Dr. Efren Abaya
Chairman,
Scholarship Committee
19 October 2018

Report on PACES Pilot Lecture on
Science and Technology

The inaugural lecture of the PACES lecture series, organized by PACES in cooperation with the Philippine Embassy in Vienna, was held at the Multipurpose Hall of the Philipine Embassy in ARES Tower in the 22nd district. Welcoming guests to the first of the lecture series, PACES President Malou Reininger said that PACES is promoting the study of science, technology, engineering and mathematics (STEM) as a way to contribute to the development of the Philippines, and is currently providing scholarships to four highly talented science and technology students in Philippine universities. The lecture series was conceived to aid in the dissemination of scientific knowledge and information of relevance to Filipinos and Austrians in Europe, to promote awareness and appreciation of the scientific abilities of Filipinos abroad, and to inspire the younger generation of Filipinos towards career possibilities in the fields of science and technology.

Guest speakers and PACES members during the concluding session of the pilot lecture. (Photo: Mandy Salonga)

"The Philippines global competitiveness is bolstered by its ability to make practical use of new scientific breakthroughs."

- Ambassador Cleofe Natividad

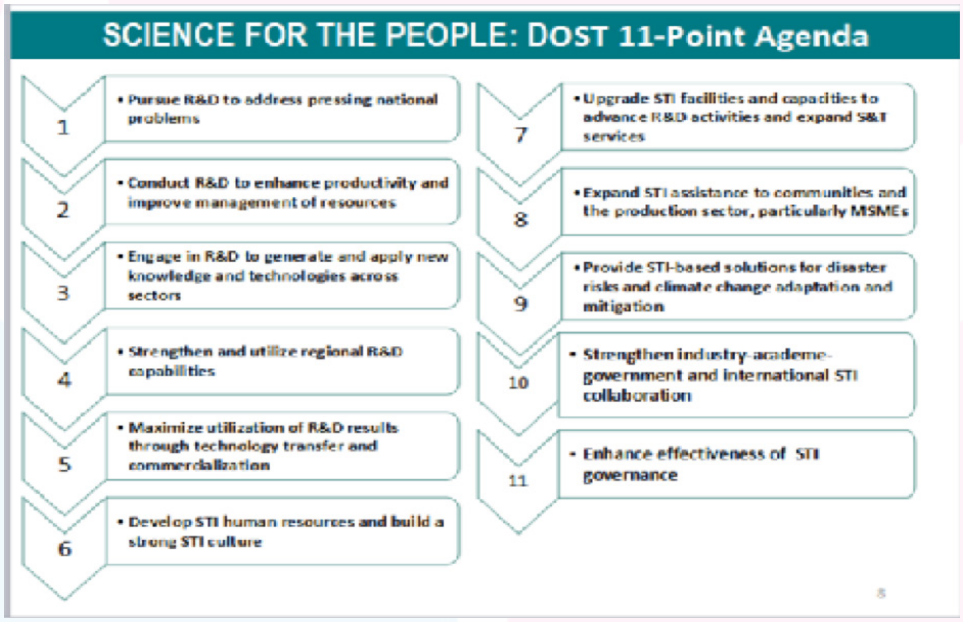
In her opening remarks, Ambassador Maria Cleofe Natividad underscored the important role that science and technology will continue to play in the lives of Filipinos. Because Filipinos pride themselves in being creative and innovative, the Ambassador stated that the country's global competitiveness is bolstered by its ability to make practical use of new scientific breakthroughs. Ambassador Natividad shared her pleasure that the Philippine Embassy in Vienna was able to host the inaugural lecture of PACES because the lecture series aligns with the mission-vision of the Philippine Embassy to become the science diplomacy hub of the Philippine Foreign Service, exploiting its unique proximity to science centres in Vienna and in the neighbouring countries in Europe, as well as the very strong community of Filipino professionals working in Austria.

Ambassador Natividad expressed her gratefulness for the participation of the two speakers, both members of the Philippine delegation to the IAEA General Conference. Ambassador Natividad related her meeting with Princess Sumaya bint Hassan of Jordan on the margins of the IAEA General Conference to forge cooperative ties with the Hashemite Kingdom of Jordan in science and technology, particularly in the field of nuclear medicine. This follows a bilateral visit to Jordan by President Rodrigo Duterte, the first Philippine president to visit this country.

Dr. Teodoro M. Gatchalian, Assistant Secretary for Administration in the Department of Science and Technology (DOST), delivered a presentation on "The Role of Science and Technology in the Philippines." He spoke on the mandate of the DOST and about its Science for the People Strategic Plan 2017-2022 which outlines strategies to harness science, technology and innovation for maximising the country's potential growth and laying a solid foundation for sustainable socio-economic development, inspired by the 10- Point Socio-economic Agenda of the Duterte Administration.and the Philippine Development Plan 2017-2022.

Dr. Teodoro M. Gatchalian

Assistant Secretary for Administration in Department of Science and Technology (DOST)



Moreover, the DOST spearheads the Harmonised National Research and Development Agenda (HNRDA) which defines the country's priorities, guides public investment in research and development (R&D), and ensures that these result in maximum economic and social benefits for Filipinos. Dr. Gatchalian asserted that science, technology and innova;on are seen as key drivers of the long-term growth of an economy through the creation of new public goods and services, and innovations that give a competitive advantage.

Dr. Gatchalian also presented DOST programs (see figure above), such as the improvement of native animal stocks such as pigs, ducks and chickens; carageenan as an agricultural supplement to improve production of rice, mungbean and peanuts; idenification of organisms that can be natural sources of medicines; three space satellites for earth observation (two already launched into orbit) developed by DOST researchers, and a hybrid electric train being tested for the Philippine National Railways.

Two of the three inventions entered by DOST for the Philippines in the International Invention Exhibition held this year in Geneva won Gold Awards out of the 1,000 entries received worldwide. These inventions include a “Portable Smart Surface System” that is capable of converting virtually any flat surface into an interactive interface for computers, and the “ Biotek-M Dengue Aqua Kit” that detects the presence of dengue infection in less than one hour.

Dr. Gatchalian spoke about DOST’s efforts to transfer technologies and inventions to the private sector so that they can be utilised to strengthen niche centres for research and development in the regions, and to search for experts who can lead these efforts.

Through PAGASA and PHIVOLCS, DOST continues to provide information to the public regarding weather and earthquake events. In manpower development, DOST has increased scholarships in Science, Technology, Engineering and Mathematics (STEM) to over 28,000 in 2018 with a further 16% increase in 2019.

Already in 2018, eight Filipino scientists were included in the Asian Scientist 100 for their significant contributions. Ms. Hillary Diane Andales, a student of the Philippine Science High School System under DOST, bested 10,000 students from over 178 countries to win the grand prize in the 3rd Breakthrough Junior Challenge held in Silicon Valley in the USA.

Dr. Carlo Arcilla

Director of the Philippine Nuclear Research Institute of the DOST spoke on

"Nuclear Science Applications in the Philippines."

He described the use of irradiated carageenan (a seaweed extract) as a plant growth promoter that could alleviate rice shortages by increasing the productivity of rice fields by up to 30%. This technology, developed by a team of researchers in PNRI led by Dr. Lucille Abad, has been successfully pilot tested in several regions of the Philippines. It has been tested as well on legumes and other vegetable plants.

Further reading on the beneficial effects of carageenan in rice production may be found on the website of the International Atomic Energy Agency (IAEA) at:

https://www.iaea.org/sites/default/files/publications/magazines/bulletin/bull59-3/5931819.pdf

PNRI Irradiation facilities are being used to increase the shelf life of rice and other foods, and to sterilise food products intended for export to meet import requirements in the destination countries. Both of these measures can increase the country's capability to sell Philippine products abroad.

Technetium-99m Production Facility at the Philippine Nuclear Research Institute in Quezon City, Philippines. (Photo: DOST)

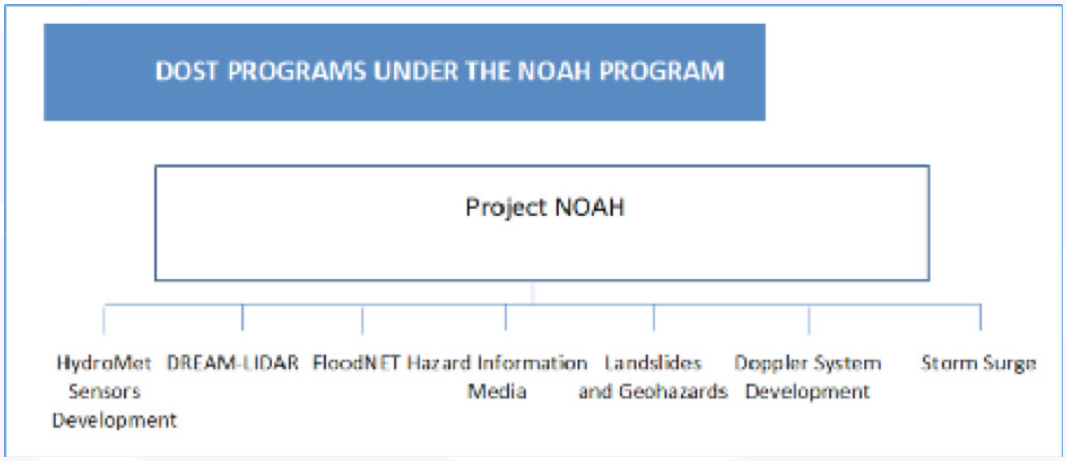
Nuclear medicine employs useful radiation for the diagnosis and treatment of cancer and other diseases. Radioisotopes are used in medical diagnostic procedures, for example in PET CT scans for imaging and scanning of body organs. In these applications, the radioisotope material has to be imported. PNRI operates a Technetium-99m production facility that is capable of producing certain radioisotopes.

Dr. Arcilla decried the shortage in the Philippines of cyclotron machines that are used to produce radioisotopes used in cancer treatment, i.e., radiotherapy. The country has only 3 cyclotron machines for a population of 100 million whereas South Korea has 50 cyclotrons for its population of 50 million. He proposed that such machines could be funded by “sin taxes” levied on products that in themselves are causes of cancer.

On another front, Dr. Arcilla, who is a geologist by training (he is a former director of the National Institute of Geology in U.P. Diliman), reported on the success of Project NOAH (Nationwide Operational Assessment of Hazards) in mitigating property damage and loss of lives from flooding and debris flows, which are common in the Philippines due to typhoons.

Boulder carried by a debris flow. (Photo credit: DOST)

In four years, Project NOAH has saved thousands of lives by providing advance warnings of incoming floods. Project NOAH utilises science and cutting edge technology to provide real-time information and timely warnings hours in advance of potential flooding.



This is complemented by accurate hazard maps to identify areas of flooding, as well as safe areas. Project NOAH employs in excess of 1,500 sensors built by scientists in DOST and deployed throughout the country, tied to a central system, to provide the real-time flood information.

Maps generated with the use of aerial camera and radar imaging provide flood models for floodplains in 17 of the 18 major river basins in the country. The project garnered numerous awards from 2012 to 2015 including a 2014 UN World Summit Award for best mobile app for m-inclusion and empowerment for its ARKO app. NOAH is accessible by mobile phone, apps, and the Internet, and is being distributed to local government units as well.

After its development in DOST, the facilities have been absorbed by PAGASA, the Philippine weather agency under DOST, and by the University of the Philippines National Institute of Geological Sciences.

A lively question and answer session followed the two presentations. (Photo credit: Mandy Salonga)

Deputy Chief of Mission and Consul General

Sulpicio M. Confiado

In his closing remarks, Deputy Chief of Mission and Consul General Sulpicio M. Confiado (now Ambassador-Designate to the Arab Republic of Egypt) shared three salient points:

There is a growing **CONVERGENCE** between PACES and its partners, specifically, the Embassy and Permanent Mission of the Philippines in Vienna, in the former's vision that science and technology shall be the key drivers for Philippine development. Citing a PACES imperative that the Philippines needs up to 400,000 more scientists, DCM Confiado stressed the need to make science education accessible to every Filipino, and to broaden the application of science and technology in poverty alleviation, especially in agriculture, fisheries, urban renewal and disaster mitigation and management.

This Convergence should lead to a sense of **STEWARDSHIP** in each Filipino, whether at home or abroad, about our collective responsibility and mission to share generously the fruits of scientific knowledge and application to everyone, especially the less privileged and marginalised communities. Science and technology, if used responsibly, has the capacity to provide a better, healthier and prosperous life for our communities.

Part of the audience attending the PACES lecture. (Photo: Mandy Salonga)

Convergence and Stewardship should lead us to active **ENGAGEMENT**. He called upon those present to support the mission of PACES or to undertake similar initiatives to bring the benefits and fruits of science and technology right into the homes of every Filipino family and community. This is the opportune time for each and every Filipino to “give back and share” their blessings.