

INTEGRATING INTELLECTUAL PROPERTY INTO INNOVATION POLICY FORMULATION IN TRINIDAD AND TOBAGO

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LIST OF ABBREVIATIONS

CARIRI	Caribbean Industrial Research Institute
CBBI	Community-based business incubators
CBI	Commercial Business Incubators
CCI	Council on Competitiveness and Innovation
CED	Centre for Enterprise Development
ECB	Enabling Competitive Business
EDB	Economic Development Board
eTeck	Evolving Tecknologies and Enterprise Development Company Limited
EU	European Union
exporTT	National Export Facilitation Organization of Trinidad and Tobago
i2i	ideas2innovation
IBIS	National Integrated Business Incubation System
ICT	Information and Communication Technology
IDB	Inter-American Development Bank
IGC	Intergovernmental Committee on IP, Genetic Resources, Traditional Knowledge and Folklore
IP	Intellectual Property
IPR	Intellectual Property Rights
KT	Knowledge Transfer
MAS	Works of MAS (part of carnival activity in T&T)
MLA	Ministry of Legal Affairs
MLSMED	Ministry of Labour and Small and Micro Enterprise Development
MPLSD	Ministry of Planning and Sustainable Development
MSE	Micro and small enterprise
MST	Ministry of Science and Technology
MTBF	Medium-Term Policy Frame Framework
MTEST	Ministry of Tertiary Education and Skills Training
MTIIC	Ministry of Trade, Industry, Investment and Communications
NCDF	National Carnival Development Foundation
NEDCO	National Entrepreneurship Development Company Limited
NIHERST	National Institute of Higher Education, Research, Science and Technology
NIP	National Innovation Plan
NIS	National Innovation System
NPF	National Performance Framework
OECD	Organisation for Economic Co-operation and Development
ORDKT	Office of Research Development and Knowledge Transfer
PBR	Plant Breeder's Right
PRO	Public Research Organisation
R&D	Research and Development
REACH	Regional Entrepreneurial, Asset, Commercialization Hub
S&T	Science and Technology
SMEs	Small and Medium-sized Enterprises
STI	Science, Technology and Innovation
STTE	Ministry of Science, Technology and Tertiary Education
TCE	Traditional Cultural Expressions
T&T	Trinidad and Tobago
TTFZ	Trinidad & Tobago Free Zones
U.S.	United States
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme

UNECE	United Nations Economic Commission for Europe
UNESCO	United Nations Educational, Scientific and Cultural Organization,
UNIDO	United Nations Industrial Development Organisation
UPOV	International Union for the Protection of New Varieties of Plants
UTT	University of Trinidad and Tobago
UWI	University of the West Indies
WIPO	World Intellectual Property Organization

EXECUTIVE SUMMARY

Objectives - A primary objective of this project was to understand the current innovation system of Trinidad and Tobago (T&T), and the extent to which intellectual property is or should be incorporated therein. It included a desk review to map the innovation system in T&T and to identify the main institutions and actors. A five-day fact-finding mission followed on October 6 to October 10, 2014, in which face-to-face interviews were conducted with some major stakeholders. These interviews provided important core information.

Our findings include:

- The innovation system of T&T is fragmented with little coordination among actors.
- Strategies tackling innovation are well drafted and ambitious, but have deficiencies in the translation into operative goals and activities.
- Overall innovation and IP performance is low.
- One of the main issues of low innovation performance is the 'Dutch' disease. Success in gas exploration means that much of competitive pressure and needs to invest in other sectors have been lifted/neglected.
- There are IP hotspots and positive deviants particularly in the creative sector, as well as in a small number of research institutes and firms.
- The level of integration of IP issues in the innovation system differs across institutions, but is generally rather low.
- There is little overall IPR awareness in the country while there are also observable differences across industries.
- Business intermediaries seem to have little IP know-how and services.
- There is lack of clarity as to ownership of research results which has proven to be a barrier for commercialization.
- Incentive systems for researchers at universities are based mostly on academic performance (publications), which is a barrier for IP-related commercialization activities.
- There is a lack of trust in institutions, e.g. whether they would honor IP created by others. Similarly, there were concerns about enforcement of IP rights.
- Access to finance and funding sources are an issue.
- There is a shortage of legal IPR services and expertise in the country.

Recommendations:

Recommendations to the Government of T&T include:

- Decrease the fragmentation of the T&T innovation system;
- Integrate IP into innovation and sectorial policies;
- Introduce clearer regulations regarding IP ownership for publicly funded R&D;
- Focus on innovation and IP hotspots;
- Establish institutionalized ways of technology transfer, such as via competence centres;
- Pool public IP service and tech transfer support services capacities;
- Improve the general awareness level of IP in T&T;
- Increase access to private /equity funding;
- Strengthen the capacity of the innovation support system to deal with business issues.

CHAPTER 1 – BACKGROUND

This report is the final output of the project ‘Integrating Intellectual Property into Innovation Policy Formulation in Trinidad and Tobago’, which was implemented by the World Intellectual Property Organization (WIPO) following a request by the Government of Trinidad and Tobago. It is a part of a series of similar reports on other countries. This project was implemented in collaboration with the University of Alicante who are coordinating a European Union project entitled IPICA¹ – Empowering Knowledge Transfer in the Caribbean through Effective IPR and KT Regimes, being implemented in the Caribbean. The aim of these projects is to map out the innovation systems of the countries under scrutiny in order to assess the way the systems treat and make use of Intellectual Property (IP). The expected output was to draft recommendations for both the countries’ governments and WIPO on how usage of IP in innovation policy making and execution in the national systems can be improved.

As laid down in the first of the series of reports², a national innovation system (NIS) is an integrated and interconnected network of institutions and actors, which, together, produce, diffuse and apply (new) knowledge for societal good. The emergence of NIS thinking is set against the increased understanding that the success of innovation does neither depend alone on singular activities performed by innovator champions, nor that it is sufficient to provide money for basic research with the expectation that this would drive innovative output into the market. Rather, innovation is understood as a complex phenomenon that requires successful and well organized interaction between a variety of actors, each fulfilling specific roles in the research, development, testing, funding, financing and marketing phases of an innovation. Correspondingly, an innovation system consists of a variety of actors: Foremost the knowledge base (public research organizations, universities, educational institutions), the industry sector (from small start-ups, established SMEs), private and public intermediaries (such as cluster organizations, funding agencies, chambers of commerce, etc.), regulative authorities or even the users of innovation.

Many international and regional organizations are working on the issue of innovation policy. Some of the more active of them are UNECE, UNESCO, UNCTAD, World Bank, OECD and the European Commission. A considerable amount of work has been done and these institutions have covered a lot of ground. However, much of this work, given the broad nature of innovation policy, has paid little regard to intellectual property and whenever it has tackled intellectual property the focus has been rather narrow and superficial. The world of innovation policy traditionally occupied by researchers, development economists, funding agencies, development agencies and the like and the world of intellectual property traditionally occupied by lawyers and patent offices have existed to a large extent in separate and distinct worlds. There has been little interaction between them, this despite the fact that for example the patent system can be seen as one of the oldest means to foster innovation.

From an IP perspective this has the consequence that understanding as to whom in the innovation system IP information should be delivered to, how it should be delivered and what should be delivered is low. Similarly, the innovation system does not know what the IP system

¹ IPICA Project is co-financed by the European Commission on the framework of the ACP-EU Co-operation Programme in Science and Technology (S&T II) with Grant Contract identification No. FED/2013/330-211

² WIPO (2013): Integrating Intellectual Property Into Innovation Policy Formulation In Serbia

can offer and as such does not know what to demand. Without input from both worlds, policy makers are not able to design good IP support services that would facilitate the effective use of the IP system by innovation system stakeholders. Consequently, the creation, diffusion and application of knowledge, which is integral to the effective functioning of the innovation system, are hampered.

The report's ultimate aim is to bring the two worlds of innovation and IP policy closer together.³ It should allow WIPO to understand the needs of actors outside the traditional sphere of IP offices – with which WIPO traditionally interacts – better in terms of service and support necessities. WIPO's role in this regard is to raise awareness amongst all stakeholders of the innovation system of the role played by IP in innovation performance and assist countries effectively integrate IP into their thinking in innovation policy formulation and implementation.

The report on Trinidad and Tobago follows the same structure as the other reports written so far,⁴ but differs in one aspect. It draws on a recent general innovation system review performed on the country for the Inter-American Development Bank (hereinafter referred to as 'the innovation system review').⁵ This has put this study in the unique position in that it can expand the IP aspects of a full set of existing findings on innovation in T&T, hereby avoiding the duplication of work. At the same time, the report also aims to be a standalone document, so it will highlight the main, and relevant IP related findings of the innovation system review.

Correspondingly, the study is structured as follows:

- Chapter 2 describes briefly the methodology for the study.
- Chapter 3 provides an account of the main strategies, policies and actors of the national innovation system of T&T, based in large parts on the innovation system review and discussing IP-related activities in the system
- Chapter 4 provides the analysis of the innovation system and the way the system is interlinked with IP, based on interview and document evidence.
- Chapter 5 provides the conclusions and main findings.
- Chapter 6 gives the recommendations.

³ One anecdotal piece of evidence of the gap between IP and innovation policy, also in the particular context of T&T, is that during our study visit there was a big conference/forum organized on innovation which did not include IP.

⁴ Other completed reports are with respect to Cameroon, Rwanda and Sri Lanka. Jamaica is forthcoming.

⁵ Guinet, J. (2014): Assessment of the national innovation ecosystem of Trinidad and Tobago – Final Report for the Inter-American Development Bank (IDB)

CHAPTER 2 - METHODOLOGY

For implementing this project, the following methodology was followed, which is in line with the previously written reports in the series:

- Desk review – A desk review of the innovation system of T&T as evidenced by the various strategies as well as studies was conducted on the system. The centre piece was the innovation system review performed for the IDB, complemented with additional sources. Throughout this process, the broad contours of the innovation system in T&T were mapped and the main institutions and people that could be contacted for more in depth information were identified.
- Interviews – However extensive a desk review may be, it cannot replace the information that can be gathered by talking to people face to face. Thus, after conducting the desk review, an interview guideline was developed. A one-week fact finding mission followed between October 6 and October 10, 2014, where face to face interviews were conducted with each of the interviewees. Interviews were in many instances group interviews with a number of staff from the interviewed institution. The information gathered from the interviewees constitutes the heart of the learning gained in this project.
- Report – On the basis of these interviews, complimented by the information gathered during the desk review stage, this report was developed which suggests some recommendations that could be considered by the Government of T&T for integrating IP considerations into the innovation policy of their country, as well as recommendations to WIPO.

CHAPTER 3 - INNOVATION SYSTEM IN TRINIDAD AND TOBAGO

3.1 POLICY AND LEGAL FRAMEWORK

Our starting point for the description of the innovation system in Trinidad and Tobago (T&T) is the chart on the actors of T&T innovation system review (see Figure 2). This chart shows the various actors and policies according to the policy formulation and policy implementation levels.

There is currently no all-encompassing central innovation strategy or innovation policy for T&T. There have been, however, a number of attempts in the past to introduce such a national policy, in also other policies that touch on different aspects of innovation. Past efforts including the following:⁶

- In 2001, a National Task Force on Science, Technology and Innovation Policy produced a report on the subject of a national innovation policy.⁷
- A Draft Policy on Science, Technology and Innovation was developed by the then Ministry of Science, Technology and Tertiary Education (STTE) in 2004.⁸
- In 2006, the exercise seems to have been repeated, this time the report was created by the National Institute of Higher Education, Research, Science and Technology.
- A draft national policy on science on science technology was developed in 2007 by NIHERST.

While this indicates that there has been already a lot of thought on and concept development with respect to innovation policy, such an all-encompassing policy has not yet materialized. Nonetheless, according to the innovation system review, there are four strategy and policy papers that deal in some ways with innovation. The policies/strategies in point are the Medium-Term Policy Frame Framework (MTPF); the National Performance Framework (NPF); the Enabling Competitive Business (ECB) Strategy; and the national ICT plan 'smartTT'. These policies (with the respective references) are described below in greater detail.

The Medium-Term Policy Framework (MTPF) 2011-2014⁹ describes the general policy goals of the Government of T&T in the timeframe 2011 to 2014, as set out by the Ministry of Planning. The policy distinguishes seven interconnected pillars of development (see Figure 1 below).

⁶ See <http://www.niherst.gov.tt/publications/st-policy-planning.htm>, as of Feb 25, 2014. This seems to be an old version of the NIHERST homepage. We have to state however that neither did we have access nor were we therefore able to analyze most of these older documents. We include the old attempts and documents here only for the sake of completeness of the analysis.

⁷ http://sta.uwi.edu/principal/documents/sci_tech_policy.pdf

⁸ Available at www.ccst-caribbean.org

⁹ see

http://www.planning.gov.tt/sites/default/files/content/mediacentre/documents/Innovation_for_Lastning_Prosperty_web.pdf

Figure 1 Pillars of the Medium-Term Policy Framework

Nr.	Pillar
	People-Centred Development
	Poverty Eradication and Social Justice
	National and Personal Security
	Information and Communication Technologies
	A More Diversified, Knowledge-Intensive Economy
	Good Governance
	Foreign Policy

Source: Ministry of Planning and the Economy 2011

These seven pillars lay the foundation for five strategic priority areas:

- Crime, law and order
- Agriculture and food security
- Health care services and hospitals
- Economic growth, job creation, competitiveness and innovation
- Poverty reduction and human capital development

While the overall theme of the MTPF is “Innovation for lasting prosperity”, it is only the strategic priority Nr. 4 of “economic growth, job creation, competitiveness and innovation” that is more specific in relation to innovation-related activities and goals (although parts of the MTPF referring to sectors such as agriculture, food security and health care services also bear innovation elements). The aim is to increase the expenditures on R&D by the country to 1% of GDP (which would correspond to an around 20-fold increase with respect to current expenditure levels)¹⁰ and to develop a National Innovation Plan (NIP) by 2012. The strategy recognizes the need for the economy to diversify in order to decrease dependency on the exploitation of natural resources. In this context, it identifies mainly three industries with potential for growth and innovation: Foremost the creative sector (music industry, film and television, festivals, etc.), the ICT services industry and renewable energy.

With respect to IPR, a specific reference was made in the context of the creative sectors, in that collective rights management was identified as a sector with growth and innovation potential. Otherwise it was stated that the intention was to establish an “...innovation system that comprises the supporting mechanisms for financing, intellectual property protection and linkages between research and development and commercialization.”¹¹

The National Performance Framework (NPF) 2012 – 2015¹² “... is Government’s ability to measure, monitor, report and use results based performance information in a systematic fashion as a normal part of doing business....” on the MPTF and its five strategic priorities.¹³ This

¹⁰ The R&D expenditures of T&T amounted to 0.05% of GDP in 2010 (the last year quoted by Guinet). Even if the energy/gas sector is excluded from the GDP, the aimed for increase in R&D expenditure can be considered very ambitious.

¹¹ MTPF 2011–2014, p. 68.

¹² <http://www.planning.gov.tt/sites/default/files/content/mediacentre/documents/National-Performance-Framework-2012-2015.pdf>

¹³ <http://www.planning.gov.tt/mediacentre/documents/national-performance-framework-2012-2015>, as of Feb 8, 2015.

document makes no specific reference to IPR (IPR is only indirectly covered through the performance indicator 'Global Innovation Index').

Another relevant strategic document is entitled "Competitive Advantage – Strategic Business Clusters and Enabler"¹⁴ and provided by the Ministry of Planning. Clusters are here understood as key industries or sectors of the country to be addressed by policy for further development in order to become more economically diversified. While the document goes not as far as to define the actual sectorial policies in great detail, it is interesting to note that the report states a diversification strategy must include the "...the development of a National Innovation Policy and Strategy to facilitate the construction of a National Innovation System."¹⁵ The six clusters identified are energy; food sustainability; culture and creative industries; maritime; tourism; and financial services. Intellectual Property is understood as an enabler for the diversification.

The Enabling Competitive Business (ECB) Strategy 2011 – 2014,¹⁶ implemented with support from the European Union, and authored by four ministries, is "...a medium term four year plan developed by both public and private sector stakeholders to address some of the key challenges that hinder the ability of Trinidad and Tobago's businesses and by extension the economy to compete globally."¹⁷ The strategy states that the "...the overarching objective of the ECB Strategy is to support the efforts of the Medium Term Policy Framework in realizing the economic transition of Trinidad and Tobago to a sustainable innovation driven economy through the implementation of a set of initiatives supportive of the diversification plan."¹⁸

The strategy governed a total of 20 development initiatives, which were broken down into three categories: policies, institutions and tools. With respect to policies, the strategy called for the development of an industrial policy, a services industry strategy, a trade policy, an investment policy, a business incubation policy and an MSE (micro and small enterprise) policy. In the field of institutions, the strategy also demanded the establishment of a number of new institutions, among which – relevant for innovation policy – the Economic Development Board (EDB) and Council on Competitiveness and Innovation (CCI) were mentioned. Tools were, for example, in the domain of e-government services. While innovation is mentioned loosely in the report, there is no specific reference given to intellectual property rights.

¹⁴ <http://www.planning.gov.tt/sites/default/files/content/mediacentre/documents/Building-Competitive-Advantage.pdf>

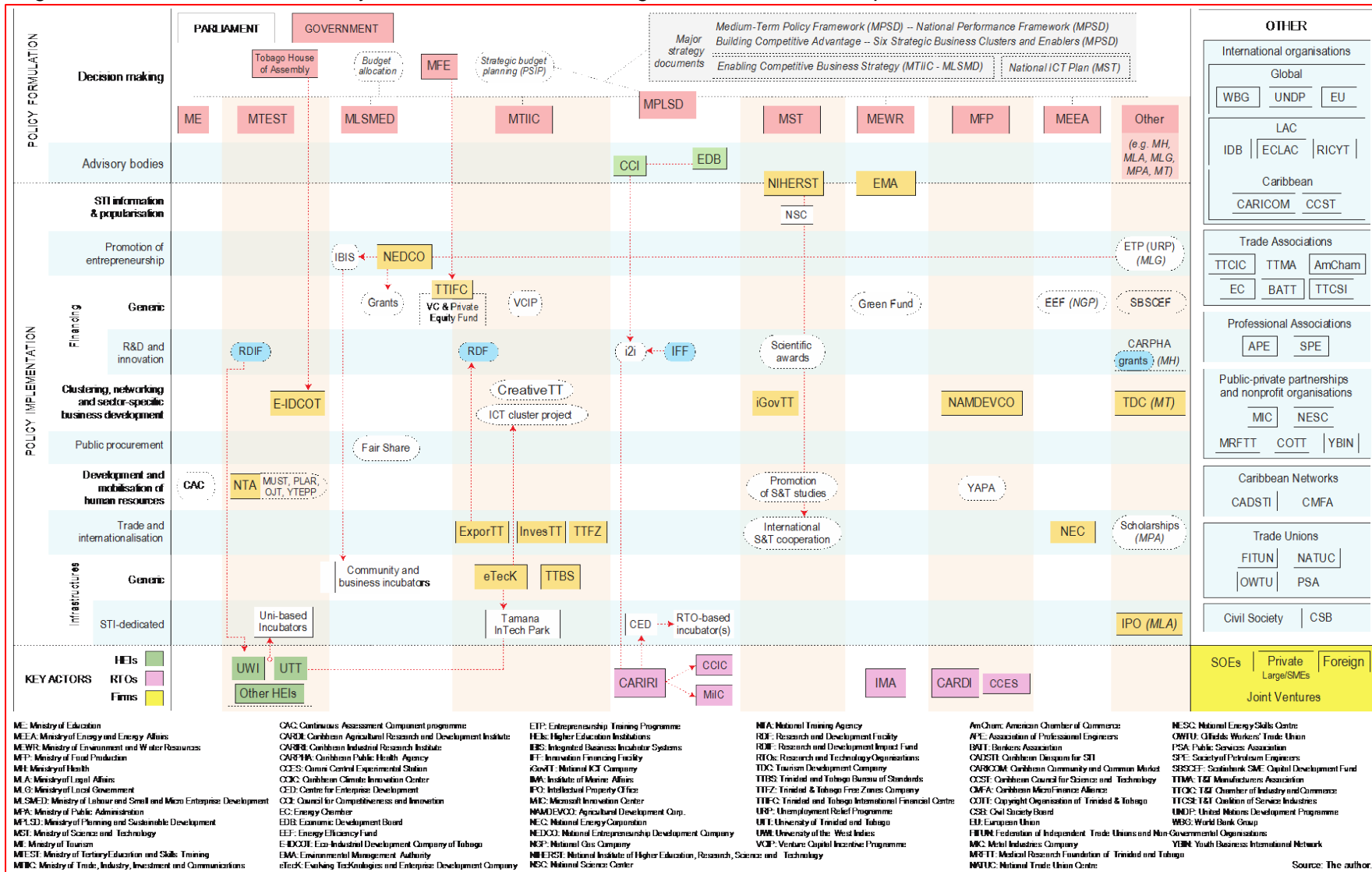
¹⁵ Ministry of Planning and Sustainable Development (2012): Building Competitive Advantage - Six Strategic Business Clusters and Enablers

¹⁶ http://eeas.europa.eu/delegations/trinidad/documents/news/ecb_sector_strategy_en.pdf

¹⁷ Enabling Competitive Business (ECB) Strategy 2011 – 2014, p. vii

¹⁸ Ibid., p. 8

Figure 2 National Innovation Ecosystem of Trinidad and Tobago: current institutional profile¹⁹



¹⁹ Source: Guinet, J. (2014): Assessment of the national innovation ecosystem of Trinidad and Tobago – Final Report for the Inter-American Development Bank (IDB)

The national ICT plan 2012 – 2016, by the name of ‘smarTT’,²⁰ builds on an earlier ICT plan that was called ‘fastforward’ and had run from 2003 to 2008.²¹ The strategy tackles a variety of ICT issues, particularly in the domain of ICT infrastructure, broadband access or e-government services. In the new plan, innovation is particularly mentioned in the context of human capital development. The plan also states that in order to “...promote innovation as an integral ingredient for global competitiveness and economic stability, the Ministry of Planning and Sustainable Development in collaboration with the Economic Development Board and the Council for Innovation and Competitiveness will champion the development of a National Innovation Policy.”

Intellectual property rights feature in this plan in the context of guaranteeing the rights “...of local content developers, in both the application, IT services and electronic entertainment spheres.”, in the course of the program ‘information society legislation-tt’ (eL-tt). Furthermore, the ICT plan also lists as imperative to establish a culture of research and development, for which it also places “...emphasis on Intellectual property (IP) legislation enforcement and public information campaigns.” There is also a plan under this imperative to establish an incubator for technology/solution transfer and commercialization.

While the four strategies and policy documents above have been mentioned in the innovation system review, there is also a draft S&T policy that could be mentioned, too. However, this policy – developed by the organization NIHERST – is not yet public and needs government approval. It seems to then co-exist with the National Innovation Plan (NIP), once the NIP is developed.

One of the key observations with regard to IP being mentioned in these policies is that the way IP could support these policies is too unspecific, even for a strategy document. There is no specific mentioning of how individual IP instruments, outreach and education activities, etc. could help achieve the stated overall goals.

3.2 INSTITUTIONAL FRAMEWORK

Policy decision-making and implementation bodies – the ministry level

According to the innovation system review, at least 15 ministries have some responsibilities pertaining to science, technology and innovation. Interview sources told us that about 33 ministries have innovation-related agendas. Within this cast of ministries, five stand out, according to the innovation system review:

- The Ministry of Planning and Sustainable Development (MPLSD), supported by the Economic Development Council (EDC) and the Council for Competitiveness and Innovation (CCI). The ministry acts as strategic coordinator, but runs also the support program i2i. It is also the organization overseeing the research organization CARIRI (see below).
- The Ministry of Trade, Industry, Investment and Communications (MTIIC). This ministry is responsible for trade-related aspects of innovation through the organizations ‘exporTT’

²⁰ <http://www.scitech.gov.tt/downloads/smarTT%20Draft%202014-05-07.pdf>

²¹ <http://www.scitech.gov.tt/downloads/smarTT%20Draft%202014-05-07.pdf>, as of February 28, 2015

and ‘investTT’, some “...more or less innovation-oriented sectoral, cluster and territorial programs (CreativeTT, eTecK and TTFZ)” and the Bureau of Standards.

- The Ministry of Science and Technology (MST) oversees science and technology policy (through the organization NIHERST) and ICT (iGovTT).
- The Ministry of Labour and Small and Micro Enterprise Development (MLSMED) “...plays the leading role, through NEDCO, in the promotion of entrepreneurship and has the responsibility for Vocational Training (NTA).”
- The Ministry of Tertiary Education and Skills Training (MTEST) is responsible for Higher Education Policy. The ministry also manages the Research Development Impact Fund, which was previously administered by the university UWI.

For the purpose of this review, it is also important to add the Ministry of Legal Affairs (MLA), as it oversees the IP Office of Trinidad and Tobago.²²

Policy decision-making and implementation bodies – the agency and program level

As described above, the ministries oversee a number of agencies or councils and deliver also support programs. In the following, we describe a selection of the most relevant ones, given feedback from our interview program and the results of the IDB innovation system review.

Agencies and support programs of the MPLSD

Regarding MPLSD, the Council for Competitiveness and Innovation (CCI) is an advisory board to the ministry and charged: i) with the development of a holistic and competitive innovation policy to lower dependency on hydrocarbons; and ii) improving the global competitiveness rank of the country. It was established in 2011. There are five board members from industry and government and four management staff.

With respect to innovation, it is first observable that the overall goal of the CCI is to build national awareness of innovation. There are two major operative activities to support the goal, and one strategic activity:

- The first operative activity is the development and execution of the i2i (‘ideas2innovation’) program. i2i (‘ideas2innovation’)²³ is basically a competition where persons can submit innovative projects. If found worthwhile, the winners obtain support for realizing their ideas.

Accordingly, there are two phases: the challenge phase, where submitted ideas are evaluated, and the program phase, where selected proposals obtain grant funding (in between TT\$75,000 and TT\$200,000), work plan guidance and technical support (through the research organization CARIRI) and community support from i2i peers and other professionals through workshops, seminars, etc. Awardees are from a variety of technological domains. Since 2012, 145 grants were provided in three rounds.

²² The fact that neither the IP Office nor the MLA have been specifically analyzed in the innovation system review is typical for many such reviews (e.g., the OECD review for Switzerland) and another indication of the aforementioned distance between the IP and innovation policy world.

²³ Homepage of the i2i program, <http://i2itt.com/about-i2i/>, as of Feb 26, 2015.

In terms of IP, the webpage of the competition provides a section that declares that ideas submitted are treated confidentially. It also provides basic information about protectability/patentability of inventions (and a link to the IP Office).²⁴

- Events such as the innovation forum 2013, where entrepreneurs and public/private sector leaders were brought together “...to explore & share practical information around the process of creating sustainable, innovative enterprises in T&T, or school’s innovation road show series.”
- The strategic activity, the development of the National Innovation Plan (NIP), has not been yet completed. However, there have been mapping exercises and studies have been conducted. For example, there is now a map – the T&T Entrepreneurship Directory – which lists all entrepreneurship-related initiatives within T&T. Initiatives are grouped under events/training/mentorship; competitions/grants/funding; incubators/flexible space; networks/markets/media.

Also established in 2011 was the Economic Development Board (EDB).²⁵ The mission is to “...reshape...strategies for economic development by facilitating diversification and achieving a diversified economy within the framework of sustainable development.” The difference between the EDB and the CCI is that the CCI is tasked with business competitiveness, while EDB’s responsibility is for overall economic development. Still, there are overlaps and it is said that both boards work closely with each other. The EDB seems to oversee particularly the development of the seven economic clusters (sectors) and, geographically, the development of five growth poles. The growth poles denote five different regions within T&T with different economic profiles, for which specific development/action plans are under development.

Agencies and support programs of the MTIC

The role of the National Export Facilitation Organization of Trinidad and Tobago (exporTT) is to generate export growth and diversification in the goods and services sector; increase the international competitiveness of exporters; develop new exporters across the various sectors of interest; and expand exports to new markets, based on market research.²⁶ Basically, exporTT implements the trade policy of T&T. exporTT offers a range of services, such as co-financing for various export activities (e.g., trade show booth rentals, product testing, etc.); training for exports; market research (conducted through the export market research centre); and the issuing of certificates of origin.

Most interesting – and also a target group for (training) offerings provided by WIPO for assisting them integrate IP into their services – are the activities in the field of innovation and IPR. exporTT will co-finance half of the registration costs for foreign trademarks. The agency also provides R&D grants.²⁷ The maximum grant is TT\$ 500,000 for research projects (TT\$ 1 million for business alliances involving more than one business), and for projects that are, amongst others, innovative, involve R&D, have commercial prospects abroad and an impact on the local economy. More specifically, exporTT also funds – with up to TT\$ 300,000 – the registration of patents abroad, provided that a feasible method of commercialization of the patent can be

²⁴ <http://i2itt.com/idea-protection-intellectual-property/>

²⁵ Homepage of the EDB, <http://edb.planning.gov.tt/>, as of Feb 25, 2015.

²⁶ Homepage of exporTT, www.exportt.co.tt/, as of Feb 25, 2015.

²⁷ <http://www.exportt.co.tt/node/64>, as of Feb 15, 2015.

shown. It is also interesting to note that while the grants are open to all types of businesses outside the energy sector, very young start-up companies are excluded.²⁸

InvesTT provides information and support for investment opportunities for investors from abroad. It takes a very sector-oriented approach, where it outlines for each main economic sector in T&T investment opportunities in general terms, but also specific projects. Furthermore, as many of its sister organizations across the various countries in the world, it also provides support and assistance for firms which wish to establish themselves in the country.

Agencies and support programs of the MLSMED

The National Entrepreneurship Development Company Limited (NEDCO), founded in 2002, has the mandate to develop "...small and micro businesses whose needs could not be met by traditional lending agencies."²⁹ Services offered comprise training (on topics such as basic business skills, marketing, strategies for success, etc.), incubator services – through the National Integrated Business Incubation System (IBIS) – and loans/finance. NEDCO has 11 regional branches ('Regional Entrepreneurship Development Centres'), one of which is also located at the UWI campus (student activities centre). While engaged in mentorship and while supporting the writing of business plans, there is neither IP in NEDCO's training nor IP support provided through the incubators. However, most of the firms supported are in rather non-innovative 'hands-on' craft and retail fields, i.e. promising firms that could benefit from more extensive IP advice are in a minority.

Loans are provided up to TT\$500,000. There is seemingly no restriction as to the type of business activity, respectively investment, which is supported. However, applicants must produce their business registration and provide a business plan as well as a resume. The IBIS system distinguishes between two types of incubator models: community-based business incubators (CBBi) that address a social objective, such as unemployment alleviation and poverty reduction and Commercial Business Incubators for high-value businesses (CBI). IBIS provides financial support (seed capital) in between TT\$5,000 and TT\$50,000, business advice services and the provision of physical premises. There are currently 2 CBBis running as pilot projects, 18 in total (eight CBBis and ten CBIs) are foreseen.

eTeck is primarily concerned with the operation and management of economic zones and industrial parks.³⁰ It also is responsible for the TamanaInTech Park, which is the largest science and technology eco business park in the Caribbean, according to their own accounts, and the largest science and technology park in T&T. The organization manages a total of 21 industrial and business parks that host 323 businesses.³¹

Agencies and support programs of the MST

The National Institute of Higher Education, Research, Science and Technology (NIHERST) has as its mission to promote "...the development of science, technology and higher education in Trinidad and Tobago, and enhance the innovative, creative and entrepreneurial capabilities of

²⁸ To this end, exportTT states that a business eligible for funding "...must be an established business in Trinidad and Tobago in operation for at least one (1) year as evidenced by audited financial statements and/or bank statements." (<http://www.exportt.co.tt/node/64>)

²⁹ Homepage of NEDCO, www.nedco.gov.tt/, as of Feb 25, 2015.

³⁰ <http://www.eteck.co.tt/2eng/default.asp>

³¹ <http://www.tamana.com/resources/eTeckAdvertorial.pdf>

the general population.”³² Its Strategic Plan 2011–2015 identifies five fields for which key objectives are defined: Research and intelligence gathering in support of economic diversification; promoting innovation and commercialization of technology in priority areas; building collaborative global relationships; fostering a culture of science, innovation and creativity; and positioning NIHERST as a world-class STI institute.

This profile of activities seems to touch also on IP issues, particularly with respect to technology transfer. Operatively, NIHERST focuses its services on the topic of STI popularizations, such as in the form of science weeks, school and family visits to the NIHERST/NGC National Science Centre, camps, workshops and clubs. There is an introduction to IP offered in camps for students of 8 to 12 years of age. In addition, NIHERST collects statistics on STI indicators and performs surveys on innovation in different industries. Science awards are provided for scientific ingenuity and ‘Trinidad and Tobago Icons in Science and Technology’. NIHERST is also involved in regional projects and provides secretariat services.

iGovTT is a state-owned company whose “...whose primary business is the provision of ICT consulting and support services for Government, as well as the provision of value-added ICT support services to Government ministries and agencies.”³³ The focus is on e-government solutions. The exposure of iGovTT to IPR issues seems to be limited.

Agencies and support programs of the MTEST

According to the innovation systems review, MTEST manages the Research and Development Impact Fund previously administered by UWI. The fund supports research projects by UWI staff of a maximum duration of 36 months with at most TT\$ 2 million. Priority research areas are Climate Change and Environmental Issues; Crime, Violence and Citizen Security; Economic Diversification and Sector Competitiveness; Finance and Entrepreneurship; Public Health; and Technology and Society: Enhancing Efficiency, Competitiveness and Social well-being

Agencies and support programs of the Ministry of Legal Affairs (MLA)

The Intellectual Property Office is responsible for all types of IP, including copyright. Its website lists a number of services, in particular “how to” guides for various types of IP and respective brochures. The office also performs searches in patent/IP databases and provides advice when called or invited, on IP issues.

Overall, the IP Office seemed to be very active, and is involved – many times seemingly on an ad hoc basis – with activities and policy formulation of other organizations. It maintains good working relationships with UWI, CARIRI and the Cocoa Research Institute; it is being consulted, called upon and referred to by the CCI and involved in the i2i competition, etc. We were told that the first IP teaching efforts at UWI, were pushed by the IP Office, in collaboration with an ICT professor, who had returned from the U.S. and holds around 20 patents.

The IP Office clearly is central, if not the hub, in T&T for all types of questions relating to IP.

³² Homepage of NIHERST, www.niherst.gov.tt/, as of Feb 25, 2015.

³³ Homepage of iGovTT, <http://igovtt.tt/services/>, as of Feb 25, 2015.

3.3 KNOWLEDGE BASE

The knowledge base, or research sector, consists of two universities that are able to undertake R&D and innovative activities to a noticeable extent as actors on their own as well as a small number of PROs. Of the latter, "...only CARIRI provides a larger springboard for a broader set of innovators."³⁴

The two universities are

- The University of the West Indies at St. Augustine (UWI). UWI is the largest generalist university of the Caribbean region, with undergraduate and graduate programs in the areas of agriculture, education, engineering, food and agriculture, humanities, law, science and technology, medical sciences and social sciences. T&T hosts one of the three campuses of the UWI in the region.

The research undertaken has been described in both our interviews and the innovation system report as mostly purely academic, executed as part of graduate and undergraduate curricula. There is also a tradition of "...conducting joint research with socio-economic actors in specialized units."³⁵ Other than that there are also research institutes that are also part of the UWI but have a more extensive, and also application-oriented, research agenda. Worthy of particular mention here are the Cocoa Research Centre and the Engineering institute.

In terms of IP, it should be noted that the university has a technology transfer office, the UWI Office of Research Development and Knowledge Transfer (ORDKT). While it supports all types of knowledge transfer activities within the UWI (and handles also IP questions), a large portion of its work is devoted to assistance in project management and fundraising "...by screening the national and above all international opportunities."³⁶

- The National University of Trinidad and Tobago (UTT) is a rather young university. It was established in 2004 "...to make the higher education system more responsive to the needs of the national economy." It was initially focused on engineering, but has expanded its scope of studies. Most interestingly, it is now also involved in the Creative Industries.

UTT is "...very active promoting entrepreneurship through innovation in teaching, the establishment of incubators, its involvement in the Tamana InTech Park and its contribution to cluster development in creative industries." uSTART is the latest such initiative by the UTT. It was set up in the fall of 2014 and is, according to their accounts, the first university-originated business incubator in T&T. It supports entrepreneurial endeavors of students and staff from UTT in the domain digital/animation, fashion, agro-processing and sound recording. uSTART will initially support 11 students.³⁷

According to a paper by Preddie, the "...The University's entrepreneurial thrust is also evident in the annual Business IDEAS and Business Plan competitions where faculty, staff

³⁴ Guinet, J. (2014): Assessment of the national innovation ecosystem of Trinidad and Tobago – Final Report for the Inter American Development Bank (IDB)

³⁵ Ibid.

³⁶ Ibid.

³⁷ <https://u.tt/index.php?wk=48=1>, as of February 25, 2015.

and students are encouraged to submit ideas that can spawn new business ventures. A novel facet of the IDEAS competition is the Master's/PhD Research Innovation and Commercialization Initiative (RIC). Introduced in 2013, the initiative encourages graduate students to consider commercialization of their research in order to create economic and social value, beyond the academic requirements of their degrees."³⁸

In terms of IP, it is interesting to note that UTT is said to have a "UTT Entrepreneurship and Technology Commercialization Unit", which would have, according to a description, functions of a technology transfer office (TTO). However, at the moment there does not seem to be a web presence, other than in social media.³⁹

Among the PROs, the Caribbean Industrial Research Institute (CARIRI) takes a lead and is, according to the innovation system review, "...on the move to become a key innovation hub for the country." It was established in 1970 with technical and financial assistance of the United Nations Development Programme (UNDP) and the United Nations Industrial Development Organization (UNIDO). Its main mission is "...to provide services in laboratory and field testing, consulting, research and development and training."

In 2013, CARIRI launched the Centre for Enterprise Development (CED).⁴⁰ The CED has three incubators:⁴¹

- The innovation incubator addresses individuals that have ideas with potential to be commercialized. Facilities include rooms where said persons can talk confidentially with experts, have their ideas assessed (proof of concept) and where further guidance regarding development can be received. This incubator "...houses also the project coordinators for the government-driven i2i competition and a 3D printer...[for] prototype development."⁴² There is also a Regional Climate Innovation Centre, set up in the course of a World Bank project.
- The business incubator can house up to around a dozen (around half physically, half in virtual form) tenants and provides services "...that growing small businesses require", which would include secretariat, internet access or meeting rooms.
- The technology incubator "...takes the form of 10 bays which will each initially accommodate projects currently being developed by CARIRI such as garlic, soy, cassava and pepper processing technologies as well as ICT related products. It caters for the incubation and commercialization of technologies sourced both locally and from abroad." The idea is that CARIRI will produce technology packages from its research (collection of info, services and activities related to the manufacture of the products), which will be made available to interested investors.

Apart from the three incubators, there is also an ICT centre that "...accommodates information and communication technology (ICT) project initiatives being undertaken by CARIRI that are geared towards enhancing the operational efficiencies of SME's. It houses a developer's studio, project meeting room, break-out room and a Cisco teleconferencing centre."

³⁸ Preddie, M.I. (2013): Towards Academic Library Support for Entrepreneurship: A Blueprint for Reinventing our Role, in: Caribbean Library Journal Vol. 1

³⁹ https://www.facebook.com/EntrepreneurshipTrinidadandTobago/info?tab=page_info. As we could not interview anyone from UTT, inferences on actual IP involvement and activity can only be drawn from available public sources.

⁴⁰ <http://www.cariri.com/new/index.php/ced>, as of February 27, 2015.

⁴¹ Ibid.

⁴² Ibid.

3.4 INDUSTRIAL BASE

The industrial base is composed mainly of three groups:⁴³

- The largest group is the oil and gas industry, which accounts for around 40% of GDP. The group consists mainly of large foreign firms and joint ventures, accompanied by smaller firms at the periphery of energy related services. This industry is, however, not innovation/research-driven in T&T. It rather applies proven technology for exploration purposes.
- The second group are "...a few hundreds..." of large and medium-sized firms (>100 employees) in non-energy sectors. According to the innovation system review, these firms "...have enough managerial and other capacities to consider adopting innovative strategies, but are dissuaded from doing so by some aspects of the business environment, including the lack of competitive pressure and/or appropriate support by the government."
- The third group is a large number of small and micro-enterprises, many of which active at the border to the informal economy. The many self-employed entrepreneurs in this group, driven by necessity rather than choice, are "...far from the innovative world narrowly defined", but are seen to have enormous potential by the innovation system review with respect to energy and creativity.

3.5 INTERMEDIARIES, INSTITUTIONS AND ACTORS THAT SUPPORT THE INNOVATION SYSTEM

There are number of intermediary organizations, such as

- The T&T Chamber of Industry and Commerce
- The T&T Manufacturers Association
- The T&T Coalition of Service Industries
- The Association of Professional Engineers.

According to the innovation system review,⁴⁴ these institutions not only have a lobbyist function, but are also important advocates of the national agenda and are facilitators of collective actions by firms.

The private market for IPR service providers is not developed in Trinidad and Tobago, according to interview sources. The interview evidence suggests that there may be only a handful of IP attorneys. The estimates are in between four to twelve such attorneys with reasonable IP knowledge.

In addition, we were told that there would be hardly anybody in the country able to draft patent claims. This means that when drafting patent applications, Trinidadians must use the services of patent attorneys from abroad, most particularly from the U.S.

⁴³ Guinet, J. (2014): Assessment of the national innovation ecosystem of Trinidad and Tobago – Final Report for the Inter-American Development Bank (IDB)

⁴⁴ Ibid.

While the situation is certainly improvable, and although there are discussions going on, on the possibility of a Regional patent Administration, it stands to reason that for Trinidad, given its size, the development of a very elaborate infrastructure of patent attorneys would not be a priority at this time. Therefore, any IP policy of the country must cater for a phased approach to training patent agents and would by necessity include the usage of international service providers/patent agents. Notwithstanding this, government and international actors such as WIPO should continue in investing into and supporting capacity building.

CHAPTER 4 - INTEGRATION OF THE INTELLECTUAL PROPERTY SYSTEM IN THE NATIONAL INNOVATION SYSTEM

4.1 OVERALL STRATEGY AND POLICY LEVEL

The strategies and policy papers were, at least at first sight, well drafted. The different strategies in place were also rather coherent and made references to each other in appropriate places. This should not be taken for granted, as some negative examples in Western and Eastern European countries show. IP was mentioned in several of the T&T strategies and policies, albeit mostly at a rather superficial level. The IP Office worked in collaboration with WIPO on a national IP strategy, which was finalized and awaits government approval to enter into force. Details on the IP strategy are given in the text box below.

The Trinidadian IP Strategy

The Trinidadian IP Strategy – entitled “*Utilizing Intellectual Property to facilitate innovation for lasting prosperity*” – has as vision that “...by 2016, Trinidad and Tobago will have an innovation-driven growth economy with greater equity, more meaningful participation and a rising tide of prosperity for all.” The strategic goal is to “...proactively use Intellectual Property as a central hub to achieve an innovation-driven growth economy in Trinidad and Tobago.”⁴⁵

The foci of the strategy lie on “...an improvement of the IP Regime, promotion of the creation and utilization of IP, fostering a culture of IP, and the strengthened protection of Intellectual Property Rights.”

Strategic measures are in the area of i) strengthening the administration of IP (with five activity areas/goals attached); ii) encouraging the commercialization of IPR (with 11 activity areas/goals attached); iii) promoting the cultivation of an IP Culture (11 goals/activity areas); iv) improving IP law enforcement (four activity areas); v) increasing the capacity to create IP (seven activity areas); vi) developing intermediary services for IPRs (three activity areas); vii) developing intellectual property human resources (eight activity areas) and viii) expanding international exchanges and cooperation in intellectual property (six activity areas).

At this time, the different policies/strategies do not make specific reference to the national IP strategy, but many strategy papers are at or nearing their end of life, and hence await replacement. This should therefore not be of major concern. However, it should be of concern that the IP Office and its governing ministry are not mentioned as key stakeholders in an innovation policy discussion, such as in the innovation system review. This risks that IP – or, to be more precise any useful national IP strategy – would be regarded as a rather specific topic, mostly disconnected from the grand theme of innovation. We had one interview partner who stated specifically that “...the IP strategy was largely outside the radar of its intended target group.”

Upon closer inspection, there are also weaknesses of the policies and strategies relating to innovation. Foremost to mention are the ambitious (medium-term) goals that seem hardly attainable. A case in point is the aim of a 20-fold increase of expenditure on R&D to 1% of GDP, which does not seem realistic at least for the given time frames. Moreover, there seems to be a

⁴⁵ Report: Development of an Intellectual Property Strategy for Trinidad and Tobago, Utilizing Intellectual Property to facilitate innovation for lasting prosperity

mismatch between strategic goals and the related activities to achieve these goals in the field. The latter seem rather narrow and, at the moment, highly focused on science popularization and raising innovation awareness. The process of translating the strategic goals into actionable goals and activities seems to be therefore a problem area.

In this context, the innovation system review notes:⁴⁶

“In the policy formulation process, there is a wide gap between high-level policy objectives that are defined with a reasonable degree of coordination, and more detailed actionable objectives that are left at the discretion of individual ministries, leaving room to misaligned and scattered activities at lower levels of governance. The problem is aggravated by the lack of a common understanding of the innovation concept. This does not lead only to wasteful duplications but also create blind spots. For example, a clear T&T science policy for innovation remains to be articulated. MST-NIHERST is working on a draft for already some time, but this should be a more collective undertaking, involving at least MTEST...and orchestrated by MPLSD.”

On the one hand, we would go even further and question whether it is meaningful to have separate S&T policies and innovation policies in place, given the large overlap of the two concepts. On the other hand, we observe that the translation/policy formulation problem from higher level to lower level goals and activities is also visible within a ministry:

- For example, MPLSD is responsible for three of the four main mentioned strategies and thus a wide range of strategic goals. However, in practice one interviewee noted that “...MPLSD can do little to convince other ministries to act according to the strategy it produces.” Another said that “...that the process of developing an innovation policy is a high level policy discussion, but the ministry has no direct control of the operational implementation. At the operational level, it is noticeable that the many strategic goals are only tackled, within MPLSD, mainly by the i2i competition program.

- Similarly, NIHERST has a wide range of objectives, particularly with respect to the S&T policy, spanning also other ministries, but is itself again mostly active in science popularization.

A small number of interview partners went even farther, in the context of the translation problem, and questioned the innovation initiatives overall:

“...innovation and innovation system are just buzz words with nothing behind it...”

“...there is a lot of discussion on innovation, but nobody is doing anything.”

“...we have not seen anything explicit on an innovation policy”

Against this backdrop, the following points concerning IP at the general innovation policy/strategy level emerged:

- The low innovation performance, as depicted in the innovation system review, is also a major cause of a low performance in the field of IP.⁴⁷ As IP is about exploitation and

⁴⁶ Guinet, J. (2014): Assessment of the national innovation ecosystem of Trinidad and Tobago – Final Report for the Inter-American Development Bank (IDB)

⁴⁷ According to WIPO statistics, there are only in between 0 to 3 PCT applications p.a. originating from T&T. National patent applications are equally low, mostly in the 1-digit range p.a., as are also design applications. Trademark application data seems to be missing for recent years (see http://www.wipo.int/ipstats/en/statistics/country_profile/profile.jsp?code=TT, as of Feb 28, 2015).

protection of innovation, innovation must predate IP usage. At the moment "...there is an imbalance of the IP system, as determined by the TRIPS agreement; the innovation output is not able to take advantage of the IP system...the relationship between innovation and IP is immature" (interviewed expert)

- There is generally a low awareness about IP and what it can do to support innovation. The low level of awareness extends from the industry sector to the various ministries and policy-making bodies. We witnessed beforehand the difficulty of key stakeholders to differentiate between utility models and patents; we were told that the concept of licensing was fairly novel to many actors and businesses, as were also the different possibilities, means and features to exploit IP; we were told an anecdote that when a patent was presented to a firm in a meeting, the reaction was that "...only paper was brought to the table." (Interviewed expert)
- The expectable negative impact of low awareness on the exploitation of IP is aggravated by the lack of modern legislation regulating ownership of IP created with government funds; in fact, there is was insecurity visible when it comes to defining who owns the IP rights resulting from government-funded R&D. T&T does not have Bayh-Dole Act-like legislation. Government-funded research resulting in IP seems to belong in the majority of the cases to the government, given the feedback we obtained. The result is first, according to an interview partner, that several pieces of IP are scattered across ministries. Interestingly, the Ministry of Finance was named as a major holder of IP in T&T, mainly because they are said to hold a basket of rights related to cocoa. Lack of awareness on how to exploit IP rights coupled with the insecurity about IP ownership and changing political foci because of fast changing administrations, may lead to lost opportunities in the commercialization of IP. A high profile case in this context is the G-Pan/PHI case (see text box below), which was mentioned by several interview partners.

The G-Pan and the Percussive Harmonic Instrument (PHI)

Steelpanns are a type of acoustic musical instrument developed in Trinidad and Tobago in the 1930s. The percussion instrument is THE national music instrument of the country and widely used for example in carnival. Since their introduction in the 1930s, steel pans have been constantly improved technologically and have been the subject of R&D activities in areas such as metallurgy, particularly with respect to production processes. Cases in point are a joint R&D project of CARIRI and Swedish firm Saab in the 1970s (which was eventually abandoned due to lack of finances and support of local pan tuners in Trinidad), or the R&D of Swiss firm PANArt, which led to the development of a new type of instrument called Pang.

T&T manufacturers never patented their instruments, so monetary returns from IP could not be obtained. Steelpan development surged in the mid-2000 years in T&T, when a team under Prof. Copeland from the University of West Indies (UWI) presented two inventions, the G-Pan and the Percussive Harmonic Instrument (PHI). The G-Pan is, unlike traditional pans that are made of oil drums, constructed from durable, high-grade steel sheets. The G-Pan "...is four inches wider in diameter, allowing for 37 notes and three octaves, compared to the 25 notes and two and a half octaves on a pan made from oil drum."⁴⁸ The PHI is an electronic instrument. Similar to an electronic keyboard, "...it gives the pannist access to a variety of virtual instruments as well as special effects and customized sounds."

During our interviews, the G-Pan and the PHI were recurring topics to which a number of our interviewees referred, making them high profile IP cases nationally. In 2011, and according to newspaper reports, Prof. Copeland registered the patents for the PHI in his own name and was accused by the Attorney General of attempting to "highjack these inventions for their private commercial gain."⁴⁹ According to our interview sources, at least the G-Pan had both government and the inventors listed as co-inventors. Eventually, the PHI dispute was subjected to mediation, the result being that any profits arising from the licensing of the patent relating to the PHI would be split in three between Copeland and his associates, UWI and the State.

The G-Pan was assigned to the State in 2009. In between 2011 and 2013, interview partners told us that the then administration planned to stop the payment of attorney fees abroad and patent office fees. The previous administration had, by contrast, provided considerable leeway in the prosecution of the patent. For commercializing the G-Pan, the patents are prosecuted now in 61 jurisdictions, and patents have been granted in a number of those including the U.S. For the PHI, patent protection has been granted in ten countries.

A U.S. company was set up to market the new pans, but, according to interview partners, "...many tasks have to be done in T&T to make the country a credible partner", e.g. in areas like production. A website for the company that was developed for commercializing the pan was later taken offline. A market report commissioned to a U.S firm gave a very strong market outlook for the instruments. However, at the time of writing this report, while the Government of TT is paying renewal fees and patent prosecution fees, the instrument has not yet been commercialized.⁵⁰

⁴⁸ Smith, A. (2012): Steel Drums and Steel bands: A History, p. 142f.

⁴⁹ Taitt, R. (2011): G-Pan Scandal, in: Trinidad Express Jul 9, 2011, http://www.trinidadexpress.com/news/G-PAN_SCANDAL-125255699.html, as of February 3, 2015.

⁵⁰ Of course it can be asked whether the G-Pan/PHI would have been successfully commercialized without the problems described.

4. 2 INSTITUTIONAL LEVEL

As section 3 has shown, there is no shortage of institutions that deal with the topic of innovation in some way or the other in T&T. The innovation system review finds that the system "...now comprise all the main types of institutions and actors that are found in more mature systems."⁵¹ However, this very variety causes considerable problems when pursuing an innovation (and/or IP) policy. The number of institutions dealing with innovation and the lack of a coordinating body with respective directive power create a very fragmented system.

According to our interviews, the recent reforms and the new policy goals (such as on innovation), have even further spurred the fragmentation, rather than help lower it.⁵² The innovation system review notes that there is "...a tendency to address institutional weaknesses by creating new organizations rather than increasing synergies between existing ones."⁵³ The situation is exacerbated by changing policy foci and responsibilities that occur with frequent changes of the administration.

In this context, it is noticeable that the understanding of the term national IP strategy (or the contents hereof) among the cast of actors may not be clearly understood or communicated. A document on what a national IP strategy should entail was drafted in 2007 but yet we were told by one interviewee that a national IP strategy was already developed in 2007.

Fragmentation has as a side effect the possible duplication of activities, but – more importantly – we find many agencies and ministries operating in 'silos', afraid that their activities would trespass the mandates and territories of other ministries and agencies. An interesting anecdote in this context is, for example, that one stakeholder avoided the use of the word 'innovation' (and used synonyms instead), because of possible competition with other government agencies. The result is that certain topics do not get treated well, and crosscutting expertise, such as the IP expertise of the IP office, is under-utilized.

The innovation system review states, in line with statements from our interview partners:⁵⁴ "Deficiencies at higher levels of governance have cascading effects down to the level of actors. It encourages some of them to develop their own, convenient visions of the national innovation policy agenda and to act as de facto public agencies in order to realize them. Others take the opportunity to continue to pursue priorities other than innovation, for example academic excellence at the expense of social relevance."

As far as IP is concerned in this context, the IP office stated in an interview that "...we are the voice in the wilderness, we make some noise, but uptake is sporadic." The level of exposure and integration of IP topics in different institutions of the innovation system is therefore different:

⁵¹ Guinet, J. (2014): Assessment of the national innovation ecosystem of Trinidad and Tobago – Final Report for the Inter-American Development Bank (IDB)

⁵² To give an example: Austria, which is clearly not an example of a streamlined and well thought through institutional set-up, has, at the federal level, only two ministries responsible for R&D and innovation and has three implementing agencies for all support programs and activities related to innovation.

⁵³ Guinet, J. (2014): Assessment of the national innovation ecosystem of Trinidad and Tobago – Final Report for the Inter American Development Bank (IDB)

⁵⁴ Ibid.

- NEDCO, the entrepreneur-supporting agency, told us in an interview that IP is a hardly tackled subject and that interaction with the IP Office to date has been minimal.
- The T&T Chamber of Commerce replied along the same lines and said that little emphasis had been put on IP, and that there are no direct services in this field available.
- NIHERST told us in their interview that they mentioned IP in their draft S&T policy paper, particularly with respect to the topic of IP awareness, but "...the thing is to be done by the IP Office." They were, however, frequently in touch with the IP Office regarding their contests: "We contacted the IP Office and they came to explain to the contestants basics about IP. So there was training on different forms of IP – but the next question was: Now what? Is IP protection worthwhile? A respective discussion ensued, and many contestants were afraid to divulge secrets, and most did not bother about IP protection in T&T. Some filed, however, for IP protection in the U.S." Interaction with the IP Office also occurred for inspecting official documents of the contests, such as non-disclosure agreements.
- The IP Office told us that they were occasionally successful in reaching out to businesses. However, many would approach them too late, only once IP-related problems had set in. Other interviewees told us that in their observation the IP Office would be in touch mainly with existing well-known businesses and organizations, but not so much with smaller start-ups.
- The university sector, and here particularly the UWI, was said to operate predominantly in traditional academic ways. The major success metric would be publications, with little incentives (also financially) to pursue other avenues of exploitation of R&D results. The university is mainly base funded. Therefore, the interest in the topic of IP and research commercialization was said to be low.⁵⁵

There are, however, also IP hotspots and positive deviants in terms of innovation and (potential or actual) IP usage:

- Foremost to mention is the sector of the Creative Industries that generates demand for and interest in IP. In fact, one interview partner told us "...that if larger scale awareness in T&T is to heighten on the topic of IP, it would be through the creative sector." Hot topics for the creative industries are in the field of copyrights, and here particularly broadcasting and licensing rights as well as protection and better exploitation of the Trinidad carnival.

⁵⁵ UWI and its technology transfer office have an IP policy in place that was said to be in need of an overhaul, which is to gear the policy more towards innovation rather than IP protection. The technology transfer office reported that UWI has filed some dozen patents so far, and that one licensing agreement was being negotiated. This can be considered a success.

Works of Mas

A particular issue with respect to the Trinidad carnival is ‘works of mas’. ‘Mas’ is a short form for ‘masquerade’. In short, works of mas is “...a performance that brings together the costume designer, bandleader, sound recording, choreographer and performers to produce an original creation” in the context of the specific form of carnival in Trinidad.⁵⁶

The carnival in Trinidad is the second largest of the world after the one in Rio/Brazil, but differs also in several key aspects from its Brazilian counterpart.

For some time now, carnival stakeholders in Trinidad have sought ways of better exploiting their carnival, e.g. through a form of IP (copyright) protection that would cater for the complexity of works of mas, and at the same time reward the creators and artists. Domestically indeed, ‘works of mas’ enjoys copyright protection in T&T.

The problem regarding exploitation of IP is that ‘works of mas’ as such, or as a “concept”, may have a rather short threshold in terms of protectability from a copyright perspective, such as originality and fixation, at the international level. The problem has been given much emphasis by the assessment, according to the estimates of the National Carnival Development Foundation (NCDF), that in between 200 and 300 cities world-wide copy the Trinidad carnival.

Since works of mas could be defined as performances, due consideration should be given as well to the protection at least of the performances themselves of the actors participating in works of mas. In addition to the national provisions that are provided therefore by Trinidad domestically, international copyright provisions, should serve as a reference in ensuring protection at the international level.

A publication issued by WIPO in 2014 regarding “Intellectual Property and Folks, Arts and Cultural Festivals. Practical Guide”,⁵⁷ offers guidance in managing the IP interests related to such events as works of mas.

T&T has also requested that works of mas be included in the definition of protectable traditional cultural expressions (TCEs) in the context of the on-going negotiations that take place within the Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (the IGC) with the view to developing an international instrument that would ensure efficient protection of TCEs.⁵⁸ Success of those negotiations would ensure that works of mas are protectable as such, internationally, as TCEs, beyond the protection that copyright may offer. Progress at the IGC has been made in developing a draft text that would ensure efficient protection of TCE at the international level, and works of mas, are included, optionally, in this draft definition that is included in the latest draft as produced in July 2014.⁵⁹ But those negotiations have proved to be until now unsuccessful in producing an instrument of protection that would be agreeable to all Member States. Such a situation has raised much frustration as expressed during our interviews.

⁵⁶ See Friday, T. (2013): Copyright Economy: Protecting ‘Works of Mas’ in Trinidad and Tobago, <http://www.iposgoode.ca/2013/11/copyright-economy-protecting-works-of-mas-in-trinidad-and-tobago/#sthash.MpL6Y5ds.dpuf>, as of February 25, 2015.

⁵⁷ See <http://www.wipo.int/tk/en/resources/festivals.html>

⁵⁸ See <http://www.wipo.int/tk/en/igc/> and Friday, T. (2013): Copyright Economy – Protecting Works of Mas in Trinidad and Tobago’s Culture Industry

⁵⁹ See http://www.wipo.int/meetings/en/doc_details.jsp?doc_id=276220

- Another hotspot in terms of IP is the Cocoa Research Institute at the UWI (see text box below).

The Cocoa Research Institute

The Cocoa Research Institute has its roots in the 1930s, when it was established under the Imperial College of Tropical Agriculture. After independence, the institute was transferred to the UWI and became the 'Cocoa Research Institute'. Since early on the institute has enjoyed support from big international chocolate producers – this support continues to date.

The tasks of the institute are two-fold: First, it manages the largest cocoa gene bank worldwide (some 2,400 varieties), which is located in T&T. This gives the institute (and T&T) a significant international role in breeding programs. Secondly, the institute is to perform research in order to support the cocoa industry. The institute has been working on a number of international projects, such as on resistance to diseases, environmental effects of cultivating cocoa, more widely in agronomy. The T&T government shoulders 35% to 40% of the funding, around 25% are funds from the international chocolate/cocoa industry and the remainder is project funds. The institute collaborates in projects with a wide range of universities and PROs abroad, such as Stanford University, Penn State or the University of Hamburg in Germany.

While the orientation of the institute was predominantly towards international industry in the past, we were told of recent strategy adaptations in the light of aims to revive the local cocoa industry. The 'Dutch Disease' particularly hit this industry. Because of better wages and employment prospects, farmers switched from cultivating cocoa to employment in the oil and energy sector. As a result, output – T&T used to be the 4th largest producer of Cocoa in the world – dropped from around 40,000 tons p.a. during peak times of the cocoa industry to a level of nowadays only some 700t p.a. In the course of this downward development, the "...sustainable base was lost" (interviewed expert), trees got overgrown by forest.

A re-ignition of the Trinidadian cocoa industry was said, against this backdrop, to necessitate significant investment that would only start to pay off after around seven years. The industry structure needs to be re-modelled: In the past, cocoa was only seen as a commodity plant, and farmers obtained only 5%-7% of the end price in a very long value chain. However, the potential is said to be "enormous", because Trinidadian varieties of Cocoa are of very high value, which could mean that T&T could have the chance to obtain significant shares of the upper end of the cocoa market, where, for example, gourmet chocolatiers operate.

There are a variety of challenges for the institute and the local industry, which involve innovation and IP. First, the institute is in the process of setting up a 'Cocoa Innovation Centre'. There were failed attempts in the past to reach out to farmers, mainly because these attempts did not account for the profitability of the farmers on the ground. The new innovation centre is to take a 'value chain' approach, i.e. it also looks at the economic and business model dimension.

Secondly, there are IP issues to sort out. Awareness about IP was said to have only come late in 2000. The IP is owned by the government, which was said to slow down potential commercialization. Another important consideration is the development of a Geographical Indication (GI), which does not yet exist for cocoa from T&T. Cocoa research at the institute has, however, advanced to the point that plant breeders' rights (PBRs) were applied for through the Ministry of Food Production in 2010. It is only with Cocoa that respective advancements

have been realized.⁶⁰ These cocoa applications are currently undergoing substantive testing which is to be completed in 2016. Notwithstanding this, awareness on IP by students and researchers is low, respective training is needed. This would also help professionalize negotiations in the IP field in the international context.

The new innovation centre itself could prompt a variety of IP issues that need to be sorted out: ownership of IP from research results, IPR regulations in collaborative research projects or the development of a comprehensive IP strategy for the centre, as part of its business strategy, are just some of the issues that come to mind. These could all be an area for which WIPO assistance would, in all likelihood, be welcome.

The vision for the centre is a comprehensive, interconnected mesh of services and activities, of which traditional research is only part of. This includes the operation of open laboratory facilities, where farmers could be trained and could work together with researchers; training of farmers, also on business aspects; research to increase productivity; and pilot cooperatives with farmers. So far, the centre and plans are, however, only in their infancy.

- Yet another hotspot that was already mentioned several times is CARIRI. Again, many of the promising activities seem to be in their infancy. But what is interesting to observe is the level of cooperation with other actors, such as with the i2i initiative of the CCI. There has been also a memorandum of understanding signed by CARIRI with the IP Office for the provision of support on IP matters.
- We also have anecdotal evidence for single firms that deal with the topic of IP rather extensively. A case in point is the cosmetics firm 'Sacha Cosmetics', an internationally active SME that specialized in exotic makeup. The firm uses professional IP management advice, conducts R&D and utilizes patents, trade secrets as well as trademarks in an international context. The firm could be the subject of a more widely marketed case study, how entrepreneurs from the Caribbean could use IP to their benefit.

General success factors for integrating IP with individual actors of the innovation system of T&T
Three success factors emerged from the discussion on the hotspots of IP activity in Trinidad and Tobago:

- Emerging demand for IP know-how services differs according to industry. There are industries that have already tackled IP issues, such as the creative sector, and others where the exposure to IP has been fairly low. This corresponds also to the level of innovative/creative activity.

Regarding the energy/hydrocarbon sector, there have been so far, for example, no significant indigenous attempts at innovation and/or IP creation/exploitation. While some interview partners maintain that there would be a potential in inward technology transfer (i.e., learning from the multinationals), this channel seems to not have really been exploited so far. The petroleum studies unit at UWI is mostly a teaching unit and only

⁶⁰ Trinidad and Tobago is party to the 1978 Act of the UPOV Convention, which turns out to be a very important IP right for Trinidad and Tobago. Apart from cocoa, there is considerable amount of breeding work on-going in Trinidad and Tobago in several areas including anthuriums, hot peppers, pumpkins, orchids and blackeye peas. The true benefits of acquiring PBRs will usually accrue once the varieties are licensed in their largest markets. This should add support to further work in leveraging the neo-tropical biodiversity resources and breeding expertise in the country.

slowly moving towards more in-depth research activities. However, the unit also showcases the potential as it is funded through international firms (from international industry to the local scientific base).

The firms very much determine the curriculum; students must do a master's thesis with relevance to industry, etc. There would be, according to interview sources, potential for T&T-specific R&D in the petrochemical sector, for example because of the specific type of sand present around T&T. Again, a number of IP issues would need to be tackled, such as the management of IP in research collaboration between the unit and industry; setting up of an appropriate IP policy, etc.

- The other recurring issue in many interviews in the context of IP and institutions is trust. Several interview partners stated that many firms would not trust state-run agencies/institutions to honor the firm's IP and deal with it accordingly. The possibilities of enforcing IP in T&T were a related area of concern. These statements are also in line with findings from other developing countries, where institutions are usually weak or young.
- Last, but not least, one topic to underline is access to finance. Most actors complained about very little funding possibilities, both from government sources but also from the private sector (private investors, Venture Capital firms). This might be an issue the Government of T&T should look into.

CHAPTER 5 – CONCLUSIONS

The main findings of the study are:

- The innovation system of T&T is a very fragmented one, with little coordination among actors. This limits the possibilities and endangers success of overarching policies, such as envisaged with a national IP strategy.
- Strategies tackling innovation – there is not yet an all-encompassing central innovation or S&T policy – are well drafted and ambitious, but have deficiencies in the translation into operative goals and activities.
- Overall innovation and IP performance is low. However, this is the result also of the economic development stage of the country, where most of the industry is also not innovative.
- One of the main issues of low innovation performance is the ‘Dutch’ disease. Success in gas exploration means that much of competitive pressure and needs to invest in other sectors have been lifted/neglected. The current government strategies aim for a larger diversification and hint at possible new sources for innovation and IP.
- Nonetheless, there are IP hotspots and positive deviants, which also have addressed IP issues successfully or need to address them. These hotspots are particularly in the creative sector, as well as in a small number of research institutes and firms.
- The level of integration of IP issues in the innovation system of Trinidad & Tobago differs across institutions, but is generally rather low. Innovation output can rarely take advantage of IP for successful commercialization endeavors.
- Correspondingly, there is little overall IPR awareness in the country. However, there are also observable differences across industries.
- Particularly business intermediaries such as chambers seem to have rather little IP know-how and services in the field of IP.
- A visible legislative shortcoming in the area of IP is the lack of clarity as to ownership of research results. This has proven to be a barrier for past commercialization attempts.
- Incentive systems for researchers at universities are based mostly on academic performance only (publications), which is a barrier for IP-related commercialization activities.
- An issue that emerged is that of trust in institutions, e.g. whether they would honor IP created by others. Similarly, there were concerns about enforcement of IP rights.
- Access to finance and funding sources are an issue.
- There is a shortage of legal IPR services and expertise in the country. While partly attributable to the development stage, it stands to reason that given the size of the country, it may be more beneficial to have IPR support systems with regional networks, so as to better harness/optimize expertise in all aspects of intellectual property.

CHAPTER 6 – RECOMMENDATIONS

RECOMMENDATIONS TO THE GOVERNMENT

Recommendation 1: Consider means to decrease the fragmentation of the T&T innovation system

Much has been said and written about the fragmentation and the lack of coordination among the various state agencies and institutions in T&T, and the innovation system review has highlighted options to reduce this fragmentation. At this point, we want to re-iterate the respective recommendations of the innovation system report, not only because they have their merits but because the respective issues were also widely featured in our interviews. There is good reason to consider merging ministries, such that only one to two are responsible for science, technology and innovation policy.⁶¹ At the operational level, one could also consider mergers and the creation of only few select (one to two) innovation/funding agencies, which operate support programs designed by the various ministries. This process would mimic the ‘agencification’ process observable in many European countries. It would reduce the need for coordination, and it would be easier to create ‘one-stop-shops’ for researchers and firms that are simpler to navigate in, especially if there would be only one to two central agencies that provide funding for R&D and innovation.

Recommendation 2: Make IP a more integral part of innovation and sectorial policies

As in many other countries, T&T’s draft innovation and policy papers seem to treat IP as a rather specific topic, even if they mention IP at various places. IP should be, however, understood as an integral factor in fostering innovation and economic development and thus ways to cater more for IP in the various policies and institutions should be explored. One particular measure could be to consider moving the IP Office from under the auspices of the Ministry of Legal Affairs to the responsibilities of the MST or MPLSD. This would highlight the business component of the IP Office’s work, rather than the purely legal aspect, and in so doing upgrade the role of the IP Office – whose resources and know-how seem to be under-utilized – in the overall innovation system. An IP strategy for the country should be made part of an innovation strategy.

Even more so, we recommend that innovation and IP policy/strategies be part of sectorial strategies. It is the sectorial strategies, in our experience, that are best suited to give direction and concrete substance to otherwise potentially abstract innovation and/or IP policies. Sectorial policies define where the country wants to go, e.g. in terms of the energy industries, the cocoa industry or the creative sector. To achieve these goals, innovation has a certain part to play, as does labor policy, regulation, business support, finance and also IP.

⁶¹ One could of course argue, like in many states, that there is a cycle of breaking up big institutions to create smaller more flexible ones, and then merging them again to create synergies and counter fragmentation. Therefore, it could be argued that merging/splitting is just a fad, and not a solution to the underlying problem. While there is also ways to increase the effectiveness of individual institution by giving them clearer mandates, the number of actors involved in innovation and R&D in Trinidad is simply too high, particularly given the size of the country.

The following example should help clarify the intention:

If we assume that T&T would wish to push the renewable energy sector, e.g. become the number one exporter of certain types of solar technology, innovation and IP would need to be part of such a policy. An innovation policy in this sector could focus on the particular strengths and weaknesses of the researchers in that area in T&T. It could elaborate, for example, special incentives (like prizes for solving a particular problem of the islands), dedicated funding schemes and grants (only available for endeavors in green technologies), or the public procurement of local innovative solutions, etc.

IP problems could be identified: How relevant is IP in the context of this field (patents, trademarks, copyrights, etc.)? What is the international position of T&T's IP in this field? What measures should be concretely taken to improve the IP position of T&T in this field? What could be expected in terms of realistic results? Are there particular IP issues that need to be addressed in other parts of the sectorial policy (e.g., in public procurement)? What actions need to be taken by government and which by the private sector?

The answers and activities with respect to innovation and IP will clearly differ according to sectors and technology fields. As can be seen, making innovation and IP part of sectorial strategies adds therefore concreteness and teeth to otherwise rather abstract concepts of innovation and IP.

Recommendation 3: Consider the introduction of clear(er) regulations regarding IP ownership for publicly funded R&D (e.g., a Bayh-Dole like legislative act)

This recommendation is rather straightforward, given the experiences with the G-Pan/PHI case but also respective interview feedback.

The introduction of a Bayh-Dole Act in T&T, which would give ownership of IP generated from government-funded R&D to the university where the research was conducted, would be one way of several to clarify ownership issues. Bayh-Dole has proven vital in countries like the U.S., where it was shown that the organizations responsible for the R&D are much better in commercializing research results than ministries (which have less insight into the markets, less incentives to commercialize and are also more subjected to changes in policy because of changing administrations after elections).

However, the introduction of Bayh-Dole – or any other legislative initiative in this context – should be accompanied with realistic expectations of the possible benefits. Bayh-Dole may be a good step to facilitate technology transfer, but it is not a license for commercial success. It gives the universities a tool to create value, but only sometimes will this value be realized through the process of the licensing of the patent. The patents might be also used for increasing the reputation of the university or for allowing/facilitating collaboration with industry and other research partners, even if the patent is not licensed.

Recommendation 4: Focus on the innovation and IP hotspots

In a small country like T&T, and also with the rather low innovation output, there are not many actors that could be viably addressed by an elaborate high-level innovation and/or IP policy. Instead, it stands to reason to address these few promising actors more directly. Innovation and/or IP policy would in this context transform into innovation and IP management for these hotspots. With respect to the research/knowledge base, with only two universities and one major PRO, this means that the policies could address these three hot spots more directly. A requirement, to be ensured by government, is that these institutions have the clear mandate to engage in commercialization activities, and that they should be also held accountable to that end.

It could be considered, in a combined innovation policy/IP strategy for universities, to modernize the incentive systems. This would also help to improve IP usage and commercialization. Research funding and career advancement should therefore not only be contingent on academic achievement, but also on commercialization activities (spin-off creation, commercialization). Elements of competitive funding should be introduced to spur innovative activities.

On competitive funding

Introducing competitive funding is not so much an issue of money but one of policy. An approach would be, for example, to cut base funding of the universities by 10%. These 10% – plus another 3%, which would be necessary to ensure acceptance in the university, because there is, overall, more money available – could be redistributed back to the universities via competitive grant schemes.

Such grant schemes would need to incorporate a quality aspect (scientific quality, as measured e.g. through peer reviews, should be a precondition) and a relevance aspect (such as tailoring the grants to certain subjects; requiring the funded research to contribute to the solution of pressing country problems; requiring applied research; and fostering commercialization, etc.)

Because different disciplines and faculties may have different foci and capabilities, ‘performance contracts’ might be considered for the universities. These contracts would be made between funding ministries and the universities and research institutes, and they would detail all aspects, in a negotiated and individualized manner, against which performance of the universities and faculties would be measured to obtain funds (base funds as well as competitive ones).

Recommendation 5: Consider the establishment of institutionalized ways of technology transfer, such as via competence centres

In Europe, so-called competence centres established in many countries have proven to be a success for applied research and institutionalized technology transfer between the science base and industry. The basic idea is to have a unit of its own, which deals with a specific research topic in a holistic way and is focused on solving real-life problems. The unit could be ideally owned in significant parts (e.g., around 50%) by industry and (the other 50%) by the university. The university would supply researchers, from various faculties, i.e. an interdisciplinary manner. An important point in this context is that a competence centre should have the ability to set its

own wide reaching and interdisciplinary research agenda. The unit would likely have its own research infrastructure. It could be contemplated that the centre has its own legal personality, though this is not a must. Similarly, it could be contemplated to make such a centre run on a time-limited basis (e.g., for seven years) after which achievements are evaluated. A goal could be that the centre should achieve after these seven years a significant extent of financial independence.

An example from the Czech Republic of a possible set-up is described below.

Centres of excellence and research centres in the Czech Republic⁶²

The Czech government decided to focus on innovation and established a special operational program for research and development for innovation for 2007-13. The program is based on a SWOT analysis of the Czech innovation system and is embedded in a number of relevant planning documents.

Priority axis I supports the creation of a few large Centres of Excellence, akin to competence centres. Priority axis II funds comparatively smaller regional R&D centres, with mainly a sector-specific, application-oriented and demand-driven mission. These centres help local firms and other users to innovate strategically and to perform their mission better. The centres are now starting their operational activities.

Both kinds of centres are being established within existing universities and PROs, primarily the Czech Academy of Sciences, preferably in the form of co-operation between institutions. They are not distinct legal entities but have their own management, rules and procedures, as well as their own supervisory and advisory board. The use of European Structural Funds – an instrument by which the EU fosters the development of local geographies – is therefore expected to lead to a physical and organizational restructuring of the Czech university and public research landscape. About two thirds of the money is used for new buildings and scientific equipment; another third goes to new research staff, graduate schools and mechanisms to strengthen governance and research management.

The process of selection and implementation was highly structured:

- Applicants had to present an attractive research agenda, supported by (i) the credibility of the key staff / their track record, and (ii) a clear understanding of and access to their target groups (academia, industry, public institutions etc.). Investment in infrastructure had to be justified in the light of the research agenda.
- Evaluation was performed both by national experts (20% of weight) and international experts (80%) including a consensus meeting and an evaluation report of about 10 pages. There were essentially six criteria: (i) quality of the research agenda, (ii) credibility of the key staff, (iii) attractiveness for and access to the target group, (iv) management, (v) human resource policy (esp. regarding young researchers), and (vi) budget and funding.
- Recommendations were made by a combined national and international panel.

⁶² This box is a slightly abridged and modified transcription from Ohler et al. 2011.

- After green light from the evaluation panel and the adoption by the Government an intense negotiation of performance contracts took place for the period ending in 2018 at the earliest. A very important aspect in these performance contracts is that the performance indicators are addressing exclusively those types of outcomes that can directly be managed by the centres and their managers, in particular publications, patents, completed PhDs, generated income from grants and contracts. A major issue in the negotiation was the specification of the management and governance model including supervision and advice.
- For the five largest centres the scientific / executive director was recruited with the help of search committees, including both national and international members. The search process provided lots of valuable insights into the perception of the Czech research system by the international scientific community; more importantly number of expats could be motivated to return.

Care must be taken when implementing such a competence centre scheme, because of the complexity of issues and design options. It is beyond the scope of this paper to outline the detailed ways on how e.g. for the petroleum or cocoa sectors, competence centres could be established. However, as evaluations have shown, such competence centres can provide true added value over purely academic research at universities or PROs, particularly from an industry or MNC point of view. They could therefore provide a way to get foreign multinationals more involved in R&D in T&T.

Recommendation 6: Pooling of the public IP service and tech transfer support services capacities

The study has shown that the country has very little capacity in the private legal market to support firms with IP, in particular with patenting issues. It is also likely that, given the size of T&T, full-fledged IPR support system would require a regional network so as to cover every detail of IPR.

Instead of having small IP units dispersed throughout the system – a technology transfer office at the UWI, a unit at UTT, some other form of support for CARIRI –, it would seem beneficial to pool IPR support together in a central government technology transfer and IP unit.⁶³ The unit will have more critical mass, be able to create synergies among its staffs' know-how and have higher visibility. The central tech transfer/IP unit would manage technology transfer and commercialization for all UWI, UTT and CARIRI and could possibly also work for the private sector.

There are a number of good examples in this context, both in larger and in small countries. In the UK, Imperial Innovations – the former technology transfer office of the Imperial College in London – is now a separate, stock-listed firm that deals with tech transfer not only from Imperial College, but also from other universities. In Estonia, a country of the size of T&T, the Estonian

⁶³ This would not exclude the availability of a focal point in the relevant institutions to interact with the researchers and the centralized unit.

Intellectual Property and Technology Transfer Centre⁶⁴ takes over this suggested central role and provides a range of IP services, in addition to the registration services offered by the national IP office. A similar set-up exists in Ireland.

Whether a central tech transfer/IP service centre should be part of the IP Office of Trinidad and Tobago, a separate entity like in Estonia or part of another agency, is subject to further analysis. If it is made part of the IP Office, there must be clear demarcation lines between the departments dealing with commercialization and those more impartial departments that have registration and examination duties. The approach of Estonia has, in the context of T&T, the disadvantage of adding yet another institution to the local innovation system. The option to have the tech transfer unit part of another agency depends on which agency is being looked at. A newly to be created/merged central agency that would also have financing and venture capital competencies would seem ideal, in that it could provide also financial start-up support (as in the case of Imperial Innovations) and be at the same time very close to the local business community.

In any case, the profile for staff working at such a central tech transfer/IP service unit would be different to that found at TTOs in larger countries. Besides having specific expertise in well-defined relevant technology fields, staff must also have generalist knowledge and embrace collaboration with IPR service providers abroad, e.g. in the U.S. or in Europe. This means that a particular function of the central tech transfer/IP service unit would be to signpost Trinidadian innovators to international IP experts.

It is important to note here that the IDB is presently carrying out a project with a focus on enhancing and facilitating innovation and commercialization in the Caribbean, called: Regional Entrepreneurial, Asset, Commercialization Hub (REACH). In the context of that project, the Trinidad and Tobago government may want to look at how certain IP services could be centralized.

Recommendation 7: Improve the general awareness level of IP in T&T, but also with executives of important stakeholders in the innovation system of T&T

The overall low awareness level of IP is common with many other (also economically more advanced) countries and should be addressed at several levels. The broadest impact can be obtained, if IP is more integrated into the curricula of universities. There should be – mandatory – courses for engineers, artists and students in the business faculties in which not only the legal but the business aspects of IP are highlighted. That is to say: highlighting those aspects that make IP appealing to the audiences and demonstrate the benefits IP can hold for value creation.

However, this approach would be only effective in the long run. In the short run, training could be offered to executives of key stakeholder organizations on IP matters, as well as to policy makers, again highlighting not so much the legal aspects but the ways that IP can help the various institutions achieve their objectives. Experience has shown that the success of such training is higher if the executive level is targeted. It is the executives who can ensure that the

⁶⁴ <http://www.epa.ee/sites/www.epa.ee/files/elfinder/dokumendid/2014-04-03-marius-kuningas.pdf>, as of February 28, 2015.

subject of IP is treated adequately throughout the whole of their organizations. IP management also seems critical, as was highlighted, to many government departments and state owned companies that are IP owners. As such it would be useful for them to have a better understanding of IP management.

The central IP Office could be in a good position to provide such training and has in the past already offered respective advice to various stakeholders. However, we have also noticed that the information and brochures provided on the office's homepage are rather technical, focused on "how to" guides to obtain protection with a particular legal instrument, rather than on the business-oriented "why to" questions. WIPO could also be approached to provide advisory and training support.

An alternative promising approach would be to focus on particular IP needs during different phase of business creation or operation, perhaps even tailored to specific industries. There is also a lack of testimonials and real life case studies on using IP in T&T. Hence, the recommendation would be also to create and update the respective material. A source of inspiration could be the SME page of the Swiss Federal Institute of Intellectual Property⁶⁵ and WIPO's IP Advantage database on Case Studies on Intellectual Property.⁶⁶ The IDB REACH project would be probably a good platform for documenting, housing and disseminating such case studies.

Recommendation 8: Consider options to increase access to private /equity funding

While we did already discuss potential means to introduce competitive funding for the research sector, we also recommend that the Government of T&T should consider, more broadly, the problem area of lack of funding for innovation, research and development in the corporate sector. This refers mainly to improved access to private capital (such as venture capital), given the many statements about the lack of such funding options.

While it would go beyond the scope of this report to discuss in detail how such an improved access to private equity capital can be achieved, there are a number of issues to consider, such as the creation and maintenance of an investor-friendly climate or tax incentives for rich individuals and companies making investments in innovation-driven firms and start-ups. Moreover, T&T could consider following the path of establishing a venture/private equity industry like it was done in other nations, including Israel or to some degree in China. Such steps would broadly foresee first the creation of state-owned venture investment firms, which could eventually be privatized after some time. All these activities should be sub-ordinated to the main goal of providing stable, well-marketed⁶⁷ private funding and investment opportunities. This is illustrated with a small case study on the VC funds in Israel.

⁶⁵ See <https://kmu.ige.ch/en/introduction/smes-report.html>, as of February 28, 2015.

⁶⁶ See <http://www.wipo.int/ipadvantage/en/>

⁶⁷ This is the task of invesTT.

Investment opportunities and the VC industry in Israel⁶⁸

Being challenged by the need to be successful internationally – Israel’s home market is small, the surrounding regional market not well developed and in some instances also hostile to the country –, and with a need to develop many industries from scratch, one important success factor for Israel’s innovation-driven economy was the development of a local and highly successful Venture Capital industry.

The first two private VC funds were established in 1985 and 1990, respectively. In the 1990s, there was a successful government initiative called Yozma (engl.: ‘initiative’) which offered tax incentives to foreign VC investments in Israel. The initiative furthermore doubled any VC investment from abroad with government funds. State-owned VC firms were set up, too, and later privatized. Today, there are some 70 active VC funds in Israel, including 14 subsidiaries/branches of international VC funds.

The main success factor about the finance of innovation was, however, not so much the creation of the VC industry itself, but the creation of investment and funding opportunities. One interviewed expert said that “...there is enough money worldwide which seeks investment opportunities. If you can credibly market the capabilities of your start-up industry, money will flow by itself. The VC industry appearance is hence a secondary effect of the development, not the primary cause.” Against this backdrop, it is notable that much of the government activity is linked to promoting Israel as a top destination for investments.

Recommendation 9: Consider means, including training, to increase the capacity of the innovation support system to deal with business issues

A common observation in many countries, including T&T, is that innovation support is often engineering driven (i.e., engineers mainly assessing technological merits of innovation projects) or it may be legally driven (e.g., when IP consultants analyze the legal IPR issues). In T&T, we have heard feedback, for example, that more emphasis on commercial aspects should be placed within the i2i scheme.

Innovation is about the market introduction or commercial usage of new things (products, processes, business models, etc.). This means that those providing innovation support should apply good business knowledge for assessing project proposals, too. Otherwise projects – with clear technological merits or good patent protection – that do not have a proper commercial dimension will get unduly supported, i.e. projects that will ultimately fail. Properly accounting for the commercial perspective entails training, learning opportunities for innovation supporting institutions and respective support staff as well as usage/employment of experts with an industry/market background.

⁶⁸ taken from Radauer, A. & Good, B. (2014): Evaluierung der Wiener FTI-Strategie („Evaluation of the Viennese RTDI strategy“) (unpublished)

REFERENCES TO STUDIES AND ARTICLES

Friday, T. (2013): Copyright Economy: Protecting 'Works of Mas' in Trinidad and Tobago, <http://www.iposgoode.ca/2013/11/copyright-economy-protecting-works-of-mas-in-trinidad-and-tobago/#sthash.MpL6Y5ds.dpuf>, as of February 25, 2015.

Guinet, J. (2014): Assessment of the national innovation ecosystem of' Trinidad and Tobago – Final Report for the Inter-American Development Bank (IDB)

James, V. (2012): The Economic Contribution of Copyright-Based Industries in Trinidad and Tobago, p. 13f

Ohler, F., I. Sanc, B. Bayer, L. Behlau and M. Stampfer (2011): Report to the Czech Ministry of Education, Youth and Sports on the Evaluation and Negotiations of Projects under OP RDI, Technopolis Group, Vienna

Preddie, M.I. (2013): Towards Academic Library Support for Entrepreneurship: A Blueprint for Reinventing our Role, in: Caribbean Library Journal Vol. 1

Radauer, A. & Good, B. (2014): Evaluierung der Wiener FTI-Strategie („Evaluation of the Viennese RTDI strategy“) (unpublished)

Report: Development of an Intellectual Property Strategy for Trinidad and Tobago, Utilizing Intellectual Property to facilitate innovation for lasting prosperity

Smith, A. (2012): Steel Drums and Steelbands: A History, p. 142f.

Taitt, R. (2011): G-Pan Scandal, in: Trinidad Express Jul 9, 2011,

http://www.trinidadexpress.com/news/G-PAN_SCANDAL-125255699.html, as of February 3, 2015.

WIPO (2013): Integrating Intellectual Property into Innovation Policy Formulation In Serbia

APPENDIX A – INTERVIEW PARTNERS

Representatives from the following institutions were interviewed (sometimes as 1:1 interviews with one interviewee, sometimes as group interviews with a group of representatives from these organizations).

1. CARIRI, Hayden Ferreria, Chairman
2. Caribbean Centre for Competitiveness, Mrs. Indera Sagewan-Alli, Executive Director
3. Cocoa Research Institute at UWI, Prof Pathmanathan Umaharan, Head
4. Council for Competitiveness and Innovation (CCI) and Economic Development Board (EDB), Ministry of Planning and Sustainable Development – Dr. Rikhi Permanand, Executive Director (both for CCI and EDB) and Mr. Kieron Swift, Business Unit Manager (CCI)
5. Ministry of Science and Technology (MST), Ms. Shaliza Mohammed, Senior Specialist
6. National Carnival Commission, Mark Byam, Corporate Secretary
7. National Carnival Development Foundation, Mr. Mahindra Satram-Maharaj, Chairman and Mr. Jean-Paul Pouchet, IC Marketing and Innovation
8. National Entrepreneurship Development Company Limited (NEDCO), Ms. Krystal Baynes, Executive Manager, Legal and Corporate Services
9. National Institute of Higher Education, Research, Science and Technology (NIHERST), Joseph Ryan, Programme Officer
10. Office of Research Development and Knowledge Transfer (ORDKT), University of West Indies, Ms. Lauren Boodhoo, Manager, Intellectual Property
11. Office of Trade Negotiations (formerly the CRNM), CARICOM Secretariat, John Malcolm Spence, Senior Coordinator, Intellectual Property, Science and Technology Issues
12. Petroleum Studies Unit, Faculty of Engineering, University of West Indies,, Professor Andrew Jupiter
13. Patent Agent, Everard Byer
14. Sacha Cosmetics, Aruna Maharaj, Business Development Manager and Gunjan Sharma-Maharaj, Chief Executive Officer, Intellectual Property, Athlete & Artiste Management and IP Consultant to Sacha Cosmetics
15. T&T Chamber of Commerce, Rianna Paul, Research and Trade Economist
16. Trinidad IP Office, Mr. Regan Asgarali, Acting Controller, Annmarie Omed Joseph, Deputy Controller, Richard Aching, Manager, Technical Examination
17. University of West Indies (UWI), Professor Clement Sankat, Pro Vice Chancellor and Campus Principal –
18. Trinidad and Tobago Copyright Collection Organization, Richard Cornwall, Vice President/CEO

APPENDIX B – MAIN IP LAWS AND WIPO TREATY MEMBERSHIP

Main IP Laws:

Copyright Act of 2008 and Copyright (Amendment) Act of 2008
Protection of New Plant Varieties Act of 2007
Industrial Designs Act, 2007
Layout-Designs (Topographies) of Integrated Circuits Act of 2007
Patents, Designs, Copyright and Trade Marks (Emergency) Act, 2007
Patents and Designs Act 2007
Intellectual Property (Miscellaneous Amendments) Act of 2000
Patents Act, 1996
Trade Marks (Amendment) Act 1997
Trade Marks Act of 1997
Trade Marks (Amendment) Act of 1996
Trade Marks (Amendment) Act of 1994
Geographical Indications Act of 1996.

Membership of WIPO administered Treaties

Berne Convention (1988), Brussels Convention (1996) Budapest Treaty (1994), Locarno Agreement (1996), Nairobi Treaty (signed 1981) Nice Agreement (1996) Paris Convention (1964) Patent Cooperation Treaty (1994), Phonograms Convention (1988), Strasbourg Agreement (1996), Trademark Law Treaty (1998), UPOV Convention (1998), Vienna Agreement (1996), WIPO Convention (1988), WIPO Copyright Treaty (2008), WIPO Performances and Phonograms Treaty (2008).

APPENDIX C - PROJECT TEAM

Ms. Tamara Nanayakkara, Head, Innovation Policy Section, Innovation Division, WIPO
Mr. Paul Regis, Program Officer, Caribbean Section, Regional Bureau for Latin America and the Caribbean, WIPO
Mr. Alfred Radauer, Senior Consultant, Technopolis, Austria
Ms. Alexandra Mayr, Deputy Director, International Project Management Office, University of Alicante, Spain