

Chapter 14

Vigorously Advancing Science, Technology, and Innovation

Science, Technology, and Innovation (STI) is crucial for fostering social progress and a vibrant economy. It is also a key for promoting sustainable development.

Access to advanced and appropriate STIs promote steady, improved well-being, reduce susceptibility of the vulnerable sectors to shocks, and drive productivity gains which ensure stable and rising incomes. The adoption of STI leads to achievement of significant economic growth as new processes, products and services are developed and deployed. These innovations can address the long standing needs especially of those in the disadvantaged sectors in several strategic areas including health, education, energy, disaster resiliency, and climate change adaptation.

For STI to effectively flourish and significantly contribute to socio-economic development, the government and private sectors should pursue a well-functioning STI ecosystem. This requires ensuring stable policies, well-functioning institutions, educated manpower, sound research and education infrastructure and strong linkages between public and private innovation actors, strong commitment to research and development and balanced intellectual property rights (IPRs) framework.

The development of an effective STI ecosystem is a long-term process. The Philippine Development Plan 2017-2022 recognizes that pursuing and advancing STI require long-term investment and long gestation period before desired capabilities and capacities are attained.

Assessment and Challenges

The level of STI capability in the region is low due in part to low investments in Research and Development (R&D) as well as investments in human capital, and weak linkages in the STI ecosystem. In the region, this is reflected through reliance on import and less diversification of local products. Use of STI in agriculture and in industry remains low as reflected in low productivity and output in the sector (*see Chapters 8 and 9*).

The following are the factors behind the weak performance of the STI sector:

Weak STI culture and linkages. The RDC prepared the Central Visayas Regional Development Research Agenda (CV-RDRA) 2009-2015 to maximize the contributions of the region's R&D manpower to support the implementation and realization of the development goals of the RDP. The agenda was advocated to RDRA member research institutions and higher education institutions (HEIs) to align their respective research priorities with the RDP.

The findings of an assessment in 2016 are: most researches congregated on health and social related topics; there is a need to push R&D on other development sectors; RDRA is not that popular yet among the research community and to some extent not used in prioritizing research topics; there is weakness in research utilization even for those that were funded, and accessing researches is difficult; there are only few HEIs capable of producing peer-reviewed quality researches; research outputs are mostly confined in the database systems of HEIs and are not actively marketed for utilization by the industry; and only few HEIs have links with the industry including agriculture sector.

Low government spending on STI. Government spending is crucial in strengthening STI. Investments can be used to upgrade and build new facilities and acquire technology and equipment necessary to address R&D needs.

R&D spending dramatically decreased by half from PhP549 million in 2011 to PhP257 million in 2013 (see Table 14.1). There is also huge imbalance on R&D spending between the government and the private sector. Data shows that government R&D spending only accounts for 2.7 percent and 6.1 percent of the total R&D spending in 2011 and 2013, respectively.

Decreasing trend is also observed in R&D intensity which is the ratio of R&D expenditures to GRDP (see Table 14.2). In 2013, the region posted an R&D intensity of 0.04 percent which is lower than the national average of 0.14 percent. Both figures are way below 1.0 percent benchmark recommended by the United Nations Educational, Scientific, and Cultural Organization (UNESCO). The global average is 2.04 percent.

Government procurement procedures hamper the acquisition of the necessary R&D facilities and equipment. Delay in acquisition of research-related materials and equipment reduces research productivity, publication and dissemination, and transition to actual production and market innovations. Moreover, grants on research do not compensate HEIs for the salary of faculty members' research activities. This contributes to lack of motivation of HEIs to encourage their faculties to pursue R&D activities.

Inadequate S&T human resources engaged in STI R&D. Another major contributing factor for technology generation and innovation is the availability of adequate S&T human resources engaged in R&D. As of 2013, there were 2,451 R&D personnel and 1,686 researchers in the region of which the government sector only

Table 14.1 Central Visayas R&D Expenditures (in PhP '000)

YEAR	TOTAL SPENDING	GOVERNMENT	PRIVATE
2011	549,404	14,897	534,507
2013	256,835	15,958	240,877

Source: Department of Science and Technology

Table 14.2 Central Visayas R&D Intensity (in PhP '000)

YEAR	TOTAL SPENDING	GRDP	R&D INTENSITY
2011	549,404	590,909,134	0.09%
2013	256,835	732,977,310	0.04%

Source: Department of Science and Technology

accounted for 16 percent and 22 percent, respectively. This also means that there are 281 researchers for every one million population in the region. This is slightly higher than the national ratio of 270 but falls short from UNESCO standard of 380.

Absence of vibrant intellectual property culture. Only a few HEIs in the region apply for patents in their research and innovation work. HEIs are not actively engaged in transforming patented portfolios into commercial use. The reason given is that HEIs do not have the staff and the expertise to follow through on patent application and are easily discouraged by the difficult institutional and documentary requirements needed. There is also the ‘for compliance only attitude’ among researchers which slows down the transition between patent acquisition and actual application and use of the patented technology.

Strategic Framework

STI will contribute in the achievement of the overall PDP goal of establishing the foundation for inclusive growth, a high-trust and resilient society and a globally competitive knowledge economy by increasing the country’s potential growth.

To achieve this, the region will embark on promoting and accelerating technology adoption and stimulating innovation.

Increasing STI in the agriculture, industry, and services sectors as well as investments in technology-based start-ups, enterprises and spin-offs will result to the promotion and acceleration of technology adoption.

On the other hand, enhancing the creative capacity for knowledge and technology generation, acquisition and adoption, and strengthening open collaboration among actors in the STI ecosystem will stimulate innovation (*see Figure 14.1*).

Strategies

STI utilization in the agriculture, industry, and services sectors increased

Promote commercialization and utilization of technologies from publicly-funded R&D.

Based on the RDRA 2009-2015 assessment, there are already researches that are ready for use. Those that have high potential for commercialization will be given priority assistance. The application of these R&D outputs to the agriculture, industry, and services sectors will be given priority to improve productivity and to increase income and employment opportunities especially in the countryside. The government will also foster the development of networks and markets, and undertake effective marketing strategies for products resulting from new technologies.

Develop a vibrant intellectual property rights (IPR) culture among HEIs.

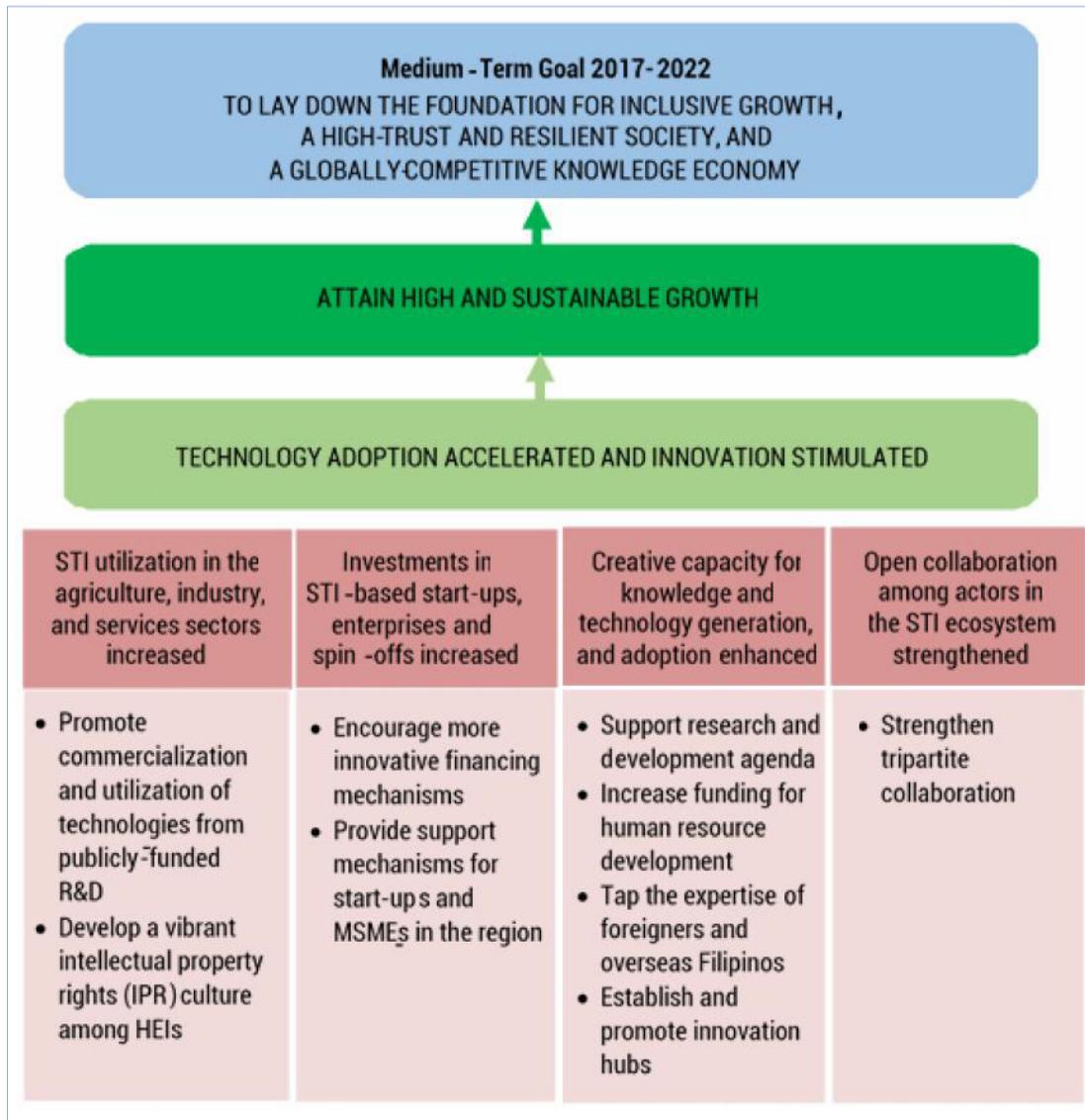
The establishment of an Innovation and Technology Support Office (ITSO) is a major contributing factor in strengthening IPR capability among HEIs. The ITSO can advise the faculty, students, support staff, or any client, who have developed an innovation, or formulated a product on how to protect their intellectual property. It can also provide technical assistance through seminar-workshops on the basics of IPR, and hands-on training on patent search to establish the novelty and patent potential of their R&D findings. Some HEIs can emulate good practices of other HEIs on this regard.

Investments in STI-based start-ups, enterprises and spin-offs increased

Encourage more innovative financing mechanisms.

The government will enhance existing financing mechanisms to encourage more clients to avail of these services. The DOST-Grants in Aid Program (DOST-GIA) aims to increase investment in S&T human resource development and R&D. The Niche Centers in the Regions for R&D Program under the DOST-GIA will capacitate R&D

Figure 14.1 Strategic Framework for Vigorously Advancing Science, Technology, Innovation



institutions and enhance industrial competitiveness. The CHED is also offering grants that could stimulate strong collaborative research and innovation ventures and sustainable partnerships for extension activities during the K to 12 transition.

Provide support mechanisms for start-ups and MSMEs in the regions. The government will strengthen the policy and regulatory environment, and introduce new mechanisms to support ‘technopreneurs,’ start-ups, spin-off companies, and MSMEs. Incubation centers

funded by government will be enhanced to address current needs for technology commercialization. Expansion of these centers to other strategic areas in the region will be pursued with strong partnership with the private sector to further promote available technologies, and to extend consultancy and other services for productivity improvement. These initiatives are intended to encourage uptake of innovation-based entrepreneurship.

The Small Enterprise Technology Upgrading Program (SETUP) will be expanded to enable

more MSMEs to access government assistance for the provision of innovative and cost-effective facilities, provision of technical support for compliance with product and quality standards, packaging and labeling, as well as training and consultancy services.

Creative capacity for knowledge and technology generation, acquisition and adoption enhanced

Support research and development agenda. The RDRA for the term 2017-2022 will be actively promoted to HEIs and research institutions to align their research priorities that will address the needs and research gaps in the RDP. The Regional Development Research Council as the lead advocate of the RDRA will also facilitate the sourcing of technical assistance and funds to those who will be doing R&D on topics identified in the RDRA.

Increase funding for human resource development (HRD). Scholarship grants provided by government will be enhanced to improve and ensure access of worthy and deserving applicants. The government will also enhance its HRD program to address the STI needs of its current workforce and its stakeholders through partnership with local and foreign donors. The established research consortia on health, education and STI in the region, composed of government agencies, HEIs and private sector, can tap into funding and technical assistance from local and foreign donors.

Tap the expertise of foreigners and overseas Filipinos (OFs). Mechanisms will be established to encourage overseas-based experts to share their knowledge and specializations with the academe and industry through ICT, such as e-

learning. Taking advantage of international expertise will speed up products and process development and build capacity in the field. The *Balik Scientist* Program and other related initiatives will be strengthened. HEIs in the region which are interested in availing of the program will be given assistance.

Establish and promote innovation hubs and other similar mechanisms. Fabrication labs (FabLabs) and other innovation centers in the region will be strengthened and will be expanded to strategic areas in the region. This will promote not only innovation, but design and creativity as well, and will provide support for the creation of incubation centers for MSMEs and start-ups. Coordination and other institutional mechanisms among government agencies, the academe, the private sector, and people's organizations for the necessary investments, training, and other support to the establishment of innovation centers will also be strengthened.

Open collaboration among actors in the STI ecosystem strengthened

Strengthen tri-partite collaboration. Collaboration in R&D based on the triple helix model will be pursued. Under this model, the coordination and cooperation of university, industry, and government will be strengthened. The government will continue to address bottlenecks and barriers preventing effective partnerships such as bureaucratic processes and procedures that discourage firms to invest in R&D and install innovation in their production processes. The chambers of commerce and industry who are members of the RDC can be tapped to become strong partners in providing assistance in marketing and financing for the commercialization and application of potential R&D outputs.

Legislative Agenda

The region will support the following legislative agenda identified in the PDP 2017-2022 that are needed to strengthen the effectiveness of the strategies:

Table 14.3 Legislative Agenda to Leverage Science, Technology, and Innovation, 2017-2022

LEGISLATIVE AGENDA	RATIONALE
An Act Establishing the Science for Change Program	Aims to achieve a higher standard of S&T, by prescribing the basic policy requirements for the promotion of S&T and comprehensively and systematically promoting policies for the progress of S&T.
An Act Adopting Innovation as a Vital Component of the Country's Development Policies to Drive Inclusive Development, Promote the Growth and National Competitiveness of MSMEs, and for other Purposes	Intends to generate and scale up action in all levels and areas of education, training, research and development towards promoting innovation and internationalization activities of MSMEs as a driver of sustainable and inclusive growth.
An Act Strengthening the Balik Scientist Program and Appropriating Funds Thereof	Seeks to strengthen the scientific and technological human resources of the academe, public institutions, and domestic corporations, through the promotion of knowledge sharing and accelerate the flow of new technologies into the country.