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**INTEGRATING INTELLECTUAL PROPERTY INTO INNOVATION POLICY  
FORMULATION IN JAMAICA**

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## LIST OF ABBREVIATIONS

ACUM	Atlantic Caribbean Union Mission
BSJ	Bureau of Standards Jamaica
CEIS	Caribbean Energy Information System
CI	Creative Industries
CMO	Collective Management Organisation
CMI	Caribbean Maritime Institute
CSME	Caribbean Single Market and Economy
CPAS	Caribbean Patent Administration
CTI	Commission for Technology and Innovation, Switzerland
EHF	Environmental Health Foundation
GDP	Gross Domestic Product
HEART-NTA	Human Employment and Resource Training Trust, National Training Agency
ICT	Information and Communications Technologies
IDB	Inter-American Development Bank
IMF	International Monetary Fund
IP	Intellectual Property
IPIKA	Empowering knowledge transfer in the Caribbean through effective IPR & KT regimes [an EU-funded project, ed.]
IPR	Intellectual Property Rights
JACAP	Jamaica Association of Composers Authors and Publishers (JACAP)
JAMCOPY	Jamaican Copyright Licensing Agency
JAMMS	Jamaica Music Society
JAMPRO	Jamaica Promotions Cooperation
JAMU	Jamaica Union Conference
JCO	Jamaica Chamber of Commerce
JDBC	Jamaica Business Development Corporation (JDBC)
JEA	Jamaica exporters Association
JIPO	Jamaican Intellectual Property Office
JNBS	Jamaica National Building Society

KT	Knowledge Transfer
LED	Light-Emitting Diode
LIME	Landline, Internet, Mobile, Entertainment [a telecom provider, ed.]
MIIC	Ministry of Industry, Investment and Commerce
MOA	Ministry of Agriculture
MoE	Ministry of Education
MORI	Mona Office for Research and Innovation
MSMEs	Micro, Small and Medium-Sized Enterprises
MSTEM	Ministry of Science, Technology, Energy and Mining
MTF	Medium Term Socio-Economic Framework
NCB	National Commercial Bank
NCST	National Commission on Science and Technology
NCU	Northern Caribbean University
NDP	National Development Plan
NiH	National Institutes of health
NIS	National Innovation System
NNI	National Nutraceutical Industry
OECD	Organisation for Economic Co-operation and Development
PAG	Plan Advisory Group
PCT	Patent Cooperation Treaty
PDU	Plan Development Unit
PETROJAM	Petroleum Corporation of Jamaica
PIOJ	Planning Institute of Jamaica
R&D	Research and Development
S&T	Science and Technology
SGSRE	School of Graduate Studies, Research & Entrepreneurship
SIPP	Security Interests in Personal Property Act
SMEs	Small and Medium-Sized Enterprises
SRC	Scientific Research Council
SSF	Self-Start Fund

STI	Science, Technology and Innovation
SUJ	Start-Up Jamaica
T&T	Trinidad and Tobago
TCC	The Competitiveness Company
TISC	Technology and Innovation Support Center
TIF	Technology Investment Fund
TRIPS	Trade Related Aspects of Intellectual Property Rights
TTO	Technology Transfer Office
U.S.	United States
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
UNECE	United Nations Economic Commission for Europe
UNESCO	United Nations Educational, Scientific and Cultural Organization
UPOV	International Union for the Protection of New Varieties of Plants
UTech	University of Technology
UWI	University of the West Indies
WIPO	World Intellectual Property Organisation

## EXECUTIVE SUMMARY

Objectives: The primary objective of this project was to understand the current innovation system of Jamaica and the extent to which intellectual property is or should be incorporated therein. It included a desk review to map the innovation system in Jamaica and to identify the main institutions and actors. A fact-finding mission followed on March 16 to March 20, 2015 in which face-to-face interviews were conducted with some major stakeholders. These interviews provided important core information.

### Our findings include:

- Jamaica has a very ambitious and complex overarching development strategy with 'Vision 2030' that tackles also the innovation dimension. However, the 'vision' may be over-ambitious and there are issues with respect to implementation, including the planned development of an S&T Strategy, which is delayed.
- Aside from the creative sector, overall innovation and IP performance is low. 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; also in some research institutes such as the UWI, UTech and the CMI. The nutraceutical industry, the app development and games/animation industries within the creative sector as well as the upcoming logistics hub are upcoming fields of opportunities.
- The level of integration of IP issues in the innovation system of Jamaica differs across institutions, but is generally rather low. Correspondingly, there is little overall IPR awareness in the majority of institutions with whom we met. However, there are also observable differences across industries particularly in the creative sector, which has strong IP awareness on copyright issues and a strong institutional anchoring of IP topics with its collective management organisations (CMOs).
- Linkages between research and industry including incentives for commercialisation are weak.
- Access to finance and funding sources are an issue, which is exacerbated by the tight public budgets and the current IMF requirements.
- There is a shortage of legal IPR services particularly in relation to patents and respective expertise in the country.

### Recommendations to the Government of Jamaica

1. Consider simplifying and increasing the level of concreteness of the upcoming S&T and innovation plan with realistic goals.
2. Focus efforts on integrating IP into the upcoming areas of economic opportunities, as identified, as well as the innovation hotspots.
3. Consider the establishment of a national IP champion together with a well-resourced implementation structure.
4. Continue to follow the approach to become signatory to important IP treaties.
5. Strengthen the capacity of intermediary organisations to provide adequate IP support.
6. Create efforts to establish a relevant statistical basis for monitoring innovation, R&D and IP activity.
7. Improve the general awareness level of IP in Jamaica.
8. Consider options to increase access to private /equity funding.

## CHAPTER 1 - BACKGROUND

This report describes the findings of the study on 'Integrating Intellectual Property Into Innovation Policy Formulation in Jamaica, which was commissioned by the World Intellectual Property Organisation (WIPO), Innovation Policy Section, to Technopolis. 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 is coordinating a European Union project entitled IPICA<sup>1</sup> – 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 studies are 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 reports,<sup>2</sup> 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 organised 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 organisations, universities, educational institutions), the industry sector (from small start-ups, established SMEs), private and public intermediaries (such as cluster organisations, 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

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<sup>1</sup> 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

<sup>2</sup> *WIPO (2013): Integrating Intellectual Property Into Innovation Policy Formulation In Serbia.*



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 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. 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 Jamaica follows the same structure as the other reports written so far<sup>3</sup>, particularly the one on Trinidad and Tobago written by the same author. 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 Jamaica, 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.

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<sup>3</sup> Other completed reports are with respect to Serbia, Cameroon, Rwanda, Sri Lanka and Trinidad and Tobago. They are available at <http://www.wipo.int/ipstrategies/en/>. This is the last in this series.

## 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 Jamaica was the starting point of the analysis. Compared to the review of T&T, we found somewhat less documents; a thorough analysis of the innovation system as such, like it was done for T&T, was lacking for Jamaica. Correspondingly, this report has much more of a stand-alone document character than our last report on Trinidad and Tobago. It must also be noted that the consequence of the fewer analyses performed in the past on the Jamaican innovation system translates also into a lighter empirical foundation and more explorative character of the study at hand.
- *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 and programme was developed. A one-week fact finding mission followed between March 16 and March 20, 2015, where face to face interviews were conducted with each of the interviewees representing important stakeholders of the Jamaican NIS. Interviews were in many instances group interviews with a number of staff from the interviewed institutions. The information gathered from the interviewees constitutes the heart of the learning gained in this project. The list of interviewees is provided in the Annex to the report.
- *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 Jamaica for integrating IP considerations into the innovation policy of their country.

## CHAPTER 3 – INNOVATION SYSTEM IN JAMAICA

### 3.1 Policy (and legal) framework

#### *Overview*

In section 3, we provide a discussion of the policy and legal framework for the innovation and IP system in Jamaica. We start by briefly describing the legal IP framework. Because of the focus of the report on the innovation system, we limit ourselves to a short description of Jamaica's current memberships in international treaties. For further information, readers are advised to consult the respective pages and information sources provided by WIPO.<sup>4</sup> We then discuss the major strategy and policy documents of Jamaica relating to innovation.

#### *IP legislation*

Jamaica is currently signatory to 11 (out of a total of 26 existing) treaties administered by the WIPO.<sup>5</sup> The treaties signed include in particular copyright-related treaties – such as the Berne Convention for the Protection of Literary and Artistic Works (entry into force in Jamaica in 1994), the WIPO Copyright Treaty (in force in Jamaica since 2002) or, most recently, the Beijing Treaty on Audiovisual Performances (signed by Jamaica in 2012, however the treaty as such is not yet in force) and the Paris Convention for Industrial Property. Jamaica is member of the World Trade Organisation (WTO) and therefore also a contracting party to the TRIPS agreement.

Notable exceptions of treaties where Jamaica is NOT (yet) a signatory country include the Patent Cooperation Treaty (PCT) and the Madrid Agreement for marks.<sup>6</sup> It is therefore not possible to use these two widely used internationally harmonised ways to file patent and trademark applications with Jamaica as a designation country. Moreover, Jamaica is also not member of the International Union for the Protection of New Varieties of Plants (UPOV).

The overall picture therefore is that Jamaica has mandated to fulfil the minimum requirements for IPR protection as defined by the TRIPS agreement, has some considerable thrust with respect to implementing international treaties in the copyright field, but is not as active in participating in specific international treaties concerning trademarks, patents or plant varieties. This picture is also the result, according to our interview partners, of a strong lobbying position of copyright-related industries in Jamaica.

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<sup>4</sup> See WIPO-Lex Jamaica, <http://www.wipo.int/wipolex/en/profile.jsp?code=JM>, as of July 1, 2015.

<sup>5</sup> Summary Table of Membership of the World Intellectual Property Organization (WIPO) and the Treaties Administered by WIPO, plus UPOV, WTO and UN, <http://www.wipo.int/treaties/en/summary.jsp>, as of July 1, 2015.

<sup>6</sup> We mention those because these treaties (and the non-membership) have been explicitly highlighted and discussed in the interviews.

### *Strategies in place to drive innovation*

The core strategy and policy document for Jamaica, not only for Jamaican innovation policy, is the '**National Development Plan – Vision 2030**'. The genesis of this plan dates back to November 2005, when – on the occasion of the 50th anniversary of Planning Institute of Jamaica (PIOJ) – the then Minister of Finance and Planning challenged the institute to produce national development plans “...*that are realistic, achievable and more relevant to the country’s realities.*”

In 2006, the process of developing the plan was formally started. A Plan Development Unit (PDU) was established at the institute, together with a Plan Advisory Group (PAG) with members from private and public sectors as well as civil society.

The plan development process was comprehensive and elaborate. It entailed the establishment of 32 task forces, where each was charged with developing a specific sector plan. In the end, after mergers of some task forces, there were 28 task forces working on 31 sector plans. The common framework used was the 'Threshold 21' model by the Millennium Institute in the U.S.<sup>7</sup> The Millennium Institute also supported the development of 'Vision 2030'.

Development time for the vision, which comprised extensive public consultations, reviews and workshops with stakeholders throughout Jamaica as well as with members from the diaspora, was around 3.5 years. In May 2009, 'Vision 2030' was formally adopted, covering a planning period from 2009 to 2030.

'Vision 2030 Jamaica' has three components:

- The *Integrated National Development Plan (NDP)* is the overall plan behind 'Vision 2030', integrating all individual 31 sector plans. It stipulates the overall national vision, four national goals, fifteen national outcomes and the strategies required for achievement in this context.
- The *Medium Term Socio-Economic Framework (MTF)* is a plan that is to be renewed every three years. It “...*summarises the national priorities and identifies the key actions to achieve those targets over each 3 year period from FY2009/2010 to FY 2029/2030.*”
- The 31 so-called 'sector plans' detail activities in different thematic fields. The notion of 'sector' is used in the policy documents to refer not only to economic sectors (industries), but also to horizontal subjects and thematic challenges. One of the sector plans deals specifically with science, technology and innovation.

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<sup>7</sup> Threshold 21 is described by the Millennium Institute to be a “...*quantitative to tool for integrated, comprehensive development planning. Its purpose is to support the broad process of medium- to long-term development planning by deepening understanding of the key structural relations, and enhancing the analysis of development strategies.*” The purpose of the model is to provide a framework with which the relationship between different sectors and the potential impacts of policies can be analysed. The model can be customised for individual countries and has been, according to the Millennium Institute, applied in a number of countries, including China, Italy, Malawi or Mozambique. (see Millenium Institute: T21 Integrated Development Model, <http://www.millennium-institute.org/resources/elibrary/papers/T21Overview.pdf>).

The national vision statement for Vision 2030 is: “*Jamaica, the place of choice to live, work, raise families and do business.*”<sup>8</sup>

The four national goals are:<sup>9</sup>

- *Goal 1:* Jamaicans are empowered to achieve their fullest potential
- *Goal 2:* The Jamaican society is secure, cohesive and just
- *Goal 3:* Jamaica’s economy is prosperous
- *Goal 4:* Jamaica has a healthy natural environment.

The 15 national outcomes are presented below (see Table 1).

The outcomes, together with statistical data, the rationale behind them, the strategies to be pursued, etc. are described in detail in chapter 3 of the National Development Plan, which is 226 pages long. For each outcome, the development plan defined a series of quantitative indicators against which success and performance of the planned activities are to be measured. According to interview sources, the most general aim of ‘Vision 2030’ is to be at the level of developed countries.

Table 1 - National Outcomes as envisioned by the National Development Plan for Jamaica

<i>Nr.</i>	<i>National outcome</i>
1	<i>A Healthy and Stable Population</i>
2	<i>World-Class Education and Training</i>
3	<i>Effective Social Protection</i>
4	<i>Authentic and Transformational Culture</i>
5	<i>Security and Safety</i>
6	<i>Effective Governance</i>
7	<i>A Stable Macro Economy</i>
8	<i>An Enabling Business Environment</i>
9	<i>Strong Economic Infrastructure</i>
10	<i>Energy Security and Efficiency</i>
11	<i>A Technology-Enabled Society</i>
12	<i>Internationally Competitive Industry Structures</i> <sup>10</sup>

<sup>8</sup> see <http://www.vision2030.gov.jm/>, as of Jul 20, 2015

<sup>9</sup> National Development Plan, Chapter 2, <http://www.vision2030.gov.jm/Portals/0/NDP/Chapter%20%20%28web%29.pdf>

13	<i>Sustainable Management and Use of Environmental and Natural Resources</i>
14	<i>Hazard Risk reduction and Adaptation to Climate Change</i>
15	<i>Sustainable Urban and Rural Development</i>

Source: National Development Plan, Chapter 3,

[http://www.vision2030.gov.jm/Portals/0/NDP/Chapter%203%20\(web\).pdf](http://www.vision2030.gov.jm/Portals/0/NDP/Chapter%203%20(web).pdf)

Turning the attention now to the topic of science, technology and innovation, the most relevant aspects are found in outcome 11 (*“a technology-enabled society”*). Nonetheless, we also find treatment of innovation topics as well as indicators that typically fall (also) into the sphere of research and innovation policy in other outcomes, such as, for example:

- *Outcome 2 (training)*: Percentage of population with tertiary education to grow from the target of 12% in 2012 (the level of Barbados) to 37% in 2030 (to be *“at the level of top ten OECD countries”*)
- *Outcome 8 (an enabling business environment)*: Goals defined are, amongst others, in relation to the development of SMEs (including training of SMEs); access to capital; or investment promotion. Interestingly, there is only one indicator defined in the NDP, the international ‘ease of doing business’ index.
- *Outcome 9 (strong economic infrastructure)*: This outcome includes an e-readiness indicator.
- *Outcome 12 (international competitive industry structure)*: Reference to innovation is found in relation to the ICT industries and the service sector (however, as it seems not to the other described economic sectors).
- *Outcome 14 (hazard risk reduction)* has also a reference to innovation.

The indicators for outcome 11 are presented in the table below. It can be seen that at the top of the hierarchy of policy and planning documents, three indicators are used: the number of publications and the number of resident patent applications, normalised by population size, plus the e-readiness index. The NDP does not make specific use of a version of a composite indicator, such as developed by WIPO (global innovation index) or in Europe in the course of the Innovation Union Scoreboard.

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[Footnote continued from previous page]

<sup>10</sup> Specific reference is made under this outcome to nine industries: agriculture, manufacturing, mining and quarrying, construction, creative industries, sport, Information and Communication technology (ICT), services and tourism.

Table 2 - Proposed indicators and target values for outcome 11

<i>Indicator</i>	<i>Baseline: 2007 or most recent</i>	<i>Proposed target 2012</i>	<i>Proposed target 2015</i>	<i>Proposed target 2030</i>	<i>Comment</i>
<i># of scientific publications/million population</i>	<b>48</b>	<b>&gt;=55</b>	<b>&gt;=62</b>	<b>&gt;=105</b>	<b>Target for 2015 is to meet CARICOM average of 71 scientific publications per million population (reported in 2000 World Science Report) and global average by 2030.</b>
<i>Resident patent filing per million population</i>	<b>4</b>	<b>&gt;=12</b>	<b>&gt;=18</b>	<b>&gt;=53</b>	<b>Target set to reach leading Caribbean benchmark by 2015.</b>
<i>E-readiness Index</i>	<b>5.05</b>	<b>&gt;=5.50</b>	<b>&gt;=6</b>	<b>&gt;=8</b>	<b>Targets set to meet the global average by 2015 and the average score for the top twenty countries by 2030.</b>

Source: National Development Plan, Chapter 3,

[http://www.vision2030.gov.jm/Portals/0/NDP/Chapter%203%20\(web\).pdf](http://www.vision2030.gov.jm/Portals/0/NDP/Chapter%203%20(web).pdf)

The section on issues and challenges for STI in Jamaica of the National Development Plan lists the following main concerns:<sup>11</sup>

- *Low levels of investment into R&D.* The country spends less than 1% of GDP on R&D, although it states to have “path-breaking work” in agricultural research and has expanded the science infrastructure.
- *Lack of a National Innovation System.* The section states: “Linkages between key players in the innovation process are weak or, in some cases, non-existent when compared to innovation processes in the developed world and rapidly developing economies that are deliberately poised to leapfrog into developed country status.”
- *Protection of Intellectual Property.* Some IP issues are discussed within the section on innovation policy, which has to be underlined as positive (i.e., IPR being seen as part of innovation). The report states: “We already possess the basic legal framework for protection of intellectual property. However, the framework has a number of weaknesses, including limited capacity of collecting agencies and other institutions, existing high levels of piracy, and relatively

<sup>11</sup> National Development Plan, Chapter 3, [http://www.vision2030.gov.jm/Portals/0/NDP/Chapter%203%20\(web\).pdf](http://www.vision2030.gov.jm/Portals/0/NDP/Chapter%203%20(web).pdf)

*low public appreciation of the importance of intellectual property rights. Jamaica is not a signatory to a number of intellectual property treaties, and conventions, including the Madrid Protocol.*"

As will be shown later, interview feedback would suggest that particularly in the field of copyright, CMOs have improved their standing and position. Becoming member of important international treaties is still in the works.

- *Limited role of government.* Under this point, the NDP states that the government could provide a greater catalytic role through adoption of ICT and e-government technologies, but that it lacks a specific vision or agenda for STI development.
- *Human Resource Development.* The NDP contemplates that science and technology education at the primary, secondary and tertiary levels: *"Secondary school examination pass rates are particularly low in subjects that are critical for technological progress, including mathematics and sciences. We have a low capacity for enquiry-based approaches to learning, and scientific enquiry is not a core component of teacher training. Technology deployment and usage is still curtailed by a combination of human resource factors including high illiteracy rates, loss of ICT skills due to migration, and low skill levels and high technology anxiety among the elderly."*
- *Inadequate data on ICT industry.* Under this point, the NDP calls for more data on ICT usage at both macro and micro levels.

The NDP defines two strategic approaches to tackle the issues noted with science, technology and innovation. On the one hand, the intention is to integrate science and technology into all areas of development. On the other hand, the aim is to establish a *"dynamic and responsive"* National Innovation System:

- The first strategic approach envisages a variety of goals termed 'selected sector strategies', including improved capacity for education; stronger ties between industry and academia; the establishment of a funding system with venture capital, foreign direct investment, loan schemes, etc.; creating *"an effective policy and legislative framework and advance STI including strengthening the Intellectual Property Rights (IPR) System"*; or a range of ICT-related measures. The NDP lists – in this context and exemplarily – no less than 17 goals or 'selected sector strategies'.
- The second strategic approach on establishing a *"world-class"* National Innovation System has eight goals or 'selected sector strategies', which cover the creation of finance and incentive mechanisms to attract research in Jamaica; to promote STI capacity formation and inward technology transfer (into the country); to create knowledge parks and centres of excellence; to invest, with private co-investors, into research infrastructure; to develop and organize world-class research teams. There is also a specific measure for ICT (*"increase commercial funding and grants for ICT research and innovation"*). Most interestingly, there is a call to *"...create a national research and development agenda."*

Furthermore, the NDP also assigns institutional responsibilities for implementation. Accordingly, it stipulates the National Commission on Science and Technology (NCST) to be the main coordinating agency for STI in Jamaica. More specifically, the task of the NCST is to elaborate a National Science and Technology Policy.



Together with the NCST, the NDP defined 10 responsible agencies for implementing the plan: besides NCST, the Scientific Research Council; two ministries (the Ministry of Mining and Telecommunications; the Ministry of Education); three universities (University of the West Indies (UWI); University of Technology; Northern Caribbean University); the College of Agriculture, Science and Education; the Office of the Prime Minister; and the Jamaica Library Service.

The '**Science, Technology Innovation – Sector Plan 2009 –2030**' is the base document upon which the summary in the NDP is built. Being therefore more elaborate, it details the aspects and issues described in the major NDP document. The document was, however, at the time of writing of this report (six years after the launch of 'Vision 2030') only available as a draft. Notable is also that the Sector Plan proposes more indicators than the NDP (#scientists and engineers/population; #of professionals in R&D; %change of government investment in R&D; personal computer ownership per 100 population; #government services available on-line). It also mentions more responsible agencies and stakeholders.<sup>12</sup> There is a long list of planned activities in the 'action plan' section of the document.

The 'Science, Technology Innovation – Sector Plan 2009 – 2030' is not to be confused with the envisaged **National Science and Technology Policy**, which is expected to be – according to interview sources – the key document for STI policy in Jamaica and related implementation activities. At the time of writing of this report, this National Science and Technology Policy did not (yet) exist, however.

Interestingly, though, there is a National Science and Technology Policy to download from the responsible Ministry of Science, Technology, Energy and Mining (MSTEM) dating from 1990 and retrievable from a prominent and easily accessible part of the ministry's homepage.<sup>13</sup> An undated UNESCO report – created seemingly in the mid-2000 years, before 'Vision 2030' was developed – states that the first science and technology (S&T) policy was promulgated in 1960, and superseded by the 1990 policy which was still in place and relevant in the mid-2000 years.<sup>14</sup>

Most of our interview partners referred in their interviews, though, to 'Vision 2030' and not to the existing National Science and Technology Policy. The conclusion therefore is, on the one hand, that 'Vision 2030' seems to be of high relevance for policy planning and making in Jamaica, while the 1990 Science and Technology Policy's relevance is limited. The same rather low relevance seems to apply for the Jamaica Science Technology and Innovation Roadmap from 2012, also retrievable from the MSTEM's homepage alongside the old S&T

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<sup>12</sup> In addition to the ones mentioned in the NDP, the Sector Plan lists, among others: the Ministry of Industry, Investment and Commerce; the Jamaica Manufacturers Association (JMA); the Jamaica Exporters' Association (JEA); the Jamaica Teachers Association (JTA); or "other" tertiary institutions.

<sup>13</sup> <http://mstem.gov.jm/?q=national-science-technology-policy>, as of Aug 31, 2015

<sup>14</sup> Villavicencio, D. & Ponce, L. (undated): Science and Technology System in Jamaica, <http://mstem.gov.jm/sites/default/files/Science%20and%20Technology%20System%20in%20JA%20UNESCO.pdf>, as of Aug 26, 2015.

Policy.<sup>15</sup> This 2012 report seems to be a comparative study on STI policies in benchmarking regions informing policy rather than a policy document in itself.

### **The role of IPR in ‘Vision 2030’**

Because ‘Vision 2030’ is a major policy planning document and seemingly relevant to policymaking, IPR topics should be featured and discussed there appropriately. Upon closer inspection, IPR is mentioned several times in the NPD, not only on the topic of STI (outcome #11). It is mentioned, too,

- ...in relation to building a nation brand in the course of outcome #4 on authentic and cultural transformation, where it is said that the state should review and enhance laws and the IP framework across all major IP instruments and to promote the use of IP as a tool for economic development. A focal point here is also the subject of cultural heritage.
- ...in outcome #5 on security and safety deals also with cyber and intellectual property crimes, i.e. the topic of IP enforcement.
- ...in outcome #8 on an enabling business environment tackles the issue of membership in different international treaties; the need to step up support in IPR members due to the envisaged implementation of the Caribbean Single Market and Economy (CSME); and the role of effective IPR protection in e-commerce.
- In outcome #12 on internationally competitive industry structures where *“...weaknesses in the legal and institutional framework for protection of intellectual property and high levels of piracy”* are mentioned as challenges.

It is notable that the economic industry sectors discussed do not mention intellectual property rights, except for the creative industries whose definition is based on the use of copyright. The overall conclusion would be that ‘Vision 2030’ touches upon IP issues, but does so only superficially.

To note is that Jamaica does not yet have a dedicated national IP strategy.

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<sup>15</sup> Ivey, I. (2012): Jamaica Science Technology and Innovation Strategic Road Map – International STI Best Practice Delivery Models, [http://mstem.gov.jm/sites/default/files/Science%20Technology%20and%20Innovation%20Roadmap\\_OPTIMIZED.pdf](http://mstem.gov.jm/sites/default/files/Science%20Technology%20and%20Innovation%20Roadmap_OPTIMIZED.pdf)

### 3.2 Institutional framework

#### *Policy decision-making and implementation bodies – the ministry level*

According to interview and literature sources, the following ministries are mainly involved in STI issues:

- The **Ministry of Science, Technology, Energy and Mining (MSTEM)**<sup>16</sup> – formerly the Ministry of Mining and Telecommunications – is seemingly the most important ministry in relation to science, technology and innovation. In terms of STI, MSTEM is tasked, among others, to encourage private sector innovation in the science, technology, energy and mining domains; and to promote and enable the exploitation of science and technology for innovation and economic development.

It supervises the two major agencies in relation to coordination of STI, namely the **National Commission on Science and Technology (NCST)** and the **Scientific Research Council (SRC)**. Other agencies labelled as ‘science’ agencies are the Earthquake Unit and the International Centre for Environmental and Nuclear Sciences (ICENS).

In the field of ‘technology’, relevant agencies under the auspices of MSTEM are: the e-learning Jamaica initiative; the Postal Corporation of Jamaica; the Spectrum Management Authority and the Universal Service Fund. There is hence a clear focus in the ‘technology’ area on the ICT subject, with related policies such as the ‘National Cyber Security Strategy’ and the ‘E-Powering Jamaica-Master Implementation Plan 2012’ which govern also regulatory issues.<sup>17</sup>

Other goals relate to specific energy and mining sectors, where the ministry supervises agencies such as Petrojam (Petroleum Corporation of Jamaica); the Wigton Windfarm or the Jamaica Bauxite Institute.

- The **Ministry of Education (MoE)**<sup>18</sup> is “...the government entity responsible for the management and administration of public education in Jamaica.” The agency supervises more than 1,000 public educational institutions of all levels with over 100,000 students and over 20,000 teachers. Most importantly in the context of STI policy is its supervisory role for two public **universities** as well as for the **Heart Trust/NTA**, the National Training Agency for vocational training in Jamaica.

The ministry’s functions are to plan, develop and implement educational policies and programmes; to monitor and evaluate the performance of locally and internationally funded projects and programmes; data collection and statistics preparation in the

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Villavicencio, D. & Ponce, L. (undated): The Science and Technology System in Jamaica, <http://mstem.gov.jm/sites/default/files/Science%20and%20Technology%20System%20in%20JA%20UNESCO.pdf>, as of Aug 31, 2015.

<sup>16</sup> <http://www.mstem.gov.jm/>, as of July 30, 2015

<sup>17</sup> <http://mstem.gov.jm/?q=policy-technology>, as of July 30, 2015

<sup>18</sup> <http://www.moey.gov.jm/about>, as of July 30, 2015.

educational field; to develop and support programmes geared towards personal and national development; and to provide guidance in financial matters for all educational institutions and affiliated agencies.

- The **Ministry of Industry, Investment and Commerce (MIIC)**<sup>19</sup> aims, in its mission statement, “...to increase local and foreign investments; be the driver of innovation and job creation; promote and protect Jamaican brands, consumers and businesses; and to create an enabling environment to increase earnings from export.” The ministry has focal activities in areas related to import monitoring, (fair) trade, imports and exports licensing or consumer protection. It is notably responsible for the administration of free trade zones.

In the context of innovation, the following agencies operating under the MIIC are relevant:

- First, the **Bureau of Standards Jamaica** is responsible for standards development in Jamaica.
- Secondly, the ministry supervises the **Jamaican Intellectual Property Office (JIPO)**.
- The third agency to mention in the context of innovation is the **Jamaica Business Development Corporation (JDBC)**, which operates a number of business intermediary services; in particular, it has a toolkit for Micro- and Medium-Sized Enterprises (investment calculators, sample business plans, etc.) and is active in supporting start-ups through ‘**Start-Up Jamaica**’ (see also later in section 3.5).
- While not an agency, it seems that the ministry – in particular through the JDBC providing specific support to MSMEs – has an important role to play for the upcoming **Jamaica Logistics Hub**. This hub is expected to boost the economy and could provide considerable innovation- and IP-related opportunities.
- Eventually, there is also a **self-start fund (SSF)** which is a government owned micro-finance institution.

*Policy implementation bodies – the agency and programme level*

### **The National Commission for Science and Technology (NCST)**

Among the agencies at the implementation and planning level below the ministry level, it is the **National Commission for Science and Technology (NCST)** that stands out in the area of innovation and research policy.<sup>20</sup> The NCST is, according to the National Development Plan, “...the main coordinating agency for STI in Jamaica”.<sup>21</sup> It is specifically tasked, within the Plan, to develop a Draft National Science and Technology Policy.

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<sup>19</sup> <http://www.miic.gov.jm/statements.php>, as of August 5, 2015

<sup>20</sup> <http://ncst.gov.jm/>, as of Sep 15, 2015

<sup>21</sup> Vision 2030, National Development Plan, Chapter 3, p. 185, <http://www.vision2030.gov.jm/Portals/0/NDP/Chapter%203%20%28web%29.pdf>

The NCST was founded in 1993 in the course of a project, on the initiative of one single person. We were told that the NCST saw a drop in activity in the timeframe of 2010 to 2013 due to government change and change of political foci. In 2014, work at the NCST regained momentum.

The NCST “...comprises representatives from public and private sector institutions, and academia whose decisions are implemented through steering committees, a secretariat, or through varying sub-committees.”<sup>22</sup> According to the NCST homepage, there are currently 28 members. The operative arm, the secretariat, consists of two persons plus a research director and an administrative secretary. **A National Foundation for Development of Science and Technology** “...was established to assist in funding the operations of the NCST including the Secretariat as well as science and technology activities and projects.”<sup>23</sup>

While to date there is no final and publicly available draft version of the intended National Science and Technology Policy, a number of activities have begun since 2014, the most significant of which are, according to interview sources:

- The field of popularisation of S&T was identified as a priority activity. One specific activity in this field is the organisation, together with the Scientific Research Council (SRC), of the ‘**S&T Month**’ – which is every year during the month of November.<sup>24</sup> Within the S&T month, there are a number of events organised, including: the awarding of a ‘**National Medal for Science and Technology & Innovation Awards**’ which seems focussed on outstanding research activity; ‘**National Innovation Awards**’, of which there were 14 in 2014 in different industry sectors; ‘**Venture Support**’, which is a spin-off from the National Innovation Awards and is intended to bring the innovators to meet with potential investors including capital providing institutions; as well as ‘**Science in the Park**’, which is a public exhibition of innovation and research activity in Jamaica.
- Another top priority is the **nutraceutical industry**. According to interview sources, there are as many as 80 plants endemic to Jamaica with medical properties, out of 160 that have been recognised to have such properties worldwide. Particular hope lies on ‘ganja’, the name given to the female plant of marijuana. The legal (medical use) demand for ganja/marijuana has been increasing considerably lately, due to legal reform particularly in some states in the U.S. The objective is therefore to establish a National Nutraceutical Industry (NNI).<sup>25</sup> The NCST was mandated to launch this industry, and a launch event took place in March 2015. Initially activities have comprised: the development of a map of actors; an analysis of value chains in the NNI; the studying of production processes and standards; or the identification of scientists and research needs. There is seemingly intense inter-institutional collaboration with, for example, the Bureau of Standards, JAMPRO, JDBC

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<sup>22</sup> Hutchinson, R. (2012): Jamaican Information Service, <http://jis.gov.jm/national-council-on-science-and-technology-to-be-re-established/>

<sup>23</sup> <http://ncst.gov.jm/national-foundation-for-st/>, as of Sep 19, 2015.

<sup>24</sup> <http://ncst.gov.jm/programmes/biotechnologybiodiversity/>, as of Sep 18, 2015.

<sup>25</sup> <http://ncst.gov.jm/programmes/nutraceuticals-and-functional-foods/>, as of Oct 9, 2015.

as well as with foreign organisations and countries and regions including Canada and the U.S. (Colorado).

- A third, envisaged, activity is, according to interview sources, an **audit of some 12 research institutes** working for the government in various fields. The mapping is to analyse what exists in terms of research capacity on the ground, what is being used and how to best empower the respective capacities for the creation of a **science and technology park** that sees examples in Singapore or Malaysia as role model. A particular challenge for this endeavour seems to be the fact that the research institutes operate under the auspices of different ministries.
- A fourth activity seems to be the **Technology Investment Fund (TIF)**, which is “...a special fund established to finance investments in commercial activities which contain new or substantial technological improvements and which would not qualify for funding using the existing criteria of commercial and development banks. It will also provide funding for research and development activities to enhance competitiveness and/or complement productivity in existing commercial enterprises.”<sup>26</sup> According to the NCST homepage, the TIF operates “...somewhat like a venture capital...providing sponsorship for ST&I projects which would not meet the criteria for funding normally applied by commercial/development banks.”<sup>27</sup>

The TIF did not come up, however, in any of our interviews as a significant source of finance (or even as a discussion topic). The NCST homepage says that there were two applications to the fund which were granted, but also states that “...there is a need to resuscitate and inject funds in order to facilitate any reasonable contribution to the demands being made by local innovators and those looking to use ST&I as a critical tool to develop their businesses and ideas.” The 2014 IDB Private Assessment Sector Report for Jamaica also noted three problems with respect to the TIF: i) lack of funds, ii) not user-friendly website and iii) no focus on micro, small and medium sized enterprises (MSMEs).<sup>28</sup> The most immediate conclusion to draw is that the TIF is not a highly relevant actor in the Jamaican innovation system.

Similarly, there is also an **R&D tax credit scheme** operated by the NCST. It, too, was not featured in any of our interviews. The IDB 2014 Private Assessment Sector Report states: “Most of the issues with the TIF also constrain firms’—and particularly MSMEs’—effective use of the R&D Tax Incentive Scheme. Particularly important is the fact that there is no clear focus on MSMEs and no special provisions for them.”<sup>29</sup>

So far, the NCST does not seem to have dealt to a larger extent with IP issues. Nonetheless, it has identified important problem areas relating to IP that need to be tackled, such as the management of the costs of international IP protection or the role of IP in an attempt to facilitate and boost sharing of results by various R&D-performing actors, particularly the aforementioned institutes. It was said that there is counselling provided to participants of the awards on IP, before they enter the competition. There is clear awareness on the role of IP particularly because of historic events, such as when in the 1950s Jamaican plant

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<sup>26</sup> <http://ncst.gov.jm/programmes/technology-transfer/>, as of September 11, 2015.

<sup>27</sup> **Error! Hyperlink reference not valid.** <http://ncst.gov.jm/technology-investment-fund/>

<sup>28</sup> Inter-American Development Bank (2014): Private Sector Assessment Report.

<sup>29</sup> Ibid.



specimens were taken away to other countries, which then proved to be the basis for foreign commercial products. The development of the National S&T Policy could prove to be a vital occasion to have IP covered, with support from WIPO, appropriately in the respective policy definition.

### **The Scientific Research Council (SRC)**

The **Scientific Research Council (SRC)** is “...Jamaica’s principal public sector agency, responsible for the fostering and coordination of scientific research and the promotion of its application. Most of the Council’s projects support the growth and development of the agro-industrial sector in Jamaica through research, adaptation of available technologies, creation of new and appropriate technologies and the provision of training and technical assistance.”<sup>30</sup> The SRC is interesting in that it is both an agency of MSTEM as well as an entity engaged in R&D, in addition to providing validation and testing services.

Established in 1960, the SRC’s organisation structure distinguished between six divisions, of which three are directly operationally involved with R&D matters:

- The Information Services Division with a Science and Technology Popularisation Unit (which in turn runs the schools science and education Centres). It also hosts a specialised library and the Caribbean Energy Information System (CEIS), which collects information on energy issues for 18 Caribbean countries.
- The Product Research and Development Division conducts applied R&D, which means more specifically: the provision of quality tests and analytical services; R&D on extraction technologies (inclusive of essential oils and natural products); the development of value-added products.
- The Process Development Division focuses on optimising production processes, developing engineering designs, conducting feasibility studies for the design and operation of wastewater treatment solutions.

The other three divisions are administrative (finance and accounting; human resources) as well as management divisions (executive directors’ office).

According to the interviews, the SRC is performing mostly contract research as well as exploratory and applied research. The emphasis has shifted to an extent away from contract research, which in the past accounted for 90% of the activities. The organisation is now more active in applied research and commercialisation / marketing as well as science popularisation.

An important target group were said to be MSMEs and start-ups, which can have some of their (new) products and ideas tested as well as further developed in collaboration with the SRC. The technology fields the SRC specialised in are waste management and energy, agro and biological sciences. The government covers 80% of the costs of the SRC, 20% have therefore to be covered by the private market. There is also collaboration with larger multi-national companies. The homepage of the SRC lists numerous past achievements, such as:

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<sup>30</sup> <http://www.src.gov.jm/>, as of Sep 11, 2015

the development of a solar crop dryer; solar salt evaporation technologies; reuse of treated sewage and wastewater for irrigation and soil conditioning, etc.<sup>31</sup>

Historically, the SRC was also, in the 1960s, tasked with defining S&T policies, and it was only afterwards that this function has been separated into the NCST. The SRC is a member of Board of the NCST.

In terms of IP it is notable that the SRC does not have currently an IP policy (one particular issue for example being that there is no clarity in the context of contract research as to who owns the IP that is generated). In the past, there used to be an IP manager, but currently legal advice on IP is available through a legal representative who is part of the SRC's board. The SRC has currently three U.S. patents, of which one seems to be commercially promising. A significant barrier is the available funds for the relevant international IP protection, and it was said in this context that "*...we have no money to play around.*"

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<sup>31</sup> <http://www.src.gov.jm/about/achievements/>, as of Sep 20, 2015.



## The Jamaica Intellectual Property Office (JIPO)

JIPO is a fairly young organisation, as it was only established in 2001 and only in 2002 did it acquire the status of a statutory body, under the Jamaica Intellectual Property Office Act. It is an agency of the MIIC, i.e. the ministry in charge for industry. Prior to that the various areas of IP were administered from different Ministries of the Government, until the decision was taken to establish a central IP Office. JIPO is the central focal point for IP in Jamaica and covers the whole range of IP protection instruments: copyright and related rights; trademarks; geographical indications; industrial designs; patents; plant varieties. JIPO also deals with issues related to traditional knowledge and cultural expressions.

JIPO has some 26 staff to perform its tasks. These tasks include the traditional registration services for patents, trademarks, industrial designs and geographical indications; an advisory function to the minister concerning IP policy as well as the provision of general advice concerning the development of IP policy, also on cross-sectorial issues; facilitation tasks regarding the use of IP by Jamaican creators and innovators; representing the government on IP at local, regional and international levels; and increasing public awareness on IP.

Operationally, JIPO “...conducts Public Education programmes for educational institutions, other Government agencies, community and business groups, and members of the creative community, as well as the enforcement arms of IP - the Police, Customs and the Judiciary on an on-going basis.”<sup>32</sup> The respective activities are bilateral, respectively multilateral collaboration with other government arms and agencies on specific topics; participation in international projects; the organisations of events and seminars; and the provision of advice to various stakeholders and innovators / creators. A specific target groups for advice were said to be MSMEs.

In the interviews, a number of hot topics emerged, for which JIPO had to provide advice and/or input, such as:

- *Collaboration with universities:* JIPO staff gives presentations to university staff as well as students on demand. In general, they felt that IP awareness was low, and said that “...IP is equated frequently to copyright. This means that whenever the topic is some form of IP (be it patents, trademarks or indeed copyright), the term copyright is used throughout.” The types of presentations depend on the technology / research field, e.g. to song-writing classes; advice was given on the development of an IP strategy of a university. The mode of operation, also in relation to organisations other than universities, is that JIPO either reacts on requests or pro-actively approaches organisations. To note is that there is no dedicated person to undertake these tasks.
- *Use of IP as collateral:* Recently, in 2013, a law was passed – in the scope of the Security Interests in Personal Property Act (SIPP) – that allows the use of IP as collateral for loans. This new law, aimed seemingly and primarily at the Creative Industries, has sparked interest in how to value IP. IP that can be used as collateral

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<sup>32</sup> <https://www.jipo.gov.jm/?q=node/35>

includes copyrights, patents or trademarks. Against this backdrop, JIPO is seeking to facilitate training for financial institutions on how to value respective IP.

- *Participation in commissions:* JIPO has participated in newly established commissions for the creative industries and for the nutraceutical industries. It engages there in working groups and has drafted, for example, a policy document in the Creative Industries Commission.

The JIPO also informed us that they intended to join the Madrid and PCT systems. It is also important to note that the office has slightly changed its status so as to enable it to use some of the funds it generates for their activities.

Overall, the interviews suggest the collaboration of JIPO with a smaller core group of institutions seems to work rather well. This applies particularly to the Creative Industries. By contrast, collaboration with stakeholders from technological fields could be improved.

### 3.3 Knowledge/research base

There are a variety of tertiary educational institutions in Jamaica, but only a select few seem relevant in the context of conducting research and their principal ability to spin out innovations:

**The University of Technology, Jamaica (UTech)** is a technical tertiary institution, which started focused mainly as an engineering school that was founded in 1958 originally as the 'Jamaica Institute of Technology'<sup>33</sup> and was accorded university status in 1995.<sup>34</sup> It offers graduate and undergraduate degrees not only in areas related to engineering, but also in business administration, law, tourism or health sciences. The syllabi are modelled after the British polytechnic system. Currently, there are 50 programmes and about 10,000 enrolled students.

Of special relevance in the area of innovation and IP is the **School of Graduate Studies, Research & Entrepreneurship (SGSRE)**. The SGSRE replaced, as a 'virtual' institution, the Office of Research and Graduate Studies in 1997. The principal aims of the SGSRE are:

- To develop and deliver graduate programmes in line with international standards and best practices.
- To guide research and support research activities performed across UTech.
- To generate income through supporting entrepreneurial activity, e.g. by providing consultancy services and creating innovations.

The main activities can be described as helping researchers access funding and supporting them in the research. In interviews, the SGSRE was described as a research management's office that acts as a central unit to support researchers with questions related also to innovation and IP management.

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<sup>33</sup> Later on, it was also named 'College of Arts, Science and Technology', which reflects the very close relationship between the arts and technical sciences we have witnessed in the Caribbean and in Jamaica in particular at university level, a relationship that is, for example, not common at respective peer institutions in Central Europe.

<sup>34</sup> Homepage of UTech, <http://www.UTechjamaica.edu.jm/>, as of August 7, 2015

Part of the SGSRE is the relatively young **Office of Intellectual Property** which was established in 2009 and, starting with 2010, has commenced with the “...*professional legal and IP protection, registration advisory & business services related to intellectual property to the public, industry, scientists, inventors, creative practitioners, academicians, businesses and students.*”<sup>35</sup> The SGSRE, together with its IP Office, therefore discharges the principal functions of a technology transfer office (TTO) paired with research support services, a set-up which can be also frequently found in Europe.<sup>36 37</sup> There is an internal IP policy, however it is not (yet) published. The SGSRE also operates a consultancy unit, by which it wants to leverage the know-how present at UTech and generate additional income through contract research and consultancy assignments. The SGSRE is also UTech’s contact point for many international projects, such as the EU-funded Cap4Inno project<sup>38</sup> or IPICA<sup>39</sup>, which have been said to have an important role in building capacity and know-how.

Another important institution is an **incubator facility**, located at UTech’s **Technology Innovation Centre (TIC)**. According to interview sources, the business incubator, around 13 years old, was the first in the English-speaking Caribbean. It has been to date used by 34 companies/spin-offs from UTech. The plan is to turn the incubator into a business development centre open also for start-ups outside of UTech. The TIC does not offer IP support to its tenants.

**The University of West Indies (UWI)** at Mona (Mona Campus) is the founding campus of the regional (multi-national) University of the West Indies, and was established in 1948.<sup>40</sup> It is also the central/headquarters for the whole of the UWI campuses in the Caribbean.

UWI at Mona offers undergraduate, masters and doctoral programmes in a variety of fields, including humanities and education; science and technology; agriculture; engineering; law; medical sciences; social sciences. Programmes such as Entertainment Management and Masters in International Trade have an IP component. A masters program in IP with a focus on the creative and cultural industries is proposed to be started soon. There are also customised courses offered to lawyers.

The number of enrolled students (on- and off-campus) was around 15,000 in 2013. The university was described in interviews as a “*traditional*” university built on the UK system.

UWI Mona states that “...*research and innovation is the centrepiece of the UWI Mona’s transformational agenda*”.<sup>41</sup> Coordinating research at UWI Mona is the **Mona Office for**

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<sup>35</sup> <http://www.UTechjamaica.edu.jm/offices/SGSRE/intellproperty.html>

<sup>36</sup> Although a distinction is also that the tasks of the SGSRE are broader, particular because of its duty to develop graduate programmes.

<sup>37</sup> An example of such a combined research services / TTO unit is, for example, the unit ‘Research Support, Innovation & Technology Transfer’ (<http://www.boku.ac.at/en/fos/>), of the University of Natural Resources and Life Sciences, Vienna / Austria

<sup>38</sup> <http://www.cap4inno-project.org/>

<sup>39</sup> <http://www.ipica-project.eu/> a partner in this project as well

<sup>40</sup> UWI was originally an independent external college of the University of London.

<sup>41</sup> <http://www.mona.uwi.edu/researchinnovation>

**Research and Innovation (MORI)** (formerly: the Office for Sponsored Research), which is part of the Principal's office. MORI's tasks are:<sup>42</sup>

- To seek partnership with foreign universities/colleges with potential for collaborative research, student and staff exchanges and technical assistance.
- To seek contracts from local private and public sector entities (contract research and development projects).
- To manage and administer licensing, patents and joint venture.

The picture therefore emerges again of a unit combining research (contract) management with technology transfer office (TTO) functions. Plans are to grow MORI and its capacities. According to interview sources, there is no UWI-wide/ campus-spanning TTO (i.e., a TTO that would span all the UWI campuses across the Caribbean, though one seems to be contemplated; MORI is basically such a unit only for the MONA campus). A small unit within UWI Mona has designed and circulated a centrally developed IP policy that will be functionally implemented by the individual national campuses.

Of all UWI campuses, UWI Mona has the most patents: 17 published patents, of which nine granted, most of which in the U.S., many of which related to biotech.<sup>43</sup> Against the backdrop of being a “*traditional*” university, it was said in interviews that the prevailing success metric for researchers at UWI Mona is nonetheless the number of scientific publications, following “...*the mantra of publish or perish*”, although there seems to be now also more consideration given to patents in an attempt to use “*international best practices*” to assess research performance.

UWI Mona can draw on a variety of interesting research results that sound promising for commercialisation, mainly biotech/health-related which also are behind most of the filed patents. So far, however, only one invention was commercialised, a cardiac simulator (see text box below).

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<sup>42</sup> <http://www.mona.uwi.edu/osr/>

<sup>43</sup> Written correspondence with UWI Mona staff and interview sources.

### **Cardiac simulator – a potential success story for a Jamaican invention to be commercialised**

The Cardiac Simulator uses a pig's heart "...which is very similar to a human heart in most respects, and makes it move as if it is alive and beating and has artificial blood flowing through it. The heart is connected to computer software, inclusive of simulated vital signs monitor. The simulator allows the heart to beat in synchrony with the vital sign traces being displayed on the monitor."<sup>44</sup> The simulator can be used by local medical trainees to practice and train open heart procedures rather inexpensively in areas/regions where there is not so much opportunity to practice, because of lack of high-volume surgery centres.

There have been requests by various U.S. clinics to test the simulator prototypes. The commercialisation partner is the U.S. firm "Kind Hearts", based in North Carolina, which manufactures the devices and coordinates the testing to provide 'proof of concept'. The U.S. firm approached UWI Mona pro-actively. According to interview sources, the project has also received U.S. NiH funding. UWI sees the benefit of the invention not only in some monetary returns, but also in boosting international recognition. The intent is to make UWI Mona a centre for simulator development in this field.

Apart from MORI, to mention is also Mona **Business Hub**<sup>45</sup>, which incorporates an incubator, focussed primarily on IT start-ups. Plans are to expand the incubator facilities and cover also other technologies. Overall, driven by a new principal, the cardiac simulator is an example of a "*transformational strategy*" pursued that puts more emphasis on projects and R&D with commercial prospects and with aims and benefits aligned to national and regional development needs.

UTech and UWI Mona can be considered the two main actors of the Jamaican university and research base. In our field trip, we nonetheless found interesting examples of other institutions that hold promise for bringing out innovations, and with probable needs in the IP field:

One interesting example is the **Caribbean Maritime Institute (CMI)**.<sup>46</sup> It is a tertiary institution for maritime education, training, research and consultancy and states that in these fields it is the regions centre of excellence. The institute was established in 1980 in a joint collaboration between Norway and Jamaica. The Institute has three 'schools': the School of Academic Studies (which performs research and grants bachelor degrees and master's degrees in a variety of fields); the School of Marine and Professional Studies; and the School of Advanced Skills. The plan is to obtain university status and become the Caribbean Maritime University.

Originally tasked with training seafarers, CMI has expanded its scope considerably and performs also research and innovation activities, focused not so much on basic research but on developing practical solutions for country needs. A particularly interesting project was

<sup>44</sup> UWI Mona (2013): UWI Mona's Cardiac Simulator goes into commercial production, <http://www.mona.uwi.edu/marcom/newsroom/entry/5349>

<sup>45</sup> <https://www.mona.uwi.edu/businesshub>, as of September 1, 2015.

<sup>46</sup> <http://www.cmi.edu.jm/>

related to LED lighting (see text box below). Similar projects exist with respect to water treatment or a solar energy-powered refrigerator.

### **The LED street lighting retrofit project**

Jamaica's street lighting system traditionally uses a proprietary lighting system, where replacements are costly. Because it does not use the newest energy-saving LED technology, it is also rather power hungry by today's standards, and this in a country where electricity is notably more expensive than, for example, in the U.S.

The idea was therefore born to replace the street lighting system with newer LED lights. However, CMI researchers sought to replace just the bulbs, not the whole street light lamps. This is similar to when consumers today replace their light bulbs at home with fitting LED light bulbs. The technological challenge was not so much in designing appropriate LEDs – these existed already as commodity – but to combine several of them into a bulb casing compatible with the old streetlights in Jamaica.

This task was not particularly high-tech, but proved to be beneficial at multiple levels: First, it was an innovation that saves Jamaica electricity costs and is therefore an environmental innovation. Secondly, it also proved to be a social innovation, as local Jamaican workers could do the manufacture of the retrofit bulbs as handicraft work, without too much training. The innovation is therefore also a means to battle unemployment. Thirdly, the project was also a good example in demonstrating clever public procurement in the context of innovation.

To date, the lighting system from the airport to Kingston has been retrofitted with the LED lamps; further retrofitting is expected. IP issues do not abound, as the base LED technology was developed and protected elsewhere. No action was therefore taken in the context of IP. However, we believe that there could be possible courses of action for example with respect to using utility models or trademarks, particularly should be considered to make the retrofitting of street lamps e.g. an international / regional business model.

A particular field of activity with potential is also training in relation to the upcoming Jamaican logistics hub. In respect to this hub, there may be also potential for new innovations. The CMI has up till now not paid too much attention to IP protection (there is no IP policy yet, for example), due to a) many inventions having a rather 'low tech' character, b) the high costs for the necessary international protection as well as to an extent probably c) because of the 'social innovation' character/culture which could stand against strong IP protection and commercialisation aims. CMI found an 'open source' approach more beneficial for its purposes, though this attitude could change with progress *"...when we have sth. really great (in terms of technology) coming out."*

**The Northern Caribbean University (NCU)** is *"...a private, liberal-arts institution, and is owned and operated by the Jamaica Union Conference (JAMU) and the Atlantic Caribbean*

*Union Mission (ACUM) of Seventh-day Adventists.*” The university is the oldest private tertiary institution in Jamaica. Around 5,000 students from 34 countries are enrolled.<sup>47</sup>

According to interviews, the NCU has an IP policy and has also patented some inventions, particularly in the agri-cultural sector and in relation to breadfruit research. There is no dedicated technology transfer office (TTO), but a legal department and an Office for Research and Grants. The focus of the Office for Research and Grants is, as the name suggests, however less focussed on IP and commercialisation issues than on taking out grants from various, in particular, international sources. Notable is also that NCU performed research on health benefits of certain plants and drinks<sup>48</sup> – which are then quoted by industry as testimonials – but there does neither seem to be the desire, nor the basis to commercialise said research using IP rights. Interestingly, the university envisages producing certain agricultural goods, which it researches and sells under its own brand and in its own shop (in which case trademark protection would be relevant), though not in large quantities.

### 3.4 Industrial base

According to the IDB Private Sector Assessment report, “...*Jamaica is a highly entrepreneurial society, with a relatively large private sector and a fairly high level of early-stage entrepreneurial activity. The private sector employs almost 90% of the country’s working labour force, and approximately 82% of the working labour force employed by the private sector works in micro, small and medium-sized enterprises (MSMEs). The retailing of merchandise (with little, if any, transformation) and small-scale farming are the types of low-value-added activities in which many own-account workers (who make up one-half of all workers in MSMEs) and microenterprises are involved.*”<sup>49</sup>

To note, according to the IDB report, is a high failure rate of MSMEs. Whereas farming is dominated by small firm activity, and not very popular among educated young people, other sectors (transportation, storage, communications, real estate, manufacturing) also have a larger number of medium-sized or large enterprises. Services are unsurprisingly concentrated in the tourism sector. This sector also holds, the potential and promise to create business for other sectors. The IDB report notes specifically on innovation deficiencies of the industrial base, pointing to low rankings in innovation scoreboards. This poor performance – in comparison to peer countries from the region – is attributed to factors such as a lack of scientists and engineers or poor collaboration between universities and industries.

On the other hand, “...*there is hope for improvement, as the country’s capacity for innovation is ranked 60th, the second-highest in the region after Guyana’s (38th).*”<sup>50</sup> The report

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<sup>47</sup> <https://www.ncu.edu.jm/AboutUs.aspx>, as of September 11, 2015.

<sup>48</sup> An example here would be a drink based on the Sorrel plant, whose properties were analysed and the respective positive results quoted by GraceKennedy.

<sup>49</sup> International Development Bank (2014): Private Sector Assessment of Jamaica. The recently launched Global Innovation Index by WIPO puts Jamaica at rank 96 of 141 countries. Trinidad and Tobago is ranked 80<sup>th</sup>, Barbados ranked 37<sup>th</sup> and Guyana 86<sup>th</sup> (see [http://www.wipo.int/export/sites/www/econ\\_stat/en/economics/gii/pdf/2015/gii\\_2015\\_rankings.pdf](http://www.wipo.int/export/sites/www/econ_stat/en/economics/gii/pdf/2015/gii_2015_rankings.pdf))

<sup>50</sup> <https://www.ncu.edu.jm/AboutUs.aspx>, as of September 11, 2015.

therefore generally draws – with exception for the “hope of improvement” – a bleak picture of the innovation capabilities of the private sector and sees lack of innovation as a key challenge for private sector development. It also identifies four emerging sectors: tourism; information and communications technology (ICT); food processing; as well as the culture/creative and sports industries.

The Creative Industries are particularly noteworthy: A study commissioned by WIPO found that in 2005, “...*the copyright sector contributed J\$29 billion in producer’s values at constant (1996) prices (US\$464.7 million), or 4.8 % of GDP. The sector also accounted for 3.03 % of employment.*”<sup>51</sup>

In our interview programme, we found examples of ‘positive deviants’ from the on average low performing and innovation lacking industrial base, that also have an exposure to IP topics. These examples are the firms ‘Biotech R&D’ and ‘GraceKennedy’.

#### **Case study: GraceKennedy**

The company ‘GraceKennedy’ was founded 1922 in Jamaica and was originally involved in trading and steam ships. Today, the firm operates as a conglomerate with two divisions: food and financial services. Relevant for innovation and IP is particularly the food division. The company has five food factories in Jamaica and sells a variety of foods under its own brand, but also through distributors, in the region and to countries like the UK (where the subsidiary Grace Foods Ltd. was established), to the U.S., Canada or Ghana. The company has around 2,000 employees worldwide, among them 1,200 are in Jamaica.

The food industry is known to be very innovative, and so GraceKennedy is also actively innovating. Innovation is centralised in Jamaica (except for the UK, which has its own innovation team). Innovation has three components: i) strategic sourcing (raw materials, external innovations); ii) product design and development (developing products according to regulatory requirements; new formulations (most notably for beverages); innovative packaging) and iii) business development (new markets and distribution channels).

The company is exposed to IP at several levels, most notably with respect to internally developed product formulations. These are protected by trade secrets, and for this specific purpose there is also a written policy in place. Also important are brands and hence trademarks, which need to be protected and are protected in several markets. Patents play a role, though to a lesser extent. In its innovation processes, GraceKennedy collaborates with researchers from local universities, particularly UWI, but also, for example, the NCU.

According to a GraceKennedy representative, while “...Jamaica has some brilliant minds”, the problem is to transform good research into practical results and commercial successes. More specifically, there is a lack of structures and frameworks to foster collaborations between the research and industrial sectors. And there is also fragmentation and a need to concentrate the research capacity.

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<sup>51</sup> JIPO Homepage, citing James, V. (2007): The Economic Contribution of Copyright-Based Industries to the Jamaican Economy.



To note is also an emerging cluster of firms in the ICT sectors who are active in App development as well as in computer animations. These firms are supported in particular through Start-Up Jamaica (see also section 3.5 below).

Eventually, there are also efforts to resuscitate and/or develop industry sectors like the coca industry or the bamboo industries. Bamboo, for example, is used in construction. However, it could be used more if material properties are better-understood and respective standards developed.

### 3.5 Intermediaries, institutions and actors that support the innovation system

There are a number of business intermediary organisations in Jamaica, of which the following are particularly noteworthy:

- **Start-Up Jamaica (SUJ)** is *“...a public/private partnership between the Government of Jamaica through The Ministry of Science, Technology, Energy and Mining (MSTEM) and the Development Bank of Jamaica (DBJ) on the one hand, and local and overseas private investors on the other, with the support of The World Bank Project “Youth Employment in Digital and Animation Industries”. The local and overseas private investors include JNBS, LIME, NCB, and Oasis500.”*<sup>52</sup> SUJ is a physical facility that takes equity in start-up companies that focus on mobile/ICT technologies. Support provided covers training in *“...key skills and technology, business, management, legal and accounting support that will prepare them to pitch to equity investors (“Angels” or “Venture Capitalists”) and receive investments to grow their businesses.”*<sup>53</sup> The training was said to have also an IP component. Start-ups are supported throughout a period of 100 days. So far, according to the SUJ homepage, 26 firms have obtained ‘Oasis-500’ funding/investments.<sup>54</sup>

MSTEM sees SUJ as an important element to turn Jamaica from a country of technology users into a country of technology creators. SUJ is also an attempt to create a network of local mentors, business angels and investors / private equity providers; so far, there has been already a small network established, according to interview sources.

- **The Jamaica Business Development Corporation (JDBC)** *“...has been established as one of the premier business support organizations in Jamaica, and is well respected by clients and funding institutions alike.”*<sup>55</sup> The main target groups are MSMEs. Services provide include business advice and training (though not specifically IP advice, IP services are referred to JIPO); technical services (which

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<sup>52</sup> <http://start-upjamaica.com/about.html>, as of Sep 5, 2015.

<sup>53</sup> Ibid.

<sup>54</sup> ‘Oasis 500’ is a Jordan-based early stage investment company (see [www.oasis500.com](http://www.oasis500.com))

<sup>55</sup> [http://www.jdbc.net/index.php?option=com\\_content&view=category&layout=theme1869:category&id=9&Itemid=167](http://www.jdbc.net/index.php?option=com_content&view=category&layout=theme1869:category&id=9&Itemid=167), as of Sep 20, 2015.

includes assistance in product development up to commercialisation, visual design services, food and agro-processing services, engineering services or incubators); support for marketing; as well as research services (provision of data as well as market research). The MSME toolkit is a list of electronic tools and documents that can help firms check and examine certain aspects of their businesses. According to the JDBC, some 2,000 MSMEs took already advantage of the offerings by a team of 30+ advisers and consultants.

- The **Human Employment and Resource Training Trust, National Training Agency (HEART Trust)**<sup>56</sup> is specialised in providing vocational training in Jamaica. It operates 29 training centres throughout the country. According to interview sources, the HEART trust has an IP management committee. Exposure to IP is in the form of trademarks as well as with respect to questions regarding the use of training material and the respective rights management. However, IPR as subject of vocational training seems to have been less of a topic within the trust's training activities.
- The **Jamaican Exporters Association (JEA)** "*...is a non-government members association which was established in 1966 to promote and support the growth and development of the export sector.*"<sup>57</sup> It has established a network of export centres and business information points for advisory services in various places throughout Jamaica and provides loans to exporting firms.

One particularly noteworthy activity is the creation of a subsidiary of JEA, the **Competitiveness Company**<sup>58</sup>, in 2005. It applies the concept of clusters to the Jamaican context and offers the following services: cluster creating advisory services (by which participating firms are helped in coordinating activities with other firms and entities); strategy coaching; market research and policy research. The institution can therefore provide advice and data.

- The **Jamaica Chamber of Commerce** is a private chamber, where membership is not obligatory.<sup>59</sup> The chamber is particularly active in representing the business side in policy making and in advocating Jamaica as business location. The Chamber has a number of committees grouped into clusters, where members work together on topics such as taxation, regulatory environment, etc. Members are both from within Jamaica and subsidiaries of international firms.

In the area of copyright and creative industries, there are three CMOs to be mentioned:

- **JAMMS (Jamaica Music Society)** was established in 2006. JAMMS "*...was established with the collaboration of the International Federation of Phonographic*

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<sup>56</sup> [www.heart-nta.org/](http://www.heart-nta.org/), as of Sep 24, 2015.

<sup>57</sup> <https://www.exportjamaica.org/>, as of Sep 30, 2015.

<sup>58</sup> [http://www.exportjamaica.org/start/index.php?option=com\\_k2&view=item&id=7:the-competitiveness-company&Itemid=111](http://www.exportjamaica.org/start/index.php?option=com_k2&view=item&id=7:the-competitiveness-company&Itemid=111), as of Sep 30, 2015.

<sup>59</sup> <http://jamaicachamber.org.jm/the-jamaica-chamber/>, as of Sep 30, 2015.

*Industry (IFPI), the Recording Industry Association of Jamaica (RIAJam), among other local interests, and has been constituted to represent both local record producers/labels as well as international recording companies/labels.*<sup>60</sup> JAMMS represents international and national record producers.

- **JACAP** is the **Jamaica Association of Composers Authors and Publishers**.<sup>61</sup> It began operations in 1999 representing 44 members. By April 2013, JACAP had 3,152 members in Jamaica. The association represents the primary right holders of music creators (composers and authors) and publishers.
- **JAMCOPY** “..., the **Jamaican Copyright Licensing Agency**, is the national rights management organisation in the text and image sphere.” JAMCOPY was established in 1998, and in 1999 the Jamaican Government recognised JAMCOPY as the sole national licensing body for the reproduction of copyright protected materials published in the print media and signed the first licensing agreement.

Interview sources have reported about a **lack of qualified legal support for IP**, particularly in patenting matters. Accordingly, actors have reverted to use foreign (e.g., U.S.) legal support for the filing of patents. Country size is certainly an issue in this context (in addition to the usage levels of IP), and it stands to reason that a country like Jamaica cannot provide a sufficiently large market to support patent attorney businesses across all technology fields. A possible course of action could be to build up some capacity for the core economic strategy areas – e.g., the creative industries, the nutraceutical industries –, and for remaining fields to use foreign legal and patent agent services, e.g. as part of a regional network that is built for this purpose.

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<sup>60</sup> <http://www.jammsonline.com/>, as of Sep 28, 2015.

<sup>61</sup> <http://www.jacajamaica.com/>, as of Sep 28, 2015.

## CHAPTER 4 – ANALYSIS OF THE LEVEL OF INTEGRATION OF IPR IN THE NATIONAL INNOVATION SYSTEM

### 4.1 Overall strategy and policy level

#### *Overall strategic approach with 'Vision 2030'*

We start our analysis of the level of integration of IPR in the national innovation system at the overall strategy and policy level. In the context of Jamaica, this leads to a closer look at the 'Vision 2030' and its corresponding National Development Plan.

The first impression of the vision is generally a positive one. The NDP is very comprehensive, follows a sophisticated multi-dimensional structure and framework (connecting all parts) and covers a wide range of topics both at strategic level as well as with respect to evaluation requirements and monitoring. What is also positive is the extensive involvement of various stakeholders. At least as far as innovation policy is concerned, it seems that all relevant actors had the opportunity to (and did) contribute to the development of the vision. The various stakeholder consultations, working groups as well as, also outside the scope of 'Vision 2030', the number of inter-agency commissions being set up indicates that there is no shortage of these forms of communication across institutions and agencies.

What is also positive is that all major stakeholders generally accept the vision as a guiding document. This is frequently not the case, with many strategies being 'dead' documents ending up as in practice irrelevant papers in drawers. Not only did most stakeholders in our interviews refer to 'Vision 2030', the strategy and its guiding function also survived government and administration changes.

Upon closer inspection, there are also weaknesses visible in the innovation policy field.<sup>62</sup> These seem to be mainly in the area of implementation. It is clear that the implementation of the sectorial plan on S&T is lagging, not the least because of the delay in the required development of an S&T strategy. While many interview partners point to the lack of funds as major issue, there may be also other factors contributing to the delays or below plan achievement so far. One such factor may be overly ambitious targets and goals, as noted in the UNCTAD review. One other factor may be that the strategy is too complex for a country like Jamaica, treating many goals and subjects rather at a 'meta-level' and lacking concreteness in relation to specific activities to be carried out.

The small size of the country means, for example, that only two to three major university actors are present (particularly UTech and UWI) and hence, there may not be a need for a fully-grown strategy document that is designed to cover a large number of universities. Against this backdrop, it could be desirable to align the overall S&T strategy more to the individual institutional strategies of relevant actors in the research base. In very small countries, it is conceivable that the overall S&T, national, strategy is actually the combined strategy of the few number of relevant actors, i.e. the institutional strategies. We believe that it could be therefore worthwhile to attempt a simplification of the vision in the S&T area, with

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<sup>62</sup> As innovation and IP policy are the foci of the study, we only look at these aspects of 'Vision 2030'.

more realistic well-substantiated goals that arise from a higher level of detailed activities described for the few relevant institutions engaged on R&D and innovation in Jamaica.

In terms of IP, and in line with the above considerations, we found that IP is indeed mentioned throughout the National Development Plan, but again a more specific level of detail on how exactly IP should be used to leverage innovation (and what specific activities should be undertaken) could prove beneficial.

#### *Current economic opportunities*

From our interviews, it emerged that there are three economic areas that hold promise for the medium-term economic future:

- The nutraceutical industries
- The creative industry (including an App/animation/ICT cluster of firms)
- The upcoming logistics hub

These three areas, “hot topics” so to speak, are subject to specific policy activity, and they also witness a surge in entrepreneurial interest. They also face, to different extents, challenges in the area of IP that could or need to be addressed.

In the area of the **nutraceuticals**, Jamaica, given its natural resources, reacts to the fast growth of the market for nutraceuticals that is expected to “...be worth US\$600 billion with the opening of the Asian markets in 2018.”<sup>63</sup> The challenges are manifold and include the need to perform research on plant properties, create new breeds up to regulatory reform, finding viable business models and exploring business partnerships with investors and trading partners abroad. Likewise, there are also a number of IP-related challenges: the general awareness on IP issues, the specific use of geographical indications (GIs), trademarks, plant varieties, perhaps also process patents, design protection (for packaging, for example), use of IP in joint collaborative R&D projects, etc. It is advisable that these issues are tackled early on in the formulation of a strategy for the nutraceuticals industry, so that there are no opportunities lost.

Jamaica can draw already on a core of successful researchers (e.g., at UTech and UWI) as well as examples of innovative / growing business in the area. One such business is the Eden Garden / Biotech R&D institute, which are part of the EHF group of companies.

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<sup>63</sup> [http://www.jamaicaobserver.com/news/Jamaica-launches-National-Nutraceutical-Industry\\_18518952](http://www.jamaicaobserver.com/news/Jamaica-launches-National-Nutraceutical-Industry_18518952), as of Sep 28, 2015.

### Case study – The EHF Group of Companies

The history of the EHF Group of companies, particularly the Bio-Tech R&D institute and the 'Eden Garden' facility, date back to the early 1990s. The EHF (Environmental Health Foundation) group of companies was set up in 1992 by scientist and former politician Dr. Henry Lowe. The group includes a number of firms working on different aspects of nutraceuticals.

The group, of which Dr. Lowe is head of, includes "...a commercial entity, *EHF Resource Development Limited*. This company has subsidiaries *Pelican Publishers Limited* (a boutique publishing house with an emphasis on wellness and health publications), *Eden Gardens Wellness & Lifestyle Limited* (a premier wellness & lifestyle centre), and *Bio-Tech R&D Institute* (a company engaged in the research, development and commercialization of health and wellness products from Jamaican plant-based materials)."<sup>64</sup> It also includes a not for profit organisation, the Environmental Health Foundation (EHF) with the mission to "...enhance the quality of people's lives in Jamaica."<sup>65</sup> All entities within the group are privately owned.

Of particular interest in the context of this study is the Bio-Tech R&D institute, which was founded rather recently in 2010. As for its mission, the institute "...is to create value through the development and commercialization of nutraceuticals, functional foods, cosmeceuticals, ethical drugs and related goods and services. To achieve this mandate, the Institute facilitates research and development of health products from biological materials, particularly those indigenous to Jamaica."<sup>66</sup>

In terms of activities, the institute "...undertakes research and product development using natural products; trains postgraduates and young scientists in the field of translational research and development; initiates and commercializes health and wellness products and services; develops cooperation between individuals and organizations locally and internationally (in the areas of production, marketing, distribution and sales); and offers science and technology information and services for health education and R&D purposes."<sup>67</sup>

The institute has already developed a number of products, such as "...*Alpha Prostate Formula 1*, an anti-cancer dietary supplement which works to aid prostate health in men."<sup>68</sup> There are other products on the market, such as medicinal herb teas that are branded under the 'Eden Garden' brand. The 'Eden Gardens Well & Lifestyle Limited' commercial branch operates a wellness, spa and hotel centre in Jamaica, where the respective 'Eden Garden' branded nutraceutical products are also sold. The EHF foundation, in turn, sponsors R&D projects through grants it provides for researchers, but also has other projects running, such as in the area of awareness raising or education.

<sup>64</sup> <http://biotechrdi.com/html/index.php/about-us/board-members/dr-henry-lowe/>, as of Sep 29, 2015.

<sup>65</sup> Ibid.

<sup>66</sup> <http://www.ehfjamaica.com/pages/bio-tech-rd-institute-limited>, as of Sep 29, 2015.

<sup>67</sup> Ibid.

<sup>68</sup> Ibid.

IP is an important topic for the EHF group; trademarks are used, and Dr. Lowe is said to be the holder of a “number” of patents. In our interview, (the cost of) international IP protection was mentioned as a major issue.

The **Creative Industry (CI)** is the other hotspot for economic development with a strong IP component. The specific contribution of the CI to Jamaica’s economy has already been noted (see section 3.4). Drawing on our interviews we found that, within the creative industries, there is, on the one hand, a more culturally focused strand visible (in the areas of music, for example) as well as an ICT-related strand that centres around an agglomeration of App developers as well as games and animation firms that are addressed by Start-Up Jamaica (see also section 3.5).

The supported firms provide apps for a variety of global but also Jamaica-specific challenges: support of fast registration of businesses in company databases; easy exchange of business information; an app that allows anonymous submissions of crime reports, etc. As with start-up companies in other countries, there is often a strong link between universities and the firms, i.e. start-ups being often established by students of these universities.

The App firms may face a number of IP-related challenges, such as in the field of copyright, licensing (usage terms of open source software, finding the right license model), patents (particularly if the U.S. markets addressed), trademark issues or how to use IP to make a viable business model. The support that SUJ provides resembles to an extent the programme of the ‘CTI Start-Up’ programme in Switzerland, where coaching is provided for Swiss start-ups admitted to the programme. The Swiss programme offers also special and professional IP coaches and IP support modules. It could be considered whether SUJ can also benefit of specific training provided in the field of IP to coaches and/or the App developers.<sup>69</sup>

In the interviews we were also told about the efforts to establish a Jamaican animation industry, given the creative talent that is available in Jamaica and already existing commercial endeavours. Here, again IP issues arise, mostly in the area of copyright.<sup>70</sup>

In terms of the Creative Industries in general, we noted – as indicated already in other places throughout the report – the relatively strong work done in IP policy making in Jamaica, fuelled in particular by activities of the three – rather young – CMOs. Still, there are issues to be addressed. On the one hand, all CMOs complained about an improvable public awareness of IP issues. On the other hand, the CMOs also sought advice on how to deal with the challenge of the on-going digitalisation of media, respectively media convergence as

<sup>69</sup> Radauer, A. & Streicher, J. (2008): Support Services in the Field of IPR for SMEs in Switzerland – A Review, [https://www.ige.ch/fileadmin/user\\_upload/Institut/e/i1050101e.pdf](https://www.ige.ch/fileadmin/user_upload/Institut/e/i1050101e.pdf), as of Sep 30, 2015.

<sup>70</sup> In a recent evaluation of the Animation Media Cluster Stuttgart (AMCRS) we conducted in Germany, it emerged that the animation market is globally very competitive, with the competition being fuelled by cost considerations and favourable government tax incentives for local animation firms. Most of the turnover seems to be made, outside the U.S., in the form of service contracts for film studios. The challenges to make a living from own productions (i.e., own IP) are enormous, even for relatively rich German firms. Depending on the business models (services or creation/production of own IP), there will be different needs in terms of IP management knowledge for animation firms in Jamaica (see Radauer (forthcoming): Evaluation of the ACMRS Stuttgart).

well as the emergence of new business models in the CI. They share these challenges also with CMOs e.g. in Europe.

The last sector to be addressed is the upcoming **logistics hub**. The government, through its Global Logistics Hub Initiative, plans to make Jamaica the number 4 port and logistics hub in the world, after Rotterdam, Dubai and Singapore. The plan is to take advantage of an expanded Panama canal and favourable geographic conditions as “...it sits astride the trade routes in the Windward Passage and has access to the 800 million-person market of North, Central and South America.”<sup>71</sup> There are numerous challenges to be tackled, which comprise also establishing a generally better economic environment, according to the above referred to article by Selko. There is evidence that Jamaica is moving in the right direction in this respect.

At the forefront, it may seem that innovation and IP are of less relevance with respect to the logistics hub, because most of the investment seems to centre around construction-related tasks (for sea and airport facilities, docks, etc.). However, – as was done in Singapore –, the plan is also to use the hub to boost the economy in adjacent free economic zones. In particular, there are plans to set up a technology park in such a zone, where IP awareness and advice to tenants could be needed:

*“Phase one of the development will be an Information and Communications Technology (ICT) Park. Which will house facilities for Software Development, Telecommunications/Co-Location sites, Bio-Technology, Business Process Outsourcing...IT/Security Consultancy and Network Operations Centre. The projection is that 21,000 jobs will be created. Total investment for completion of the buildings is estimated at \$90 million.”<sup>72</sup>*

There will be probably an opportunity (and need) for service-related innovations, too, where again IP issues (on copyright, perhaps even patents) may arise.

## 4.2 Institutional level

As with other countries scrutinised in the series of WIPO innovation system reports, including Trinidad and Tobago as peer, there is no lack of numbers of institutions dealing with innovation-related matters. Whereas in Trinidad and Tobago there was wide-spread consensus that fragmentation and lack of inter-institutional links are a major hindrance for fostering innovation, respective feedback from Jamaica was more mixed: Some interviewees said that “...we are small, know each other so we can easily hook up”, while others took the opposite view and complained about the aforementioned fragmentation and the lack of substantial collaboration among institutions. After our interviews, we would rather side with the latter group of interview partners.

A second observation is a discrepancy between the level of consideration given to IP in the Creative Industries – which is substantial – and other industries and more

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<sup>71</sup> Selko, A. (2015): Can Jamaica Emerge as a Global Logistics Hub?, in: Material Handling & Logistics, <http://mhlnews.com/transportation-distribution/can-jamaica-emerge-global-logistics-hub?page=3>, as of Sep 30, 2015.

<sup>72</sup> Ibid.



science/engineering related fields, where respective IP activity and awareness seems rather low. We did not observe this discrepancy in such form in Trinidad and Tobago and were told in interviews that the representatives of the Creative Industries “...are extremely well organised, for example through their collective societies, and are very good at lobbying their causes.” Accordingly, IP seems quite well integrated into the CI agendas, while this is not so in institutions active in other technology fields.

Earlier in this report, we described already major weaknesses and causes identified for low performance in innovation (which is in all likelihood also correlating with weak IP awareness), which would normally give a rather depressing picture. Following our observation in many countries, however, that there are positive deviants in all economies, we identified a number of them in Jamaica, too: UWI with projects such as the cardiac simulator; the cluster of App and animation firms supported through SUJ; companies such as GraceKennedy or Biotech R&D. These organisations can provide the seed for future innovative activity in their respective fields, and they can act also as role models / case studies for other local innovators. Important in this context are sectorial policies (sectors seen in the sense of economic sectors), such as the nutraceutical industries. It seems therefore viable to try to understand sectorial innovation and IP needs in greater detail, and derive conclusions on courses of action to be taken.

A number of institutions could benefit from better and tailored IP support:

- The universities and research organisations could benefit from an upped activity on how to better perform technology transfer. Furthermore, there is also room to improve tertiary education on IP, e.g. by integrating IP management as mandatory topic in curricula of business, engineering schools. Some advances have been made, again however mostly only in the creative fields, e.g. with the aforementioned new master’s degree programme in Intellectual Property and Creative Industries at UWI. Still, “...the tendency is to view IP as a law subject” (quote interview).
- Intermediary organisations such as the Heart Trust or SUJ could benefit from input regarding IP components of their work. This refers for example to the design of courses on IP or respective modules in vocational training offerings; or how IP support and coaching is provided to start-ups.
- Policy design organisations such as the NCST or the SCR can probably benefit most at this time by obtaining support for the drafting of IP and innovation policies. The timing would be also well suited for this endeavour, as the S&T policy is still in development and major parts of ‘Vision 2030’ regarding innovation and S&T could benefit from an update. A good case can be made for a national IP strategy.

A last point is to be made with respect to available data and statistics that need to be improved, in order to serve their function to inform, monitor and provide support for steering policy.

The timing for an “offensive” regarding IP support seems right, because the overall impression is that a) innovation has been re-discovered and gained important momentum in the last two years in Jamaica and b) because many of the organisations in the innovation system have recently set promising activities, and some actors seem eager to push forward.

## CHAPTER 5 - CONCLUSIONS

The main findings of the study are:

- Jamaica has a very ambitious and complex overarching development strategy with 'Vision 2030' that tackles also the innovation dimension. However, the 'vision' may be over-ambitious and there are issues with respect to implementation.
- There is not yet an S&T strategy, the respective development is delayed.
- 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.
- 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 the agricultural sector; also in some research institutes such as the UWI (where we also find innovations such as the cardiac simulator in areas like life sciences), UTech or the CMI.
- The nutraceutical industry, the creative industries (including app development and games/animation) as well as the logistics hub are upcoming fields of opportunities. Efforts in IP support could focus on these fields, in addition to strengthening any other of the aforementioned 'positive deviants'.
- The level of integration of IP issues in the innovation system of Jamaica differs across institutions, but is generally rather low. Innovation output can rarely take advantage of IP for successful commercialisation endeavours.
- Correspondingly, there is not sufficient overall IPR awareness in the country. However, there are also observable differences across industries.
- The exception to this observation is again the creative sector, which has strong IP awareness on copyright issues and a strong institutional anchoring of IP topics with its CMOs.
- Incentive systems for researchers at universities are based mostly on academic performance only (publications), which is one barrier for IP-related commercialisation activities.
- Access to finance and funding sources are an issue, which is exacerbated by the tight public budgets and the IMF requirements.
- 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 TO THE GOVERNMENT OF JAMAICA

### **Recommendation 1: Consider simplifying and increasing the level of concreteness of the upcoming S&T and innovation plan with realistic goals**

As discussed above in section 4.1, we believe that a less complex strategy for S&T and innovation that, on the one hand, has more realistic goals and, on the other hand, is more concrete in terms of to be executed activities could prove a viable way forward. The size of the country would allow for such an approach.

The strategy could focus therefore much more on and integrate more the institutional strategies of the few main actors involved in R&D, particularly the UWI and the UTech. The less complex, more institution-leaned and realistic goal oriented approach would also make the strategy document, we believe, more relevant for policy making and implementation.

It would be important to have IP issues concretely and comprehensively considered within the innovation policy, and not to treat the IP topic as purely separate topic. The rationale is that IP is to support innovation. The IP system has historically been designed to support innovation and should therefore be treated as one instrument by which innovation can be fostered.

### **Recommendation 2: Focus on economic opportunities**

The interviews have shown that the greatest thrust for economic development stems currently from three sectors: the Creative Industries, the nutraceutical industries and the upcoming logistics hub. For all three sectors, there is considerable policy planning and activity going on, and in all three areas innovation (and hence also IP) will play a role. The needs in terms of IP will differ across the sectors:

- The nutraceutical industries will need to tackle issues like protection of plant varieties, IP in R&D collaborations, perhaps (process) patenting as well as know-how protection, trademarks and geographical indications.
- The creative industry needs support with copyright-related themes even if it stands out relatively best in terms of IP usage and awareness. For the CMOs, the usage / dealing with IP in new digital environments is a challenge that could merit support. Specific start-up IP support for software-based start-ups (app firms, animation firms, etc.) may be required in the form of respective professional advice.
- The logistics hub has an innovation component particularly with respect to service innovation and technology park facilities to be established in free zones. It should be ensured that adequate IP advice is available for tenants in this park. There might be also IP advice necessary for the development of service innovations.

All sectors will need to deal with IP management skills, general IP awareness as well as with ways to use IP in new business models. The advice is therefore to give the topic of IP due and specific attention in all strategic approaches in the development of the three sectors.

### Recommendation 3: Focus on the innovation hotspots

As in the case of other countries, our recommendation would be to focus policy activity on those few positive deviants which could be considered IP and innovation hotspots (i.e., institutions, firms that have already created a good track in innovation and/or IP, or show promising developments). Directed support to these hotspots could prove considerably more effective in creating value for the Jamaican economy than broad policy attempts targeting the whole population.

A number of measures could be envisaged:

- Regarding the universities, it has come out clearly that there are innovation hotspots, with students and professors at UWI, UTech, NCU and CMI performing good research and founding start-ups. Respective ‘entrepreneurial’ activity should be encouraged.
- Against this backdrop, it could be considered, in a combined innovation policy/IP strategy for universities, to modernise the incentive systems. This would also help to improve IP usage and commercialisation. Research funding and career advancement should therefore not only be contingent on academic achievement, but also on commercialisation activities (spin-off creation, commercialisation). Elements of competitive funding should be introduced to spur innovative activities.<sup>73</sup>
- Technology transfer offices should be established and/or strengthened. They should implement an IP policy that is supported at executive/dean level. We recommend pooling the TTOs in order to create critical know-how mass and have them being able to work with a sufficiently large portfolio of promising innovations. This could mean that there would be only one central TTO run by Jamaican government that would service all universities in Jamaica.
- Along the same lines, we also recommend that TTO functions be naturally merged with complementary services, such as research management services (e.g., for collaborative research projects with foreign partners and/or with industry), as it is done already in the universities. This path should be pursued and fostered further, e.g. by strengthening the link between university spin-off/start-up support and IP/tech transfer.
- IP teaching at universities should be fostered. The notion of IP as a purely law-driven subject should be dropped. IP management skills should be taught in mandatory courses in relevant study fields, e.g. in business, engineering, medical and creative/art schools. So far, promising developments have been focussed solely on the creative fields.

With respect to corporate settings, there are also hotspots like the ‘Eden Garden’ / EHF group of companies or the cluster of promising app developers. Again, the idea would be to directly support these ‘positive deviants’ and help master the IP challenge. This entails the provision of respective advisory services, but – as it turned out that international IP

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<sup>73</sup> See also the earlier innovation review of Trinidad and Tobago that details in a text box one possible approach to establish competitive funding at universities.

protection is a considerable challenge – it could also be considered to help the most promising commercial endeavours with the international filing and IP maintenance costs, such as in the form of grants or subsidies.<sup>74</sup>

**Recommendation 4: Consider the establishment of a national IP champion together with an implementation structure.**

In order to boost uptake and awareness of IP issues in the National Innovation System, the government could consider appointing a national IP champion with cross-institutional responsibilities. JIPO could take a respective role, but in order to increase policy attention and exercise the coordinative function more efficiently across various institutions, the IP champion (an individual with/without a small team) could also be a newly created position close to government. The U.S. ‘IP czar’ could be an interesting model to study in this context. It is important that the ‘IP champion’ is adequately resourced and has proper implementation structures and powers at his/her disposal.

**Recommendation 5: Continue to follow the approach to become signatory to important IP treaties**

By comparison to other countries studied in this series on national innovation systems, Jamaica falls somewhat behind in terms of signed international IP treaties. Because IP protection is particularly important for doing business internationally, the recommendation is to continue efforts to join the Madrid system and the PCT.

**Recommendation 6: Strengthen the capacity of business intermediary organisations to provide adequate support on IP matters**

There is a body of business intermediary organisations, where it seems worthwhile to increase their capacity to provide support on IP matters, particularly advice on IP management issues. This includes the chamber of commerce, SUJ or the JDBC. HEART could offer also courses on IP management, once demand builds up from respectively affected business sectors.

It is, however, conceivable that at least in the short run there may not be enough demand for IP-related service offerings by these institutions. Against this backdrop, one approach, which seems feasible, is that these organisations provide only very basic information and refer to a centralised IP service unit. Nonetheless, a certain level of IP awareness and awareness of IP management issues should be aimed for with the staff of such organisations.

This unit to be referred to for IP matters could be JIPO, or perhaps, the suggested and to be newly established central TTO. The central TTO could hence provide IP services not only to researchers but also to businesses, in an approach to create even more critical mass. The approach of separating registration functions of an IP office and IP service provision (advice,

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<sup>74</sup> This specific recommendation should be of course compatible with IMF-imposed budgetary rules and constraints.

training etc.) is implemented successfully in countries like Estonia. It would help underline the impartial character of those functions of JIPO dealing with registration and examination.<sup>75</sup>

A notable shortcoming is the limited base of legal support. Patents (patent agents) and industrial designs are the key focal areas where there seems to be lack of legal expertise. It does not seem feasible, given the size of the country and the level of demand for such services, to create a system that would offer respectively high quality legal support in every technology and IP field. The approach could be therefore to establish such high quality support only and foremost in critical areas important to the country, and otherwise rely on using patent agents from abroad. This support from abroad could be also organised in a regional network.

### **Recommendation 7: Create efforts to establish a relevant statistical basis for monitoring innovation, R&D and IP activity**

The availability of reliable statistical data for R&D, innovation and IP activity was a recurring discussion topic in our interviews. Therefore, the recommendation is to step up efforts for the creation of relevant indicators and the collection of the respective information.

In the context of IP, it was – for example – mentioned that relevant patent filing activity of Jamaican innovators/inventors takes place abroad (particularly in the U.S.), but the respective activity is not recorded and/or considered in government statistics or as a performance measure in the sectorial S&T plan of ‘Vision 2030’. It is therefore important to invest time into a more detailed specification of IP performance measure.

Data collection exercises could also be an opportunity to enquiring in greater detail into the IP performance and IP management of certain actors in the innovation system. For example, in the course of the planned audit by the NCST on the twelve research institutes, information could be also collected on the IP performance and strategies of these institutes. The respective info could then be used to improve the IP strategies, e.g. through respective advice.

### **Recommendation 8: Improve the general awareness level of IP in Jamaica, but also with executives of important stakeholders in the innovation system of Jamaica**

Jamaica shares the, on average, low awareness of IP in numerous parts of the innovation system with many other countries. Against this backdrop, we typically recommend an approach that addresses several levels. In the long term, broadest impacts can be expected if the curricula of tertiary institutions – particularly of business schools, creative schools, engineering and natural sciences as well as medical schools – include mandatory courses on IP management that examine the topic of IP from a business/management perspective (see also recommendation 3).

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<sup>75</sup> An interesting development in the context of pooling expertise, now at the regional level, is in many ways also the planned Caribbean Patent Administration (CPAS). The idea is to establish a regional patent office that operates in way similar way to, for example, the European Patent Organisation and Office in Europe. Corresponding drafts for an institution-enabling Caribbean Patent Convention – whose creation was facilitated by WIPO – are now on the table of the Caribbean Community, which has to decide now on the creation of a respective regional organization.

In the short run, however, awareness raising could be focused on the executive level of key industry players and R&D organisations and their respective stakeholders. Targeting this audience ensures that the topic of IP gets the proper management support and attention necessary for further implementation steps. A prerequisite is the availability/usage of good training material that also includes relevant case studies from Jamaica and the region.

Notwithstanding this focus on the executive levels, there may be also opportunities to provide more information on IP in the course of science popularisation events, such as the S&T month. A critical success factor for respective activity is to have relevant examples (case studies) from the region on the use of IP and the use of practical, non-legal language.

The need for higher IP awareness seems also necessary in the light of new policy thinking in developed economies. Concepts like 'frugal innovation' have increased the level of interest of businesses in developed economies in innovations being developed in emerging economies. This is an opportunity for emerging economies like Jamaica, but it should be ensured that the respective IP behind the 'frugal' innovations is well protected.<sup>76</sup>

### **Recommendation 9: 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 Jamaica should consider, more broadly, the problem area of lack of funding for innovation, research and development in the corporate sector. This refers specifically to improved access to private capital (such as venture capital), given 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. The TIF could be strengthened, too.

Moreover, Jamaica 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 privatised after some time. A respective case study on how this was performed in Israel can be found in the earlier report on Trinidad and Tobago. Of course the current budgetary limitations imposed by the IMF concerning Jamaica have to be observed.

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<sup>76</sup> According to Radjou and Prabhu, "...frugal innovation is a way that companies can create high-quality products with limited resources. Once the preserve of firms in poor markets, Western companies are now seeking ways to appeal to cost-conscious and environmentally-aware consumers at home. With an estimated trillion-dollar global market for frugal products, and with potentially huge cost savings to be gained, frugal innovation is revolutionizing business and reshaping management thinking." (Radjou, N. & Prabhu, J. (2015): Frugal Innovation: How to do more with less).

**ANNEX 1 - INTERVIEW PARTNERS<sup>77</sup>**

1. Bamboo and Hemp Innovation and Development - Miss Maxine Harris
2. Biotech R&D - Tanesha Samuels, Group Planning and Analytics Manager
3. Bureau of Standards Jamaica (BSJ) - Ms. Michelle Sturridge, Ms Shauna Cameron, Mr Wendell Richards,
4. Caribbean Maritime Institute (CMI) - Fritz Pinnock, Executive Director
5. Cocoa Industry Board - Mr. Leroy Grey
6. GraceKennedy Ltd. - Zak Mars, Chief Innovation Officer
7. Human Employment and Resource Training Trust, National Training Agency (HEART-NTA)
8. Jamaica Association of Composers Authors and Publishers (JACAP) - Miss Lydia Rose, General Manager
9. Jamaica Business Development Corporation - Janine Taylor
10. Jamaica Exporters Association (JEA) - Mrs. Camille Beckford-Scott, Marketing Manager
11. Jamaica Music Society (JAMMS) - Mr. Evon Mullings, General Manager
12. Jamaican Copyright Licensing Agency (JAMCOPY) - Miss Carol Newman, General Manager
13. Jamaican Intellectual Property Office (JIPO) - Ms. Lilyclaire Bellamy, Executive Director, Miss Marissa Longsworth, Manager, Copyright; Mr. Jason Wongsam, Manager Patent, Acting
14. Ministry of Agriculture (MOA) - Dr. Lisa Myers, Dr. Maureen Wilson
15. Ministry of Education, College of Agriculture, Science and Education - Dr. Robert Logan
16. Ministry of Industry, Investment and Commerce (MIIC) - Beverley Rode-Forbes
17. Ministry of Science, Technology, Energy and Mining (MSTEM) - Miss Kadian Smith, Principal Director, Cecil McCain, Director, Post and Telecommunications
18. Ministry of Tourism and Entertainment – Mrs. Gilliam Wilkinson, Director of Entertainment
19. National Commission for Science and Technology (NCST) - Professor Errol Morrison, Director General, Patricia Lewin, Senior Technology Officer
20. Northern Caribbean University (NCU) - Marilyn J. Anderson, Vice President Academic Administration, Steven Lawrence, Director, Distance Education, Academic Administration, Andel Bailey, Chairman, Mathematics and Engineering Department, Dr. Delano Lewis
21. National Cultural and Creative Industries Commission (NCCIC) – Dr. Deborah Hickling
22. Scientific Research Council (SRC)/ PCG - Cliff Riley, Executive Director

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<sup>77</sup> The interviews were sometimes one on one and sometimes group interviews



23. Sugar Industry Research Institute – Dr. Maureen Wilson
24. The Competitiveness Company (TCC) - Dr. Beverly Morgan, CEO
25. University of Technology, Jamaica (UTech) – Dr. Paul Ivey, Dr. Ruth Potopsingh, Ms. Dionne Palmer, Dr. Martin Henry
26. University of the West Indies (UWI), Mona – Professor Ichencubacawa, Deputy Principal, Dr. Georgiana Gordon- Strachan, Director, Mona Office for Research and Innovation, Lorna Thomas – Black, Administrative Officer, Dr. Syvlia A. Mitchell, Lecturer in Biotechnology, Dr. Beverley Pereira, Dr. Trevor Yee, Mrs Loran Thomas-Black

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## ANNEX 3 - PROJECT TEAM

- Ms. Tamara Nanayakkara, Head, Innovation Policy Section, Innovation Division, WIPO
- Ms. Carol Simpson, Program Officer, Caribbean Section, Regional Bureau for Latin America and the Caribbean, WIPO
- Mr. Alfred Radauer, Senior Consultant, Technopolis, Austria
- Mr. Roberto Escarré Urueña, Director, International Project Management Office, University of Alicante, Spain
- Ms Noelia López del Castillo, Senior Project Manager, International Project Management Office, University of Alicante, Spain

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