

COMMENTARY

The “Land for Skills” Program: A Mechanism for Conserving Research and Human Resources in a Developing Country in the Era of Globalization

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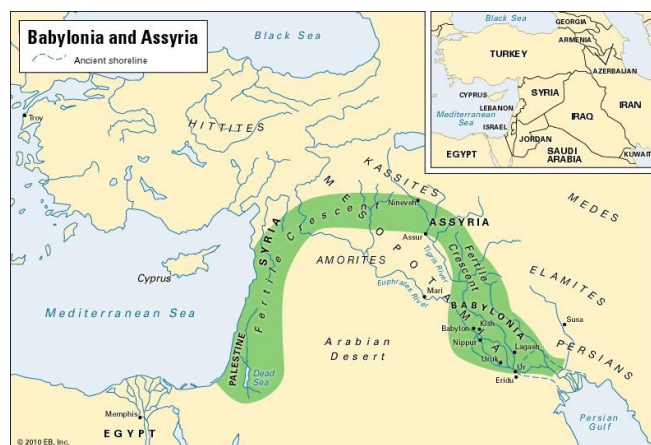
The problem of developing countries in transitioning their emerging economies into the relative stability of fully developed ones has never been more closely reflected during the era of Globalization, than in the crucial factor of conserving human resources for their own development. In this working paper, the author analyzes the bases of this predicament for developing countries in general and proposes a pathway for sustaining Research and Development (R&D) manpower in a pilot project in the Philippines.

BACKGROUND

Since the dawn of agriculture and domestication that transformed the Fertile Crescent and other regions into early economic empires, Land has been accepted as an unquestioned economic resource more enduring and therefore more valuable than the human resource which transformed the land.

In fact, the wars that ensued among these empires and later colonial powers displayed a denigration of the human resource value as it employed slavery, conscripted armies and sacrificed human lives in pursuit of territories where geographical maps had to be constantly redrawn. With the advent of the First Industrial Revolution¹, touted as an upgrade from the practice of slavery, as common land or arable farming in open fields became regulated, the dissolution of the monasteries led to Enclosure farming where lands were fenced (enclosed) and deeded or titled to individual owners². Land then became the default vehicle by which landed classes were created and the majority non-landed classes became the receptive participants not only of an emerging market of the Manufacturing Age but as military manpower for the conquest of more lands. In a sense, Man became a secondary enabler for Land, the principal goal in wealth creation of that era or Man in the service of Land.

The Digital Age of Information Technology (IT) which came at the heels of the Second Industrial Revolution³ however, not only transformed the conduct of economic enterprises across territories or countries on a global scale, but also instilled the existence of a cyber- “territory” other than Land that competed for its value and spurred the awareness that its conquest entailed an influence on the human resource which controlled it. It was a different landscape altogether where cyberspheric links superseded geographical location in the creation of wealth. In the arena of competing forces, with all variables being equal, it could even be argued that the possessor of technology or fruits of information technology could very well defeat the possessor of a geographical entity, no matter how well-endowed in natural resources the land is. This we see in the current US developments on capturing gas from shale rock by fractional distillation (fracking) versus its former state of dependence on Organization of Oil-Producing Countries(OPEC) states for energy. In effect, IT was challenging the traditional paradigm that placed the primacy of Land over Labor as an economic asset. To put it more directly, the value of human capital versus Land is once again revisited in a bottomline question: which now has the more enduring value, Land or Labor? In applying this basic question to the economic goals of a developing country, what is the relation of Land to Labor in this Era of Globalization?



As a former *Balik-Scientist* awardee (1984) who together with fellow awardees Drs. Ben Pecson, Ruben Umali and Roberto Ingles, underwent the frustrating experience of establishing an early Research and Development (R&D) infrastructure component for the Philippines through the Society of Balik-Scientist Awardees, Inc⁴, I posed the question to a Filipino-Chinese businessman who was affiliated to some of the successful business ventures in the Philippines asking him: If he could choose only one of two projects to invest on in the Philippines, Land or Labor, which would he choose? After much thought, the very revealing answer – Land – confirmed the cautionary Pre-Digital Age mindset prevailing in the Philippine business sector, a potential ally in nurturing and maintaining R&D human resources in the Philippines.

I came to understand with later developments that this mindset was part of a host of socio-economic confounders brought in by advent of Globalization itself.

GLOBALIZATION CONFOUNDERS IN THE ECONOMIC DEVELOPMENT OF A DEVELOPING COUNTRY

There are both active and passive factors in wealth creation. Goods and services, being created from direct efforts of an individual are clearly the active generators of wealth while Property, as represented mainly by Land identifies as the passive factor. Then⁴ as now, the value of Land is not only subject to the market forces of supply and demand but also reflect an under-appreciation of the role Land plays in furthering man's development. One only had to note the observation that John Locke⁵ made during his time that most of the landed gentry lived beyond their estates and ended up selling their land at rock bottom prices to pay their debts- to understand that man can undervalue or over-value Land. Taxes are supposed to serve as a fair estimate of the value of these factors of wealth creation, to include a fair estimate of the value of Land, but early economists⁶, stemming from the belief that men should own what he creates and that by itself, ownership of land which belongs to Nature only increases speculation and non-productivity, advocated that Land and not income should be the sole form of taxation to help generate wealth⁷. Speculation is applied to these estimates of wealth creation when enhancements to these factors (in wealth creation) are implemented for a given period of time. Enhancements are non-essential additives given to goods, services or properties which do not affect its basic function but add in the estimation of its cost, as exemplified by packaging, advertisements and delivery costs. With Land, the basic nature of its productivity or non-productivity, enabled by human effort, already attaches its basic value. Enhancements to Land value are determined when the aspects of Location, Accessibility to Water, Power and Transportation and of course the land's natural resources are factored in. In the Digital Age, enhancements for Land is taken a step further in the form of forecasting of a locality's strategic value in say, 5 years akin to futures trading of agricultural crops. This is where hairs split between determining the boundaries of how reliably reflective or how artificial an IT-created enhancement to Land is to the actual value of Land.

In the Digital world, the rate at which IT-created enhancements are implemented can be increased within a compressed period of time causing an efficient rise in the market value of goods and services and a consequent global concentration of capital. Instead of using the capital to generate more goods and services and provide jobs in the pre-crash period of 2008, this efficiency instead prompted increased speculations which funneled investment funds for short-term capital gains. For Land, this increased speculation led as well to the search for capital gains where real estates were repackaged as IT-created Commodity Derivatives and sold and resold through investment institutions to include lending banks which later led to the housing bubble and the economic crash of 2008. The fruits of a digital world did increase global wealth as surplus capital, but because what was being subsequently pursued as a wealth-multiplier was a digital construct without serious concerns on its validation to the actual basic goods, services and/or properties, the result was an over-evaluation of both and the ever-rising debt needed to service them which rose further with every reselling and repackaging. Due to the extent of multinational connections of these lending institutions, defaulting of their debt servicing created a ripple effect on the global economy causing a stagnation of real and lower middle incomes worldwide and a depressed demand for goods and services. As a result growth for the most dynamic markets as the US and Europe has slowed and Japan has remained in a slump for years showing a slow recovery as of late.

"In the 1990s, modern communications and the world-wide opening of capital markets have given an enormous impetus to this inflow. In just three years, from 1990 to 1993, the amount of internationally mobile capital almost tripled to \$3 trillion. Most of these funds can be poured into or withdrawn from a market with a few keystrokes on a computer. Rather than being invested in productive activities that generate jobs, it circulates through the international financial circuit in search of capital gains. In other words, it is used for speculation"⁸.

"...budget cuts and a growing debt load have reduced the demand for goods and services by the state. Up to now, the decline in purchasing power has been masked by deficit financing. However, the end of this strategy is coming in sight: both governments and consumers are more indebted than ever before. Both are attempting to lower their debt. There is now a virtual consensus in Washington that the budget must be balanced; in Europe, the monetary union projected since 1999 forces all countries but tiny Luxembourg to cut their deficits."⁹.

During the troubled period however, the Philippine economy relatively sheltered from capital gains involvement and focused on basic housekeeping (anti-corruption campaigns, etc) seem to have fared well as shown by its resiliency to the effects of global trade based on comparative metrics with the developed economies.

COUNTRY	ANNUAL GROSS DOMESTIC PRODUCT GROWTH %					
	2008	2009	2010	2011	2012	2013
Philippines	4.153	1.148	7.632	3.6%	6.8%	7.2%
USA	(-0.3 %)	(-3.1%)	2.9%	1.8%	2.8%	1.9%
Germany	1.0%	(-4.69%)	4.0%	3.1%	0.7%	0.4%
Japan	1.6%	(-5.5%)	4.7%	(-0.6%)	2.0%	1.2%

Sources: World Bank, Bureau of Economic Analysis, CIA World FactBook

So in summary, the prevailing business mindset in the Philippines reflects the cautionary mood of the global economy where despite a surplus global capital which normally would spell employment and investments at full throttle, there is instead inhibition of employment and depression for consumer demand due to the debt servicing incurred which is still being addressed. Despite a resilient performance of the Philippine economy which buffered itself from a downturn period in the global economy, its business sector, following the global economic mindset, is still not a ready and reliable ally in initiating a sustainable R&D strategy for the Philippines.

THE ROLE OF GOVERNMENT AND ITS OVERSEAS HUMAN RESOURCE IN THE PHILIPPINE ECONOMY

Traditionally, the Philippine government has been a passive regular recipient of hard-earned higher valued non-Philippine currencies from the skilled labor it exports to the Middle East and Southeast Asia, as well as from the Philippine diaspora of technical and scientific skilled workers who poured into other developed countries to the benefit of their host countries during its Martial Law and immediate post-Martial Law period. Although recognizing the value of its human resource, the Philippine government also carried the burden of having to lose the skilled labor it needed to sustain its growth. Among its skilled labor, medical and non-medical scientists and engineers hold a crucial place in its R&D development strategy. It is basically because the Philippine infrastructure has not developed to the level that it could nurture this skilled human resource that it could not retain it, to the detriment of its further development. The previous *Balik-Scientist* programs have been laudable in this respect but a quick review of the outcome of its efforts started since the inception of the program will show that it is not enough for the government to sponsor an overseas scientist for a year or two. The ongoing arrangements of the overseas scientist linking up with the Philippine-based scientist is commendable as well but the attraction of a developed infrastructure friendly to further scientific growth as is found in developed countries will always be a motivating factor in attracting these scientists to invest their skills elsewhere other than the Philippines. If the goal is sustainability of economic growth and eventual breakthrough as an emerging developed economy, then the retention of R&D manpower is crucial. If we think of sound research and development proposals or programs, these are long-term commitments evaluated on a five-yearly basis. This will entail nurturing a homegrown community of R&D manpower for the long-term. So how will the Philippine government build this R&D-friendly infrastructure to be competitive with the attraction of existing scientist-friendly infrastructures in developed countries already beckoning for their migration? Will the overseas scientist workforce be able to effectively counter this skilled manpower drain by 'mentoring' Philippine-based scientists alone? Certainly remote supervision can only go so far. The Philippines will need a homegrown skilled workforce on its ground and the solution will involve ensuring that this workforce stay for the long-term to be able to implement the R&D development programs they started out with. Yet with the unreliability of capital from a cautious business community to invest in an R&D-friendly infrastructure, the burden for now seems to fall mainly on the Philippine government which needs the same capital to maintain the over-all economic growth it has attained. How do we now break this chicken-and-egg situation involving Government, Capital, Land and Labor?

THE "LAND FOR SKILLS" PROGRAM: WHAT AND HOW

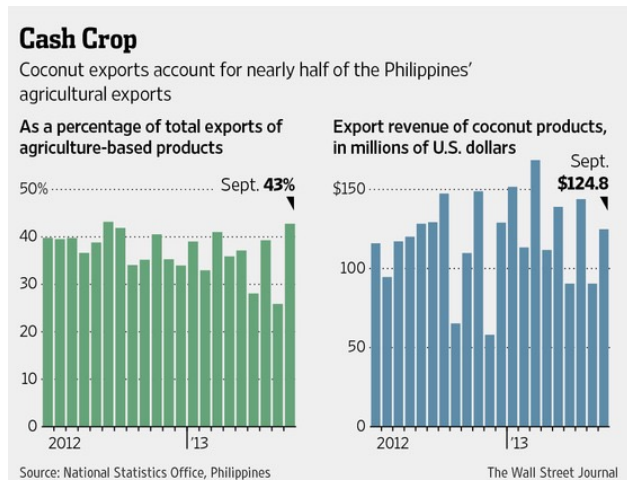
What It Is:

The "Land For Skills" Program (LFSP) is a Research and Development strategy to be applied by a developing country to spur its economic development to the level comparable to that of a developed country by defining for its crucial R&D sector a pathway for landownership which is consistent with the R&D worker's contribution to national economic progress. The author's background as a former returning scientist and his familiarity with the Philippine condition contributes to the applicability of this program as a pilot project in the Philippines.

It is accepted that a developing country has meager resources which explains its reliance on outside sources for the capital it will need for growth. Capital from its natural resources coming from its reliable asset, Land, has had setbacks of plunder and exploitation from its colonial and autocratic past, but it still remains, largely unused because of lack of investment capital, and speculated on by real estate developers, who ironically block these lands for any use other than speculation. There is no existing national R&D strategy nor perspective attached to real estate development in the Philippines. If at all, it would be by way of additional real estate taxes that would fill government coffers but would this alone lead to sustaining an active R&D community in the Philippines? This link of Land to Labor and to subsequent national development does not exist as an actionable policy because the primacy of the human resource over Land has still not been accepted even if multiple examples of it can be given.

Let us take as a primary example the yield of a common agricultural crop from the Land in the Philippines – coconuts. The Philippines' coconut exports averaged \$1.5 billion annually in the past five years. World-wide, the Southeast Asian country ranks second only behind Indonesia in terms of total coconuts produced, according to the United Nations.

Even with the loss of an estimated 15 million trees in typhoon Haiyan's path in the more than 41,660 hectares affected in six provinces with total damage of \$38 million as estimated by its government—the Philippines will still remain a huge player in the global market, with more than 300 million coconut trees remaining. But what about the skilled human resource researching on the downstream



coconut-generated products in the field of medicine, engineering and agriculture? Could not for example, research and development on the beneficial health effects of coconut oil be pursued further than what had already been arduously done by Filipino and other pioneering scientists in the field^{10, 11, 12, 13, 14}? The economic benefit to be derived by investing on an R&D team pursuing work on this field alone would be exponential. It is after all, the human resource which is the wealth-multiplier and not the Land. In pursuit of retaining skilled human resource to sustain R&D development, it is Land which can now be used to sustain a science and technology community in the Philippines turning the paradigm back into Land in the service of Man. It is so for the following reasons:

- (1) *Land means geographical commitment.* As a motivator for the overseas skilled human resource, a salary, financial and tax incentives can only go so far as the capital provided for it will go. Land as an incentive remains and when linked to the skilled human resource, will commit the skilled labor to focus on development affecting the geographical entity surrounding the Land he has been made responsible for as a Lessee for 25 years or as its final owner- whether that entity be the province, the region or the country. There may be other compensatory incentives linked to the award but such as livelihood, a stipend or consulting fees but land will remain as the main motivator in ensuring that the R&D worker remains committed to implementing and completing a development project in the Philippines.
- (2) *The role of Land in sustaining R&D development for a cash-strapped developing country complements its need to retain skilled manpower.* In the Philippine colonial period, *encomienda* classes were created by decrees awarding feudal lords vast tracts of land without assurances of development from those awarded but as part of a primordial system of taxation of the Spanish empire. In the Digital Age, strengthening the link of Land to its needed skilled human resource would address its development needs without heavy reliance on outside capital which may have to encumber on the economy as later payment of loans.
- (3) *The 'incubator' concept for R&D growth is geographical.* The successful examples of Silicon Valley and even the Research Triangle area of North Carolina are R&D communities living in a defined geographical space or Land. There are other less known examples in Japan (RIKEN), Germany and the (Brazil, Russia, India and China) BRIC emerging economies.
- (4) *Earlier defined uses of Public Lands will lessen its non-productive use.* Upon the inception of the American period, public lands were estimated to be 83.5% of the archipelago's land area¹⁵. The Land Management Bureau under the Philippine Department of Environment and Natural Resources (DENR) lists the unused land for public domain (in land area) distributed throughout the periods since then.

Period	Public Lands Distributed
1930-1940	93,694 patents with 289 for judicial titling
1950-1960	1.4 million hectares
1970-1980	>2 million hectares
1990-2000	1.32 million hectares

Of the Philippine total land area estimated at 30 million hectares estimated by the DENR¹⁶, 15.05 hectares or 50% are classified forestland, with unclassified forestland spanning 0.755 million hectares or 3%. The remaining 47% or 14.9 million hectares are alienable and disposable (A & D) lands. In trying to estimate the area needed for the historical model of an R&D community (Silicon Valley), our web search turned out to have elusive results due to the continuing expanding growth of the area, so we focused on the original acreage Silicon Valley started out with which was registered as

8,000 acres in Stanford University. The more revealing aspect was the context in which this historical note was presented.

"About 60 years ago, Stanford University had some financial problems. The authorities of university tried to resolve these problems by leasing part of the university land to high-tech companies for 99 years."

"In the 1950's, the idea of building an industrial park arose. The university had plenty of land over 8,000 acres...but money was needed to finance the University's rapid postwar growth. The original bequest of his farm by Leland Stanford prohibited the sale of this land, but there was nothing to prevent its being leased. It turned out that long-term leases were just as attractive to industry as out right ownership; thus, the Stanford Industrial Park was founded. The goal was to create a center of high technology close to a cooperative university¹⁷."

True, the companies who pioneered at Silicon Valley did have venture capital but they were not yet the tech giants the world now recognize them to be. They were initially middle-sized companies and many were startups. The combination that actually worked was an entrepreneur-scientist-friendly environment and space to implement R&D work. Does this automatically mean a university from the start? Not necessarily. Although a change agent by itself, universities tend to follow in areas after development has taken place. Here we distinguish between a pioneer area where development has set in and a frontier area where only scarce development has taken place. An example of a pioneer area would be the Clark Green City at the Clark Special Economic Zone in Pampanga where an industrial park with its attendant university (UP) is to be built. A frontier area as exemplified by Palawan province at the southwest regional area in which an R&D-friendly infrastructure has yet to be built. Although universities are the ideal institutions to carry out R&D work in developed pioneer areas, it is difficult for universities to venture into frontier areas where the student population is not yet viable. Business companies however, have to a large extent managed to integrate this capability of R&D work into their own infrastructure and what attracts them to a particular geographical area is land availability, the existing tax rates and the existence of basic infrastructure (light, water, housing and nowadays, health, security concerns and internet capability). Through a government-sponsored LFS Program, these companies with venture capital may be attracted to initiate R&D with locally-based skilled manpower in a frontier area and move development forward. If this momentum is sustained with more companies, it may reach a later level of development attractive to universities where an industrial park can now emerge and be sustained.

The Philippines, however, cannot remain Manila-centric in its pattern of development forever. Today, there are enclaves of rising communities which offer housing facilities and other amenities for Filipino engineers built in pioneering areas of neighboring Indonesia to spur their growth. To survive regionally, we can do no less than invest in our own. Instead of having idle lands for real estate speculation, these lands will serve as the very capital needed to attract skilled manpower to spur growth. In the LFS Program, the government, not individuals, initially takes the burden of this startup venture capital by providing the Land, lease to own for 25 years to deserving Filipino skilled manpower.

HOW TO IMPLEMENT THE 'LAND FOR SKILLS' PROGRAM (LFSP)

The guiding principles in implementing the LFSP are Accountability, Reliability and Goal-Orientation. In the Philippine model, each principle can be translated and implemented in relation to its national, provincial and awardee levels:

- 1) **Accountability:** A mechanism for accountability in the implementation of the LFSP will be defined on the national, provincial and the awardee level. The proportion of disciplines among the awardees will be determined by the geographical area on which a LFSP pilot area will be implemented as well as the economic priorities of the provincial and national economic planners.
 - a) On the *national level*, the LFSP will be the responsibility of the National Economic and Development Authority (NEDA) as the lead government agency working with the Land Management Bureau under the Department of Environment and Natural Resources (DENR) and the Dept. of Science and Technology (DOST). The metrics upon which the LFSP will be evaluated will be determined by NEDA sourcing data regarding the awardee performance and land utilization from DOST and Land Management Bureau (DENR), respectively and the rendering of periodical executive reports as to its national economic impact to the Office of the President. Land taxation may be frozen to its pre-LFSP levels but its reimposition should be resolved by a consensus statement from NEDA, DOST and the Land Management Bureau (DENR)
 - b) On the *Provincial level*, Administrative boundaries are already defined in the 26 provinces of the Philippine archipelago. Although the top executive provincial post belongs to the Provincial Governor, the Governor's office has historically been shown to be vulnerable to changing political climate affecting the sustainability of long-term programs such as that of the LFSP. Strategically, the burden of implementing LFSP on the provincial level will be with the Vice Governor's office working with the Governor's office. Traditionally, the Governor has been mainly concerned with short-term political activities and the upcoming provincial elections while the office of the Vice-Governor has been largely underutilized, if at all. Expecting no immediate change in this political culture, the long-term LFSP program has better chances of surviving from provincial governor to provincial governor when placed under the Vice-Governor's office when the arrangement with the Governor is

that he is to take political credit when the LFSP succeeds in his province.

- c) On the *Awardee level*. The LFSP will be reserved for top Filipino graduates in Science, Technology, Literature, Music and Arts during the period of the program implementation. The awardee will be Filipino citizens and should consent to a legal contract with the Philippine government for non-transferrable lease-to-own rights to habitable property within the pilot project area of the LFSP for a period of 25 years in which the awardee will agree:
- i) that the awardee's primary residence will be within the LFSP pilot implementing area for the duration of his property contract, to be confirmed by a NEDA-DOST-DENR verification system related to his work project within the pilot implementing area.
 - ii) that his work project be evaluated by the DOST and NEDA as to its feasibility, safety and provincial and national economic impact on a yearly and 5-yearly basis.
 - iii) that if on the 10th year of his project's evaluation, his/her project's has been evaluated as being favorable for an extension, the comparative lease value of the land will be considered half-paid.
 - iv) that if on the 15th year of his evaluation, his/her project has been given a favorable evaluation for extension or market implementation, the comparative lease value of the land will be considered 3/4ths paid.
 - v) that if on or before the 25th year of his/her project, a manufacturing business entity had resulted whose NEDA, DOST and Phil. Chamber of Commerce (PCC) evaluations had deemed the project favorable for success, the comparative lease value of the land will be considered fully paid and the necessary deed and title to the land be given to the awardee.
 - vi) as a full land owner on or before the 25th year of his project evaluation, the awardee will be granted permanent resident status of the R&D community in the Philippines and will be entitled to join a community of elders having advisory function to guide future awardees and the conduct of the LFSP in the Philippines.
 - vii) the attainment of a successful small business entity based on R&D work evaluated by DOST, NEDA and the PCC mechanisms at a period shorter than the timelines approximated will be duly recognized and given the full lease-to-own award.
 - viii) the awardees may work together with other fellow awardees from different disciplines on the R&D project to ensure its success. A collaborative venture must identify the roles and % efforts of the individual awardee and the NEDA-DOST-PCC mechanisms must apply the corresponding credit towards the achievement of the award.
 - ix) that failing to meet the evaluation hurdles within the time frame for evaluations will keep the lease-to-own award in an unpaid status.
 - x) the lease-to-own award can only be in an unpaid status for a maximum of 25 years after which if still with unearned lease payment, it will be given to the next deserving awardee.
 - xi) the lease-to-own award cannot be paid through any means other than the periodic evaluated performance of the awardee during his award period through the NEDA-DOST-PCC mechanisms.
 - xii) during the period of this lease-to-own contract, the awardee will have the privilege of further training/education abroad for a total period of five (5) years which may be allocated according to the status of his project and the need for further training.

The length of the award (lease to own for 25 years) has already defined the period of funding for salaries which should be covered by Philippine laws as to what the fair amount for a starting awarded scientist should be. Since this is best taken up by government agencies dealing with scientists and the national budget and are subject to the changing costs of living, they are not detailed in the general LFS Program. The funding sources to tap mentioned in part on (a) *National Level*, p. 10 are international bodies (meaning i.e., World Bank, Asian Development Bank) and/ or private sector (i.e., Ayala Foundation, Metrobank Foundation and other regional and global funding institutions) who would like to see a share of government investment in their own growth before they reciprocate funding which they rate as having the potential to move the national or regional economies forward. In the case of the LFS Program, the government share as Land is defined. The corresponding value of land can be used to translate what the corresponding funding being applied for from the international bodies will be.

2) Reliability

- a) On the *national level*. The evaluation measures of performance should have a national equivalent through an annual NEDA-based ranking scale of each province on all aspects of good governance. This should be a public event where the best-ranked province for

good governance is acclaimed nationally and the NEDA ranking of each province shown. By generating public interest on the national economic goals, the Philippine government will increase the stakeholders for these goals, thus garnering their moral and/or material support as well. The Land Management Bureau (DENR) working with the DOST and Provincial government will identify the lands to be included under the LFSP. Upon the 5-yearly evaluation of the awardee project, the DOST will invite the participation of the business sector (represented by the Phil. Chamber of Commerce [PCC]) to help evaluate the market feasibility or potential of the awardee's project.

- b) On the *Provincial level*. The Office of the Provincial Vice-Governor will be the hub of this NEDA-DOST-DENR-PCC program. The office will host the necessary offices and infrastructure where the awardees' projects are evaluated and implemented. Yearly evaluations will be presented before the Governor and the Provincial Board and the five-yearly evaluation presented before the NEDA-Bureau of Lands-PCC bodies. The final evaluation of the award where the Land award will convert from lease to own will be presented before the Office of the President.
- c) On the *Awardee level*. Aside from individual competence in their respective fields, the criterion of enthusiasm in sharing multi-or interdisciplinary teamwork or team-building will hold a significant weight in the awardee selection criteria. An awardee candidate no matter how competent or gifted cannot work in secrecy nor isolation from his fellow R&D workers when the bottomline goals of the LFSP involve the economic progress of an entire nation and the reliance on scientific-based communication among and between different disciplines to achieve this.
- 3) Goal Orientation. An R&D-friendly infrastructure in the Philippines is the goal of the LFSP and as such it cannot be other than socio-economically holistic in nature. This means that the human resource on which the success of this program depends on should reflect the diversity of an R&D community. Although science and technology workers form a crucial part of this manpower, non-academic inventors, and gifted individuals in the arts, literature and music should form part of this community as well. Creativity is an important factor in R&D process and the instead of a situation where a sterile environment is mandated from above, a fertile environment nurtured by the experience of its own inhabitants in the LFSP, is nurtured from below. The infrastructure being sought for this skilled manpower are those that will answer the basic needs for an R&D worker: Housing, Water and Food resources, Power and internet accessibility, Social interaction with co-workers in the same field, Health and Security and educational opportunities for him/herself and his/her family. It is obvious that not all aspects of this ideal infrastructure will be immediately available to the awardee, but with the availability of the land upon which he will live, the impetus to achieve the other components, by working with fellow awardees in related disciplines and with the provincial government, will be better within reach.
- a) On the *national level*. To a significant extent, the national government, in tapping international bodies or the private sector who see the same potential in investing in R&D human resources, can utilize these channels to invest in their needed domiciles to answer for housing of the awardees within the pilot area.
- b) On the *Provincial level*. These domiciles need not be luxurious condos but will be functional and modest abodes with reasonable amenities for weather acclimatization, containing the same number of rooms, to include a working room for the awardee. The proximity of domiciles of awardees having the same, similar or related disciplines will be given due consideration. The Provincial Government under the Office of the Vice-Governor shall establish a Housing Board which will maintain architectural standards to visually identify the R&D area as a distinct functioning unit. The Provincial Government shall also provide the necessary security personnel whose main task is to secure the area from interlopers and develop a security policy in keeping with the potential proprietary issues that may arise from the R&D nature of work done within its area of administration.
- c) On the *Awardee level*. Engineer-awardees can for example, as a start, apply their individual or group projects towards providing innovative water and energy-efficient power sources affecting the R&D pilot area. Architects and artist-awardees can design functionally efficient facilities to house transformative institutions of learning of various disciplines within the R&D area. Computer engineers and artists can combine their skills to bring animation and gaming to the competitive heights required for this age. Chemists, Botanists, Marine scientists, Pharmacists working with veterinary and human medical staff will form the nidus of a long awaited Philippine pharmaceutical industry which focuses on the archipelago's biodiverse flora and fauna. Aeronautical engineers and Physicists can initially focus on developing energy efficient aero-mobile security forces for the R&D Pilot area if not for the Province before focusing on exploiting the Philippines' epiequatorial position in efficiently bringing geostationary satellites

in position. Physician awardees can focus on developing emergency room services and address public health problems within the R&D pilot area with the long-term vision of eventually developing a medical center and teaching institution which can provide health coverage for the R&D area's future population while all disciplines can participate in the development of an educational structure in stages appropriate for the R&D Pilot area. The collaborative possibilities are only limited by one's imagination.

FACTORS IN IDENTIFYING THE PILOT (FRONTIER) AREA FOR THE LFSP IN THE PHILIPPINES

Although this topic is best discussed in higher-level circles involving national policies, allow me to mention some factors that I think are important in identifying the R&D pilot area for the Philippines.

- A. **Economic.** The economic progress of the R&D pilot area should neither be as progressive as the urban centers or capitals of developing countries nor should it be so depressed that the time and effort in solving the basic security, health and education needs would encroach on the efforts needed to get the basic R&D initiatives started. It cannot be the National Capital Region (NCR) for example since the measure of the LFSP outcome may be confounded by the basic economic strides already achieved by the NCR. Jolo, in Sulu province, even with the peace pact arrived at by the government with the Moro Islamic Liberation Front (MILF) may not provide the proper incentive for the awardee since its economic and security stability may take a period longer than the mid-way evaluation needs of the individual awardee, assuming that the area attracts enough applicants. The presence of potential natural resources, although not fully tapped in the region is also a factor in bringing in the role of LFSP in the area.
- B. **Political.** Certain regions of the Philippines are noted by their fealty to a traditional politician. A region traditionally identified as the political bailiwick of a traditional politician often colors whatever R&D gains attained in a pilot R&D area and may discourage the institutional (Congressional) follow-up support it needs specially when congressional politicians identify the project as their opponent's. In effect, the over-all influence of this factor may be negative in terms of bringing the full scale support it needs.
- C. **Security.** Security concerns are usually a component of economic growth and they may be overtly expressed as in the aforementioned example of Jolo but security concerns may also be impending for which the bringing in of economic catalysts as in the LFSP may provide a solution.

Based on the 3 factors mentioned, the province of Palawan may be the ideal region to test the economic results from an LFSP implemented in its administrative area.

- A. **Economic.** The region is neither on the forefront of Philippine economic progress but neither is it a laggard. In the approximation of neurosurgical coverage, in the author's previous experience basing health care as a measure of economic growth, the Southwestern sector is frequently bypassed for the more lucrative areas of Cebu in the middle Visayas and Davao of the Southern region of Mindanao. The relatively newly discovered Malampaya Oil and Gas fields is within its administrative jurisdiction of Palawan although the distribution of oil and gas-generated resources from those fields have not yet been finalized to its favor. If there will be a place where economic outcome can be fairly measured based on the input of an LFSP, it will be in Palawan.

- B. **Political.** The Province of Palawan has not been known as either an incumbent's or opposition bailiwick. It therefore does not have the encumbrances inherent to a region personified by a traditional Filipino politician.
- C. **Security.** The recent territorial claims by neighboring nations conflicting with the Philippines' Exclusive maritime Economic Zone are taking place within reach of the Palawan coastline. In 1998, Abu Sayyaf pirates using a southern route from the Sulu seas hostaged tourists from neighboring Malaysia to hide them in Palawan. Although, the pirates were subsequently subdued and most of the hostages freed, the hostage taking situation revealed the pirates' traditional claims of institutionalizing a cross-insular caliphate from the Sulu seas to include Palawan. These security concerns are not issues to ignore, but can be better addressed or supported with the robust growth of economy in Palawan.

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