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Contribution by Philippines

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technology and innovation for development”

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INPUTS FROM THE PHILIPPINES

PRIORITY THEME 2: GLOBAL COOPERATION IN SCIENCE, TECHNOLOGY AND INNOVATION FOR DEVELOPMENT

United Nations Commission on Science and Technology for Development (CSTD)

Questions 1-3: What STI cooperative mechanism(s) at global or regional levels has your country joined in? To what extent the existing cooperation programmes are aligned with the development priorities of participating developing countries? What are the main outcomes of such mechanism(s)? And what are the impacts of the resultant cooperation on your country? Pls. include the gender dimension.

The Philippines has been involved in several global and regional cooperative mechanisms related to various fields in science, technology, and innovation. Some of these mechanisms are:

a. Association of Southeast Asian Nations (ASEAN)

The Department of Science and Technology represents the Philippines at different levels in the ASEAN Committee on Science, Technology and Innovation (COSTI), a major sectoral body of ASEAN that supports economic integration and cooperation towards the ASEAN Economic Community. The ASEAN Ministerial Meeting on Science, Technology & Innovation sets the direction for ASEAN STI development to fulfill the objectives, missions, and strategies contained in the ASEAN Plan of Action on Science, Technology and Innovation (APASTI). In its recent version, APASTI 2016-2025, ASEAN Member States (AMS) developed policies and mechanisms to support active cooperation in research, STI development, technology transfers and commercialization, and the establishment of strong networks of scientific and technological institutions with the active participation of the private sector, the academe, and other relevant organizations.

With the DOST's involvement at the Vice-Ministerial level and nine Sub-Committees of specific areas, the Philippines was able to forward its international cooperation agenda and at the same time maximize possible opportunities provided by other AMS and ASEAN's Dialogue Partners. It can be seen that the Philippines has demonstrated active involvement in COSTI's 20 networks, centers, and expert groups.

Several DOST officials and experts are appointed as key opinion leaders in the ASEAN High-Performance Computing Taskforce, ASEAN Hydroinformatics Data Centre, ASEAN Young Scientist Network, ASEAN Centre on Microbial Utilisation, ASEAN Network of Innovation Centres, and ASEAN Technology Management Hub, among others. The DOST is also one of the founding members of the ASEAN Network on Bio-, Circular and Green Economy, a major coalition of public, private, and non-government organizations in ASEAN aimed to strengthen ASEAN's capacity in research, development, and technology diffusion to enable the adoption of applicable technologies for sustainable development.

The Philippines, through the Department of Science and Technology, also committed and implemented the Scholarship Offerings for ASEAN Researchers coming from Cambodia, Lao PDR, and Myanmar. This scholarship programme targeted to contribute to the efforts of addressing the gap in STEM education. It aimed to generate an advanced pool of Cambodia, Lao PDR, and Myanmar (CLM) scientists and engineers that will be able to contribute to their respective country's development after they finish the programme. The objective is to promote human resource development in engineering and sciences for sustainable socio-economic development of the ASEAN region particularly in Cambodia, Lao PDR, and Myanmar. To date, there have been 15 graduates and 26 scholars undergoing their programs.

Women and youth engagement remains a vital component of APASTI. One out of the four APASTI thrusts focuses on talent mobility, people-to-people connectivity, and inclusiveness which includes strengthening engagements and expansion of opportunities for women, youth, and the disadvantaged groups in STI. One notable initiative is the Underwriters Laboratory-ASEAN-US Science Prize for

Women. The Prize has been emphasizing the role of female scientists who have used their work to improve society in sustainable ways and have acted as role models for other women learning, working in, and pursuing careers in science, technology, engineering, and math (STEM) since 2016.

Currently, the DOST is leading the initiative on the ASEAN Shared AI Guideline for the Responsible Use of Artificial Intelligence Tools. Guided by the ASEAN Guideline on AI Governance and Ethics, the shared AI guideline will set the foundation for transparency and explainability, fairness and equity, security and safety, human-centric, privacy and data governance, accountability and integrity, and robustness and reliability in dealing with AI tools specifically Natural Language Processing tools.

The APASTI and DOST's Harmonized Research and Development Agenda share commonalities in their direction and coordination of STI efforts in the Southeast Asian region. This is further reflected in COSTI's active cross-sectoral and cross-pillar efforts spanning health, disaster risk, energy research, and trade and industry.

Another concrete example under the ASEAN membership of the Philippines is the DOST-Industrial Technology Development Institute's (DOST-ITDI) participation in the ASEAN Cooperative Project Report. It provided a training on Advanced Materials Characterization Techniques for Young Researchers from ASEAN Member Countries. The outcomes of the project include (i) establishing linkages with various researchers in the ASEAN Community, (ii) opening possible future collaborations with other countries, (iii) identifying barriers to information sharing among member countries and develop means to address the barriers, and (iv) development and harmonization of policies and standards relevant to the ASEAN region.

b. e-Asia

e-ASIA is a multilateral international joint initiative between a number of public funding organizations of the East Asia Summit (EAS) member countries including 10 ASEAN member countries and 8 additional countries such as Australia, Japan, New Zealand, China, India, South Korea, Russia, U.S. Under e-ASIA JRP, the Philippines has joined in various cooperative mechanisms on joint STI research projects fostering collaboration and knowledge sharing among member organizations (MOs) in the region. Specifically, the STI-related areas include alternative energy, agriculture, health research, materials (nanotechnology), disaster risk reduction and management, information and communication technology, advanced interdisciplinary research towards innovation, as well as the environment (e.g., climate change adaptation and marine science).

The existing cooperation programs at e-ASIA JRP are aligned with the priorities of the Philippines on STI. The alignment ensures that the Philippines can effectively address its national development goals and meet the needs of Filipinos as guided by the pronouncements of the current administration. The main outcomes of joint projects under e-ASIA JRP include collaborative research findings, knowledge exchange, as well as capacity-building among member organizations from different countries. The resultant cooperation in the Philippines has had significant impacts, both socially and economically. It has led to advancements in the previously mentioned fields in STI.

Regarding the gender dimension, e-ASIA JRP recognizes the importance of gender equality and encourages the participation of women scientists in its initiatives. The cooperation provides opportunities for women to contribute to research and innovation, promoting inclusivity and diversity in the STI sector in the Philippines. This inclusion of the gender dimension helps in addressing gender disparities and empower women in the field of science, technology, and innovation. In fact, during proposal development, women are highly encouraged to get involved in joint projects.

c. International Atomic Energy Agency (IAEA)

The Philippines engages in technical cooperation activities with the IAEA as part of its national development efforts, particularly in enhancing capacities in the field of nuclear science and technology for application in agriculture and food security, industry, human health, water resource management, environmental protection, energy, among others.

The cooperation is guided by the Country Programme Framework (CPF) which constitutes the frame of reference for the medium-term planning of technical cooperation between the Republic of the Philippines and the International Atomic Energy Agency (IAEA) for the period covered, normally, 5-7 years. Currently, the signed CPF between the Philippines and IAEA covers the period 2022-2027. It serves as the basis for the conceptualization and formulation of viable technical cooperation projects that meet the current priorities of the Philippine Government for socio-economic development as identified in the AmBisyon Natin 2040 (“*Our Ambition 2040*”, *direct translation*), the Philippines’ twenty-five-year long term vision - Filipinos enjoy a strongly rooted, comfortable and secure life -, and the Philippine Development Plan (PDP 2017-2022), the medium-term plan defining the strategies toward achieving the vision during the period and the Government’s commitments to the UN Sustainable Development Goals (SDGs) while meeting the quality and sustainability criteria of the IAEA. The document will be updated to adopt to the priorities under the new PDP Plan 2023-2028.

The programmes and projects under the cooperation is strictly guided by the CPF ensuring alignment to the national priorities of the Philippines. The IAEA’s technical cooperation modalities encourage project ownership by the Member State thus ensuring that projects are focused and aligned with national priorities. The Philippines has benefited from its membership in the IAEA through the enhanced capacity building for officials, experts and researchers of the DOST (particularly its attached agency, the Philippine Nuclear Research Institute), other National Government Agencies, and State Universities.

Some of the major national development efforts supported by the IAEA include the following:

- The concrete move to establish a nuclear power programme in the Philippines. The issuance of Executive Order 116 on 24 July 2020, creating the Nuclear Energy Program – Inter Agency Committee which was tasked to study for the adoption of a National Position of a Nuclear Energy Program in accordance with pertinent IAEA guidelines and standards
- Measures to address the COVID-19 pandemic with the IAEA’s donation of equipment and related supplies for COVID-19 detection
- The Philippines participated in the new IAEA-TC project, “Supporting National and Regional Capacity in Integrated Action for Control of Zoonotic Diseases,” which started its implementation in 2021. This project aims to strengthen regional and national capabilities for surveillance of and timely response to zoonotic disease outbreaks, at the environment-animal-human interface.
- The Philippines was designated as one of the three Member State participating in the pilot implementation of Nuclear Technology (NUTEC) for controlling plastic pollution project, together with Indonesia and Malaysia. Relative to this, the Philippines is receiving expert guidance in the feasibility study being conducted for the project.
- The Multipurpose Gamma Irradiation Facility (MGIF) of the DOST-PNRI, even during the pandemic, the Philippines received experts for the project to upgrade and develop capacity in enhancing the utilization of the upgraded irradiation facility.
- The establishment of the Subcritical Assembly for Training, Education and Research (SATER), the only operational nuclear facility in the country.

d. Asia-Pacific Economic Cooperation (APEC)

The Philippines is also a member of the Asia-Pacific Economic Cooperation (APEC). In terms of STI, the DOST represent the country in the Policy Partnership on Science, Technology, and Innovation (PPSTI). Currently, there are priorities of APEC and the Philippines that are similar such as the support for multilateral trading system, trade facilitation, connectivity, digitalization and innovation, responses to COVID-19 pandemic, health security, capacity building, climate change issues, food and energy security, and MSMEs in the digital economy.

In STI, particularly, priority is also put into the areas of connectivity, digitalization, and innovation. Connectivity means digital and people-to-people connectivity and mobility of researchers and S&T personnel. Digitalization also comes in manufacturing sector, investment in digital technologies, and supporting MSMEs to be equipped with digital tools and skills to access global markets and participate in the digital economy. There are also efforts to improve productivity through digitalization and supply-chain resilience. Lastly, innovation is focused towards sustainable and economic growth. This also includes cybersecurity, data privacy, and online consumer protection.

The main outcomes in this mechanism are capacity building, mobility of S&T researchers, knowledge and information exchange, and sharing of best practices.

e. For technology transfers and inventors: International Federation of Inventors' Associations (IFIA) and the United Nations Economic and Social Commission for Asian and the Pacific (ESCAP) of the Asian and Pacific Center for Transfer of Technology (UNESCAP-APCTT)

The Philippines, through the DOST-Technology Application and Promotion Institute is a member of IFIA and APCTT. IFIA helps provide a platform to showcase the talents and collaborate with fellow members in the international arena that provide an opportunity to participate in exhibitions, conferences, seminars, and workshops that will benefit the inventors and innovators and foster the exchange of knowledge and ideas. APCTT, on the other hand, continues to be a platform where Member States in Asia Pacific region actively support one another with the aim to strengthen the national innovation systems and creating an enabling environment for technology transfer to address the regional and global development challenges through the participation in international forums and conferences as resource speakers and/or participants for the sharing of knowledge and expertise.

Membership in these mechanisms is aligned with the DOST's efforts in identifying opportunities for international market penetration of technologies developed in the Philippines. It provides both financial and technical support to DOST-generated or funded technologies in their early commercialization stages, enabling them to enter foreign markets. In addition, it enhances the country's global competitiveness and contributes to inclusive economic growth. It then leads to potential outcomes such as elevating DOST-generated technologies to become globally competitive and ready for the international market. It also fosters more robust cooperation among diverse government entities in the Philippines concerning DOST-developed and/or generated technologies. Lastly, it strengthens the engagement of market experts from the Science and Technology (S&T) community.

f. World Meteorological Organization

The Philippines, through the DOST-Philippine Atmospheric, Geophysical and Astronomical Services Administration (DOST-PAGASA), participates in the WMO Congress and Executive Council meetings and activities. The Philippines is a member of the WMO Regional Association V where the common goal of expanding technical knowledge through the conduct of trainings and scholarship programs are being shared with by members. There are number of stations/facilities enrolled in the World Weather Watch (WWW) where data generated from it are being updated/posted in the GTS for sharing of member countries that can be utilized for research purposes, enhancement in operation and possible projects for collaboration.

Active membership in the WMO helps in the improvement of the country's meteorological agency mandated to provide science and technology-based assessments pertinent to decision-making in relevant areas of concern such as in disaster risk reduction, climate change adaptation and integrated water resources management, as well as capacity building, among others.

g. Weather and Climate Science for Service Partnership for South East Asia (WCSSP-SeA)

The WCSSP-SeA is a Newton Fund project implemented by the UK Met Office (UKMO) in partnership with SeA countries such as the Philippines, Indonesia, Malaysia and Vietnam. The WCSSP-SeA project aimed to develop science and innovation partnerships that promote the economic development and welfare of developing countries in Southeast Asia. The UKMO, as the implementing entity, aimed to build the basis for services to support climate and weather resilient economic development and social welfare through strong strategic partnerships harnessing UK scientific expertise. In acknowledging the need for improving the accuracy and effectiveness of impact-based forecasts in the Philippines, the project aimed to form strong, sustainable science and innovative partnerships that can be harnessed to advance scientific understanding and modeling capabilities that can be used to deliver underpinning services to protect lives and livelihood.

Through the WCSSP-SeA project, the researchers gained access and knowledge to cutting-edge resources from the experts from the Met Office and academic institutions in the United Kingdom. Standard operating procedures were also refined and adapted towards the implementation in the agency and stronger linkages and collaboration were built between the agency and the local

government units. The WCSSP-SeA also hosts workshops where other Southeast Asia countries participate and become engaged with the Philippines that becomes an avenue to interact with ASEAN member states. The impact of these outcomes leads to the implementation of the Impact-Based Forecasting and Warning System (IBF-WS) as a paradigm shift from the conventional early warning system. This system provides a specific guidance to the users for a specific circumstance, takes into account the information on risk consisting hazard, vulnerability and exposure to enable the general public better understand the potential impacts caused by a severe and high-impact weather events, and in addition, expected social and economic impacts are also taken into account so that stringent contingency measure can be instituted by local and national government.

h. Southeast Asia-Europe Joint Funding Scheme (SEA-EU JFS) for Research and Innovation

The Southeast Asia-Europe Joint Funding Scheme for Research and Innovation (JFS) is a joint funding of bi-regional and multilateral research and innovation projects. The funding for the projects is provided by funding agencies or ministries at national, regional or local level from Southeast Asia and Europe.

The JFS is aligned with the development priorities of the country, particularly with the United Nations' Sustainable Development Goals (SDGs) 6, 7, 9, 11, 12, and 13 and NEDA's Philippine Development Plan towards AmBisyon Natin 2040, and the Harmonized National Research and Development Agenda (HNRDA), especially related to the areas of industry, energy, and emerging technologies. It brings together resources from multiple funding sources, allowing for larger-scale projects and initiatives that may not be feasible with individual funding alone. It promotes innovation and the development of new technologies, products, or services.

i. UKRI-JST-DOST 'Science, Technology and Action' Nexus for Development (STAND) Collaboration

This cooperation aims to promote international research interaction and exchange among researchers in Japan, United Kingdom and Southeast Asia, through collaborative research projects (with focus on currently or recently funded by the Japan Science and Technology Agency (JST) and UK Research and Innovation (UKRI) that contribute to sustainable development in Southeast Asia). This is also aligned with the development priorities of the country, particularly with the United Nations' Sustainable Development Goals (SDGs) 6, 7, 9, 11, 12, and 13 and NEDA's Philippine Development Plan towards AmBisyon Natin 2040, and the Harmonized National Research and Development Agenda (HNRDA).

The collaborative projects facilitated the exchange of knowledge, expertise, and best practices among participating countries and research institutions/universities. The mechanism influenced the enhancement of skills and capabilities of research institutions and researchers involved.

Question 4: What are the main difficulties member countries have encountered or are facing when implementing the cooperation mechanisms?

In the Philippines' experience, some of the common main difficulties member countries have encountered are as follows:

- a. Funding remains one of the top challenges in various multilateral programs such as in operationalizing ASEAN COSTI's direction. Proponents are limited to small-time grants that have become supplementary instead of serving as the sole funding source from the ASEAN STI Funds. Dialogue Partner (DP) funds are technically accessible and can be listed as possible sources, however, in reality, the chances of receiving DP funds are next to zero due to several reasons including STI not being a priority, a specific DP fund being fully allocated for other Sectoral Body, and funds sought by scientists are viewed excessive. It can be noted that there are only two funds exclusive to COSTI: the ASEAN STI Fund and the ASEAN-India S&T Development Fund, meanwhile, there are a total of 17 external funding mechanisms from Dialogue Partners.
- b. Differences in policies, regulations, and legal frameworks among the participating countries and agencies can complicate cooperation programs. This includes differences in eligibility requirements and evaluation criteria of joint research programs and funding mechanisms among member countries have resulted in challenges in aligning project proposals with the expectations of all parties involved.

- c. Coordinating different timelines among participating countries sometimes become a challenge that can lead to delays in project implementation and communication.
- d. Aligning priorities among countries with distinct agendas can be a complex task, especially when there is limited selection from the available funds.
- e. The joint review process in joint research programs can be time-consuming and require significant coordination among stakeholders.
- f. In highly specialized joint initiatives and mechanisms, there could be lack of competent human resource to carry out the projects. Developing and least developed countries may face challenges in terms of technical capacity and expertise in specific fields.
- g. The COVID-19 has also caused disruptions in the implementation of several mechanisms due to realigned resources. Setbacks in physical implementation were also reported due to the limitations and restrictions set during the outbreak.
- h. Geographical distances and language barriers can sometimes also cause difficulty in connecting with potential partners.
- i. Success hinges on having clearly defined objectives and goals for each cooperation mechanism. Ambiguity in objectives can lead to misunderstandings and hinder progress.
- j. Inadequate infrastructure and access to advanced technologies can limit the effectiveness of cooperation programs. Investment in infrastructure development is often required to support research and development activities.
- k. Bureaucratic processes and protocols may cause delays in decision-making processes and can slow down the implementation of cooperation mechanisms.
- l. Disparity among members in mechanisms can also be a challenge, especially in economic resources, technological capability, and industrialization.

Despite these challenges, the DOST of the Philippines continues to work towards resolving such issues to ensure smooth implementation of STI cooperation mechanisms.

Question 5: In respect of achieving the objectives and goals, what are the factors contributing to the success or failure of the cooperation mechanism(s) that your country has joined in?

Several factors can contribute to the success or failure of cooperation mechanisms:

- Clear and well-defined objectives: Success hinges on having clearly defined objectives and goals for each cooperation mechanism. Ambiguity in objectives can lead to misunderstandings and hinder progress.
- Coordination and effective communication among participating members and stakeholders: strong commitment and active participation of member organizations/countries, effective communication and coordination among stakeholders lead to successful mechanisms. In the same manner, failure can arise from factors such as lack of consensus among participating countries, poor communication and diverse interests and objectives. Timing in the involvement of concerned stakeholders is also critical (e.g., involving governments at the beginning of the project such as in planning and preparations may be crucial in the implementation stage). It is important to have a “voice” in the mechanism to push for national priorities and goals which can also be beneficial in others. With positions being acknowledged and considered, there may be more active participation of the members. Private sector participation is also helpful such as in APEC to boost the achievement of national goals.
- Adaptability and flexibility: Being adaptable and open to adjustments in response to changing circumstances or emerging challenges is critical. Rigidity can impede progress when unexpected issues arise.
- Robust monitoring and evaluation mechanisms help assess progress toward goals, identify areas for improvement, and demonstrate the impact of the cooperation mechanism.
- Legal and regulatory framework: Ensuring that the cooperation mechanism complies with legal and regulatory requirements in both the Philippines and partner countries is crucial to avoid complications and setbacks.
- Adequate and sustained funding is crucial for the longevity and success of cooperation mechanisms.
- Planning for the sustainability of projects beyond the cooperation mechanism’s duration is essential. Long-term strategies should be in place to ensure that the benefits endure.

- In the specific case of ASEAN COSTI, despite funding limitations, ASEAN COSTI's projects are largely successful due to the relentless efforts and dedication of its Member States. It is the responsibility of the AMS leads that are assigned to priority projects to see to it that programs are not halted due to funding and other limitations. This is curbed by AMS self-funding their involvement or sponsoring other AMS in all matters relating to the rollout of the activities. Additionally, while DP funding is hard to access, COSTI works closely with interested Dialogue Partners to curtail financial restrictions by providing experts, sponsorships, infrastructure, and the like.
- Qualified and competent human resources can drive innovation and problem-solving. This would also mean that lack of expertise and technical capacity can be a barrier in achieving the objective/s of the cooperation mechanisms.

Question 6: In your country's view, what role could CSTD play in coordinating and imparting directionality to international STI collaboration and technology sharing?

The CSTD plays a significant role in facilitating dialogue and knowledge exchange among Member States, it could be in support of the promotion of collaborative projects. It continuously provides a space for sharing best practices, experiences, and lessons learned, helping countries to enhance their STI capabilities. It could further create fruitful partnerships among Member States if there would be a similar cooperation mechanism such as those mentioned above that would allow technology sharing. CSTD can initiate projects, programs, and activities where various Member States could co-host and collaborate for concrete outputs such as in research and development, capacity building, and technology sharing.

The CSTD can impart directionality by promoting the alignment of international STI collaboration, national policies, and technology sharing with the Sustainable Development Goals (SDGs). The CSTD can help identify priority areas for collaboration and guide Member States towards impactful and sustainable STI initiatives. It can continuously provide police recommendations based on global STI trends and emerging technologies, thereby assisting Member States in formulating and updating their national STI policies and strategies. The CSTD can also inform Member States about international funding opportunities and grant programs for STI projects. This information can help the country access external funding to support its research and innovation initiatives.

The Commission can aid in identifying possible/potential international collaborators that can provide relevant technologies and expertise. In addition, the Commission can further promote capacity building. By facilitating partnerships, providing technical assistance, and helping in mobilizing resources, the CSTD can contribute to bridging the gap in STI and digital divide and ensuring equitable access to scientific knowledge and technological advancements. Lastly, the CSTD can help emphasize the importance of ethical and responsible STI practices in international collaborations, ensuring that research is conducted with integrity and in adherence to ethical standards.

Overall, the Philippines recognizes the CSTD as a valuable platform for promoting global STI collaboration, sharing expertise and resources, and addressing common challenges. The Philippines supports the role of the CSTD in coordinating efforts and providing directionality to international STI collaboration and technology sharing, in line with national development priorities.