

Knowledge-Based Development and Governance: Challenges and Recommendations to the Duterte Administration, 2016-2022

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Introduction

Many developing countries have been beset by persistent problems of inequality and poverty. The Philippines is one of those countries. Its gross national income (GNI) per capita is now the lowest among the five original ASEAN member-countries (Indonesia, Malaysia, Philippines, Singapore, and Thailand). Its inequality and poverty metrics at 46 percent (Gini coefficient, 2012) and 25.2 percent (headcount, 2012), respectively, remain the highest relative to the four other ASEAN originals plus newcomer Vietnam. This situation has persisted despite the country's economic growth during the current administration averaging 6.2 percent, the highest over the last four decades or so.

Inequality, Growth, and Poverty

Income inequality typically results from unequal access to services such as healthcare and education which are basic to gainful employment or other income-generating activities like entrepreneurship. This is a key point that the country's leaders should be mindful of, for at least two reasons. First, inequality constricts economic growth, which in itself is a necessary condition, though not sufficient, for poverty reduction (Rodrik 2001). In addition, inequality directly dampens

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poverty reduction. In short, inequality is a hindrance to both economic growth and poverty reduction (Balisacan and Pernia 2003).

Second, persistent inequality erodes people's faith and trust in government and private-sector institutions. This puts at risk the democratic process as people feel left out and become deeply disaffected, and perhaps, increasingly restive (OECD n.d.). Fortunately, Filipinos are widely known to be patient, religious, and forbearing. But it is downright iniquitous for leaders to take advantage of these Filipino traits.

Inclusive Growth

"Inclusive growth" can be simply defined as economic growth that reduces inequality and poverty. The Philippine Development Plan 2011-2016 amplifies it as growth that "is rapid enough to matter, given the country's large population, geographical differences, and social complexity. It is sustained growth that creates jobs, draws the majority into the economic and social mainstream, and continuously reduces mass poverty" (NEDA 2011, 18). Hence, inclusive growth is rapid and self-sustaining economic growth that benefits all members of society, especially the poor, by creating opportunities for socio-economic participation.

The chief economist of the United Nations Development Program, Thangavel Palanivel, identifies four features:

Growth is inclusive when it: (i) takes place in the sectors in which the poor work (e.g., agriculture); (ii) occurs in places where the poor live (e.g., undeveloped areas with few resources); (iii) uses the factors of production that the poor possess (e.g., unskilled labor); and (iv) reduces the prices of consumption items that the poor consume (e.g., food, fuel, and clothing). (Palanivel in Duran 2015)

Clearly, inclusive growth is a goal that developing countries like the Philippines must arduously work for to achieve. However, given the country's large and still fast-growing population, complicated further by its socio-political structure, geography, and religion, this "holy grail" has remained elusive.

Human Capital Undergirds Inclusive Growth

That education is widely acknowledged as a key factor in economic development is now largely taken for granted. The development discourse has moved on to the importance of science and technology to underpin a country's capacity for innovation and the need for a population with adequate technological education

and skills to carry out the requisite applied work and other related activities. As early as 1966, Nelson and Phelps made this link, noting that education is needed for workers to use new technologies to promote economic growth. Further, new growth theorists such as Lucas (1988), Romer (1990), Mankiw, Romer, and Weil (1992), and Barro and Sala-i-Martin (1997) argue that “the accumulation of human capital through education and on-the-job training fosters economic growth by improving labor productivity, promoting technological innovation and adaptation, and reducing fertility” (Son 2010, 10).

Son (2010, 18), moreover, believes that the “link between the education and economic development is realized through the labor market.” The knowledge and skills gained from the educational system should be utilized by firms in the production of goods and services such that monetary compensation will then be given to the workers commensurate with their labor productivity. On the whole, education enables people to achieve holistic development. It enriches people’s capacity to participate in the economy as productive agents and, at the same time, raises their creativity and entrepreneurial skills to develop technological advances that can eventually spur innovation in the various sectors such as agriculture, industry, and services (Ozturk 2010). Hence, education at all levels and in all forms matters to a developing country in its quest for economic growth.

Innovation through Science and Technology

In this age of globalization driven by the rapid progress in science and technology, the country’s human or knowledge capital can be considered a potent resource to achieve and sustain inclusive growth. This is because the ability to harness the tools for developing regions and cities largely depends on the skills and capacities of the workforce to create new knowledge, innovate, and improve productivity. At the macroeconomic level, human capital accumulation advances labor productivity, moves technological innovation forward, raises capital returns, and helps achieve sustainable growth. At the same time, human capital at the micro level is the education component that raises labor productivity and earnings (Son 2010, 2).

Technological innovation supports the manufacturing sector which, in turn, generates direct and indirect jobs, with the latter generally targeted at sectors that have less access to economic and social opportunities. Innovation also encourages and supports small and medium-sized enterprises that create income for the poor. In other words, innovation—especially at the local level where it is closer to the people, can “create opportunities for good and decent jobs and secure livelihoods” and “support inclusive and sustainable business practices” (Duran 2015), both hallmarks of inclusive growth.

Philippine Innovation Remains Low, Affecting Its Capacity to Support Inclusive Growth

With a flourishing service sector that nearly doubled in size in 2012 (World Bank in Habito 2015b) and a manufacturing sector showing resurgence in 2013, the country had one of the fastest gross domestic product (GDP) growth rates in Asia and the world (Habito 2015b). Investment strongly drove our GDP growth with a spike in capital formation in 2014. What this suggests is that innovation is essential to foster manufacturing and investment. Thus, while infrastructure and institutional and policy reforms can certainly help the economy, the government cannot rely on these alone. Higher development would still require the building up of the “suprastructure”— a term first used by Dutch researchers Peter Nijkamp and Barry Ubbels (1999) to refer to the knowledge and research capital of a country.

One might conclude that the presence of a growing manufacturing sector in the country is enough as an indication that the Philippines is on the right track. On the contrary, the actual measure of manufacturing should rely not on sheer presence or size but on the kind of industry that we have. While other Asian countries, particularly Malaysia, Singapore and South Korea, have successfully established themselves in the development of high-technology and, accordingly, high-value products, “Philippine technology has low technology and scale quality, and is concentrated in low-productivity subsectors such as food, beverage, tobacco, textile, footwear, clothing and garments” (Pernia, Padilla-Concepcion, and Clarete 2014).

The lack of enthusiasm and actual spending for the human or knowledge capital (the suprastructure) has been partly identified as a culprit. The low prioritization of knowledge capital accumulation, in effect, undermines further development in science and technology (S&T) and research and development (R&D) in the country. This provides an explanation of why the Philippines fell three places in 2012, from 89th to 92nd, in the World Knowledge Economy Index (KEI)—an index that gauges whether the environment is conducive to the effective use of knowledge for economic development, determined mainly by the generation and use of S&T. A low level of innovation implies a labor force that may be competent in routine work but not predisposed to actively create improvements in industries or move production up the value chain.

In 2012, UNESCO reported that “a clear challenge for our S&T policy will be to seek ways to leverage technological capacity in local firms and in sectors other than the assembly of electrical components.” In a think tank meeting on human capital organized by the UP Office of the President on August 29, 2015, engineer

and educator Dr. Jose B. Cruz, Jr. highlighted that in manufacturing, our work force has a tendency to stay at the lowest level of production. He maintained that if we have more software engineers and designers, instead of mostly programmers, our computing industry would have a greater capacity for innovation and consequently an increased amount of intellectual property. Dr. Filemon Uriarte of the National Research Council of the Philippines (NRCP) supported this view when he said that we have a deficiency in human resources at higher levels even outside manufacturing. He cited the case of the business process outsourcing industry where the Philippines, albeit first in the voice sector, is sorely lacking in higher-end, non-voice services up the value chain.

Synergy among the Government, Industry, and Academe

Industry, too, does not seem to “figure significantly in the design of research agenda of experts and agencies” (Co and Gamboa 2014, 13). In state universities and colleges (SUCs), the R&D agenda are designed, implemented, and monitored only by internal stakeholders (e.g., academic administrators, faculty, and staff), thereby excluding largely or entirely the industry and private sector in the process. As a result, “there appears to be a weak focal watershed of agency convergences and a delinked partnership and harmony between the industry and the experts” (Co and Gamboa 2014, 13).

The results of the 2009 Survey of Innovative Activities in the Philippines, which reveals limited government support for private innovative activities and poor networks for knowledge production, corroborate the findings of Co and Gamboa (National Statistics Office 2009 in Pernia, Padilla-Concepcion, and Clarete 2014). Results also show that the country did not have enough university-industry linkages, with weak access of firms to technical support from government and research institutions. As stressed by the survey, “networking, linkages and technical partnerships between the government, industries, and universities [are necessary] to enable manufacturing to flourish, thereby fostering inclusive economic growth through job creation.” Essentially, these studies indicate the need to incentivize and facilitate partnerships and linkages between private firms and the academe.

Similarly, many other studies have emphasized the link between economic growth and skills development—which includes formal instruction in schools and universities, but also unstructured on-the-job experiences and enterprise-based trainings (Angara 2015). It is important for leaders to consider these connections in decision-making, especially in light of the fact that even with 10 percent of the Filipino population working overseas and with our economy growing faster than

many ASEAN countries, the unemployment rate in the Philippines from 2000 to 2014 was still 8.3 percent, whereas Cambodia had 0.7, Thailand 1.7, Vietnam 2.6, Singapore 3.1, Malaysia 3.3, Laos 3.7, and Myanmar 4.0 (Habito 2015a).

Educational Reform for the People

For the past years, the Philippine government has been keen on policy reforms in the educational sector especially in basic and higher education. The signing of the Enhanced Education Act of 2013 into a law has become the foremost reform and most massive investment in basic education. The law seeks to produce more competitive global Filipino youth through the implementation of the K to 12 program in basic education. It also aims to equip the youth with 21st-century skills and mindsets prior to high school graduation. By adding two years to secondary education and developing a more comprehensive basic education curriculum, the government expects to better prepare the youth for employment, entrepreneurship, or higher education both in the country and overseas.

The Commission on Higher Education (CHED) in its Strategic Plan for 2011-2016 identified its goals as “formation of high-level human resource, and generation, adaptation, and transfer of knowledge and technology for national development and global competitiveness” (CHED 2011, 1). With this in mind, the Commission aims to address, in particular, the management system and quality of, and access to, higher education in order to produce competitive and responsive Filipinos who will then address the domestic and international needs of industries.

Low Government Spending on Education Hampers Innovative Activities that Can Help the Poor

The current administration has been supportive of efforts to modernize tertiary and postgraduate education as well. Since Benigno S. Aquino III assumed the presidency, government expenditure on public education has enjoyed annual increases. Out of the education sector's PHP 364.9 billion budget for 2015, PHP 43.3 billion was given to SUCs—a 13.8 percent increase over the 2014 allotment—“to provide for needed faculty, operating funds, and capital outlays,” according to President Aquino himself. Over PHP 3 billion was made available for scholarships under SUCs and more than PHP 2 billion for scholarships administered by CHED.

The budget of the University of the Philippines (UP), as specified in the General Appropriations Act, also climbed from PHP 4.6 million (actually released) in 2011

to PHP 13.1 million in 2015. UP President Alfredo E. Pascual remarked that “The increased funding for UP shows that the national government now recognizes that every peso given to the University is not an expense but an investment in the future of our country.” UP, as the national university, is mandated to lead in the vision for S&T and R&D in the Philippines.

But are these enough? Data show a correlation between global ranking and state funding: in ASEAN, the top performing universities are those that received the biggest monetary support from government. Thus, in the 2014 Quacquarelli Symonds university rankings, UP—whose government budget was somewhere at the bottom of the list—not surprisingly placed only 8th out of the top 10 universities in ASEAN and 63rd out of the top 300 in Asia. The National University of Singapore, which placed first in ASEAN, had a government budget almost equal to the combined funding of all the universities that placed sixth to 10th, including the Philippines. In the 2010 KEI rankings where the Philippines was 89th, those ASEAN countries which benefitted from generous public spending on higher education also fared better: Singapore was 19th, Malaysia 48th, and Thailand 69th.

In short, although public education in the country has received the biggest share of the national budget in the past few years, we continue to lag behind our ASEAN neighbors. It is important to note, however, that our level of public spending on education as a fraction of the GDP has historically always been quite low relative to other ASEAN and East Asian countries (Pernia, Padilla-Concepcion, and Clarete 2014). In 1980, we spent 1.72 percent of the GDP on public education and 2-3 percent in the 2000s, compared with the ASEAN-5's average of 5-6 percent over the same periods. In other words, seemingly significant increases in country's public spending for education in recent years merely diminished our lag vis-a-vis other ASEAN countries marginally.

The study by Co and Gamboa (2014) likewise indicates sluggish R&D spending in the country particularly from the government. In 2011, over 60 percent of R&D expenditures were made by private industries and 22 percent came from higher education institutions. In the same year, government spending accounted for only 17.3 percent total R&D expenditures. In UNESCO 2014 Report on Higher Education in Asia, it was mentioned that the R&D expenditure in the Philippines was 0.11 percent of the GDP, compared to 4.03 percent in South Korea, 2.23 percent in Singapore, 1.07 percent in Malaysia, and 0.25 in Thailand. Undoubtedly, this affects our economic growth potential, specifically our capacity for innovation in products and processes as well as services and programs for people, especially the poor.

In a study on the link between poverty alleviation and educational attainment in Cameroon, Njong (2010, 7) reveals that “as educational achievement increases, the likelihood of an individual to be poor declines” as educated individuals have higher chances of being employed with higher wages. Ukwueze and Nwosu (2014, 17) have a similar finding in Nigeria, and they recommend higher funding for education “to help the education sector... grow and also improve the human capital development.” Indeed, education can help mobilize the people to engage in economic activities that will lift them out of poverty. As for developing countries like the Philippines, the challenge for the next administration is not only to make education a tool for upward mobility but also a development goal through greater access to higher quality education in all forms.

What, then, are some ways by which Philippine education can help attain inclusive and sustainable growth?

The Creation of a Knowledge-Based Network

Government Should Massively Invest in Building Up of Our Human Capital and Sustaining the Suprastructure (Human and Knowledge Capital) for Economic Growth

Innovation supports inclusive growth by enabling development at different levels, thereby helping excluded groups—the poor and other vulnerable sectors of society—attain better standards of living. But as innovation is only possible with a human resource base that has high levels of education and technical skills, it follows that there is a need to make huge investments in strengthening our education system and building our knowledge capital.

Thus, according to Pernia, Padilla-Concepcion, and Clarete (2014, A14), “In the longer term, the goal should be to develop Filipino scientists and engineers with PhDs (besides MS and MA degrees) in quantity and quality adequate to support the economy’s endogenous growth that will be inclusive and self-sustaining. Highly trained scientists and engineers are needed not just in the academe but also in industry. They are the ones who would enable our suprastructure to steadily move to higher planes as will be required by an increasingly sophisticated knowledge-based economy.” To have a “pool of scholars” that will sustain the supply of qualified students for higher education in the long run, investment in the primary and secondary levels of education is also necessary.

UNESCO 2014 Report on Higher Education in Asia indicated that the Philippines had 78 researchers per one million inhabitants. This was very low

compared to 5,804 in South Korea, 6,505 in Singapore, 1,643 in Malaysia, and 332 in Thailand.

Investing in the suprastructure does not only consider the formal educational system as the sole mobilizer for human capital development. As skills are not only gained from formal education in universities, emerging studies also recognize the role of non-formal and non-traditional education and training as potent tools to develop human capital. These experiences allow people to hone “work-skills that can be profitable later on” (Angara 2015). Hence, investment in the technical-vocational sector is also crucial in alleviating poverty.

Through these combined investments in formal and non-formal education at different levels, our human or knowledge capital will be more dynamic and flexible in the face of rapid technological advances.

To have sufficient, trained personnel needed for the massive and sustained development of human capital in the country, UP proposes to the government the following approaches:

a. Undertake large-scale foreign training of young Filipinos at the postgraduate levels

In building the capacity for R&D in universities and industries, the challenge is in producing teachers and researchers who are competitive not only locally but more so internationally and in large number. This entails obtaining education and training from foreign institutions.

We propose that government invest in programs for sending abroad large numbers of faculty members, researchers, and top college graduates to pursue advanced study (on MS, MA, PhD, and/or postdoctoral fellowships) or short-term training. Exposure to established research universities in developed countries will enable them to acquire new knowledge and technologies that they can use in addressing the pressing needs of Philippine industry and society, possibly in collaboration with their foreign mentors.

Sending our people abroad for advanced studies is one thing. Ensuring their return upon completion of their studies is another. Experience has shown that contractual obligations are not always enough. The promise of productive and remunerative engagement on their return, such as the grant of an initial research funding, can provide an effective inducement for coming back.

UP has an established fellowship program for its faculty and researchers to upgrade their capabilities through masteral, doctoral, and/or postdoctoral fellowships as well as short-term training in foreign universities. UP also has a system for internships in industry. State-funded initiatives in other universities could use UP's existing programs as models.

b. Promote the large-scale return of foreign-trained Filipinos in every discipline

The Philippine Statistics Authority (2014) estimates that there were 2,295,000 overseas Filipino workers as of 2013. Almost 12% of these are tagged as professionals and 7.6% are technicians and associate professionals; the rest are laborers, trade, service, and plant workers, clerks, and officials of government and special-interest organizations.

This means that there is a pool of around 275,000 expatriate Filipino professionals from which we can draw experts in various fields. We are looking for those who are PhD holders, MS or MA holders, professionals, technicians and the like. Of particular interest to us are those who meet ASEAN professional standards. We want to attract these target individuals to return to the country through appropriate incentive programs and actual availability of jobs with competitive salaries and benefit packages, including relocation assistance, housing, healthcare, faculty items (if in a university), etc. More faculty items for teaching and research should be made available to SUCs so they can absorb the returnees and allow them more time for conducting and engaging in research.

A massive government-led information campaign here and abroad should complement these measures to encourage shifts towards knowledge-based careers, to promote nation-building, and to convey the urgency of developing knowledge capital and producing knowledge-based and high-value products. Such campaigns can be championed by notable and influential personalities with the media and private sector as advocacy partners.

Hand in hand with targeting the large-scale return of experts is counteracting "brain drain"—ensuring that enough of our human resources at the highest levels remain in the country—through competitive compensation and benefits, among others.

c. Facilitate the recruitment and employment of expatriate academics and researchers

Besides sending our faculty and researchers for studies abroad and attracting expatriate Filipinos to come back, we can accelerate the building up of human capital in the country by hiring highly trained and experienced international experts and educators. Such foreign expatriates will be able to quickly augment the ranks and raise the quality of the teaching and research faculties in our universities. They will also be able to help upgrade our R&D capabilities through mentoring and collaborative work. To facilitate bringing in more advanced knowledge and skills from abroad, the government must review the existing policies for employment of expatriate professors, including the grant of tenure.

Government Should Establish a Network of R&D Hub-and-Spokes Organizations at the National and Regional Levels

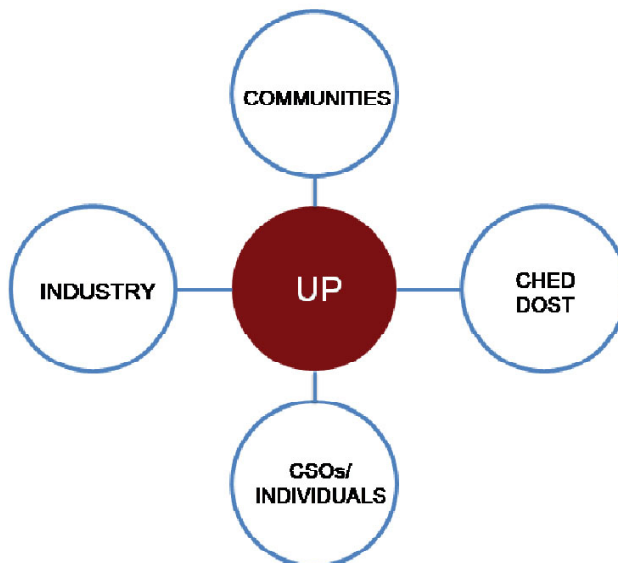
UP envisages the country's R&D efforts to be organized at the national and regional levels using the hub-and-spokes model. Such set-up will maximize the benefits of investments in knowledge capital development and supporting infrastructure by bringing together various stakeholders (institutions such as universities, the private sector, government agencies and offices, civil society organizations, and their experts) in a focused and coordinated way.

A hub can be considered a center of strength—an expert or an institution—that serves to influence and drive others (the spokes) to adopt an agenda, cause, or scheme. The spokes, on the other hand, are expected to support and work in partnership with the hub to implement the initiatives and programs that the hub spearheads. Hubs will be situated across multiple locations—at the different geographic regions of the country. Thus the model not only focuses on strong connection and effective distribution but more importantly on continuing cooperation or partnership among experts. The activities of and contributions from the spokes as driven and coordinated by the hub can generate a synergy of long-term solutions for a region or industry sector served by the hub-and-spokes organization.

Creating R&D hub-and-spokes organizations focused on regions can build or enhance regional competitiveness. The idea is to create such a network of experts for a region based on the region's priority or niche industries. Since productivity is determined by the fundamentals that are in place (or local "comparative advantage" in economics), it is also the role of the hub-and-spokes

organization, besides steering the region towards innovation, to ensure that basic needs for R&D to run efficiently are present in the region: hard infrastructure (i.e., facilities such as railways, roads and Internet, and even services like water supply), services (both basic services as in healthcare and those that add value to products such as food processing), and disaster prevention and mitigation.

There are three possible models. Model 1 takes advantage of UP's unique role as the national university whose faculty and staff are experts on national development issues. In this model, UP will be the hub that will tie together in a network such government agencies as CHED and DOST for support in the forms of funding and technical or administrative expertise. Thus, DOST and CHED along with civil society organizations (CSOs) and individuals and local industry will serve as spokes around UP (the hub).



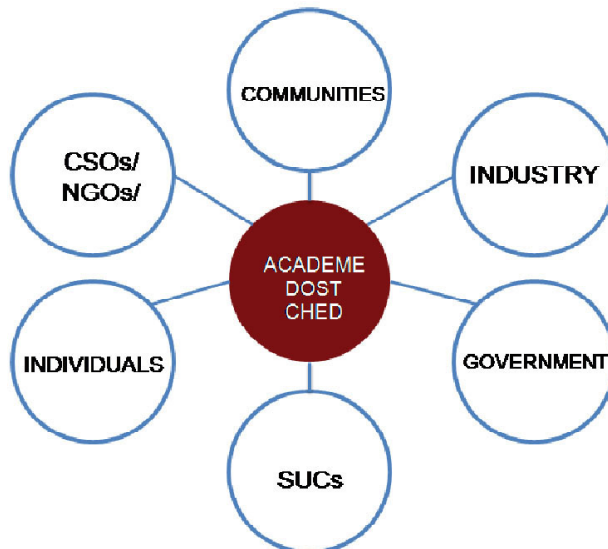
Model 1

In other areas like Mindanao, UP may not be the hub of the knowledge network. Thus in Model 2, leading SUCs like the Mindanao State University can serve as the hub. The spokes will be other SUCs like UP Mindanao, CSOs and Mindanao advocates, government agencies and local industry.



Model 2

The hub can also be more than one institution, as illustrated in Model 3. To ensure a trans-disciplinary approach in implementing research initiatives and crafting policies and programs, partnership among institutions is inevitable. The spokes will be the government, SUCs, CSOs, individuals, and local industry.



Model 3

For example, in Leyte, Visayas State University could serve as the hub for post-Yolanda environmental and ecological initiatives and efforts for the region. The university, with its environmental management and agriculture undergraduate programs, can engage in field research in the region to assess the ecological situation. It can also seek the help of other SUCs in Leyte in gathering information from the field. The findings can then be used by the LGUs in crafting and implementing policies for the rehabilitation of areas ravaged by the typhoon. The office of the Department of Environment and Natural Resources in Region 8 and environmental groups and NGOs may also provide information for researchers and lawmakers and may serve as links to communities. Communities, in turn, may contribute by providing feedback when the policies are implemented.

The hub-and-spokes framework should also include various industries to promote innovation. This collaborative model of development is necessary for sustainable and inclusive growth.

Because the model depends on effective and successful linkages and interconnectivity, UP likewise proposes the following:

a. Strengthen the integration of geographical territories

Integrated planning requires enhancing connectivity not only between disciplines and sectors but also naturally between geographical areas. Liu and Gannon (in Trace, Frielink, and Hew 2009) underscore how improved transport links not only facilitate economic growth but also poverty reduction, because they create opportunities for the poor to generate income and increase the capacity of government to redistribute it. With the presence of local transport, communities can move their produce from farms to neighboring markets and purchase manufactured goods with the proceeds (Trace, Frielink, and Hew 2009).

Maritime connectivity is especially important to advance the flow of goods and services in an archipelagic country like the Philippines where “poor roads and non-existent rail communications mean that sea or river transport is required to access local urban centers” (Trace, Frielink, and Hew 2009). Investments in maritime development should be able to contribute to the development of coastal areas which are prominent in an archipelagic country such as the Philippines and where many poor people live.

To strengthen integration among regions, the government must invest in the smart planning and management of physical infrastructure. Not only must it be built but also maintained, repaired, and improved by competent

and skilled personnel. Well-functioning roads and ways and transport services support the suprastructure growth and innovation.

The state of the Internet in the Philippines must also be improved. According to a report by Akamai (2015) on the Internet in the Asia-Pacific region, the Philippines placed at the bottom six of the rankings in terms of Internet speed. Lardizabal and Bonalos of CNN Philippines (2015) have also reported that businesses in the country suffer from poor connectivity in customer transactions and this translates to profit losses. Slow Internet speeds do not only affect businesses; poor connectivity affects other sectors like education and government, as this hampers the efficient flow of information and knowledge. Reliable Internet services are necessary in making effective connections among individuals, communities, and institutions, given the geography of the country.

Other models of the hub-and-spokes framework may be considered depending on the needs of the concerned geographical area and/or sector.

b. Strengthen the integration of sectors in the development agenda

The integration of expertise, skills, and knowledge through collaboration is crucial in order to attend to complex issues, both old and new, in society. For example, agriculture and coastal management are essential to productivity, and productivity determines food security, nutrition, and wellness. But these areas are also connected to the health sector as society strives to prevent, control, and manage diseases; and to the education sector as we seek more advanced technologies to influence the quality and quantity of products and services for agriculture, aquaculture, and health.

Better health leads to greater productivity and longer working lives, favoring innovation. With these sectors working together, the Philippines can boost its competitiveness in health research and innovation by developing research skills and infrastructure and multiplying investments in R&D.

c. Strengthen the integration between and among science and engineering, the social sciences, arts, and the humanities

While R&D operates directly within the fields of science and engineering, it must be kept in mind that the social sciences, arts, and humanities likewise contribute to economic growth. According to writer and educator

Prof. Jose Dalisay, Jr. of UP Diliman, the so-called “creative industries” like mass communication, entertainment, film, media, and music—behind which are people from the arts and humanities—earn substantial revenues for the country and help raise its international profile, promoting national awareness, tourism and investment, as they do in more culturally conscious countries as the UK, the US, Japan, and Thailand. It is also through science communication that the products of scientific development and innovation can be transformed into more readable and accessible format for policy formation and public consumption. For UP Vice President for Academic Affairs Gisela P. Concepcion, socio-cultural and historical studies must be made part of the holistic approach, not to foster regionalism, but to value cultural diversity and richness as a basis for developing niche markets including ecotourism and high-quality products and services in the region.

Furthermore, it is the spirit of innovation, and not only technical expertise, that economies today need: “the ability to think imaginatively, develop creative solutions to complex challenges, and adapt to changing circumstances and new constraints” (Phelps 2014).

Professor of law and ethics Martha Nussbaum (2010) also agrees that in a democratic world, we need the abilities that the arts and humanities foster: critical thinking, history (especially knowledge of the world and its many cultures and religions) and the “imaginative ability to put ourselves in the positions of people different from ourselves, whether by class or race or religion or gender....” She adds: “The imagination is an innate gift but needs refinement and cultivation; this is what the humanities provide.” As stated by Vice President Concepcion, it is in “the humanities where we learn ethics, civics and public mindedness” which are all important if we aim for inclusive growth. Hence, the key for a dynamic research is an integration of relevant disciplines to perform studies that matter to national development. Researches should not only be done to improve the state of research and development but to perform researches for development and inclusive growth.

d. Develop selected SUCs in the regions to become research-intensive universities

The Philippines can learn from the experience in some of its neighboring countries that have registered positive growth and educational development. The government should promote and encourage electively the emergence of research-intensive universities in the regions to serve as R&D hubs to which will be dispersed the increasing number of PhDs and

research experts to be produced by or brought into the country as recommended earlier in this paper. The existence of such regional research-intensive universities will foster healthy and productive competition among regions in the country.

Top performing SUCs would be identified, given appropriate funding support, and declared as research universities based on their having met certain hurdles such as proportion of PhDs in the faculty, number of publications in acceptable international journals, proportion of postgraduate students, etc. Such regional research universities should enjoy increased budget support and full autonomy like UP.

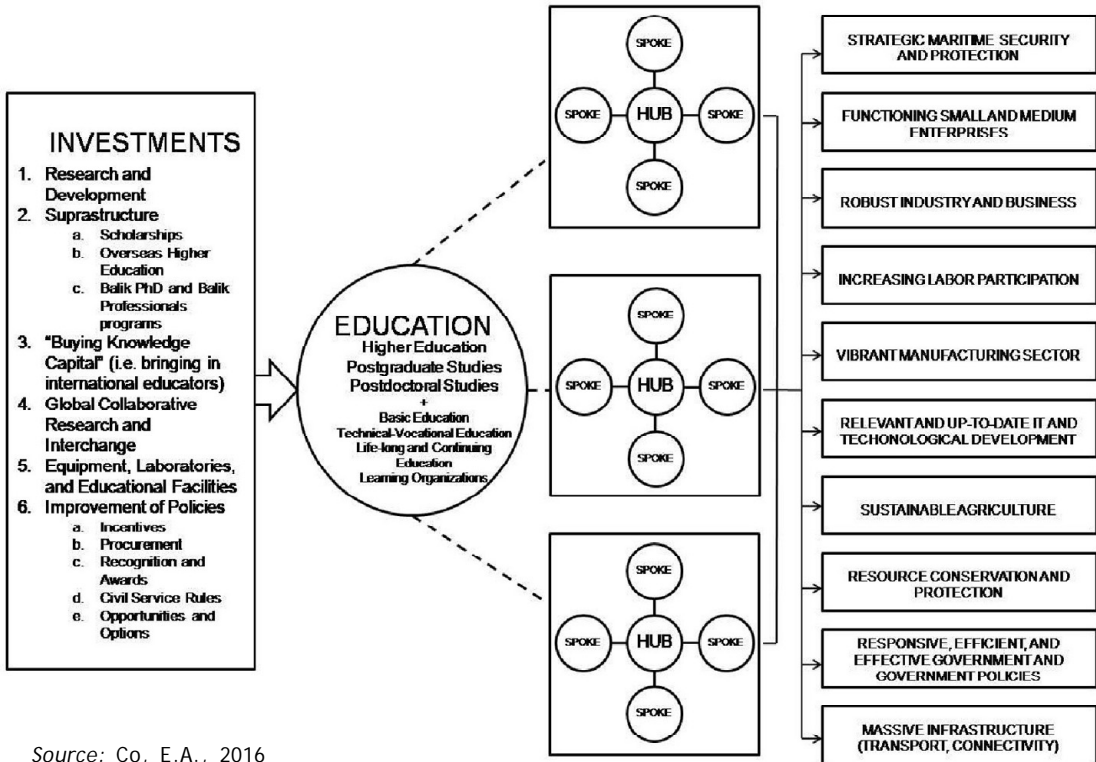
e. Review existing policies in order to streamline supporting processes

For the knowledge capital to yield innovation, the government must create the right policy environment to facilitate research activities. Laws that look good on paper must be accompanied by workable implementing guidelines that suit the actual situation. For instance, the Government Procurement Reform Act (GPRA) of 2003, while a landmark law on procurement as there was none before its promulgation, has regulatory gaps, such as guidelines to facilitate government-to-government transactions, guidelines for direct purchase from foreign manufacturers of sophisticated R&D equipment not produced locally, etc. National policies should be revisited and reviewed periodically. After thorough assessment, policies that have been overtaken by technological advances should be updated so that they do not hinder or slow down processes. New policies should be crafted to address emerging concerns in R&D.

Conclusion

Infrastructure—both physical and cyber—is essential to development but it is hardly enough if we aim for sustainable, inclusive growth. More importantly, what is needed is the suprastructure. In this age of globalization driven by scientific and technological advancement, the country's human and knowledge capital can be considered a potent resource to achieve and sustain inclusive growth. With the Philippines lagging behind its neighboring countries in ASEAN, we need to accelerate the building up of our human and knowledge capital for innovation. This can be done through substantial spending for education. Developed economies in Asia and around the world have shown the critical importance of human and knowledge capital to growth.

Below is a framework of what UP visualizes for the attainment of inclusive and sustainable growth. It entails putting a premium on education of all kinds—higher education, postgraduate studies, basic education, technical-vocational education, and life-long and continuing education. With the hub-and-spokes organizations being set up across the nation, focused and coordinated utilization of knowledge capital will be facilitated, and sustainable, inclusive growth achieved.



Source: Co, E.A., 2016

A Framework for Knowledge-Based Development and Governance

Creating a suprastructure—with “supra” denoting a strong recognition that actual work needs to reach beyond infrastructure (or the “substructure”) should be a priority and is an important means of attaining inclusive and sustainable growth. Leadership and management of both hard and soft infrastructure are crucial. With their know-how, experts can help effectively design and set the directions for present and future environments necessary to stimulate and continue innovation in general, and to strengthen the competitive advantage of every region in the country in particular.

It is imperative to rapidly and drastically raise the investment budget from both the government and private sector through public-private partnerships, for the knowledge capital base. This will allow the country, for one, to make huge investments in MS and MA programs, as had been done in the dynamic Asian economies, and, two, to invest substantially in doctorate programs to develop Filipino experts of high quality and in sufficient quantity needed in various fields. A significant number of students, faculty members, and researchers should be sent overseas for advanced education, specialized training, and collaboration. Providing competitive incentives and rewards for productivity and innovation should be a priority.

Such investments, more importantly, should be directed towards the large-scale return of highly skilled people after education and training overseas, and these include our Filipinos overseas who have been working as professionals and specialists in other countries. For them to want to go back to the Philippines (and to their own regions, in particular), they must be assured of a clear demand and a sustainable system of incentives and rewards, not just from higher educational institutions but from the major sectors of society as well: agriculture and aquaculture, information and communication technology, manufacturing, and energy, to name a few. These should be in place in every level of the “suprastructure” hierarchy—from top to bottom—in both rural and urban zones in every region of the country. Major secondary cities (“growth poles”) are of particular interest.

Commitment to this mammoth task entails sorting out complexities and fixing arthritic rigidities in governance and in legislative and judicial institutions.

A cabinet-level Knowledge Capital Development Commission (KCDC) should be set up to develop and sustain the massive investments on human capital. This Commission should also be able to identify the roadmap to reform the state of research and development in the country.

Government salaries should be increased to correspond to the high-level expertise and competencies. Plantilla items should be made available and matched with the right people.

Contracts and agreements should be in place. Government processes, especially procurement policies, should be updated to facilitate and enable faster delivery of services in research and development.

A massive information campaign must be launched to bring about a paradigm shift so that the government, private sector, and the citizenry in general become mindful of the critical importance of S&T and R&D in building the knowledge economy, which is needed to move the country onto a higher path of self-sustaining and inclusive economic growth such that no Filipino will be left behind.

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