

*“By the year 2000, a number of research and development breakthroughs are expected to have materialized . . . ”*

## **The Science and Technology System in the Philippines in the Year 2000\***

by

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Various forms of economic pressure point to science and technology (S & T) as an unquestionable source of hope in the years ahead. A greater number among the Filipino people is becoming increasingly aware of what S & T can do for them, the political and social setting notwithstanding. These trends, coupled with a determined effort to upgrade the quality of S & T manpower in the country, give a favorable outlook as a whole to the Philippine S & T system at the coming turn of the century.

Within the next fifteen years little structural changes in the country's S & T delivery system are foreseen or anticipated. Research and development (R & D) councils shall continue to be the planners and coordinators for their respective sectors with the R & D institutes constituting the core of implementors. The National Science and Technology Authority (NSTA) is still expected to be at the helm of the whole infrastructure, providing directions and taking overall responsibility for S & T. By the turn of the century the National Research System shall have evolved into a well-defined network of institutions consisting of the following clusters: the NSTA R & D institutes, the R & D institutes or centers operated by other ministries or government units, the R & D units (other than the full blown institutes or centers) of other government agencies, the R & D organizations operated by the private sector, the S & T foundations and higher educational institutions.

NSTA will play a very distinct role with respect to each of these subgroupings. In the case of R & D institutes within its umbrella, NSTA shall exercise direct control and supervision. In the case of R & D centers, institutes or units under other government ministries, NSTA shall be exercising budgetary review powers. In the case of R & D centers operated by the private sector, NSTA shall administer a system of incentives that is expected to evolve through a series of legislative measures. S & T foundations shall continue to be under the supervision of NSTA with the sectoral councils playing a greater role in directing and coordinating their R & D activities. Higher educational institutions shall continue to benefit from government financial assistance for R & D through the NSTA by way of contract research arrangements in lieu of grants-in-aid.

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By the year 2000 a number of R & D breakthroughs are expected to have materialized as envisioned in the S & T Plan. These would include successes in tissue culture applications; propagation of wheat, soybean and cotton; new feedstuff formulations; new fertilizer and pesticide formulations; culture techniques for various marine species, genetic improvement of dairy animals; new food processing technologies; new packaging technologies; design and fabrication of manufacturing equipment; coco-chemical production; production of organic-based industrial chemicals; new industrial materials; new building materials; utility vehicle design and production; alternative energy conversion technologies; design and fabrication of medical equipment; production of more pharmaceuticals from plants; production of pharmaceuticals for common diseases like acute respiratory infection and diarrhea; production of vaccine; schistosomiasis control; development of simple diagnostic techniques for common diseases and disorders; use of microprocessors for process control and for mechanical systems; and data communications.

The capability for scientific and technological services (STS) is expected to be enhanced with the increase in the number of testing facilities through private sector initiatives, the expansion and upgrading of design engineering services both in the government and private sector, as well as the availability of S & T information from more sources.

Scientific and technological education and training (STET) will get a big boost with the identification of regional centers of excellence in science and technology education. Each political/geographic region will have a state-supported or state-assisted institution of higher learning in S & T -- most likely to be selected from among the Institution Building Program (IBP) schools.

The existing science communities are expected to have experienced growth and changes by the year 2000. For the Diliman Science Community, growth will gravitate on graduate S & T education as envisioned for the national centers of excellence for the basic sciences. The Los Baños Science Community shall attract national, regional and international attention with its activities and accomplishments in biotechnology, microbiology and genetics. The Bicutan Science Community shall be favored with the establishment of a graduate school for the industrial and engineering sciences under NSTA's aegis. The Ermita Science Community will be strengthened by the expansion of capabilities for pharmaceutical research and development.

With the full operationalization of the University of the Philippines in the Visayas in Iloilo, a number of S & T oriented institutions are expected to rise within the area. A community for the marine sciences is therefore expected to flourish there. Hence, the birth of a new science community in that area may be anticipated. However, the industrial development in other places like Cebu may spur the growth of S & T activities in the area that may yet serve as a nucleus for a new science community.

At the turn of the century, S & T activities in the regions will center on clusters of pilot processing facilities being administered by NSTA's regional offices. These pilot facilities shall serve as a medium or venue for technology diffusion activities which would also take care of the technological aspects of local enterprise development. The pilot facilities will reflect some regional specialization in response to particular needs and available resources. For example, the pilot facilities in Baguio will showcase technologies for the processing and packaging of fruits and vegetables while the pilot facilities in Iloilo will demonstrate marine products processing technologies, etc.

New R & D institutes are expected to spin off from some existing programs. An Institute for Chemical Research and Development is expected to be established from

the existing program on chemical research at the National Institute of Science and Technology (NIST). In the same manner an Institute for Pharmaceutical Research and Development could also be anticipated. NIST's standards and testing center has also all the makings of a separate or full blown institute. Food research and development activities are to be consolidated and strengthened under the Food and Nutrition Research Institute.

A Council for Social Science Research is very likely to rise within the NSTA system. There is also a strong possibility that a Natural Science Research Council will already be operational by the year 2000. The National Research Council of the Philippines will by then revert to its old form of being a state-supported collegial body of scientists and researchers. The National Academy for Science and Technology will by then have evolved into an active advisory body on national issues with S & T implications.

Commercialization of newly developed or adapted technologies will be spearheaded by a National Research and Development Corporation whose major role will be to venture, by itself or jointly with private groups, into commercialization of technologies which the private sector, by themselves, may not pick up right away. The viability of R & D corporations has been demonstrated in other countries like Korea, Japan and the United Kingdom. The National R & D Corporation envisioned in the Philippines, however, is one which is not wholly owned by the government. Private sector equity participation in this corporation is expected to be realized through incentives for investment (into the corporation) in a similar fashion as incentives for R & D activities or expenditures.

The S & T system in the year 2000 will be characterized by a very much improved quality of S & T manpower. The number of persons engaged in S & T activities will not substantially increase though. Government expenditures for S & T manpower development will be focused more on graduate scholarship and training, in the institution and strengthening of graduate S & T programs, and in the building of capabilities in regional centers of excellence for S & T education. The sectoral councils will be very much involved in this effort.