.4	69.5	22.3	8.1
REGIONS									
North	74.4	16.7	9.0	71.9	18.6	9.6	67.7	18.4	13.9
South	63.3	29.8	6.9	65.8	27.2	6.9	57.2	34.3	8.5
East	55.9	36.4	7.7	57.9	34.1	8.0	43.2	42.9	13.9
West	70.2	22.0	7.8	64.8	24.4	10.8	55.4	32.0	12.6
ALL INDIA	**66.3**	**25.9**	**7.9**	**65.2**	**25.9**	**8.9**	**56.1**	**31.7**	**12.2**

Note: Responses are to the statement: "How well informed are you regarding each issue: informed, not informed or no opinion?"

(Cont...)

Appendix Table 12:
Distribution of persons feeling informed about public issues
(All India, percentages) Year: 2003–04

Characteristic	Poor people			Old people			Women		
	Informed	Not informed	No opinion	Informed	Not informed	No opinion	Informed	Not informed	No opinion
LOCATION									
Rural	65.5	25.5	9.0	63.0	27.0	10.0	63.1	26.3	10.6
Urban	62.8	27.9	9.4	59.2	30.7	10.0	62.5	27.7	9.8
SEX									
Male	69.5	23.3	7.2	67.1	25.2	7.7	63.0	27.3	9.7
Female	59.9	29.0	11.1	56.7	31.0	12.3	62.8	26.1	11.1
AGE GROUPS (YEARS)									
10–30	63.8	26.3	9.8	60.6	29.1	10.4	62.1	27.0	10.8
31–45	66.1	25.9	8.1	63.2	27.5	9.4	64.9	25.5	9.6
Over 45	65.1	26.1	8.7	63.6	26.6	9.8	62.4	27.3	10.3
FORMAL EDUCATION									
Illiterate	55.1	30.0	14.8	53.8	29.9	16.3	54.2	29.2	16.6
Upto 12th	65.3	26.5	8.2	62.3	28.8	8.9	63.2	27.5	9.3
Graduate degree	79.4	16.8	3.8	74.4	21.1	4.6	77.7	17.4	4.9
Postgraduate degree	83.2	13.7	3.1	79.6	16.7	3.7	80.1	15.9	4.0
Other degrees	72.9	21.8	5.3	74.3	21.0	4.7	67.6	20.6	11.7
FORMAL OCCUPATION									
Professionals	83.7	12.7	3.6	79.8	16.4	3.8	79.9	16.3	3.9
Administrative workers	67.8	26.4	5.9	62.3	31.8	5.8	62.6	29.7	7.7
Clerical workers	72.5	22.9	4.6	68.4	23.4	8.2	70.6	21.4	8.0
Service workers	74.5	19.1	6.4	69.7	23.5	6.8	66.9	26.3	6.7
Productive workers	64.5	30.9	4.6	63.0	31.7	5.3	60.5	31.3	8.2
Others	63.4	26.8	9.8	60.7	28.6	10.7	62.0	27.0	11.0
INCOME QUANTILE (Q)									
Q 1	61.1	28.8	10.2	59.6	29.2	11.2	59.0	29.2	11.8
Q 2	65.0	25.8	9.2	62.9	27.2	9.9	64.6	25.6	9.8
Q 3	68.1	24.2	7.8	63.5	28.3	8.2	65.6	25.9	8.5
Q 4	69.5	22.6	7.9	63.9	26.9	9.2	67.3	23.2	9.5
Q 5	73.5	19.3	7.2	69.2	23.5	7.3	70.0	20.1	9.9
REGIONS									
North	73.3	15.6	11.1	73.7	15.5	10.8	74.0	14.5	11.5
South	64.3	27.7	8.0	60.6	29.9	9.5	59.2	30.7	10.1
East	56.1	36.8	7.0	53.2	39.0	7.8	55.9	34.8	9.3
West	64.7	25.2	10.2	60.2	28.4	11.4	62.3	27.1	10.6
ALL INDIA	**64.7**	**26.2**	**9.1**	**61.9**	**28.1**	**10.0**	**62.9**	**26.7**	**10.4**

Note: Responses are to the statement: "How well informed are you regarding each issue: informed, not informed or no opinion?"

(Cont...)

Appendix Table 12:
Distribution of persons feeling informed about public issues
(All India, percentages) Year: 2003–04

Characteristic	Handicapped people			Rural development			Economic		
	Informed	Not informed	No opinion	Informed	Not informed	No opinion	Informed	Not informed	No opinion
LOCATION									
Rural	24.3	25.4	50.3	55.7	29.4	14.9	40.0	36.9	23.1
Urban	32.7	31.0	36.4	49.4	35.5	15.0	37.9	41.8	20.3
SEX									
Male	29.9	25.0	45.2	62.3	25.8	11.9	46.5	35.2	18.4
Female	23.6	29.1	47.3	45.4	36.6	18.0	32.3	41.5	26.2
AGE GROUPS (YEARS)									
10–30	27.0	27.2	45.8	54.0	31.2	14.8	40.0	38.5	21.5
31–45	28.0	26.1	45.9	55.5	30.2	14.3	40.2	37.4	22.4
Over 45	24.6	27.8	47.6	51.8	32.3	15.8	37.2	38.7	24.0
FORMAL EDUCATION									
Illiterate	13.6	24.8	61.5	41.0	35.4	23.6	25.3	39.4	35.3
Upto 12th	28.5	29.1	42.4	54.9	31.6	13.6	39.5	40.1	20.4
Graduate degree	41.4	20.4	38.2	72.1	21.3	6.6	64.1	26.2	9.6
Postgraduate degree	38.5	13.3	48.3	78.7	16.8	4.4	74.2	20.6	5.3
Other degrees	57.7	28.1	14.2	67.9	26.4	5.7	65.2	28.3	6.5
FORMAL OCCUPATION									
Professionals	45.7	15.9	38.4	77.0	16.8	6.2	67.5	23.6	8.9
Administrative workers	45.6	34.7	19.6	57.1	32.6	10.3	49.4	38.2	12.5
Clerical workers	46.7	23.9	29.4	70.7	21.2	8.1	58.1	29.9	12.0
Service workers	37.0	22.5	40.4	65.5	25.0	9.5	52.6	33.2	14.2
Productive workers	31.2	32.4	36.4	54.8	36.8	8.4	38.8	44.9	16.2
Others	24.7	27.4	47.9	52.1	31.9	16.0	37.2	39.0	23.8
INCOME QUANTILE (Q)									
Q 1	25.4	26.6	48.1	49.7	33.1	17.3	33.8	40.5	25.7
Q 2	23.1	27.7	49.2	54.7	32.2	13.1	40.2	39.0	20.7
Q 3	29.5	28.0	42.5	57.0	29.5	13.6	43.0	37.2	19.7
Q 4	32.4	27.9	39.6	59.6	27.3	13.2	48.0	33.4	18.6
Q 5	33.5	21.4	45.1	65.0	23.7	11.3	54.6	29.2	16.2
REGIONS									
North	7.5	6.6	85.9	67.2	17.8	15.0	55.5	24.1	20.4
South	23.2	27.1	49.8	55.8	31.1	13.1	39.3	41.1	19.6
East	43.5	43.9	12.6	43.1	41.9	15.0	33.0	45.8	21.3
West	32.6	30.9	36.5	49.6	34.0	16.4	31.0	42.0	27.0
ALL INDIA	**26.7**	**27.0**	**46.2**	**53.9**	**31.2**	**14.9**	**39.4**	**38.3**	**22.3**

Note: Responses are to the statement: "How well informed are you regarding each issue: informed, not informed or no opinion?"

(Cont...)

Appendix Table 12:
Distribution of persons feeling informed about public issues
(All India, percentages) Year: 2003–04

Characteristic	Politics			Foreign policy			Environment		
	Informed	Not informed	No opinion	Informed	Not informed	No opinion	Informed	Not informed	No opinion
LOCATION									
Rural	37.7	39.8	22.5	15.0	49.3	35.7	36.2	37.3	26.4
Urban	42.4	37.9	19.7	21.1	51.1	27.9	41.9	37.7	20.4
SEX									
Male	50.9	32.6	16.5	21.9	48.6	29.5	44.0	35.2	20.8
Female	27.1	46.0	26.8	11.6	51.0	37.3	31.8	39.7	28.6
AGE GROUPS (YEARS)									
10–30	38.2	40.3	21.5	16.5	50.3	33.2	39.8	36.9	23.4
31–45	41.5	38.4	20.1	17.5	50.2	32.3	37.6	38.4	24.0
Over 45	38.4	37.8	23.8	16.4	48.4	35.3	34.1	37.7	28.2
FORMAL EDUCATION									
Illiterate	20.1	46.7	33.2	4.7	46.1	49.1	22.1	39.4	38.5
Upto 12th	41.2	39.1	19.8	16.0	52.8	31.2	38.4	39.0	22.5
Graduate degree	61.9	26.6	11.5	42.1	40.8	17.1	62.4	25.7	11.9
Postgraduate degree	69.8	22.0	8.2	55.3	32.3	12.4	76.0	18.6	5.3
Other degrees	54.7	35.2	10.1	39.2	48.2	12.6	59.4	28.3	12.3
FORMAL OCCUPATION									
Professionals	67.1	22.7	10.1	41.2	43.0	15.8	64.2	25.4	10.4
Administrative workers	59.2	30.4	10.4	30.6	47.9	21.6	45.6	37.5	16.9
Clerical workers	62.7	27.3	10.0	35.1	48.4	16.5	57.5	28.5	14.1
Service workers	51.6	32.5	15.9	20.0	53.0	27.0	46.0	35.3	18.7
Productive workers	45.7	39.0	15.3	17.0	55.1	27.9	39.7	43.5	16.8
Others	36.3	40.6	23.1	14.9	49.8	35.2	35.8	38.0	26.2
INCOME QUANTILE (Q)									
Q 1	33.8	41.3	24.9	11.8	49.7	38.6	32.0	39.6	28.4
Q 2	40.4	39.6	20.0	16.5	51.3	32.2	37.4	38.7	23.9
Q 3	42.8	38.5	18.7	19.9	51.3	28.8	43.1	36.0	20.8
Q 4	45.7	35.1	19.1	24.5	48.8	26.7	46.3	33.5	20.2
Q 5	52.0	30.6	17.4	36.2	38.7	25.2	57.3	24.3	18.4
REGIONS									
North	46.6	30.6	22.8	27.3	39.9	32.8	54.4	23.6	21.9
South	35.4	43.4	21.2	15.2	52.5	32.3	27.9	43.5	28.6
East	33.7	46.6	19.8	12.7	57.4	29.9	32.1	46.1	21.8
West	40.1	37.4	22.5	12.3	50.1	37.6	36.7	37.4	25.9
ALL INDIA	**39.1**	**39.3**	**21.7**	**16.8**	**49.8**	**33.4**	**37.9**	**37.4**	**24.6**

Note: Responses are to the statement: "How well informed are you regarding each issue: informed, not informed or no opinion?"

(Cont...)

Appendix Table 12:
Distribution of persons feeling informed about public issues
(All India, percentages) Year: 2003–04

Characteristic	Scientific discoveries			Space exploration		
	Informed	Not informed	No opinion	Informed	Not informed	No opinion
LOCATION						
Rural	20.5	44.4	35.1	13.2	47.0	39.8
Urban	30.6	44.2	25.2	22.1	48.2	29.7
SEX						
Male	28.1	43.3	28.6	19.8	46.8	33.4
Female	18.7	45.4	35.8	11.8	47.9	40.3
AGE GROUPS (YEARS)						
10–30	25.0	43.9	31.2	17.0	47.6	35.4
31–45	23.5	45.6	30.9	15.7	47.9	36.4
Over 45	19.9	44.2	35.9	13.3	46.3	40.5
FORMAL EDUCATION						
Illiterate	7.9	44.8	47.3	2.8	44.4	52.8
Upto 12th	23.1	46.6	30.4	15.3	49.9	34.9
Graduate degree	52.5	32.2	15.3	41.0	39.6	19.3
Postgraduate degree	68.1	22.5	9.5	57.9	29.3	12.8
Other degrees	46.9	37.6	15.5	32.7	52.3	15.1
FORMAL OCCUPATION						
Professionals	49.4	36.9	13.8	40.6	41.8	17.7
Administrative workers	36.5	43.7	19.8	29.5	47.3	23.1
Clerical workers	41.9	41.2	16.9	32.0	48.3	19.7
Service workers	26.9	49.6	23.5	20.4	55.5	24.2
Productive workers	25.6	48.9	25.5	16.0	54.8	29.2
Others	21.4	44.4	34.2	14.0	47.0	39.0
INCOME QUANTILE (Q)						
Q 1	17.9	45.3	36.8	10.9	47.4	41.7
Q 2	20.5	47.1	32.4	14.4	49.5	36.1
Q 3	27.4	45.1	27.5	18.7	48.0	33.3
Q 4	35.4	39.3	25.3	26.0	44.6	29.3
Q 5	48.8	29.7	21.5	34.5	39.4	26.1
REGIONS						
North	40.1	31.6	28.3	25.4	36.8	37.8
South	17.4	48.6	34.0	14.4	51.9	33.7
East	14.0	56.3	29.6	8.9	55.8	35.3
West	21.5	42.4	36.0	14.1	46.0	39.9
ALL INDIA	**23.4**	**44.4**	**32.2**	**15.8**	**47.4**	**36.8**

Note: Responses are to the statement: "How well informed are you regarding each issue: informed, not informed or no opinion?"

Appendix Table 13:
Attentive, interested and residual public
(All India, percentages) Year: 2003–04

Characteristic	Attentive	Interested	Residual	Total
LOCATION				
Rural	15.8	10.2	74.0	100.0
Urban	26.2	12.2	61.6	100.0
SEX				
Male	25.3	10.9	63.8	100.0
Female	12.4	10.7	76.9	100.0
AGE GROUPS (YEARS)				
10–30	19.5	11.2	69.2	100.0
31–45	19.7	11.0	69.3	100.0
Over 45	16.4	9.5	74.1	100.0
FORMAL EDUCATION				
Illiterate	1.2	9.6	89.2	100.0
Upto 12th	19.2	11.1	69.6	100.0
Graduate degree	49.0	10.8	40.3	100.0
Postgraduate degree	60.4	9.4	30.2	100.0
Other degrees	53.5	16.9	29.6	100.0
FORMAL OCCUPATION				
Professionals	48.6	9.2	42.2	100.0
Administrative workers	45.7	11.7	42.5	100.0
Clerical workers	46.3	10.9	42.7	100.0
Service workers	34.2	10.9	54.9	100.0
Productive workers	24.4	14.2	61.5	100.0
Others	15.9	10.6	73.5	100.0
INCOME QUANTILE (Q)				
Q 1	12.1	11.5	76.5	100.0
Q 2	16.7	10.1	73.2	100.0
Q 3	24.2	10.4	65.4	100.0
Q 4	33.4	10.4	56.2	100.0
Q 5	39.0	9.6	51.4	100.0
REGIONS				
North	19.8	4.5	75.7	100.0
South	21.3	17.3	61.4	100.0
East	14.6	10.7	74.7	100.0
West	19.9	10.7	69.3	100.0
ALL INDIA	**18.9**	**10.8**	**70.4**	**100.0**

Note: To be classified as attentive to a given issue area, respondents were asked whether they were "very interested" in that area, whether they were "very well–informed" about it, and whether they regularly read a daily newspaper/ magazine. Citizens who reported that they were "very interested" in an issue, but who did not think that they were "very well–informed" about it, were classified as the "interested public". All other individuals were classified as members of the "residual public" for that issue area.

Appendix Table 14:
Public attitude towards science and technology related issues
(All India, percentages) Year: 2003–04

Characteristic	S&T makes our lives healthier, easier and more comfortable			The quality of science education in Indian schools is satisfactory			We depend too much on science		
	Agree	Disagree	do not know	Agree	Disagree	do not know	Agree	Disagree	do not know
LOCATION									
Rural	75.3	4.9	19.9	49.2	16.8	34.0	73.4	9.3	17.4
Urban	80.2	4.3	15.5	53.2	18.4	28.5	77.0	9.4	13.7
SEX									
Male	81.5	4.1	14.4	54.3	19.8	25.9	78.3	9.7	11.9
Female	71.9	5.3	22.8	46.4	14.7	38.9	70.5	8.8	20.7
AGE GROUPS (YEARS)									
10–30	79.7	4.1	16.2	54.1	17.6	28.3	76.8	8.8	14.3
31–45	75.2	5.3	19.5	49.2	16.9	33.9	73.3	9.6	17.0
Over 45	71.7	5.3	23.0	43.2	16.9	39.9	70.1	9.9	20.0
FORMAL EDUCATION									
Illiterate	55.5	6.9	37.6	25.6	12.1	62.3	56.5	9.8	33.7
Upto 12th	80.5	4.4	15.1	55.3	17.5	27.2	77.9	9.1	13.0
Graduate degree	95.0	2.3	2.6	68.9	25.6	5.5	87.7	9.8	2.5
Postgraduate degree	98.0	1.5	0.6	69.2	28.6	2.2	90.7	8.4	0.9
Other degrees	97.6	1.6	0.9	70.6	23.1	6.3	92.9	6.5	0.7
FORMAL OCCUPATION									
Professionals	91.7	4.5	3.7	67.9	23.2	8.9	86.7	9.9	3.4
Administrative workers	91.0	1.7	7.3	59.8	24.8	15.4	84.6	7.7	7.7
Clerical workers	90.5	4.4	5.1	63.8	23.6	12.6	82.7	10.7	6.6
Service workers	80.9	3.3	15.7	51.3	18.2	30.5	75.2	7.7	17.1
Productive workers	80.4	4.4	15.2	57.7	15.9	26.4	81.7	8.2	10.1
Others	75.3	4.8	19.9	48.7	16.8	34.5	73.2	9.3	17.5
INCOME QUANTILE (Q)									
Q 1	71.9	4.9	23.2	44.4	15.9	39.7	70.8	9.2	20.0
Q 2	76.8	4.3	18.8	50.7	16.9	32.5	73.3	9.4	17.3
Q 3	80.9	5.1	14.0	56.1	17.0	26.9	77.8	9.2	13.0
Q 4	84.5	4.0	11.4	60.7	20.1	19.2	81.5	9.8	8.7
Q 5	87.2	5.0	7.8	56.9	26.8	16.3	84.6	8.3	7.1
REGIONS									
North	89.7	2.8	7.5	56.1	17.4	26.4	88.5	5.3	6.2
South	70.0	6.0	24.1	51.6	17.3	31.1	70.2	12.0	17.8
East	75.2	4.2	20.6	44.4	20.3	35.3	66.7	11.5	21.8
West	72.7	5.7	21.6	49.9	14.3	35.8	72.8	8.5	18.7
ALL INDIA	**76.7**	**4.7**	**18.6**	**50.4**	**17.2**	**32.4**	**74.4**	**9.3**	**16.3**

Note: Responses are to the following statements:" For each statement, please tell me if you generally agree, disagree or do not know."

(Cont...)

Appendix Table 14:
Public attitude towards science and technology related issues
(All India, percentages) Year: 2003–04

Characteristic	Scientists should be allowed to do research on animals			Science changes our lives fast			Technological discoveries will eventually destroy the earth		
	Agree	Disagree	do not know	Agree	Disagree	do not know	Agree	Disagree	do not know
LOCATION									
Rural	50.7	18.6	30.7	72.6	8.0	19.4	38.2	24.4	37.4
Urban	55.1	18.3	26.6	80.4	5.5	14.1	42.4	25.9	31.7
SEX									
Male	57.8	18.8	23.4	79.1	7.0	13.9	44.1	26.0	29.9
Female	46.1	18.3	35.6	70.7	7.5	21.7	34.8	23.6	41.5
AGE GROUPS (YEARS)									
10–30	54.9	18.1	27.0	76.6	7.6	15.8	40.4	26.8	32.8
31–45	51.1	18.9	29.9	75.2	6.6	18.2	39.6	23.7	36.7
Over 45	46.4	18.9	34.7	70.8	7.2	22.0	37.1	21.6	41.3
FORMAL EDUCATION									
Illiterate	29.3	17.3	53.4	57.3	7.4	35.4	21.8	16.1	62.1
Upto 12th	55.4	19.0	25.6	77.9	7.3	14.7	42.1	26.3	31.6
Graduate degree	75.2	18.2	6.7	90.1	7.2	2.6	58.0	32.4	9.6
Postgraduate degree	80.6	16.4	3.0	96.0	3.2	0.8	58.7	38.0	3.3
Other degrees	68.6	17.6	13.8	92.8	6.7	0.5	55.3	27.3	17.3
FORMAL OCCUPATION									
Professionals	75.5	15.6	8.8	89.2	5.3	5.4	57.9	29.5	12.6
Administrative workers	63.1	18.0	18.9	89.2	3.4	7.4	53.0	31.4	15.6
Clerical workers	68.5	21.2	10.3	88.8	6.7	4.5	55.9	27.5	16.6
Service workers	58.2	15.2	26.5	75.9	7.8	16.4	46.3	22.5	31.2
Productive workers	61.1	17.4	21.5	86.2	4.8	8.9	46.3	24.7	29.0
Others	49.8	18.7	31.5	73.2	7.5	19.3	37.5	24.5	37.9
INCOME QUANTILE (Q)									
Q 1	47.5	17.1	35.4	69.0	8.2	22.8	35.0	22.3	42.6
Q 2	50.1	18.4	31.5	75.2	6.4	18.3	39.5	23.8	36.7
Q 3	55.0	21.1	23.8	80.5	6.1	13.4	42.8	27.2	29.9
Q 4	62.0	20.2	17.9	83.4	7.6	9.0	46.2	30.5	23.3
Q 5	69.1	18.7	12.3	87.3	6.0	6.7	52.0	30.7	17.3
REGIONS									
North	64.2	14.4	21.3	90.7	3.1	6.2	41.9	32.0	26.1
South	52.3	17.2	30.4	72.4	8.3	19.3	38.3	22.4	39.3
East	45.8	18.4	35.9	60.9	13.0	26.1	38.7	23.9	37.3
West	47.0	23.1	29.9	76.2	4.8	18.9	38.9	21.6	39.4
ALL INDIA	**52.0**	**18.5**	**29.5**	**74.9**	**7.3**	**17.8**	**39.4**	**24.8**	**35.7**

Note: Responses are to the following statements: "For each statement, please tell me if you generally agree, disagree or do not know."

(Cont...)

Appendix Table 14:
Public attitude towards science and technology related issues
(All India, percentages) Year: 2003–04

Characteristic	New technology makes work interesting			Modern science and technology will create better opportunities for the next generation			Technological development creates an artificial and inhuman way of living		
	Agree	Disagree	do not know	Agree	Disagree	do not know	Agree	Disagree	do not know
LOCATION									
Rural	57.3	10.6	32.1	50.6	12.2	37.2	40.5	17.4	42.2
Urban	68.5	7.3	24.2	60.6	11.5	27.9	46.7	18.4	34.9
SEX									
Male	66.1	9.9	24.0	59.3	12.1	28.6	46.5	19.3	34.1
Female	55.0	9.4	35.6	47.7	11.9	40.4	38.0	16.0	46.0
AGE GROUPS (YEARS)									
10–30	64.4	9.7	25.9	56.3	12.1	31.6	44.1	18.7	37.2
31–45	58.8	10.0	31.2	52.9	12.1	35.0	41.9	17.3	40.8
Over 45	54.0	9.1	36.9	47.9	11.8	40.3	38.6	15.8	45.6
FORMAL EDUCATION									
Illiterate	33.9	9.9	56.2	29.3	10.0	60.7	21.9	10.3	67.8
Upto 12th	64.7	9.9	25.4	56.6	12.8	30.7	45.0	18.9	36.1
Graduate degree	86.9	7.8	5.3	81.3	12.3	6.4	65.3	24.7	10.0
Postgraduate degree	93.7	5.0	1.3	88.5	8.3	3.2	67.7	26.7	5.6
Other degrees	89.7	6.0	4.3	76.4	12.0	11.6	66.1	20.9	13.0
FORMAL OCCUPATION									
Professionals	84.2	7.8	7.9	78.8	11.1	10.1	63.2	23.1	13.7
Administrative workers	81.6	5.8	12.6	81.4	6.8	11.8	54.8	28.0	17.2
Clerical workers	80.8	9.4	9.8	74.5	10.8	14.7	65.0	18.7	16.3
Service workers	66.0	10.3	23.7	56.4	16.1	27.6	48.7	14.3	37.0
Productive workers	66.4	8.9	24.7	58.5	10.9	30.6	49.6	17.7	32.7
Others	58.4	9.8	31.9	51.2	12.1	36.7	40.1	17.4	42.5
INCOME QUANTILE (Q)									
Q 1	53.1	10.4	36.4	46.5	11.1	42.3	34.4	16.4	49.2
Q 2	60.7	8.9	30.4	52.6	12.1	35.3	42.8	15.9	41.3
Q 3	67.1	9.3	23.6	60.0	12.6	27.4	50.4	19.1	30.5
Q 4	71.6	9.5	19.0	65.1	14.4	20.5	53.4	21.4	25.2
Q 5	79.8	7.0	13.2	71.2	11.5	17.3	56.3	25.2	18.5
REGIONS									
North	72.8	6.0	21.2	66.3	8.1	25.6	46.2	22.4	31.4
South	56.4	11.3	32.3	51.8	10.6	37.6	42.4	13.9	43.7
East	52.1	14.5	33.4	45.9	15.8	38.3	35.8	19.4	44.8
West	61.2	7.0	31.8	50.9	13.0	36.1	44.6	15.2	40.2
ALL INDIA	**60.6**	**9.6**	**29.8**	**53.5**	**12.0**	**34.5**	**42.3**	**17.7**	**40.0**

Note: Responses are to the following statements: "For each statement, please tell me if you generally agree, disagree or do not know."

(Cont...)

Appendix Table 14:
Public attitude towards science and technology related issues
(All India, percentages) Year: 2003–04

Characteristic	People should live a simpler life without much technology			Computers and factory automation will create more jobs than they will eliminate		
	Agree	Disagree	do not know	Agree	Disagree	do not know
LOCATION						
Rural	42.3	25.2	32.4	27.2	28.1	44.7
Urban	47.2	28.0	24.8	37.8	29.8	32.4
SEX						
Male	46.9	28.3	24.8	33.8	32.7	33.6
Female	40.6	23.8	35.6	26.8	24.5	48.7
AGE GROUPS (YEARS)						
10–30	44.1	28.3	27.6	32.7	30.0	37.3
31–45	44.4	25.4	30.2	29.9	27.2	42.9
Over 45	42.3	21.6	36.1	25.3	26.9	47.8
FORMAL EDUCATION						
Illiterate	29.8	15.8	54.4	11.7	20.2	68.1
Upto 12th	45.5	28.1	26.4	32.5	30.0	37.5
Graduate degree	59.8	33.9	6.3	53.6	35.2	11.2
Postgraduate degree	63.8	32.7	3.5	49.2	44.3	6.5
Other degrees	59.5	30.5	10.0	70.2	19.2	10.7
FORMAL OCCUPATION						
Professionals	56.7	34.7	8.6	50.3	36.7	13.0
Administrative workers	57.7	27.6	14.7	55.0	26.5	18.4
Clerical workers	57.2	29.5	13.3	49.3	32.6	18.1
Service workers	43.3	30.0	26.7	39.1	27.8	33.1
Productive workers	49.1	25.7	25.2	35.1	30.0	34.9
Others	42.5	25.5	32.1	28.2	28.1	43.7
INCOME QUANTILE (Q)						
Q 1	39.6	23.6	36.8	24.4	24.9	50.7
Q 2	44.9	23.9	31.1	28.7	30.5	40.7
Q 3	46.9	29.1	23.9	37.1	30.3	32.6
Q 4	49.5	32.1	18.4	41.2	32.6	26.2
Q 5	50.8	33.8	15.5	41.1	37.6	21.3
REGIONS						
North	51.2	31.6	17.2	22.0	46.1	31.9
South	45.7	19.1	35.2	40.9	16.5	42.7
East	32.3	29.5	38.2	27.0	24.1	48.9
West	46.2	23.9	29.9	31.5	27.7	40.7
ALL INDIA	**43.8**	**26.0**	**30.2**	**30.3**	**28.6**	**41.1**

Note: Responses are to the following statements: "For each statement, please tell me if you generally agree, disagree or do not know."

Appendix Table 15:
Promise and reservation index
(All India, percentages) Year: 2003–04

Characteristic	Promise Index (P)	Reservation Index (R)	Ratio of 'P' and 'R' (P/R)
LOCATION			
Rural	56.4	53.4	1.06
Urban	64.1	60.5	1.06
SEX			
Male	63.4	59.4	1.07
Female	53.8	51.5	1.04
AGE GROUPS (YEARS)			
10–30	61.1	57.5	1.06
31–45	57.8	55.1	1.05
Over 45	54.0	51.2	1.05
FORMAL EDUCATION			
Illiterate	37.1	36.9	1.01
Upto 12th	61.8	58.3	1.06
Graduate degree	80.8	74.2	1.09
Postgraduate degree	86.0	75.9	1.13
Other degrees	80.8	80.5	1.00
FORMAL OCCUPATION			
Professionals	77.9	72.4	1.08
Administrative workers	77.9	70.9	1.10
Clerical workers	75.8	71.5	1.06
Service workers	61.7	59.7	1.03
Productive workers	63.6	63.1	1.01
Others	56.8	53.7	1.06
INCOME QUANTILE (Q)			
Q 1	52.8	49.6	1.06
Q 2	58.8	55.0	1.07
Q 3	63.7	61.4	1.04
Q 4	67.7	64.9	1.04
Q 5	72.2	67.3	1.07
REGIONS			
North	70.0	61.9	1.13
South	56.0	56.5	0.99
East	51.4	47.6	1.08
West	57.7	56.3	1.03
ALL INDIA	**58.6**	**55.5**	**1.06**

Note: The index of scientific promise (P) includes responses to the following four statements: "For each statement, do you generally agree or disagree".
- S&T makes our life healthier, easier and more comfortable.
- Scientists work on things to make our lives better.
- The application of S&T makes work more interesting.
- S&T will create more opportunities for the next generation.
- The index of scientific reservations (R) includes responses to the following four statements: "For each statement, do you generally agree or disagree".
- We depend too much on science and technology.
- Technology creates an artificial and inhuman way of living.
- Science makes our life change too fast.
- Computers and factory automation will eliminate more jobs than create.

Appendix Table 16:
Public opinion on government spending
(All India, percentages) Year: 2003–04

Characteristic	Population control				Health care			
	Sufficient	Insufficient	Not at all	do not know	Sufficient	Insufficient	Not at all	do not know
LOCATION								
Rural	41.9	38.4	5.1	14.6	42.2	42.9	4.8	10.1
Urban	38.0	41.9	4.7	15.3	41.5	45.6	3.0	9.9
SEX								
Male	43.4	41.3	4.3	11.0	43.8	45.2	3.7	7.4
Female	38.1	37.7	5.7	18.5	40.1	42.3	4.9	12.7
AGE GROUPS (YEARS)								
10–30	41.0	39.3	5.2	14.5	43.4	42.2	4.7	9.8
31–45	41.3	41.3	4.2	13.1	41.3	46.0	3.3	9.3
Over 45	39.5	37.8	5.4	17.4	39.5	44.6	4.5	11.3
FORMAL EDUCATION								
Illiterate	33.9	34.2	6.7	25.1	35.0	40.8	5.6	18.6
Upto 12th	42.2	39.7	4.7	13.4	43.8	43.3	4.2	8.7
Graduate degree	45.2	48.2	3.9	2.7	45.2	50.9	2.4	1.4
Postgraduate degree	45.8	49.7	2.1	2.4	41.4	56.0	1.4	1.2
Other degrees	55.8	38.8	4.0	1.4	47.7	48.8	3.1	0.4
FORMAL OCCUPATION								
Professionals	48.6	45.8	2.7	2.9	47.1	49.4	2.3	1.2
Administrative workers	45.7	46.5	2.7	5.1	39.2	53.8	2.6	4.3
Clerical workers	49.0	42.1	4.1	4.7	51.0	43.3	2.2	3.5
Service workers	40.9	44.3	5.8	9.0	45.9	43.9	4.9	5.3
Productive workers	43.9	38.8	4.6	12.6	45.8	45.0	2.5	6.6
Others	40.0	38.9	5.1	15.9	41.3	43.3	4.5	10.9
INCOME QUANTILE (Q)								
Q 1	39.4	37.2	5.2	18.3	38.8	44.7	4.7	11.8
Q 2	41.7	38.9	4.6	14.8	42.8	43.1	4.1	10.0
Q 3	43.8	39.1	5.9	11.2	47.4	39.0	4.7	8.8
Q 4	41.4	44.8	4.3	9.5	44.7	45.3	3.2	6.8
Q 5	34.7	53.7	3.6	8.0	39.7	52.5	2.4	5.4
REGIONS								
North	47.8	33.9	4.3	14.0	43.0	45.1	3.6	8.2
South	45.4	40.0	3.5	11.1	43.5	45.7	4.4	6.3
East	36.7	38.3	7.7	17.3	35.1	45.7	6.2	13.0
West	34.7	44.7	4.4	16.2	46.0	39.3	3.0	11.8
ALL INDIA	**40.8**	**39.5**	**5.0**	**14.8**	**42.0**	**43.7**	**4.3**	**10.0**

Note: Responses are to the following statements: "For each issue please tell me, is the government spending sufficient, insufficient, not at all or do not know."

(Cont...)

Appendix Table 16:
Public opinion on government spending
(All India, percentages) Year: 2003–04

Characteristic	Education				Older people			
	Sufficient	Insufficient	Not at all	do not know	Sufficient	Insufficient	Not at all	do not know
LOCATION								
Rural	40.4	40.8	7.0	11.8	27.6	47.4	9.6	15.5
Urban	44.8	40.6	3.5	11.1	27.9	47.9	8.5	15.7
SEX								
Male	44.4	41.9	5.1	8.5	29.9	49.3	8.6	12.1
Female	38.9	39.5	6.9	14.7	25.4	45.7	9.9	19.0
AGE GROUPS (YEARS)								
10–30	43.7	40.2	5.6	10.5	29.2	45.2	9.1	16.6
31–45	39.9	42.6	5.8	11.6	26.9	49.8	8.6	14.6
Over 45	39.2	39.7	7.1	14.1	24.9	50.3	10.4	14.4
FORMAL EDUCATION								
Illiterate	30.1	36.0	10.6	23.3	19.9	43.2	11.9	24.9
Upto 12th	44.5	41.1	4.9	9.4	29.3	47.8	8.8	14.2
Graduate degree	47.3	47.3	3.7	1.7	32.4	54.8	7.1	5.7
Postgraduate degree	46.2	48.9	3.4	1.5	34.9	54.4	5.7	5.1
Other degrees	47.8	48.3	3.2	0.6	40.9	45.5	4.5	9.1
FORMAL OCCUPATION								
Professionals	49.1	46.2	3.0	1.7	33.3	53.4	7.4	5.9
Administrative workers	37.5	54.1	4.1	4.4	29.7	56.6	7.1	6.7
Clerical workers	49.8	41.2	5.4	3.6	36.7	49.2	7.1	7.0
Service workers	43.6	40.7	7.1	8.6	28.1	50.4	10.3	11.3
Productive workers	47.8	39.0	4.9	8.4	33.8	44.6	9.7	11.9
Others	40.9	40.4	6.2	12.5	26.8	47.2	9.4	16.6
INCOME QUANTILE (Q)								
Q 1	38.0	41.8	6.7	13.6	26.9	46.2	10.2	16.7
Q 2	41.1	40.7	6.4	11.8	28.1	47.1	8.1	16.8
Q 3	47.1	37.3	5.3	10.3	28.4	48.5	9.5	13.6
Q 4	47.6	40.0	5.0	7.4	29.2	49.2	8.3	13.4
Q 5	44.9	46.1	2.5	6.5	25.8	55.2	7.1	11.8
REGIONS								
North	42.2	38.9	9.5	9.4	34.1	43.3	6.9	15.6
South	41.1	43.8	5.8	9.4	30.2	51.9	8.0	9.9
East	31.9	47.9	6.5	13.7	21.2	50.4	11.8	16.6
West	50.4	33.5	2.8	13.3	26.0	45.0	10.0	19.1
ALL INDIA	**41.7**	**40.7**	**6.0**	**11.6**	**27.7**	**47.5**	**9.3**	**15.6**

Note: Responses are to the following statements: "For each issue please tell me, is the government spending sufficient, insufficient, not at all or do not know."

(Cont...)

Appendix Table 16:
Public opinion on government spending
(All India, percentages) Year: 2003–04

Characteristic	Poor people				Women			
	Sufficient	Insufficient	Not at all	do not know	Sufficient	Insufficient	Not at all	do not know
LOCATION								
Rural	23.9	51.3	11.1	13.8	27.4	46.3	10.8	15.6
Urban	22.4	53.9	10.2	13.5	29.8	47.1	8.5	14.6
SEX								
Male	24.8	54.6	10.4	10.2	30.9	46.8	9.3	13.0
Female	22.1	49.4	11.3	17.2	25.3	46.2	10.9	17.6
AGE GROUPS (YEARS)								
10–30	24.6	49.6	10.6	15.1	29.2	44.9	9.8	16.1
31–45	22.7	54.5	10.7	12.0	27.5	48.4	9.9	14.2
Over 45	21.5	54.7	11.6	12.2	26.2	48.1	11.0	14.7
FORMAL EDUCATION								
Illiterate	18.6	47.0	13.1	21.3	20.9	42.0	14.1	22.9
Upto 12th	24.3	52.4	10.4	12.8	29.3	47.0	9.3	14.5
Graduate degree	27.2	60.0	8.7	4.1	34.4	52.9	7.9	4.7
Postgraduate degree	28.8	59.7	9.1	2.3	36.4	52.4	5.7	5.5
Other degrees	31.1	50.8	11.0	7.1	37.0	45.4	9.0	8.6
FORMAL OCCUPATION								
Professionals	25.4	60.8	10.4	3.4	33.9	54.2	6.9	5.0
Administrative workers	24.7	61.3	7.1	6.8	31.2	55.9	4.3	8.6
Clerical workers	35.5	52.6	6.9	4.9	42.7	46.8	5.2	5.3
Service workers	22.1	56.3	13.9	7.7	30.9	41.9	16.5	10.7
Productive workers	27.2	50.7	11.7	10.3	34.4	42.8	8.7	14.0
Others	22.9	51.5	10.9	14.8	27.0	46.4	10.4	16.2
INCOME QUANTILE (Q)								
Q 1	23.4	50.2	11.6	14.8	26.7	45.9	11.2	16.2
Q 2	23.3	51.7	10.6	14.4	27.6	46.2	10.3	15.9
Q 3	22.7	54.8	11.2	11.3	30.2	46.9	8.9	14.0
Q 4	24.6	53.4	9.0	13.0	30.8	46.5	8.7	14.0
Q 5	24.6	57.9	8.0	9.5	28.1	53.6	7.6	10.6
REGIONS								
North	33.9	47.1	7.5	11.5	36.8	43.9	7.4	11.9
South	24.5	57.6	9.4	8.4	34.7	47.2	7.9	10.2
East	17.4	51.6	13.9	17.1	17.0	48.9	15.0	19.1
West	19.3	52.0	12.0	16.7	25.3	46.0	10.0	18.8
ALL INDIA	**23.4**	**52.0**	**10.8**	**13.7**	**28.1**	**46.5**	**10.1**	**15.3**

Note: Responses are to the following statements: "For each issue please tell me, is the government spending sufficient, insufficient, not at all or do not know."

(Cont...)

Appendix Table 16:
Public opinion on government spending
(All India, percentages) Year: 2003–04

Characteristic	Handicapped people				Infrastructure			
	Sufficient	Insufficient	Not at all	do not know	Sufficient	Insufficient	Not at all	do not know
LOCATION								
Rural	27.6	43.0	9.9	19.5	35.5	43.5	7.9	13.1
Urban	30.6	41.7	9.0	18.7	42.3	40.4	5.3	12.0
SEX								
Male	30.3	45.1	9.3	15.3	39.3	44.7	6.2	9.8
Female	26.6	40.2	10.0	23.1	35.7	40.5	8.1	15.8
AGE GROUPS (YEARS)								
10–30	29.7	41.6	9.1	19.6	38.9	41.6	7.0	12.5
31–45	28.2	43.7	10.2	17.9	36.8	44.6	6.4	12.2
Over 45	26.0	43.7	10.4	19.9	35.3	42.4	8.3	14.1
FORMAL EDUCATION								
Illiterate	21.4	36.5	12.6	29.6	30.2	37.9	10.6	21.4
Upto 12th	29.8	43.2	9.0	18.0	38.9	43.4	6.3	11.5
Graduate degree	33.8	51.3	8.3	6.7	43.6	46.6	6.2	3.6
Postgraduate degree	36.2	52.4	7.0	4.4	43.5	49.1	2.8	4.6
Other degrees	35.9	44.1	6.0	14.0	46.8	46.6	1.7	4.9
FORMAL OCCUPATION								
Professionals	36.0	48.1	9.4	6.5	41.8	48.2	5.9	4.1
Administrative workers	32.0	54.3	4.8	8.9	42.1	49.1	3.5	5.3
Clerical workers	38.0	48.0	7.0	7.0	48.4	43.7	4.8	3.1
Service workers	28.4	42.6	13.5	15.5	42.4	39.2	9.4	9.0
Productive workers	36.1	39.9	7.0	17.1	43.6	40.2	4.5	11.8
Others	27.5	42.3	9.8	20.4	36.6	42.4	7.4	13.6
INCOME QUANTILE (Q)								
Q 1	27.6	42.1	10.3	20.0	33.5	43.6	8.1	14.8
Q 2	28.6	41.3	9.6	20.5	37.1	42.6	7.0	13.3
Q 3	28.5	44.5	9.2	17.7	42.3	40.6	6.2	11.0
Q 4	29.7	42.3	9.6	18.3	45.0	40.0	6.2	8.8
Q 5	32.6	48.7	5.9	12.8	40.8	47.1	4.5	7.6
REGIONS								
North	39.6	40.0	6.5	13.8	45.7	39.7	4.4	10.2
South	32.9	45.6	7.5	14.0	38.1	45.1	7.8	9.0
East	18.5	46.1	13.4	22.0	24.1	47.3	10.3	18.3
West	24.5	39.2	10.7	25.6	42.2	38.7	6.0	13.1
ALL INDIA	**28.5**	**42.6**	**9.7**	**19.2**	**37.5**	**42.6**	**7.1**	**12.8**

Note: Responses are to the following statements: "For each issue please tell me, is the government spending sufficient, insufficient, not at all or do not know."

(Cont...)

Appendix Table 16:
Public opinion on government spending
(All India, percentages) Year: 2003–04

Characteristic	Agriculture and rural development				Sanitation and safe drinking water			
	Sufficient	Insufficient	Not at all	do not know	Sufficient	Insufficient	Not at all	do not know
LOCATION								
Rural	29.6	47.1	9.2	14.0	29.4	46.9	9.1	14.6
Urban	30.7	43.3	6.5	19.5	34.4	47.4	6.5	11.7
SEX								
Male	31.6	49.0	7.2	12.2	32.3	48.6	7.7	11.4
Female	28.2	43.0	9.7	19.0	29.3	45.6	9.0	16.1
AGE GROUPS (YEARS)								
10–30	30.8	44.4	8.6	16.1	32.0	46.3	8.3	13.5
31–45	29.7	48.5	7.5	14.3	29.6	48.8	8.1	13.5
Over 45	28.1	46.8	9.0	16.1	29.6	47.0	8.7	14.7
FORMAL EDUCATION								
Illiterate	24.5	40.8	10.7	23.9	25.4	40.6	11.1	22.9
Upto 12th	30.8	46.7	8.1	14.5	31.8	48.2	7.8	12.3
Graduate degree	34.2	52.0	6.9	6.9	35.6	52.4	6.8	5.2
Postgraduate degree	39.0	52.3	4.0	4.7	37.6	54.6	4.1	3.7
Other degrees	36.6	57.3	2.6	3.4	34.7	62.1	1.4	1.8
FORMAL OCCUPATION								
Professionals	35.1	54.6	5.9	4.4	35.3	52.9	7.5	4.3
Administrative workers	31.8	57.8	2.8	7.6	28.5	59.6	4.5	7.3
Clerical workers	37.6	47.3	5.4	9.7	44.5	44.5	5.8	5.2
Service workers	31.1	45.0	8.3	15.6	32.5	46.4	8.7	12.4
Productive workers	35.0	42.8	7.1	15.1	37.1	44.4	10.4	8.0
Others	29.2	45.7	8.8	16.4	30.0	46.9	8.3	14.8
INCOME QUANTILE (Q)								
Q 1	27.7	46.7	8.3	17.2	28.0	46.8	9.5	15.8
Q 2	28.8	46.0	9.4	15.8	29.2	48.3	8.2	14.4
Q 3	34.5	42.8	8.7	14.0	36.1	44.0	8.1	11.9
Q 4	33.3	45.7	7.7	13.3	35.6	48.3	6.1	10.1
Q 5	30.4	53.8	4.5	11.3	34.9	53.3	4.5	7.2
REGIONS								
North	40.5	41.9	6.0	11.6	44.6	39.9	5.1	10.3
South	28.2	51.6	9.6	10.5	27.1	53.9	11.3	7.7
East	18.8	48.1	11.6	21.5	18.0	48.2	12.1	21.7
West	32.4	43.1	6.7	17.8	33.7	46.6	5.3	14.5
ALL INDIA	**29.9**	**46.0**	**8.4**	**15.6**	**30.8**	**47.1**	**8.3**	**13.8**

Note: Responses are to the following statements: "For each issue please tell me, is the government spending sufficient, insufficient, not at all or do not know."

(Cont...)

Appendix Table 16:
Public opinion on government spending
(All India, percentages) Year: 2003–04

Characteristic	Scientific research				National defence			
	Sufficient	Insufficient	Not at all	do not know	Sufficient	Insufficient	Not at all	do not know
LOCATION								
Rural	23.0	21.8	11.9	43.4	28.0	19.9	10.5	41.6
Urban	30.2	22.1	8.5	39.2	36.2	20.5	7.8	35.5
SEX								
Male	28.5	24.1	10.4	37.0	35.7	22.3	8.7	33.4
Female	21.7	19.7	11.3	47.3	25.1	17.9	10.7	46.3
AGE GROUPS (YEARS)								
10–30	26.8	22.2	10.8	40.3	32.5	20.1	9.2	38.2
31–45	24.2	22.5	10.6	42.7	29.7	20.7	9.9	39.7
Over 45	22.2	20.6	11.4	45.7	26.6	19.2	10.6	43.6
FORMAL EDUCATION								
Illiterate	13.0	14.5	13.7	58.7	15.2	14.1	13.4	57.3
Upto 12th	26.2	21.9	10.7	41.2	31.8	20.5	9.3	38.5
Graduate degree	41.3	36.0	6.6	16.0	50.6	29.4	5.7	14.2
Postgraduate degree	47.6	36.4	5.0	10.9	59.0	28.5	2.6	9.8
Other degrees	39.1	36.4	4.3	20.2	46.5	31.0	3.5	19.0
FORMAL OCCUPATION								
Professionals	38.1	33.2	7.1	21.7	46.3	30.2	4.5	19.0
Administrative workers	41.1	34.3	5.0	19.6	53.7	26.4	4.0	15.9
Clerical workers	41.9	27.7	8.1	22.2	50.1	23.0	7.0	19.9
Service workers	31.5	19.1	8.6	40.8	40.7	20.6	7.1	31.6
Productive workers	29.8	19.2	10.9	40.1	40.2	16.8	9.0	34.1
Others	23.5	21.3	11.2	43.9	28.2	19.6	10.2	42.0
INCOME QUANTILE (Q)								
Q 1	21.1	20.8	12.9	45.2	25.9	19.3	11.4	43.4
Q 2	25.3	19.2	10.6	44.9	29.9	19.1	9.8	41.2
Q 3	28.3	23.5	8.4	39.8	33.7	21.8	7.6	36.9
Q 4	31.0	25.7	9.1	34.2	37.5	21.6	7.6	33.3
Q 5	36.1	30.5	6.8	26.6	47.1	23.1	5.2	24.6
REGIONS								
North	37.7	19.8	9.4	33.1	45.1	18.5	6.6	29.7
South	26.3	27.6	9.8	36.2	31.1	24.3	9.4	35.2
East	15.0	25.7	15.3	43.9	22.4	22.6	13.7	41.3
West	22.6	15.6	9.0	52.8	24.6	15.8	9.0	50.6
ALL INDIA	**25.1**	**21.9**	**10.9**	**42.1**	**30.4**	**20.1**	**9.7**	**39.8**

Note: Responses are to the following statements: "For each issue please tell me, is the government spending sufficient, insufficient, not at all or do not know."

Appendix Table 17:
Social impact of science and technology
(All India, percentages) Year: 2003–04

Characteristic	Culture			Education			Economy		
	Significant	Not significant	do not know	Significant	Not significant	do not know	Significant	Not significant	do not know
LOCATION									
Rural	53.9	14.5	31.5	74.7	7.3	17.9	57.2	11.7	31.1
Urban	55.5	16.8	27.7	80.0	5.8	14.3	59.5	11.5	29.1
SEX									
Male	59.5	16.2	24.3	81.3	7.1	11.6	64.2	12.1	23.7
Female	49.3	14.2	36.6	71.2	6.6	22.1	51.5	11.2	37.3
AGE GROUPS (YEARS)									
10–30	56.5	15.1	28.4	79.0	7.1	13.9	59.8	12.2	27.9
31–45	54.4	14.6	31.0	75.1	6.2	18.7	57.7	11.6	30.6
Over 45	49.6	16.1	34.3	71.5	7.2	21.3	53.5	10.3	36.2
FORMAL EDUCATION									
Illiterate	34.8	12.2	53.0	55.1	6.6	38.2	35.9	9.7	54.4
Upto 12th	57.0	15.8	27.2	80.4	7.1	12.5	60.5	12.7	26.8
Graduate degree	76.1	17.7	6.2	92.1	6.3	1.6	83.9	10.1	6.1
Postgraduate degree	80.8	17.5	1.8	96.1	3.4	0.6	91.2	4.5	4.3
Other degrees	73.9	19.9	6.1	92.6	5.9	1.6	80.9	11.0	8.1
FORMAL OCCUPATION									
Professionals	74.2	17.8	7.9	93.5	4.4	2.2	82.0	9.6	8.4
Administrative workers	69.8	15.2	15.1	90.9	3.8	5.3	80.0	5.1	14.9
Clerical workers	67.4	20.5	12.0	89.1	6.8	4.1	76.0	12.6	11.4
Service workers	59.0	13.6	27.4	79.1	10.8	10.1	60.1	15.5	24.4
Productive workers	58.4	16.7	24.9	81.8	4.9	13.3	61.7	12.0	26.4
Others	52.7	14.9	32.4	74.7	7.0	18.3	55.9	11.7	32.5
INCOME QUANTILE (Q)									
Q 1	51.2	13.3	35.5	72.6	6.6	20.9	53.8	11.2	35.0
Q 2	53.8	14.4	31.8	74.8	7.7	17.5	56.3	12.2	31.5
Q 3	57.9	17.8	24.3	80.4	5.8	13.7	62.0	12.5	25.5
Q 4	59.5	18.8	21.7	83.0	8.3	8.7	64.7	11.9	23.4
Q 5	62.1	18.1	19.9	86.7	5.7	7.5	73.4	8.5	18.1
REGIONS									
North	61.4	14.3	24.4	82.6	5.9	11.5	68.7	8.8	22.4
South	49.2	22.2	28.6	72.6	11.0	16.3	56.5	15.7	27.8
East	58.8	13.1	28.1	72.7	7.3	20.0	60.1	13.3	26.6
West	48.8	12.2	39.0	77.1	4.0	19.0	47.9	9.3	42.8
ALL INDIA	**54.4**	**15.2**	**30.4**	**76.3**	**6.9**	**16.9**	**57.9**	**11.6**	**30.5**

Note: Responses are to the following statements: "For each issue area please tell me about the contribution of science and technology: significant, not significant or do not know."

(Cont...)

Appendix TaAppendix Table 17:
Social impact of science and technology
(All India, percentages) Year: 2003–04

Characteristic	Society			Agriculture			Environment			Day–to–day life		
	Significant	Not significant	do not know	Significant	Not significant	do not know	Significant	Not significant	do not know	Significant	Not significant	do not know
LOCATION												
Rural	64.4	10.5	25.0	74.0	8.4	17.6	61.6	9.2	29.2	70.1	7.5	22.4
Urban	67.4	11.0	21.6	69.3	9.2	21.5	61.9	11.4	26.7	75.0	7.1	17.9
SEX												
Male	70.6	11.2	18.2	77.4	8.3	14.3	67.7	10.3	22.0	76.0	7.7	16.3
Female	60.0	10.2	29.8	67.8	9.0	23.2	55.5	9.4	35.1	67.1	7.0	25.9
AGE GROUPS (YEARS)												
10–30	67.3	10.8	21.9	74.1	8.1	17.7	63.7	10.2	26.1	74.0	7.5	18.6
31–45	65.4	10.8	23.8	72.0	9.2	18.8	61.1	9.6	29.3	70.7	6.9	22.4
Over 45	60.5	10.4	29.1	70.0	9.1	20.9	57.6	9.3	33.1	66.9	7.7	25.4
FORMAL EDUCATION												
Illiterate	43.8	9.5	46.7	59.2	7.9	32.9	40.4	8.5	51.1	52.9	5.4	41.8
Upto 12th	68.7	11.2	20.1	74.7	9.0	16.4	64.6	10.5	24.9	74.4	8.3	17.3
Graduate degree	85.9	10.6	3.5	85.2	9.1	5.7	84.2	9.5	6.3	89.8	6.5	3.8
Postgraduate degree	91.3	6.0	2.6	92.4	4.2	3.5	91.7	5.7	2.6	95.8	2.7	1.5
Other degrees	85.8	5.8	8.4	87.0	7.2	5.8	86.4	5.6	8.0	93.7	5.3	1.0
FORMAL OCCUPATION												
Professionals	84.2	10.5	5.3	87.6	6.9	5.5	83.8	8.1	8.1	89.0	5.5	5.5
Administrative workers	81.2	5.3	13.5	83.9	6.5	9.7	72.4	8.2	19.4	86.1	5.8	8.2
Clerical workers	81.9	9.8	8.3	80.3	7.6	12.1	78.3	10.8	10.9	85.4	8.2	6.4
Service workers	67.8	10.7	21.4	72.3	7.8	19.9	66.3	9.0	24.7	78.1	5.6	16.3
Productive workers	66.9	11.0	22.1	75.0	9.4	15.6	63.9	12.1	24.0	74.0	10.0	16.0
Others	63.7	10.8	25.5	71.5	8.7	19.7	59.9	9.8	30.3	69.9	7.4	22.7
INCOME QUANTILE (Q)												
Q 1	60.8	10.0	29.2	70.7	7.3	22.0	58.2	8.4	33.4	67.9	5.9	26.2
Q 2	64.6	11.4	24.0	72.0	9.2	18.8	59.8	10.6	29.6	70.3	8.6	21.1
Q 3	69.5	11.2	19.3	74.8	9.3	15.9	65.3	11.0	23.7	75.6	8.4	16.0
Q 4	72.3	11.4	16.3	75.0	11.4	13.5	67.5	12.2	20.3	77.0	9.4	13.6
Q 5	79.0	9.6	11.3	81.1	8.1	10.9	77.0	8.6	14.4	83.8	5.1	11.0
REGIONS												
North	74.6	8.4	17.0	84.6	5.4	10.0	75.9	6.1	17.9	82.7	4.4	12.8
South	58.4	17.0	24.5	64.3	18.0	17.7	55.4	15.4	29.3	62.0	15.6	22.4
East	64.5	8.8	26.7	69.3	6.5	24.2	62.2	8.2	29.6	69.5	5.3	25.2
West	63.7	9.2	27.1	72.2	5.7	22.0	54.3	10.0	35.7	71.5	5.1	23.3
ALL INDIA	**65.3**	**10.7**	**24.0**	**72.6**	**8.6**	**18.7**	**61.6**	**9.8**	**28.5**	**71.5**	**7.4**	**21.1**

Note: Responses are to the following statements: "For each issue area please tell me about the contribution of science and technology: significant, not significant or do not know."

Appendix Table 18:
Public understanding of science and technology related issues
(All India, percentages) Year: 2003–04

Characteristic	Centre of the earth is very hot			The oxygen we breath comes from plants			Plants are living organisms		
	Correct	Incorrect	do not know	Correct	Incorrect	do not know	Correct	Incorrect	do not know
LOCATION									
Rural	53.5	10.7	35.8	85.1	2.5	12.3	87.2	3.0	9.8
Urban	65.1	7.5	27.4	87.1	2.7	10.2	89.8	2.8	7.4
SEX									
Male	62.8	9.9	27.3	90.0	2.3	7.7	90.8	2.5	6.6
Female	51.0	9.7	39.3	81.4	2.9	15.7	85.0	3.4	11.6
AGE GROUPS (YEARS)									
10–30	60.0	10.9	29.0	88.6	2.3	9.1	89.3	3.1	7.6
31–45	55.0	9.5	35.4	84.0	3.0	12.9	87.7	2.6	9.7
Over 45	51.9	7.5	40.6	80.9	2.8	16.3	85.1	3.0	11.9
FORMAL EDUCATION									
Illiterate	32.4	8.7	58.9	68.3	2.8	28.8	75.8	2.9	21.3
Upto 12th	60.2	10.5	29.3	89.4	2.6	8.0	90.4	3.1	6.5
Graduate degree	84.4	7.9	7.7	97.3	1.9	0.8	96.8	2.1	1.1
Postgraduate degree	87.5	6.2	6.2	97.8	2.1	0.1	98.9	0.8	0.2
Other degrees	95.1	3.0	1.9	98.1	1.7	0.2	97.5	1.0	1.6
FORMAL OCCUPATION									
Professionals	76.6	9.4	14.0	96.0	2.0	2.0	96.3	2.3	1.4
Administrative workers	82.1	7.3	10.6	92.7	4.9	2.4	95.1	0.9	4.0
Clerical workers	80.3	8.8	10.9	91.9	5.4	2.7	95.8	1.3	2.9
Service workers	63.5	8.8	27.7	89.5	1.7	8.8	91.6	3.2	5.1
Productive workers	66.7	7.6	25.6	91.5	2.1	6.4	89.8	3.7	6.5
Others	54.5	10.0	35.5	84.6	2.6	12.8	87.1	3.0	9.9
INCOME QUANTILE (Q)									
Q 1	48.7	9.8	41.4	81.8	2.9	15.3	84.9	3.3	11.8
Q 2	55.0	11.4	33.6	85.4	2.4	12.2	87.4	2.7	9.9
Q 3	65.9	9.3	24.8	89.7	2.3	8.0	91.9	2.2	5.9
Q 4	71.3	8.0	20.7	92.4	2.5	5.1	92.5	3.2	4.3
Q 5	75.3	6.8	17.8	92.6	2.0	5.4	92.7	2.8	4.5
REGIONS									
North	59.8	8.9	31.2	91.5	1.1	7.4	96.3	0.8	2.9
South	70.0	6.4	23.7	82.6	5.4	12.0	79.6	6.1	14.3
East	47.5	13.5	39.0	84.6	1.8	13.7	87.2	2.3	10.5
West	52.4	10.0	37.6	84.4	2.3	13.3	88.3	2.8	8.9
ALL INDIA	**56.9**	**9.8**	**33.3**	**85.7**	**2.6**	**11.7**	**87.9**	**2.9**	**9.1**

Note: Responses are to the statement: "Please tell me whether each statement is correct, incorrect or do not know."

(Cont...)

Appendix Table 18:
Public understanding of science and technology related issues
(All India, percentages) Year: 2003–04

Characteristic	We should not sleep under a dense tree at night			The new born baby is a boy or girl depends upon his/her father			Electrons are smaller than atoms		
	Correct	Incorrect	do not know	Correct	Incorrect	do not know	Correct	Incorrect	do not know
LOCATION									
Rural	75.4	10.9	13.6	35.4	29.5	35.1	27.4	8.5	64.1
Urban	78.7	10.4	10.9	45.2	26.5	28.3	37.6	10.0	52.4
SEX									
Male	80.0	10.2	9.8	41.0	29.8	29.2	36.4	9.2	54.4
Female	72.8	11.3	15.9	35.6	27.4	37.0	24.3	8.7	67.0
AGE GROUPS (YEARS)									
10–30	78.2	10.6	11.2	38.7	28.0	33.3	35.3	9.5	55.3
31–45	75.3	10.7	14.0	39.4	29.6	31.1	27.0	8.5	64.4
Over 45	73.4	11.3	15.3	36.1	29.0	35.0	23.0	8.2	68.8
FORMAL EDUCATION									
Illiterate	59.6	12.7	27.7	23.2	23.2	53.6	5.6	4.9	89.5
Upto 12th	79.4	10.9	9.8	39.2	30.2	30.6	31.5	9.9	58.6
Graduate degree	90.7	6.8	2.4	61.4	29.9	8.6	70.6	11.6	17.8
Postgraduate degree	94.2	5.2	0.6	66.6	27.8	5.6	77.9	9.5	12.6
Other degrees	93.4	3.7	2.9	61.3	30.6	8.1	74.0	11.6	14.4
FORMAL OCCUPATION									
Professionals	88.7	8.1	3.2	56.0	31.9	12.1	60.5	9.7	29.8
Administrative workers	83.9	5.3	10.8	53.5	29.1	17.4	57.0	9.9	33.2
Clerical workers	88.5	6.4	5.1	56.7	31.7	11.6	53.5	10.4	36.1
Service workers	80.0	10.1	10.0	42.0	28.1	29.9	41.0	7.6	51.4
Productive workers	79.3	10.4	10.2	41.2	29.4	29.5	34.7	6.9	58.5
Others	75.2	11.1	13.7	36.7	28.4	35.0	27.7	9.0	63.3
INCOME QUANTILE (Q)									
Q 1	71.9	11.6	16.5	32.9	26.2	41.0	23.1	7.4	69.5
Q 2	77.0	10.7	12.3	37.4	30.7	31.9	27.8	9.9	62.3
Q 3	81.0	9.8	9.2	42.2	30.9	26.9	35.1	10.8	54.1
Q 4	82.6	9.7	7.7	49.5	30.3	20.1	46.5	9.5	44.0
Q 5	83.5	9.6	6.9	52.0	27.1	20.8	55.3	10.8	33.9
REGIONS									
North	79.4	12.7	7.9	38.4	26.6	35.0	28.3	6.3	65.4
South	70.9	14.4	14.6	43.6	26.4	30.0	39.0	9.9	51.1
East	76.5	8.0	15.5	31.9	34.5	33.6	29.4	10.8	59.8
West	78.1	8.7	13.2	39.6	26.9	33.5	26.0	8.7	65.3
ALL INDIA	**76.4**	**10.8**	**12.8**	**38.3**	**28.6**	**33.1**	**30.4**	**8.9**	**60.7**

Note: Responses are to the statement: "Please tell me whether each statement is correct, incorrect or do not know."

(Cont...)

Appendix Table 18:
Public understanding of science and technology related issues
(All India, percentages) Year: 2003–04

Characteristic	Antibiotics kill viruses as well as bacteria			Vaccines must be administered prior to infection			The universe began with a huge explosion		
	Correct	Incorrect	do not know	Correct	Incorrect	do not know	Correct	Incorrect	do not know
LOCATION									
Rural	8.0	36.2	55.8	66.6	6.2	27.3	31.8	12.3	55.9
Urban	8.7	47.1	44.3	74.4	4.4	21.2	39.9	12.4	47.7
SEX									
Male	8.9	45.0	46.1	71.9	6.1	22.0	39.0	12.8	48.2
Female	7.4	33.8	58.7	65.8	5.2	29.0	29.4	11.8	58.8
AGE GROUPS (YEARS)									
10–30	8.7	43.6	47.7	70.9	6.0	23.1	36.9	12.5	50.6
31–45	7.2	37.8	54.9	69.6	5.6	24.8	33.1	12.4	54.5
Over 45	8.1	31.6	60.3	63.3	5.1	31.6	29.3	11.9	58.8
FORMAL EDUCATION									
Illiterate	4.7	13.9	81.3	50.7	4.4	44.9	11.5	9.3	79.1
Upto 12th	8.9	41.6	49.5	71.5	6.1	22.4	36.0	12.9	51.1
Graduate degree	10.1	75.8	14.0	87.7	5.6	6.7	67.3	15.2	17.5
Postgraduate degree	13.9	75.7	10.4	93.8	4.0	2.2	71.3	12.5	16.2
Other degrees	7.3	83.3	9.4	83.9	9.0	7.1	55.0	17.9	27.1
FORMAL OCCUPATION									
Professionals	11.4	66.7	21.8	84.9	5.6	9.5	56.3	15.6	28.2
Administrative workers	8.4	67.2	24.3	85.3	4.9	9.8	60.0	9.1	30.9
Clerical workers	8.4	68.0	23.7	83.5	5.3	11.2	58.0	16.0	26.0
Service workers	7.4	53.2	39.4	73.6	3.9	22.6	43.9	10.4	45.7
Productive workers	8.7	46.1	45.2	73.5	3.6	22.9	38.9	11.0	50.1
Others	8.0	36.5	55.5	67.2	5.8	26.9	31.9	12.2	55.9
INCOME QUANTILE (Q)									
Q 1	7.9	31.4	60.8	62.5	6.4	31.2	26.9	12.0	61.1
Q 2	7.5	36.9	55.6	69.8	4.8	25.4	32.3	12.0	55.7
Q 3	7.7	48.1	44.2	74.8	5.6	19.6	41.4	12.5	46.1
Q 4	10.9	53.8	35.3	77.6	5.2	17.2	46.3	14.0	39.7
Q 5	10.0	61.0	29.0	80.4	4.7	14.9	57.2	12.0	30.8
REGIONS									
North	8.1	30.6	61.3	82.5	5.5	11.9	34.8	8.7	56.5
South	8.0	55.6	36.4	62.9	6.8	30.3	41.3	13.2	45.5
East	9.5	35.3	55.1	53.8	7.9	38.4	30.1	13.0	56.9
West	7.2	37.4	55.3	75.6	2.9	21.5	31.7	13.9	54.3
ALL INDIA	**8.2**	**39.4**	**52.4**	**68.8**	**5.7**	**25.5**	**34.2**	**12.3**	**53.5**

Note: Responses are to the statement: "Please tell me whether each statement is correct, incorrect or do not know."

(Cont...)

Appendix Table 18:
Public understanding of science and technology related issues
(All India, percentages) Year: 2003–04

Characteristic	Human beings developed from earlier species of animals			Cigarette smoking causes lung cancer			Hybrid varieties yield more than local varieties		
	Correct	Incorrect	do not know	Correct	Incorrect	do not know	Correct	Incorrect	do not know
LOCATION									
Rural	52.3	11.8	35.8	85.3	3.6	11.2	73.1	4.8	22.1
Urban	63.6	8.6	27.8	91.2	2.2	6.6	66.4	4.6	29.0
SEX									
Male	61.3	11.2	27.5	90.0	3.0	7.0	77.5	4.4	18.1
Female	49.9	10.6	39.5	84.0	3.3	12.7	64.8	5.1	30.2
AGE GROUPS (YEARS)									
10–30	58.3	11.2	30.4	88.5	3.3	8.2	71.8	5.0	23.1
31–45	55.4	10.6	34.0	86.4	3.2	10.4	72.2	4.3	23.5
Over 45	49.6	10.5	39.8	84.2	2.9	12.9	68.5	4.5	27.0
FORMAL EDUCATION									
Illiterate	30.8	9.1	60.1	76.3	3.5	20.2	54.0	5.6	40.5
Upto 12th	59.0	11.7	29.3	89.0	3.2	7.8	73.7	4.6	21.6
Graduate degree	84.0	9.1	7.0	95.8	2.5	1.7	88.7	3.9	7.4
Postgraduate degree	83.3	11.9	4.8	97.8	1.4	0.8	91.4	2.5	6.1
Other degrees	86.0	7.4	6.6	97.5	2.4	0.1	92.3	4.7	3.1
FORMAL OCCUPATION									
Professionals	76.6	11.6	11.8	94.1	3.1	2.8	90.8	2.9	6.3
Administrative workers	77.7	7.8	14.5	97.7	0.8	1.6	86.8	1.9	11.3
Clerical workers	77.7	7.9	14.4	93.7	3.1	3.2	81.4	3.8	14.7
Service workers	68.7	7.8	23.6	92.0	1.7	6.3	76.5	2.7	20.9
Productive workers	61.4	11.4	27.2	91.8	1.9	6.3	75.4	7.0	17.5
Others	53.3	11.0	35.7	86.0	3.3	10.7	69.5	4.8	25.7
INCOME QUANTILE (Q)									
Q 1	47.4	11.4	41.2	83.2	3.7	13.0	67.0	4.3	28.7
Q 2	54.7	11.0	34.3	88.4	2.9	8.7	71.6	5.6	22.7
Q 3	63.7	10.5	25.8	90.0	2.6	7.4	75.3	4.6	20.1
Q 4	69.0	9.8	21.2	91.8	2.4	5.8	77.3	4.7	18.0
Q 5	75.1	9.6	15.4	92.3	3.3	4.4	77.1	4.7	18.3
REGIONS									
North	53.2	12.0	34.9	93.9	2.0	4.1	66.1	4.2	29.8
South	66.3	9.6	24.0	87.8	5.1	7.1	73.7	7.4	18.9
East	47.7	10.4	42.0	77.1	4.2	18.6	70.8	4.6	24.7
West	56.1	11.5	32.4	89.4	1.6	8.9	73.7	3.2	23.1
ALL INDIA	**55.6**	**10.9**	**33.5**	**87.0**	**3.2**	**9.8**	**71.2**	**4.7**	**24.1**

Note: Responses are to the statement: "Please tell me whether each statement is correct, incorrect or do not know."

Appendix Table 19:
Level of information about scientific technologies and processes
(All India, percentages) Year: 2003–04

Characteristic	Technologies and processes related to agriculture			Technologies and processes related to household sector		
	Least informed	Moderately informed	Most informed	Least informed	Moderately informed	Most informed
LOCATION						
Rural	13.0	52.1	35.0	4.5	30.7	64.8
Urban	27.0	48.1	24.9	0.7	16.5	82.8
SEX						
Male	12.5	46.5	41.1	2.3	22.0	75.7
Female	21.7	55.4	23.0	4.5	31.1	64.4
AGE GROUPS (YEARS)						
10–30	18.6	50.9	30.6	2.8	23.2	74.0
31–45	15.5	50.4	34.1	3.5	27.1	69.4
Over 45	15.4	51.6	33.0	4.6	33.5	61.9
FORMAL EDUCATION						
Illiterate	21.0	59.1	20.0	9.2	46.6	44.2
Upto 12th	17.2	50.8	31.9	2.0	23.3	74.7
Graduate degree	9.1	37.2	53.7	0.4	7.3	92.3
Postgraduate degree	5.9	28.3	65.8	0.0	3.3	96.7
Other degrees	2.4	34.9	62.8	0.5	3.6	95.9
FORMAL OCCUPATION						
Professionals	9.9	39.6	50.5	0.5	12.0	87.5
Administrative workers	8.4	43.1	48.5	0.2	6.2	93.6
Clerical workers	12.8	42.2	45.0	0.0	6.3	93.7
Service workers	16.9	41.7	41.4	1.5	12.9	85.6
Productive workers	15.8	51.9	32.3	1.3	14.6	84.1
Others	17.6	51.9	30.5	3.8	28.9	67.4
INCOME QUANTILE (Q)						
Q 1	18.5	53.9	27.6	5.5	35.1	59.4
Q 2	15.8	51.0	33.2	3.2	27.3	69.5
Q 3	15.3	49.4	35.3	1.3	17.5	81.3
Q 4	16.6	45.0	38.3	0.1	13.0	86.9
Q 5	17.1	42.6	40.4	0.3	8.7	91.0
REGIONS						
North	14.2	44.4	41.4	1.5	14.7	83.8
South	16.1	55.9	27.9	2.2	19.0	78.8
East	20.0	52.7	27.2	6.5	37.1	56.4
West	17.5	50.7	31.8	3.2	33.0	63.8
ALL INDIA	**17.1**	**50.9**	**32.0**	**3.4**	**26.5**	**70.1**

Note: Respondents have been asked to answer a set of questions about awareness and usage designed for agriculture, household, communication, and health techniques/technologies. For agriculture, some of the techniques/technologies include the use of manure/fertiliser, the use of water harvesting or green manuring. In the case of households, techniques/technologies are quite different and revolve around the use of durables like washing machines and water purifiers. In the case of health, it is the awareness about X–rays, CAT Scans and ECGs that are sought to be determined.

(Cont...)

Appendix Table 19:
Level of information about scientific technologies and processes
(All India, percentages) Year: 2003–04

Characteristic	Technologies and processes related to communication			Technologies and processes related to health		
	Least informed	Moderately informed	Most informed	Least informed	Moderately informed	Most informed
LOCATION						
Rural	44.4	36.7	18.9	21.6	64.3	14.1
Urban	22.2	36.6	41.2	14.1	59.4	26.4
SEX						
Male	29.7	38.1	32.1	16.6	61.7	21.6
Female	46.1	35.2	18.7	22.2	64.0	13.8
AGE GROUPS (YEARS)						
10–30	31.0	40.4	28.6	20.1	62.6	17.2
31–45	40.6	35.1	24.3	15.6	64.3	20.2
Over 45	50.5	30.1	19.4	22.0	61.9	16.1
FORMAL EDUCATION						
Illiterate	73.4	23.8	2.9	33.7	62.8	3.5
Upto 12th	31.6	44.0	24.4	17.5	66.1	16.5
Graduate degree	7.4	19.1	73.5	3.6	46.8	49.6
Postgraduate degree	2.0	12.8	85.3	0.7	31.8	67.5
Other degrees	3.2	14.8	82.0	1.2	40.0	58.8
FORMAL OCCUPATION						
Professionals	10.9	26.7	62.4	6.1	47.8	46.1
Administrative workers	9.1	23.1	67.8	4.8	42.4	52.8
Clerical workers	10.1	26.7	63.1	3.8	52.2	44.0
Service workers	22.2	38.3	39.5	9.6	65.8	24.7
Productive workers	23.8	41.6	34.7	16.3	60.7	23.0
Others	41.2	37.2	21.6	20.9	64.1	15.0
INCOME QUANTILE (Q)						
Q 1	48.4	35.6	16.0	24.9	63.3	11.9
Q 2	38.0	41.1	20.9	19.6	66.8	13.6
Q 3	28.7	38.4	32.8	13.2	63.5	23.4
Q 4	21.5	31.7	46.8	11.8	57.8	30.4
Q 5	12.5	28.8	58.7	8.1	47.8	44.1
REGIONS						
North	29.4	45.3	25.4	5.8	67.7	26.5
South	30.3	32.4	37.3	20.9	59.3	19.8
East	47.7	32.3	20.1	26.3	61.8	11.9
West	42.5	36.8	20.7	23.3	62.7	13.9
ALL INDIA	**37.9**	**36.7**	**25.4**	**19.4**	**62.9**	**17.7**

Note: Respondents have been asked to answer a set of questions about awareness and usage designed for agriculture, household, communication, and health techniques/technologies. For agriculture, some of the techniques/technologies include the use of manure/fertiliser, the use of water harvesting or green manuring. In the case of households, techniques/technologies are quite different and revolve around the use of durables like washing machines and water purifiers. In the case of health, it is the awareness about X–rays, CAT Scans and ECGs that are sought to be determined. The population was divided into the following three groups based on the number of questions answered correctly.

Appendix Table 20:
Public views and attitudes about natural phenomena
(All India, percentages) Year: 2003–04

Characteristic	Round	Shape of earth				When we throw an object upward, why does it come down to earth?				
		Flat	God's property	Others	do not know	Due to gravitational force	Nothing to grab upward	God knows	Others	do not know
LOCATION										
Rural	78.4	5.7	1.4	0.3	14.2	47.1	13.2	4.8	1.8	33.1
Urban	85.8	6.1	0.8	0.6	6.7	61.9	8.7	4.1	1.7	23.6
SEX										
Male	86.5	5.0	0.8	0.5	7.2	59.6	11.0	3.8	1.8	23.8
Female	74.7	6.6	1.7	0.3	16.7	43.3	12.9	5.4	1.6	36.8
AGE GROUPS (YEARS)										
10–30	85.2	4.9	0.8	0.4	8.7	58.4	10.5	3.3	1.5	26.3
31–45	78.6	6.4	1.2	0.3	13.5	47.6	13.2	4.8	1.7	32.7
Over 45	72.4	7.2	2.3	0.3	17.8	40.0	13.7	7.2	2.4	36.8
FORMAL EDUCATION										
Illiterate	55.6	8.1	3.4	0.3	32.6	10.3	20.8	9.4	2.3	57.3
Upto 12th	86.3	5.4	0.8	0.3	7.1	57.6	10.6	3.8	1.8	26.2
Graduate degree	94.7	3.3	0.1	1.1	0.8	93.9	2.9	0.3	0.4	2.5
Postgraduate degree	94.9	3.9	0.0	1.2	0.0	98.3	1.3	0.0	0.0	0.3
Other degrees	96.4	3.2	0.0	0.4	0.0	95.7	2.2	0.0	0.3	1.8
FORMAL OCCUPATION										
Professionals	91.1	4.2	0.0	0.7	4.0	83.3	5.2	1.7	0.9	9.0
Administrative workers	93.2	2.7	0.1	1.6	2.3	82.3	4.0	1.7	0.9	11.1
Clerical workers	95.0	2.9	0.1	0.4	1.6	84.4	5.5	0.9	0.4	8.8
Service workers	86.2	6.9	0.5	0.2	6.2	67.4	6.7	2.9	2.0	21.0
Productive workers	86.9	5.6	0.5	0.3	6.8	57.3	9.0	3.1	1.8	28.9
Others	79.2	6.0	1.4	0.4	13.1	48.2	12.7	5.0	1.8	32.3
INCOME QUANTILE (Q)										
Q 1	75.2	6.5	1.6	0.3	16.4	41.4	12.7	5.7	2.0	38.3
Q 2	78.9	6.6	1.6	0.2	12.7	48.5	13.7	5.3	1.5	31.1
Q 3	87.0	4.6	0.6	0.7	7.1	62.0	10.1	3.4	1.9	22.5
Q 4	90.6	4.0	0.6	0.5	4.4	69.7	9.8	2.2	1.2	17.1
Q 5	91.4	3.9	0.3	1.0	3.4	78.2	6.5	1.5	1.2	12.7
REGIONS										
North	82.6	3.3	0.8	0.6	12.8	47.6	16.6	2.5	3.0	30.3
South	84.5	7.2	0.5	0.5	7.2	56.9	9.6	4.0	1.1	28.4
East	76.7	2.7	1.2	0.3	19.1	50.9	7.5	4.4	0.8	36.4
West	79.2	9.4	2.3	0.2	8.8	50.8	13.8	7.0	2.0	26.4
ALL INDIA	**80.6**	**5.8**	**1.3**	**0.4**	**12.0**	**51.4**	**11.9**	**4.6**	**1.7**	**30.3**

Note: Respondents were posed a closed–ended set of questions related to geography and natural phenomenon. Based on responses to a particular question each respondent was characterised under a different response category.

(Cont...)

Appendix Table 20:
Public views and attitudes about natural phenomena
(All India, percentages) Year: 2003–04

Characteristic	How are days and night formed?					What is the effect on seeing the eclipse?				
	By rotation of earth	By rotation of sun	God knows	Others	do not know	Negative effect on eye	No harm in seeing	Bad effect on the unborn child	Others	do not know
LOCATION										
Rural	51.6	10.7	6.0	0.9	30.8	53.6	5.5	20.9	0.8	19.3
Urban	64.8	10.7	4.3	0.5	19.8	64.6	5.6	13.6	0.4	15.7
SEX										
Male	63.3	9.9	4.4	1.0	21.4	63.4	5.5	14.4	0.7	16.0
Female	47.6	11.4	6.6	0.6	33.8	50.2	5.5	23.1	0.7	20.4
AGE GROUPS (YEARS)										
10–30	61.9	9.7	4.3	0.5	23.5	61.0	5.2	16.1	0.5	17.2
31–45	52.4	10.9	5.8	0.9	30.0	54.2	6.3	20.2	0.4	18.9
Over 45	44.4	12.6	8.0	1.1	34.0	50.1	5.3	23.4	1.4	19.8
FORMAL EDUCATION										
Illiterate	17.8	15.5	11.5	1.3	53.9	35.1	5.2	29.2	0.8	29.7
Upto 12th	61.7	10.0	4.4	0.7	23.2	60.0	5.4	17.2	0.7	16.8
Graduate degree	90.6	6.0	0.4	0.2	2.8	79.9	7.0	8.1	0.3	4.7
Postgraduate degree	94.8	3.4	0.6	0.3	0.9	81.2	7.2	7.6	1.5	2.5
Other degrees	94.4	4.0	0.0	0.5	1.0	75.9	4.1	6.6	0.5	13.0
FORMAL OCCUPATION										
Professionals	80.4	6.7	1.6	0.8	10.5	74.3	6.9	11.1	0.1	7.6
Administrative workers	81.7	6.9	0.3	0.4	10.7	73.9	6.2	6.3	1.0	12.6
Clerical workers	81.0	9.0	1.5	0.2	8.4	72.4	8.4	8.9	0.4	9.8
Service workers	64.4	11.0	4.0	0.6	20.1	68.2	4.1	13.1	0.3	14.3
Productive workers	59.8	11.3	3.0	1.7	24.2	64.2	6.8	13.9	0.3	14.8
Others	53.0	10.9	6.0	0.7	29.3	54.8	5.3	19.9	0.8	19.3
INCOME QUANTILE (Q)										
Q 1	44.9	11.9	7.1	1.0	35.1	50.6	4.7	22.2	0.8	21.8
Q 2	54.1	11.4	5.9	0.6	28.0	57.4	5.6	18.3	0.7	18.0
Q 3	65.8	9.4	3.5	0.6	20.7	61.9	6.5	16.0	0.9	14.7
Q 4	73.2	8.2	3.1	0.3	15.3	66.5	6.0	13.9	0.4	13.3
Q 5	80.7	6.3	2.3	0.8	10.0	69.3	8.1	10.3	0.4	11.9
REGIONS										
North	55.7	12.8	5.3	1.4	24.8	70.1	2.3	17.5	1.0	9.1
South	56.3	11.5	3.8	0.3	28.2	52.2	7.1	10.7	0.6	29.4
East	54.0	6.6	4.8	0.5	34.2	53.2	5.5	19.4	0.3	21.6
West	55.9	12.0	7.7	0.9	23.5	52.6	6.9	25.8	0.9	13.9
ALL INDIA	**55.5**	**10.7**	**5.5**	**0.8**	**27.6**	**56.8**	**5.5**	**18.8**	**0.7**	**18.2**

Note: Respondents were posed a closed–ended set of questions related to geography and natural phenomenon. Based on responses to a particular question each respondent was characterised under a different response category.

(Cont...)

Appendix Table 20:
Public views and attitudes about natural phenomena
(All India, percentages) Year: 2003–04

Characteristic	How do eclipses occur					How did human beings/man evolve?				
	When earth or moon comes in between	Due to shadow of stars	Due to rahu or ketu	Others	do not know	Biological theory	Monkey	Brahma/ Adam	Others	do not know
LOCATION										
Rural	38.1	5.5	12.4	1.5	42.6	14.9	40.4	13.0	0.7	31.1
Urban	50.5	7.1	6.7	1.1	34.5	22.6	42.6	10.6	0.5	23.8
SEX										
Male	48.1	6.3	9.0	0.9	35.6	19.7	44.1	11.8	0.8	23.6
Female	35.3	5.6	12.4	1.9	44.8	14.5	37.9	12.8	0.5	34.3
AGE GROUPS (YEARS)										
10–30	46.8	5.8	8.5	1.0	37.9	19.0	43.0	10.3	0.7	27.0
31–45	39.3	6.4	11.6	1.5	41.1	16.8	39.7	13.6	0.4	29.5
Over 45	32.8	5.9	14.8	2.1	44.4	13.3	38.0	15.3	0.6	32.8
FORMAL EDUCATION										
Illiterate	9.3	4.0	19.0	3.5	64.2	2.9	29.5	15.9	0.7	51.0
Upto 12th	44.8	6.9	9.6	0.9	37.8	17.1	44.5	12.2	0.6	25.6
Graduate degree	84.8	4.9	1.7	0.2	8.4	44.4	43.0	5.6	0.4	6.6
Postgraduate degree	94.0	2.1	0.5	0.5	2.9	49.3	40.3	6.2	1.7	2.4
Other degrees	84.8	3.8	1.1	0.7	9.6	45.0	49.1	2.8	1.2	1.9
FORMAL OCCUPATION										
Professionals	73.2	4.7	4.4	1.3	16.4	37.9	40.1	7.2	0.6	14.2
Administrative workers	67.2	8.0	0.5	0.2	24.1	41.3	38.9	11.2	0.6	8.0
Clerical workers	73.2	7.4	2.5	0.5	16.2	36.6	44.5	6.0	0.3	12.6
Service workers	51.4	6.4	5.2	0.7	36.4	19.5	47.2	7.9	0.5	24.9
Productive workers	44.3	6.6	8.6	0.8	39.6	18.7	41.5	12.8	1.1	26.0
Others	38.9	5.9	11.6	1.5	42.1	15.3	40.8	12.8	0.6	30.5
INCOME QUANTILE (Q)										
Q 1	32.5	5.1	14.0	1.7	46.7	11.9	35.9	15.0	0.7	36.6
Q 2	38.2	6.3	10.7	1.3	43.5	15.1	45.8	11.0	0.8	27.4
Q 3	50.9	6.5	7.1	1.5	34.0	21.5	45.7	11.0	0.6	21.1
Q 4	59.7	7.7	6.2	0.4	26.0	28.3	43.6	8.1	0.2	19.8
Q 5	69.3	6.5	4.4	0.1	19.8	33.4	40.8	9.2	0.4	16.2
REGIONS										
North	43.0	2.9	9.7	3.3	41.1	9.6	39.6	15.1	1.0	34.7
South	40.7	9.4	7.2	0.8	41.9	24.2	48.5	8.2	0.8	18.4
East	42.0	3.6	13.6	0.6	40.2	17.6	33.6	10.9	0.5	37.4
West	41.2	7.8	11.9	1.0	38.1	17.3	42.9	14.5	0.3	25.1
ALL INDIA	**41.7**	**6.0**	**10.7**	**1.4**	**40.2**	**17.1**	**41.0**	**12.3**	**0.6**	**29.0**

Note: Respondents were posed a closed–ended set of questions related to geography and natural phenomenon. Based on responses to a particular question each respondent was characterised under a different response category.

(Cont...)

Appendix Table 20:
Public views and attitudes about natural phenomena
(All India, percentages) Year: 2003–04

Characteristic	How rainbow is formed					On which objects lightning strikes most				
	Shadow falling on rain drops	A symbol of rain	Indra/ Rama's bow	Others	do not know	High trees	Black objects	Eldest sibling	Others	do not know
LOCATION										
Rural	31.8	23.9	9.6	1.0	33.8	59.1	18.1	2.6	3.9	16.3
Urban	42.1	26.1	5.0	0.5	26.4	60.7	17.7	3.4	3.6	14.6
SEX										
Male	40.4	23.6	6.6	1.1	28.3	61.5	18.4	2.5	4.3	13.2
Female	29.2	25.4	9.9	0.6	34.9	57.6	17.5	3.2	3.4	18.4
AGE GROUPS (YEARS)										
10–30	38.2	23.8	6.9	0.7	30.3	60.8	17.9	2.5	3.4	15.3
31–45	33.1	25.1	9.0	0.9	32.0	59.1	18.4	2.9	4.0	15.6
Over 45	29.1	25.4	10.4	1.0	34.1	57.2	17.6	3.6	4.6	17.1
FORMAL EDUCATION										
Illiterate	12.8	24.1	15.6	0.8	46.7	44.9	22.1	3.6	4.7	24.8
Upto 12th	35.4	26.2	7.0	0.9	30.6	61.4	17.2	3.0	3.8	14.7
Graduate degree	73.5	14.8	1.7	0.6	9.4	76.8	14.8	0.7	2.4	5.2
Postgraduate degree	80.8	14.8	0.8	0.3	3.3	77.2	15.8	0.5	2.4	4.1
Other degrees	66.9	20.0	0.9	1.6	10.6	85.8	10.0	0.6	1.7	1.9
FORMAL OCCUPATION										
Professionals	62.7	16.8	1.6	0.6	18.4	75.9	12.6	1.1	3.3	7.2
Administrative workers	66.2	21.5	0.5	0.2	11.5	80.7	8.2	3.8	0.8	6.5
Clerical workers	66.5	18.0	2.5	0.4	12.5	66.8	21.2	2.2	3.0	6.9
Service workers	39.8	25.3	4.7	1.2	29.0	65.2	13.0	3.5	4.1	14.2
Productive workers	34.9	28.2	6.1	0.7	30.0	51.3	22.1	4.8	4.3	17.5
Others	32.4	24.8	8.9	0.9	33.0	58.7	18.2	2.8	3.9	16.5
INCOME QUANTILE (Q)										
Q 1	27.9	22.7	11.0	1.1	37.3	57.9	15.7	2.7	3.9	19.9
Q 2	32.3	26.9	7.8	0.7	32.3	62.3	17.6	3.0	3.8	13.3
Q 3	39.6	26.8	5.4	0.8	27.4	59.6	20.5	3.2	3.6	13.1
Q 4	50.5	23.9	4.6	0.5	20.5	60.2	22.1	2.6	3.4	11.6
Q 5	57.2	22.1	3.1	0.2	17.5	59.0	21.7	3.1	5.6	10.6
REGIONS										
North	28.4	26.8	7.6	1.2	36.1	49.2	33.8	2.2	6.3	8.6
South	41.0	27.8	2.6	0.8	27.8	61.9	8.4	4.4	1.9	23.5
East	33.4	13.2	12.6	0.9	39.9	72.8	3.2	0.9	1.1	21.9
West	36.5	30.0	9.3	0.5	23.7	54.5	25.6	3.9	5.8	10.2
ALL INDIA	**34.8**	**24.5**	**8.2**	**0.8**	**31.6**	**59.5**	**18.0**	**2.8**	**3.8**	**15.8**

Note: Respondents were posed a closed–ended set of questions related to geography and natural phenomenon. Based on responses to a particular question each respondent was characterised under a different response category.

(Cont...)

Appendix Table 20:
Public views and attitudes about natural phenomena
(All India, percentages) Year: 2003–04

Characteristic	Why does earthquake occur					What are the causes of famine/flood				
	Due to some activity under the earth's crust	Shaking of earth/heat/ repositioning of the snake's horn	Caused by god	Others	do not know	Natural	Due to cutting of forests/ trees	Due to impact of goddess	Others	do not know
LOCATION										
Rural	33.7	19.0	7.6	1.3	38.3	28.4	33.6	10.2	1.9	25.9
Urban	47.1	15.9	6.2	2.1	28.8	37.6	35.6	6.0	2.8	18.0
SEX										
Male	44.2	16.8	6.0	1.9	31.1	33.3	38.2	6.2	2.3	20.1
Female	31.0	19.5	8.4	1.1	40.0	28.9	30.1	11.8	2.0	27.2
AGE GROUPS (YEARS)										
10–30	41.2	16.6	6.0	1.3	34.9	31.2	36.5	7.4	2.1	22.9
31–45	36.3	19.2	6.6	1.6	36.2	30.8	33.5	9.5	2.5	23.8
Over 45	31.1	20.3	10.5	1.8	36.3	31.1	29.5	12.2	2.0	25.2
FORMAL EDUCATION										
Illiterate	9.0	23.9	12.5	1.3	53.3	19.2	18.4	19.6	2.7	40.2
Upto 12th	39.6	17.9	6.4	1.7	34.4	32.6	36.8	6.9	2.1	21.5
Graduate degree	80.7	8.8	1.5	1.0	8.1	46.7	46.7	0.9	1.7	4.1
Postgraduate degree	86.3	7.7	1.2	0.6	4.3	36.1	59.9	0.4	1.1	2.5
Other degrees	84.7	5.6	3.3	0.8	5.7	51.7	40.8	1.0	1.3	5.2
FORMAL OCCUPATION										
Professionals	71.3	9.5	3.3	0.8	15.2	40.9	44.0	2.2	1.7	11.2
Administrative workers	67.3	8.5	2.2	0.6	21.4	45.8	39.6	1.4	2.1	11.1
Clerical workers	68.8	12.7	3.7	0.5	14.3	43.8	42.3	2.6	1.1	10.3
Service workers	42.4	17.3	5.1	2.9	32.4	40.6	34.6	5.7	2.7	16.4
Productive workers	42.1	13.0	5.1	2.0	37.8	33.5	29.7	6.7	4.0	26.1
Others	34.7	19.0	7.7	1.5	37.1	29.8	33.7	9.7	2.1	24.7
INCOME QUANTILE (Q)										
Q 1	28.1	19.4	8.1	1.4	43.0	27.2	29.3	10.7	2.6	30.2
Q 2	35.4	19.2	7.7	1.6	36.1	30.5	34.2	10.2	2.0	23.2
Q 3	46.0	16.3	5.8	1.7	30.3	36.2	38.1	6.2	2.0	17.5
Q 4	56.3	16.1	5.8	1.8	20.1	37.2	42.0	5.9	1.6	13.3
Q 5	61.9	12.1	5.0	0.6	20.4	35.6	46.2	4.6	0.9	12.5
REGIONS										
North	31.0	26.3	7.4	2.3	33.0	15.4	39.0	12.3	4.2	29.2
South	40.3	10.6	6.0	1.0	42.1	34.6	33.2	3.5	3.1	25.6
East	37.3	15.4	3.4	0.3	43.5	36.5	24.5	9.1	1.0	28.9
West	41.2	19.8	11.3	2.3	25.3	36.5	39.4	10.5	0.7	12.8
ALL INDIA	**37.6**	**18.1**	**7.2**	**1.5**	**35.5**	**31.1**	**34.1**	**9.0**	**2.2**	**23.6**

Note: Respondents were posed a closed–ended set of questions related to geography and natural phenomenon. Based on responses to a particular question each respondent was characterised under a different response category.

(Cont...)

Appendix Table 20:
Public views and attitudes about natural phenomena
(All India, percentages) Year: 2003–04

Characteristic	Why one should not sleep under a tree at night					Why is water from handpump/well cool in summers and warm				
	Release of bad air	Tradition	Ghost residing on trees	Others	do not know	Constant temperature of water	Heat inside the earth	in winters? God knows	Others	do not know
LOCATION										
Rural	49.7	8.3	10.3	6.7	24.9	24.2	16.7	8.5	1.1	49.5
Urban	60.5	9.8	7.4	3.9	18.3	32.9	18.3	7.0	1.6	40.3
SEX										
Male	59.8	8.5	6.8	5.7	19.2	31.9	18.3	6.4	1.2	42.2
Female	45.9	9.1	12.1	6.1	26.8	21.6	16.0	9.7	1.2	51.4
AGE GROUPS (YEARS)										
10–30	57.1	8.3	7.8	5.5	21.3	29.9	16.6	6.4	1.1	45.9
31–45	51.7	9.0	9.9	5.9	23.5	24.7	18.2	8.7	1.4	47.1
Over 45	44.7	9.5	12.9	6.8	26.2	21.9	17.4	10.9	1.2	48.6
FORMAL EDUCATION										
Illiterate	22.8	9.6	19.3	9.9	38.4	5.3	13.3	16.0	1.3	64.0
Upto 12th	56.8	9.3	7.7	5.2	21.0	27.1	18.6	6.5	1.2	46.6
Graduate degree	86.2	4.7	1.0	2.3	5.8	65.3	15.4	1.6	1.2	16.5
Postgraduate degree	95.1	1.9	0.7	1.1	1.3	70.2	20.5	1.1	1.3	6.9
Other degrees	89.3	5.1	2.2	1.7	1.8	71.6	14.3	1.3	0.9	11.9
FORMAL OCCUPATION										
Professionals	79.8	5.4	2.6	4.2	8.0	55.3	15.9	2.6	1.7	24.5
Administrative workers	75.7	4.5	1.8	4.5	13.6	49.9	15.0	2.2	1.4	31.6
Clerical workers	80.0	8.4	2.0	2.2	7.4	52.0	22.3	3.3	1.0	21.5
Service workers	64.4	5.4	5.9	6.5	17.8	30.7	16.7	8.3	2.0	42.3
Productive workers	55.3	9.0	8.0	5.8	21.9	24.9	17.1	6.4	1.8	49.9
Others	50.3	9.1	10.2	6.1	24.3	24.6	17.2	8.6	1.1	48.5
INCOME QUANTILE (Q)										
Q 1	43.8	9.2	11.4	7.7	27.8	20.8	16.4	8.6	1.2	53.0
Q 2	52.8	7.4	10.4	6.3	23.0	24.9	16.8	9.3	1.1	47.9
Q 3	60.9	9.2	6.7	3.5	19.6	30.7	18.4	6.7	1.3	42.9
Q 4	67.0	9.7	6.3	2.9	14.0	40.3	17.8	6.3	1.3	34.3
Q 5	74.3	6.8	4.3	2.9	11.6	44.9	20.2	6.0	1.3	27.6
REGIONS										
North	60.4	3.6	7.8	11.3	16.9	26.3	20.9	10.7	1.5	40.6
South	45.8	13.5	8.2	5.9	26.6	29.6	18.2	5.0	0.9	46.3
East	51.2	5.1	11.8	3.4	28.6	29.0	7.9	3.9	0.6	58.6
West	53.8	12.6	9.8	3.6	20.3	22.9	21.4	11.9	1.8	41.9
ALL INDIA	**52.9**	**8.8**	**9.5**	**5.9**	**23.0**	**26.7**	**17.2**	**8.1**	**1.2**	**46.8**

Note: Respondents were posed a closed–ended set of questions related to geography and natural phenomenon. Based on responses to a particular question each respondent was characterised under a different response category.

Appendix Table 21:
Public perception towards significant contribution of science and technology
(All India, percentages) Year: 2003–04

Characteristic	Weather Forecasting			Communication			Transport		
	Yes	No	do not know	Yes	No	do not know	Yes	No	do not know
LOCATION									
Rural	30.0	21.2	48.8	67.8	10.2	22.0	68.9	11.6	19.5
Urban	40.6	20.7	38.7	76.3	7.3	16.5	73.7	10.2	16.1
SEX									
Male	38.2	22.9	38.9	76.2	9.0	14.7	75.6	11.1	13.2
Female	27.9	19.2	52.9	64.3	9.7	26.0	65.0	11.3	23.7
AGE GROUPS (YEARS)									
10–30	35.0	21.3	43.7	72.3	9.4	18.4	71.4	11.4	17.2
31–45	33.4	21.2	45.4	71.1	9.0	19.9	71.0	10.6	18.4
Over 45	28.5	20.4	51.1	64.8	9.8	25.5	67.1	11.4	21.4
FORMAL EDUCATION									
Illiterate	14.8	16.9	68.4	53.8	10.2	36.0	57.0	11.2	31.7
Upto 12th	34.0	22.4	43.5	72.2	9.7	18.1	71.8	11.7	16.5
Graduate degree	60.5	22.3	17.2	89.5	6.6	3.9	86.4	8.8	4.8
Postgraduate degree	72.2	16.6	11.2	94.7	3.3	2.0	91.4	6.2	2.4
Other degrees	76.4	15.6	8.0	92.6	4.4	3.0	93.4	4.7	1.9
FORMAL OCCUPATION									
Professionals	57.3	22.2	20.4	86.5	7.1	6.4	86.2	8.3	5.4
Administrative workers	60.3	14.1	25.6	83.3	5.6	11.1	77.8	11.0	11.2
Clerical workers	56.1	20.7	23.2	87.7	4.8	7.5	87.4	7.4	5.2
Service workers	44.0	24.0	32.0	82.6	7.4	10.0	81.3	7.9	10.9
Productive workers	39.9	22.0	38.2	79.9	7.5	12.6	77.9	7.2	14.9
Others	30.5	21.0	48.5	68.1	9.8	22.1	68.4	11.7	19.8
INCOME QUANTILE (Q)									
Q 1	27.4	20.8	51.8	63.0	11.1	25.9	66.1	12.1	21.8
Q 2	31.5	22.4	46.1	72.4	8.6	19.0	71.9	10.8	17.2
Q 3	39.2	20.3	40.5	77.2	7.5	15.3	73.6	10.3	16.1
Q 4	41.9	21.2	36.9	78.2	8.1	13.7	74.8	10.6	14.6
Q 5	51.5	19.1	29.4	82.3	7.3	10.4	78.8	10.0	11.2
REGIONS									
North	46.5	17.0	36.5	84.0	2.9	13.1	83.1	3.9	13.0
South	30.6	28.9	40.5	65.2	12.7	22.1	65.0	14.2	20.9
East	23.2	25.1	51.7	57.1	15.8	27.1	57.4	16.9	25.6
West	32.7	14.6	52.8	74.5	6.4	19.1	75.3	9.9	14.8
ALL INDIA	**33.1**	**21.1**	**45.9**	**70.2**	**9.4**	**20.4**	**70.3**	**11.2**	**18.5**

Note: Responses are to the following issues: "For each issue area, please tell me, is the contribution of science and technology significant: yes, no or do not know."

(Cont...)

Appendix Table 21:
Public perception towards significant contribution of science and technology
(All India, percentages) Year: 2003–04

Characteristic	Health			Education			Agriculture		
	Yes	No	do not know	Yes	No	do not know	Yes	No	do not know
LOCATION									
Rural	65.8	16.5	17.7	68.1	13.5	18.4	66.3	15.8	17.9
Urban	71.0	14.2	14.9	72.3	11.3	16.4	55.8	16.1	28.0
SEX									
Male	71.4	15.6	12.9	74.2	12.6	13.2	69.6	15.2	15.2
Female	63.1	16.1	20.8	64.4	13.2	22.4	56.8	16.6	26.6
AGE GROUPS (YEARS)									
10–30	69.1	14.7	16.2	72.1	12.0	15.9	62.8	16.1	21.1
31–45	67.4	16.1	16.6	68.6	13.5	17.9	65.1	15.3	19.6
Over 45	63.1	18.2	18.8	63.8	14.2	21.9	62.0	16.2	21.8
FORMAL EDUCATION									
Illiterate	52.8	17.7	29.5	52.2	13.9	33.8	53.6	15.7	30.7
Upto 12th	69.1	15.8	15.0	72.0	12.9	15.1	64.0	16.2	19.9
Graduate degree	83.6	12.7	3.7	86.0	11.5	2.5	75.7	16.0	8.4
Postgraduate degree	88.2	10.5	1.3	88.3	9.7	2.0	83.0	10.4	6.6
Other degrees	92.1	6.8	1.1	95.2	3.7	1.2	91.4	4.6	4.0
FORMAL OCCUPATION									
Professionals	81.9	13.8	4.3	86.1	9.6	4.3	78.5	13.5	8.0
Administrative workers	76.3	14.8	9.0	77.1	11.8	11.1	69.7	14.4	15.9
Clerical workers	83.5	11.9	4.6	84.0	12.5	3.5	75.6	15.2	9.2
Service workers	76.7	13.2	10.1	81.6	8.8	9.6	72.3	8.3	19.4
Productive workers	75.9	12.4	11.6	78.3	9.1	12.5	70.7	13.1	16.2
Others	65.5	16.3	18.3	67.4	13.4	19.3	61.5	16.4	22.1
INCOME QUANTILE (Q)									
Q 1	64.6	16.0	19.4	66.1	13.1	20.8	62.2	15.7	22.1
Q 2	65.4	17.4	17.2	67.9	14.1	18.0	62.9	16.7	20.4
Q 3	71.5	14.3	14.1	73.0	11.8	15.2	65.4	15.1	19.4
Q 4	72.2	14.7	13.1	76.5	10.8	12.7	64.0	15.5	20.5
Q 5	75.0	14.4	10.6	75.1	14.8	10.1	63.5	18.4	18.1
REGIONS									
North	76.2	10.6	13.2	79.0	6.5	14.5	74.8	6.9	18.2
South	61.9	20.2	18.0	63.1	17.6	19.3	53.3	25.4	21.3
East	53.7	23.4	22.9	58.1	19.5	22.5	55.3	21.3	23.5
West	76.3	10.0	13.7	76.3	8.5	15.2	68.5	11.0	20.5
ALL INDIA	**67.3**	**15.8**	**16.9**	**69.3**	**12.9**	**17.8**	**63.2**	**15.9**	**20.9**

Note: Responses are to the following issues: "For each issue area, please tell me, is the contribution of science and technology significant: yes, no or do not know."

(Cont...)

Appendix Table 21:
Public perception towards significant contribution of science and technology
(All India, percentages) Year: 2003–04

Characteristic	Availability of goods and services			National security		
	Yes	No	do not know	Yes	No	do not know
LOCATION						
Rural	39.8	24.0	36.2	27.9	18.9	53.2
Urban	43.0	22.8	34.2	35.9	21.3	42.8
SEX						
Male	45.3	25.2	29.5	37.6	20.7	41.7
Female	36.2	22.1	41.7	22.8	18.5	58.7
AGE GROUPS (YEARS)						
10–30	41.8	24.1	34.0	32.6	19.3	48.2
31–45	41.9	23.4	34.7	30.3	20.2	49.6
Over 45	37.1	22.9	40.0	24.9	19.8	55.3
FORMAL EDUCATION						
Illiterate	29.1	20.3	50.6	11.4	16.8	71.8
Upto 12th	40.8	24.8	34.4	31.2	20.2	48.6
Graduate degree	60.7	25.1	14.2	58.0	22.9	19.0
Postgraduate degree	75.2	15.1	9.7	71.8	16.1	12.0
Other degrees	66.6	20.7	12.8	72.2	17.3	10.5
FORMAL OCCUPATION						
Professionals	61.3	21.4	17.3	54.5	21.5	24.0
Administrative workers	55.4	21.1	23.6	60.1	17.8	22.1
Clerical workers	56.3	25.0	18.7	54.2	21.1	24.7
Service workers	46.7	27.1	26.1	39.0	23.8	37.2
Productive workers	45.2	22.8	32.1	38.6	17.5	43.8
Others	38.9	23.7	37.4	27.6	19.5	52.9
INCOME QUANTILE (Q)						
Q 1	36.6	23.2	40.2	24.9	18.6	56.5
Q 2	42.5	24.1	33.3	29.5	21.4	49.0
Q 3	44.4	23.3	32.3	34.7	19.6	45.7
Q 4	43.9	25.3	30.8	38.4	19.7	41.9
Q 5	50.5	22.0	27.5	48.6	19.7	31.8
REGIONS						
North	68.2	9.6	22.2	44.1	11.9	44.0
South	25.0	34.3	40.7	26.9	26.5	46.6
East	29.9	31.6	38.5	19.4	27.5	53.1
West	40.3	19.8	40.0	31.0	13.5	55.5
ALL INDIA	**40.8**	**23.7**	**35.6**	**30.2**	**19.6**	**50.2**

Note: Responses are to the following issues: "For each issue area, please tell me, is the contribution of science and technology significant: yes, no or do not know."

Appendix Table 22:
Public perception about scientists and scientific research
(All India, percentages) Year: 2003–04

Characteristic	A scientist usually works alone			Scientific work is harmful			Researchers work for the good of humanity		
	Agree	Disagree	do not know	Agree	Disagree	do not know	Agree	Disagree	do not know
LOCATION									
Rural	33.0	25.9	41.1	34.1	34.1	31.8	61.9	7.4	30.7
Urban	41.7	26.5	31.8	43.0	32.3	24.8	69.4	7.3	23.3
SEX									
Male	39.8	28.6	31.6	38.6	37.6	23.8	69.7	7.4	22.9
Female	31.3	23.5	45.2	34.8	29.5	35.7	58.5	7.3	34.2
AGE GROUPS (YEARS)									
10–30	38.7	27.4	33.9	39.1	34.4	26.4	67.2	8.2	24.7
31–45	34.3	26.6	39.0	35.6	34.9	29.5	63.6	6.6	29.8
Over 45	29.8	22.5	47.7	32.3	30.1	37.5	57.6	6.4	36.0
FORMAL EDUCATION									
Illiterate	17.1	14.0	68.9	23.2	20.8	56.0	40.6	5.4	54.0
Upto 12th	38.2	28.0	33.8	39.3	35.2	25.5	67.9	7.9	24.2
Graduate degree	55.5	37.8	6.7	47.2	48.4	4.4	85.7	9.0	5.2
Postgraduate degree	53.8	41.8	4.4	41.6	56.6	1.8	92.5	4.9	2.5
Other degrees	77.8	16.1	6.0	70.7	23.0	6.3	85.7	6.4	8.0
FORMAL OCCUPATION									
Professionals	51.7	38.0	10.3	44.8	48.7	6.5	84.7	8.5	6.8
Administrative workers	61.9	23.0	15.2	48.2	37.7	14.1	77.1	8.4	14.5
Clerical workers	52.7	30.8	16.5	48.0	39.6	12.4	79.8	10.9	9.3
Service workers	36.2	33.7	30.0	37.9	36.6	25.5	70.4	7.2	22.3
Productive workers	44.6	21.2	34.2	43.3	29.2	27.5	70.2	6.1	23.7
Others	33.7	25.5	40.9	35.6	32.8	31.6	62.2	7.3	30.5
INCOME QUANTILE (Q)									
Q 1	31.1	23.1	45.7	33.4	30.8	35.8	57.1	7.0	35.9
Q 2	33.7	25.4	40.8	38.4	30.8	30.8	63.9	7.2	28.9
Q 3	40.4	28.3	31.3	39.6	35.4	25.1	70.2	8.1	21.7
Q 4	46.4	31.0	22.6	41.1	41.7	17.2	76.5	8.0	15.5
Q 5	40.4	37.3	22.4	36.7	48.3	15.1	77.7	7.3	15.0
REGIONS									
North	27.0	39.6	33.4	30.6	48.9	20.5	82.3	4.2	13.6
South	51.1	13.8	35.1	46.1	18.4	35.5	51.2	10.7	38.2
East	30.1	29.0	41.0	29.7	37.5	32.8	56.1	9.8	34.0
West	35.0	22.1	42.9	40.4	29.5	30.1	66.3	5.2	28.5
ALL INDIA	**35.5**	**26.1**	**38.4**	**36.7**	**33.6**	**29.7**	**64.1**	**7.4**	**28.6**

Note: Responses are to the following statements: "For each statement, whether you generally agree, disagree or do not know."

(Cont...)

Appendix Table 22:
Public perception about scientists and scientific research
(All India, percentages) Year: 2003–04

Characteristic	Scientists do not enjoy much as other people do			Scientists help in solving the problems			Scientists are considered as peculiar people			Scientists are not likely to be religious minded		
	Agree	Disagree	do not know	Agree	Disagree	do not know	Agree	Disagree	do not know	Agree	Disagree	do not know
LOCATION												
Rural	44.4	16.0	39.5	62.0	8.2	29.9	39.9	20.2	39.9	32.1	23.5	44.3
Urban	47.6	20.3	32.0	68.9	7.9	23.2	45.9	21.2	33.0	36.1	27.1	36.8
SEX												
Male	50.1	18.5	31.5	69.1	8.7	22.2	45.6	22.9	31.5	37.5	27.0	35.4
Female	40.7	16.1	43.2	58.8	7.5	33.6	37.7	18.1	44.2	29.0	22.1	48.8
AGE GROUPS (YEARS)												
10–30	48.6	18.3	33.1	67.2	8.5	24.3	43.8	22.0	34.2	34.3	26.5	39.2
31–45	43.6	17.3	39.0	63.3	8.0	28.7	41.0	20.4	38.6	33.0	24.4	42.6
Over 45	40.1	15.0	44.9	57.5	7.3	35.3	37.6	17.3	45.2	31.3	20.6	48.1
FORMAL EDUCATION												
Illiterate	28.2	10.5	61.2	41.2	6.2	52.6	25.8	11.2	63.0	19.2	13.7	67.1
Upto 12th	47.6	18.4	34.1	67.8	8.6	23.7	43.5	22.3	34.2	35.0	26.3	38.7
Graduate degree	64.0	24.9	11.1	84.7	9.4	5.9	60.5	28.0	11.5	50.7	33.7	15.6
Postgraduate degree	73.0	21.8	5.2	91.0	7.1	1.9	63.4	31.4	5.2	48.8	44.3	6.9
Other degrees	63.0	21.9	15.1	86.0	8.5	5.6	66.7	19.9	13.5	49.7	32.0	18.3
FORMAL OCCUPATION												
Professionals	60.7	24.5	14.8	85.3	8.2	6.5	57.4	30.1	12.5	50.9	32.6	16.5
Administrative workers	53.6	26.4	20.0	79.1	9.8	11.1	60.7	17.8	21.5	46.1	28.1	25.8
Clerical workers	61.0	22.0	17.0	82.8	6.8	10.3	54.1	24.2	21.7	48.4	30.1	21.5
Service workers	51.2	16.6	32.2	70.7	7.6	21.7	46.2	21.0	32.8	35.6	25.7	38.7
Productive workers	49.4	18.3	32.3	68.5	6.9	24.6	47.6	18.1	34.3	41.8	20.3	37.9
Others	43.9	16.7	39.4	62.0	8.2	29.8	40.0	20.1	39.9	31.5	24.3	44.2
INCOME QUANTILE (Q)												
Q 1	42.4	13.8	43.7	57.0	8.1	34.9	37.0	18.4	44.6	30.3	20.9	48.8
Q 2	44.0	16.4	39.6	64.4	7.3	28.3	42.8	18.6	38.6	32.3	23.8	43.9
Q 3	48.0	21.0	31.0	70.7	8.2	21.0	43.5	24.8	31.7	35.9	29.0	35.1
Q 4	51.6	24.2	24.3	73.2	10.0	16.7	50.3	23.3	26.5	39.8	30.0	30.2
Q 5	55.1	23.8	21.0	80.2	6.5	13.2	51.6	28.1	20.3	39.9	34.5	25.6
REGIONS												
North	60.3	17.0	22.6	79.8	5.6	14.6	51.3	24.5	24.2	39.8	29.4	30.8
South	43.3	16.1	40.6	56.4	12.3	31.3	42.1	17.3	40.6	36.2	19.8	44.0
East	35.9	17.8	46.3	55.2	9.9	35.0	37.7	17.7	44.5	29.5	21.3	49.1
West	43.0	18.0	39.0	64.7	5.3	30.0	36.8	22.2	41.0	28.9	27.3	43.8
ALL INDIA	**45.4**	**17.3**	**37.3**	**64.0**	**8.1**	**27.9**	**41.6**	**20.5**	**37.8**	**33.3**	**24.6**	**42.1**

Note: Responses are to the following statements: "For each statement, whether you generally agree, disagree or do not know."