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31

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Annette Insanally

Caribbean universities, largely operating in small island states (small-scale economies, populations, and political structures) represent catalysts for national and regional development. In this context, some have been more successful than others in responding to social demands, characterized by their degree of success in developing a critical mass of expertise, maintaining professional and intellectual legitimacy, their efficient use of resources while maintaining qualitative objectives and establishing external links. At the operational level, creating evaluation mechanisms, networks, regional centers, the use of new information technologies and delivery systems, advances in science and technology. (See OECD Publishing, **Beyond GDP: Measuring What Counts for Economic and Social Performance** - ***Country-experiences with using well-being indicators to steer policies***, November 27, 2018).

An important consideration for Caribbean higher education institutions (HEIs) is how to ensure that they are not left behind in the global thrust for resilience and survival amidst a multiplicity of man-made and natural disasters. In this context, the institutions' focus on continuous quality improvement can be a worthy mechanism if a multi-pronged, institution-wide approach is taken for a rational response to the inherent challenges.

Increasingly, Caribbean institutions are recognizing that a value-added mechanism could be transformational partnerships to cultivate global dialogue and expand the capacity of each institution for educating students, conducting research and serving communities. This calls for complementary regional action, whereby the combined strengths of the network of institutions can be harnessed and weaknesses mitigated, strategic action and best practice can be shared and emulated and challenges and failures analyzed. Of merit would be the production of a regional database informing on successful activities and new ideas of higher education practitioners working on solving global problems through innovative international collaboration. This would set the agenda and establish partnerships for future initiatives in key development areas: Priorities for LAC countries; Strategy and Policy; Research Collaboration; Student Mobility (including short-term, project-based and practical professional experiences); Faculty Mobility and Collaboration; Collaboration with the Productive Sector to Address Global Challenges; Innovative Use of Technology for

International Collaboration; Resource Mobilization and Partnership Building for Sustainable Development; Transformative agendas; Curriculum revitalization and cross-cutting themes; Teaching and Learning Effectiveness and implementation of Quality Policy.

An important point of departure is the fact that 2019 is a milestone year for the Sustainable Development Goals (Agenda 2030). It includes the first comprehensive review of progress on the entire 2030 Agenda since implementation began in 2016. This review will be held as the 74th Session of the UN General Assembly (UNGA) kicks off in September 2019. Twenty-one (21) of the SDGs'169 targets will mature in 2020, and with 12 of them focused on biodiversity, they are essential for the success of the SDGs and the Paris Agreement on climate change. The Caribbean has a critical window of opportunity for clear and coherent action by Member States to address the future of these targets.

In January 2019, The University of the West Indies (The UWI) was selected by the International Association of Universities (IAU) as its global leader in the mobilization of research and advocacy for the achievement of a climate-smart world. The UWI has already selected a global cluster of universities from Europe, Africa, Asia, the Americas and Oceania to assist in the task of achieving SDG 13 having recognised decades ago that climate change, rising sea levels and ocean temperatures, were an existential threat to the Caribbean, small island states, and the world, and to this end provided a body of scientific knowledge to prove and promote the case. The UWI's commitment to supporting the Caribbean region in the development of a culture of resilience and resilience planning as part of its Triple A Strategic Plan 2017-2022 is evidenced through a number of initiatives with global impact. In August 2018, The UWI was selected by the Inter-American Development Bank (IDB), the World Bank, and Virgin United to host the launch of the Caribbean Climate-Smart Accelerator, a ground- breaking initiative to support the Caribbean becoming the world's first 'climate-smart zone'. (Sir Hilary Beckles, www. uwi.edu)

Caribbean HEIs would do well to participate in Forums which provide a unique interface for them to share their experiences and strategies for advancing the sustainable development agenda. The Higher Education Sustainability Initiative (HESI), a partnership between UN-DESA, UNESCO, UNEP, UN Global Compact's Principles for Responsible Management Education (PRME) initiative, UNU and UN-Habitat, is one of the key implementation partners of the Global Action Program on Education for Sustainable Development (GAP)[1] and is a forum for dialogue and for sharing how universities are integrating the SDGs into sustainability strategies in the form of research, teaching, pedagogy, and campus

1 GAP, which was launched in 2014 in the follow- up of the Decade of Education for Sustainable Development (ESD) (2005-2014), seeks to generate and scale-up Education for Sustainable Development and accelerate progress towards sustainable development. All higher education institutions may join the network freely.

practices. Students could join, and be actively engaged in national and international student organizations, to ensure their voice is heard and receive the necessary support.

UNESCO-ISEALC has an integral role to play in this and is galvanizing the endorsement by regional HEIs of a consistent and coherent plan of action (CRES 2018 Plan of Action) and so guarantee their commitment to joint action for the sake of the region's sustainable development and to ensure that the region is not left out of global efforts and achievements. It is envisaged that regional networks will contribute to the creation of a Regional Common Knowledge Space intended to harness the productive good of regional HEIs and be conducive to the creation of harmonized accreditation systems, increased facilitation of joint programmes and increased accessibility to the regional HEI product. An important partner would be the Caribbean Nucleus of the Regional Center for Cooperation in Higher Education (CRECES) with which the Universities Caribbean Association has a Cooperation Agreement.

Current strategies and practices at Caribbean HEIs are trending towards a value-creating use of knowledge resources for innovation and entrepreneurship. This stems from an increasing awareness that to effectively support entrepreneurship and innovation, HEIs themselves need to be entrepreneurial and innovative in how they organise education, research and engagement with business and the wider world. Several HEIs have taken a proactive approach and piloted new ways of integrating new teaching methods into their curricula, developing activities to stimulate the entrepreneurial mindset, supporting start-ups, strengthening collaboration with business and the wider world, and taking a more international approach to their activities.

The Youth Progress Index is one of the first ever concepts for measuring the quality of life of young people independently of economic indicators. This framework can be a significant contribution to the policy debate, including for advocacy, as well as scholarly research, on measuring performance of societies related to youth matters, and defining progress beyond economic achievements. Young people from around the globe must be encouraged to take advantage of opportunities to discuss, understand, share, find solutions to and develop strategies on Caribbean and global issues pertaining to ocean conservation and preservation, marine pollution, climate change-related impacts on the oceans, sustainable blue economy, coral reefs and fisheries, among others. Young people are directly affected by these problems, and actively engaging youth on sustaining and improving the health of our oceans is imperative if we want to successfully implement the SDGs, especially Goal 14 (life under water). (POLICY TOOLKIT Youth Entrepreneurship for the Green and Blue Economies, published by The Commonwealth Secretariat, 2018). Linguistic differences must not constitute a barrier to integrated action for development.

Science and technology is generally considered key to the future of all developing countries and an important solution to inequality in our societies. Caribbean HEIs must participate in inter-related local and global action to encourage our children to think as innovators; increase the number of science academies in our communities; increase access to education using internet technology to greater numbers of our population and mobilize policy support for development and capacity.

The articles in this edition address these issues of human capital management and development and provide us with important information for a better understanding of the challenges facing our higher education sector.

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Topic 1:

Higher education, innovation and economy

- **The Caribbean University- Innovation and Economic Development**
  Dr Bhoendradatt Tewarie
  Member of Parliament, Government of Trinidad & Tobago

- **Tertiary Education–Private Sector Engagement: A Strategic approach to catalysing innovation, economic revitalisation, and inclusive development in CARICOM countries**
  Dr Glenford Howe, Dr Halima-Sa'adia Kassim, Dr David Rampersad
  The University of the West Indies, St Augustine Campus, Trinidad &Tobago

The Caribbean University- Innovation and Economic Development

Dr Bhoendradatt Tewarie

:: ABSTRACT

Caribbean society needs an innovation-led Caribbean University system to achieve economic progress and sustainable development. The Caribbean University needs to have a sustainable economy and society surround it so that the business of the University can become viable and the fulfillment of its mandate more meaningful and satisfying. Forging a partnership among Caribbean Universities together with a corresponding partnership with the Government and Business might be the beginning of an innovative intervention to support an innovation driven sustainable development initiative for the Caribbean region.

Keywords: Caribbean universities, sustainable development

L'Université Caraïbeen - Innovation et Développement Économique

Dr Bhoendradatt Tewarie

:: RÉSUMÉ

La société des Caraïbes a besoin d'un système d'universités caraïbeens axé sur l'innovation pour réaliser des progrès économiques et un développement durable. L'Université Caraïbeen doit avoir une économie et société a l'entour d'elle pour que ses activités puissent devenir viables et que la réalisation de son mandat soit plus significative et plus satisfaisante. L'établissement d'un partenariat entre les universités caraïbeens avec accompagne par un partenariat entre le gouvernement et le monde des affaires pourraient être le début d'une intervention innovante visant à soutenir une initiative de développement durable axée sur l'innovation pour la région des Caraïbes.

Mots-clés: Universités des Caraïbes, développement durable

La Universidad del Caribe- Innovación y Desarrollo Económico

Dr Bhoendradatt Tewarie

:: RESUMEN

La sociedad caribeña necesita un sistema de universidades caribeñas liderado por la innovación para lograr el progreso económico y el desarrollo sostenible. La Universidad del Caribe debe estar rodeada de una economía y una sociedad sostenibles para que los negocios de la universidad puedan ser viables y el cumplimiento de su mandato sea más significativo y satisfactorio. Forjar una asociación entre universidades del Caribe junto con una asociación correspondiente con el gobierno y las empresas podría ser el comienzo de una intervención innovadora para apoyar una iniciativa de desarrollo sostenible impulsada por la innovación para la región del Caribe.

Palabras clave: universidades caribeñas, desarrollo sostenible

A Universidade do Caribe – Inovação e Desenvolvimento Econômico

Dr Bhoendradatt Tewarie

:: RESUMO

A sociedade caribenha precisa dum sistema de universidades caribenhas encabeçado pela inovação para atingir o progresso econômico e o desenvolvimento sustentável. A Universidade do Caribe deve estar cercada por uma economia e uma sociedade sustentáveis para que os negócios da Universidade possam ser viáveis e para que o cumprimento do seu mandato seja significativo e satisfatório. Criar uma parceria entre universidades do Caribe, uma associação do governo e as empresas poderia ser o início duma intervenção inovadora para apoiar uma iniciativa de desenvolvimento sustentável promovida pela inovação para a região do Caribe.

Palavras-chave: Universidades do Caribe, desenvolvimento sustentável

:: Some Basic Questions

How do humans live?

They breathe oxygen, they drink water, they eat food and they seek shelter from the elements.

Beyond that, they learn things and they apply what they learn to cope with the challenges of everyday life, in the process making adaptations, as required, to survive and to thrive.

Then human beings make things, they do things, they make things happen and in the process, they produce, they create, they experience the world through their five senses and they think, they make assessments, they experiment, they make mistakes, they review and reflect, they take corrective action, they sometimes succeed. Societal Progress depends on the success of human beings.

Human beings imagine – that is to say use their imagination to pursue productive endeavour or work or creative aspirations but they also, as well, pursue recreation, leisure and pleasure.

To do these things human beings must exert effort and burn energy and when human effort alone is not enough they harness sources of energy to get things done.

It is from these simple human needs and motivations and the demands of the environment that the man-made world has been created, and continues to be created with its great complexity and its many complicated issues and problems. As societies evolve and the world advances, the challenges increase. Every new challenge or problem, demands a solution or resolution.

So one of the big challenges wherever we live today, is effective problem identification and solution finding.[1] And there is an expectation, in the societies in which we live, that problems will be identified well in advance by educational institutions, especially higher educational institutions and that solutions for

1 Defining what exists against what might be more desirable among a range of considered options and working through how to achieve the best option are critical factors in problem solving and solution finding.

See Watanabe, Ken, Problem solving 101: A Simple Book for Smart People London, Vermilion, 2009.

such problems will be provided by these institutions either on their own or in collaboration with others.[2]

Indeed, bringing clarity to problem identification and precision to solution finding with relevance and responsiveness remain two of the foremost challenges of higher educational institutions today.

What Does Society Want?

From academics, society wants probing questions which get to the root of persistent problems which require creative solutions.

From research, society wants the answers to these probing questions by way of clear solutions and a road map for the application of such solutions.

In the solution of problems not identified before, not solved before or not solved well enough before, lies the opportunity for innovation.

The air we breathe, for instance, how do we keep it clean? Trinidad and Tobago produces a high level of carbon emissions for example. The burning of garbage in several countries contributes to air pollution.

The water that we drink and which is the liquid-base and necessary input of so many products in the market place – how do we keep water clean and unpolluted? How do we purify contaminated water for reuse; how do we make water plentiful in a world of water scarcity, where water wars are predicted between communities and nations?[3] In the Caribbean, Guyana and Dominica are rich in water while Antigua-Barbuda must import water to be sustained.

The United Nations has warned of a food-water-energy stress nexus;[4] that is to say, that as the world population grows, the need to grow and produce more

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2 See Cherwitz, Rick. How can we reengineer universities to solve society's problems? The Dallas Morning News, February 28, 2018. "Society's complex problems cannot be solved by any one academic discipline or sector." Cherwitz calls for academic engagement "where collaboration and partnership with the University produce solutions to society's most vexing problems."

3 The United Nations World Water Development Report 4: Managing Water under Uncertainty and Risk, Volume 1, UNESCO Publishing, 2012. "By 2025, 1.8 billion people will be living in countries or regions with absolute water scarcity and two-thirds of the world population will be living under stress conditions"

4 The United Nations World Water Development Report, 2014. Water and Energy Volume 1.

food will intensify, the demand for energy will also increase and the water demands of more people, more food, more energy (for instance securing shale gas requires a lot of water) will be increasingly high.

The countries of the Caribbean are hardly self-sufficient in food. The issue of agricultural production, food self-sufficiency, self-sustainability in food and nutrition and food security have come up as issues in individual countries as well as a matter of concern at the level of the Caribbean Community (CARICOM). Yet progress in this area has not been steady.

With today's technology and proliferation of methodologies – from grow box to hydroponics to organic and protected agriculture, why is agricultural production and processing so deficient? We neither produce enough food to feed ourselves nor are we anywhere near production levels required to effectively support the Tourism industry, the number one export of most Caribbean countries.

What about housing? Recently the islands of Dominica, Barbuda, Virgin Islands, Puerto Rico and parts of other countries were devastated by hurricanes. Rebuilding is taking place as we speak. Natural disasters are plentiful in the Caribbean. The region is also earthquake prone. Should research and innovation from the regional university system not be providing sustainable solutions for housing, seizing opportunities presented by Dominica, Barbuda, Virgin Islands and Puerto Rico to develop an expertise for housing design and construction for tropical zones that are prone to natural disasters and earthquakes? Think of the opportunity for collaboration!

The basic things, therefore, that human beings do – breathe oxygen, drink water, eat food, seek shelter – require innovative solutions. These challenges provide opportunities for the Caribbean university.

Some of these solutions can be, island or country specific, or custom built for the region or have global applications. Or they can have specific value for island communities or countries in tropical zones.

But the opportunity does exist for research and innovation to support development needs of a fundamental kind in the region. For that to happen, collaborative arrangements need to be made with governments to influence the policy agenda and to agree on targeted solution finding and with private sector partners to make solutions real.

:: Sustainable Development and Its Demands

The problem of air pollution is an environmental problem, so is the problem of water resources management. But with climate change and the alteration of weather patterns, the region may well experience increasing rainfall in coming years. This can cause flood as has been the case in Jamaica on occasion, in Puerto Rico not so long ago and most recently in Trinidad and Tobago. This may well require infrastructural solutions.

So an environmental challenge and a water resources management problem may well demand, at least in part, an infrastructure related solution. The use of Agricultural production and its links with the Tourism industry and the pursuit of the desirable goal of food security is an economic development issue. The issue of housing is a human and community development issue but, in addressing the issues of hurricanes and earthquakes in the design of housing solutions, one must of necessity, take into account disaster preparation and anticipatory management issues. Innovative Engineering solutions are, therefore, demanded.

If, for instance, water resources management and prevention and containment of flooding can be linked to irrigation solutions for farmers and a boost to sustainable agricultural production, we begin to discern how the quest for a solution to one problem can lead to the solution of another and how the challenges of development are interconnected. Heavy rainfall may cause floods but more rainfall can be leveraged to support agriculture. Need for additional water capture can lead to the creation of leisure and recreation spaces. And a strategic appreciation of the value of effective deployment of water resources may lead to policies for rainwater harvesting in the construction of new buildings.

In addition, in seeking sustainable solutions to economic challenges (like agriculture, food, security, tourism); in seeking sustainable solutions to human problems (like shelter/housing) we are required to address other challenges which impact on human wellbeing. In trying to address environmental issues such as air quality, water resources management, flooding, in a sustainable way, we inevitably have to appreciate the interconnectedness of things, take an integrated approach to solution finding as we identify multiple, interconnected problems which require an integrated planning approach to solution finding, and the execution of elements of a synergistic solution model. Such an approach takes us beyond economic development alone, beyond human development alone, beyond environmental conservation for sustainable development alone into a sustainable development framework of operations.

Sustainable development, now signed on to by every nation in the world and driven by 17 agreed sustainable development goals by the United Nations, acknowledges that development sits on three vital pillars – economic development, human development and environmental conservation and ecological sensitivity with regard to human decisions and actions and with regard to the use of natural resources and natural assets around us. The objective of the sustainable development approach driven by the UN in all subscribing countries, is to achieve development in each location with balance and for each nation to achieve prosperity with inclusiveness for its population and with greater equity in a shared prosperity model in which the gaps between extreme wealth on the one hand and extreme poverty on the other can be reduced.

The world has embraced the Sustainable Development approach which requires interdisciplinary solutions, integrated planning, and synergistic approaches to execution in a developmental model which seeks to meet "the needs of the present without compromising the ability of future generations to meet their own needs."[5] This of course, is the classic definition of the Sustainable Development paradigm from the Brundtland Commission and Universities, including Caribbean Universities, must embrace and internalize sustainable development in a meaningful way to increase their value going forward.

This means disrupting silo disciplines, embracing multi-disciplinarity and the collaboration that comes with it, strengthening critical thinking to reassess our experience of living, rethinking the problems that we face and the challenges which we need to overcome in order to come up with more creative and innovative solutions to the problems which confront us.

:: Perpetual Innovation

Sustainable Development demands perpetual innovation because the world as a whole for the sake of the planet, and every country in which we live for the sake of quality of life, are seeking to achieve the goal of sustainable development for the first time; it has never been done before. It is an experiment in progress. An experiment by its very nature will have set backs, mistakes will be made, failures will occur, and innovative solutions to make corrections must emerge to advance progress.

The pursuit of sustainable development goals demands innovation, and achievement is dependent on innovation. Perpetual innovation, therefore, is the

5 World Commission on Environment and Development (1987) Our Common Future. (Brundtland Report) p. 16. Retrieve at: http://www.un-documents.net/our-common-future.pdf

essential requirement to make sustainable development happen. Sustainable development anywhere, is not achievable without perpetual innovation, however, to establish and nurture a culture committed to perpetual innovation requires one to make a realistic assessment of things as they are, of the world as it is, so that we can make things better, do things differently, make innovative leaps. This means that we must critically assess situations and come up with creative solutions and innovative measures. So essential prerequisites for innovation, therefore, are critical thinking skills, creative thinking disposition, and imaginative solution finding capacity. In the Caribbean University, critical thinking skills, creative thinking skills and an appreciation of how innovation works need to be brought together to support multidisciplinary research and innovation and the application of innovative interventions to the solution of problems. This was the thinking frame behind my establishment of the Institute of Critical Thinking when I served at the University of the West Indies in 2005.

Remember, the objective is not innovation for the sake of innovation. The objective is sustainable solutions through relevant research and the application of knowledge. But sustainable solution finding will drive innovation because often, sustainable solutions are without precedent or depend on drawing on existing knowledge generated elsewhere to customize, culturize or reinvent appropriate solutions.

:: Private Sector

The issues I have raised so far have to do with public policy and the public good; but how does the Caribbean University contribute to innovation in the private sector? Trade, investment, productivity, competitiveness and innovation are critical factors for industrial and business success. Industrial and business success are fundamental to economic growth and development progress in any country or region. Competitiveness, Michael Porter told us some time ago in **The Competitive Advantage of Nations**, takes place at the level of the firm. And we know now that the competitiveness of a firm depends on continuous improvement and innovative interventions and leaps.

Joseph Schumpeter identified in the nineteenth century, where and how innovation takes place in a firm. He cites changes in methods of production, methods of transportation, the design, invention or manufacture of a new product, change in industrial organization structure and systems and the opening up of new markets.[6]

6 Schumpter, Joseph. Essays: On Entrepreneurs, Innovations, Business Cycles and the Evolution of Capitalism Transaction Publishers, New Brunswick, New Jersey (1989).

Arthur Lewis, Nobel Prize winning Caribbean economist and former Vice Chancellor of the University of the West Indies and former President of the University of Puerto Rico also argued that "Everything begins with the market."[7] In other words, work backwards from the market to design business success.

Today, when research, knowledge, science and technology drive all progress, we speak of knowledge transfer, technology transfer, absorptive capacity but also knowledge generation and application of know-how to the production process. We emphasize logistics. We examine the value chain; design for instance, is more important in the value chain than actual manufacture or production. Today information technology has made it possible to have flat organizations and work from anywhere systems and business to business arrangements across borders are vital elements in boosting market penetration and export growth. For small and medium enterprises, many of them family businesses which proliferate in the region, business to business arrangements are critical to success. For the larger firms, the conglomerates like Massy, ANSA McAl, Guardian Holdings, Sagicor, Grace Kennedy, Cave Shepherd, Sunshine Snacks whose footprints in the region are large, investments, acquisitions, clusters and partnerships might be the preferable route; but business to business relations are critical for the success of smaller firms.

All Caribbean countries are weak in competitiveness, weak in innovation, relatively low in productivity. Where does the Caribbean University fit? In 2010, I established the Caribbean Centre for Competitiveness at the University of the West Indies with support from the IDB to address this need. But this institution was not sustained.

The task of providing innovation support for businesses and stimulating innovation in business begins with the graduate produced by the Caribbean University, calls for expertise in productivity and competitiveness and requires knowledge collaboration between the private sector and the University.

Most graduates of Caribbean Universities are absorbed by the private and public sectors as employees at different levels.

What do employers want? They want problem solvers and solution finders who can work with others within an established structure and framework but who can also add value to a department, organization or institution.

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7 Lewis, Arthur W. (1954) "Economic Development with Unlimited Supplies of Labor" Volume 22 of Manchester School, University of Manchester, 1954.

Moreover employers want employees who can follow instructions and work with a plan, yes, but they also want men and women who can question things in a constructive manner with a view to making improvements. Employers also want employees who can take initiative, handle challenging situations on their own and who can display entrepreneurial energy and drive. Such people are often described as intrapreneurs.

But Caribbean society also needs entrepreneurs in manufacture, services and ICT based industries including new applications in a world in which, because of the internet, it is possible to create born global industries, from any geographical location regardless of country size as well as international collaborations and partnerships and even a multinational business involving two or three people at different points of the globe.

So how do we create graduates that are work ready and desired by industry, intrapreneurs that can lead change in firm innovation in businesses large, medium and small including family businesses which have great deal of difficulty transitioning to higher levels of competitiveness as well as new entrepreneurs for new business creation in a knowledge demanding, technology driven world of software applications, with the growing impact of artificial intelligence?

:: Curriculum Redesign

One vital intervention required at the level of the Caribbean University is curriculum redesign and reformulation.

Brain power might be a genetic inheritance and learning generally adds capacity and expands the knowledge pool from which the individual can draw for applications; but curriculum is a mind altering device; curriculum can help shape the way that a generation thinks and the economic transformation required for sustainable development, the innovation required to drive the process, the attitudinal and dispositional shifts required of University graduates to manage this new paradigm, the self-starting, work ready intrapreneurs required to stimulate and own the process of innovation to transform firms, the entrepreneurs required to create the new businesses to connect with a knowledge based, technologically driven world, these things require not only a redesign of curriculum, but also, a rethinking of teaching methodologies to stimulate critical thinking, build creative capacity, teach problem identification, provoke solution leadership, cultivate a healthier respect for powers of the imagination. In addition partnerships must be built with business and other stakeholders to inform the process of curriculum reconstruction.

Notions such as productivity, efficiency, effectiveness, competitiveness, innovation and sustainable development must be introduced to the student and creatively engaged and beneficially understood. The attitudinal and dispositional shifts required to make change happen must be explored and internalized by a generation of graduates who must lead change and effect economic transformation for sustainability of the region.

The research culture and the science and technology knowledge exposure must buttress all of these things. Entrepreneurship must be taught, business ideas must be generated, intellectual property created, new businesses established and regional and international linkages forged, all for the purpose of supporting a thriving culture of entrepreneurship and innovation, which if properly done, can lead to sustainable development of the region.

So curriculum redesign, realignment and reformulation are required to support attitude shifts for intrapreneurship, entrepreneurship and innovation that can lead to sustainable development in industry and throughout the region. The Caribbean can hardly go much further with the current State driven models for economic development. Entrepreneurial energy is required to quicken the pace of development and progress.

:: Institutional Infrastructure

The Caribbean University must create a forum or institution adequately resourced, which allows industry to benefit from research outcomes that can be of value but it also needs to be informed by industry of what is critical to its progress. In this way, industry feedback can influence a research agenda for solutions and University research solutions can find application in industry to stimulate innovation. It is important that such a forum or institution be mutually agreed, mutually supported and sustained as a long term partnership. Moreover, a structure for the exchange of comparative information among Caribbean based and/or focused Universities needs to be established. It is desirable that this be one integrated, adequately resourced institution to support innovation collaboration for results.

In this way, meaningful research, yielding valuable solutions and stimulating vital innovations and spreading an innovation culture in industry, can be financially supported to create value that can generate wealth, making for a virtuous circle in support of perpetual innovation.

:: Higher Education Essential for Economic Development

The relationship between higher education and economic development is well documented.

Linsu Kim in his book **Imitation to Innovation**[8] points out that it is impossible to build a national innovation system on primary and secondary education alone. Comparing a range of countries of roughly equivalent levels of achievement in the 1950's, he demonstrates rather graphically, how growth in higher education participation dovetailed with research capacity to facilitate knowledge transfer, to build competitive power and to quicken the pace of development in Korea over a 30 year period. Tertiary education expansion, emphasized Science and Technology, building a focused research capability, distinguished between tacit and explicit learning and leveraged each for higher impact and designed learning systems to support innovation. And this worked.

Frank Hezemans, researcher on the economics of education, has argued that whatever the benefits of a sound primary and secondary education, as an economy matures, it is critical to have a certified reservoir of tertiary education skills.

The World Bank is clear on the role of the University in the development process:

> *"higher education plays a key role in training qualified individuals who will be capable of implementing new technologies and using innovative methods to establish more efficient enterprises and institutions and thus allocate resources more effectively. Through research and increased knowledge, higher education can also help to address the challenges arising from population growth, limited arable land, endemic diseases, urbanization, energy costs and climate change."*[9]

Economist Paul Romer just won the 2018 Nobel Prize for Economics. He comes from a formidable line of new endogenous theory economists. Endogenous growth theory specifies that technical progress results from three factors namely – investment, the size of capital stock and the stock of human capital. Romer has argued that new knowledge is the ultimate determinant of long term economic growth. He has also argued that the strength of the patent system

8 Kim, Linsu. Imitation to Innovation: The Dynamics of Korea's Technological Learning, Harvard Business School Press, 1997.

9 World Bank, Financing Higher Education in Africa World Bank Publications, 2010.

depends on investment in research and technology. For Romer, the technological advance of a firm or of a country, depends on the creation of new ideas. Romer further argues that ideas are more important than natural resources. Using his knowledge of the process of reverse engineering in Japan as a point of departure, Romer postulates that new knowledge enters the production function either via the intermediate goods stage or the final goods stage. Along with other endogenous growth theorists he argues that when improvement in productivity takes place it can generally be linked to a greater level of investment in human capital and a faster rate of innovation because of it.[10]

Romer and other proponents of the new endogenous growth theory argue that both government and private sector institutions should strive to provide incentives to individual creativity as well as firm creativity. Clearly the name of the game is innovation. For the endogenous growth school of thought, knowledge based industries such as communications, software, high tech industries, artificial intelligence are particularly important because this is where brainpower, creativity and the imagination can come together meaningfully.

Sustainable development and the innovation on which it depends, has both tangible and intangible elements and one must appreciate that synergy of these elements is a critical factor in making development happen.

There is, therefore, an important relationship between natural resources, investment, entrepreneurship and the creation of business and their contribution to capital formation on the one hand and human capital development and formation and the brain power and imagination which makes competitiveness and innovation possible on the other. Of significant value is the technology which makes it possible for intangible assets to get the most leverage out of tangible assets.

:: Tangible and Intangible Assets

The relationship between tangible and intangible assets in the development process was recognized a long time ago by a nineteenth century educator and philosopher from Peru named Augusto Salazar Bondy. This is his perspective on Development:

> *"Underdevelopment is not just a collection of statistical indices which enable a socio economic picture to be drawn. It is also a state of mind, a*

10 Romer, P.M. (1990) Endogenous Technological Change. Journal of Political Economy, Volume 98, No. 5, Part 2, p. S71-S102, University of Chicago Press, p. S84.

> *way of expression, a form of outlook and a collective personality marked by chronic infirmities and forms of maladjustment."* [11]

So underdevelopment is reinforced by mindset, or a frame of collective outlook.

Lawrence E. Harrison was familiar with the thinking of Augusto Salazar Bondy and that made him reflect on what makes development happen. This is what Harrison himself wrote:

> *"What makes development happen is our ability to imagine, theorize, conceptualize, experiment, invent, articulate, organize, manage, solve problems and do a hundred other things with our minds and hands that contribute to the progress of the individual and of human kind. Natural resources, climate, geography, history, market size, governmental policies and many other factors influence the pace and direction of progress. But the engine is human, creative capacity."* [12]

But how does human creative capacity work? Let us pay attention again to what Harrison has to say:

> *"It is not just the entrepreneur who creates progress, even if we are talking narrowly about material-economic progress. The inventor of the machine employed by the entrepreneur, the scientist who conceived the theory that the inventor turned to practical use; the engineer who designed the system to mass produce the machine; the farmer who uses special care in producing a uniform new material to be processed by the machine; the machine operator who suggests some helpful modification to the machine on the basis of long term experience in operating it – all are contributing to growth. So is the salesman who expands demand for the product by conceiving a new use for it. So too are the teachers who got the scientist, the inventor and the engineer in their professions and who taught the farmer agronomy".* [13]

This kind of thinking is "systems thinking" and, therefore, if we want a society that is productive, entrepreneurial and creative and which can generate wealth creating capacity on a sustainable basis, then we need to rethink and redesign the connectivities and synergies within the society. And we need to craft and

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11 Harrison, Lawrence E. (1985) Underdevelopment is a State of Mind: The Latin American Case University Press of America, p. xi

12 Ibid p.2

13 Ibid p.2

fashion better integration and more effective synchronization in the societies in which we live, work, manage, lead and co-develop. Because that is what productive citizens in a society do. They co-develop the society. In small societies such as exist in the Caribbean, the Caribbean University can play a key role in bringing together strategic partners to facilitate the highly interconnected process of making development happen.

For sustainable development to manifest, co-development responsibilities and obligations and a collaborative culture which makes it successful, are even more critical because in a sustainable development framework, economic development, human, family and community development considerations and the custodianship of the environment on behalf of future generations become paramount concerns which demand that capacity be built and synergy be harnessed to manage these often competing pursuits to achieve mutual support and optimization of value.

This it seems to me would be beyond the capacity of Caribbean University to do. The University can strengthen itself to better serve the society. The University can transform itself to better facilitate innovation in the economy and society and the University can play a bridging role in bringing together strategic partners to facilitate the process and perhaps even quicken the speed of innovation. But the mandate of leading and managing the process of development in a society remains the mandate and domain of government. There is a limit beyond which the Caribbean University cannot go and would not be expected to go, therefore. The Caribbean University may be able to influence policy or strategic choices but the University cannot act for government or make it do anything that government does not want to do.

With regard to existing industries in the Caribbean the Regional University can rethink agriculture for food security; it can support the manufacturing sector to be more competitive and to grow exports; it can support the growth of Services Exports and it can help to design weather resistant buildings to strengthen sustainable development in the region. These four sectors are basic. For a fifth, looking at where the 4th Industrial Revolution[14] is headed, the Regional University can work with countries to select interventions that might help such a country to leapfrog stages of development. This is possible and the Caribbean University needs to work through this.

14 The emerging technologies offer possibilities for a country or society to make leaps although lagging behind in development terms in other areas. Calculating where an intervention might make a decisive difference could be valuable.

Innovations in the Agricultural and food technology sectors, manufacturing, services, tourism, housing and digital services can make a big difference to country economies and perhaps to regional progress on the whole. It will rejuvenate existing industries through innovation and facilitate leapfrogging on the digital economy side.

:: Green and Blue Economy

But the movement of the world to the pursuit of sustainable development goals means that the countries of the region must shift to a sustainable development paradigm.

This means that agriculture must be sustainable agriculture. Manufacture must focus on renewable products and greener practices; Tourism can only be sustainable tourism for tourism to make sense, services should not create a problem of e-waste.

But it also means focusing on renewable energy. It means cultivating a green economy. It means, that for countries whose shores are daily washed by the Ocean around us, looking at the Blue Economy and its prospects and opportunities is mandatory. It means looking at recycling and looking at renewable products as a way of life.

The Green Economy concept has its roots in the relationship between sustainable environmental management and economic development but overtime, it has come to include poverty eradication. The Green Economy represents a largely undiscovered realm of labour and economic activity with multiple opportunities for innovation in areas such as agriculture, agro-tourism, ecotourism, energy, construction, creative industries, forestry, fishery and manufacturing.

And the biggest opportunity of all in this sunshine region is solar energy. Why can't we tap the sun to better effect? The solar research, applications and innovation capacity of Caribbean Universities is much too underdeveloped.

The Blue Economy is a developing World Initiative pioneered by Small Island Developing States (SIDS) but relevant to all coastal states. The Blue Economy conceptualizes oceans as "development spaces" where spatial planning integrates conservation, sustainable use, oil and mineral extraction, bio-prospecting, sustainable energy production including wind, marine transport, sustainable fisheries and aquaculture, coastal tourism and the possible use of seabed resources and potential sources of renewable energy.

There are relatively new areas that are vitally important to small islands and which can dramatically change the development paradigm and improve jobs, quality of life, and standard of living in an inclusive way for whole island communities and national populations.

The Green and Blue Economies are interconnected and can complement each other and build synergies with each other. The opportunities for critical thinking, problem identification, creative solution finding and innovation abound. The Green and Blue economies and the industrial possibilities which derive from these offer abundant possibilities for innovative interventions and sustainable growth and development of Caribbean economies.

In all of these things we must leverage the world's appropriate, relevant technologies to see how they best fit.

:: Reflections on Missed Opportunities

It would not be productive at this point to offer more examples of what can be done or what may be desirable. I must, however, reinforce the fact that crime is a scourge in the region and well organized and emphasize that crime requires innovative solutions.[15] I think, and hope, that I have made the basic point that innovation is essential to the future success of the Caribbean University and that I have suggested some simple ways of proceeding. But the Caribbean has missed a number of opportunities. I will mention only a few:

1. The collapse of the West Indian Federation
2. The unfulfilled promises of independence
3. Failure of the countries of the ACS to establish the world's first Sustainable Tourism Zone
4. CSME and CSME/SICA economic integration and
5. The collapse of the New World Movement which sought to create a global network of Caribbean thinkers to found a Caribbean-focused intellectual space.

There was not much in the way of development thinking that had to do with self-sustainability of communities or of outpost economies in the colonial era.

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15 Tewarie, Bhoendradatt.(2015) Sustainable Development: Thinking It Through; Making It Happen Hasib Publications p. 141-143.

Two of the rebellious actions of Mohandas Karamchand Gandhi of India, for instance, the first country to declare independence in the British Empire, had to do with the weaving of cotton instead of importing British textiles and the making of salt from the sea instead of using imported salt. Such action symbolized a battle over what was produced, about the means of production and about whom economic action served. But these actions were also about import dependence, self-sufficiency and self-sustainability. In the Caribbean such issues only came to be raised by Arthur Lewis and Lloyd Best in the 1950's and 1960's respectively and in Latin America by Raúl Prebisch from the 1940's, who all offered divergent solution approaches to the development dilemma.[16]

In the Caribbean, the issues of import dependence, self-sufficiency and self-sustainability remain deep issues as significant structural transformation from what obtained in the colonial era has not been achieved. Development in the region, regardless of country, is sporadic, haphazard; sustainable development elusive, and self-sufficiency and sustainability, a long way off. Caribbean countries have had growth and have made some developmental progress but Caribbean countries are nowhere near overcoming the challenge of sustainable development.

When political independence came, whether in the nineteenth century in Latin America or the twentieth in the Anglo-Caribbean, it came absent of economic viability and, in spite of nationalist, anti-colonial fervour and political rhetoric, devoid of capacity, know-how and do-how, to actualize a national vision of a desirable future. Nations were born but societies had to be forged, economies had to be structured and developed, and success strategies fashioned. And so, the Caribbean road to development, even after Independence, has been long and hard.

This is how Wendell Bell noted sociologist and Caribbeanist, Professor Emeritus at Yale, wrote about Jamaica at Independence:

> *"It was a heady time in Jamaica. Everyone was looking forward to the future. People of all walks of life talked of little else but the coming Independence. What had to be done to create a new Jamaica? What would Jamaica be like, what ought it to be like- after Independence? They wrote*

16 Lloyd Best, Arthur Lewis, Raul Prebisch. These Economists rethought the development paradigm in different ways. Prebisch posed the concept of developing countries being at the periphery of dominant, centralized systems in the developed world; for Arthur Lewis, surplus labour from agriculture redirected elsewhere could take a country to the next stage of development. The Lewis model became important to East Asia to develop manufacturing. Best together with Canadian Economist Kari Levitt, identified the structural relationship of ex-colonial societies to the colonizing countries as Plantation Economies that were the suppliers of raw materials for the progress of other societies at the expense of the development of the producing economies.

a new constitution. They designed a new government. They envisioned a new rational future. Some of them questioned and thought of redesigning the entire society." [17]

The promise of Independence of course was not fulfilled in Jamaica or anywhere else. Before that, we had missed the promise and potential of regional unity and economic integration for the prosperity with the collapse of West Indian Federation. We have so far failed to establish the Caribbean as a Sustainable Tourism Zone although my proposal to do so was accepted by the Association of Caribbean States (ACS) in 1998.[18] Think of economic benefits and the transformation of the Tourism Industry that would have occurred since 1998 – two decades ago had we initiated the process then!! My recommendation then was that the ACS countries act together to create the world's first Sustainable Tourism Zone.

We have not actualized the Caribbean Single Market and Economy (CSME). It was agreed in 1989 – three decades ago.

In 2004, on behalf of the Government of Trinidad and Tobago, as Principal of the Trinidad Campus of the University of the West Indies I put forward a proposal to CARICOM Heads of Government in Port-of-Spain for fast tracking the CSME within a 12 month period and proceeding in the subsequent year to deepen economic integration within CARICOM and forging a wider integration initiative with the countries of Central America arguing that integration had proceeded at too slow a pace, was too limited and had been minimalist in its achievements.

The Heads listened but did not accept.

:: Persistent Challenges

Where is the Caribbean today?

Some of our countries, for instance Trinidad and Tobago, have been graduated to "developed" status by the World Bank and the OECD. Most countries of the region are ranked high in human development terms and most are high income or middle income.[19]

17 Bell, Wendell. (1997) Foundations of Future Studies: Volume 1: Human Science for a New Era Transaction Publishers, p. 5.

18 Tewarie, Bhoendradatt. (2015) Sustainable Development: Thinking It Through; Making It Happen Hasib Publications, p. 149-182.

19 United Nations Development Programme (UNDP), Human Development Indices and Indicators: 2018 Statistical Update (2018). Retrieve at: http://hdr.undp.org/sites/all/themes/hdr_theme/country-notes/TTO.pdf

But meaningful development remains elusive and self-sufficiency and sustainability nowhere in sight.

Food production in the context of food security is weak. Most countries are tourism dependent and have much to do to build a sustainable tourism product. Imports are higher in volume and cost more than exports bring in, in most cases. And the base of production, as well as the opportunities for export, is narrow. Meaningful diversification of the economy has not been achieved.

No matter how strong an individual economy may seem at any given point in time, these Caribbean countries remain fragile.

In addition, the middle class is shaky, the working class poor, poverty persists as a challenge, productivity is low, competitiveness weak and applied innovation essentially absent in the face of spontaneous creativity.

Societies so weak cannot properly sustain the Caribbean University. Such societies cannot become strong unless the Caribbean University leverages knowledge to support these societies.

For their own sustainability Caribbean Universities need to help Caribbean societies to develop economically and to achieve sustainability. And as I have emphasized, sustainable development demands perpetual innovation support both directly and indirectly from the university.

It is from sustainable economic growth that resources are generated to invest in education, research, security, infrastructure and so on. This means that natural resources and human and intellectual capital have to be managed carefully to produce, in a competitive way, the goods and services that the rest of the world demands.

:: Good Examples

Education and innovation to spur development has worked for other countries.

South Korea, as I mentioned, used higher education to move from Agriculture to Industrialization and from imitation to innovation.[20]

Costa Rica used a major ICT based intervention throughout its education sector at a critical time in its evolution to play a major role in developing and branding that country positively.[21]

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20 Kim, Linsu. Imitation to Innovation: The Dynamics of Korea's Technological Learning Harvard Business School Press, 1997.

21 Frankel, Jeffrey, A. (2012) What Small Countries Can Teach the World.Faculty Research Working Paper Series Harvard Kennedy School and NBER p. 4

In Mauritius, education strategies supported private sector led tourism growth which attracted foreign investment, facilitated linkages in the economy and strengthened the services sector.[22]

A well thought out higher education strategy supported Singapore's strategy of wooing foreign investment for strategic sectors as well as the Singapore government's paternalist guidance of both economic development and the social order.[23]

Sometimes, within the framework of a vision for a country, a single institution can be created which makes a decisive difference. Take the case of ANII in Uruguay (Agencia Nacional de Investigación e Innovación). In a ten year lifespan so far, ANII has invested USD$300 million in training, research and innovation across 6000 projects, has launched 6 incubators to support 480 entrepreneurs, has supported more than 700 innovation projects in existing companies, has created 5 technological centres for specific sectors, has supported more than 1000 research projects that involve creating local solutions to relevant problems in the country on priority areas (health, energy, education, etc.) and has stimulated solutions to several private and social challenges. ANII has developed a strong internal organizational and governance structure which ensures transparency, permanent improvement and measurement of results. Over the last nine years, Uruguay has grown at a rate of 7% on average every year. Caribbean Universities may want to examine the possibility of creating an institution such as this over the longer term.[24]

In **The New Imperative of Innovation: Policy Perspectives for Latin America and the Caribbean** the authors explain that "Innovation is the transformation of new ideas into economic and social solutions" and that at the firm level "innovation means transforming ideas and knowledge into economic advantages such as higher productivity growth, new markets and higher market shares. Hence, firms are agents in charge of transforming knowledge into new economic solutions for their own benefit and the economy as a whole."[25] The Caribbean University must understand and appreciate the meaning of this

22 Ibid p.6

23 Ibid p.5

24 ANII in Uruguay (Agencia Nacional de Investigación e Innovación). Retrieve at: *http://www.anii.org.uy/*

25 Navarro, Juan Carlos. Benavente, José Miguel. and Crespi, Gustavo. (2016) The New Imperative of Innovation Policy Perspectives for Latin America and the Caribbean Inter-American Development Bank.

for structuring an institution or a system for making innovation work for the University, for firms, clusters and for the economy at large. The establishment of infrastructure to create an institution and to facilitate a system capable of playing an interventionist role, brokering knowledge for innovation to boost competitiveness for positive results, will be an important step for the Caribbean University.

:: Government, University, Private Sector Need Each Other

When I served as Pro-Vice Chancellor for Planning and Development at UWI, I initiated a Graduate Tracer Survey which tracked graduates annually from 2009 which covered Mona, St. Augustine and Cave Hill campuses of the University of the West Indies. The essence of findings covering 4 years of graduates are contained in a recently published document on challenges to the private sector in Trinidad and Tobago by the Inter American Bank (IDB). The findings are based on surveys of graduates one year after graduation.[26]

What the survey finds is mismatching of skills between graduates from some faculties and the expectations of the firms which employ them. There is little correlation between field of study and job acquired. In the same IDB study, employers complain about the level of preparation of graduates for the job. The graduate tracer studies had also revealed that a significant percentage of graduates were underemployed; that is to say doing jobs which demanded less capacity than they could offer given their level of education.

As the IDB document points out, this kind of situation can lead to emigration and brain drain which undermines the value of educational output of higher educational institutions to the society and, I might add, diminishes the talent pool from which innovation and innovative actions might emerge. I also add now that this ultimately undermines the value of the Caribbean University to the region. Mismatches and misalignments of this kind are a reflection of both inappropriateness of curriculum and programme and relevance and responsiveness to the marketplace by educational institutions but also, the slowness of firms to become more competitive and knowledge-driven. Clearly for transformation to take place, structured mutual support by University and private sector are necessary to create a stronger culture of innovation.

26 Khadan, Jeetendra. (2016) Are Oil and Gas Smothering the Private Sector in Trinidad and Tobago? Inter-American Development Bank. Retrieve at: *https://publications.iadb.org/bitstream/handle/11319/8104/Are-Oil-and-Gas-Smothering-the-Private-Sector-in-Trinidad-and-Tobago.pdf?sequence=1&isAllowed=y*

The Caribbean University cannot survive and thrive unless Caribbean societies develop and progress economically and do so sustainably. Sustainable Development depends on perpetual innovation to solve problems, to make improvements and to create leaps in performance. In a knowledge world, the role of the University must not be underestimated.

In a knowledge economy driven by science and technology, Universities are vital to research, innovation and output of graduates, necessary to innovation at the firm level and critical to the solution of small and large problems of society. At the same time Universities flourish in thriving societies where the demand to responsively address challenges with solutions is higher.

Caribbean society needs an innovation-led Caribbean University system to achieve economic progress and sustainable development. The Caribbean University needs to have a sustainable economy and society surround it so that the business of the University can become viable and the fulfillment of its mandate more meaningful and satisfying.

Forging a partnership among Caribbean Universities together with a corresponding partnership with the Government and Business might be the beginning of an innovative intervention to support an innovation driven sustainable development initiative for the Caribbean region.

BIOGRAPHY NOTE

:: Dr. Bhoendradatt Tewarie

Is a former Principal of the Trinidad and Tobago Campus of the University of the West Indies and former Pro-Vice Chancellor for Planning and Development at UWI. He is currently a Member of Parliament on the Opposition bench and has served in two Governments as Minister of Trade, Industry and Enterprise and Minister of Planning and Sustainable Development.

Dr. Tewarie's most recent book publication is entitled *Sustainable Development: Thinking It Through, Making It Happen* and he is currently working on another: *The Tangibles and Intangibles of Sustainable Development*. He has published three other books on Economic Development, Higher Education Governance and on V.S. Naipaul as well as many articles on development, education and literary issues.

He has also produced and directed 3 documentary films. Two have been shown at the Trinidad & Tobago Film Festival and the other at Cannes in the Short Film category. He is currently working on another longer film entitled *Festival Paradise*.

Dr. Tewarie received his B.A. from Northwestern University, his M.A. from the University of Chicago and his PhD from the Pennsylvania State University and completed Leadership and Fore-sighting programmes at Oxford University and University of Houston respectively. He has been elected to the Hall of Honour of Queen's Royal College in Trinidad and is a former Fulbright Scholar and delivered the Seventh CARICOM Distinguished Lecture on Development in the Caribbean some years ago.

On the invitation of President Sir Hilary Beckles, Dr Tewarie was invited to deliver the inaugural lecture at the first "One Caribbean" symposium of *Universities Caribbean* (formerly UNICA) in November 2018 in Santo Domingo. His talk was entitled: "The Caribbean University, Innovation and Economic Development".

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