

## Chapter 11

# China's Philanthropic Gestures, Genomic Technologies, and the Imminent Setbacks in Developing Nations

### ABSTRACT

*This study focused on the trajectory of the human genome sequencing and the emanating technologies developed to address the leading causes of death in the industrialized nations. It also examined the flourishing biotechnology and industrial startup companies established for wealth creation. However, in the developing and least-developed nations, we discussed the inability of these nations to have access to capital, the Internet and other telecommunication network to create quadripartite linkage among governments, industries, universities, venture capitalists who create local startup companies. The need to ingeniously revise, and develop innovative technologically-oriented curricula in their academic institutions was emphasized. By far most important, they must invest intellectual resources to eliminate the existing barriers between scientific disciplines and behavioral sciences, because genomics is an eclectic science. Expert committees formed from these intellectual groups could devise the strategies and recommendations to eliminate poverty, reduce unemployment and eventually create badly needed national wealth.*

### PART I: INNOVATING GENOMIC TECHNOLOGIES IN DEVELOPING NATIONS

#### Introduction

Over the years, China has also established a viable genomic institute; and the government continues to invest colossal sums of money to develop authentic technologies and build competent molecular sciences workforce. Recently, the high-speed large capacity disk array system was installed in of the nation's genomic institutes. This computational machine was developed to handle copious amounts of data and maintain the capacity to save such data. Besides the data backup capability, their new com-

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puter has the capacity to protect sensitive research data from unexpected loss. The intrinsic goal of the Chinese human genome center has been to contribute to human society through the development of efficient diagnosis of illnesses, prevention and the application of effective therapeutic interventions to meet the needs of the society.

The Beijing Genomic Institute (BGI) is one of China's leading research facilities on throughput sequencing-based profiling tools, and the institute is committed to excellence in genome sciences. BGI continues to conduct a large-scale genomic research in bioinformatics, genome dynamics, and genotyping with over 100 bioinformatics specialists. Research scientists at BGI have focused their investigations on the Human HapMap project, the super-hybrid Rice Genome project, silkworm genome, chicken genome variation in collaboration with United Kingdom and United States partners and the Sino-Danish pig genome project.

Other technologically savvy developing nations such as Brazil, Korea, and India have directed their research interest on their pharmaceutical industry; systematically using genomic science and bioinformatics to develop agriculture, chemicals, biodefense, and energy. Brazil now leads the world in biofuels and the prevention of citrus diseases. Korea continues to invest in cloning and tissue engineering. As these technological initiatives occur at exponential rate in the developed nations, we continue to observe imminent setbacks in developing and underdeveloped nations.

## **Imminent Technological Setbacks in Developing Nations**

By April 2003, when the U.S. Department of Energy and National Institutes of Health (NIH) announced the completion of the human genome sequencing and listed over twenty potential industries that could benefit from this international feat, our team wondered how will this be implemented? No sooner did we ponder about these "startup" companies, than we observed venture capitalists announcing innovative genomic and biotechnological enterprises. These genome-based companies include the following: Gene tools, LLC; New England Biolabs, Inc; DNA Vision; Complete Genomics; Alpha DNA; LifeSpan Biosciences; Inc Exigon A/S; Alpha Diagnostic Int. Inc; Amgen; Clontech Laboratories, Inc; Genetics Institute, Inc; Genox Corporation; Genset; The Great American Gene Company; Novex; and Oxford Molecular, to name a few.

Over the years, it seems the prominent characteristics of underdeveloped nations and their endemic poverty consists of underdevelopment of private sector, paucity of viable entrepreneurs, and a lack of access to capital and budding venture capitalists that are relatively unstable financially. The intersectorial collaboration among government, academic institutions, industries, startup companies and venture capitalists rarely exist in most of the developing and underdeveloped nations.

By far the most crucial syllabi enshrined in the academic institutions by previous colonial administrators are neither revised nor transformed to meet the pressing needs of both urban and rural dwellers while the former group routinely appreciates and utilizes the technological gadgets from the industrialized nations, their rural counterparts continue to experience economic and social disparities; therefore, they are compelled to migrate from rural to urban areas. In many of the rural areas of the underdeveloped nations, the rural dwellers who are herbalists have comprehensive knowledge about which plants have healing properties. Collaboration with rural dwellers could have created massive impetus for genomic-based pharmaceutical industries, biofuel, and prevention of citrus diseases among other startup companies.

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