

Table 1. Central plan outlay for selected Ministries/Departments for 2000–2001 to 2001–2002 (Rupees in crores)

	2000–2001 Budget estimates	2000–2001 Revised estimates	2001–2002 Budget estimates
Ministry of Agriculture	2930	2507	3009
Department of Agriculture and Cooperation	1950	1677	1970
Department of Agricultural Research and Education	630	550	684
Department of Animal Husbandry and Dairying	300	230	300
Department of Food Processing Industries	50	50	55
Ministry of Environment and Forests	850	610	800
Ministry of Health and Family Welfare	4920	4478	5780
Department of Health	1300	1188	1450
Department of Indian Systems of Medicine and Homeopathy	100	90	120
Department of Family Welfare	3520	3200	4210
Ministry of Human Resource Development	6910	6300	7570
Department of Elementary Education & Literacy	3729	3250	4000
Department of Secondary Education & Higher Education	1721	1700	1920
Department of Women and Child Development	1460	1350	1650
Ministry of Information Technology	542	506	535
Ministry of Non-Conventional Energy Sources	945	859	1040
Ministry of Science & Technology	856	831	947
Department of Science and Technology	362	362	410
Department of Scientific and Industrial Research	358	329	362
Department of Biotechnology	136	140	175
Department of Atomic Energy*	2047	1820	2068
Department of Ocean Development	135	86	142
Department of Space	1700	1600	1710

*The R&D expenditure is approximately 20% of total budget for DAE, according to the budget estimates of 2001–2002.

Source: Website <http://www.nic.in/indiabudget/>

The Plan allocation for the Ministry of Health & Family Welfare has been stepped up from Rs 4920 crore to Rs 5780 crore. Components of the allocation include Rs 225 crore for National Malaria Eradication Programme (including Kala-azar), Rs 75 crore to National Leprosy Control Programme, Rs 210 crore for National AIDS Control Programme, Rs 136 crore to National Tuberculosis Control Programme and Rs 140 crore to the National Trachoma and Blindness Control Programme. Traditional knowledge is to be protected by

establishing a ‘Traditional knowledge digital library’. This would provide the knowledge already in public domain, to be made available in international languages, to prevent grant of patents. Indian Systems of Medicine and Homeopathy would be accorded benefits similar to the pharmaceutical industry.

More sops come for the Information Technology (IT) sector. Doing well and encouraged to do better, ‘profits derived by the units located in the software technology parks from the export of “on-site” services will be eligible for deduction

like their other export income. Units located outside these zones will also get the benefit of tax exemption on such “export earning”, as evident from the Union Budget 2001–2002 speech of the Finance Minister. The Ministry of Information Technology gets a Plan Outlay of Rs 535 crore in the budget. This will spur the spirit of entrepreneurship in the IT industry.

The Ministry of Agriculture has an allocation of Rs 3009 crore. Among several reforms to be initiated in the agricultural sector, one is for agricultural graduates with the support of NABARD, a scheme, for setting up Agriclincs and Agribusiness Centres. Such centres will provide services such as soil testing facilities and consultancy. Eastern and north-eastern parts of the country will see improved crop productivity through crop diversification and employment of improved technologies. Rs 61 crore has been allocated for the Centrally Sponsored Scheme on ‘On-farm water management for increasing crop production in eastern India’.

Education that makes the future scientists and technological workforce, will have the base of Indian Institute of Technology (IIT) expanded and Regional Engineering College (REC) strengthened. Roorkee Engineering College will be upgraded to an IIT with more funds for IIT, Guwahati. New institutes will be set-up with public–private partnership and role of private sector funding is to be encouraged. Together with this, an integrated National Education Programme – the Sarva Siksha Abhiyan has been launched for universalizing quality elementary education in ‘Mission’ mode.

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Budget 2001–2002 and biotechnology

Biotechnology today is a fast growing frontier area of research with immense technological benefits to society in diverse ways such as food security, environment protection, nutritional supplement, medicine, health care products and other industrial applications. Keeping in view the government’s commitment to the safe use of biotechnology, India is poised for take-off in this challenging field.

The Finance Minister’s Union Budget 2001–2002 speech states: ‘To be globally competitive, our companies need to increase their investment and expenditure for research and development. Currently, a weighted deduction of 150% of the expenditure on in-house R&D in certain areas is allowed to companies. Sir, I propose to extend this weighted deduction to biotechnology as well for clinical trials,

filing patents and obtaining regulatory approvals.’ This will surely give a shot in the arm for biotechnology in India and accelerate the pace of technological advance in this area. India possesses an inherently stable platform to build on, comprising wide knowledge skills, trained manpower and rich bio-resources.

In a recent status paper on biotechnology by the Confederation of Indian

Industry (CII) in January 2001, details of past consumption of biotech products in India and future consumption estimates have been published (see Table 1). According to the report, biotech health care products would see the maximum future consumption estimates accounting for 40% of the market by 2010. The report further adds 'over the next five years, biotechnology can offer opportunities for fresh investment of Rs 7 to 8 billion in India'. This could trigger, according to CII's estimate, a turnover to the tune of Rs 9 to 10 billion over 5–7 years. The major demand in India would be seen in animal and health care products such as vaccines, diagnostics, therapeutic recombinant proteins, antibiotics and vitamins. Indicators for diagnostics demand in India, which relies on imports for half its requirements, project a market rise from US \$ 100 million (in 1997) to \$ 200 million (in 2001). Vaccines have a market of \$ 100 million with an estimated growth of 20% per year. Animal health care products would also see an increasing demand to reach \$ 200 million by 2001.

In bioinformatics, CII feels that to achieve a 5% global market share by 2005, which would bring in a cool \$ 3 billion to India is 'an opportunity not to be missed'. It has thus sent out a plea for industry and government to work together with researchers. High-yielding hybrids in agriculture, bio-fertilizers, bio-pesticides, growth promoters, enzymes, organic and amino acids and yeast products would see some significant increase in market demand as well.

By CII estimates, the overall biotechnology industry in India would have a market of about US \$ 2.5 billion (in

2001) and US \$ 4.5 billion (in 2010). In order to fully utilize this enormous growth industry, a few important considerations have to be dwelt upon. Although the Finance Minister has allowed 150% weighted deduction in this year's budget on clinical trials etc. as mentioned above under sub section 2(A) (B) of section 35 of Income Tax Act, the industry feels that the government has put in certain conditions, in fine print, that would constrain the industry. The industry had been looking forward to reduction in import duties, presently up to 58%, on reagents and equipment for use in R&D and manufacture in the biotech sector. The 2001 budget has not reduced these duties, which the industry feels makes the manufacture of biotech products unsustainable. However, the removal of surcharge on import duty will result in an effective reduction in customs duty. In addition, the industry feels that sops offered to the IT sector must be extended to the biotechnology sector (BT). Although Rs 75 crore has been allocated for modernizing the patents office in India, industry sources say the ground reality is that little seems to be happening about computerizing the patents office. Since there is now an increase in the rate of filing patents, more offices should be opened around the country, with careful site selection commensurate with the patent filing activity.

One bright spark on the horizon for industry which would also help the biotech sector is that Indian companies wishing to invest abroad may now invest up to \$ 50 million on an annual basis through the automatic route without being subject to the three years profitability condition. 'forward looking', says

the happy industry. Other positive pointers are:

- Section 115 ACA, which provides for taxation of income by way of dividends or long-term capital gains in respect of GDR of an Indian company purchased by an Indian employee in accordance with a notified ESOP, has been extended to the pharmaceutical, biotechnology and other knowledge-based industries. This has been done retrospectively from last year.
- Indian companies that have issued ADRs/GDRs may acquire shares of foreign companies up to an amount of \$ 100 million or an amount equivalent to ten times their exports in a year, whichever is higher.
- Increase in health outlay has gone up from Rs 4920 crore to Rs 5780 crore. There will be special focus on traditional medicine with the government proposing to set up traditional knowledge digital libraries. Indian systems of medicine are to be extended similar benefit as pharmaceutical industry. The government will focus on drugs standards, quality control, drug testing centres, etc.
- The span of control of drugs to be reduced. However, government will retain the right to intervene.
- The Rs 150 crore R&D fund for the Drug Development Promotion Foundation, set in the last budget, was not disbursed. The Finance Minister has promised that it will be operationalized during the year 2001–2002.

Industry says that the above proposal will help promote R&D and enable pharmaceutical companies to make overseas acquisitions and investments. However, some key demands have not yet been met. These are:

- One hundred per cent tax exemption on IPR income
- Tax holiday for pharma companies having R&D as one of their main objects
- Imposing import duties on certain drugs currently exempt from import duty.

If India is to see itself complying with the standards set by WTO by 2005, a closer look at the policy framework, IPR policies and delays in current regulatory procedures caused by multi-agency operation through a multitude of committees, needs to be urgently looked at. Also, the industry feels that regulatory procedures and food safety guidelines may be

Table 1. Past consumption of biotech products in India and future consumption estimates (Rupees in millions)

Biotech products	Actual consumption 1999	Future consumption estimate 2005	Future consumption estimate 2010
Human & animal health care products	32240 (37.5)	35320 (37.6)	93540 (40.0)
Agricultural products (including seeds)	25670 (29.8)	28880 (30.7)	78720 (33.7)
Industrial products	27090 (31.5)	28500 (30.3)	53590 (22.9)
Other biotech products	1040 (1.2)	1300 (1.4)	7940 (3.4)
Total	86040 (100)	94000 (100)	233790 (100)
In million US Dollars	1789	2186	4270

Source: Sandhya Tewari (ed.), *Business Opportunities in Biotechnology*, Confederation of Indian Industry, 2001.

Figures in parentheses indicate contributions in % of the total.

Table 2. A selection from DBT's budget estimates
(Rupees in lakhs)

Programme/scheme/project	Plan (actuals) 1998–1999	Plan (BE) 1999–2000	Plan (BE) 2000–2001
Scientific institution/professional bodies			
National Institute of Immunology	1059.00	1300.00	1400.00
National Centre for Cell Science	700.00	800.00	800.00
Center for DNA Fingerprinting and Diagnostics	576.00	650.00	600.00
National Brain Research Centre	0.00	0.00	500.00
National Centre for Plant Genome Research	0.00	0.00	350.00
Basic and product-oriented R&D			
Aquaculture and marine biotechnology	189.80	200.00	200.00
Plant biotechnology	419.70	530.00	630.00
Basic research and emerging areas	514.79	500.00	450.00
Biofertilizer	190.00	195.00	140.00
Medicinal and aromatic plants	199.88	150.00	130.00
Animal biotechnology	296.68	315.00	300.00
Seribiotechnology	149.94	150.00	125.00
Tree and woody species, application of tissue culture	650.02	555.00	600.00
Development of biological pesticides	300.00	250.00	200.00
Medical biotechnology and immunodiagnosics	602.77	950.00	700.00
Vaccine research and development	174.55	150.00	100.00
Biodiversity conservation and environment	196.46	200.00	250.00
Human genetics and genome analysis	391.00	390.00	250.00
Others			
Bio-informatics	509.07	600.00	600.00
Biotech product, process development, technology transfer	506.87	500.00	500.00
IPR and Biosafety	15.00	10.00	10.00

Source: DBT's website www.dbtindia.org
BE = Budget estimates.

redrafted on a regular basis, in consultation with industry and international experts.

Peering into what the Union Budget

2001–2002 holds for the Department of Biotechnology (DBT), there is an increase in central plan outlay budget estimates to Rs 175 crore. DBT's plan outlay and a

selection of budget estimates for the past three years are presented in Table 2.

Manju Sharma, Secretary, DBT, when asked to comment on the Plan outlay for DBT, said to N.S. that she was satisfied with the outlay for her Department in the last year of the IX plan, ending on 31 March 2002. Special emphasis is being given to emerging areas by additional allocations such as for genomics (Rs 15 crore), medicinal plants (Rs 15 crore); National Bio-resource Development Board, NBDB (Rs 12 crore); pending approval by the Parliamentary Standing Committee. The NBDB, established in June 1999, is meant to carry out sustainable development and utilization of precious bio-resources of the country using biotechnology tools and techniques. Areas such as DNA fingerprinting and Brain research will also see support in this outlay.

DBT seems to be on 'quick step' to achieving its goals towards product development, technology transfer in addition to basic research using biotechnological tools for socio-economic progress of the country. More cash in the kitty would give the extra zing for just this.

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MEETING REPORTS

Solid state physics symposium*

DAE Solid State Physics Symposium (SSPS) is the largest annual event in which the latest research findings in the area of condensed matter physics in India are discussed. Invited talks by experts provide scholarly reviews on frontier topics in this field and motivation to students to pursue a research career in condensed matter physics. Special evening

lectures highlight important recent developments and give possible future directions of research in condensed matter physics. In the 43rd DAE SSPS organized recently, there were ~300 presentations and the symposium was attended by ~400 delegates.

In his presidential address, R. K. Singh (Vice Chancellor, Guru Ghasidas University, Bilaspur) began his talk by drawing attention to the importance of information technology and biotechnology in the current times and mentioned that this was a culmination of the sustained efforts in

condensed matter physics research. Then he proceeded to discuss the role of materials science bridging technology with solid state physics.

The symposium was inaugurated by R. Chidambaram (ex-chairman, AEC, Mumbai). His remarks dealt with the role of hydrogen bonding in organic and inorganic materials in general and in biomolecular materials in particular. He mentioned that hydrogen bond is anisotropic in nature and from the point of view of its strength, it is in between the two extremes, i.e. the covalent bond

*A report on the 43rd DAE Solid State Physics Symposium held at the Guru Ghasidas University, Bilaspur during 27–31 December 2000.