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Technology Commercialisation And Intellectual Property Rights in Ghana¹

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ABSTRACT

By an Act of Parliament of the Republic of Ghana, CSIR Act 521 of 1996, the Council for Scientific and Industrial Research, CSIR, Ghana's main R&D Organisation was re-established with a new mandate to conduct market-oriented, demand-driven research and also to commercialise the research results & technologies developed. The CSIR was tasked to recover three-quarters of its annual operating expenses through contract research and services. Over five years of implementation, what are the experiences? This paper looks at the implementation process, the attitude of research scientists towards the change and the impact of the commercialisation process on the socio-economic development of Ghana. The constraint of commercialisation including inadequate intellectual property laws is discussed. The intellectual property rights protection from the perspective of a developing country is also discussed. Intellectual property-related laws cannot remain static in a world where economic development is becoming increasingly technology-based. Intellectual property laws are going to be more stringent and stricter in the days to come, offering more opportunities and challenges.

1.0 INTRODUCTION

1.1 *Demography*

Ghana referred to, as the Gateway to Africa is located South of the equator in the West African Sub region. With an area of 238, 5378 Sq. km about 23.8 million hectares, the country is inhabited by 18.8 million people (2000) who speak several languages with English as the Official language and the language of Instruction in schools. Ghanaians profess three main religions, Christianity, Islam and African Traditional religion. Ghanaians have per capita income, GNP of US \$390 and a GDP per capita of 1,881 (PPP US\$) in 1999. Ghana hopes to attain the level of middle-income country status by the year 2020 [1]. The Country ranks quite low on the Physical Quality of Life Index (PQLI) 199 and the Human Development Index (HDI) value is 0.542 (maximum of 1.0). The Adult literacy rate of the country is 54%, although very low, is one of the highest in Sub-Saharan African. Life expectancy is 56.6 years [2].

1.2 Economy

Ghana's economy is predominantly agrarian and commodity based, with Agriculture dominating in terms of employment, revenue and export earnings. It accounts for 50% of the labour force and 42% of GDP [3]. Other major exports are minerals (notably gold, diamonds, bauxite & manganese) the tourism Industry is however becoming an important foreign exchange earner. Ghana's current level of investment in R & D is 0.3% of GDP [4]. This has left large investment in fixed capital and equipment and acquiring natural resources at risk from boom & bust cycles fuelled by global commodity market fluctuations.

1.3 Intellectual Property Protection

Ghana had now realized the impact that lack of enforcement of Intellectual property rights has had on the economy, the local Industries and the Culture. Previously Ghana has had a very basic problem with the philosophy of Intellectual property rights, which have been enforced primarily through civil litigation. Only recently has the Government of Ghana regarded the enforcement of Intellectual property rights as its responsibility and those persons who infringe upon these rights as engaging in acts inimical to the interest of the state. However, Trade Related Intellectual Property Rights, popularly known as TRIPS, has emerged as a major area of concern for developing economies (including Ghana) owing to its widespread socio-economic and political implications. In spite of a lot of drum beating across the globe in this regard, a common agenda concerning a wide variety of issues continues to be elusive to-date. Two diametrically opposite opinions seem to have emerged on most of these issues. These opinions range from extreme opposition to the grant of Intellectual Property Rights (IPRs) to support for unfettered protection to IPRs. Nevertheless, in some academic circles, it is growingly felt that such extreme viewpoints may be detrimental to the interests of a developing economy like Ghana, particularly in the area of agriculture. In a sense, the existing evidence pertaining to IPRs does not seem to focus adequately on agriculture, which continues to be the primary sector of economic activity in a large number of developing economies

1.4 S & T Infrastructure

Since the attainment of political Independence in 1957, successive Governments have endeavoured to make science and technology a critical basis for the country's development. The National Research Council was established in 1958 with the broad aim of coordinating scientific research to support the country's development. Out of the Council, there is currently

the Ghana Academy of Arts & Sciences and the Council for Scientific and Industrial Research (CSIR). The Noguchi Memorial Institute for Medical Research, the Ghana Atomic Energy Commission, the Ghana Standards Board and the Cocoa Research Institute of Ghana have all been established over the years to promote scientific activities geared at Scientific Sectors of the National Economy. Scientific education has also been deemed to be an important aspect of the national program for Introducing S & T into the country's development efforts. Despite the various actions taken by successive governments, Ghana has not been able to develop the S & T base to address the country's basic human needs of foods security, shelter, clothing and transportation.

2.0 TECHNOLOGY COMMERCIALISATION IN GHANA

The development & application of S & T is recognized worldwide as vital for a nation's overall socio-economic development. When used effectively, S & T is able to improve productivity and meet the needs of society. Currently, the status accorded S & T in Ghana is low; S & T has a low priority rating in the eyes of policy makers and managers of the nation's resources. This has resulted in the inadequate investment committed to S & T. Presently the Country's resource allocation is around 0.3% of GDP [4]. Until 2001, there was no explicit, legally standing S & T policy to guide national development in Ghana. The lack of such an explicit policy for Ghana has been identified as the single most outstanding obstacle to capitalizing on the technology factor for development [4]. In addition to the low priority to S & T, the poor performance of various sectors of the economy, especially in the manufacturing Industry, could be attributed to the lack of its application and legislation of proper intellectual property laws and its enforcement.

2.1 *Current Institutional Arrangements for Promotion of S & T*

Since the attainment of independence in 1957, Ghana has established scientific and technological capabilities in R & D, industry and the provision of essential services. Currently, the Council for Scientific and Industrial Research (CSIR), Ghana's main Research & Technology Organization (RTO) with thirteen institutes, the Ghana Atomic Energy Commission (GAEC), the Ghana Standards Board and other agencies, including non-governmental organizations, undertake research & service activities in S & T. In addition, the Universities of Ghana and a number of polytechnics provide training and other human resource development capabilities in S & T. Other specialized institutions including the Ghana Regional

Appropriate Technology Industrial Service (GRATIS) with its Intermediate Technology Transfer Units (ITTU's), the National Board for Small Scale Industries (NBSSI), the Technology Consultancy Centre (TCC) and the Development and Application of Intermediate Technology (DAPIT) also exist for the development and transfer of technologies to all sectors of the national economy, especially the micro, small and medium enterprises. However, activities of all these institutions are not synchronised.

2.2 *Implementation of Technology Commercialisation in Ghana*

By an Act of Parliament of the Republic of Ghana CSIR Act 521 of 1996, the CSIR was re-established with a new mandate to conduct market-oriented, demand – driven research and also to commercialised the research results and technologies developed [5]. The CSIR was tasked to recover three-quarters of its annual operating expenses through contract research and services. The Implementation process started in 1997 with different consultants recruited to restructure the CSIR with support from the World Bank, the ODA and other donor agencies. It was mandated that by December 2001 the CSIR should generate 30 % of its Annual Budgetary Requirement (ABR) and that Government support to the CSIR would be slashed by 30% [6]. Many structures were put in place including:

1. Creation of Central Commercialisation and Information Division (CCID) at CSIR and Commercialisation and Information Division (CID) at all the Institutes of the CSIR.
2. Training programs in business management for Directors and Research Managers
3. Recruitment of a Commercial Director and commercial managers
4. Promotion criteria were changed with more emphasis placed on technology transfer and Commercialisation.
5. Three Sectional Coordinating Committees were also established within the CSIR with a view to providing comprehensive overview of the use of S & T as well as the implementation of research programs among all institutions in the country. These Committees areas of operation cover all sectors of the national economy.

However, the implementation process was flawed from the beginning.

1. RTO transformation process is a continuous and iterative process and it can be divided into three phases, namely: *diagnosis*, *planning*, and *implementation* [7]. The South African consultants engaged to facilitate and direct the process were highly incompetent [8]

2. Until 2001, Ghana had no explicit National Science Policy, so the transformation was not done within any proper policy framework. This actually contributed to the poor planning before the implementation.
3. The commercialisation process was not linked directly to intellectual property protection. The knowledge level on IPR among scientists even after five years of commercialisation is very low. Most technologies developed have found their way to the end users without any gain to the developers.
4. Poor commitment from the leadership of the CSIR and its institutes and all levels of staff [9]. This is as a result of poor communication as to why the change is necessary and the benefits the change will bring. Research Scientists did not see the reason why they had to commercialise, because they were trained and employed as scientists and not marketing executives. Many saw it as one of the bad policies of the Government.
5. There was and there is no reliable and systematic method for collecting, storing and utilizing data that measure performance.

2.3 *Technology Commercialisation in Ghana, the Way Forward*

It must be understood that for technology innovation and its commercialisation to be successful in Ghana and other under-developed economies, the impetus for change must come from all sections of society under competent political leadership. The weak political commitment and infrastructure, vast bureaucracies, misdirected education and training, scarce financial resources, poor research productivity and inadequate demands on the national R&D system are all constraints to technological innovation and commercialisation [10]. The creative scientists at home are frustrated due to hierarchies of authority, lack of delegation and mistrust in sharing information. The most critical barriers facing successful technology commercialisation in Ghana today can best be categorized as: *Financing, Management, Marketing/Commercialisation and Infrastructure*. Addressing these barriers, would contribute significantly to improving the technology commercialisation climate in Ghana.

- The shortage of financing for SMEs, primarily for seed or early stage companies.
- The lack of financing options related to commercialisation and early growth situations, where public offerings or other forms of institutional financing may not be appropriate.
- The lack in Ghana of tax related incentives, to stimulate investment in the technology sector.
- A general shortage of experienced leadership in SMEs, with ability in all the functional disciplines required to successfully nurture and grow companies.

- The continuing risk, that researchers and entrepreneurs, particularly in the medical field, will leave Ghana at an ever-increasing pace.
- The lack of an adequate "venture culture" amongst many technology developers and entrepreneurs;
- The difficulty, particularly for early stage companies, in identifying how and where to access financing.
- The relative lack of financing support, not burdened by perceived "bureaucratic red tape", for specific project and marketing initiatives.
- The lack of incentive in certain sectors to encourage buyers of technology based products and services to invest in the development and procurement of same, in Ghana.
- The difficulty many inventors and early stage SMEs encounter in protecting proprietary intellectual property.
- The need to focus efforts largely on technology sectors and initiatives in which clear competencies (or the potential for same) exist in Ghana, and where the "value added upside" potential is greatest.
- The competition between academia and industry for Science and Technology funding, and the gap that exists in better linking initiatives between the two.
- The need for Government generally to be supportive, but non-intrusive in facilitating technology commercialisation.
- The need to support entrepreneurship at the secondary and post-secondary education levels, to assist the youth of the country to take a stronger role in creating their own employment, thereby enhancing and sustaining economic development in Ghana.

3.0 INTELLECTUAL PROPERTY RIGHTS - GHANA'S EXPERIENCE

The Administration and enforcement of intellectual property rights (IPR) in developing countries must be seen in another dimension to the administration of IPR and their enforcement in developed countries. There is no question that the trend in the globalisation of business will accelerate international licensing and protection of intellectual property. No doubt, the Western legal tradition of intellectual property rights will be foisted on developing countries as the price of admission into the world market controlled by the countries of North America and Europe.

In Europe and the United States, the system of intellectual property rights emanated as early as the 16th century [11]. In Ghana and like other developing countries, before the 1970's and 1980's most of the laws regarding the protection of intellectual property were mere replicas of existing laws of their colonizing countries [12]. These laws had been designed specifically to protect the rights of the colonizing nationals and their businesses and firms, and no account was taken of the different conditions in the colonies and the developed countries. Immediately after Africa's emergence from post-colonialism, African governments still did not attach much priority to the need to protect intellectual property rights. Many industries were in their infancy, and the domestic manufacturing base was virtually nonexistent. What was prevalent in Africa was a vibrant folklore tradition around which cultural industries clustered in areas such as music, textiles, jewellery, and the like. A quick survey of the intellectual property system in Ghana up to the 1970s reveals that the Ghanaian Trade Mark Register had recorded approximately 17,000 trademarks, out of which 90 percent were owned by foreign companies and individuals. In 1996, there were 27,625 marks on the register, with Ghanaians owning 15 to 20 percent of those registered [12].

In respect of patents, Cap 179, which was the colonial Patent Registration Ordinance, merely extended the validity of all patents registered in the United Kingdom to the Gold Coast colony at that time. All patents so registered belonged to foreign individuals or firms. This ordinance, due to the difficulties in setting up a patent system, remained in force in Ghana until July 1, 1994, when a new patent law was enacted [12]. It must be noted, however, that most of the intellectual property laws enacted after the 1970s tended to have a different bias since they had to respond to new national environments and the varied global trade requirements of emerging nations struggling to level the playing fields in international commerce and investment activities. Intellectual property-related laws cannot remain static in a world where economic development is becoming increasingly technology-based [13]. Intellectual property laws are going to be more stringent and stricter in the days to come, offering more opportunities and challenges.

3.1 *Putting an End to Piracy*

Ghana passed a strong, modern, and vibrant copyright law, PNDCL 110, in 1985 to replace the obsolete Copyright Act of 1961 — one of the pieces of post-colonial legislation regulating the copyright industry. A collective body for the administration of authors' rights, known as the

Copyright Society of Ghana (COSGA), was set up in 1986. Ghana adhered to the Berne Convention in 1991, and COSGA embarked on a program of concluding reciprocal representation agreements with other collective societies worldwide. The government of Ghana and the Copyright Administration from 1985 to 1990 found themselves more or less helpless to fight the piracy that was rampant. Thus, Ghana lost international respect and gained a reputation for being a safe haven for pirates and pirated works. At the same time, Ghanaian music suffered a reversal since the pirated foreign imported music was able to capture the market. It became evident to the Ghanaian authorities that when one copies, one does not, in any way, encourage national authorship, national culture, or national creativity [12]. This holds true for all the different strata of the intellectual property legal system, whether it be the copyright, patent, industrial design, or trademark system. If we in Africa pursue such a course of copying blindly all that comes from the developed countries, we would forever be trapped in a cultural negation of our own making that would undoubtedly retard both our economic and cultural progress. The government of Ghana, through the Copyright Office, was thus compelled to take the initiative in the fight against piracy. The Copyright Office, in close cooperation with the various organs of the music industry and with the technical cooperation of the International Federation of the Phonographic Industry (IFPI) in London and its national group in Ghana, the Association of Recording Industries of Ghana — ARIGh — instituted the “banderole” system. The system was modelled along the lines of the Portuguese system, because after Portugal introduced this system, it achieved a near-zero rate of piracy [12]. The affixing of an authentication stamp known as the “banderole” on all musical works became mandatory in Ghana beginning June 1, 1992. This stamp is a security device that is sequentially numbered; individual numbers are allocated only to genuine producers of musical works, and imports of all pre-recorded musical works have to be authenticated by the Copyright Office, in cooperation with the Customs Excise and Preventive Service (CEPS). The recording industry in Ghana agreed with the Internal Revenue Service (IRS) to use the banderoles as a source of direct prepaid income tax.

3.2 *The Evolving Role for Patents*

In light of the success of the banderole system, one is tempted to ask why the patents regime has not proved so effective a stimulant in the economic development of Ghana. Why is the commercialisation process not achieving the expected results? Why is it that technologies developed by our scientific Institutions find their way to the end users without any gain to the

developers? It is, of course, well known that a patent system requires a relatively expensive infrastructure with experts in various technical fields. The patent law in Ghana is only a few years old, and the regulations to enable the law to be implemented were only recently enacted. The role the patent regime can play is only now evolving; however, with growing awareness of industrial property laws, this field is likely to be strengthened in the years to come. This situation is being repeated across most of the continent.

However, it cannot be denied that the trademark and design system and, to a lesser extent, the patent system have played an influential role through the licensing, distribution, and franchising of intellectual property rights in developing countries. They have assisted in the transfer of technology and the dissemination of new forms of know-how through minimum standards of licensing and usage of these rights. However more needs to be done. The commercialisation process in Ghana should go hand in hand with the protection of intellectual property rights. It is also imperative for research scientists in Ghana to be very conversant with the intellectual property laws. Scientists must be educated to know that their knowledge is an asset that must be protected and used for their personal development and the overall economic development of Ghana for that matter.

The example of Ghana gives one reason to be optimistic for the future of intellectual property rights in developing countries. We in the Third World should not see the observance and enforcement of intellectual property rights as merely protecting the interests of the developed world, but rather as a powerful tool to galvanize our domestic industry while retaining national culture, national inventiveness, and national creativity. However, the effects of TRIPS on the Ghanaian economy warrants serious research attention. It scarcely needs to be overemphasized hereto that Ghana in this regard is of particular interest for a number of reasons. First, the Ghanaian Economy is a predominantly agricultural economy in that the economic fortunes of roughly two- third of the working population are directly tied with this sector. As such, anything adversely affecting the growth of the farm sector has lot many implications. Second, up until the signing of the GATT agreement in 1994, it had already experienced roughly a decade of economic growth in the wake of the economic liberalization. Finally, over this period, the country has had an economic policy, which was characterized by economic transformation of the agricultural sector. The signing of the GATT agreement therefore tantamount to a pronounced policy swing. It is, therefore, of immense academic interest, as also

of great significance from the policy-making point of view to look at the effects and implications of TRIPS as well as the agenda that Ghana should pursue to safeguard its interests in the emerging scenario. Given the existing state in Ghanaian agriculture, the relevant questions to be asked therefore are: How will this primary sector of the economy get affected in the long run by the IPRs? Will the small and marginal farmers at the lower rung of the rural hierarchy, withstand the onslaught of IPRs?

4.0 CONCLUSIONS

In concluding this paper, the following recommendations to the various issues raised on the four main barriers to technology commercialisation are listed.

4.1 *Recommendations*

- That a Capital Gains Offset tax credit for prescribed investments be established,
- That a National Research and Development tax credit for companies performing prescribed Research and Development, as defined by Government, be implemented,
- That the Nation facilitates the establishment of a formal mentoring program for SMEs. This program would identify prospective mentors, and match them with SMEs, but not underwrite the costs of mentors.
- That the Nation facilitate through locally based agencies, informal low cost workshops and networking sessions, with a focus on enhancing a "venture culture" in Ghana.
- That the Nation, leveraging off existing initiatives, maintain an interactive database and "hotline" to provide guidance to SMEs in identifying sources of financing, mentoring, and other assistance, specifically directed towards Ghana based technology companies.
- That the Nation impose guidelines on such public sector organizations such as the CSIR and Ghana Standards Board which would ensure that Ghana suppliers who meet quality and pricing specifications, are given equal opportunity to win contracts.
- That the Nation consider additional incentives to the technology transfer arms of Ghanaian Universities, which ensure that where practical, first priority is given to exploitation of technology in Ghana, before said technology is licensed outside the country.
- That the Nation vigorously encourages large Ghanaian multinationals to invest in technology development by their supplier infrastructure.

- That the Nation facilitates a funding pool, which would, under prescribed conditions, help to underwrite intellectual property protection, and if necessary, prosecution of intellectual property breaches, outside Ghana.
- That the Nation continue to encourage donor agencies which provide program support to SMEs, to minimize the lead times and logistics associated with such programs and services.
- That the Nation, through the Ministry of Environment, Science and Technology (MEST), establish a program to identify a finite number of technology sectors which offer the greatest potential economic upside potential, and then focus its S&T support primarily on those sectors.
- That the Nation, through MEST, continues to examine the relative roles and performance of University and commercially based technology development, and ensures that support is directed primarily to where the greatest commercialisation potential exists.
- That the Nation, through MEST, maintain close liaison with the various technology specific industry associations, to keep abreast from a non partisan perspective, of issues and needs which are unique to each sector.
- That the Nation continues to support vigorously, missions to market Ghanaian products abroad, as well as those intended to increase the awareness of opportunities in Ghana, amongst technology companies and academia outside Ghana.
- That the Nation, through the Ministry of Education closely examine the merits of increasing funding at the post secondary education level to programs which focus specifically on enterprise and entrepreneurship development.

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