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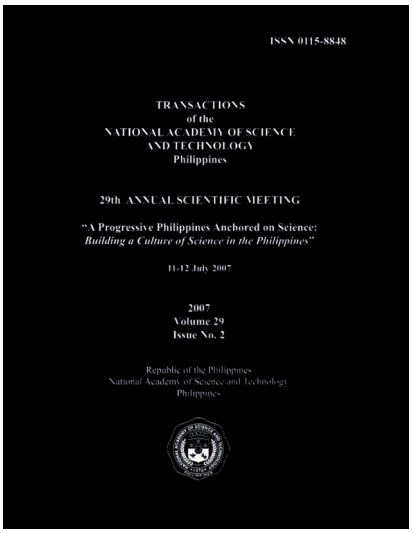

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Building a Culture of Science in the University of the Philippines

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Let me start by thanking the Academy for inviting me to this meeting to share with the science community our ideas and thoughts on a topic which we in the University of the Philippines (UP) very much believe in — building a culture of science in the Philippines. It is a theme which UP itself is committed to. It is a theme that is a prominent part of our ten-point agenda for UP for the coming years.

This morning I shall divide my talk into two parts: first, I shall share with you what we have done to strengthen our science and technology programs in UP. Then I shall discuss our partnership with the private sector in developing our Science and Technology Parks in Diliman.

I shall be the first to say that it is not only during our term that UP has focused on science and technology. That we have a very strong science and technology program is the product of the vision and leadership of many UP presidents before me. When we took over in 2005, we thought it extremely necessary to continue to stress the role of science and technology as contributor to increased productivity, competitiveness and economic growth. What this country needs is a large scientific manpower base—an ingredient so very crucial for a country's progress and development. And UP, being the national university, must take the lead in building up the country's scientific manpower.

If one were to examine the country's college enrollment profile, one would see that 41% of our college students are enrolled in business-related or teacher/training and education programs. UP's enrollment profile, on the other hand, is quite unlike the national profile. At present 42% of our students are enrolled in science and technology programs. This is a profile we would like to maintain, if not improve. Many countries have achieved economic prosperity because they have invested heavily in the sciences and their applications. Guided by the experiences of these countries, we in UP deem it important to continue to strengthen our existing science and technology

programs, in particular, our information and communications technology and biotechnology programs, and develop initiatives in emerging science and technology fields.

Today we are happy to report that we have moved forward, pursuing major programs and projects to support a science culture in UP.

First, we have put in place an Agenda for Emerging Fields in Science and Technology.

The objective of this agenda is to develop cutting-edge fields that need to be advanced at the highest possible level of inquiry in order to generate new knowledge, building on our existing resources—i.e., our rich pool of scientists, our updated infrastructure and high-tech equipment and laboratories acquired from unexpended balances and through the support of government agencies mostly from the Department of Science and Technology (DOST) and its various Councils, the Department of Agriculture, foreign donors, and industry collaborators.

Given our limited financial resources, we have decided to focus our research thrusts and directions on some priority projects, selected on the basis of the following criteria: emerging fields that have high scientific/ technological and social impact; the possibility of inter-/multi-disciplinary involvement of different departments/colleges/constituent universities; the presence of existing and potential expertise and facilities, financial sustainability; competitive advantage in human resources and raw materials; and potential economic value.

The following have been identified as specific fields: (1) materials (like bio-materials, biofuels, nano materials, pharmaceuticals and molecular medicines); (2) biotechnology (like nanotechnology, food sufficiency, bioinformatics, and biodiversity); (3) pervasive computing (advanced microelectronics and computational algorithmics, "systems on a chip," and environmental monitoring); and (4) measurement and instrumentation in support of the first three.

We are determined to provide the necessary working environment and financial support for the implementation of this agenda. The UP Board of Regents has established the Emerging Fields in S&T Grant Fund which has two components: (1) the Institutional Development Grant—for the acquisition of equipment and for maintenance and operating costs to be used by existing as well as proposed R&D programs; and (2) the Emerging S&T Research Grant—for the undertaking of research projects in support of the emerging S&T fields agenda.

We have so far approved funding for 12 projects for Diliman, Los Banos, Manila and Mindanao. In Diliman, for example, projects that will

boost the research capabilities at the College of Science, in materials and in ultrafast and high resolution optical signal measurement, which is a core technology in nanoscience and nanotechnology R&D are now ongoing.

The emerging fields chosen by UP are well within the National Science and Technology Plan 2002–2020 of the DOST. In fact the DOST was among the first institutions that we consulted when we were formulating the agenda, aware of the need to move side by side with government in the effort to promote science and technology.

The identification of these emerging S&T fields has important implications on the University's curricular offerings, on its teaching and learning approaches, and on its research and extension directions. But at the same time that we are instituting the necessary changes, we are deeply aware that the University needs to remain responsive to the demands of the knowledge-based economy without compromising its social responsibility.

Second, we have established the UP Scientific Productivity System

The UP Scientific Productivity System (SPS) is both an award system and an incentive system, designed to encourage scientific productivity for national development. Deserving scientists among our faculty and research staff in the natural and physical sciences, medicine, agriculture, fisheries, engineering, and the social sciences may earn the rank of Scientist I, II, or III. The rank is a recognition given by UP as an Award, called the UP Scientific Productivity Award.

Evaluation of applicants is based on a set of high standards that will enable "UP Scientists" to occupy their rightful place in the international community of scholars. Only the best and the most deserving are conferred the title which they will hold for three years, and which may be renewed depending on their performance.

The following criteria are used for evaluation:

- scientific publications in refereed reputable journals and books
- peer-reviewed technological output and discoveries
- scientific standing in the international science community
- professional standing in the international science community

The Scientist rank carries monetary awards of P96,000, P120,000 and P144,000 annually for UP Scientist I, II and III respectively. This program is funded from the UP Scientific Productivity System Endowment Fund established by the BOR in 2005.

The Scientific Productivity Award was given for the first time in 2006. In the entire UP System, twenty-three scientists received the award: three faculty members were named UP Scientist III; five were named UP Scientist II, and fifteen were named UP Scientist I.

The SPS is UP's version of the Scientific Career System (SCS) of the Civil Service Commission and the DOST. In fact, the Scientific Career Council helped us craft our SPS which now serves as model to revise/ upgrade the SCS rating system.

Third, we are fast-tracking the development of the National Science Complex.

The National Science Complex and Technology Incubation Park was established through Executive Order (EO) 583, signed by President Gloria Macapagal Arroyo on 8 December 2006. President Arroyo also directed the Department of Budget and Management (DBM) to release P500 million for the project. This initiative was the result of lobbying by Filipino scientists including UP alumni, based both here and abroad, with the support of the DOST, legislators from both chambers of Congress, and other government officials.

The Science Complex hopes to "serve as the national hub for the generation and application of new scientific knowledge in the natural and applied sciences and mathematics."

It is organized, managed, and operated by the College of Science, UP Diliman and will harness the resources of nine (9) of UP's leading research institutions: the National Institute of Geological Sciences (NIGS), the Marine Science Institute (MSI), the National Institute of Physics (NIP), the National Institute of Molecular Biology and Biotechnology (NIMBB), the Institute of Biology (IB), the Institute of Chemistry (IC), the Institute of Environmental Science and Meteorology (IESM), the Department of Mathematics (DM), and the Natural Science Research Institute (NSRI).

The National Science Complex and Technology Incubation Park will be completed on a 21.9-hectare lot in UP Diliman. We hope to complete soon the NIP and Mathematics buildings and start the construction of the Chemistry building with funds from government.

Fourth, the College of Engineering has finalized its proposal for the infrastructure development of the Engineering Complex.

In 1996, President Fidel V. Ramos signed an Executive Order creating the National Graduate School for Engineering. The NOSE was

created to consciously build up the number of advanced degree holders in engineering. We have invested P200 Million for the construction of two buildings—the Department of Electrical and Electronics Engineering and the Engineering Library and Computer Science Building. Plans for the construction of new buildings and the repair/renovation of existing buildings have been finalized and have been presented by the Dean of the College of Engineering to President Gloria Macapagal Arroyo, who has committed to provide funding support to see through the completion of the NGSE.

The challenge to promote and develop science and technology is enormous. It requires huge amounts of resources—human resources, physical resources and financial resources -- which universities alone cannot provide. We must assume that government funding in the future will be tight. An alternative is to establish strategic partnerships with the private sector, with industry, in areas where collaborations can result in win-win situations.

The UP-Ayala Technopark

In 2000, UP partnered with the Ayala Foundation to establish a Joint Experimental Facility on Technology Development and Technology-based Entrepreneurship. With this partnership, the UP-Ayala Technopark was established. This project is an academe-industry collaboration that features a network of SMITES (small and medium IT enterprises) located in a PEZA declared information and technology zone in UP Diliman. The facility exists in an environment where interaction, innovation and entrepreneurship are encouraged via idea-exchange and shared access to human resources and information. The building which now houses the project was built in 1993 with support from the Department of Science and Technology. Today, the place is booming, with 9 locators engaged in hardware/software development. The most notable of the projects is the Java Education Development Initiative, a courseware project that makes free, high-quality IT and Computer Science instructional materials, which have been translated into Portuguese, French and Bahasa. The modules are now being used in the US, in Brazil and France. The Philippines used to just be among the so-called "others" that produced Java developers. Now, we are among the top ten countries. In the Philippines, the JEDI program has at least 160 partner schools or 52,000 students and 1600 teachers using the training modules.

The North Science and Technology Park

Construction on the North Science and Technology Park on the

38.6-hectare property in UP Diliman, in partnership with Ayala Land, Inc., is now underway. The project, begun in 2000, culminated in the signing of a long-term lease and development agreement between UP and Ayala Land Inc. in October 2006.

Initial development includes the construction of ten (10) low rise buildings for lease to office tenants in high-technology fields, i.e. telecommunications, telematics, IT and biotechnology and high value business outsourcing (BPO) industry, i.e., accounting, animation, software development, design and engineering services, as well as start-up companies or incubators.

The S&T park is envisioned to be the most prestigious and dynamic example of industry-academe collaboration, and is expected to contribute significantly to national growth. Governments all over the world have recognized the all-important link between scientific expertise and economic development, and universities have set up S&T Parks adjacent to their campuses. The most famous examples are: Bangalore and Hyderabad of India, Tsukuba Science City in Japan, Haidan Science Park in Beijing, Singapore Science Park adjacent to the National University of Singapore, and, of course, the by-now legendary Silicon Valley in the United States.

At the same time, the S&T Park reinforces the University's status as the country's national university, and strengthens its image both locally and globally. We foresee that it will not only be providing a venue for the transformation of innovative ideas into cutting-edge commercial products, and providing faculty members and students access to world-class learning laboratories, but also that it will offer competitive employment opportunities.

For many years now, there has been widespread concern over the phenomenon known as brain drain. Our University has not been exempt. At present, the Philippines cannot adequately provide first rate PhD training in S & T, and this forces students to go abroad for their graduate degrees. Were UP to offer more "world-class" graduate degree programs in terms of program offerings, faculty, facilities, and total environment, we believe that this could prove to be the key to reversing the brain drain. This will also allow for the further training and updating of existing PhD holders in the faculty, as they serve as thesis/dissertation advisers, a must if the UP is to offer world-class graduate degree programs.

We also believe that if comparable job opportunities are available right in their own backyard, our students will opt to stay and honor the commitment they made when they entered the University.

Finally the S&T Park is the best possible use for our idle assets. It will expand our academic prerogatives, and help us to fulfill our mandate of being truly a national university, serving the interests of the nation.

We plan to set up more of the same in our other campuses.

The role of UP in manpower development cannot be overemphasized. Today's students must build upon their mentors' accomplishments, and raise scientific research to higher levels. It is this kind of manpower which can innovate and respond to the needs of society in this swiftly changing world. And even as they contribute to national S&T development, they will strengthen UP's presence in the international scientific community, through extensive publication in reputable peer-reviewed journals, as well as research dissemination through various international scientific forums.

Through these programs, UP also plans to strengthen its partnership with government and industry to ensure that research undertaken will result in products of economic and commercial value, as well as social relevance. The social impact of such technologies will lead to a greater appreciation of S & T on the part of the larger community which the University serves.

Colleagues, ladies and gentlemen, as you can see, the University of the Philippines has accepted its share in the responsibility for creating the country's next generation of scientists. These young men and women will be on the forefront of the country's development in the 21st century.

About the Author: Dr. Emerlinda R. Roman is currently the President of the University of the Philippines (UP) and holds the distinction of being its first woman president. She is a Professor of Business administration and was Chancellor of UP Diliman for two terms. More information on UP's programs is available at www.up.edu.ph.