

CHAPTER 12

Science And Technology (including Meteorology)

Science and Technology are increasingly being recognized as important factors in the economic transformation and are expected to play a vital role in ensuring national security and social stability. While significant developments in S&T have helped to overcome many of the problems faced by the humankind including eradication of some of the important communicable diseases, food and energy shortages etc, the emphasis now is shifting towards utilization of science and technology for sustainable development. Keeping this in view, the S&T programmes during the Tenth Five Year Plan have been directed to strengthen application oriented research and development activities for technology generation; promote human resource development; encourage research and application of S&T for forecasting, prevention and mitigation of natural hazards; integrate the developments in science and technology with all sphere of national activities and harness them for improving livelihood, employment generation, environment protection and ecological security. Significant achievements have been made during the Annual Plan 2003-04 in various spheres of science and technology. Salient features of the achievements during the Annual Plan 2003-04 and the programmes/activities envisaged during the Annual Plan 2004-05 have been highlighted in the following paragraphs.

DEPARTMENT OF ATOMIC ENERGY (R&D SECTOR)

Review of Achievements during the year 2003-04

2. The research and development activities relating to Pressurized Heavy Water Reactor (PHWR)/Light Water Reactor (LWR) have led to the Fuel Handling System Training Simulator becoming fully operational, and installation of the 2 MW in-pile loop in DHRUVA Reactor for nuclear fuel studies. The Indian Environmental Radiation Monitoring Network (IERMON) also became operational. A programmes has been initiated for development of a Compact High Temperature Reactor (CHTR) system for non-grid based electricity generation applications, and development of Accelerator Driven Sub-critical System (ADS). The technologies for sewage sludge hygenisation and the Nisarga-Runac technology that converts biodegradable solid waste into useful manure and methane, have been developed at Bhabha Atomic research Centre (BARC). Technology for biogas plants was also under transfer to a number of entrepreneurs. Two more high yielding varieties of groundnut namely TG-37A and TPG-41, developed at BARC were notified for commercial cultivation. Thus, a total of 24 varieties of high yielding crops developed at BARC, have been released for commercial cultivation. DAE has set up an interface with Ministry of Agriculture to ensure that technologies developed by the DAE organisations are widely deployed. Using Giant Metrewave Radio Telescope (GMRT), discovery of a “binary millisecond pulsar” was made by an international team of researchers.

3. The salient milestones achieved under the accelerator programme included operationalisation of Phase-I of Superconducting Linear Accelerator (LINAC) Booster at Pelletron Heavy Ion Accelerator at Tata Institute of Fundamental research (TIFR), commissioning of a 1.7 million-volt tandetron accelerator at Kalpakkam, and widening the user base of Indus-1. The construction of a 2.5 GeV Indus-2 at Centre for Advanced Technology (CAT), Indore, made significant progress.

Major Programme for the year 2004-05

4. During the Annual Plan 2004-05, BARC will be completing the manufacture of reactor pressure vessel and instrumentation & control (hardware) for the Advanced Reactor Experimental Facility (P-4 facility). Installation, trial runs and commissioning of various equipment / systems for setting up facility for characterisation of plutonium based fuels would also be carried out. As a part of the Prototype fast Breeder Reactor (PFBR) project, IGCAR will take up testing of the steam generators. Various experiments will continue in the 1/4 scale reactor assembly model. The Advanced Heavy Water Reactor (AHWR), design validation programme will be continued at BARC. For the Critical Facility for AHWR & 500 MWe PHWRs, construction of civil structure and procurement of various components are likely to be completed. Setting up and commissioning of facility for preparation of Thorium-Plutonium Oxide & Thorium-Uranium Oxide micro spheres will reach an advanced stage. The CAT will be focusing on development of laser cutting technique and laser beam delivery system for different applications and take up the work on high power industrial accelerator.

Department Of Biotechnology

Review of Achievements during the year 2003-04

5. The Department of Biotechnology (DBT) is moving steadily in the direction of converting R&D leads into products and processes and commercialization through technology transfer and public-private partnerships. Indigenous Genetically Modified (GM) crops of mustard, rice, cotton, sugarcane resistant to insects and viral diseases as well as quality traits have been developed and evaluated as per biosafety regulations. Research leads from medicinal plants are being pursued for development of anti-cancer, anti-HIV, anti-diabetic as well as immuno-modulatory products involving industry. Tissue culture derived plants of black pepper, tea, large cardamom and vanilla with improved productivity have been demonstrated on large scale. Vegetation mapping and landscape level biodiversity characterization has led to isolation of new genes and molecules and databases for their identification.

6. Biotechnological methods such as cloning and ovum pick-up have been developed to improve farm animals reproduction and productivity. Clinical trials of anthrax vaccine for animals developed indigenously has been initiated. Successful leads have also been obtained in stem cell transplantation and genomic/proteomics research and R&D projects in the area of nano-biotechnology have been initiated to develop drug delivery systems.

7. About a dozen technologies from indigenous research related to diagnosis of Human Immuno-deficiency Virus (HIV) and white spot disease in shrimps; microbial treatment of fossil fuels; mushroom based technologies for nutritional enrichment; drug delivery system for systemic fungal infections have been transferred to industry and are commercialized. Several technologies have also been developed and demonstrated on large-scale to treat industrial effluents, restoration of degraded land and pesticide remediation in the area of environmental biotechnology.

Major Programme for the year 2004-05

8. During the Annual Plan (2004-2005), besides continuation of ongoing programmes and schemes, it is proposed to support programme based R&D activities in the areas of Testing Tuberculosis Vaccine Candidates; Clinical Trial for Recombinant Products; Molecular Ecology of

Diseases; Mission Mode Programme for New Crop Varieties; Bioresource Utilization; Marine Biotechnology and Proteomics Research. Efforts will also be made to formulate a comprehensive biotechnology policy to address needs and priorities of the nation and implementational strategies, linkages with other ministries/departments as well as industry. A collaborative project on cereal genomics involving molecular markers and genes discovered in rice, maize and wheat would be initiated. Similar programmes for improvement of semi-arid crops and a network on biotechnological interventions for sustainable water security will be supported. In addition, R&D projects on development of vaccines and diagnostics for respiratory diseases, cervical cancer, emerging and re-emerging communicable diseases, cardio vascular disorder etc. will be initiated.

9. The infrastructure development at biotechnology park in Lucknow and incubator facilities in Andhra Pradesh has started and it is expected that the biotechnology park at Lucknow will become operational in March'2005. It is proposed to establish one or two more such incubator facilities in other states based on techno-economic feasibility. DBT has also proposed to promote development of biotechnology clusters around institutes of excellence through new modalities of public-private partnerships and academia-industry interactions.

DEPARTMENT OF SPACE

Review of Achievements during 2003-04

10. The INSAT-3A & INSAT-3E were launched in April 2003 & September 2003 respectively besides the experimental Communication Satellite GSAT-2 launched in May 2003. The INSAT communication capacity has increased to more than 130 transponders, enhancing the capability for meteorological and disaster warning services. The launch of RESOURCESAT-1 (IRS-P6), on 17th October 2003 has enhanced the scope of remote sensing applications by providing data with better spatial and spectral resolutions and also has given further fillip for the IRS data sales through International Ground Stations. The Geosynchronous Satellite Launch Vehicle GSLV was declared operational after its second successful test flight GSLV D2 on 8th May 2003. The indigenous cryogenic engine for the upper stage of GSLV qualified successful testing for 1000 seconds, 300 seconds more than required duration. PSLV, had its seventh successful flight on 17th October 2003 placing RESOURCESAT-1 in the predetermined polar orbit. M/S Antrix Corporation signed a contract for launching a satellite for European country using India's PSLV. Work was initiated on the scientific mission to moon, Chandrayaan-1. INSAT and IRS systems contributed in meeting varieties of social needs including Tele-medicine, Tele-education, disaster management support and natural resource management applications. Under the Tele-medicine network, a novel application of space technology was established to bring health care to remote locations of the country connecting 46 district hospitals in rural and remote areas including the Andaman and Nicobar, Laksha Dweep and J&K to 14 speciality hospitals in major cities. The application of remote sensing was expanded many fold.

Major Programmes for the Year 2004-2005

11. The major thrust would be on Launching and operationalisation of GSAT-3 (EDUSAT) onboard GSLV, CARTOSAT-1 (IRS-P5) satellite onboard PSLV and INSAT-4A satellite, besides continuing efforts on thrust areas of Space Applications. The first satellite in the fourth generation INSAT satellites, INSAT-4A, carrying high power Ku band and C band transponders would be launched augmenting the INSAT system capacity to about 165 transponders. In the area of Remote Sensing, CARTOSAT-1 (IRS-P5) would be launched and operationalised onboard India's PSLV. The satellite would be exclusively used for mapping applications. The commissioning and testing of the Second

Launch Pad at Satish Dhawan Space Centre, Sriharikota would be completed by conducting the mock-up trials. Efforts would be made towards the development of GSLV-Mk III, which would have a capability to launch 4 tonne class of satellites into Geo-synchronous Transfer Orbit and up to 10 tonne satellite in low-earth orbit. In the area of Space applications, the Tele-medicine network would be expanded on users' demand. Pilot projects would be initiated in Karnataka, Maharashtra and Madhya Pradesh to promote education and about 100 satellite receiving terminals will be installed in each of the above States for transmitting real time class room education (higher education) to remote and inaccessible locations. An education network connecting primary schools in a predominately tribal area of Karnataka would be established. Village Resource Centres (VRC) would be set up for providing space enabled services such as tele-medicine, tele-education, Geo-spatial information on natural resources, natural disasters, environment and infrastructure along with other community-centric e-governance related services serving the rural community / backward region of the country. A National level digital data base for all the hazard prone districts of the country would be created to support hazard zonation and decision making process for Disaster Management applications and a Decision Support Centre will be established to act as a real time single window disaster management support service provider, which will be linked with the National and State level Emergency Operations Centres.

DEPARTMENT OF SCIENTIFIC & INDUSTRIAL RESEARCH

Review of Achievements during 2003-04

12. The Department of Scientific and Industrial research (DSIR) has been implementing the Technology Promotion, Development and Utilisation (TPDU) scheme during Tenth Plan. Under its various ongoing programmes, 75 new in-house R&D Units and 20 new Scientific and Industrial Research Organisations (SIROs) were recognized besides renewing the recognition of in-house R&D units of nearly 250 companies. Around 800 proposals from public funded institutions were processed for custom duty exemption certificates. In addition, 14 projects were completed and 69 ongoing projects were monitored for further progress under the Programme Aimed at Technological Self Reliance.

13. Council of Scientific & Industrial Research (CSIR) through its 38 laboratories and 47 regional centres provided S&T inputs for development of socio-economic sectors and completed 60 years of its existence. Several new initiatives were taken up, which included: creation of a CSIR Diamond Jubilee Technology Award; Diamond Jubilee Invention Award for school children; Diamond Jubilee Research Intern Award; and establishment of Institute of Genomic and Integrative Biology by changing the mandate of Centre for Biochemical Technology, Delhi. In addition, an innovative knowledge network, across & beyond CSIR Laboratories was created. The R&D efforts of CSIR led to generation of Rs. 270 crore as External Cash Flow (ECF). Technologies were provided for industrial competitiveness and several industrial units were set up with technological support of CSIR viz (i) technology support for converting light naphtha and natural gas condensates to high value liquefied petroleum gas (LPG) and high octane gasoline at GAIL Vaghodia, Gujarat; (ii) a new design of 35-60 HP tractor with deep cultivation capacity, enhanced soil gripping, and efficient off the field running with high fuel efficiency; (iii) development of a two seater trainer aircraft; (iv) completion of the first prototype of Light Transport Aircraft - SARAS and its first successful inaugural flight; and (v) development of a Thin Film Composite (TFC) reverse osmosis (RO) high flux membrane for treatment of tertiary treated sewage water of 1 million liters/day capacity. The menthol mint oil production was commercialized using high yielding varieties of menthol through cost effective processing technologies of CSIR.

Major Programmes for the Year 2004-2005

14. DSIR under the scheme TPDU would continue the activities relating to Industrial R&D Promotion; Technology Development and Innovation; Technology Management; Industrial Technology Transfer; Consultancy Promotion and Industrial R&D and Technology Information Facilitation. Support would also be provided to two public sector enterprises, namely Central Electronics Limited (CEL) for development of technology and promotion for solar cells and Solar Photo Voltaic (SPV) systems, electronic components and electronic systems and National Research Development Corporation (NRDC) for supporting and promoting domestic technology transfer, export of technology and invention promotion.

15. The emphasis of CSIR under the National Laboratories would be to undertake programmes in a network mode, drawing capabilities and resources from the existing core competencies of the laboratories. Three types of activities would be focused under the National Laboratories, namely; Continually building and refurbishing competence at global level, taking up in-house projects with well defined objectives, deliverables time frame; and performing contract R&D for industry and other users to deal with problems through expertise gained over the years. The current activities of CSIR, inter-alia would encompass the establishment of capabilities in the newer S&T areas, generation on technological know-how and strategic options over a wide spectrum of S&T. CSIR's capabilities in emerging technological areas through massively networked projects would be identified and strengthened by selecting a group of networked projects with super ordinate goal. Under the scheme National S&T Human Resource Development focus would be made on new activities relating to training and motivation for selected science teachers, inculcating the spirit of entrepreneurship in research scholars and establishing fellowships in trans-disciplinary areas. With regard to the scheme Intellectual Property & Technology Management, efforts would be made to capture, secure, enhance and realize the value from the intellectual property of CSIR. Under the New Millennium Indian Technology Leadership Initiative Scheme efforts would be continued to identify, select and support the plans and programmes to attain global leadership position in selected niche areas.

Department Of Ocean Development

Review of Achievements during 2003-04

16. The 23rd Antarctic Expedition was launched from Cape Town, South Africa. Oceanographic process and resource assessment in Southern Ocean, were studied. An ice core laboratory was established at National Centre for Antarctic and Ocean Research (NCAOR) to preserve the samples collected at Antarctica and to conduct paleo-oceanographic studies. Survey for the third Indian station at Antarctica was completed. The important activities carried out under the Polymetallic Nodules Programme included: survey using multi-frequency exploration system at closer grids of 6.25 km at selected profiles to assess resources of nodule deposits at Central Indian Ocean Basin (CIOB); monitoring of the environmental parameters; refurbishment of shallow bed mining system with unmanned submersible upto a depth 6000m with Russian Collaboration; and validation campaign for improving the efficacy of Pilot plant for metal alloy product. Under the Ocean Observations and Information Service Programme 22 Argo buoys were deployed in the Indian Ocean Region and data was collected from 270 Argo floats deployed by various other countries. A Regional Argo Data Centre at Indian National Centre for Ocean Information Service (INCOIS), Hyderabad was established. A set of 10 Information Kiosks one each in the coastal states and satellite radio broadcast were set up for dissemination of Potential Fishing Zone (PFZ) information

and to facilitate the dissemination of data/data products to user community. The major achievements under Marine Research & Technology Development programme were related to environment and productivity studies, deep-sea fishery resource assessment in the west coast; completion of toxicity studies for anti-diabetic compound; etc. A reverse osmosis desalination plant at Vizhinjam wave energy plant site was commissioned. More than 150 transducers manufactured by M/s Bharat Electronics limited, Bangalore and National Institute of Ocean Technology (NIOT) were tested and calibrated in Acoustic Test Facility (ATF). Indigenously developed Acoustic Tide Gauge with Solar panels and telemetry option was installed at Minni Bay, Port Blair and 2 more in Myanmar. Under the Gas Hydrates programme, an Indo-Russian Centre for Gas Hydrate (IRCGH) Studies was established at NIOT, Chennai to coordinate and conduct the Gas Hydrate related activities.

Major Programmes for the Year 2004-2005

17. The XXIV Indian Scientific Expedition to Antarctica would be launched and the activities relating to Paleo-climatology, Polar Environment & Ecology and Sea ice-atmosphere interaction and modelling, Polar Remote Sensing, Southern Ocean Oceanography and the role of cryo-sphere in the climate system would be continued. Under the Polymetallic Nodule Programme, updation of geo-statistical resource evaluation in the retained pioneer area including survey using multi-frequency exploration system along the selected profiles would be carried out for identifying and validating the trends of higher abundance of nodules at the CIOB. The major activities to be pursued under the Ocean Observation and Information Services programme would include: acquisition of a new vessel for sustained deployment, retrieval, maintenance & operation of the data buoy network; calibration and validation of satellite data; procurement and deployment of 40 Argo Profiling Floats; launching of Wireless Application Services (WAP) and web casting for effective dissemination of ocean data products; and dissemination of web-based services in near real time to the scientific community and operational agencies. For the assessment of Marine Living Resources, surveys of continental slope of Indian EEZ would be conducted. Under Drugs from Sea, clinical trials on anti-diabetic compound would be carried out including continuation of pharmacological and other regulatory studies for two leads already identified. The major activities of NIOT would be relating to deployment of pilot scale demonstration of technology for 1 MW Ocean Thermal Energy Conversion (OTEC) plant; and design and analysis for a low temperature desalination plant for island community at Kavaratti, Lakshadweep. Under the scheme 'Comprehensive Bathymetric Survey of EEZ', commissioning of bathymetric survey beyond 500 m depth and acquisition and commissioning of a new Multi-beam sonar system capable of measuring depth up to 1000m will be completed. The activities under Gas Hydrates Exploration & Technology Development programme would include, studies on identifying the most potential areas for detail survey of gas hydrates, and swath bathymetry in potential areas.

DEPARTMENT OF SCIENCE AND TECHNOLOGY

Review of Achievements during 2003-04

18. The thrust of the programmes of the Department of Science and Technology (DST) has been on basic research, technology development, S&T manpower development, providing scientific services to the community and to undertake programmes relevant to societal needs. Within the framework of the broad strategy, some new initiatives were taken. These included: building strengths in a few chosen emerging S&T areas like system/integrative biology, nano-technology, synchrotron facility, 6 to 8 M optical telescope, molecular electronics; evolving a tripartite arrangement for the involvement of scientific agencies, national laboratories/IITs and universities to prepare an Integrated

Manpower Development Programme; augmenting the scheme for women scientists; promotion of India's capability to set up centres of excellence jointly with other countries through bilateral S&T programmes; encouraging talented young Indian researchers working abroad to return by offering competitive career awards to work in Indian institutions of their choice in nationally important programmes; encouraging higher value addition activities and preservation of natural resources through the development and application of high technologies such as biotechnology, new materials, computers, telecommunications and information techniques and systems, micro-electronics, etc. In order to convert technologies into commercially viable products and services, mechanism of Technology Development Board, Technology Business Incubators and joint projects in the Drugs & Pharmaceutical Industries with the private sector participation were undertaken. The activities relating to 'Observing 2004 as the Year of Scientific Awareness' were also initiated during the year. As a part of this programme, Vigyan Rail, a science exhibition on wheels projecting achievements in various sectors was inaugurated.

Major Programmes for the year 2004-05

19. During the Annual Plan (2004-05) the DST would continue to encourage research in basic sciences, and attempts would be made to ensure that such research is made relevant to national priorities and goals. It would be geared towards stimulating economic growth. The synergy among science and technology, public policy and organisation would be built in order to achieve the national goals; focussing on knowledge capital as a tool for faster economic development; reorganising the technology transfer systems to make them client-controlled and user-driven so that technology dissemination losses could be minimised; making efforts to fulfill the S&T vision in a socially relevant and participatory mode.

20. The scheme for providing infrastructural facilities for basic research in the universities and other educational institutions, will be further strengthened for promoting R&D in new and emerging areas and attracting fresh talent, An initiative to promote research and development in the critical area of Nano- Technology would be augmented during the current year. To enhance the pace of commercialisation of innovative technologies developed through R&D process, the department would continue to strengthen the Technology Development Board and the Technology Business Incubators. Collaborative research projects leading towards drug development in the area of diseases which are of importance to our country, would continue to be supported. These investments would be aimed at ensuring that the quality of research output in these critical areas remains at par with the world level and the price of critical life saving drugs is within the reach of a common citizen. The Department of Science & Technology has also proposed to join hands with the University Grants Commission to launch Mission HOPE (Higher Education-Opportunities for Promoting Entrepreneurship) which aims to Convert Aspirations to Real Enterprises (CARE).

21. The details of plan outlays/expenditure for various S&T Departments and the State wise S&T plan outlays/expenditure are given in Annexure-12.1 and 12.2 respectively.

Annexure 12.1

Central Scientific Departments Progress of Plan Expenditure

(Rupees in Crore)

S. No.	S&T Departments/ Agencies	Annual Plan 2002-03 BE	Annual Plan 2002-03 Actuals	Annual Plan 2003-04 BE	Annual Plan 2003-04 RE	Annual Plan 2004-05 Outlay
1	2	3	4	5	6	7
1	Department of Atomic Energy (R&D Sector)	535.00	405.56	464.00	427.97	703.58
2	Deptt. of Ocean Development	175.00	139.59	175.00	150.00	236.00
3	Deptt. of Science and Technology (Incl. Meteorology)	625.00	537.07	800.00	614.75	900.00
4	Deptt. of Bio-technology	225.00	204.78	260.00	250.00	310.00
5	Scientific & Industrial Research	440.00	355.13	520.00	450.00	650.00
6	Department of Space	1950.00	1846.70	2050.00	1950.00	2400.00
	Grand Total	3950.00	3488.83	4269.00	3842.72	5163.58

Annexure 12.2

S&T Plan Outlay under the State Plan

(Rupees in Lakh)

S. No.	States/UTs	10th Plan Outlay	2002-03 B.E	2002-03 R.E	2003-04 B.E	2003-04 R.E	2004-05 B.E
1	Andhra Pradesh	500.00	105.00	20.00	22.00	17.04	113.64
2	Arunachal Pradesh	420.00	126.00	126.00	153.00	152.82	25.00
3	Assam	750.00	145.00	145.00	145.00	145.00	405.00
4	Bihar	0.00	0.00	0.00	20.00	0.00	0.00
5	Chattisgarh	300.00	48.00	48.00	73.00	73.00	73.00
6	Goa	175.00	35.00	35.00	57.15	75.15	138.90
7	Gujarat	29835.00\$\$	6524.00\$\$	6524.00\$\$	7224.00\$\$	7424.00\$\$	7174.97\$\$
8	Haryana	565.00	110.00	169.00	120.00	320.00	250.00
9	Himachal Pradesh	592.00	128.00	108.00	45.64	25.64	24.00
10	Jammu & Kashmir	3619.00 *	576.00 *	576.00 *	614.00 *	616.80	512.83
11	Jharkhand	33000.00 +	6000.00 +	6000.00 +	4700.00 +	4700.00 +	8646.00 +
12	Karnataka	1293.00	182.00	191.00	249.00	186.27	194.00
13	Kerala	12000.00\$\$	2500.00 *	2000.00 *	3750.00 *	3188.00	5000.00
14	Madhya.Pradesh	858.00	172.00	190.00	192.00	191.50	201.50
15	Maharashtra	4325.00	23.00	23.00	270.00	270.00	0.00
16	Manipur	1227.00	195.00	195.00	502.00	502.00	459.64
17	Maghalaya	515.00	85.00	85.00	85.00	85.00	90.00
18	Mizoram	513.00	110.00	110.00	106.00	101.00	106.00
19	Nagaland	350.00	20.00	49.00	294.00	44.00	82.00
20	Orissa	2281.00\$\$	320.00\$\$	320.00\$\$	875.52\$\$	140.20	200.00
21	Punjab	3303.00	263.00	263.00	230.00	428.00	754.00
22	Rajasthan	753.00	215.00	65.00	77.00	77.00	90.00
23	Sikkim	600.00	75.00	75.00	175.00	75.00	75.00
24	Tamil Nadu	4735.00	204.00	165.00	186.79	221.74	195.52
25	Tripura	904.00	20.00	20.00	5.06	57.71	16.38
26	Uttar Pradesh	5950.00	825.00	350.00	416.00	350.00	416.00
27	Uttranchal	304.00	361.00	361.00	720.00	20.00	20.00
28	West Bengal	13831.00	3507.00\$\$	489.00	329.00	621.50	1202.00
	Total States	123498.00	22874.00	18702.00	21636.16	20108.36	26465.38
	U.Ts.						
1	A&N Islands	212.00	35.00	35.00	20.00	49.00	50.00
2	Chandigarh	60.00	15.00	15.00	14.00	14.00	13.00
3	D & N Haveli	35.00	6.00	6.00	6.00	6.00	6.00
4	Delhi	700.00	130.00	80.00	150.00	301.00 *	5.00
5	Daman & Diu	80.00	13.00	13.00	15.00	15.10	15.00
6	Lakshadweep	307.64	63.00	63.00	75.00	70.00	73.00
7	Pondicherry	140.00	35.00	40.00	35.00	35.00	35.00
	Total UTs	1534.64	297.00	252.00	315.00	490.10	197.00
	Grand Total	125032.64	23171.00	18954.00	21951.16	20598.46	26662.38

\$\$ Including Information Technology

* Including Ecology and Environment

+ Including Technical Education and Ecology & Environment