

**REMARKS AND
KEYNOTE ADDRESS**

OPENING REMARKS

SCIENCE IN THE 21ST CENTURY: SCIENCE FOR HUMANITY

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It gives me so much pleasure to open today's ceremonies and welcome you all to this momentous celebration of the National Academy of Science and Technology's (NAST) Silver Anniversary and 23rd Annual Scientific Meeting. The theme we have chosen is "*Science in the 21st Century*". We hope, through this meeting to come up with policy recommendations that will address pressing S&T issues of the country. Issues such as biotechnology, forestry, water, waste management, information and communications technology, and the development of a stronger and more responsive Scientific Community.

Progress in Science and Social Reality

We experienced momentous changes in science in the 20th century—changes that have benefited humanity and changes that threatened the very existence of the human species. Probably, one of the most important factors to these changes is the "progress in science", so said Sir Joseph Rotblat, 1995 Nobel Laureate for Peace. Apparently, because of such pace of scientific progress, society often finds itself struggling to cope up with the equivalent consequences. The 21st century can expect swifter advances in science; but can the society keep pace with such developments? How can we optimize the potential of S&T so that they contribute to improving human lives more than or instead of threatening our survival?

The Goal of Science

I believe science has its most significant goal: the pursuit of truth and knowledge and to bring the blessings of science for the enjoyment of the greatest number of people. Pope John Paul II said that science can authentically serves the

cause of humanity only if knowledge is enjoined to conscience. He wished that the progress in science “contribute to the building of society ever more respectful of all that is truly human.”

The clash between today’s rapid scientific progress and the centuries-old beliefs and values leaves us two questions: first, of what value is discovery of the secrets of nature (which after all is what science is probing) if it does not lead to the improvement of the quality of life?; and second, of what value is science and technology in our aspiration for a better life if it relegates human to just being a tool to promote science “for science’s own sake”?

I should say scientific progress should be accompanied by social responsibility, which is a commitment to the people, imbued with social conscience. Indeed, Sir Joseph Rotblat rightfully says, “Knowledge brings responsibility.”

Two years ago, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and the International Council for Science (ICSU), in cooperation with other partners, conducted the *World Conference on Science* in Budapest. The Conference was a rare opportunity for global leaders of national governments and institutions, educational and research establishments, members of the scientific community, the industrial sector, intergovernmental organizations, and international scientific non-governmental organizations, as well as the media and the general public to convene and discuss science as we enter the 21st century. Outcome of this international conference was a new “social contract” manifested in the *Declaration* and the *Science Agenda*. In the Preamble of the *Declaration on Science and the Use of Scientific Knowledge*, the nations and the scientists are enjoined to acknowledge the urgency of using scientific knowledge “in a responsible manner to address human needs and aspirations without misusing this knowledge.” I believe this is the gist of the whole Conference, without going further into the details of what had been agreed upon by the different nations.

Milestone Accomplishments of the Filipinos: Science for Humanity

On the other hand, I just would like to go very briefly into what the Filipino scientists have accomplished for the last 25 years—and I would proudly say that all these have contributed, in one way or the other, to the betterment of the lives of our countrymen.

Agricultural Sciences

Our talented and dynamic agricultural scientists have come up with research findings of national and international applications. Our research in tissue culture, for instance, made it possible for us to develop a 100 percent pure *makapuno-bearing* trees. We are also able to speed up the propagation of banana, a main export product of the country. Even our method of rapid propagation of cassava is now being acknowledged and used worldwide. Moreso, we have made significant advancements in tissue culture on other important crops such as orchids, calamansi,

among others, and these have helped alleviate the quality of life of many of our farmers.

The discovery of how we can induce mango trees to flower regardless of season contributed millions of dollars to our export industry.

The Philippine archipelago is surrounded by a great body of water; even inside the island are many bodies of water. We have therefore many fisher folks who rely heavily on fishing to make ends meet. One of our experts in fisheries management, who is also a member of the Academy, was able to develop a technology that made tilapia industry a profitable venture. Results of his assiduous research are now being used in other countries. In this respect, science and technology has contributed to the upliftment of the lives of many of our fisher folks in the tilapia industry.

In Mindanao where the geographical terrains are generally steep, the Sloping Technology Land Technology, also known as SALT, caught the interest of the international community. SALT has been proven an effective method of cultivating the upland areas where soil erosion is a problem.

We have many other accomplishments in agricultural science such as the artificial culture of crabs and other marine life; the use of indigenous materials to produce alternative livestock feed; the animal acupuncture to treat some animal illness the varietal improvement of primary crops like rice, corn, coconut, sugarcane, vegetables, fruit crops, and even ornamental crops; the genetic resources conservation of certain food crops; and the rice research and development... through all these milestones, our Filipino agricultural scientists have greatly contributed towards national progress.

Biological Sciences

Our scientists devoted much effort to catalogue our species biodiversity, most especially in entomology. Studies of our flora resulted in a "red book" on endangered plant species. Our studies in conotoxin interest the international scientific communities as this substance shows many potential uses in medicine and neurological research. The Philippines has a bounty of medicinal plants, two of which are lagundi and sambong. Our research efforts paved the way to produce the now standard lagundi for asthma and sambong as diuretic and anti-urolithiasis.

We have also done significant scientific works for the conservation and protection of our environment and these noble efforts continue to present.

Filipino scientists have also learn to use biotechnology as a tool that will help improve the lives of many people. The Academy has been actively involved in the formulation of guidelines in the use of biotechnology as a research tool and protocols for field-testing of GMOs and potentially harmful exotic species. NAST also initiated and co-sponsored public dialogues to promote public awareness and understanding on the risks and benefits of biotechnology.

Health Sciences

The works of our medical scientists in infectious and tropical diseases have been quite beneficial to the Filipinos and the scientists of other countries accorded high esteem to our Filipino medical investigators. Within a decade, we have accurately assessed the epidemiology of many degenerative diseases, notably diabetes mellitus, hypertension, rheumatic heart disease, and other cardiovascular diseases. The Filipino pharmacologists are at the forefront of exploring the medicinal potentials of plants. In the last 25 years, we pioneered programs in community health and innovative methods of developing and producing health practitioners for rural communities. These became models for many developing countries. Other significant accomplishments include the near eradication of polio and small pox; the reduction of infant death rate; prolongation of life span through improved health services. The establishment of the National Institutes of Health in UP Manila is one big stride towards better biomedical research.

Social Sciences

In the social sciences, our social scientists have contributed greatly to the expansion of knowledge and its application in such areas as economics, public administration, philosophy, communication, sociology, political sciences, social works, statistics, anthropology, geography, history, linguistics, demography. In the development of theoretical, conceptual, and methodological perspectives, in institutional development, and in policy contributions and networks, they have accomplished enormously to help uplift the social condition of our people. They have established a number of research institutions in various universities and state colleges. They continually do comprehensive studies and analyses of issues such as population, environment and resources, economy, and governance and politics.

Mathematical, Physical, and Engineering Sciences

For the last 25 years, chemical sciences significantly contributed to the broadening of knowledge in such areas of research as nutritional values of Philippine legumes, biochemistry of toxic peptides from the venom of a marine snail, chemistry of natural products and essential oils from Philippine plants, among others.

Physics, on the other hand, saw the birth of single-chip graphical interface accelerator or more commonly known as S3. We also contributed to the development of electronic telephone, the one-chip digital camera, and even the original microchip. Our Filipino scientists working in foreign land contributed to the theory of automatic control and mapping of polynyas (or sea ice). And do you know that the so-called "karaoke" is a product of a Filipino's creativity and inventiveness?

In mathematics, our research in this area began to develop two decades ago. So far, our contributions include, among others, the theoretical research in algebra, graph theory, and combinatorics, which was used in solving optimization problem

of industry. It is also relevant in the new world of information and communications, particularly in coding theory and cryptography. The development of engineering industries in our country owes largely to the analysis and differential equations, which are at the core of physics and engineering. Finally, high-performance computing systems have been developed that enhanced our supercomputing capabilities at much lower costs. The Philippine universities now use them to do mathematical modeling in biology, finance, and other areas.

Conclusions

These are but glimpses of what have we accomplished and contributed in various fields of science and technology. All these fall under the realm of the goal of science: "the pursuit of truth and knowledge to bring the blessings of science for the enjoyment of the greatest number of people."

If I may reiterate another passage in the Preamble of the World Conference on Science's *Declaration on Science and the Use of Scientific Knowledge*:

"The sciences should be at the service of humanity as a whole, and should contribute to providing everyone with a deeper understanding of the nature and society, a better quality life and a sustainable and healthy environment for the present and future generations."

We can achieve this if we truly and genuinely dedicate *science for humanity* and if we in the scientific community *continue* to be *scientists with souls*.

On behalf of the National Academy of Science and Technology, I cordially welcome you to our **25th Anniversary and 23rd Annual Scientific Meeting**.

Good morning.

KEYNOTE ADDRESS

HON. ALBERTO G. ROMULO
Secretary of Foreign Affairs

NAST President Dr. Perla Santos Ocampo, the esteemed members of the National Academy of Science and Technology, awardees, participants and guests to this 23rd Annual Scientific Meeting, my warmest greetings.

I commend the organizers of this event for their efforts to focus on the essential role of science and technology in national development through the conduct of activities such as this forum where new findings can be presented.

Admittedly, we still have a long way to go when it comes to developing our scientific competence to a level where we can compete globally. We have to prioritize and realign research and development efforts in these areas to enable more Filipinos to acquire the knowledge and skills useful in making them productive and responsible citizens.

The scientific challenges of the 21st century call for aggressive, integrated, comprehensive, and sustained responses that should involve not only the government but other institutions as well.

The administration of President Gloria Macapagal-Arroyo is mustering enough political will to fully encourage and support science and technology-oriented endeavors through the leadership of the Department of Science and Technology and the agencies under it. We have various entities working together and implementing specific programs and projects that seek to create and maintain the most favorable environment possible for the nurturance of scientists.

This mandate is enshrined in Article XIV, Section 10 of our Constitution, which states that: "Science and Technology are essential for national development and progress."

The goal of science is more than the generation of knowledge or technologies. It also involves harnessing and orchestrating research funding that addresses specific and priority concerns at the global, national and local levels. It further entails developing processes and mechanisms for translating scientific findings into a

variety of innovations and technologies that cannot be measured simply by their market value but by their contribution to social goals.

Sadly, the outstanding achievements of our scientists are not treasured the way we honor the works of celebrities, sports champions and other artists, it is lamentable how fast and how expensive we fete and exalt sports heroes and how we wished the same measure and consistency of recognition is accorded our scientists and their works.

We are grateful that NAST, for 25 years now. Has been unwavering in its commitment to promote science and technology in the Philippines by serving as the country's highest recognition body for researchers and through other activities that address vital issues and concerns in these fields.

This meeting is one such activity which gathers together science and technology luminaries here and abroad to exchange and share experiences, insights and lessons on their respective undertakings and which can form the bases for policy making and program formulation. To be led by the academicians themselves, the forum promises to showcase the best of scientific works the past few years and in the widest range of fields that cover engineering science and technology, math and physical sciences, biological sciences, social sciences, agricultural sciences, and health sciences.

I feel honored to address the country's topnotch scientists in diverse disciplines who have greatly shaped the thrusts and directions of S and T in the country. Most of all, it is a great privilege to be in the company of the esteemed members of the Academy – the academicians whose cumulative achievements represent the best of what the Philippines has produced in science.

I wish to congratulate the new batch of academicians whose investiture will be the highlight of tomorrow's proceedings. A glance at their body of work will show that the academicians' work have largely been devoted to the day-to-day problem of Filipinos and of the nation. From the collective achievements of its members emanate NAST's contributions to society. Unlike most government entities, the Academy is not a service agency but a recognition body composed of the best and the brightest in the scientific arena.

For those who are not yet familiar, being conferred this prestigious and lifetime rank is not by application but by peer recognition and election by NAST's members. Academicians, now numbering 72 of whom 48 are living, spend a lifetime in research, teaching and public service in the pursuit of science and its applications, they set the standards, so to speak, for substance, rigor, and relevance, which aspiring scientists can emulate.

NAST, therefore, serves as a repository of competent scientific and technological human resources who can be tapped for advisory and advocacy work, policy formulation and program planning, leadership of S and T organizations, research reviews, organization of public workshops and scientific meetings, formulation of research guidelines and regulations, information dissemination and legislative work,

The academicians' expertise is much sought after by different sectors of society and by local and international organizations engaged in research and development work. They influence the scientific communities through their participation and leadership of S and T policy-making bodies which are usually involved with setting research directions and priorities, identifying and defining research problems, evaluating R and D projects, and assessing their impact.

Aside from recognizing scientists, researchers and other creative workers, the Academy also convenes roundtable conferences, informal discussions, and other consultative meetings on S and T policy matters of national and international importance and addresses them to concerned peacemakers.

For the past few years, the Academy has been very active in giving expert advice and recommendations on a number of bills, resolutions, and executive orders that have benefited immensely the Congress, Senate, and other concerned government agencies.

For the year 2000, NAST was able to secure President Macapagal-Arroyo's approval for Republic Act 9107, also known as the Philippine Science Heritage Center Act. This is a project of NAST, which will serve as a prime government museum and as the center of science museum in the Philippines.

Today, at 25 years, we can say that NAST has unfailingly done its duty in providing due recognition and incentives to S and T through the conferment of the NAST Awards in a total of 10 categories and a host of special awards to notable Filipinos and visiting foreign scientists.

Recently launched was the "High Greenwood Environmental Science Award" solicited by incumbent NAST President Perla Santos Ocampo. The Award recognizes distinguished efforts in the protection and conservation of our fast-dwindling natural resources.

With the myriad problems we face in health, ecology, environment, food security, malnutrition, and others, NAST continues to perform its share in finding solutions to these problems. The challenges may change but the Academy responds in an excellent, relevant, and humane manner bearing in mind the greater good of the greater number of people, as what science should always stand for.

In closing, let me emphasize that if we want to shape the future, we should invest in scientific research. What is good for science and technology is for the good of the country. I am not a scientist in the real sense of the word. I am more involved in finance matters and now in governance at the national level but I fully share and support Dr. Santos Ocampo's view that "science and technology should be fully dedicated to the betterment of the people's quality of life and well-being. The pursuit of truth and knowledge should mean bringing the blessings of science for the benefit and enjoyment of all."

With these guiding principles, I wish you a meaningful and relevant exchange and sharing through this forum.

Thank you,

CLOSING REMARKS

HON. ESTRELLA F. ALABASTRO

Secretary, DOST

Let me first extend my congratulations to the National Academy of Science and Technology for the holding of a successful 23rd Annual Scientific Meeting. Let me also say that I consider it a privilege to be the Secretary of the Department of Science and Technology at this time that the Academy is celebrating its Silver Anniversary. Your untiring effort and unconditional support to the promotion of S&T culture have helped us a lot in our advocacy. With all these, let me say "Thank you very much".

True to its mandate, the Academy has become a well-spring of competent scientific and technical manpower in the country. The Academicians who compose the prestigious membership of NAST are among the Philippines' leading scientists in their respective fields; continuously making and leaving a lasting mark in the Philippine S&T history through their beneficial contributions. They also have, through their example, inspired young scientists to follow in their footsteps.

Those wise men and women are expected to lead the way in the harnessing of S&T to improve the lives of our people. In particular, we expected them to show us how S&T can be used in the country's fight against poverty, which President Arroyo has made as her primary mission. The President has, time and again, emphasized four vital components in the fight against poverty.

First, to tap the opportunities of the new economy, we are espousing an economic philosophy of transparency and free enterprise, for these are the catalysts that nurture the entrepreneurial spirit to be globally competitive. The science community's contribution can be in the form of technological intervention to enable our enterprises to produce competitive products and services for the world market. The improved technologies and technical services that our research and academic institutions can extend to the industry, especially the SMEs, can make a significant difference in enhancing their competitiveness.

The second component of our fight against poverty is to ensure that economic opportunities are extended to the countryside, whose population is still largely economically dependent on agriculture. We must, therefore, strive to create a

modernized and socially equitable agriculture sector. For the year 2001, the DOST has committed about PhP225M of R&D funds for projects that would focus on agricultural modernization and social equity. I hope that the other agencies and institutions will likewise re-orient their R&D programs to give emphasis to the needs of the agricultural sector.

The third component of our fight against poverty is this: we must give a social bias to balance our economic development. This is embodied in the provision of safety nets for sectors affected by globalization as well as the mitigation of adverse effects on the environment by some economic activities.

The fourth component of our fight against poverty is good governance. We have to ensure that our gains are not dissipated through corruption or by our ineffective and inefficient use of our resources. Our S&T organizations should see to it that we serve our clientele well by extending quality services at the least cost to them.

In the planning and implementation of our S&T programs, we have to remember that our main national resource is our people. Recognizing that some industry sectors are highly dependent on a competent workforce, President Arroyo has singled out two sectors which should be given special emphasis: Information and Communication Technologies (ICT) and Tourism. The DOST has, in the past 8 years, already identified ICT programs as priority. In fact, it was through DOST initiative that our major research and academic institutions got connected to the internet.

Indeed, we are blessed by the availability of very good people in various fields of endeavor whose abilities are at par with their counterparts in other places in the world. But this valuable resource must be nurtured and maintained. I am always bothered whenever I read about the exodus of Filipino professionals in technical fields, not only in high demand areas such as ICT but also in areas requiring creative skills such as wood-working. I believe that it is important to continually develop people in strategic areas, so that we will have enough pool of people to service our national requirements.

Our dilemma in S&T administration has always been this. If we are to develop national capabilities, in what strategic areas should we invest public funds? While it may be relatively easy to pinpoint present needs, what S&T interventions should be made, and what resources should be committed to these needs, it is much harder to decide what specific capabilities should be built up now, so that we can adequately respond to the needs of tomorrow.

I think this is where these inputs of NAST and other research/academic institutions will be invaluable. We need to hear your thoughts on what you consider as the enabling technologies of the future, and in which we need to build up our capabilities.

The DOST has started the process of putting together a national S&T plan, for the short-term, medium term and long-term. Undersecretary Fortunato de la Peña, who has been assigned to be in-charge of this task has started to consult with various groups on the features of the plan, including the strategies to be pursued in its implementation. I understand that this assignment had been originally given to NAST

by the previous Secretary of DOST and Academician, Dr. Filemon A. Uriarte. Usec. de la Peña has been coordinating closely with NAST so that we can fast track the development of the plan.

As we bring the 23rd Annual Meeting of NAST to a close, I would like to say that the DOST is very lucky to have within its easy reach, the brightest minds in the Philippine science community, the Academicians of NAST and our National Scientists. This annual affair has become an important venue where these Academicians and other science luminaries converge and share the latest developments and breakthroughs in science and technology.

We salute our National Scientists and Academicians for their total commitment to the promotion of science in the country and to their dedication to their responsibility to provide advice to the government on S&T policies and directions. Again, congratulations to the Academy.

Mabuhay po kayo!

