Message

MESSAGE

It is my pleasure to present to you the DOST 2003 Annual Report.

The DOST 2003 Report is a testament to the science community's outstanding achievements in the service of its publics.

In that year, we paid closer attention in coordinating and directing our projects and activities toward the attainment of the milestones we set under the 2002-2020 National Science and Technology Plan. We also placed greater emphasis in bringing to the awareness of the common tao our research results and innovations with great commercial potential. And we continued our lead programs and projects in improving the Nation's productivity and competitiveness, promoting S&T development, and the monitoring of meteorological and seismic phenomena that could affect the lives and well-being of every Filipino.

Our commitment to the science and technology enterprise comes from an abiding belief that knowledge is a powerful force for progress. As we work to open new frontiers in R&D, policymaking, and education, we have kept our eye on the main objective — economic and social prosperity that can benefit all citizens.

The best way to keep the Philippines prosperous and secure is to keep it at the forefront of learning and discovery, which we consider to be the DOST's foremost responsibility. We will leave no stone unturned in gearing the Department's thrusts to the development of a forward-looking, knowledge-intensive economy through innovation and an unwavering commitment to excellence.

Let me take this opportunity to express my thanks to the DOST family for their dedication in meeting the day-to-day challenges of delivering exceptional service to the Filipino people.

ESTRELLA F. ALABASTRO
Secretary

Highlights

H I G H L I G H T S

The Department of Science and Technology (DOST) is mandated to be the leader, direction-giver and coordinator of the country's scientific and technological development efforts so that their results redound to the well-being and better quality of life for Filipinos.

In line with the national development priorities of the government and the strategies outlined in the National Science and Technology Plan (NSTP), the Department in 2003 focused its programs and activities on priority areas that would help result into immediate economic benefits for the country. The DOST broadened the access to quality S&T services, accelerated the transfer and use of R&D results, and continued to build the country's S&T capacity.

In broadening the access to quality S&T services, the DOST has implemented the Small Enterprise Technology Upgrading Program (SETUP) focusing on six identified priority sectors namely: food processing; furniture; fashion accessories; gifts-toys-housewares; marine and aquatic resources; horticulture; and metals and engineering. Technology roadshows were held in various regions to effectively disseminate information on successful interventions to Small and Medium Scale Enterprises (SMEs). Also, it continued to provide testing and calibration services, technical assistance, information and consultancy services to various clients. Programs to mitigate hazards and disasters were also implemented to prevent loss of lives and properties brought about by natural calamities such as tropical disturbances, earthquakes and volcanic eruptions.

Generating new knowledge through R&D and bringing these R&D results to the market are keys to economic growth. To accelerate the transfer and use of R&D results for productivity and new wealth creation, the Department implemented the Technology Incubation for Commercialization (TECHNICOM) program to fast-track the transfer and commercialization of promising R&D results of government R&D institutes, academe and the private sector. Its R&D efforts were focused on developing innovative technologies which support productivity improvement and global competitiveness of Philippine products and enterprises. These include researches on biotechnology, environment, new technologies and products, and process improvements for higher productivity. It leveraged its meager R&D resources with the private sector through research contracts. To help make the country a world-class provider of information and communication technology (ICT) services and products, the Department focused its efforts on the interconnection of academic, research and government institutions nationwide and the development of software. Moreover, it exerted efforts to strengthen intellectual property and technology management in the S&T community.

The Department spearheaded the building of the country's S&T capacity at the individual, institutional and policy levels to ensure that indigenous knowledge systems are further developed, that local interests and needs are acted upon, and that local capabilities to assimilate technologies from abroad are further increased. It continued to implement various S&T HRD programs at secondary, undergraduate and graduate levels including upgrading training for science and mathematics teachers. Moreover, it provided training opportunities, recognized and awarded outstanding scientists and technologists, strengthened S&T institutions, fostered international scientific linkages and enhanced the S&T policy environment.

In support of President Gloria M. Arroyo's declaration that science and technology shall be the foundation of future economic growth, the Department in 2003 focused its programs and activities on priority areas that would help result into immediate economic benefits for the country.

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Broadening the Access to Quality S&T Services

To broaden the access to quality S&T services, the DOST implemented the Small Enterprise Technology Upgrading Program (SETUP) as the unifying platform of its technology transfer services. It continued to diffuse technologies, to disseminate S&T information and to provide consultancy services, as well as S&T services related to disaster preparedness and hazard mitigation.

1.1 SMALL ENTERPRISE TECHNOLOGY UPGRADING PROGRAM (SETUP)

The cornerstone of the Department's efforts to broaden the access to quality S&T services is the Small Enterprise Technology Upgrading Program or SETUP which it has implemented since 2002 in response to the President's call to support the small-and- medium-scale enterprises, the economy's engine for job creation and wealth distribution. The SETUP has been designed to enhance the productivity and competitiveness of Small and Medium Enterprises (SMEs) by encouraging and assisting them to adopt technological innovations that address their technical problems and enhance their operations through better product quality, human resources development, cost minimization, waste management, and other operation related activities.

The DOST has initially focused the provision of its S&T services ranging from technology upgrading and acquisition, packaging and labeling, technical consultancy services, product standards development and identification, technology training on networking and linkaging assistance to SMEs in six identified priority sectors. The six priority sectors are: food processing; furniture; fashion accessories and gifts-toys-housewares; marine and aquatic resources; horticulture; and metals and engineering. As such, the SETUP unifies all existing DOST technology intervention programs being undertaken by all DOST agencies like the Manufacturing Productivity Extension for Export Modernization Program (MPEX), the Consultancy for Agricultural Productivity Enhancement (CAPE), the S&T Enterprise Assistance Mechanism/DOST-Academe Technology-Based Enterprise Development Program (STEAM-DATBED), the Venture Financing Program, the Pilot Plant Assistance Program of the Technology Application and Promotion Institute (TAPI-DOST), and the specific S&T services being provided by the R&D institutes and sectoral planning councils of the Department.

Also, the SETUP features the assistance and services being rendered by the Packaging Research and Development Center of the Philippines (PRDCP) under the Industrial Technology Development Institute (ITDI-DOST). The PRDCP offers technical assistance in packaging research and development, in-service training and education on the latest packaging techniques, product label design, nutrition labeling, shelf life testing and other testing services. To date, the PRDCP has developed the packaging of 127 new products including 12 products that have successfully penetrated the export market. Examples of these products are, but not limited to, the tropical fruit mix in stand up pouch, pickled shredded green papaya, canned *laing*, *bagoong alamang* in boilable pouch, generic packaging for tamarind products and cured meat.

TABLE 1: REGIONAL DISTRIBUTION OF THE 2003 SETUP ACCOMPLISHMENTS

Region	No. of SMEs assisted	No. of S&T Interventions	No. of New Jobs Created	Reported Ave. Increase in Gross Revenues
ALL REGIONS	1,368	1,136	11,346	30%
NCR	681	563	19	N.A.
CAR	8	10	339	43%
I	18	36	50	45%
II	40	40	183	11%
III	7	7	680	10%
IV	35	24	1,063	25%
V	15	11	703	100%
VI	40	55	2,960	50%
VII	145	97	1,929	43%
VIII	57	81	159	60%
IX	58	50	311	10%
X	73	66	700	N.A.
XI	19	15	655	10%
XII	149	53	695	68%
CARAGA	17	17	441	N.A.
ARMM	6	11	459	N.A.

Through the Department's Grants-in-Aid Program, P 83.1 M funding support was provided for the SETUP implementation in 2003, largely as seed funds for technology acquisition to 196 projects (61 in food processing sector, 26 in furniture sector, 17 in fashion, gifts, toys and housewares sector, 45 in marine and aquatic resources sector, 13 in horticulture sector and 10 in metals and engineering sector). Some 24 projects involving training, consultancy services, and ISO accreditation, have also been supported.

At the forefront of the SETUP implementation are the DOST Regional Offices that have been primarily responsible for identifying and selecting client-SMEs under the SETUP, and the management of technology intervention projects for specific client-SMEs. Also, the DOST Regional Offices have primarily been involved in showcasing successful DOST interventions for SMEs to effectively communicate them with the active participation of the local media to entrepreneurs and the general public through the holding of Technology Transfer Roadshows in Regions I, II, III, IV, VI, VII, VIII, IX and NCR.

BOX 1: SUCCESSFUL DOST INTERVENTIONS FOR SMEs IN THE REGIONS

The DOST has had successful S&T interventions among region-based SMEs. The list below is indicative rather than comprehensive.

In the National Capital Region (NCR), the Moonbake, Inc. in Las Piñas City was provided with technical assistance in establishing the processing of 'ready-to-eat', no preservative, nutritious canned laing (gabi leaves) developed by the Food and Nutrition Research Institute (FNRI). It also received a P1.6 million financial assistance for expanding its production facilities, introducing other laing variants such as those with tuna flakes and in curry powder. Moonbake, Inc. now exports to the Middle East, Canada, Taiwan, Australia, Japan and United States.

In Region I, the Ilocos Food Products in Bantay, Ilocos Sur was provided by the DOST with technical assistance in designing and installing its facilities to increase its product lines, among which, are chicharon, banana chips, squash noodles and basi (rice wine). As a result, its annual sales doubled from P2 million to P4 million.

In Region II, the Wagas Herbal Soap Herbakh Philippines, Inc. based in Ilagan, Isabela was provided with technical assistance in the extraction of essential oil and scented soap production, increasing its product lines to three (papaya; lemongrass; papaya-lemongrass scented soaps) and production capacity from 1,000 to 10,000 soap cakes. Encouraged by its initial success, Wagas has arranged for the planting of ilang-ilang trees in 30 hectares of denuded areas along Sierra Madre to ensure the steady source of essential oil for herbal soaps.

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In 2003, the SETUP assisted 1,368 existing SMEs and provided 1,136 technology interventions that resulted into the creation of 11,346 new jobs and a 30% average increase in gross revenues of client SMEs. The regional distribution of SETUP accomplishments are shown in Table 1. Of the SETUP's client-SMEs, 35 were reported to have developed capacity and confidence to export products to markets in US, Italy, Japan, Hongkong, Taiwan, Norway, France, Germany, China and Australia, to name a few.

1.2. TECHNOLOGY DIFFUSION SERVICES

The Department diffused technologies developed by its agencies to 76 technology adoptors. Of these technologies, those developed by the Forest Products R&D Institute (FPRDI) like kiln dryers and spray booths for the furniture industry had the most number of adoptors.

FIGURE 1: Technologies Transferred by Area and by Number of Adoptors

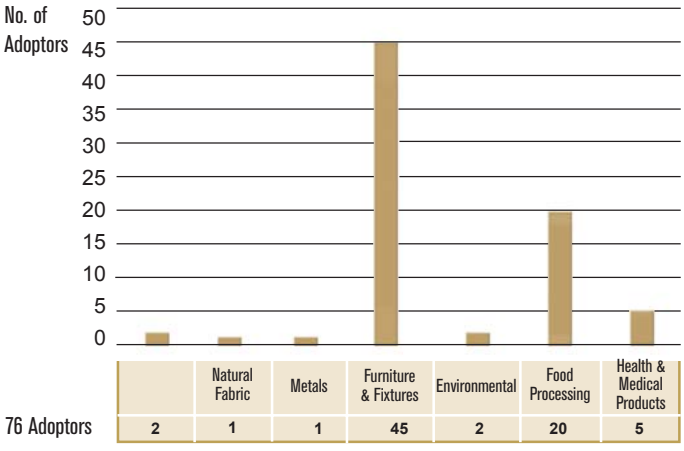
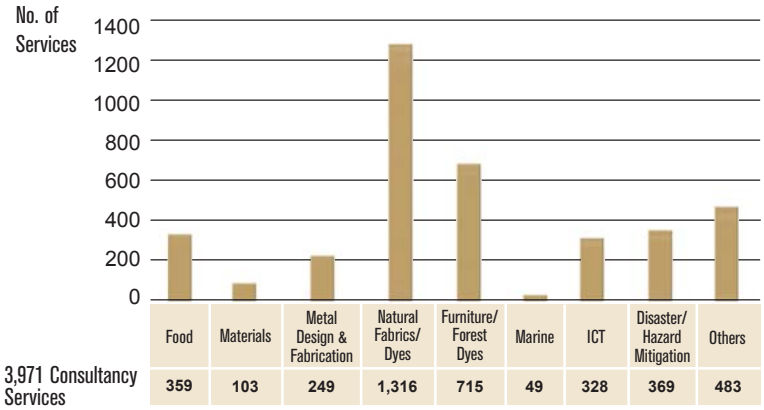


FIGURE 2: Consultancy Services by Area and by Number of Services



1.3. CONSULTANCY SERVICES

The diffusion of knowledge and technologies was also done through consultancy services. The Department, as a whole, responded to 3,971 consultancy service calls. The most number of consultancy service calls were in the areas of natural fabrics and dyes and furniture.

1.4. S&T INFORMATION DISSEMINATION AND PROMOTION

The Department continued to disseminate knowledge and technologies through Techno Gabay of the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development Council (PCARRD) that complemented the efforts of local government units (LGUs) and rural-based organizations in providing extension delivery services to rural poor. PCARRD maintained 148 Farmers' Information and Technology Services or FITS all over the country in 55 LGUs and other extension service organizations, providing information services to 61,090 stakeholders. Also, 110 Magsasaka-Siyentistas were deployed as resource persons in 350 technology dissemination services; 7 technologies assessed for commercialization; 208 technologies identified and renewed for promotion; intellectual property (IP) management system was mainstreamed in 4 institutions; and 8 projects were audited in terms of (IP).

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In Region III, the Aweca Group of Companies in Angeles City was provided with technical assistance in installing fluidized-bed combustion of stream generation, resulting into 30% – 44% reduction in fuel cost expenses and enabling the company to share 5% of its total savings as incentive bonus to its workers.

In Region IV, the Lety's Special Buko Pie in Los Banos, Laguna was provided with technical assistance in adopting the blast-freezing technology that improved the shelf life of buko pies from 7 days to 7 months, and in training its workers in Good Manufacturing Practices (GMP) and Hazard Analysis Critical Point (HACP), enabling it to increase its gross sales to P1.5 million just in the initial year of DOST intervention.

In Region VI, the Tribal Trends, Inc. based in Potolan, Iloilo received DOST technical assistance in installing a wet-filter spray booth and a drying room developed by the Forest Products Research and Development Institute (FPRDI) doubling its bamboocraft production capacity. As a result, the Tribal Trends, Inc. increased its workers from 12 to 90, penetrated new markets in Belgium, Lebanon, France and Japan, and set trial shipments to New York and Istanbul markets.

In Region VII, the Frame Foundation Philippines, Inc. in Lahug, Cebu City was assisted through the DOST-supported Costume Jewelry Center that introduced metal stamping technology for producting high-end fashion accessories products such as brass, copper, galvanized sheets or cold rolled sheets resulting into more product lines reaching different markets and achieving greater sales.

In Region VIII, the Pitad, Inc. in Mondragon, Northern Samar was provided technical assistance in the adoption of twinning machines for the manufacture of high-value coco coir products, resulting into 30% increase in production and a 60% improvement in the quality of local fiber.

In Region IX, the Tugbungan Fishworkers Multi-purpose Cooperative in Zamboanga City was supported by the DOST in establishing a commercial-scale production of bottled Spanish-type sardines, producing an average of 210 cases of 24 eight-ounce jars per month and resulting into P200,000 increase in its monthly income and 250% increase in employment.

In Region X, the Vjandep Bakeshop in Cagayan De Oro City was provided with technical assistance in expanding its pastel products, packaging and labeling of its products, and training its workers in good manufacturing practices (GMP), hazard analysis critical point (HACP) and cleaner production (CP) technologies. The Vjandep Bakeshop now produces 400 dozens of paster per day, earning P280,000 monthly income and employs 34 workers.

BOX 2: LIST OF INFORMATION SYSTEMS/DATABASES

- Micro-Small-Medium Enterprise (MSME)
  http://www.sme.pcarrd.dost.gov.ph/
- Mango Information Network (MIN)
  http://www.min.pcarrd.dost.gov.ph/
- Horticulture Information Network (HORTINET)
  htttp://www.hortinet.pcarrd.dost.gov.ph/
- Bamboo Information Network (BAMBOONET)
  http://www.pcarrd.dost.gov.ph/cin/bamboonet/
- Swine Information Network (SwIN)
  http://www.pcarrd.dost.gov.ph/cin/SWIN/
- Poultry Information Network (PIN)
  http://www.pcarrd.dost.gov.ph/cin/poultry/
- Agro-Forestry Information Week (AFIN)
  http://www.pcarrd.dost.gov.ph/cin/AFIN/
- Agricultural Machinery Information Network (AgMacIN)
  http://www.pcarrd.dost.gov.ph/cin/agmachin/
- Plat Resources of Southeast-Asia (PROSEA-Philippines)
  http://www.pcarrd.dost.gov.ph/prosea/
- Expert Database
  http://www.tapi.dost.gov.ph
- Aqua Infotech
  http://www.pcarmrd.dost.gov.ph
- Food Technology Website
  htttp://www.pcierd.dost.gov.ph
- E-Health
  http://www.ehealth.ph
- SciNET-Phil Integrated Library
  Management System

Similarly, the Department maintained a number of knowledge databases, the majority of which were designed to share and disseminate knowledge and technologies to SMEs and those engaged in agriculture.

The Department disseminated knowledge and technologies through technology fairs and exhibits. The Annual S&T Fair in July 2003 drew a total of 10,143 visitors/guests at the Philippine Trade Training Center. A total of 91 DOST-assisted SMEs displayed/sold their products which generated total sales of P1.68M. Four technologies were eventually covered with Memoranda of Agreement; including one for export to Australia and Canada valued at P2.2 M. Furthermore, 22 Filipino-Chinese businessmen visited ITDI and four of them entered into contract agreements while seven signified interest to avail of MIRDC's technical services.

The Department honored the Filipino inventors' ingenuity through the month-long celebration of the National Inventors' Week (NIW) in 2003, a Festival Year for Filipino Inventors. Various activities were conducted for inventors, highlighted by marketing and selling blitz of Filipino inventions in strategic venues (Megamall, House of Representatives, and the Philippine Trade Training Center). In Congress, 39 inventors participated and exhibited their products which generated sales amounting to P489,535.00. An estimated 2,000 visitors were registered. During the main event at the PTTC, "Inventors' Fair and Invention Contest," a total of 62 inventors and exhibitors participated and the total sales generated was P1.042M. A two-day Entrepreneurship Training facilitated by the Passion for Perfection, Inc. for inventors was conducted and benefited 40 inventor-participants. The activity aimed to reinforce and further hone the entrepreneurial capabilities of the inventors in order to help them promote and commercialize their products.

DOST Secretary Estrella F. Alabastro and President Emeritus Filemon T. Berba Jr., of the Philippine Quality Award Foundation and member of the UP Board of Regents assisted by DOST Undersecretary Eriberta B. Nepumuceno, cut the ribbon formally opening the 2003 National Science and Technology Week last July 14, 2003 at PTTC, Roxas Blvd., Manila

The "Sail on Science" (SOS), a collaborative project among the William, Gothong and Aboitiz (WG&A), the Phil. Science Journalists Association and the S&T Information Institute pilot-tested the showing of S&T films and videos on board the Super Ferry 12 bound for Cebu and back to Manila on February 20-21, 2003.

WINNERS OF THE 2003 NATIONAL INVENTION CONTEST WITH PRESIDENT GLORIA MACAPAGAL-ARROYO

The general assembly and regional congress for the organization of the Visayas and Mindanao Chapters of the Philippine Science Journalists were supported. As a result, Proclamation 437 was signed by President Gloria Macapagal Arroyo declaring the 3rd week of July each year as Science Journalism Week. Moreover, the libraries of the Department catered to 40,950 library clients.

The 25th Annual Scientific Meeting (ASM) with the theme *"Addressing the Demographic Crisis in the Philippines"* was held at the Manila Hotel on 09-10 July 2003. Plenary sessions, simultaneous technical paper presentations, scientific poster exhibits, awarding of science achievers, and the launching of new awards of the National Academy of Science and Technology (NAST) highlighted the Scientific Meeting. Another highlight of the two-day affair was the launching of the book, Rizal the Scientist, a compendium of all papers presented during a NAST co-sponsored symposium in commemoration of Rizal's Centennial Death (1896) delving on the scientific endeavors of Dr. Jose Rizal. Also, the two new awards launched were the NAST-LELEDFI Award for Outstanding Research on Tropical Medicine and the Outstanding Science Journalism Award.

1.5. LABORATORY AND MEASUREMENT TESTING SERVICES

To help SMEs develop new products, improve product quality and their competitiveness, the Department provided 59,291 laboratory and calibration or measurement tests for 14,599 clients, the most number of whom availed of DOST's measurement and calibration testing services. The DOST generated ₱ 38.132 M income from these services.

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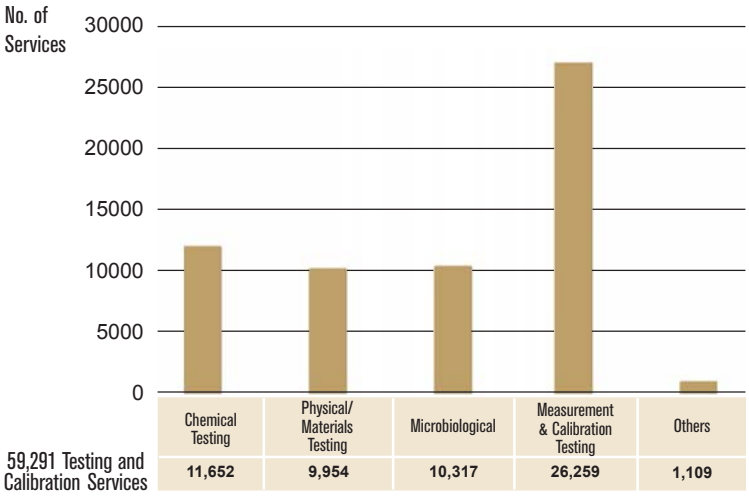
In Region XI, the Food Expert's (FoodEx) Multi-Purpose Cooperative in Toril, Davao City was provided with technical assistance in establishing a common service facility for dehydrating fruits and vegetables. The FoodEx has successfully introduced its product line, 'Fruit Bytes' (packaged dried mango) to the local, US and Australian markets.

In Region XII, the Al-Barrakah Restaurant and Catering Services in Pikit, Cotabato City was assisted in improving its processing of ethnic foods and native delicacies, enabling it to produce 144,000 packs of "tinagtag" per year valued at P201,600.00.

In Caraga Region, the Katrin's Food in Butuan City was provided technical assistance in establishing a mini kaong processing plant that qualifies products to international market standards. Its production capacity is now 280 twelve-ounce bottles per day earning a monthly income of P130,000.00

FIGURE 3: Testing and Calibration Services by Area and by Number of Services



1.6. DISASTER PREPAREDNESS AND HAZARD MITIGATION SERVICES

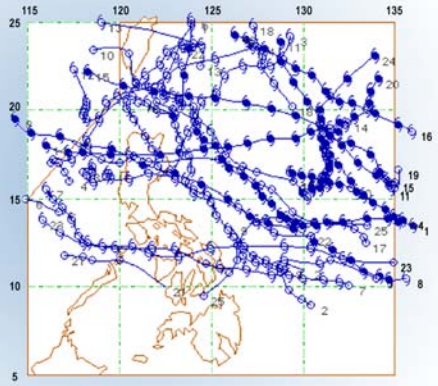
Given its geophysical characteristics, the country is prone to natural hazards. The adverse effects of natural hazards like weather, climate, earthquake and volcano eruptions can be mitigated through systematic and scientific analyses and the provision of timely and accurate information, forecasts and warnings to the general public. The Department helps to mitigate the adverse effects of these natural disasters through the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) and the Philippine Institute of Volcanology and Seismology (PHIVOLCS).

The tracking and forecasting of and warning for tropical cyclones and other severe weather disturbances involve the reception and collection of synoptic and upper-air observational data from national observation network and from around the world including the plotting and analysis of weather charts, prognostication of synoptic situation and processing techniques.

In 2003, PAGASA closely monitored and tracked 25 tropical cyclones, higher than the normal annual average that entered the Philippine area of responsibility. As a result, it issued, 335 international warnings and 288 domestic weather bulletins and advisories. Moreover, PAGASA provided a total of 87 significant weather forecasts (SIGMET) for air navigation safety, 730 special weather forecasts for more specific special clients and 730 forecasts/outlooks for Mt. Pinatubo lahar-affected areas, Mt. Mayon and other selected areas. The timely and fairly accurate warnings and bulletins substantially contributed in mitigating their adverse effects.

FIGURE 4: FISCAL YEAR 2003 TROPICAL CYCLONE TRACKS

1. TY AMANG (April 16-24)
2. TD BATIBOT (May 19-20)
3. TS CHEDENG (May 25-30)
4. TS DODONG (May 31-June 03)
5. TY EGAY (June 13-18)
6. TD FALCON (July 09)
7. TS GILAS (July 15-19)
8. TY HARUROT (July 19-23)
9. TD INENG (July 30)
10. TS JUANING (Aug.01-04)
11. TY KABAYAN (Aug.04-06)
12. TS LAKAY (Aug. 18-20)
13. TS MANANG (Aug. 19-20)
14. TY NIÑA (Aug. 20-24)
15. TY ONYOK (Aug. 29-Sept. 02)
16. TY POGI (Sept. 07-10)
17. TD QUIEL (Sept. 15-19)
18. TS ROSKAS (Sept. 18-10)
19. TD SIKAT (Sept. 25-26)
20. TY TISOY (Oct. 17-24)
21. TD URSULA (Oct. 30-Nov. 04)
22. TS VIRING (Oct. 30-Nov.04)
23. TS WENG (Nov. 12-15)
24. TY YOYOY (Nov. 27-30)
25. TD ZIGZAG (Dec. 25-28)



PAGASA continued to monitor through telemetry and multiplex telecommunications system network the conditions of the country's major river basins and dams. It issued a total of 108 basin flood bulletins for Pampanga, Agno, Bicol and Cagayan river basins, 1 flood bulletin for Binga/Ambuklao dam, and 34 general flood advisories for non-telemetered principal river systems during the occurrence of tropical cyclones and monsoon rains.

FIGURE 5: ACTIVE VOLCANOES, FAULTS AND TRENCHES IN THE PHILIPPINES

To continuously improve their services, PAGASA introduced innovations, such as the issuance of hourly updates for landfalling tropical cyclones, the modification of the format of the severe weather bulletin, and the establishment of community-based flood monitoring forecasting and warning systems in Dumangas, Iloilo and Guagua, Pampanga.

On the other hand, PHIVOLCS closely monitored and plotted 993 earthquakes, four of which with magnitude of 5.0 and above, as follows: Northern Samar (July 2, Ms 6.0), Batanes (Ms 5.2), Negros Oriental (July11, Ms 5.9), and Romblon Island (Ms 5.3). It also monitored volcanic activities particularly over Kanlaon and Mayon volcanoes.

PHIVOLCS implemented the Phase II of the P1.007 billion project on "Improvement of Earthquake and Volcano Monitoring Network in the Philippines" to establish the Volcano Array Observation Network for each of the six most active volcanoes and the new unmanned seismic stations in which earthquake data recorded would be relayed to PHIVOLCS central office in Quezon City by satellite communication. This helped overcome the problem of lack of communication during large-magnitude earthquakes.

Accelerating the Transfer and Use of R&D Results

Generating new knowledge through R&D and bringing these R&D results to the market are keys to economic growth. To accelerate the transfer and use of R&D results for productivity and new wealth creation, the Department has implemented the Technology Incubation for Commercialization (TECHNICOM) program to fast-track the transfer and commercialization of promising R&D results of government R&D institutes, academe and the private sector. It exerted efforts to strengthen intellectual property and technology management in the S&T community. Also, the DOST continued pursuing its R&D efforts while leveraging its meager R&D resources with the private sector through research contracts.

2.1. THE TECHNICOM PROGRAM

The TECHNICOM program has been designed to facilitate technological innovation enterprise spin-offs. Tie-ups with universities for the incubation and commercialization of R&D results are established and strengthened. Marketing links or strategic partnerships with the industry sector, with international entities and with other government agencies are to be initiated. In all these, venture capital plays an important role. Capability building support in high technology areas also complements the program. The TECHNICOM program targets to: 1) stimulate technological innovation; 2) strengthen the capacity of enterprises to tap and adapt promising R&D results; 3) increase private sector investment and adoption of government-initiated R&D breakthroughs; and 4) maximize benefits from government's investments in R&D activities.

In 2003, the TECHNICOM program established its frameworks, mechanisms and guidelines to properly implement/undertake technology commercialization projects. Assistance was provided to technology innovations in food fortification, information technology, medicine, metal industry, and construction. The program supported the preparation of business plans for technology commercialization and conducted feeder programs to encourage innovativeness and entrepreneurial activities among undergraduate and graduate students. It supported the preparation of commercialized feasibility studies to translate research results into investment portfolios. Moreover, it provided assistance to patent applications of breakthrough Filipino innovations under its Intellectual Property (IP) protection system.

As a result, the TECHNICOM program has laid the foundation for the commercialization of 12 technologies, namely: 1) Enriched Rice Premix; 2) PVP-Carrageenan Hydrogels for Burn / Wound Dressing and Bed Sores - Phase 1; 3) Shop-fabricated Houses for Various Purposes; 4) Natural Dye Technology; 5) Compressed Natural Gas (CNG) Components - Phase 1; 6) Locally Developed PC-Based Access Point Deployment Kit; 7) Digital Multimeter; 8) Locally Developed Human Breast Milk Pasteurizer; 9) Vermimeal Production; 10) Salmonella Das; 11) Bayanihan Linux Terminal Server Installer: An Open Source Thin Client Implementation; and 12) Soccer Robot System.

The TECHNICOM program also supports the protection of intellectual property rights. Last year, the Department supported the patent application of 10 technologies, namely: 1) Pilinut Shell Cutter (Invention); 2) Photo-Activated Mask (Utility Model); 3) Chitosan-Impregnated Filter Mask (Utility Model): 4) Processing of Textile Wastes into Activated Carbon Fabric and Products Thereof (Invention); 5) Process for Producing Titanium Dioxide Photocatalyst (Utility Model); 6) Modification of the Design of the UASB Reactor (Invention); 7) Natural Dye Technology (Utility Model); 8) Compressed Natural Gas Components (Utility Model); 9) Integrated Mill Production of CNSL-Based Products (Utility Model); 10) Enriched Rice Premix (Utility Model)

BOX 3: ENRICHED RICE PREMIX TECHNOLOGY: AN EXAMPLE OF TECHNICOM RESULT

The Food Fortification Act of 2000 requires the mandatory iron fortification of staple food like rice. In this regard, the Food and Nutrition Research Institute (FNRI) has developed a process for fortifying rice with iron using an extrusion technology. Under the TECHNICOM program, a collaborative arrangement with a private company was made to conduct a pilot-scale production of iron fortified rice premix. The licencing and technical assistance agreement with the private company is now being finalized.

2.2. IMPROVING INTELLECTUAL PROPERTY MANAGEMENT

Parallel to its TECHNICOM program initiative were the Department's efforts to strengthen intellectual property and technology management in the national R&D system. Based on the revised legal framework guidelines on intellectual property management issued in 2002, a purposive inventory of the Department's intellectual property assets was undertaken. An intellectual property (IP) focal person in each of the DOST attached agencies was designated. Training and capacity building in intellectual property management and commercialization were intensified. Closer collaboration with the academe and other members of the S&T community in nurturing an IP culture and in developing IPR protocols has been established.

As a result, 29 out of the 98 pending patent applications by the DOST since 1988 were filed during the Arroyo administration. Seven out of the 18 patents assigned to the Department since 1987 were granted from 2001-2003. At the national level, patent applications from Filipinos increased from 946 in 2001 to 1,285 in 2003. Moreover, as percentage of the total patent applications, their share significantly increased from 25% in 2001 to 62% in 2003.

2.3. R&D PROGRAM

To continuously generate new knowledge, the Department invested P 395.2 million in R&D in 2003. Of this amount, 59%, was made by its seven R&D institutes, 13 percent by the DOST Central Office through its grants-in-aid program, and 16 percent by its five sectoral planning councils, also through their grants-in-aid programs as shown in Figure 6.

BOX 4: DOST R&D INITIATIVES

The potentials of biotechnology in food security and economic growth are being harnessed by exploring genes in coconut with traits that are of higher laurate content for oil production, a papaya with resistance to ringspot virus and with delayed ripening traits, and a tissue culture protocol for the carabao mango. Cheaper alternatives to expensive and imported fertilizers and synthetic plant hormones are being looked into. Rhizobacteria, the genetic substance regulating plant growth in vegetable production and ornamentals propagation is being assessed. The use of the much improved embryo transfer (ET) biotechnique has already resulted into 11 cow calves with superior genetic traits and is now being applied to produce high-quality water buffaloes (carabao). To support the country's reforestation program, biotechnology is now being employed to produce superior forest tree planting materials. Moreover, to address the country's number 4 cause of deaths in the country, antibody biotechnology is being applied to develop drugs for breast cancer from the country's indigenous marine and terrestrial sources.

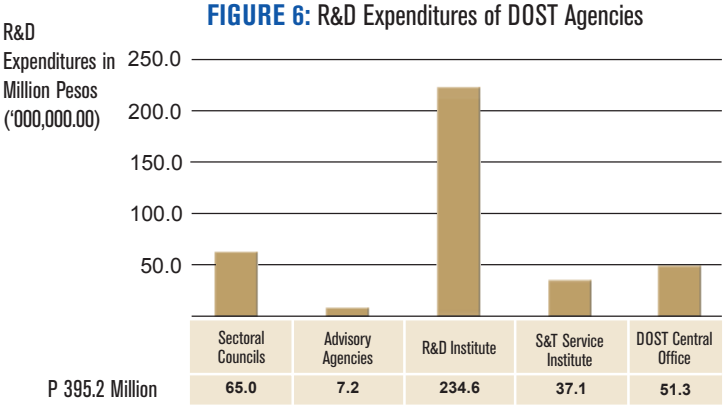
Marine resources like coral, reef fishes, seaweeds and seagrasses, and mangrove communities have been assessed and studied in 18 provinces comprising the country's eastern coast providing invaluable information for coastal resource management. The protocol and facilities have been established for tritium-labelled saxitoxin that is used as receptor assay to manage harmful algal blooms in the country, and thus, safeguarding public health.

The immunodot 'dipstick', an alternative diagnostic tool for schistosomiasis, has been evaluated in terms of its applicability in assessing infection and treatment efficacy as well as its sensitivity and specificity when used in the field setting. The methods for preparing iron-fortified rice have been standardized and the packaging materials for its storage have been studied. A radiachromic carrageenan-based hydrogel is being developed as visual indicator for quality assurance in radiation sterilization and food irradiation.

Modifying the atmosphere inside packaging materials of mangoes through the incorporation of zeolite in the plastic has been found to balance oxygen and carbon dioxide, control enzymatic reactions and deterioration, and thus, extending their shelf life up to 33 days while maintaining their sweet taste, aroma and smooth texture. To help boost carabao mango exports from southern Philippines particularly to Hongkong and China, modern packing houses in six Mindanao regions have been established. Efforts to standardize the formulations for bangus products have been initiated with the cooperation of the academe and private firms.

Stress grading rules for tropical timber in the Philippines using the ISO standards for lumber machine grading has been developed and pilot-tested in private lumber companies to determine the pricing scheme for stress graded lumber and to validate the distribution of lumber in the various stress grades. The use of low and medium density polyethylene (LMPE) waste plastics, waste plastic aluminum packaging laminates (PAPL), and oriented polypropylene laminates (OPL) as feasible alternative to chemical binders for plywoods has been tested at the laboratory and pilot scales.

FIGURE 6: R&D Expenditures of DOST Agencies

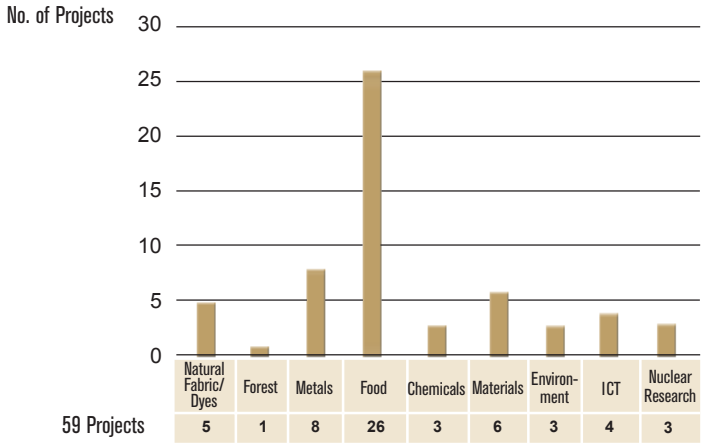


The DOST invested in R&D the development of the country's metrology or measurement standards, information and communications technologies, packaging, agriculture biotechnology, health biotechnology, mango R&D, clean technologies, cancer genetics and microelectronics and engineering.

2.4. RESEARCH CONTRACTS

The Department leverage its meager R&D resources with private firms and other government institutions through research contracts. Last year, it catered to 59 research contracts, the most number of which were in the food manufacturing.

FIGURE 7: Contract Researchers by Area and by Number of Projects



cont.

To improve the productivity and the quality of abaca products and thus, enhance the global competitiveness of the country's abaca fiber industry, a mechanized *pinukpok* rotary press, a solid stainless steel roller that flattens out and smoothens long (30-50 meters) *sinamay* fabrics has been designed and developed. Also, a tuxer enabling a 360 % productivity increase in the process of separating the outer covering of the abaca leaf sheath (tuxy) containing the primary fiber from the inner layer that is discarded, and an autofeed decorticator with a 400 % productive capacity more than the conventional decorticators have been designed, developed and field-tested.

To support the furniture and handicraft industry, a Geographic Information System (GIS)-based mapping of forest-based raw materials has been done while information on available technologies has been disseminated through various fora and the internet. Cleaner production technologies are being introduced to industries, particularly small and medium enterprises (SMEs) through technology demonstrations and assessments and extension services.

The proto-type facility for the synthesis of nitrides or diamond and diamond-like-carbon (DLC) films intended for coating and various industrial applications such as diffusion barriers, cryogenic thermometers and Josephson junctions have been improved. Coating technologies yield surface coatings with diamond-like-hardness or gold-color finish that can be used in the semiconductor, manufacturing, and metal industries.

To build the country's capabilities in ICT and make the country a world-class provider of ICT services and products, the BlueZ protocol stack has been customized and led to the development of the following commerciable products - BlueAds, BlueZ protocol stack, and the Bayanihan Linux Developers's kits including sample applications (ASTI BT Kit checkers and ASTI Bluehood) that validate its installation to the operating system. The BlueZ and its applications were already integrated with the Bayanihan Linux Version 2.0 released last January, 2003.

The development of an advanced broadband wireless system has resulted into three marketable products – the wireless system training kit enabling the conduct of hands-on experiments with wireless transmission technologies; the PC-based WiFi access point, a cost-effective, reliable and secure broadband wireless access point based on a simple PCMCIA card connected to a Linux-enabled PC that was already successfully demonstrated; and the wireless training modules. Moreover, a microwave link design has been developed and successfully tested, drawing PLDT to partner with DOST-ASTI in developing ICT technologies. Moreover, efforts are being made to harness advanced broadband wireless technologies for rural connectivity.

The Bayanihan Linux, an open source-based software for workstations and servers, has been developed as an alternative to commercially available desktop software for use by academic institutions, local government units, and small to medium scale business enterprises (SMEs). Partnerships have been forged with a number of academic and private business institutions to promote the use of the BL software.

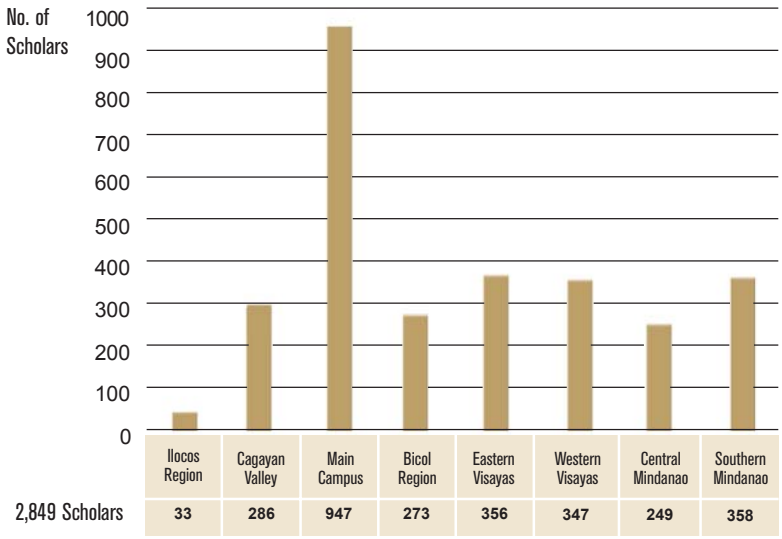
Building from earlier successful work demonstrating the suitability of MBE-grown GaAs/AlGaAs optoelectronic discrete devices for local area network communication, efforts have been initiated to study extensively the physical properties of the MBE-grown materials for the development and design of innovative optoelectronic devices that can be used either in fiber optic communication (both long haul and short haul) and the integration of this system (detector and emitter) on a single wafer (optical electronic integrated circuits).

S&T Capacity Building

The S&T capacity of a country is defined as the personnel, infrastructure, investment, and institutional and regulatory framework available to generate activities and acquire scientific knowledge and technological capabilities for addressing, with competence and creativity, local, national, and international needs. (Inter-Academy Council, 2004). The Philippines needs to continuously build its S&T capacity at individual, institutional and policy levels to ensure that indigenous knowledge systems are further developed, that local interests and needs are acted upon, and that local capabilities to assimilate technologies from abroad are further increased.

To help build the country's S&T capacity, the Department continued to implement various S&T HRD programs at secondary, undergraduate and graduate levels including upgrading training for science and mathematics teachers, provided training opportunities, recognized and awarded outstanding scientists and technologists, strengthened S&T institutions, fostered international scientific linkages and enhanced the S&T policy environment.

FIGURE 8: Number of PSHS Schoolars by Campus



3.1. SPECIALIZED SCIENCE SECONDARY SCHOOL PROGRAM

The Philippine Science High School (PSHS) with 7 campuses all over the country continued its specialized science secondary school program benefiting 2,849 students as of the end of June 2003. For the school year 2002-2003, a total of 629 graduated from the seven campuses. It should be noted that 16 students from PSHS Class 2003 were awarded the UP Oblation Scholarships, normally accorded to top 50 UP College Admission Test (UPCAT) examinees every year. The distribution of PSHS enrolment is shown in Figure 8.

3.2. S&T UNDERGRADUATE SCHOLARSHIP PROGRAM

The biggest number of beneficiaries under the S&T undergraduate scholarship program administered by the Science Education Institute (SEI) are poor but deserving students who have been entitled under Republic Act 7687. In February, 2003, a total of 16,416 graduating high school students hurdled the S&T scholarship examination for the school year 2003-2004. For the year 2003, a total of 9,998 undergraduate scholars were supported. Among the 1,997 scholars who graduated in March 2003, 184 or 9 % were with honors.

3.3. GRADUATE SCHOLARSHIPS

To address the need for competent S&T professionals in basic/advance sciences, engineering, agriculture, aquaculture and marine fisheries, engineering, health and science education, the Department provided 596 MS and PhD scholarships and grants for masters' theses and doctoral dissertations including the Faculty Development Program for selected Teacher Education Institutions and the Physics Teaching scholarship program.

TABLE 2: NUMBER OF 2003 DOST-SEI SCHOLARS, ON-GOING AND GRADUATES

	2003	
	ONGOING	GRADUATED
RA 7687	8,798	1,818
MERIT	838	134
JUNIOR LEVEL ASSISTANCE PROGRAM (JLAP)	146	35
SCIENCE EDUCATION	177	10
GREAT-M	39	—
TOTAL	**9,998**	**1,997**

3.4. MATHEMATICS AND SCIENCE TEACHER UPGRADING PROGRAM

In 2003, the Department through the SEI continued to implement the Project Rescue Initiatives in Science Education (Project RISE) by upgrading 1,066 elementary and secondary science and mathematics teachers from public schools nationwide and at the same time adjusted its strategy in upgrading science and math teachers by directing its efforts to specific target areas and by developing new and more cost-effective learning approaches.

LEARNING MATH THROUGH PWA WITH MATH SUPERVISOR AT THE WEST VISAYAS STATE UNIVERSITY

MUST PARTICIPANTS (ELEMENTARY MATH) DURING THEIR COMPUTER SESSION AT THE ATENEO DE ZAMBOANGA UNIVERSITY.

Likewise, the Department through SEI implemented the Mindanao Upgrading of Science Teachers Project (Project MUST) to improve the competence and capabilities of elementary and secondary teachers in schools predominantly attended by Muslim students and other ethnic groups. Project MUST is designed as a 90-hour teacher training program conducted during summer months to develop the teacher's skills in integrating instructional materials unique to the local culture. The program develops the teacher's innovativeness and creativity in coming up with lessons that are culture-based, and in developing instructional materials using local resources. In 2003, 1,139 elementary and secondary science and math teachers coming from the Mindanao regions were trained and provided with stipend and book allowance for the training duration.

3.5. YOUTH SCIENCE PROGRAM

Youth Science Programs promote partnerships with the private sector, motivate students, teachers and schools to engage in scientific endeavors through science and math competitions, and to develop a science culture among the youth and the general public. The Department through SEI continued to actively participate in the Intel Philippines Science Fair, the International Science and Engineering Fair (ISEF), the Australian Mathematics Competition and the National Science Club Month. In the 2003 Australian Mathematics Competition (AMC), two Filipino high school students achieved grand prizes with four other Filipino participants receiving the AMC special achievement awards, nine others receiving certificates of high distinction, and one getting a special award having the best standardized score.

It likewise continued to implement the Computer Literacy Program through which 181 public secondary schools received computers and software packages.

3.6. SCIENTIFIC CAREER SYSTEM

The DOST continued to administer the Scientific Career System (SCS) that was established by the Civil Service pursuant to E.O. No. 784 dated 17 March 1982. The SCS is a system of recruitment, career progression, recognition and reward for scientists in the public service, as a means of developing a pool of highly qualified and productive scientific personnel. It now covers the following major disciplines: a) basic/natural sciences and mathematics; b) engineering and information and communication technology; c) medical sciences; d) agricultural sciences; e) selected field of social sciences and; f) others – library and archival sciences, and scientific and technical documentations. As of end of 2003, there were 99 conferred scientists.

3.7. BALIK-SCIENTIST PROGRAM

The Balik-Scientist Program arranges the contracted return of Filipino S&T experts from abroad to render services in local institutions, government, private and academe, along their field of specialization. This program has attracted a number of foreign-based Filipino scientists to help in local developmental efforts. In 2003, 12 applications were received and processed.

3.8. S&T AWARDS AND RECOGNITION

The Department confers awards and recognition to outstanding achievements by Filipino scientists and technologists. Also, these are aimed at encouraging the younger generation to pursue careers in advanced scientific studies and researches. Through the National Academy of Science and Technology (NAST), science achievers were screened for the following Awards: (a) Outstanding Young Scientists (OYS); (b) TWAS Prize for Young Scientist in the Philippines; (c) Outstanding Scientific Papers; (d) Outstanding Books and Monographs; (d) Hugh Greenwood Environmental Science Award; (e) Pro Scientia Transformatrix Award; and (f) NAST-DuPont Talent Search for Young Scientists. Academy membership as well as the rank and title of National Scientist were likewise screened.

The Outstanding Young Scientist (OYS) awardees were: 1) Nathaniel C. Bantayan, Ph.D. (Forestry Engineering); 2) William L. de los Santos, Ph.D. (Agronomy and Soils); 3) Ma. Corazon A. de Ungria, Ph.D. (Molecular Biology); 4) Evelyn Grace T. de Jesus-Ayson, Ph.D. (Zoology); 5) Agnes T. Paras, Ph.D. (Mathematics); 6) Carla B. Dimalanta, Ph.D. (Geology); 7) Mary Ann A. Endoma, Ph.D. (Chemistry); 8) Jesus N. Sarol, Jr., M.D. (Epidemiology); and 9) Jose Alberto S. Reyes, Ph.D. (Psychology).

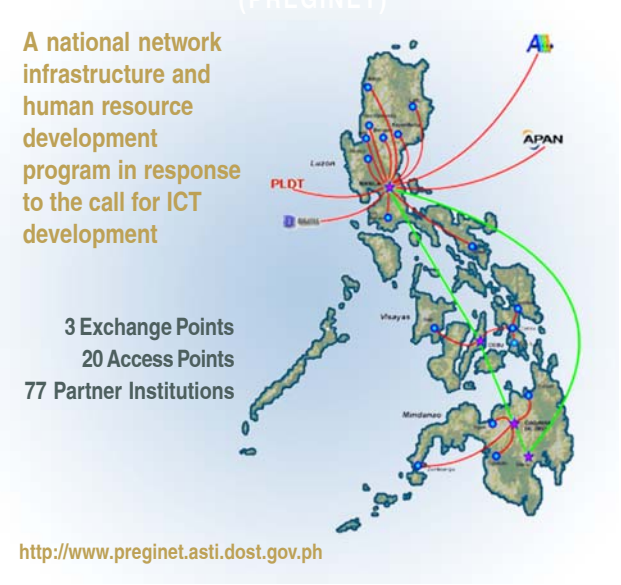
Moreover, the Hugh Greenwood Environmental Science Award, intended to recognize outstanding scientific and technological research works that contribute to environmental protection and conservation was accorded to Porfirio Alexander M. Aliño, Ph.D (Marine Biology), an OYS awardee in 1993. He was recognized for his significant contributions in the field of coastal resources management by developing methods to assess and monitor coral reefs and organizing various training programs for a broad range of stakeholders.

3.9. INSTITUTION BUILDING AND NETWORKING

Part of the Department's S&T capacity building efforts is to enhance S&T institutions through quality assurance. In 2003, the Standards and Testing Division of the Industrial Technology Development Institute (ITDI) earned the ISO/IEC 17025 quality certification. This was in addition to a number of existing quality certifications that the DOST agencies already maintain. The Metal Industry Research and Development Center (MIRDC) maintains the ISO 14001 certification for environmental management system, the ISO 9001 certification for its Industrial Training and Staff Development Section, the ISO/IEC Guide 25 certification and the NATA accreditation for force and mass metrology for its Metals Testing and Calibration Laboratory. The Food and Nutrition Research Institute (FNRI) maintains the ISO/IEC Guide 25 and ISO/IEC 17025 certifications for its Food Analytical Service Laboratory.

The Department confers awards and recognition to outstanding achievements by Filipino scientists and technologists.

FIGURE 9: PHILIPPINERESEARCH, EDUCATION, AND GOVERNMENT INFORMATION NETWORK



The Department through the Advanced Science and Technology Institute (ASTI) maintained the Philippine Research, Education and Government Information Network (PREGINET), a high performance broadband network that has 3 exchange points and 20 access points in almost every region linking 77 academic, research and government institutions nationwide to the different international research and education networks.

The PREGINET provided services in terms of mirroring a list of digital libraries of more than 115 countries for fast, easy and reliable access of reference and educational materials. It also rendered videoconferencing and webcasting services. PREGINET played an important role in establishing the Philippine Bioinformatics Working Group that organized the 1st Philippine Bioinformatics Workshop enabling the participants to set up their institutions' Bioinformatics Access Node and to use the applications in their fields of work.

To sustain the PREGINET, partnerships and agreements were made with: 1) the Department of Agriculture-Bureau of Agricultural Research (DA-BAR) for the integration and connectivity of its Agriculture and Fisheries Research and Development Information Systems (AFRDIS) network; 2) the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD) for its Farmers Information and Technology Services (FITS-Techno Pinoy) Centers; 3) the Open Academy for Philippine Agriculture (OPAPA) for the interconnectivity of its participating institutions as well as the provision of network backbone; 4) the Philippine Council for Aquatic and Marine Research and Development (PCAMRD) for hosting PhilReefs and Aqualine databases that are used by organizations involved in fisheries and related areas; 5) the University of the Philippines - Open University for the development and adoption of networking technologies, services, and applications for distance learning; 6) the Commission on Election – National Capital Region (COMELEC-NCR) for hosting its web content and databases such as the registered voters' list; 7) the League of Provinces of the Philippines (LPP) for hosting the websites of the provincial governments and for considering PREGINET as the Government Exchange Point for government agencies in Metro Manila and the regional sites; and (8) the School Over the Internet (SOI) - Asia, for making available over PREGINET several real-time and archived lectures on agriculture, fisheries, education, health and other fields of study that the faculty, students, researchers and experts can avail of.

The academic, government, and research sectors benefited from the PREGINET in terms of technical services and the generated research outputs. To cite a specific example, the digital content system for digital libraries and as a repository for library holdings were utilized by the College of Medicine of the University of the Philippines-Manila and the Department of Environment and Natural Resources (DENR).

The PREGINET serves as a testbed for the development and testing of next generation network technologies, applications and services with the aim of sharing and transferring these technologies for the benefit of the S&T community. Research efforts in advanced networking technologies particularly Internet Protocol version 6 (IPv6) came up with promising results as the ASTI became the first institution in the Philippines to secure an IPv6 block allocation from the Asia Pacific Network Information Center (APNIC). It is now promoting in the country the adoption of IPv6, a technology that has already been deployed in a few selected partner institutions. Moreover, the ASTI through the PREGINET developed and deployed network measurements and monitoring tools as well as multimedia over IP applications. In the field of Grid Computing, the ASTI pursued research activities to determine the feasibility of establishing the Philippine Grid as linked to the Global Grid for advanced applications and technologies.

To help provide baseline data for policymaking, the Department in 2003 conducted national surveys like the Survey of R&D Human Resources and Expenditures, the 6th National Nutrition Survey and the ICT Resources and Manpower Surveys.

3.10. SCIENTIFIC LINKAGES AND INTERNATIONAL COOPERATION

Scientific linkages and international cooperation contribute significantly to the country's S&T capacity building efforts through exchange of information and scientific personnel, collaborative research, and even R&D infrastructure upgrading. The Department maintained its scientific linkages and partnerships with countries like China, Taiwan, Republic of Korea, Russia, US and Japan as well as with international and regional organizations such as the World Meteorological Organization (WMO), International Atomic Energy Agency (IAEA), the Committee on Science and Technology of Association of South East Asian Nations (ASEAN-COST) and the Industrial Science and Technology Working Group of the Asia Pacific Economic Cooperation (APEC-ISTWG), the International Tropical Timber Organization (ITTO), Australian Center for International Agricultural Research (ACIAR) and the Consultative Group on International Agricultural Research (CGIAR), the International Astronomical Union (IAU).

Under the DOST-JSPS Program, the exchange of S&T experts between Japan and the Philippines was arranged. In 2003, Dr. Graciano P. Yumul, Jr., Executive Director of PCIERD and nine other grantees successfully completed their 24-day visit to Japan. From the Japanese side, three scientists were programmed to visit the Philippines, namely: a) Prof. Shigeyuki Suzuku (Okayama University), b) Dr. Yuichi Chigusa (Dokkyo University School of Medicine), and c) Dr. Yutaka Tamai (Hokkaido University). Moreover, two Filipino researchers started their PhD dissertation grants bringing to 12 the total number of ongoing RONPAKU fellows.

3.11. CREATING A MORE CONDUCIVE S&T POLICY ENVIRONMENT

To help provide baseline data for policymaking, the Department in 2003 conducted national surveys like the Survey of R&D Human Resources and Expenditures, the 6th National Nutrition Survey and the ICT Resources and Manpower Surveys.

The Department continued to advocate the National Science and Technology Plan (NSTP) to various sectors as basis for allocating scarce S&T resources. A series of multi-sectoral consultation meetings were held on the draft Science and Technology Human Resource Development Plan, an operational plan of the NSTP.

The honorarium guidelines formulated in 1995 was updated with the issuance on June 30, 2003 of the Memorandum Circular No. 001, series of 2003, entitled "Revised Implementing Guidelines on the Grant of Honoraria to Personnel Whose Services are Engaged by the National Science and Technology System" in accordance with RA 8439. This narrowed the gap between S&T government honorarium rates and those of foreign institutions and the private sector. Also, the Department pursued the finalization of the proposed legislative bill amending RA 7687, "S&T Scholarships Act" with the provision for a mandatory monthly PAGCOR contribution of P10 M to the S&T scholarship funds.

The DOST, through the NAST, organized a series of policy advocacy fora and roundtable discussions encouraging greater public participation in discussing important and pressing S&T issues. Among these were: a) the Water and Fish Summit where the proposed integrated water policy plan was crafted; b) the Regional Forum on Biotechnology and GMOs; c) the Workshop on Toxic and Hazardous Waste Remediation where a project proposal was prepared for international funding; d) the Round Table Discussion on Human Genome: Promises and Problems where resolutions and statements on human genome and human reproductive cloning were presented; and e) the Round Table Discussion on 'Population: How and Why It Matters?'where a resolution on population was presented.

The DOST through the NAST organized a series of policy advocacy fora and roundtable discussions encouraging greater public participation in discussing important and pressing S&T issues.

The Department through the National Biosafety Committee of the Philippines (NCBP) addressed the policy issues affecting biosafety risks. The NCBP is a multi-disciplinary, interagency, scientific and technical advisory committee tasked with "the study and evaluation of existing laws, policies and guidelines on biotechnology and recommending measures for its effective utilization and prevention of possible pernicious effects on the environment." In 2003, the NCBP evaluated 21 applications for research/requests for importation of regulated materials. Its inspection team visited six laboratories/facilities and proposed field release sites where experiments on GMOs would be carried out and monitored ten planning/harvest activities for the field test of Bt and Round-up ready corn.

URCES MANAGEMENT

FIGURE 10: Distribution of 2003 Expenditures of the DOST System by Expense Classification

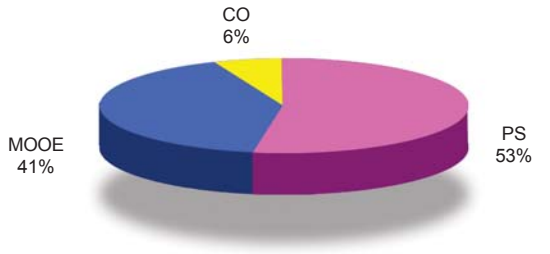
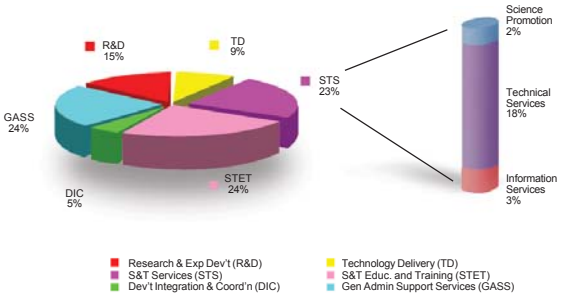


FIGURE 11: Distribution of 2003 Expenditures of the DOST System by Expense Classification



DOST System spent a total
han half of this amount or 53% went to Personal Services
31 billion, 41% or P 1.111 billion was spent
ther Operating Expenses (MOOE) and 6% or P 169.798
lay (CO).

vere distributed according to the following major
ment: research and development with a total expenditures of P 395.154 million or 15%; technology delivery which accounted for P
S&T services (STS) at P 628.073M or 23%; S&T
(STET) with P 679.115 million. or 25%; development
ation of the national research or S&T System with P
and general administration and support services with P
.

logical services (STS) as one the Department's mandates
unctions with corresponding amount spent: technical
million or 18%; information services with P 83.932
million or 3% and Science Promotion with P 67.559 million or 2%.

Among the DOST agencies, SEI is visibly the biggest cost center summing up to P 370.623 million or 14% with more than 90% of its expenditures spent for S&T education and training. PAGASA came as second top spender with P352.348 million or 13%. The Central Office spent a total of P 345.051 million or 13% with the biggest portion of its total expenditures spent for technology delivery function.

Among the research and development institutes (RDIs), ITDI and MIRDC spent the biggest amount for R &D with P 157.811 million and P 106.437 million respectively.

For the DOST Regional Offices, total expenditures reached P 195,352 million.

TABLE 4: Distribution of 2003 Expenditures of the DOST System by Agency and by Expense Classification

AGENCY	TOTAL	EXPENSE CLASSIFICATION		
		PERSONAL SERVICES	MOOE	CO
GRAND TOTAL	**2,712,168,085**	**1,431,272,278**	**1,111,196,811**	**169,698,995**
Sectoral Councils	**285,816,916**	**132,833,767**	**150,722,013**	**2,261,136**
PCARRD	117,112,374	71,340,358	45,473,930	298,086
PCAMRD	27,744,194	13,997,000	13,747,194	—
PCASTRD	47,813,110	13,549,220	32,300,840	1,963,050
PCHRD	35,514,703	17,050,500	18,464,203	—
PCIERD	57,632,535	16,896,689	40,735,846	—
Advisory Agencies	**42,387,831**	**17,742,940**	**24,644,891**	**—**
NAST	21,321,831	3,236,940	18,084,891	—
NRCP	21,066,000	14,506,000	6,560,000	—
R&D Institutes	**559,457,827**	**425,378,406**	**126,230,062**	**7,849,358**
ASTI	20,391,723	16,818,047	3,393,692	179,984
FNRI	65,136,000	49,534,000	12,871,000	2,731,000
FPRDI	64,984,000	54,365,000	10,619,000	—
ITDI	157,810,705	121,273,266	32,136,910	4,400,529
MIRDC	106,436,929	80,771,386	25,338,748	326,795
PNRI	92,270,000	60,296,000	31,974,000	—
PTRI	52,428,470	42,320,707	9,896,712	211,050.60
S&T Service Institutes	**1,284,101,817**	**589,119,383**	**645,531,632**	**49,450,802**
PAGASA	352,347,734	276,947,589	60,796,912	14,603,232
PHIVOLCS	151,141,802	56,006,000	80,076,232	15,059,570
PSHS	236,338,000	129,412,000	93,700,000	13,226,000
SEI	370,622,849	16,160,286	354,462,563	—
STII	32,446,369	21,765,358	10,681,011	—
TAPI	48,769,064	22,255,150	26,513,914	—
NCC	92,436,000	66,573,000	19,301,000	6,562,000
DOST- OSEC	**540,403,694**	**266,197,782**	**164,068,213**	**110,137,699**
Central Office	345,051,213	121,465,788	113,983,328	109,602,097
CAR	11,879,344	8,436,000	3,443,344	—
REG 1	11,406,314	7,938,579	3,467,735	—
REG 2	13,390,129	9,353,000	4,037,129	—
REG 3	15,426,523	12,000,134	2,955,787	470,602
REG 4	22,717,880	17,604,100	5,113,780	—
REG 5	15,248,000	11,840,000	3,408,000	—
REG 6	14,238,629	11,420,507	2,818,122	—
REG 7	14,361,928	10,196,633	4,165,295	—
REG 8	13,739,000	10,515,532	3,223,468	—
REG 9	12,265,198	8,144,639	4,120,559	—
REG 10	15,570,600	12,410,200	3,160,400	—
REG 11	13,743,000	10,312,000	3,366,000	—
REG 12	12,740,465	7,584,904	5,155,560	65,000
Caraga	8,625,473	6,975,766	16,497,069	—

Source: DOST Councils, Institutes, Agencies and Regional Offices

TABLE 5: Distribution of 2003 Expenditures of the DOST System by Agency and by S&T Function

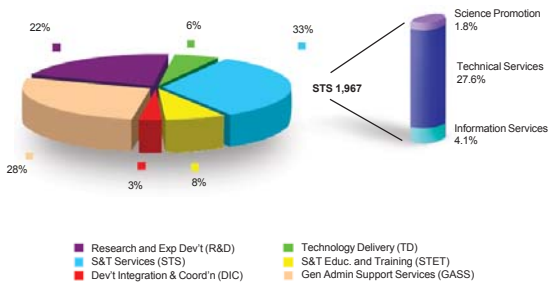
AGENCY	TOTAL	S&T FUNCTION							
				SCIENTIFIC AND TECHNOLOGICAL SERVICES (STS)			S&T EDUCATION AND TRAINING	DEV'T. INTEG. & COORD. OF THE NAT'L RES OR S&T SYSTEM	GEN. ADMIN AND SUPPORT SERVICES
		RESEARCH & DEVELOPMENT	TECHNOLOGY DELIVERY	INFORMATION SERVICES	TECHNICAL SERVICES	SCIENCE PROMOTION			
Grand Total	**2,712,168,085**	**395,153,716**	**235,073,843**	**83,932,373**	**476,581,141**	**67,559,413**	**679,114,914**	**132,130,302**	**642,622,383**
Sectoral Councils	**285,816,916**	**65,003,436**	**5,882,710**	**6,112,476**	**1,524,220**	**2,113,975**	**53,869,047**	**74,303,064**	**77,097,988**
PCARRD	117,112,374	35,888,292	4,811,670	2,508,184	—	—	1,599,606	32,506,251	39,798,371
PCAMRD	27,744,194	8,937,750	318,600	167,265	143,370	167,265	1,856,250	7,220,500	8,933,194
PCASTRD	47,813,110	9,782,660	402,440	839,910	1,364,350	1,786,710	15,502,670	7,537,650	10,596,720
PCHRD	35,514,703	5,962,629	200,000	565,432	16,500	160,000	4,710,521	14,417,734	9,481,887
PCIERD	57,632,535	4,432,105	150,000	2,031,685	—	—	30,200,000	12,620,929	8,197,816
Advisory Agencies	**42,387,831**	**7,208,000**	**—**	**1,158,000**	**1,281,852**	**12,405,366**	**304,000**	**—**	**20,030,612**
NAST	21,321,831	1,330,000	—	—	1,281,852	9,945,366	—	—	8,764,612
NRCP	21,066,000	5,878,000	—	1,158,000	—	2,460,000	304,000	—	11,266,000
R&D Institutes	**559,457,827**	**234,619,216**	**32,921,043**	**11,949,722**	**93,288,157**	**2,801,000**	**8,651,959**	**40,000**	**175,186,729**
ASTI	20,391,723	10,033,527	—	—	—	—	—	—	10,358,196
FNRI	65,136,000	30,503,000	2,799,000	622,000	5,417,000	2,801,000	—	—	22,994,000
FPRDI	64,984,000	43,223,000	800,000	752,000	—	—	—	40,000	20,169,000
ITDI	157,810,705	73,962,052	9,972,636	—	37,706,410	—	—	—	36,169,607
MIRDC	106,436,929	34,715,171	7,034,481	4,776,113	15,232,407	—	5,260,127	—	39,418,630
PNRI	92,270,000	26,622,439	5,218,105	2,791,711	27,791,227	—	2,733,099	—	27,113,419
PTRI	52,428,470	15,560,028	7,096,821	3,007,898	7,141,113	—	658,733	—	18,963,877
S&T Service Institutes	**1,284,101,817**	**37,055,332**	**—**	**50,712,025**	**355,105,445**	**26,103,539**	**568,697,214**	**7,575,807**	**238,852,459**
PAGASA	352,347,734	26,744,427	—	—	209,960,684	—	10,721,794	—	104,920,828
PHIVOLCS	151,141,802	10,044,802	—	5,941,000	105,677,000	—	465,000	—	29,014,000
PSHS	236,338,000	—	—	—	—	—	209,628,000	—	26,710,000
SEI	370,622,849	266,103	—	175,200	7,625,941	761,216	339,401,420	7,575,807	14,817,162
STII	32,446,369	—	—	5,415,015	—	13,733,524	—	—	13,297,830
TAPI	48,769,064	—	—	3,314,810	19,895,820	11,608,796	—	—	13,949,638
NCC	92,436,000	—	—	35,866,000	11,946,000	—	8,481,000	—	36,143,000
DOST-OSEC	**540,403,694**	**51,267,732**	**196,270,090**	**14,000,150**	**25,381,467**	**24,135,535**	**47,592,694**	**50,211,431**	**131,544,596**
Central Office	345,051,213	51,267,732	123,203,620	1,687,782	—	14,681,249	38,566,179	39,162,680	76,481,971
CAR	11,879,344	—	4,744,788	1,501,393	1,760,458	—	349,484	377,863	3,145,357
REG 1	11,406,314	—	6,436,700	693,796	735,722	471,340	—	—	3,068,755
REG 2	13,390,129	—	6,600,800	390,700	354,600	1,517,800	—	—	4,526,229
REG 3	15,426,523	—	1,933,900	779,851	3,998,100	256,252	1,600,326	2,290,933	4,567,161
REG 4	22,717,880	—	12,565,170	998,790	2,498,170	1,069,170	454,620	1,988,230	3,143,730
REG 5	15,248,000	—	5,339,952	705,730	3,087,247	743,027	545,507	—	4,826,537
REG 6	14,238,629	—	5,940,127	112,096	2,566,778	348,478	—	1,462,612	3,808,538
REG 7	14,361,928	—	3,503,000	1,399,000	1,622,000	416,000	681,000	616,000	6,124,928
REG 8	13,739,000	—	3,945,905	984,908	1,163,364	1,294,807	1,018,519	1,297,600	4,033,897
REG 9	12,265,198	—	3,658,007	1,292,156	1,773,017	1,073,190	1,374,215	—	3,094,613
REG 10	15,570,600	—	8,053,620	1,180,540	2,394,040	490,190	—	—	3,452,210
REG 11	13,743,000	—	4,348,000	1,258,000	983,000	649,000	345,000	1,086,000	5,074,000
REG 12	12,740,465	—	3,127,859	832,126	741,402	744,110	2,223,155	1,929,514	3,142,299
Caraga	8,625,473	—	2,868,641	183,282	1,703,568	380,922	434,688	—	3,054,371

Source: DOST Councils, Institutes, Agencies and Regional Offices

4.2. Human Resources Management

The DOST System has a total workforce of 4,944 composed of 3,626 (73%) technical personnel and 1,318 non-technical personnel. Technical personnel are those who perform planning, research, and technical services while non-technical personnel are those who perform administrative, clerical and other support services.

FIGURE 12: Distribution of 2003 Personnel of the DOST by S&T Function



By functional categories, the distribution of DOST System personnel are as follows: research and development – 1,074 (22%); Technology delivery – 277 (6%); scientific and technological services – 1,654 (33%); S&T education and training – 388 (8%); development, integration and coordination of the national research or S&T system – 155 (3%); and general administration and support services – 1,396 (28%). It is worth noting that the most numerous personnel are involved in scientific and technological services which include information services, technical services and scientific promotion.

In terms of educational attainment, more than half of DOST human resources are bachelor's degree holders numbering to 2,755 or 56%. Master's degree holders totaled 711 or 14% while doctoral degree holders numbered to 162 or 3%.

Gender-wise, DOST employees are divided almost equally with the female employees (51%) slightly more than the males.

Among the agencies under the DOST System, PAGASA accounted for the biggest number of employees with 1,177 or 24%, while NAST, the smallest with 11 or 2%.

FIGURE 12b: Distribution of 2003 DOST Personnel by Personnel Classification and by Sex

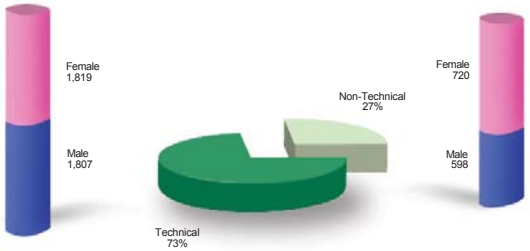
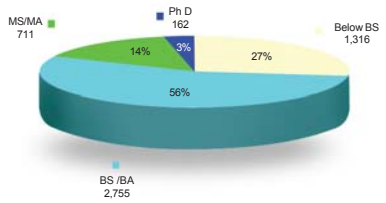


FIGURE 13a: Distribution of 2003 DOST Personnel by Level of Education



Total Personnel - 4,944

FIGURE 13b: Distribution of 2003 Personnel by Level of Education and by Sex

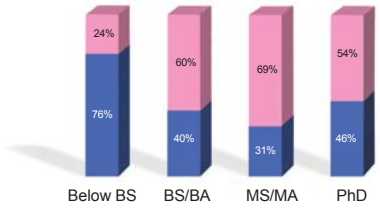
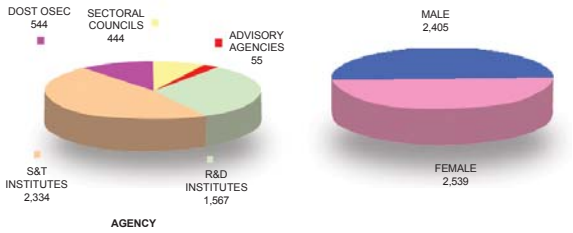


FIGURE 14: Distribution of 2003 Personnel of the DOST



Total Personnel - 4,944

TABLE 6A: Distribution of 2003 Personnel of the DOST System by Agency, S&T Function and by Sex

AGENCY	TOTAL		TECHNICAL PERSONNEL																	
			Sub-total TECHNICAL		Research and Experimental Development		Technology Delivery		Science and Technological Services						S&T Education and Training		Dev't., Integration & Coord'n of the Nat'l Research or S&T System		General Admin & Support Services	
									Information Services		Technical Services		Science Promotion							
	T	F	T	F	T	F	T	F	T	F	T	F	T	F	T	F	T	F	T	F
GRAND TOTAL	**4,944**	**2,539**	**3,626**	**1,819**	**971**	**553**	**272**	**111**	**173**	**111**	**1,327**	**470**	**83**	**62**	**380**	**236**	**136**	**104**	**284**	**172**
Sectoral Councils	**444**	**279**	**273**	**176**	**102**	**59**	**14**	**11**	**47**	**27**	**5**	**—**	**3**	**3**	**12**	**11**	**81**	**61**	**9**	**4**
PCARRD	254	161	170	107	86	53	13	10	41	21	—	—	—	—	3	3	24	19	3	1
PCAMRD	47	30	27	19	—	—	—	—	—	—	—	—	—	—	—	—	23	16	4	3
PCASTRD	30	21	12	9	—	—	—	—	3	3	1	—	1	1	3	3	24	16	4	3
PCHRD	62	42	39	31	—	—	1	1	3	3	4	—	2	2	6	5	23	20	—	—
PCERD	51	25	25	10	16	6	—	—	—	—	—	—	—	—	—	—	7	4	2	
Advisory Agencies	**55**	**27**	**25**	**11**	**13**	**5**	**—**	**—**	**3**	**2**	**—**	**—**	**3**	**2**	**—**	**—**	**2**	**2**	**4**	**—**
NRCP	44	19	20	7	13	5	—	—	3	2	—	—	—	—	—	—	—	—	4	—
NAST	11	8	5	4	—	—	—	—	—	—	—	—	3	2	—	—	2	2	—	—
R&D Institutes	**1,567**	**862**	**1,149**	**634**	**530**	**309**	**96**	**34**	**66**	**51**	**309**	**142**	**—**	**—**	**21**	**17**	**—**	**—**	**127**	**81**
ASTI	46	24	29	12	26	9	—	—	—	—	—	—	—	—	—	—	—	—	3	3
FNRI	200	162	157	133	97	88	3	1	7	7	26	25	—	—	—	—	—	—	24	12
FPRDI	246	113	148	74	75	29	27	17	11	7	—	—	—	—	—	—	—	—	35	21
ITDI	409	233	317	203	186	113	—	—	26	21	71	44	—	—	—	—	—	—	34	25
MIRDC	250	87	195	41	19	2	49	6	8	4	88	9	—	—	11	9	—	—	20	11
PNRI	244	136	182	98	69	40	17	10	6	5	74	30	—	—	7	5	—	—	9	8
PTRI	172	107	121	73	58	28	—	—	8	7	50	34	—	—	3	3	—	—	2	1
S&T Service Institutes	**2,334**	**1,073**	**1,824**	**802**	**311**	**170**	**—**	**—**	**38**	**19**	**956**	**290**	**59**	**44**	**340**	**204**	**—**	**—**	**120**	**75**
PAGASA	1,177	457	996	379	268	151	—	—	—	—	719	221	—	—	9	7	—	—	—	—
PHIVOLCS	218	64	181	48	28	12	—	—	18	10	135	26	—	—	—	—	—	—	—	—
PSHS	502	290	338	200	—	—	—	—	—	—	—	—	—	—	323	195	—	—	15	5
SEI	44	37	25	22	—	—	—	—	—	—	7	5	15	14	—	—	—	—	3	3
STII	75	46	57	34	—	—	—	—	12	4	—	—	30	22	—	—	—	—	15	8
TAPI	58	38	40	23	—	—	—	—	4	1	27	14	4	3	—	—	—	—	5	5
NCC	260	141	187	96	15	7	—	—	4	4	68	24	10	5	8	2	—	—	82	54
DOST-OSEC	**544**	**298**	**355**	**196**	**15**	**10**	**162**	**66**	**19**	**12**	**57**	**38**	**18**	**13**	**7**	**4**	**53**	**41**	**24**	**12**
Central Office	152	90	68	51	13	8	—	—	—	—	—	—	—	—	—	—	42	35	13	8
CAR	27	13	18	8	1	1	11	4	1	—	3	3	—	—	1	—	—	—	1	—
REG 1	22	11	14	6	—	—	11	4	—	—	2	1	1	1	—	—	—	—	—	—
REG 2	27	16	19	11	—	—	11	4	1	1	1	1	4	4	—	—	—	—	2	1
REG 3	33	18	26	12	—	—	17	7	2	2	3	2	3	—	1	1	—	—	—	—
REG 4	43	24	36	20	—	—	20	7	2	2	6	5	3	3	1	1	4	2	—	
REG 5	32	18	20	11	—	—	12	5	1	1	4	3	1	—	—	—	1	1	1	1
REG 6	32	19	24	15	—	—	14	8	—	—	7	5	1	1	—	—	2	1	—	—
REG 7	30	15	24	11	—	—	13	6	3	2	5	2	—	—	—	—	—	—	3	1
REG 8	31	13	23	9	1	1	14	4	2	—	2	1	1	1	2	2	1	—	—	—
REG 9	20	8	14	6	—	—	6	1	2	1	4	3	2	1	—	—	—	—	—	—
REG 10	28	18	22	13	—	—	12	6	3	2	5	4	1	1	—	—	1	—	—	—
REG 11	25	14	17	10	—	—	4	2	1	1	9	5	—	—	1	—	2	2	—	—
REG 12	22	13	14	8	—	—	10	6	—	—	2	2	—	—	—	—	—	—	2	—
CARAGA	20	8	16	5	—	—	7	2	1	—	4	1	1	1	1	—	—	—	2	1

Source: DOST Councils, Institutes, Agencies and Regional Offices *Note:T - Total personnel (male and female)* *F - Female*

TABLE 6B: Distribution of 2003 Personnel of the DOST System by Agency, S&T Function and by Sex

AGENCY	TOTAL		NON-TECHNICAL PERSONNEL																	
			Sub-total NON-TECHNICAL		Research and Experimental Development		Technology Delivery		Science and Technological Services						S&T Education and Training		Dev't., Integration & Coord'n of the Nat'l Research or S&T System		General Admin & Support Services	
									Information Services		Technical Services		Science Promotion							
	T	F	T	F	T	F	T	F	T	F	T	F	T	F	T	F	T	F	T	F
GRAND TOTAL	**4,944**	**2,539**	**1,318**	**720**	**103**	**36**	**5**	**3**	**30**	**16**	**37**	**20**	**4**	**4**	**8**	**8**	**19**	**9**	**1,112**	**624**
Sectoral Councils	**444**	**279**	**171**	**103**	**12**	**7**	**1**	**—**	**14**	**6**	**—**	**—**	**—**	**—**	**—**	**—**	**5**	**2**	**139**	**88**
PCARRD	254	161	84	54	12	7	1	—	3	1	—	—	—	—	—	—	5	2	63	44
PCAMRD	47	30	20	11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20	11
PCASTRD	30	21	18	12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	18	12
PCHRD	62	42	23	11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	23	11
PCERD	51	25	26	15	—	—	—	—	11	5	—	—	—	—	—	—	—	—	15	10
Advisory Agencies	**55**	**27**	**30**	**16**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**—**	**1**	**1**	**—**	**—**	**—**	**—**	**29**	**15**
NRCP	44	19	24	12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24	12
NAST	11	8	6	4	—	—	—	—	—	—	—	—	1	1	—	—	—	—	5	3
R&D Institutes	**1,567**	**862**	**418**	**228**	**91**	**29**	**3**	**2**	**12**	**7**	**32**	**17**	**1**	**1**	**2**	**2**	**—**	**—**	**277**	**170**
ASTI	46	24	17	12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	17	12
FNRI	200	162	43	29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	43	29
FPRDI	246	113	98	39	44	17	2	1	3	1	—	—	—	—	—	—	—	—	49	20
ITDI	409	233	92	30	44	9	—	—	8	5	16	3	—	—	—	—	—	—	24	13
MIRDC	250	87	55	46	2	2	1	1	—	—	12	12	—	—	—	—	—	—	40	31
PNRI	244	136	62	38	1	1	—	—	—	—	4	2	—	—	1	1	—	—	56	34
PTRI	172	107	51	34	—	—	—	—	1	1	—	—	1	1	1	1	—	—	48	31
S&T Service Institutes	**2,337**	**1,073**	**510**	**271**	**—**	**—**	**—**	**—**	**4**	**3**	**2**	**2**	**—**	**—**	**4**	**4**	**—**	**—**	**500**	**262**
PAGASA	1,177	457	181	78	—	—	—	—	—	—	—	—	—	—	—	—	—	—	181	78
PHIVOLCS	218	64	37	16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	37	16
PSHS	502	290	164	90	—	—	—	—	—	—	—	—	—	—	—	—	—	—	164	90
SEI	44	37	19	15	—	—	—	—	—	—	1	1	—	—	2	2	—	—	16	12
STII	75	46	18	12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	18	12
TAPI	58	38	18	15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	18	15
NCC	260	141	73	45	—	—	—	—	4	3	1	1	—	—	2	2	—	—	66	39
DOST-OSEC	544	298	189	102	—	—	1	1	—	—	3	1	2	2	2	2	14	7	167	89
Central Office	152	90	84	39	—	—	—	—	—	—	—	—	—	—	—	—	14	7	70	32
CAR	27	13	9	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9	5
REG 1	22	11	8	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	5
REG 2	27	16	8	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	5
REG 3	33	18	7	6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7	6
REG 4	43	24	7	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7	4
REG 5	32	18	12	7	—	—	1	1	—	—	1	—	1	1	1	1	—	—	8	4
REG 6	32	19	8	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	4
REG 7	30	15	6	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	4
REG 8	31	13	8	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	4
REG 9	20	8	6	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	2
REG 10	28	18	6	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	5
REG 11	25	14	**8**	**4**	—	—	—	—	—	—	1	–	—	—	—	—	—	—	7	4
REG 12	22	13	**8**	**5**	—	—	—	—	—	—	1	1	1	1	1	1	–	–	5	2
CARAGA	20	8	**4**	**3**	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	3

Source: DOST Councils, Institutes, Agencies and Regional Office

TABLE 7: Distribution of 2003 Personnel of the DOST System by Agency, Level of Education and by Sex

AGENCY	TOTAL		BELOW BS		BS/BA		MS/MA		Ph D	
	Total	Female	T	F	T	F	T	F	T	F
Grand Total	**4,944**	**2,539**	**1,316**	**314**	**2,755**	**1,644**	**711**	**494**	**162**	**87**
Sectoral Councils	**444**	**279**	**64**	**16**	**229**	**154**	**111**	**85**	**40**	**24**
PCARRD	254	161	34	7	127	86	66	49	27	19
PCAMRD	47	30	6	2	21	14	14	11	6	3
PCASTRD	30	21	5	1	18	15	5	4	2	1
PCHRD	62	42	11	5	35	23	13	13	3	1
PCIERD	51	25	8	1	28	16	13	8	2	—
Advisory Agencies	**55**	**27**	**19**	**2**	**25**	**20**	**9**	**5**	**2**	**—**
NRCP	44	19	17	2	18	13	7	4	2	—
NAST	11	8	2	—	7	7	2	1	—	—
R&D Institutes	**1,567**	**862**	**415**	**91**	**865**	**565**	**249**	**182**	**38**	**24**
ASTI	46	24	9	5	32	17	5	2	—	—
FNRI	200	162	24	7	119	102	48	46	9	7
FPRDI	246	113	74	15	119	68	44	25	9	5
ITDI	409	233	97	22	239	158	64	48	9	5
MIRDC	250	87	105	11	118	66	25	10	2	—
PNRI	244	136	49	9	154	96	35	25	6	6
PTRI	172	107	57	22	84	58	28	26	3	1
S&T Service Institutes	**2,334**	**1,073**	**756**	**195**	**1,329**	**720**	**207**	**141**	**42**	**17**
PAGASA	1,177	457	560	152	571	283	33	17	13	5
PHIVOLCS	218	64	49	4	154	54	7	5	8	1
PSHS	502	290	45	4	343	211	99	68	15	7
SEI	44	37	7	4	26	22	8	8	3	3
STII	75	46	16	5	50	35	7	5	2	1
TAPI	58	38	7	4	45	31	6	3	—	—
NCC	260	141	72	22	140	84	47	35	1	—
DOST-OSEC	**544**	**298**	**62**	**10**	**307**	**185**	**135**	**81**	**40**	**22**
Central Office	152	90	37	8	76	57	19	12	20	13
CAR	27	13	2	—	11	6	9	5	5	2
REG 1	22	11	1	—	15	7	4	3	2	1
REG 2	27	16	3	1	11	5	11	9	2	1
REG 3	33	18	1	—	18	10	12	8	2	—
REG 4	43	24	2	—	26	15	14	8	1	1
REG 5	32	18	3	1	16	9	11	6	2	2
REG 6	32	19	3	—	19	12	9	7	1	—
REG 7	30	15	2	—	23	14	5	1	—	—
REG 8	31	13	2	—	25	11	3	1	1	1
REG 9	20	8	1	—	14	7	5	1	—	—
REG 10	28	18	1	—	15	9	10	9	2	—
REG 11	25	14	2	—	13	9	10	5	—	—
REG 12	22	13	1	—	14	9	5	3	2	1
Caraga	20	8	1	—	11	5	8	3	—	—

Source: DOST Councils, Institutes, Agencies and Regional Offices *Note:T - Total personnel (male and female)* *F - Female*

Organizational Chart

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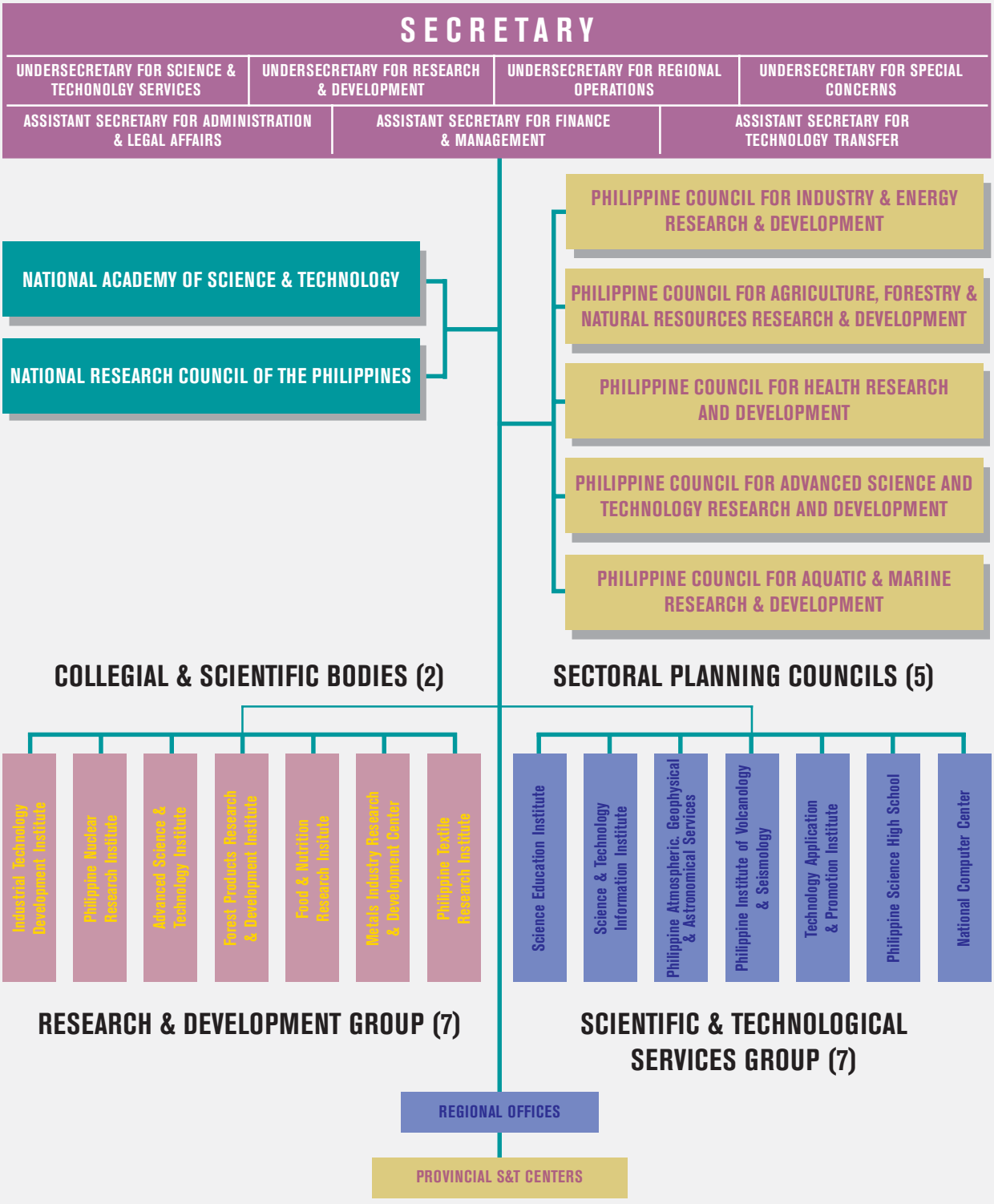

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