



Enhancing Scientific Cooperation between the
European Union and Central America

Fortaleciendo la cooperación científica entre la
Unión Europea y América Central



Guidelines on the CA innovation system

Setting up the Public/Private dia- logue



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1. EXECUTIVE SUMMARY

These guidelines are based on the contributions by the Central American Partners of ENLACE: Costa Rica, Guatemala, Honduras, Nicaragua and Panama.

The individual reports were created based upon questionnaires and desk research. A compilation of the relevant strategic documents for each country has been used as the basis for each national guideline.

The objective of this study is to enhance our understanding of the national innovation system in the target countries in Central America. An overview of the situation in each of the studied countries as regards *Innovation Infrastructures* such as clusters, technology and innovation centers, technological and science parks, business-start-up centers/ technology incubators and some further related organizations are given. The general environment is described as well as important strategic documents and the main programs and instruments for support. The report concludes with a list and description of the main infrastructures.

2. INTRODUCTION

As to report on the *Innovation Infrastructures* in the target countries in Central America – *i.e.*: Costa Rica, Guatemala, Honduras, Nicaragua and Panama -- the ENLACE consortium created.

The isthmus of Central America forms a bridge between North and South America. It includes the countries of Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, and Panama and spans 521,500 square kilometers. The region has a population of approximately 45.7 million. Population growth in much of the region remains high because of continuing high birth rates and falling death rates.

Central America contains some of the poorest countries in Latin America as well as a couple of the better off. In Nicaragua, Honduras, Guatemala, and El Salvador, half of the population lives in poverty. However, the economic situation is very different in countries such as Costa Rica and Panama, which boast of the high per capita income, low unemployment, and more favorable social development indicators. With the exception of Costa Rica, most of the countries in the region have large income inequalities. Panama and Guatemala, for example, have among the most highly skewed distributions of income in the world. During 2008-2009, while the United States and much of the world were involved in a recession, the Central American region was not as affected, due to trade agreements with a wide variety of customers, as well as the Dominican Republic, Central America Free Trade Agreement (DR-CAFTA). As an example, Costa Rican exports to Mainland China were US\$848 million, an increase of 247 percent from 2005 to 2007.

Although at different speeds and degrees of success, all Central American countries conducted significant structural reforms in the 1990s. Results have been favorable in terms of lowering inflation and fiscal deficits, allowing these countries to achieve higher levels of macroeconomic stability. The reforms have also succeeded in increasing the inflows of Foreign Direct Investment (FDI) to the region¹. Unfortunately, the results have not been as good in terms of increasing economic growth, and Total-Factor Productivity (TFP) growth remains low. Presumably, low TFP growth is due to low rates of innovation and technology adoption. Still, some countries of the region, like Costa Rica, are Latin-American leaders in encouraging innovation as a competitive factor. For example, according to the World Economic Forum's 2008–2009 Global Competitiveness Report, Costa Rica ranked as a regional leader (39th overall), above Mexico (70th overall) and Chile (44th overall), in innovation matters, as a result of improvement in the country's innovation system and human skills. Consequently, inflows of FDI with high technological content have increased in Costa Rica in sectors such as medical devices and electronics. The key investors in the region are the United States, Spain, Germany, Korea, and Japan, and investment from China is expected in the future.

As to report on the *Innovation Infrastructures* in the target countries in Central America – *i.e.*: Costa Rica, Guatemala, Honduras, Nicaragua and Panama -- the ENLACE consortium created a methodology to uni-

1 According to the Financial Times report, San José is the fifth city of future in Latin America (30/04/2011).

formly report the ways different measures of innovation and technology adoption has been promoted in each country in order to be able to compare them in a meaningful way. The global objective of this report is learning as much as possible from available aggregate data and also to learn from the particular innovation and technology adoption cases.

3. COSTA RICA



3.1. Introduction

3.1.1. General Environment for Setting Up Innovation Infrastructures

With the creation of the Vice-presidency for Research at the University of Costa Rica during the late 70's, the research activity was institutionalized as one of the main cornerstones of Costa Rican higher education and the development of projects and programs boosted not only in the academic units but also at research institutes. During this same period, the National Council for Scientific and Technological Research (CONICIT) was established as a public organization which aims to manage the financial incentives to improve human resource capabilities, research projects, infrastructure and consulting in technological innovation not only in research but also for private companies, especially to SMEs.

The Ministry of Science and Technology is the Regent which coordinates and directs the implementation of strategies and policies. In 1990, Costa Rican Congress approved the Law 7169 to set up the National System of Science and Technology by the Promotion of National Scientific and Technological Development.

Costa Rica currently has nationwide research centres in fields such as biodiversity, management and sustainable use of resources, health, and entrepreneurship, among others. Universities have also provided an important part of these research centres, enhancing in this way the generation of research, development and innovation sources.

Furthermore, there are other government and private organisms that have also contributed with Costa Rican research and innovation by developing different initiatives as joint efforts of both private and public ventures.

3.1.2. Strategic Documents

Some of the strategic documents that have been used nationally and regionally to progress science and technology are the following:

- **XXI Century Strategy** <http://www.estrategia.cr/> It is a “half century Science and Technology Road Map for Costa Rica, which main objective is to foster a long-term planning process by the development of a three stages Project: Diagnostic, Vision and Action Plan”. It has also pursued a specific goal where “The scientific and technological development of Costa Rica has enacted an important contribution to the national development, due to the momentum of visionary citizens who backed into education and knowledge as sources to reach progress for our country and a better quality of life.”
- **Atlas for Innovation in Costa Rica.** This document can be found in http://www.micit.go.cr/index.php/docman/doc_details/196-atlas-para-la-innovacion-en-costa-rica-2007.html, and it constitutes a guideline to a National System for Innovation where Costa Rica can “take advantage of the opportunities driven by science and technology to better the level of development of the country”, incorporating current trends of most modern knowledge economies.
- **The 2010 Report about Higher Education in Iberoamerica: The role of universities in the scientific and technological development.** http://www.cinda.cl/download/informe_educacion_superior_iberamericana_2010.pdf This document offers data about the actual state of science and technology in Iberoamerica but focusing it in the role that universities have had in the region. It indicates that “Each of the countries in the region has established a Science and Technology National System with a diverse structure and organization, and it acknowledges explicitly universities

as fundamental elements due to their constitution and operation.”

- In the web site <http://www.ricyt.org/>, it is possible to find **THE STATE OF SCIENCE: Principal Indicators of Iberoamerican/Interamerican Science and Technology 2009**, which pretends to “offer a quantitative and qualitative overview of the situation of science, technology and innovation in the region. It also pretends to delineate the elements for the analysis of current tendencies in these areas. In this regard, it includes the latest indicators available about science and technology in Iberoamerican countries.”
- In the web site <http://www.parquetec.org/en/noticias-y-eventos/leer-archivos-de-noticias/index.php> one can find information about a **Diagnostic of the current situation of Entrepreneurship in Central America**. In this study, the entrepreneurial development is taken as an issue where the “main interest is the need to foster more and better jobs, to improve income distribution, to renew countries’ productive environment and to generate new social wealth that can contribute to the regional development.”
- In the web site of the National Council of University Presidents www.conare.ac.cr, it is possible to find a report of the Project entitled: *Diagnostic of perception and requirements regarding the association and technology transfer of state universities with the productive sector. Stage III*. The main objective of this study is “to continue delineating the business sector’s needs and perceptions about the association and technology transfer of state universities with the development strategic sectors of the country”.
- The book entitled **Innovation, Technology and Regional Development**, compiled by Shirley Benavides and published by the Universidad Nacional de Costa Rica Publishing House, “moves through theory and practical applications related to innovation, SMES, productive units which integrate the majority of business parks in the world, which are strategic actors in the economic democratization and people’s quality of life, the relevance of knowledge transfer...”
- In the Ministry of Science and Technology web site www.micit.go.cr/ it is possible to find a document entitled **National Indicators of Science, Technology and Innovation**, that compiles the contribution of different sectors that work on these subjects. In general terms “This platform has a great importance in order to facilitate the construction of information based on the best international practices, following methodological guidelines, and with the support of national and international experts. It also pretends to address the objectives and interests of all the sectors involved in science, technology and innovation such as: government, public and private enterprises, and non-profit organizations”.

3.1.3. Specific Programs and Instruments

Among the specific programs and documents to strengthen science, technology and innovation one can cite:

- **Bioinnovar Project: empowering business**. In the web site www.inbio.ac.cr there is information regarding this initiative, which main objective is “To partner business development ventures based on the sustainable use of biodiversity, turning them into dynamic enterprises.”
- **SMES Strengthening Program of the National Food Science and Technology Center (CITA)** www.cita.ucr.ac.cr at the University of Costa Rica. The main objective of this program is “To perform an evaluating, training and consulting program for the implementation of a Food Security System (HACCP) according to the ISO Regulation ISO 22000:2005 and to develop innovative and

healthy products which will allow the participants to satisfy the requirements of the most competitive markets”.

- **Innovex Program** of the Costa Rica’s National Chamber of Industries, www.cicr.com, which expects to “gather groups of Costa Rican SMES in the application of a specific program that can increase their innovation and competitiveness through innovative products and services with added economic value”.
- **The SMES Observatory - UNED**; <http://omipymes.uned.ac.cr/>, offers a **SMES Information and Knowledge System**, which gathers basic and pertinent information that can be used by policy makers to deploy a model of development considering the current situation of the SMES business park.”
- **Bioprocessing Plant of the National Center of Biotechnological Innovations**, (CENIBiot) <http://www.cenibiot.go.cr/> it is a specific project funded by the European Union and coordinated as a joint effort by the Ministry of Science and Technology and the National Council of University Presidents (CONARE). The main objective of this Center is “to provide scaling of different biotechnological process related with the agro-industry, in order to improve not only these processes but mainly the competitiveness of this sector.”
- The Universidad Nacional de Costa Rica has a special program entitled **UNA-Entrepreneurs** www.una.ac.cr, which seeks “To advance the entrepreneurial capacities of its students and Costa Rican society in order to foster the creation of small and medium enterprises”.
- **The Costa Rican Alliance of Development Initiatives** (CINDE), <http://www.cinde.org>, has a **Program to pursue Foreign Investment** in which participates the Ministry of Foreign Trade (COMEX) and the Foreign Trade Promoter (PROCOMER). This program seeks “to draw, run and follow up different programs to pursue foreign investment in order to maximize public and private resources to bring more enterprises to Costa”.
- **Costa Rica’s Chamber of Exporters** (CADEXCO), <http://www.cadexco.net/>, seeks to bring solutions to the Costarrican export sector. It has different projects related to science, technology and innovation. Among others:
 1. **Central America Innovates**: is a regional Project based in San José, Costa Rica that seeks to support enterprises by introducing management, diagnostic, training and consulting computing systems in their innovating processes, so they can address new niche markets.
 2. **AL INVEST** is another regional Project in collaboration with the European Union, which main objective is “To support the consolidation and internationalization of SMES, taking advantage of the possibilities of the regional integration and the free trade and business cooperation agreements signed with Europe.”

3.1.4. Financing

Some of the specific programs with financial capacity to support science, technology and innovation are:

- **The Development Banking System**, established by Law of the Republic number 8634 <http://www.asamblea.go.cr/> which states in its “31th Article. - Each of the public banks, with the exception of the BANHVI, should create a specific development fund in order to finance either an individual or a legal person which present viable and feasible productive projects, according to the general provisions established by the Law and the correspondent Regulations given by the Regents. The

specific requirements of each project will be taken into consideration at the moment of granting the financing.” Actually, there are four public Banks which, according to the law, offer specific programs known as:

The Banco de Costa Rica made an agreement with the Banco Crédito Agrícola de Cartago, in order to have a special line of funds with the name of BCR-Bancredito <http://www.bancobcr.com/novedades/>. the Banco Popular y Desarrollo Nacional <https://www.popularenlinea.fi.cr/Bpop/Menu/Informado/Noticias/FODEMIPYME.htm>, consolidated the fund known as Fodemipyme, The Banco Nacional <https://www.bncr.fi.cr/PortalMiPyme/ServFinancierosServicios/ServiciosFinancieros/>, established a fund under the name of BN Desarrollo, which “is a program that promotes a business culture in Costa Rica by supporting SMES successful ventures.”

- There are other **Special Funds** such as: the *Incentive Fund* of the Ministry of Science and Technology; *PROPYME*, *FODETEC* and *FORINVES* funds granted by the National Council for Scientific and Technological Research (CONICIT), and the program LINK of the Costa Rican Chamber of Information and Communication Technologies (CAMTIC).
- Among the NGO’s which provide venture capital with no refundable funds one can cite: CR-USA Foundation, Fundecooperación and some other international entities.

3.2.Existing Innovation Infrastructures in Costa Rica

3.2.1. Key Government Players

Name	Ministerio de Ciencia y Tecnología
Status	Science and Technology Ministry
Profile	Government office for Science and Technology.
Contact Person	Clotilde Fonseca Quesada
e-mail	ebaltodano@micit.go.cr - nvalencia@micit.go.cr
website	www.micit.go.cr

The Ministry of Science and Technology was established in 1986 to facilitate scientific research and technological innovation, leading to greater economic and social progress under a comprehensive sustainable development strategy, in order to preserve the country’s natural resources for future generations, and to ensure a better quality of Costa Rican life and well being.

Name	Consejo Nacional de Investigaciones Científicas y Tecnológicas
Status	National Committee advisor for Science and Technology
Profile	Advisory office for Science and Technology, which is in charge of formulating national policies and proposing solutions for those problems that may affect Costa Rican S&T development.
Contact Person	Walter Fernández Rojas / Alejandra Araya Marroni
e-mail	wfer@cosmos.ucr.ac.cr / aaraya@conicit.go.cr
website	www.conicit.go.cr

The National Council for Scientific and Technological Research (CONICIT), was created as an autonomous institution responsible for administering funds on the research field. CONICIT is chaired by a Board of Directors whose members are appointed by the Government of the Republic, and they hold their positions for five years. The senior management is the Executive Secretariat, which is supported in two main areas: Promotion of Science and Technology, and Innovation and Administrative Support.

During its 35 years of existence, CONICIT has managed internal resources and loans aimed at strengthening local capacities in science and technology.

Name	Centro Nacional de Alta Tecnología
Status	Organization appending of the National Council of University Presidents
Profile	Organization directed to facilitate and mediate on innovation issues.
Contact Person	Eduardo Sibaja Arias
e-mail	edsibaja@itcr.ac.cr - eduardo.sibaja@hotmail.com
website	www.cenat.ac.cr

The National Center for High Technology (CeNAT) is an organ specialized in developing inter-university research and graduate programs in areas of high technology and innovation projects, and technological links with the government and the business sector.

3.2.2. Key Innovation Infrastructures

Name	Academia Nacional de Ciencias
Status	Non government institution
Profile	Promotion of scientific research and technological development.
Contact Person	Gabriel Macaya Trejos / Ericka Pérez Sánchez
e-mail	eperez@anc.cr / info@anc.cr
website	www.anc.cr

The National Academy of Sciences is a non government institution that promotes scientific research and technological development, dissemination, exchange of information and scientific material and technology between the academy, scientific institutions and authorities of the country. It provides a multidisciplinary forum for scientific discussion with emphasis on national issues.

Name	Dirección de Innovación - Ministerio de Ciencia y Tecnología
Status	Innovation Department from the S&T Ministry
Profile	Promotes, encourages and stimulates the creation of appropriate conditions for research, innovation, knowledge and technological development of Costa Rica to support the economic growth and improve Costa Ricans' quality of life.
Contact Person	Marco Chavez Ramirez
e-mail	micit@micit.go.cr , marco.chavez@micit.go.cr
website	http://www.micit.go.cr

Its general objective is to facilitate scientific research and technological innovation, leading to greater economic and social progress under a comprehensive sustainable development strategy.

Name	Centro Nacional de Innovaciones Biotecnológicas
Status	Research institution
Profile	Biotechnological research
Contact Person	Marta Valdéz Melara
e-mail	mvaldez@conare.ac.cr
website	http://www.cenibiot.go.cr

The CENIBiot includes the creation of a bioprocessing facility that allows scaling of organisms to pre-industrial processes to demonstrate the technical and economic feasibility of the research results. Research for the industrial application of technological packages for the productive sector a search for environmentally friendly solutions to agro-industrial waste pollution.

Name	Consejo Nacional de Rectores
Status	National Council of University Presidents
Profile	Coordination of all Public Higher Education Universities in Costa Rica.
Contact Person	Yamileth González
e-mail	conare@conare.ac.cr , rectoria.rectoria@ucr.ac.cr
website	http://www.conare.ac.cr

This council was created in 1974 by an agreement of all Public Universities in Costa Rica. It regulates aspects of coordination for the joined application of university autonomy in various areas.

Name	Universidad de Costa Rica
Status	Public university.
Profile	Autonomous public institution of Higher Education also dedicated to research and social issues.
Contact Person	Dr. Henning Jensen-Vicepresident for Research
e-mail	hjensen@ice.co.cr
website	http://www.ucr.ac.cr

The University of Costa Rica (UCR) is a public university. Its main campus “Ciudad Universitaria Rodrigo Facio” is located in San Pedro, in the province of San José. It is the oldest, largest, and most prestigious institution of higher education in Costa Rica. It is also the most important research university in the country, which holds approximately 42 research centers and institutes. Its faculty produces almost the 70% of all the scientific publications within the country, of which 25% are published in indexed international journals and magazines. Approximately 39,000 students attend UCR throughout the year.

Name	Instituto Tecnológico de Costa Rica
Status	Public university
Profile	Autonomous public institution of Higher Education, also dedicated to research and social issues.
Contact Person	Eugenio Trejos
e-mail	infoportal@itcr.ac.cr
website	http://www.tec.ac.cr

The ITCR is a public university that seeks to contribute to the overall development of the country through human resource training, research and extension, keeping the lead in scientific, technological and technical training and research, academic excellence and strict adherence to ethical standards and human environments from a university perspective.

Name	Universidad Nacional de Costa Rica
Status	Public university

Profile	Autonomous public institution of Higher Education, also dedicated to research and social issues.
Contact Person	Carlos Manuel Morera Beita
e-mail	
website	http://www.una.ac.cr

UNA is a public institution of higher education that generates scientific and cultural importance for the strategic national and international development, without distinction of gender, ethnicity, creed or social status. With its integral action, this University contributes to guide Costa Rican society to higher levels of welfare, equity, sustainability and democratic freedom through new paradigms, which translate and revalue human development.

Name	Universidad Estatal a Distancia
Status	Public university
Profile	Autonomous public institution of Higher Education, also dedicated to research and social issues.
Contact Person	Luis Guillermo Carpio Malavassi
e-mail	
website	http://www.uned.ac.cr

The UNED is the first of its kind in Costa Rica. It has been 33 years of continuous improvement of a distance educational system which main characteristic is to bring knowledge to the entire country no matter where the students are located.

Name	Comisión Asesora en Alta Tecnología de Costa Rica
Status	Non profit private organization,
Profile	Promotes social and economic development by taking advantage of the ICTs
Contact Person	Ricardo Monge González
e-mail	info@caatec.org, rmonge@caatec.org
website	www.caatec.org

The High Technology Advisory Committee Foundation- CAATEC- is a private, independent, impartial, non-profit, apolitical and non-government organization that seeks to improve and enhance the international competitiveness of Costa Rica, through actions aimed at improving areas of Infrastructure Technology, Education, Basic and Applied Science and Technology Generation and Transfer, especially related to the development of private and academic sectors.

Name	Cámara de Tecnologías de Información y Comunicación
Status	Non profit private organization
Profile	Chamber for information and communication technologies integrated by the major companies related to the scientific and technological development in this area.
Contact Person	Otto Rivera
e-mail	orivera@cantic.org
website	http://www.camtic.org

The Costa Rican Chamber of Information and Communication Technologies is a private, non-for-profit

business association established in 1998. It was created in order to form a strategic block that would allow to strengthen and to support the information and communication technologies (ICT) sector. Since CAMTIC began its activities representing only the Costa Rican software sector today, it groups over 90% of the software national enterprises.

Name	Centro Científico Tropical
Status	Non-governmental organization
Profile	Research in environmental and tropical natural resources
Contact Person	Gabriel Espeleta Delgado
e-mail	cct@cct.or.cr
website	http://www.cct.or.cr

CCT is a non-governmental scientific and environmental organization, the first of its kind in Costa Rica. Ever since it's founding in 1962, and through the work of noted scientists and professionals, CCT has become one of the most outstanding and influential institutions in Latin America in terms of science and conservation.

Name	Comisión de Energía Atómica de Costa Rica
Status	Autonomous public organization
Profile	Research and Studies in pacific applications of atomic energy.
Contact Person	M.Sc Lilliana Solís Díaz.
e-mail	info@cea.go.cr
website	http://www.cea.go.cr

Atomic Energy Commission is a decentralized public institution, established by the Basic Law on Peaceful Uses of Atomic Energy, No.4383, 1969. Its main purpose in to “promote the application, development and nuclear research for peaceful purposes”.

Name	Centro de Gestión Tecnológica e Informática Industrial
Status	Non profit private organization
Profile	It is committed to drive the productive sector in the region towards a sustainable development through consulting and capacity building
Contact Person	Daira Gómez Mora
e-mail	info@cegesti.org, dgomez@cegesti.org
website	http://www.cegesti.org

A private, independent and non-profit organization, founded in 1990 with the purpose of promoting and supporting the competitive position of the productive sector in Costa Rica and other Latin American countries, by offering integrated consultancy services, training, research and information to private and public enterprises, universities, technology-based companies and government organizations.

Name	Centro de Desarrollo Estratégico e Información en Salud y Seguridad Social
Status	Appendant organization
Profile	Promotes research and training in Health Sciences
Contact Person	Licda. Lilliana Murillo Zúñiga

e-mail	lmurillo@ccss.sa.cr
website	http://www.cendeisss.sa.cr

The Center of Strategic Development and Information on Health and Social Security (CENDE-ISSS) is the branch of the “Caja Costarricense del Seguro Social” (CCSS) responsible of ruling the training, research and information for educational purposes of the institutional human resources.

This center is located next to the Mexico Hospital in San José, Costa Rica, and was inaugurated on May 25th, 1974. It was originally conceived by its main proponent, Dr. Guido Miranda Gutiérrez, as a teaching and research center intended to train personnel in Health Sciences.

The CENDEISSS is today a branch of the Management Medical Division of the CCSS, and has approximately ninety employees. It functions as the transversal axis in the training of more that 35.000 employees of the most various professions and technical, administrative, financial and legal disciplines, as well as people in the area of health sciences of the CCSS.

Name	Cámara de Industrias de Costa Rica
Status	Non profit private organization
Profile	Industry chamber related to metal, food, textile and plastic industry.
Contact Person	Pedro Morales Carvajal
e-mail	pmorales@cicr.com
website	http://www.cicr.com

Costa Rica’s Chamber of Industries represents, since 1943, the country’s industrial sector. Its leadership in the business sector has enabled levels of excellence in search of better conditions not only for industry but for thousands of Costa Ricans who depend directly or indirectly from this activity.

Name	Centro de Incubación de Empresas
Status	Program from the Instituto Tecnológico de CR
Profile	Provides infrastructure and administrative services.
Contact Person	MAE. Eugenia Ferreto Gutiérrez
e-mail	eferreto@itcr.ac.cr
website	http://www.cietec.org

The Business Incubation Centre (CIETEC) is an institutional program promoted by the *Instituto Tecnológico de Costa Rica* with the cooperation and support of the Zeta Group (administrator of the Cartago Industrial Park) and the Ministry of Science and Technology. It is ascribed to the School of Business Administration of the ITCR.

Name	Centro Nacional de Ciencia y Tecnología
Status	Non profit organization
Profile	Created for dissemination of S&T advances and a research promotion.
Contact Person	Alejandra León Castellá
e-mail	leonale@racsa.co.cr
website	http://www.cientec.or.cr

The Science and Technology National Center (CIENTEC) is a non profit, non government organization, created in 1989. Its main purpose is to promote and socialize science and technology.

Name	Centro de Investigación en Ciencia y Tecnología de Alimentos
Status	Research center
Profile	Research center affiliated to UCR and Government Ministries
Contact Person	Carmela Velazquez Carrillo
e-mail	carmela.velazquez@ucr.ac.cr
website	http://www.cita.ucr.ac.cr

The Food Science and Technology National Centre (CITA was created 1974 by a cooperative agreement between the University of Costa Rica, the Ministry of Science and Technology and the Ministry of Agriculture. The Centre has had a very particular shape and innovative organization in which the University of Costa Rica established a program to work on science and food technology in the country as a way to contribute to the improvement of this economic sector.

Name	Escuela de Agricultura para la Región del Trópico Húmedo
Status	Private university
Profile	International institution in education for agriculture and rational use of natural resources.
Contact Person	Bert Kohlmann
e-mail	bkohlman@earth.ac.cr
website	http://www.earth.ac.cr

EARTH University is an international institution created out of a deep conviction that the environmental and social challenges confronting the planet can be resolved through education. It promotes science, technology and entrepreneurship while focusing on essential human values, leadership and a commitment to social and environmental service. EARTH offers an undergraduate program in agricultural sciences and the rational use of natural resources leading to the major degree.

Name	Fundación Omar Dengo
Status	Non profit private organization
Profile	National Project executor in human development, educational innovation and new technologies
Contact Person	Leda Muñoz
e-mail	info@fod.ac.cr, leda.munoz@fod.ac.cr
website	http://www.fod.ac.cr

The Omar Dengo Foundation is a private, nonprofit organization which began its activities in 1987. It executes and manages national and regional projects in the field of human development, educational innovation and new technologies. Several of its projects have benefited more than one and half million Costa Ricans, including children, young students, educators, professionals, and people from several communities and seniors.

Name	Instituto Nacional de Biodiversidad
Status	Non governmental and non profit organization



Profile	Research and biodiversity management center
Contact Person	Jesús Ugalde Gómez.
e-mail	jugalde@inbio.ac.cr
website	http://www.inbio.ac.cr

The National Biodiversity Institute (INBio) of Costa Rica is a private research and biodiversity management center, established in 1989 to support efforts to gather knowledge on the country's biological diversity and to promote its sustainable use. The institute works under the premise that the best way to conserve biodiversity is to study it, value it, and uses the opportunities it offers to improve the quality of life of human beings. INBio is a non-governmental, non-profit, public interest organization of civil society that works in close collaboration with different government institutions, universities, the private sector and other public and private organizations, both within and outside Costa Rica.

Name	Instituto Nacional de Investigación y Enseñanza en Nutrición y Salud
Status	Public organization
Profile	Research and control for public health
Contact Person	Patricia Allen Flores
e-mail	pallen@inciensa.sa.cr
website	http://www.inciensa.sa.cr

The Institute for Research and Education on Nutrition and Health (INCIENSA) is a public institution under the Office of the Minister of Health, responsible for: prevention and control of priority public health problems through the development of surveillance systems, epidemiological and laboratory based national reference centers (CNR). It runs public health research to generate knowledge to support decision making timely and effective. It also transfers the knowledge generated by educating and socializing the results with the community.

Name	Instituto Nacional de Estadística y Censos
Status	Government organization
Profile	Coordination and management in national statistics
Contact Person	Raquel Barrientos Cordero
e-mail	consejo@inec.go.cr
website	http://www.inec.go.cr

INEC is the technical lead agency for the National Statistics System that coordinates the statistical output of the country in order to respond to the needs of national information.

Name	Instituto Nacional de Tecnología Agropecuaria
Status	Research institution
Profile	Research institution ascribed to the Agriculture and Livestock Ministry
Contact Person	Adrián Morales Gómez
e-mail	amorales@inta.go.cr
website	www.mag.go.cr

Name	Instituto de Normas y Técnicas de Costa Rica
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Status	Non profit private organization
Profile	National Standarization Center
Contact Person	Carlos E. Rodríguez
e-mail	info@inteco.or.cr
website	http://www.inteco.or.cr

The Standards Institute of Costa Rica (INTECO) is a private, nonprofit organization founded in 1987. The institute aims to lead the development of Costa Rican standards, ensuring that they are suitable for socio-economic development of the country and its preparation is consistent with good practices, internationally accepted standards that promote quality improvement of processes, products and services.

Name	Organización de Estudios Tropicales
Status	Non profit consortium
Profile	Promotion of the education and research in tropical biology
Contact Person	Liana Babbar
e-mail	liana.babbar@ots.ac.cr , infoweb@ots.ac.cr
website	http://www.ots.ac.cr

The Organization for Tropical Studies (OET) is a non-profit consortium that has grown to include 63 universities and research institutions from the United States, Latin America and Australia. In the early 1960's, scientists from U.S. universities forged working relationships with colleagues at the Universidad de Costa Rica in the interest of strengthening education and research in tropical biology. Intense interest both in the U.S. and Costa Rica led to the founding of OET in 1963. OET was founded to provide leadership in education, research and the responsible use of natural resources in the tropics. To address this mission, OET conducts graduate and undergraduate education, facilitates research, participates in tropical forest conservation, maintains three biological stations in Costa Rica and conducts environmental education programs.

3.3.Conclusions/Recommendations

The 1970's was an important decade in Costa Rica due to the decisive support that the government gave to the development of science and technology, particularly by creating new organisms and different laws that boosted the research and work in these fields.

Actually, Costa Rica has a Ministry of Science and Technology which coordinates and leads the implementation of public policies and strategies to enhance science and technology development and innovation. Additionally, there are a number of adjunct institutions which provide the Ministry with specific support and advice.

During the last 20 years, a priority has been given to specific studies and strategic documents which are crucial for the analysis of science and technology development in Costa Rica. Among others, it is important to mention the *XX Century Strategy*, which delineates a long-term planning in science, technology and innovation, incorporating a diagnostic, vision and action plan; and the *Atlas for Innovation in Costa Rica*, a document that seeks to maximize the opportunities given by science and technology to the development of the country.

Furthermore, it is possible to find other sector oriented reports for higher education, science and technology principal indicators, entrepreneurship, and technology transfer. Also, all the institutions related to science and technology have their own web sites with relevant national information about the areas covered by their work.

In Costa Rica, there is also a network of research institutions which work in different topics that en-

hance the development of science and technology. As has been mentioned in the national report: *Estado Actual de la Ciencia, Tecnología e Innovación en Costa Rica (UCR, 2010)*, there are 176 public and private research centers, of which 26 have key infrastructures for the development of innovation.

A series of specific programs and instruments strengthen science, technology and innovation. Among others: BIOINNOVAR, SMES Strengthening Program of the National Food Science and Technology, INNOVEX Program, the SMES Observatory, the Bioprocessing Plant, Entrepreneurs' Program, the Program to pursue Foreign Investment and other regional and international projects such as Central America Innovates and AL INVEST.

Another relevant factor that contributes to the development of science and technology is funding. Costa Rica has specific funding programs such as the Development Banking System which by law establishes that each public bank has to have their own trust to support individuals or legal persons that present innovative ventures. Also, there are some Special Funds of which one can mention: the Incentive Fund of the Ministry of Science and Technology, PROPYME, FODETEC and FORINVES granted by the National Council of Scientific and Technological Researches, and the LINK Program of the Costa Rican ICT Chamber. Finally, CR-USA Foundation and Fundecooperación are some of the NGO's that provide no refundable venture capital.

As can be noticed, Costa Rica has a wide network of programs, supported by law, to strengthen the development of science, technology and innovation. This has represented not only an important advancement for these areas, but mainly it shows our interest in the research of biodiversity, the sustainable use of resources, the improvement of SMES, the implementation of ICT's and son on, contributing with the development of the country and its people.

3.4. References

1. *XXI Century Strategy*

<http://www.estrategia.cr/December 01, 2010>

2. *Atlas for Innovation in Costa Rica.*

http://www.micit.go.cr/index.php/docman/doc_details/196-atlas-para-la-innovacion-en-costa-rica-2007.html December 01, 2010

3. **Benavides, Shirley Ed. Innovation, Technology and Regional Development.** Heredia: Editorial Universidad Nacional, 2010.

4. See also, UNESCO Science Report 2010, The Current Status of Science around the World, Chapter 4, Latin America. <http://unesdoc.unesco.org/images/0018/001899/189958e.pdf> December 01, 2010

3.5. List of Acronyms / Definitions

MICIT: Ministerio de Ciencia y Tecnología

CONICIT: Consejo Nacional de Ciencia y Tecnología

CeNAT: Centro Nacional de Alta Tecnología

ANC: Academia Nacional de Ciencias

CENIBiot: Centro Nacional de Innovaciones Biotecnológicas

CONARE: Consejo Nacional de Rectores

UCR: Universidad de Costa Rica

UNA: Universidad Nacional

ITCR: Instituto Tecnológico de Costa Rica

UNED: Universidad Estatal a Distancia

CAATEC: Comisión Asesora de Alta Tecnología en Costa Rica

CAMTIC: Cámara de Tecnologías de Información y Comunicación

CCT: Centro Científico Tropical

CEA: Comisión de Energía Atómica de Costa Rica

CEGESTI: Centro de Gestión en Tecnológica e Informática Industrial
CENDEISSS: Centro de Desarrollo Estratégico e Información en Salud y Seguridad Social
CICR: Cámara de Industrias de Costa Rica
CIETEC: Centro de Incubación de Empresas
CIENTEC: Centro Nacional de Ciencia y Tecnología
CITA: Centro de Investigación en Ciencia y Tecnología de Alimentos
EARTH: Escuela de Agricultura para la Región del Trópico Húmedo
FOD: Fundación Omar Dengo
INBio: Instituto Nacional de Biodiversidad
INCIENSA: Instituto Nacional de Investigación y Enseñanza en Nutrición y Salud
INEC: Instituto Nacional de Estadística y Censos
INTA-MAG: Instituto Nacional en Tecnología Agropecuaria
INTECO: Instituto de Normas y Técnicas de Costa Rica
OET: Organización de Estudios Tropicales

4. Nicaragua

4.1. Introduction

4.1.1. General Environment for Setting Up Innovation Infrastructures

Nicaragua has conceived the idea that Science, Technology and Innovation are necessary for the development of society and specially in the need of improve the economic and social life style oh the nation.

During the last Government, especially due to the interest and support shown by the Vicepresident of Nicargua, CONICYT has made possible several projects regarding S+T+I. CONICYT is an organization attached to the vice-presidency of the Republic, created in 1995 to direct and coordinate all sectors and institutions involved in the development, application and implementation of all the sectors mentioned above.

CONICYT coordinates the National System of Science, Technology and Innovation (SINACYT) in order to stimulate the generation, transfer and use of knowledge in all productive and social sectors in order to creates mechanisms for management and administration of resources.

The national innovation system in Nicaragua includes a complex set of actors in the production sector (goods and services companies), public organizations under the Central Government and provincial governments, universities and research centers, nongovernmental organizations (NGOs), and civil society. These actors interact to share information and eventually knowledge, and exchange physical resources to contribute in different ways to the creation and use of knowledge for economic development in Nicaragua.

The efficiency of innovation systems in Nicaragua depends on the ability to lift and / or strengthen the capacities of each of the actors as well as the adoption of laws and policies that encourage innovation. SNIN analysis allows grouped into the following four subsystems: the productive sector, the government sector, universities and research centers, and nongovernmental organizations.

4.1.2. Strategic Documents

Based on the progress of science and technology to global and regional level, Nicaragua could not stay out of these new trends and legal instruments and recognizing the duty of the state to ensure that science, technology and innovation are oriented to the service of Nicaraguans. Through the enactment of legal instruments, the Nicaraguan Council of Science and Technology was established in 1995, through Decree 5-95, that allows supporting policies, programs and activities required in this area and to contribute and accelerate economic development in purpose of ensuring a better quality of life.

CONICYT is formally launched by the President, the Executive Secretary, 18 regular members and 17 alternate members representing different sectors of the country's government, academic and productive.

Science and technology have a great importance to the development strategies of all countries, so their generation and dissemination, transfer and use by a specific legal framework are still stimulated, to govern such activities and establish institutional mechanisms oriented support and coordination. To fulfill its role, the adoption of the following laws has been promoted: Law on Science, Technology and Innovation, Personal Data Protection, Electronic Commerce, Electronic Signature (recently approved).

The proposed Law on Science and Technology has been oriented towards sustainability of the economy and society. In this context, scientific research and technological innovation is a necessary condition for

the country to achieve its objectives in improving productivity and the relationship with the environment and obtain higher levels of social welfare for our people.

The development of our country requires the integration and coordination of activities carried out in the field of science, technology and innovation, which are linked to national development priorities.

This draft law in its art. 3. establishes the creation of the Nicaraguan Fund for Science, Technology and Innovation, known as FONICYT. This fund will be used to finance projects and programs in science, technology and innovation, adaptation of new technologies and their dissemination and the creation of funds for the development of innovation in enterprises.

CONICYT shall annually submit a budget proposal to fund its operations, programs and scientific and technological projects of national interest. This budget should be incorporated into the budget of the nation and will represent at least 1% of it, according to art. 39.

This draft law in art. 2. concerning the specific objectives, contemplates consider the science, technology and innovation, as keystones in the economic, environmental and social policies of the country, and the development and promotion of scientific, technological and innovation activities, to achieve the systemic competitiveness of the country.

In development instruments considered in this Act shall prioritize projects dedicated to modernization, innovation and technology development that are associated with business users of technology, especially for small and medium enterprises, according to art.45.

4.1.3. Specific Programs and Instruments

CONICYT is an agency attached to the Vice-presidency of the Republic of Nicaragua, counselor and coordinator of all sectors and institutions involved with development, application and implementation of Science and Technology in the country, to influence and contribute in solving science and technology problems, it has been working on the integration of sectors, in search of development of policies, strategy and plans for Science, Technology and stimulating the generation, transfer and adaptability of the knowledge of the highest level, to solve current future needs of the country.

It has been working on the creation of a Nicaraguan Science, Technology and Innovation Fund, which will go to programs and projects of scientific, technology and innovation research, adaptation of new technologies and their dissemination. Also includes management of funds to promote the development of innovative companies.

In a recent diagnosis of a National Innovation System of Nicaragua (made by CEPAL to generate inputs for the Science and Technology Plan of CONICYT), it is revealed that currently there are some skills to use, improve and build their fields of action and linkage to aforementioned sectors that make up this system. Likewise, the development of technological capabilities will allow Nicaragua to join the knowledge economy and thereby increase its strategic sectors that will result in greater economic growth and reducing poverty and inequality.

This study mentioned that Nicaragua is a country that attracts less money on research and development budget (0.05% of GDP) of all of Central America, Costa Rica allocated 0.32%, 0.09% El Salvador, Guatemala and Honduras 0.06%.

The proposed Strategic Plan of CONICYT, includes the following main lines of action:
Promote the articulation of the policies of the STI according to the criteria of coherence, complementar-

ity and collaboration.

Create an enabling environment to improve business competitiveness and facilitate the implementation and financing of joint projects between academia, the productive sector and the public sector to contribute to growth and prosperity of society.

Improve national capacities to use and develop technological innovations by increasing the quality and efficiency of the ITC.

Promote the evaluation of research results of R + D + I and the implementation of sectoral and territorial policies, both individually and collectively.

- Facilitate the participation of the beneficiaries and users of the results achieved in research and projects to meet their needs.

In parallel, we have been developing and implementing a series of activities to promote and encourage innovation in the country:

Creating a policy framework, legal and regulatory framework that promotes scientific and technological development, provided, among others: creation of a register of science, technology and innovation, creation of a scientific agenda, promoting stimulation and incentives for scientific research and technology in the country, training of human talent fostering vocations to the research and innovation, creation of a Nicaraguan Fund for Science, Technology and Innovation, which will allocate to programs and projects of scientific research, technology and innovation, adaptation new technologies and their dissemination. Agreements with International Organizations to promote specialized training for professionals through scholarships.

Popularization of science and technology through scientific conferences, forums, awards for innovation. Workshops on priority issues such as water, environment, renewable energy, information technology and biotechnology.

4.1.4. Financing

National Funds: There are currently no funds for innovation projects, we have a budget that allows us a way to promote these initiatives and work in search of funds through international organizations and participating in various international projects.

4.2. Existing Innovation Infrastructures in Nicaragua

4.2.1. Key Government Players

Name	Nicaraguan Council of Science and Technology
Status	National Secretariat
Profile	Conicyt has the mission of coordinating all sectors involved in the creation and management of Science, Technology and Innovation.
Contact Person	Guadalupe Martínez
e-mail	guadalupe.martinez@conicyt.gob.ni
website	www.conicyt.gob.ni

CONICYT coordinates the National System of Science, Technology and Innovation (SINACYT) in order to stimulate the generation, transfer and use of knowledge in all productive and social sectors in order to create mechanisms for management and administration of resources.

Name	MIFIC (Ministry of Industry and Trade)
Status	Ministry

Profile	To contribute to the integral development of Nicaragua through the formulation and implementation of policies that contribute to sustainable increase in production and business activity in the country and therefore the welfare of Nicaraguans.
Contact Person	Lic. Orlando Solorzano (Minister)
e-mail	
website	www.mific.gob.ni

Manage the Registry of Intellectual Property and boost productivity, efficiency and competitiveness of cross-chains and clusters, industry and other nonagricultural sectors, relying on the development, transfer of technology and management training with emphasis on small and medium enterprises.

The “Inter-American Development Bank (IDB) approved a loan of innovation, with the aim of supporting the Ministry of Development, Industry and Trade (MIFIC), among others, the outsourcing of Sharing Fund (Matching Grants) for SMEs of the Tourism, Dairy, Fisheries and Aquaculture, Leather and Footwear, Textile Garments, agro-industry, metalworking, crafts and more. Just as the Technology Providers PST, to implement plans for Technological Innovation and Adaptation Plans to Offer Services (PAOT) and Strengthening the National Innovation System (NIS).

Among the main objectives and contributions of the program, it supported the learning experience of new institutional arrangements and institutional strengthening of entities involved in the SIN, eliminating obstacles to increase the productivity of SMEs, including technology transfer. Support for SMEs is considered the provision of 3 factors considered of high importance: funding, information, timely technical support for technological innovation.

The main objective was to promote innovation and technological development of SMEs and strengthen the CONICYT. This project was completed in 2007 and is currently working on the second part of this project to be submitted to the World Bank for funding.

4.2.2. Key Innovation Infrastructures

Name	The Academy of Sciences of Nicaragua (ACN)
Profile	It is a private non-profit association (Decree AN 6152, 2010), whose main purpose is to promote and disseminate the science, research and scientific culture, as essential elements for sustainable human development.
Contact Person	Jorge Huete
e-mail	Jahuete@yahoo.com
Website	www.cienciasdenicaragua.org

Since its founding on March 30, 2009, the NCA aims to develop as a leading organization in the search for solutions and alternatives to contemporary issues and challenges in science, technology and innovation (STI), and aiming to contribute decisively to the improvement of Nicaraguan society and the world around us and worthily represent Nicaraguan scientists in these purposes.

Name	Technology Park (Development Project)
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Profile	It is the environment in which the university, government, businesses and regional and international organizations converge to generate research, innovation, and ongoing actions for technology transfer between sectors that comprise it, fostering the creation of innovative enterprises through incubation mechanisms in and provide other value added services and business spaces and facilities.
Contact Person	Leonel Plazaola
e-mail	leonel.plazaola@uni.edu.ni
Website	www.uni.edu.ni

To contribute to sustainable national development through research, innovation, technology transfer, entrepreneurship, business incubation and professional training, in partnership with government, business and national, regional and international organisms.

The main services offered by the park:

- Consulting
- Technical assistance and legal
- Specialized Studies
- Monitoring technology
- Monitoring Processes
- Training
- Business tables

Name	Incubator InSPIRE
Profile	It is a business incubator that fosters the creation and consolidation of companies with high growth potential, generating wealth and employment. It direct its services to youth and adult entrepreneurs, building local capacities and resources for development of Nicaragua.
Contact Person	Aura Ivania Arauz
e-mail	ivania2k@hotmail.com
Website	www.uni.edu.ni

The main services offered by the incubator:

Management Consulting: Business common needs in enterprises, marketing, accounting, legal, etc.
 Consultancies; specific business needs.
 Infrastructure: physical space, utilities, laboratories, etc.
 Networking

Name	Family Business Project
Profile	It is the project on "Promotion and Implementation of corporate governance tool Nicaraguan in SMEs", which is financed by the FOMIN /IDB and the UNI with contributions of 70% and 30% respectively.
Contact Person	Leonardo Centeno
e-mail	lcenteno@vicepresidencia.gob.ni
Website	www.negociosdefamilia.org

The project will benefit at least 100 SMEs through the implementation of corporate governance systems, whether family or nonfamily businesses.

- Will be sensitized 300 representatives of institutions involved in SME sector.
- Financial cooperation agencies and universities, 800 businesses, consultants and General public.

4.2.3. Other related Organizations

Name	INTA (Nicaraguan Institute of Agricultural Technology)
Status	
Profile	Adaptation and transfer of agricultural and forestry technologies to Small and Medium Sized Producers, ethnic communities and indigenous people to improve food and nutrition security.
Contact Person	
e-mail	
website	www.inta.gob.ni

Contributes to security, food sovereignty and nutrition aimed at building a small-medium production model of agribusiness and agro-industry through technological innovation and sustainable local development.

4.3. Conclusions/Recommendations

In order to establish a legal framework for the innovation, Nicaragua has to define and consolidate the actors involve in R+D+I. It is also necessary to approve some laws that will guarantee the correct functions of the sectors involved in S+T.

Enact laws that promote the development of project initiatives related to Science, Technology and Innovation in SMEs, in order to generate substantial contributions to development.

Interagency agreements, aimed at encouraging the integration of actors of Science, Technology and Innovation in the formation of networks to share resources, infrastructure and human capacity to achieve the transfer and application of knowledge.

Creating FOCYT, which is the Science and Technology Fund, which would allow the CONICYT obtaining resources to manage, coordinate and effectively finance scientific and technological development and innovation.

Establish competitions for non-reimbursable financing for research projects and services of S & T and Innovation for academic institutions, institutes and government agencies and private non-profit.

Search of Scholarships for the training of professionals for research and innovation, aimed at training of professionals for research through postgraduate studies at Masters and PhD, both at home and abroad. Promote the formation of innovative and modernizing business which will be aimed at training and enhancing the talent of young professionals who join the business, to facilitate processes that meet internal company needs and concerns of small and medium businesses, to enhance responsiveness to competitive conditions in the context in which they operate.

4.4. References

National Council of Science and Technology

www.conicyt.gob.ni (Last time visited: april 15th, 2011)



Ministry of Industry and Trade

www.mific.gob.ni (Last time visited: April 15th, 2011)

Family Business Project

<http://negociosdefamilia.org/> (Last time visited: april 15th, 2011)

INTA

www.inta.gob.ni (Last time visited: april 15th, 2011)

Engineer National University

<http://www.uni.edu.ni/> (Last time visited: april 15th, 2011)

Science Academy of Nicaragua

<http://www.cienciasdenicaragua.org/> (Last time visited: april 15th, 2011)

Other documents:

- National Plan for Science and Technology of CONICYT 2010-2013.

The overall objective of the National Plan of CTI is to promote economic development and social development of Nicaragua, whose main engines are science, technology and innovation.

The implementation of the Plan seeks to create a learning and knowledge generation, to ensure capacity building of stakeholders in the national innovation system in Nicaragua. This system will enhance and update useful and productive knowledge to innovate products, processes and services and thus stimulate economic and social development of Nicaragua. <http://www.conicyt.gob.ni/images/documentos/plan.pdf> (Last time visited: april 15th, 2011)

- Diagnosis of the National Innovation System of Nicaragua (CEPAL).

- Documents of the Fourth Regional Meeting of Vice-Presidents of Central America, Belize, Panama and Dominican Republic (Presentations of the Nicaragua Vice President and President of CONICYT, Mr. Jaime Morales Carazo.

4.5.List of Acronyms / Definitions

CONICYT: Nicaraguan Council of Science and Technology.

SINACYT: National Science and Technology System.

SMEs: Small, Medium Enterprises.

STI: Science, Technology and Innovation.

R + D + I: Research, development and Innovation.

5. Guatemala

5.1. Introduction

5.1.1. General Environment for Setting Up Innovation Infrastructures

Decree 63-91, Law for Promotion of Scientific and Technological Development, states that “the State recognizes that science and technology as cornerstones of national development”, and “...it is necessary to stimulate its generation, dissemination, transfer and use” and define the institutional mechanisms of its support, management and coordination.

Article 25 of that Act states as functions for the National Council of Science and Technology –CONCYT–: “Submit the national policy of scientific and technological development” and “coordinate the preparation, implementation and monitoring of National Plan for Scientific and Technological and its corresponding Sector Program.”

Although this recognition was formulated in 1991, the current development of science and technology in Guatemala is still not satisfactory. However, since 2004, the law has received a new impulse, which is evidenced by the creation of the *Presidential Commissioner for Science and Technology* and the publication of the **National Plan for Science, Technology and Innovation 2005-2014**. This Plan seeks to implement the policy of science, technology and innovation of Guatemala, as well as the correspondent actions.

Considering the national economic performance through globalization, it is necessary to set the contribution of science, technology and innovation to develop new products, the production chain, process improvement and quality standards. The link university/business, technology centres must be strengthened, to become more competitive on foreign and local markets.

The indicators analyzed revealed that poor socioeconomic status of much of the population, poor basic services and low productivity, require a special contribution of scientific and technological resources to address the development of the regions most affected by poverty, unemployment and lack of services. Particular attention must be given to the deterioration of the environment, as well as recovery and natural resource management. The Plan prioritizes science, technology and innovation that will help respond to the matters listed.

The Plan is considered of strategic importance, and will help to incorporate the national scientific and technological advances in fields such as biotechnology, ICTs, new materials, chemistry, nanotechnology, and others. This effort requires the specialization of human resources and the creation of technology centres, or the equipment of existing service units.

The Plan is a strategic tool, with a horizon of ten years, which will:

- Establish specific, measurable corporate goals, in short (less than or equal to two years) and medium-term (less than or equal to five years but more than two);
- Clearly identify essential changes for the development of science, technology and innovation, and to meet specific results required in strategic sectors.
- Every two years, assess performance and results to make needed adjustments.

In 2001, the Fund began the Competitive Agro-AGROCYT Technological Development, to 1) improve agricultural production, 2) boost food production reorganization; and 3) livestock, forestry and hydro-biological development.

PROINTEC is a program that supports technological innovation activities and implementation of the Community Centers-Information Technology -CCIT-.

5.1.2. Strategic Documents

Several strategic documents reflecting National Innovation Strategies (NIS) have been formulated in order to set up the framework for innovation and technology development:

1) **Guatemalan Science, Technology and Innovation Plan 2005-2014 (Plan Nacional de Ciencia, Tecnología e Innovación 2005-2014).**

This strategic document, a synthesis of multiple outputs from different sectors (including eminent Guatemalan scientists living in the Country and/or abroad), is a central item of the government exertion in this area that concerns itself with strategies and tactics pertaining to Science, Technology and Innovation for social and economic development, and with fulfillment of State policy concerning these topics.

Description of contents: (1) Diagnosis of Science and Technology in Guatemala; (2) Strategic Plan (mission, vision, objectives, strategies, prospective, components); (3) Development and Escalation of the Science, Technology and Innovation National System; (4) Provision for development of Productivity, Quality and Competitiveness; (5) Scientific and Technological contribution to population needs; (6) Control, Evaluation and Follow-up.

2) **Guatemalan Science & Technology Law 63-91 (Ley de Promoción del Desarrollo Científico y Tecnológico, Decreto legislativo 63-91)**

This is the Legal corpus that officially acknowledges Scientific Knowledge and Technology as most fundamental pillars for National Development. The State fully commands their generation, dissemination, transfer and utilization across the Country, defining institutional mechanism for said efforts.

5.1.3. Specific Programs and Instruments

The following Programmes and Projects supports Guatemalan technology development:

1. **National Programme for Competitiveness (Programa Nacional de Competitividad)**

Legally established by Executive Order # 942-99 (1999) and modified by Executive Orders # 132-2002 (2002) and # 306-2004 (2004), respectively, is responsible for: (1) promoting policies that improve foreign investment for productive activities within the Country; (2) support cluster formation/growth/development, whether industrial or service-oriented, identified as potentially competitive; and (3) support of Agendas focused on local sustainable development.

Given the systemic character of Competitiveness, PRONACOM stresses and seeks a wide and permanent engagement of diverse economic sectors and experts for quick, efficient economic strategy design.

2. **Science & Technology for Development Iberoamerican Programme. (Programa Iberoamericano de Ciencia y Tecnología para el Desarrollo –CYTED-)**

This Hispanic programme (Spain, Latin America) finances both domestic (member countries) scientific research projects that produce transferable technology and Innovation projects that benefit Industry.

Two open calls: #1) released to the general public, time-bound application (two months), moderate amount awarded; and #2) designed only for universities (public and private), private sector organizations (enterprises, etc.), and related government units (research institutes, etc.), no-time limit for application, generous amount awarded.

3. **7th Framework Programme for Research and Technological Development (FP7)**

Via the project called *Enhancing Scientific Cooperation between the European Union and Central America* (ENLACE), it becomes an important part of the process of allowing Guatemalan scientists to create links with peers across Europe in order to build up scientific expertise, collaborate in projects of common interest and form valuable networks.

5.1.4. Financing

There is only a mid to large-scale of important donors operating in Guatemala that offer financial support for innovation infrastructures and enterprise development, among them: Interamerican Development Bank (Banco Interamericano de Desarrollo), USAID, German Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), International Monetary Fund (IMF).

There is only a modicum of large-scale of important donors operating in Guatemala that offer financial support for innovation infrastructures and enterprise development, *inter alia*, Interamerican Development Bank (Banco Interamericano de Desarrollo), USAID, German Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), International Monetary Fund (IMF).

Every year, CONCYT publishes a call, for funding projects in the following lines:

FACYT up to Q.75,000.00

FODECYT up to Q.400,000.00

MULTICYT up to Q.500,000.00

These amounts may be increased by express permission of CONCYT. CONCYT annually establish the proportion of the budget that will be allocated to each of the lines of financing, according to the needs that are identified and priorities established by the CONCYT. Their annual budget is Q.28.000,000.00.

Universidad de San Carlos de Guatemala, thorough the Dirección General de Investigación –DIGI-, budgets Q.6.600,000.00 per year, to offer financial support for research, development, and from 2011, innovation.

DIGI makes an annual call, under strategic lines, to fund R+D+i in 12 different areas of knowledge. Starting from 2012, the amounts to be financed are:

Up to Q.190,000.00, to do research in a period of 10 months

Up to Q.400,000.00, to do research in a period up to 18 months

Up to Q.1.000,000.00 , to do research in a period up to 24 months

5.2.Existing Innovation Infrastructures in Guatemala

5.2.1. Key Government Players

Name	Guatemalan Ministry of Economy (Ministerio de Economía, Gobierno de la República de Guatemala).
Status	Government Ministry
Profile	<p>The Ministry of Economy is the main government institution responsible for Economic Integration & Foreign Trade, Foreign/Domestic Investment and Competitiveness, and Small & Medium Enterprise (SME) development in Guatemala.</p> <p>The Vice ministry of Micro, Small & Medium Enterprise (Viceministerio de la Micro, Pequeña y Mediana Empresa), for instance, has, as its main tasks, the following: (1) Formulate, promote and update strategies for Micro, Small and Medium Enterprise (MSME) development; (2) Follow up the implementation of said strategies and other business promotion policies; (3) Consult with the business community on businesses issues; (4) Identify potential productive areas for rural development; (5) Maximize Micro, Small and Medium Enterprises access to financial sources; and (6) Create institutional infrastructure to support entrepreneurship, Micro, Small and Medium Enterprise (MSME) competitiveness; and, in general, (7) procure favorable conditions for job creation.</p> <p>The Ministry of Economy cooperates with other ministries (Finance, etc.) concerning commerce and SME related issues, and is responsible for various important registries (Patents, Intellectual Property, etc.).</p>

Contact Person	Licenciado Erick Haroldo Coyoy Echeverría, Ministro de Economía
e-mail	AParedes@mineco.gob.gt
website	http://www.mineco.gob.gt/

Name	Guatemalan National Council of Science and Technology. (Consejo Nacional de Ciencia y Tecnología)
Status	National Secretariat
Profile	Top decision-making unit concerning scientific and technological development in the Country. Integrated by nine members: (1) Vice president of the Republic of Guatemala; (2) Minister of Economy; (3) President of the National Parliament's Science and Technology Commission; (4) President of the Chamber of Industry; (5) President of the Chamber of Agriculture; (6) President of the Chamber of Commerce; (7) Chancellor of the University of San Carlos of Guatemala; (8) Rector of a private university in representation of all private sector universities; and (9) President of the Guatemalan Academy of Medical, Physical and Natural Sciences.

Contact Person	Dra. Rosa María Amaya, Secretaria Nacional de Ciencia y Tecnología
e-mail	ramaya@concyt.gob.gt
website	www.concyt.gob.gt

Name	Science and Technology National Office. (Secretaría Nacional de Ciencia y Tecnología -CONCYT-)
Status	National Secretariat
Profile	This executive body is responsible for implementing all CONCYT decisions and representing the Council with all economic and social sectors
Contact Person	Dra. Rosa María Amaya, Secretaria Nacional de Ciencia y Tecnología
e-mail	ramaya@concyt.gob.gt
website	www.concyt.gob.gt

Name	Ministry of Education (Ministerio de Educación del Gobierno de la República de Guatemala)
Status	Government Ministry
Profile	The Ministry of Education is identified as a fundamental governmental organization responsible for: (1) performance, management and development of the public education system, primary and secondary levels. (2) Design and verification of the attained quality standards of the public and non public education sector, primary and secondary levels; and (3) Functioning, administration and development of scientific research according to the Guatemalan Science and Technology Law (Ley de Promoción del Desarrollo Científico y Tecnológico), primary and secondary levels. The Ministry of Education, because of the above, cooperates with other government institutions (Science and Technology National Office, University of San Carlos of Guatemala, etc.) to implement the national Action Plan related to e-education.
Contact Person	Licenciado Dennis Alonso, Ministro de Educación
e-mail	info@mineduc.gob.gt
website	www.mineduc.gob.gt

5.2.2. Key Innovation Infrastructures

This section gives an overview on further main innovation infrastructures in Guatemala.

Universities

Name	Universidad de San Carlos de Guatemala
Status	National University
Profile	<p>The Universidad de San Carlos de Guatemala –USAC-, the only Guatemala’s National University, is entrusted by the Political Constitution of the Republic of Guatemala with the promotion of scientific research in all spheres of the human knowledge and assistance in the study and solution of national problems.</p> <p>The Guatemalan National University’s Research System (Sistema Universitario de Investigación de la Universidad de San Carlos de Guatemala –SUI-) comprises a network of 48 research centers, laboratories and individual researchers within the University, the country’s largest, designed to enable interdisciplinary research, sharing of scientific results and advancement of projects seeking to solve/improve important issues related to the Nation’s development.</p> <p>The scientific production generated by its research centers and institutes (250 permanent researchers and over 6,000 part time researchers) and 13 permanent research programs is managed by the Vice-Chancellorship for Research (Dirección General de Investigación -DIGI-). DIGI supports STI, knowing that Science, Technology and Innovation is vital to our economic and social progress.</p>
Contact Person	Dr. Jorge Luis De Leon Arana, Director General de Investigación
e-mail	biousac@usac.edu.gt
website	http://digi.usac.edu.gt

University of San Carlos of Guatemala (Universidad de San Carlos de Guatemala -USAC-) and Universidad del Valle de Guatemala -UVG- are the two most important R&D centres in the national academic arena, and two of the most prominent in the regional scenario, quantitatively and qualitatively speaking. Other important centres in the Guatemalan scholarly sphere, specially considered (because of latest developments) from a technological point of view are: Universidad Rafael Landívar (URL), Universidad Galileo (UGalileo) y Universidad Mariano Gálvez de Guatemala (UMG).

Name	Universidad del Valle de Guatemala -UVG-
Status	Private University
Profile	UVG has 12 different research centres and laboratories. UVG support for research on issues related to development of the country and expected the same commitment to teaching.
Contact Person	MA. Roberto Moreno Godoy, Rector
e-mail	rmoreno@uvg.edu.gt
website	http://www.uvg.edu.gt
Name	Universidad Mariano Gálvez de Guatemala -UMG-
Status	Private University
Profile	The Instituto de Investigaciones Químicas, Biológicas, Biomédicas y Biofísicas founded in Feb. 2004, contributes to scientific and technological knowledge in the areas of life sciences, through basic and applied research
Contact Person	Lic. Eyda Mendía de Campollo, Biotechnology Director
e-mail	i2qb3@umg.edu.gt, ecampollo@umg.edu.gt
website	http://iiqb3b.umg.edu.gt

Name	Universidad Rafael Landívar de Guatemala -URL-
Status	Private University
Profile	The Directorate General for Research and Outreach (Dirección General de Investigación y Proyección -DGIP-) is responsible for guiding, planning, integrating and monitoring its ten Research Institutes and programs. They provide the country and with research of quality and relevance.
Contact Person	P. Eduardo Valdés Barría S.J., Director, Dirección General de Investigación y Proyección
e-mail	amsosa@url.edu.gt
website	http://www.url.edu.gt

Name	Universidad Galileo de Guatemala
Status	Private University
Profile	The Institute of Research and Development (Instituto de Investigación y Desarrollo -IID-) contributes in science and technology, and economic development in Guatemala, through the creation of new knowledge, its exploitation by industry, facilitating the dissemination of technological culture, and supporting the training of new professionals.
Contact Person	Ing. Judith Díaz, Directora – Instituto de Investigación y Desarrollo de Energía
e-mail	judithd@galileo.edu
website	http://www.galileo.edu

Industrial Parks

In recent years, there have been some limited, unimposing initiatives (mostly in the private sector) for the creation of industrial parks in Guatemala but information related to them is mostly unavailable or incomplete for unrelated parties. Two, however, are worthy of mention: (1) Technopark Guatemala; and (2) USAC Solar Energy Industrial Park.

The first is a private enterprise, currently located south of the Capital City (Palín, Escuintla) in the strategic Pacific coast zone, rich in soil nutrients and in energy sources. It specializes in the generation of wind-produced (eolic) energy.

The second, a project materialized by the Guatemalan National University's Faculty of Engineering (Facultad de Ingeniería de la Universidad de San Carlos de Guatemala) during the 1990's, is located inside the University's huge main campus (in an area adjudicated to the Faculty). Even though not officially foreclosed is, at present, almost non-functional. It specialized in the generation of solar energy.

Technological and Science Parks

At this time there are no technology or science parks in operation in the country but there is a vivid interest in several deciding agents related to their foundation in the Country.

University of San Carlos of Guatemala's proposal (Vice-chancellorship for Research) has been, so far, nationally influential, and was a determining factor for the creation of the Technological Parks National Committee, established by the Science and Technology National Office. These Parks have been declared a national priority by direct order of the Nation's Vice president (Head of the Guatemalan National Council of Science and Technology).

5.2.3. Other related organizations

Central American University Council. (Consejo Superior Universitario Centroamericano --CSUCA--)
CSUCA, a collegial body representative of and integrated by delegates from all National Universities in the Central American Region, is currently applying itself to mediate between scholars, policy makers

and businesspersons in order to promote public-private coalition building. CSUCA activities in this field include: (1) Education and training, generally sponsored by the German Academic Exchange Service (DAAD); (2) Public outreach and advocacy; and (3) Information exchange and dissemination.

5.3. Conclusions/Recommendations

In overall terms, only the Guatemalan Government in setting out new policies to support the growth and development of SMEs has achieved a modest degree of progress. A stronger outreach is needed if opportunities for growth in this area are to be maximized.

Specially, research-driven economic growth is not in the center of attention and has to be vigorously developed.

Yet, increasingly conscious of this, to a varying degree, many sectors in the country are especially receptive to and interested in technology and science parks (specially the *thematic* type), making their horizon promising indeed, even if, for the time being, there are none in operation.

Business incubators are functioning almost nominally at present, but the introduction of technology or science parks into the Country may change this noticeably. In general, nevertheless, recent advancement in this area (business incubation) is too dependent on donor support, raising unavoidable questions about sustainability.

The analysis of the environment and of the existent infrastructure makes evident that there is a need both to upgrade strategies in order to support innovation infrastructures and to strengthen relationships among various governmental entities responsible for the Small & Medium Enterprises (SMEs) development.

Intergovernmental co-ordination should be enhanced in order to ensure transparency and harmonization when Small & Medium Enterprises (SMEs) policies are elaborated.

There is a need to improve, moreover, the engagement not only of promoters of science and science-industry linkages, but also members of the Private Sector in policy creation.

This might prove difficult sometimes (because of the recent history of the Country) but to build and secure trust and cooperation among all members of National System of Innovation is already a recognized inevitable prerequisite for national economic development. Additional support programs for establishment of innovation infrastructures may prove helpful in this endeavor.

Human and financial resources should be incessantly directed to institutions (particularly beneficial in the case of the rural ones) involved in support of innovation infrastructures. Staff itself should be continuously improved through capacity building activities.

Increase support for research (by all sectors) is an unavoidable chore in the Country.

Best practices on implementation of SME policies and trends in the SME sector should be followed permanently.

Better dissemination of available information, finally, is as needed as is the upgrading of connectivity and the increase of entrepreneurs' and civil society's awareness regarding activities of innovation infrastructures.

5.4. References

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2. Guatemalan Information and Knowledge Society National Agenda. (Agenda Nacional de la Sociedad de la Información y el Conocimiento de Guatemala). http://www.concyt.gob.gt/comibase/com-listas/concyt/uploads/planes/GUATE_RESUMEN_EJECUTIVO_FINAL_NOV_28.pdf

3. Guatemalan Science, Technology and Innovation Plan 2005-2014 (Plan Nacional de Ciencia, Tecnología e Innovación 2005-2014). http://www.concyt.gob.gt/index.php?option=com_content&view=article&id=207:plan-nacional-de-cienciatecnologia-e-innovacion&catid=87:plan-nacional-de-cti&Itemid=165
4. Guatemalan Science & Technology Law 63-91. (Ley de Promoción del Desarrollo Científico y Tecnológico, Decreto legislativo 63-91). <http://www.eclac.org/publicaciones/xml/0/4600/Capl.htm>
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6. Honduras

6.1. Introduction

6.1.1. General Environment for Setting Up Innovation Infrastructures

Honduras is a country with a singular geographic distribution, which has allowed the development of a great number of ecosystems and subsystems that includes one of the biggest richness of biodiversity. As a result of these singularities, Honduras possesses a great potential in its comparative advantages, which could become competitive only through a Innovation and Investigation System that would allowed to use those advantages in terms of promoting the sustainable human development of its population.

To obtain the appropriate degree of progress according to the needs of a country in such a way that would transcend to each one of the citizens of any age and condition, with the guarantee that the program will not be stopped in the future as a consequence of the environmental, scientific or technological mistakes made without intention, but without enough knowledge, it is necessary to extend the activities of scientific research, so the public policy and private work decisions will be coherent with the present and future insufficiencies.

Honduras began its way to the promotion and administration of the investigation with the creation of the Honduran Council of science and Technology (COHCIT-Acronym in Spanish), created by the Presidency of the Republic of Honduras through decree number 5592 on January 16, 1993, as part of the processes of modernization of the State. The COHCIT developed among its tasks, several programs and projects such as the creation of the Excellence Center for education in information technologies (CEETI-Acronym in Spanish); the Program of Excellence National Post degrees; the construction of the building of Metrology and the creation of the Honduran Institute of Normalization (OHN-Acronym in Spanish); the identification of the Public Centers for investigation for the promotion of science in the country. Besides, the COHCIT developed several science fairs with the support of pair organizations of Colombia and Mexico.

Beginning in January of 2010, the Honduran government reactivates the processes of planning of the State, with the creation of the Planning Secretary (SEPLAN-Acronym in Spanish), absorbing COHCIT's functions inside the Section of Innovation and Competitiveness.

In Honduras, besides that, a lot of scientific societies, public institutes, foundations for research, university research institutes have functioned creating an infrastructural base for the promotion of science and technology in several disciplines.

Importance of science and technology

The facilitation of the scientific investigation and the technological innovation are indispensable tasks for the development of the country, making it competitive within a determined order for the updated technology and new systems of production and manufacturing.

Regarding this, the countries of the area have done important efforts to obtain the development of their productive systems, which reflect in front of the market not just Central American, quality and standardization norms demanded in the context of a global market.

By implementing a policy of enterprise competitiveness and productivity, it is the State's interest to impel the development of science and technology through the direct financing of investigation projects for the research enterprises and centres already existing in the country.

In order to do a modification of the achievement and form of production in the private sector, a highly professional capacity is demanded, capable of implement, develop, improve and do adjustments to the new model of production that will deliver its products for the competency of extra-regional markets.

6.1.2. Strategic Documents

The investigation in Honduras is currently conducted by institutional initiatives, without any specific

programs for the interinstitutional coordination. The science and technology investigation in Honduras is developed generally as a response of the concrete and urgent needs.

The greatest demand of scientific research proceeds from the fields of Health and from the Agropecuario sector with exportation purposes. The personnel that develop the different research activities are highly qualified and able to get the expected results. The lack of national policies to determine specific plans of development in each sector implies backwardness between the structure that asks for the research or innovation and the specific actions of the researcher.

The high Honduran potential in the agro-pecuario-forestal area is a key, the most solid in the future planning of the nation: the creation and execution of the Plan of Nation and vision of the country, contemplates the national economic specialization in that way, it is the well-aimed towards the Macro-economic specialization of the country.

There are strategic documents that provide viable solution alternatives to the biggest problems that attack the society as a whole; documents that point out the national priorities oriented to the generation of public and State policies in sensitive areas such as the economic attached to the productivity and the sustainability; the health, education, environment, food and nutrition security among other aspects. From this perspective the following are pointed:

“Visión de país 2010-2038”, A vision of country that includes principles, National objectives and goals of National priority for the period 2010-2038.

The National Congress of Honduras approved the “Vision of Country 2010-2038” and the “Plan of Nation 2010-2022”, prepared for a committee named by the Congress itself, with the intention that it will be executed during the following seven periods of Government.

The documents contained technical and conceptual approaches formulated by anterior initiatives derived at the same time from processes of consultation with the Honduran society and particular expressions from regions, counties and communities within the country.

Plan of Nation (2010-2022) and Vision of Country (2010-2038), document in which a group of goals with sub indicators are detailed, where the interest to promote the science, technology, research, development and innovation is implicit.

From that the following documents were conformed:

A Plan of Nation that covers a first phase of the *Vision of Country (2010-2022)* and that is made of strategic lineaments, objectives and indicators which will mark the progressive responsibilities of the next three governments in terms of the Vision of Country;

A rubric of 58 indicators, which contains the quantitative criteria to be reached, and that permits the measurement of the advances of the accomplishment of the Plan of Nation, according to each one of the strategic lineaments that formed it, segmented to the degree of advances expected at the end of the period of government.

A profile of decree for the creation of the National System of Planning that acts as an instrument for the execution and institutionalization of the Vision of country and the Plan of Nation, and which should contain for its right implementation, with a lawful framework, an institutional definition and a schema of operational functionality.

Within the Plan of Nation one can identify orienting principles of development:

- Focus on the human being and its reasonable integral development,
- Respect to the dignity of the human person,
- Solidarity and equity as a criteria for the state intervention,
- Subsidiarity as a state policy;
- Freedom as part of the development of the Human Being,
- Economic growth as a generating means of development;
- Democracy and political pluralism;

- Citizens participation as a generating means of governability;
- Equity of genre as a transversal axis;
- Respect and preservation of the culture and the customs of the Ethnic Groups;
- Integration and transparency as a foundation of the performance;
- Macroeconomic stability as an indispensable element of the growth;
- Sustainable development in harmony with nature.

In every one of them the applied research is implied, and in a lower degree the basic investigation as a result of implementing those orienting principles and the formulation of strategies.

The role of the Universities in the scientific and technologic development in the decade of 1998-2007. National report of Honduras. EL ROL DE LAS UNIVERSIDADES EN EL DESARROLLO CIENTÍFICO-TECNOLÓGICO EN LA DÉCADA 1998 – 2007. This report presents the role of the institutions of High Education level in the promotion of science and technology as a form of reinforcing the systems of innovation and competitiveness.

Priorities in Science and Technology Honduras 2001-2003, CTCAP, BID.: <http://www.slideshare.net/monicaguerra/prioridades-en-ciencia-y-tecnologia-para-honduras-proyecto-atn-ns-8226-rs1-presentation>. Díaz, A. (2004). The diagnostic done under the sponsorship of the Interamerican Bank for the Development (BID-Spanish acronym) and the Commission for the Scientific and Technological Development in Central America and Panama (CTCAP-Spanish acronym), projects critical information from the involved sectors and that are of interest for the Honduran State, for which the situation and progress of the science and technology in general are a fundamental point in the National Agenda of the Plan of Nation and y Vision of Country.

The report provides a profile of the priorities in science and technology, and innovation in Honduras; it includes among others the following:

- Over-takings of the Scientific Investigation in Honduras.
- Analysis of the scientific and technological national capacities.
- Research Institutions of Higher Education, Public and private labs in relation to scientific and innovation activities.
- Basic *statistics* of human and finance resources, infrastructure and innovation
- Scientific, technological and innovation programs and projects
- Effectiveness of the Programs y Projects
- Characteristics of the demand and supply of scientific, technological and innovation services

Characteristics of the activities of innovation

Limitations of the Innovation

Economic Sectors prioritized by the Government

Scientific and technological needs of the prioritized sectors

Higher Education in Iberoamerica Report 2010, Scientific-technological development *in Iberoamérica in the decade 1998-2007 and the role of the universities* Interrelations between science, technology and higher education.

The Central American case. (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua y Panamá)

[Priorities in Science and Technology for Honduras. Project](#). The report presents an x-ray of the participation of the public and private sector and the academic sector of the universities and institutions of higher education that orientate their efforts to impel the investigation in science, technology and innovation. Its participation for the economic development of the country, and in some cases identify the institutions related with systematic activities of production, promotion, diffusion and application of scientific and technological knowledge, in basic and applied investigation, innovation and development

I+D).

In other cases, identify the groups of basic projects, scientific and technological areas in which they develop, in institutions and enterprises that impel them, and their relation with the economic sectors prioritized in the country. It can be observed that from the analysis of the scientific and technological national capacities, the research institutions of higher education, public and private laboratories related to the scientific, technological and innovative activity.

www.vdivde-it.de/, “Strategy of National Systems of Innovation for Honduras and Guatemala”, is the characterization of the key actors and their tasks/roles to develop/reinforce a system of Innovation in Honduras and Guatemala. Moreover, a strategy and its correspondent execution procedure are proposed to conform a Regional System (Central America) of Innovation to an emphasis in Honduras, Guatemala and El Salvador. The report forms part of the DESCA program of GTZ, that tries to improve the political and institutional conditions to foment the technological and commercial competency of the MIP and MEs.

6.1.3. Specific Programmes and Instruments

Honduras has been considered one of the poorest countries in the world; however, the natural resources, animal and botanic species, coral reefs and sea life, indigenous settlements, touristic archeological and anthropological parks, colonial setting of small towns and villages, the nature and the natural setting of land, variety of climate and temperature in such a small piece of land give Honduras a special touch of beauty and awakens the curiosity of researchers and international organizations searching for key factors to produce a remarkable improvement in the living and working conditions, access to health and public services, security and gender equity. During the last decades, this country has endeavored with time and effort to change such negative conditions, and as a result, it has launched specific programs and develops certain legal instruments to make Honduras life better for its population and environment.

Looking for holistic approach to food safety programs: As part of the launching of 2011 as the Year of Food Safety by the Government of the Republic, the Secretary of Agriculture and Livestock, Jacobo Regalado, participated in the inauguration of the workshop “Towards a comprehensive approach to food and nutrition programs in Honduras “.

Sanitary and phytosanitary measures to help improve trade in Honduras: To ensure safe handling of products for consumption, human and certification of exports and imports in the plant and animal sector. The Honduran Government has established the National Committee on Sanitary and Phytosanitary (SPS), the National Service of Agricultural Health (SENASA), an agency of the Ministry of Agriculture and Livestock (SAG) to assure the quality standards to handle products for human consumption. Lately, the SAG proposed the expansion of representations of public and private sector.

In addition, these two large brand new projects, the SAG, SEPLAN and INA develop a series of programs and project to contribute to the general development of the nation like the following DIGIPESCA, PRONAPAC, AGRONEGOCIOS, DINADERS/ FONADERS, PRONADERS, PROMORCO, among others

Name	DIGEPESCA
Status	Dirección General de Pesca
Profile	Secretary of Agriculture and Livestock
Contact Person	Dr. Roberto Reynaud
e-mail	Robertoreynaud2003@yahoo.com
website	digipesca@yahoo.com

The National Fisheries and Aquaculture (PRONAPAC), is responsible for the conduct of matters relating to fisheries, farming and protection of aquatic species. It is incumbent, sorting, resource use and sustain-

nability of national fisheries and aquaculture.

Strengthening the exercise of state responsibility for fishing, maritime and inland water and aquaculture, in its various stages, capture, cultivation, manufacturing, storage, transport and domestic and foreign marketing, and through multidisciplinary research in order to know the real availability of resources to promote sustainable exploitation of them and get the best benefits from the standpoint of economic and social, according to the potential offered by the resource and the economic and social conditions in the country.

Name	PRONAGRO
Status	Programa Nacional Agroalimentario
Profile	Secretary of Agriculture and Livestock
Contact Person	Ing. Javier Quan, Edificio DICTA, segundo nivel, Tegucigalpa
e-mail	Javie_quan@yahoo.com
website	www.sag.gob.hn

National Program of Food and Agriculture Development (PRONAGRO), is responsible to organize the rural producers in food chains.

Name	AGRONEGOCIOS
Status	Program
Profile	Secretary of Agriculture and Livestock
Contact Person	Ing. Javier Barahona, Edificio DICTA, segundo nivel, Tegucigalpa
e-mail	cpascua@fidehonduras.com
website	www.sag.gob.hn/agronegocios

Promotes agrobusiness to generate greater added value, in order to increase competitiveness and incomes of producers. The primary objective of the Program is to strengthen the competitive position of agriculture in the valleys and plateaus of the country, for which producers are organized in chains and agro-food networks, in order to establish dialogues, agreements and initiatives to intensify, diversify, and increase the added value of agricultural production and agrobusiness

Name	DINADERS/ FONADERS
Status	Program
Profile	National Funds for Rural and Sustainable Development
Contact Person	Dr. Mario Pineda, Oficina, Col. Puerta del Sol, Boulevard San Juan Bosco, Contiguo a SETCO, Tegucigalpa,
e-mail	mpineda@pronaders.hn
website	www.sag.gob.hn/agronegocios

DINADERS/FONADERS is a decentralized office attached to the Ministry of Agriculture and Livestock, with administrative, technical and financial duties. It is the financial instrument to meet the demands PRONADERS local rural residents. During the period 2006-2010, FONADERS managed the budget and remnants to finance projects revitalizing the rural economy; manage the Natural Resource Management of Priority Watersheds (MARENA) and the Rural Development Project (PROSOC) through which is helping to reduce poverty and physical vulnerability, economic and environmental impact critical areas of territory in rural areas of selected watersheds as a basis for improving the quality of life and sustainable

development of communities

Name	PRONADERS
Status	Program
Profile	National Program for Sustainable Rural Development
Contact Person	Dr. Mario Pineda, Oficina, Col. Puerta del Sol, Boulevard San Juan Bosco, Contiguo a SETCO, Tegucigalpa, 22353302 al 05
e-mail	mpineda@pronaders.hn
website	www.sag.gob.hn/agronegocios

The National Program for Sustainable Rural Development (PRONADERS), is responsible to help improve the quality of life of rural communities, through the human, social, environmental and production, based on self-management and community participation, with a focus on sustainable management of natural resources. PRONADERS is responsible for the coordination, integration, implementation, monitoring and evaluation of actions and interventions of rural development projects with the active participation of local governments, civil society and the beneficiary population.

Name	PROMORCO
Status	Project
Profile	Project of Rural Businesses
Contact Person	Ing. Elías Nazar, Edificio SAG, Primer Nivel, Tegucigalpa
e-mail	enazar@sag.gob.hn
website	www.sag.gob.hn

PROMORCO is a joint effort of PNUD, BCIE & SAG in financing and providing necessary conditions for development in the rural areas of Honduras.

Name	Modernización del riego en microcuencas del oeste del valle de Comayagua
Status	Proyecto
Profile	Joint effort PNUD, BCIE & SAG
Contact Person	Ing. Miguel Ángel Bonilla, Col. Miramontes, 1er. Ave, calle principal, Frente a Santos y Compañía, Tegucigalpa
e-mail	mabonilla@funder.hn
website	www.sag.gob.hn

Modernization of Irrigation Projects in Comayagua West Valley, this project intends to help with the rehabilitation, construction and modernization of irrigation areas; also, it aims at promoting commercial agriculture development, training and technical assistance in the area and local development and environment protection.

In the context of the specific programs, there are others that are mentioned, which because of its economic and productive impact and its social vinculation are important; they are public and private institutions that promote or execute programs and projects of investigation and innovation (see acronyms at the end), or they provide specialized services through their laboratories.

SENASA: Servicios de Sanidad Agropecuaria (Agropecuarian Health services), under the direction of SAG. It is centered in the activity of animal health laboratory and research:

DICTA : Dirección de Ciencia y Tecnología Agropecuaria. (Direction of Agropecuarian Science and Technology) It is entered in programming and transferring science and technology processes to the agroindustry.

PROMOSTA: Proyecto de Modernización de los Servicios de Tecnología Agropecuaria: (Project of Modernization of the Agropecuarian Technology Services): It includes: National Plan of Technology and Agrofood Capacitation, Strengthening of the National Center of Transference- Investigation of Agropecuarian Technology.

Laboratories, Public, Private Instances for R+D+I development. They are instances of great specialization in different activities of resources achievement that develop investigation in the search for excellence in the quality for competitiveness.

Standard Fruit Company and Tela Railroad Company Laboratories develop investigation for their own use and benefit, doing it in banana and pineapple cultivations. They provide service to their concessionaries in different countries of the world.

Quality Control Laboratory San José, evaluates and verifies the veterinarian products of general use in the national agropecuarian system,

National Laboratory of Residue Analysis (LANAR-Spanish acronym), verifies and controls food with possible contamination of pathogen agents of different nature,

Honduran Institute of Medical- Veterinarian Investigation, unique of reference in the country in charge of the cattle diagnosis and investigation, moreover, it creates vaccines and other products for veterinarian use in the national and international field.

Laboratory of Aquatic Pathology, with verification and control in shrimp farms and aquatic products. This laboratory has under its care the aquatic industry, whose contribution to exportations is of important relevance in the equilibrium of payment in the country.

Inside of the CYTED program in Honduras, it has allowed the participation of Enterprises and National Research Institutions, in the different activities that inside its operational framework (*Subprograms, Nets and Thematic areas*) CYTED has been developing, even more the formation and training of a great amount of people in different areas included in the thematic nets through the Iberoamerican Conferences that take place in the Formation Centres of the Spanish Cooperation around Latin America.

Name	Vegetal Extracts of Central America (EXVECAN)
Status	Private Sector with Enterprise and Government vinculation
Profile	Production and services, including fitpharmaceutical products
Contact Person	Ing. Jorge Mendoza
e-mail	exvecam@multivisionhn.net
website	www.hondurascalidad.org/cyted.htm

Name	Iberoamerican Program of Science and Technology for the Developmentb(CYTED)
Status	Quality and Environment Unity, from the Planning Secretary
Profile	Promotes the participation of enterprises in different thematic areas
Contact Person	Ing. Jorge Mendoza Gerente General
e-mail	exvecam@multivisionhn.ne
website	www.hondurascalidad.org/cyted.htm

Nets in which Enterprises and Honduran Research Centres participate

Name	IBEROAMERICAN NET of AGROPLASTICULTURE
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Status	Escuela Agrícola Panamericana/ ZAMORANO
Profile	Projects of Protected Plasticulture and Agriculture. Science and Agropecuarian Production Career
Contact Person	Ing. Edwin Flores
e-mail	enflores@zamorano.edu
website	www.zamorano.edu
Name	IBEROAMERICAN NET FOR THE DEFENSIBLE APPLICATIONS OF THE PHOTOVOLTAIC ENERGY (RIASEF)
Status	Physics Departament. Universidad Nacional Autónoma de Honduras
Profile	Defensible Applications of the photovoltaic energy
Contact Person	Marco Antonio Flores Barahona
e-mail	marcoaflores@fisica.unah.hn
website	https://www.unah.edu.hn
Name	IBEROAMERICAN NET OF TRANSFERENCE OF APPROPRIATE TECHNOLOGIES WITH USE OF THE RENOVBABLE ENERGIES (RITTAER)
Status	Departamento of Physics. UNAH
Profile	Vinculation for the transference of technologies in removable energy
Contact Person	Marco Antonio Flores Barahona
e-mail	marcoaflores@fisica.unah.hn
website	https://www.unah.edu.hn

6.1.4. Financing

In the developed countries, with great economic availability, the investments in scientific research are considered the foundation towards progress, the richness and benefit of all the instances and of the citizens. On the other hand, in countries in way of development, not always are considered this way. Even more, it is considered that, because of the confined that our economy is, it is impossible to generate and create new and fresh knowledge, capable of solve our difficulties and also contribute to fix the problems of Humanity.

The financing for research is not yet typified in the Budget lines of the public finances within the Finance Administration System (SIAFI), the Budget for research is not assigned for the State, the biggest part is derived from the administration of the institutions that include in their Budget sponsorships, donations or see if they can get resources through the development of hired investigations or in collaboration with other countries or cooperating institutions, in the development of programs and specific projects.

Only the UNAH and the UPNFM inside of the Higher Education System, have Budget to pay salaries and payments to researchers. In the case of the UPNFM a fundation has been created as a fund for the development of Investigation, capacitation and publishing, the UNAH has created a fund for the creation of the University Institute of Investigation.

The investment in I+D stays constant during the last decade; however, according to Aquiles Díaz in the scientific investigation centers in their study provide a view over the investments in scientific investigation in several Honduran university centers:

UNAH: There is not specific data about that investment. According to the authority in Investigation of that center, for the period in which this study took place the UNAH invested less tan 1% of the Budget in investigation.

UPNFM: The data that has been found, according to the authorities, is that there is not anything assigned for this concept; the development of scientific investigation is financed with fideicommissum, under the

Fund of Support to the Investigation, that is not more than 0.025 of the general budget of the institution. **UNITEC** does not have the amount of the costs for research. It functions with an entrepreneur's concept, with general purposes and services to the community, satisfying the scientific and technological needs of the demand. The annual investment –at that time- in scientific-technological activities was between 1.5% and 2% of the budget.

ESNACIFOR, the investment is in the order of 0,5% of its budget, from that, 90% is for salaries, and the rest for activities of scientific research.

CURLA, it is in a similar situation, coinciding in a scientific research inferior to 1% of its annual budget.

FHIA, in its report of 2002 the Budget was of 2.65%,

In **SENASA**, the research is done to answer the questions pertaining to the agropecuarian sector, with emphasis to the lines for agroexportation purposes.

The Budget for research is very limited and depends of funds and external help. Its annual budget for investigation projects is calculated between 1% and 2%.

DICTA. It depends on the funds that the **BID PROMOSTA** program gives to do the technological transference and investigation, that are done for extra-institutional laboratories. There is an annual amount for investigation that is shared with other activities. The Budget of the Government for these purposes goes between 1% and 2%.

In general (Aguiles Díaz), the Budget in Honduras for the development and implementation of the investigation in science, technology, training, publishing and others, represents a percentage that goes between 0.05 and 0.065 of the National PIB.

6.2.Existing Innovation Infrastructures in honduras

6.2.1. Key Government Players

Honduras today has the legal conditions to Innovate and generate innovation projects at the national and international levels; however, the country still misses the social security for international investors and private sector incentives. Nevertheless, in the Nation's Plan and the Country's Project Honduras remarks the need to change those weaknesses and encourages everyone In the territory to make sure to contribute for the safety and security of all the population in the nation.

Characteristics of the Innovation Activities

Private Sector

In general, the private sector develops its activities of innovation as a response to the needs and demands emerged during the productive process. Any effort of planning and systematization has been found to develop applied investigation of long term.

The innovation processes are done with the idea of fixing concrete situations. As a consequence, it can be said that the investigations *ad hoc* that are done in the emergency situations, are done with funds assigned to emergency, projecting the solution of an established problem that could happen.

In the same way, the Honduran private sector has shown to have an excellent and new information of administration and innovation about the activity that interest them in any case, so the innovations that they develop have as an objective adjust and optimize the final product to the market for which it is directed.

Public Sector

The Honduran public sector does develop investigation in different areas, one of the strongest, in the Health System. It is necessary to distinguish the type of investigation that is done in this field. According to the statement of Doctor Carlos Ponce Garay, responsible of the Laboratories of the Fight against Chagas Disease program, “the *investigation that is done in his unit has the character of fulfilling the char-*

acteristic of functionality”.

The *macro level* of investigation in the National System of Health according to doctor Carlos Ponce Garay, Chief of the Laboratory of Leshmaniasis: se study, detect y synthetize characteristics macro of vectors, as an example the phenotypical characteristics of the *Aedes aegyptis*, transmissor vector of the dengue.

For the *micro* investigation, other laboratories are used, in the exterior, preferably. A similar situation similar is repeated in the Laboratories of the Agriculture and Cattle Secretary (SAG) and in other Units and Laboratories of the Public Sector, that develop and manage a determine level of scientific investigation.

Regarding the acquisition of techniques and updates, the mechanism used with higher frequency is the updating of necessary personnel outside of the country, in United States, Central and South America.

Higher Education Sector

In the Higher Education sector, applied investigation is produced in benefit of the sectors that ask for it, including private and public institutions, such as foreign laboratories. Concretely, the one that is done in the Microbiology and Biology careers at the UNAH. The Escuela Agrícola Panamericana participates in this classification.

This sector also looks its updating in other countries, through the search for scholarships for their personnel, preferably in the United States, Japan, Spain, Germany, among others. In the same way, UNITEC is distinguished, as a notable characteristic, for its high rate of occupation of the personnel that works in the laboratories, in other words, the teachers that direct the applied investigations have plenty of time to develop them.

Name	FUNDER
Status	Organization for the fomentation of the PYMES
Profile	Foundation for the Rural Entrepreneur Development
Contact Person	Ing. Miguel Ángel Bonilla, Col. Miramontes, 1er. Ave, calle principal, Frente a Santos y Compañía, Tegucigalpa
e-mail	mabonilla@funder.hn
website	www.sag.gob.hn

Department of Agricultural Education, Training and Development Agribusiness intends to promote the training of human resources according to needs arising from the demands of the agri-food sector to the challenges of globalization, in order to equip the country’s workforce skills and knowledge designed to produce and market a more competitive.

Key Government Players

In this section the main units or governmental institutions in charge of generating research policies are described, to be developed for other public entities or for private organizations and from the third sector (foundations, NGO’s, OPD’s).

Name	Technical Secretariat of Planning and External Cooperation
Status	Oficina gubernamental para la vinculación y cooperación externa
Profile	Secretary of Planning and External Cooperation
Contact Person	Arturo Corrales: General Secretary of Planning and External Cooperation

Contact Person	Eduardo Pavon Cambar: Competitiveness Director
e-mail	epavon@seplan.gob.hn
website	http://www.seplan.gob.hn

The Technical Secretariat of Planning and External Cooperation, under the President of the Republic shall have the following functions and attributions:

- a) Advise the President of the Republic in all matters related to the Vision of the Country, the National Plan and National Planning System;
- b) Act as technical Secretariat of the Council of the National Plan and the National Council for Competitiveness and Innovation;
- c) Advise the Regional Development Councils and conduct studies at the request of those involved in the Council;
- d) To coordinate external cooperation projects and the effective use of resources for specific innovation and development projects.

Name	Direction of Innovation and Competitiveness
Status	Governmental Office for the fomentation of the innovation
Profile	Planning Secretary Dependency
Contact Person	Eduardo Pavon Cambar: Competitiveness Director
e-mail	epavon@seplan.gob.hn.
website	http://www.seplan.gob.hn

The Direction of Innovation and Competitiveness, is the unit adscript to the Secretary of Planning and Cooperation (SEPLAN), divided in four sub directions (Science and Technology; Innovation; National System of Quality; Technologies of information and Communication), which have absorbed the formal functions of COHCIT. Sub direction of Science and Technology

Name	Honduran Institute of Anthropology and History
Status	Governmental Office for anthropologic and historic investigations
Profile	Governmental Dependency for the conservation of the national historical and anthropological patrimony
Contact Person	Abogada Carla Moncada, Virgilio Paredes Trapero, Gerente
e-mail	vparedes100@yahoo.com
website	www.ihah.hn

The Honduran Institute of Anthropology and History (IHAH) is the institution of the state in charge of conduct the anthropological and historical investigation with the idea of generates conservation policies of the cultural patrimony, adscript to the Culture, Arts and sports Secretary. Currently counts with a series of publications that can be seen as a catalogue in the web <http://www.ihah.hn/publicaciones.swf> as books, monografies and investigations. In the same way the abstracts of the investigations are published in the YaxKin magazine. All the investigation about the maya, nahualt and lenca cultures is documented in the investigations kept and published by the IHAH.

Name	National Institute of Educative Investigation and Capacitation
Status	Governmental Office adscript to the Education Secretary

Profile	It is an institution of public carácter, for the educative investigations and capacitation
Contact Person	Licda. Brenda Lagos
e-mail	brelamo@yahoo.com
website	www.se.gob.hn

The National Institute of Educative Investigation and Capacitation (INICE), is a dependency of the Education Secretary, with offices in 9 departments. The INICE has constituted since 2008 the Local Nets of Educative Investigation in Honduras (RLIEH 2008), as well as a team of investigation. INICE publishes the result of its investigations in the Educative Investigation Journal *Perspectiva Global*.

Name	Higher Education Direction
Status	Semiautonomous entity that regulates Higher Education of the country
Profile	Governmental Office that norms Higher education in Honduras
Contact Person	Abogado Victor Molina, Director Ejecutivo
e-mail	profvictormolinaunah@yahoo.com
website	http://des.unah.edu.hn/portal

The Higher Education Direction is the unity adscript to the Universidad Nacional Autónoma de Honduras (UNAH), in charge of norm, direct, control and develop the Higher Education of Honduras. Among its statutes we can find elements rule the university teaching, the investigation and the extension. Currently there are under the supervisión, 6 institutions of public higher education and 14 private ones.

Name	Direction of University Scientific Investigation
Status	Dependency of the UNAH
Profile	In charge of coordinate and direct the university scientific investigation
Contact Person	Leticia Calderón
e-mail	dicu@unah.edu.hn
website	https://www.unah.edu.hn/?cat=7

The Direction of University Scientific Investigation(DICU) is a dependency of the Universidad Nacional Autónoma de Honduras (UNAH) created in 1984, it currently counts with a catalogue of researcher teachers, with a program of researcher formation and university professors that teach how to investigate, as well as a system of statutes for investigation scholarships, of institutes of investigation and of the system of scientific Investigation of the Universidad, publishing at the same time the investigations of the university students in the Science and Technology Journal.

Name	Post Degree and Investigation Vice-Rectory
Status	Dependency of the UPNFM
Profile	Unit in charge of coordinating, directing and fomenting the university scientific investigation
Contact Person	Truman Membreño
e-mail	bitelio.t@gmail.com
website	http://www.upnfm.edu.hn/VRIP/

The Post Degree and Investigation Vice-Rectory (VRIP) is the academic unit of the Universidad Pe-

dagógica Nacional Francisco Morazán, it is the permanent organism for the planning, the coordination, the administration, advice and consultation of the investigation that generates policies and priorities of institutional investigation contributing in that way to the production of the knowledge in the Honduran society. To the VRIP there are adscripted several units: 1) The Institute of Social and Educative Investigation and Evaluation (INIEES), in charge of promoting, developing, administering and managing the educative and social investigation and evaluation in the local, national and international fields; 2) The Center of Educative Investigation and Innovation (CIIE), it develops educative innovation in the Prebasic, Basic and Middle levels of the National Educative System. 3) the Direction of Post degrees (DPG); 4) the Unity of Measurement of the Quality of the Education (UMCE), among others. The VRIP currently counts with a General Plan of the development of investigation in the University, a system of University investigation (SIU-UPN), 23 groups of Investigation correctly registered in different areas, a Fiduciary fund to support the Investigation, its own publications such as the Investigation and Postdegrees Journal and the institutionalization of the National and Regional Congresses of Educative Investigation.

Name	National System of Innovation and the Transference of Agricultural Technology
Status	Unit of the Secretary of agriculture and cattle (SAG)
Profile	Governmental Office that rules the agropecuarian investigation
Contact Person	Guillermo Solórzano
e-mail	solorzano.g@sag.gob.hn
website	http://www.sag.gob.hn/

Coordinated from the Direction of Agricultural Science and Technology (DICTA) of the Secretary of Agriculture and Cattle (SAG), National System of Innovation and the Transference of Agricultural Technology (SNITTA), maintains relations with the Central American Integration System in Agricultural Technology (SICTA), as well as coordinating the public and private efforts of the field of agricultural investigation through the National Commission of Agropecuarian Technology (CONACTA).

Name	National Forestal Investigation System, Protected áreas and Wildlife (SINFOR).
Status	Dependency of the Secretary of Agriculture and Cattle SAG
Profile	Governmental Office that rules the Forestal Investigation. It develops forestal technical, scientific and applied investigation
Contact Person	Ing. Roberto Tejada, FHIA,,
e-mail	tejada.rob@gmail.com
website	http://www.icf.gob.hn

The National Forestal Investigation System, Protected areas and Wildlife (SINFOR), was created by the initiative of the Executive Power of the Government of Honduras in November de 2010, with the purpose of coordinating the institutional efforts of the investigation, as part of this initiative, the Universidad Nacional Autónoma de Honduras (UNAH), the Escuela Nacional de Ciencias Forestal (ESNACIFOR), the Universidad Nacional Agrícola (UNA) and the Escuela Agrícola Panamericana El Zamorano (EAP), the Centro de Utilización y Promoción Forestal (CUPROFOR)

6.2.2. Key Innovation Infrastructures

In this segment the work that the institutions that conduct the processes of scientific research in Honduras is described.



Name	Direction of Agropecuarian Science and Technology Agropecuaria
Status	Dependency of SAG
Profile	Governmental Office that conducts the agropecuarian investigation.
Contact Person	Leticia Villeda
e-mail	Villeda.l@iica.it
website	http://www.sag.gob.hn/i

Through the Direction of Agropecuarian Science and Technology investigations are conducted in 10 experimental stations around the country, the way of liberating constantly variety of vegetables and animal races adapted to the climate requirements as well as the market ones. DICTA keeps relations with the international Center of Corn and wheat Improving (CIMMIT), the Center for Investigation in Tropical Agriculture (CIAT), the Tropical Agronomic Center of Investigation and Teaching (CATIE), the Interamerican Institute of Agricultural Cooperation (IICA).

Name	Centers of Investigation and Capacitation in Caficulture of the Honduran Institute of Coffee (IHCAFE)
Status	Institution decentralized from the State
Profile	Governmental office that conducts the investigation, capacitation and coordination of the caficulture sector
Contact Person	Marcial Flores. El Gerente General del Instituto Hondureño del Café, Ulises Sevilla
e-mail	jusevillapalma@yahoo.com
website	http://www.cafedehonduras.org/ihcafe/

The Honduran Institute of Coffee (IHCAFE), is an institution decentralized from the State, in charge of the investigation and capacitation of the caficulture sector, present in 15 of the 18 departments of the country, counts with the instalations for the investigation and y capacitation in the caficulture sector with 10 experimental stations, in which they conduct basic investigation in Phitoimproving, quality of the coffee, adaptation of the products for the exportation market. One of the cultives of coffee successfully liberated has been IHCAFE 90.

Name	Lancetilla Botanic Garden
Status	Dependency of the National School of Forestal Sciences
Profile	Governmental office that conducts investigation in Tropical Botanics. It is a center of International Investigation.
Contact Person	Ing. Ricardo Lezama. Responsable del manejo
e-mail	lezama_ricardo@yahoo.com
website	http://jblancetilla.org/investigacion%20en%20Lancetilla.htm

Lancetilla Botanic Garden founded by Dr. Wilson Popenoe, is currently adscript to the National School of Forestal Sciences (ESNACIFOR), which is a higher Education Institution. Lancetilla Botanic Garden is the biggest in Latinamerica, and the third at the level of America, it counts with a specialized collection of specimens of different botanic families, of alimentary, forestal, medicinal, ornamental and aromatic importance. Lancetilla Botanic Garden also has documented the tropical flora of the Honduran atlantic litoral, deposited in the Lancetilla Botanic Garden's Herbarium HJBL), which is the third biggest in Honduras.

Name	Honduran Foundation of Agricultural Investigation (FHIA)
Status	Non-governmental Organization in charge of the agricultural investigation and capacitation.
Profile	It is oriented to the agricultural and phitosanitarian investigation
Contact Person	Dr Adolfo Martínez, Director
e-mail	fhia@fhia-hn.org, adolfo_martinez@fhia-hn.org
website	http://www.fhia.org.hn/

The Honduran Foundation of Agricultural Investigation (FHIA), was designed and created by the initiative of the Secretary of Agriculture and Cattle (SAG), the American Agency for the International Development (USAID), counting with the initial support of the United Fruit Company (UFCO), began functioning in 1984 with the program of Phitoimproving bananas and plantains, liberating at the beginning of the 90's several cultivates resistant to Sigatoka Negra, currently it conducts important investigation in other three programs (Cocoa and Agroforestry; Diversification and vegetables), it counts with a unit of investigation in La Másica, Atlántida called Centro Agroforestal Demostrativo del Trópico Húmedo (CADETH). The FHIA counts with the second center of documentation in the agriculture theme, the most important of Honduras and with the agricultural chemistry laboratory which is national and international reference.

Name	National Center of Agricultural Formation (CENFA)
Status	Center adscript to the National Institute of Professional Formation
Profile	Governmental organization in charge of the agricultural investigation and capacitation.
Contact Person	Abogado David Chávez Madison
e-mail	fhia@fhia-hn.org
Website	http://www.infop.hn/programas-y-proyectos

The National Center of Agricultural Formation (CENFA), is the unit of the agricultural investigation that National Institute of Professional Formation (INFOP); its approaches orientate the investigation in horticulture.

Name	National Cardiopulmonar Institute
Status	Dependency of the Secretary of Health
Profile	Governmental organization in charge of cardiopulmonar investigation and capacitation.
Contact Person	René Francisco Cubas
e-mail	Renecubas2@hotmail.com
website	www.salud.gob.hn

The National Cardiopulmonar Institute, was founded in 1948, currently has constituted a group of researchers in the following lines of investigation: Neumology; Cardiology; Intensive Care; Respiratory Therapy y Cardiopulmonar Rehabilitation.

Name	Neurosciences Institute
Status	

Profile	Private Organization of development, in charge of the scientific study of epilepsy
Contact Person	Dr. Marco Tulio Medina, Director ejecutivo
e-mail	marcotmedina@yahoo.com
website	www.institutodeneurociencias.com/contactenos.htm

The Neurosciences Institute is a private organization of development (OPD), that has come developing a group of investigation work in neurosciences, specifically in epilepsy, its investigations are centered in the epilepsy as an illness, as well as the early detection methods, and the surgical intervention or the pharmacological treatment.

Name	Department of Applied Forestal Investigation (DIFA)
Status	Dependency of the National School of Forestal Sciences
Profile	Governmental organization in charge of forestal investigation and capacitation.
Contact Person	Cesar Leonel Bonilla
e-mail	cesalbo48@yahoo.com, esna_info@gmail.com
website	http://esnacifor.hn

The Department of Applied Forestal Investigation (DIFA) is the unit adscript to the National School of Forestal Sciences (ESNACIFOR), that is in charge of conducting the forestal investigations in silviculture, dasometry and forestal industries, it is a member of the System of Forestal National Investigation, Protected areas and wildlife (SINFOR), it has formulated its internal policy of investigation described through the Program of Forestal Investigation through the periodical publication of an investigation journal called Tatascan.

Name	Honduran Academy of Geography and History
Status	Association with nonprofit benefits purposes, dedicated to the investigation and diffusion of the historical and geographical investigations
Profile	Promote the studies of geography and history in Honduras and the Central American region
Contact Person	Noé Pineda Portillo
e-mail	noepineda@cablecolor.hn
website	www.ipgh.org/

The Honduran Academy of Geography and History is an autonomous institution, that reunites the researchers of the history and geography, divulging the investigations that the partners do, as well as world acknowledgement works. The Academy, publishes its work through a journal that counts with more than 90 numbers.

Name	Honduran Academy of the Language
Status	Association with nonprofit benefits, dedicated to the investigation and diffusion of the linguistic and literary investigations
Profile	Group of academic experts of the Spanish language in Honduras
Contact Person	Juan Antonio Medina Durón
e-mail	jamedina_2002@yahoo.com

website | <http://www.honduraslaboral.org/leer.php/205>

The Honduran Academy of the Language is an autonomous institution, created since 1948, dedicated to the promotion of literary and linguistics investigations as well as the good use of the language. It is part of the Association of Academies of the Spanish Language. It periodically publishes the results of its investigations and literary essays in the journal of the Honduran Academy of the Language.

Name	Institute of Economic and Social Investigations
Status	University Dependency of the UNAH
Profile	Racional Coordination of the individual and group investigations
Contact Person	Will Rosales
e-mail	Rosales.will@yahoo.com
website	http://des.unah.edu.hn

The Institute of Economic and Social Investigations is the unit of investigation of the Economic Sciences Faculty of the Universidad Nacional Autónoma de Honduras (UNAH), in charge of conducting the investigations in economical sciences to the highest level. It counts with a documentation center specialized and the tradition of various investigations developed, as well as the publication of the journal of Political Economy of Honduras.

Name	Institute of Social and Juridical Investigations
Status	Dependency of the UNAH
Profile	Observatory for the social and juridical investigations of the country
Contact Person	Gloria Ochoa
e-mail	gloriaochoa80@gmail.com
website	http://des.unah.edu.hn

The Institute of Social and Juridical Investigations is the specialized unit of the Social juridical Sciences Faculty of the Universidad Nacional Autónoma de Honduras, in charge of conducting the juridical investigations, counts with a body of researcher teachers and the documentation of various investigations in natural right, comparative right and jurisprudence.

Name	University institute of Democracy, Peace and Security (IUDPAS)
Status	Universitarian Dependency of the UNAH
Profile	Observatory for the democracy, security and peace
Contact Person	Julieta Castellanos
e-mail	info@iudpas.org
website	www.iudpas.org

The University institute of Democracy, Peace and Security (IUDPAS), was created by the Universidad Nacional Autónoma de Honduras (UNAH) on Febrero of 2008, with the cooperation of the Swedish Agency of International Cooperation (ASDI), to work themes such as: Secureness and Public Policies, Studies of City, Democracy and Development, and Youth. Currently within the Institute the observatory of violence is conducted, that studies the social violence, measuring the level of social conflictiveness.

Name	University Institute of Earth Sciences
Status	Dependency of the UNAH

Profile	Center of geophysica and geologic investigations
Contact Person	Dr. Navil Kawas
e-mail	navilkawas2007@gmail.com
website	http://des.unah.edu.hn

The University Institute of Earth Sciences is a unit of investigation and capacitation of the Faculty of Basic Sciences of the Universidad Nacional Autónoma de Honduras (UNAH), in charge of the studies in geomorphology, prevention and mitigation of disasters, hydrologic studies. Within the institute, there are two Master programs of post-degree, the Masters in Risks Administration and the Prevention of Disasters and the Masters in Hydrology.

Name	Institute of Investigation and Social Educational Evaluation (INIEES)
Status	Universitarian Dependency of the UPNFM
Profile	Development and foment of the scientific investigation, the Educational and social evaluation
Contact Person	Ramón Ulises Salgado Peña
e-mail	sramon50@yahoo.com
website	http://www.upnfm.edu.hn/VRIP/dependencia.html

The Institute of Research and Social Educational Evaluation (INIEES) is a dependency of the Universidad Pedagógica Nacional Francisco Morazán (UPNFM), in charge of doing investigations about educational processes and the National Educational System, in the Republic of Honduras. It is currently the referent in educational and social investigations in Honduras. In the INIEDS there is an observatory of Education, which permanently studies the achievement of the National Educative System. It publishes a specialized journal called Paradigma.

6.3. Conclusions/Recommendations

Efforts to promote science and technology began in Honduras in the early 1980 with the creation of university research institutes, foundations, associations to strengthen in the next two decades with the creation of national research systems in agriculture, forestry. Currently, the agency coordinating the systems of science technology and innovation is the Competitiveness and Innovation Directorate of the Ministry of Planning and Cooperation of the Government of the Republic. Currently available sources of important information on priorities in science and technology and institutional relationships to promote it, to be considered as baseline for promoting the creation of a National Innovation System, Science and Technology with the aim of coordinate institutional efforts being made in scientific research in Honduras.

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6.5. List of Acronyms / Definitions

Higher Education Institutions and RTD Performers

EAP	Escuela Agrícola Panamericana El Zamorano
UNA	Universidad Nacional de Agricultura
ESNACIFOR	Escuela Nacional de Ciencias Forestales
CATIE	Centro Agronómico Tropical de Investigación y Enseñanza
INIEES	Instituto de Investigación y Evaluación Educativas y Sociales
UNAH:	Universidad Nacional Autónoma de Honduras
UPNFM:	Universidad Pedagógica Nacional Francisco Morazán
DICU:	Dirección de Investigación Científica Universitaria
DES:	Dirección de Educación Superior

Governmental Sector

COHCIT:	Consejo Hondureño de Ciencia y Tecnología
CONACTA:	Consejo Nacional de Tecnología Agropecuaria
SICTA:	Sistema de Integración Centroamericana en Transferencia de Tecnología
SINFOR:	Sistema de Investigación Nacional Forestal
SNITTA:	Sistema Nacional de Investigación y Transferencia en Tecnología Agropecuaria
BCH	Banco Central de Honduras
CESCO	Centro de Estudios y Control de Contaminantes (dependiente de la Secretaría de Recursos Naturales y Ambiente SERNA)
COHDEFOR	Corporación Hondureña de Desarrollo Forestal
DICTA	Dirección de Ciencia y Tecnología Agropecuaria (dependiente de la Secretaría de Agricultura y Ganadería - SAG)
DIGEPESCA, SAG	Dirección General de Pesca
IGN	Instituto Geográfico Nacional
IHAH	Instituto Hondureño de Antropología e Historia
IHDECOOP	Instituto Hondureño de Desarrollo Cooperativo
IHNFA	Instituto Hondureño de la Niñez y la Familia
IHCAGE	Instituto Hondureño del Café
IHADFA	Instituto Hondureño para la Prevención de Alcoholismo, Drogadicción y Fármaco Dependencia
INA	Instituto Nacional Agrario
INE	Instituto Nacional de Estadísticas
SENASA, SAG	Servicio Nacional de Sanidad Agropecuaria

Non-governmental organizations and private sector



ADESOL	Asociación para el Desarrollo de la Energía Solar
CDH	Centro de Desarrollo Humano
CEDIH	Centro de Estudio de Investigación para el Desarrollo de Honduras
CEPROD	Centro de Estudio y Promoción de Desarrollo
CIT	Centro de Investigación Toxicológica
FOPRIDEH	Federación de Organizaciones Privadas para el Desarrollo de Honduras
FFS	Fundación de Fomento en Salud
FES	Fundación Friedrich Ebert
FUNADEH	Fundación para el Desarrollo de Honduras
FSM	Fundación Salvador Moncada para el avance de la Ciencia
MOPAWI	Mosquita – Pawiza
IHCAFÉ	Instituto Hondureño del Café
FHIA	Fundación Hondureña de Investigación Agrícola

7. Panama

7.1. Introduction

7.1.1. General Environment for Setting Up Innovation Infrastructures

In Panama, it is considered to be a State responsibility the establishment of the appropriate conditions for Science, Technology and Innovation development. In turn, Science, Technology and Innovation are well recognized to be in direct relationship with the improvement of the quality of life in this country. It is also conceived that the increase of the national capacities on these fields will positively contribute to Panama's performance and competitiveness within the global economy.

Since the late 90's, continuous analysis of Panamanian situation regarding Science, Technology and Innovation have carefully identified the country's strengths, weaknesses and opportunities towards a growing competitiveness and an innovative development.

Based on such analysis a National Strategy for Science Technology and Innovation was established. This strategy has two levels of action. The first one is a basic level since it deals with the promotion of the scientific basis and a scientific "culture". The second level has to do with more specific efforts towards promotion and support for more developed sectors or for sectors with higher scientific and innovation potential.

Special attention is given to human resources development and the collaboration between the academy and private enterprises. Therefore, all such activities that stress on the coordination of actions between public and private sectors towards the matching of productive competitiveness with research and development are considered of national priority.

One of the general objectives addresses technological innovation and modernization. The action lines related to this objective are: The promotion of technological generation, the adoption and transferring of technology (which includes collaboration with international partners); strengthening of the knowledge market, the creation of infrastructures for those research and development activities that may generate innovative results and finally the strengthening of clusters, scientific webs and consortia that may bring together companies, universities, research centres, production chains, business start-up centres especially those with high potential towards innovation and exports.

The main instrument for the execution of the National Strategy is an official document named National Strategic Plan for Science, Technology and Innovation (PENCIYT, Plan Estratégico Nacional de Ciencia, Tecnología e Innovación) whose most recent version is being currently updated and expected to be launched by the end of this year.

7.1.2. Strategic Documents

During the past decades, Panamanian governments promoted research and development activities and more recently these are viewed as directly related to innovation which in turn is conceived as the main route to local and international competitiveness.

The first strategic document related to R&D+ i activities is the Political Constitution of the Republic of Panama: Article 79 establishes that it is a state responsibility the formulation of a national policy for science and technology. Article 49 establishes the rights of inventors and gives the guidelines on intellectual property matters.

Different laws and codes arise from the Constitution which rule most of the aspects related to research, development and innovation:

Law No. 15, August 8, 1994: regulates on the authors/inventors moral and patrimonial rights.

Law No. 35, May 10, 1996: regulates industrial property matters.

Law No. 23, July 15, 1997, regulates intellectual property collective rights related to traditional knowledge of aborigine groups.

Chapter V of the Labor Code regulates on invention matters when a working relationship exists between

the employer and the inventor.

Law No.13, April 15, 1997 establishes guidelines and instruments for the development of Science, Technology and Innovation in Panama and important tools for economical and social progress as well. This Law gives the basis for a national policy on science, technology and innovation which is structured as the National Strategic Plan for the development of Science, Technology and Innovation. Law No 13 establishes that it is a State responsibility not only the promotion of scientific and technological research, the diffusion of its activities and results but also the financial support to such activities.

Law 13 also creates a National Fund for Science, Technology and Innovation development. This National is expected to receive governmental financing and also other national and foreign supports.

Article 78 of the Internal Revenue Code considers that donations for non- profit governmental institutions dedicated to food and farming research are tax-deductible. Also, the donations to official academic institutions dedicated to research and development are tax-deductible.

Law 25, June 4, 2001, promotes investment on technological improvement for farming and food industries by means of soft loans for innovative projects presented by farm producers.

Law 11, February 4, 2004, supports the adoption of new technologies and industrial processes by giving benefits and tax incentives to private investors from the manufacturing industry, sea resources and farming.

The National Strategic Plan for Science, Technology and Innovation, version 2006-2010 was approved on December 21, 2005 by the Cabinet Council of Ministers contains the guidelines for Science, Technology and Innovation. A new Plan has been very recently approved (December 2010) and will cover the period 2010-2014.

7.1.3. Specific Programs and Instruments

The National Secretariat of Science Technology and Innovation (SENACYT, Secretaría Nacional de Ciencia, Tecnología e Innovación), was created under the above mentioned Law No 13 and reorganized by Law No. 15, December 21, 2005. It is an official organism, responsible for the coordination and execution of State policies and decisions related to Science, Technology and Innovation.

Together with the National Secretariat, other two official organisms collaborate with the execution of such State policies and decisions:

The Inter-ministry Council of Science and Technology (CICYT, Consejo Interministerial de Ciencia y Tecnología) is in charge of the operational coordination between SENACYT and other governmental administration divisions.

The National Commission for Science, Technology and Innovation (CONACYT, Comisión Nacional de Ciencia, Tecnología e Innovación) , coordinates the participation of different representative sectors of the society on the activities administered and promoted by SENACYT. Such representatives include universities and academic institutions, primary economical sector representatives, members of the scientific community and governmental institutions.

SENACYT launches periodically different calls in order to promote and financially support researchers and entrepreneur's initiatives on research and innovation. The calls are focused on the priority sectors identified on the National Strategic Plan. Some of these calls are as follows:

- Promotion of new entrepreneurships with technological basis
- Entrepreneurship innovation projects
- Support for infrastructure and equipment
- Promotion of research and development in clusters
- Promotion of international collaboration

Regarding innovation at the private sector SENACYT has two programs: the first is called the National

Prize for Entrepreneurship Innovation. The purpose of this program is to acknowledge leader enterprises and to strengthen the innovation capacities of Panamanian enterprises. The second program is called Sectorial Studies on Competitiveness.

The purpose of this program is to identify opportunities to improve national competitiveness on the five priority areas that are defined within the National Strategic Plan for Science, Technology and Innovation development: Biosciences, tourism, logistics and multimodal transportation, information and communication technologies and agribusiness.

7.1.4. Financing

SECTORIAL FUNDING: This funding comes from the private sector and is managed coordinately by SENACYT, the private sector and research/academic community representatives.

FUNDS FOR INTERNATIONAL COLLABORATION: This funding promotes international collaboration through the establishment of a financial counterpart for the execution of different modalities of cooperation activities.

FUNDS FOR RESEARCH AND SCIENTIFIC DEVELOPMENT: This funding promotes research and innovation activities especially those that include inter institutional collaboration.

A special case is seeing for the Universidad Autónoma de Chiriquí. Law 4, January 16, 2006, establishes that this institution will receive an additional 10% of state funding. This percentage is calculated from the overall functioning budget that is assigned annually to the institution. The main objective is to support research activities by financing equipment and infrastructure acquisition.

7.2. Existing Innovation Infrastructures in Panama

7.2.1. Key Government Players

Name	Secretaría Nacional de Ciencia, Tecnología e Innovación- SENACYT
Status	National Secretariat
Profile	The National Secretariat of Science, Technology and Innovation is an autonomous institution whose mission is to change science and technology into sustainable development tools.
Contact Person	Rubén Berrocal PhD
e-mail	senacyt@senacyt.gob.pa
website	www.senacyt.gob.pa

All the activities, projects and programs held by SENACYT have the objective of strengthen, support and promote science, technology and innovation development, in order to increase the productiveness, competitiveness and modernization of private and governmental sectors and of the academic-research sector and the general public as well. The Secretariat work is guided by the National Strategic Plan for the Development of Science, Technology and Innovation.

7.2.2. Key Innovation Infrastructures

Name	Tecnoparque Internacional de Panamá
Status	Science and Technology Park
Profile	Entrepreneurship component of the City of Knowledge Foundation
Contact Person	Engineer Ricardo Endara
e-mail	rendara@cspanama.org

website	www.ciudaddelsaber.org
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The Tecnoparque Internacional de Panamá promotes a direct relationship between research and technological development organizations, productive sectors and enterprises in order to increase productivity, efficiency and competitiveness. This technological park holds collaboration programs and activities with the European Community.

Name	Acelerador de Empresas de Panamá Don Alberto Motta
Status	
Profile	Business start up/ technology incubator
Contact Person	Engineer Manuel Lorenzo
e-mail	mlorenzo@cdspanama.org
website	www.ciudaddelsaber.org

Promotes the innovator entrepreneurship by means of high added value services which include not only infrastructure and support services for the enterprise's development, but also contacts and global support.

7.2.3. Other related organizations

Name	UTP INCUBA and UTP EMPRENDE
Status	Centers which are part of the "Dirección de Gestión y Transferencia del Conocimiento" at the Universidad Tecnológica de Panamá
Profile	First technology/business start up incubator established on a public university
Contact Person	Juana Ramos Chue de Pérez PhD.
e-mail	juana.ramos@utp.ac.pa
website	www.utp.ac.pa

These centers offer support to novel entrepreneurs by means of training, advice and technical assistance for the development of competitive, innovating and solid enterprises thanks to the experience of an internal professional staff and also by the participation of external counselors.

Name	CENTRO DE INVESTIGACION Y DESARROLLO EMPRESARIAL
Status	Research and Service Center at the Universidad Autónoma de Chiriquí
Profile	Entrepreneurship research and Consulting services
Contact Person	Elvira C. de Amaya
e-mail	eguerra21@gmail.com
website	www.unachi.ac.pa

The aim of this center is to bring together the university and the Business sector, especially small and medium size Business by providing Consulting service, advice and training. The scope is to promote research and innovation within entrepreneur activities at the Province of Chiriquí which is an important point for the primary and secondary economic sectors in Panama.

Name	Dirección Universidad Empresa
Status	A division of the office of the University President
Profile	Administrative division at the University of Panama
Contact Person	Mayra Lee MSc.
e-mail	mlee14@hotmail.com
website	www.up.ac.pa

The main objective of this office is to bring together the University with the private and the governmental sectors.

Name	Centro de Incubación y Desarrollo Sostenible
Status	University division
Profile	Start-up centre
Contact Person	Horacio Rodríguez Marchena
e-mail	hrm_corp23@hotmail.com
website	www.up.ac.pa

This Centre is advocated to the developing of an entrepreneur culture at the University of Panama and to the promotion of dynamic entrepreneurship, pre- incubation, incubation, post- incubation and business start up activities, as a way to contribute to the internal gross income.

Name	Centro de Innovación e Incubación de Azuero
Status	University division- University of Panama
Profile	Regional Innovation and Business start-up centre
Contact Person	Leonardo Collado MSc.
e-mail	leonardocollado@hotmail.com
website	www.up.ac.pa

Name	Oficina de Transferencia de Resultados de Investigación
Status	University division- University of Panama
Profile	
Contact Person	Dr. Edgar Spencer
e-mail	
website	www.up.ac.pa

The purpose of this office is to transfer research results to the government and to the productive sectors.

Additional information:

“Sistema de Incubadoras para el Desarrollo Empresarial de Panamá (SIDEPE)”.

This is a Project recently established at the national level. Two public universities: Universidad de Panamá and Universidad Tecnológica de Panamá, together with one private university: Universidad Latina

de Panamá launched this Project in consortium with an agency for the promotion of the small and medium size business called “La Autoridad de la Micro, Pequeña y Mediana Empresa” (AMPYME).

The objective of the Project is to promote programs that will train students and non-established entrepreneurs in order to build small enterprises.

SIDEP will be held for 36 months and expects to train 8 thousand new entrepreneurs.

Funds will be provided by AMPYME and by the China Taiwan government. Universities will provide the personnel and the infrastructure.

The University of Panama incubators will focus on the following: agricultural industry, crafts and sustainable tourism. The Universidad Tecnológica de Panamá will focus on the technologic areas and the Universidad Latina in turn, will work the multisectors’ business in general.

7.3.Conclusions/Recommendations

Panama has a quite well established legal framework for innovation but there are still adjustments that to be performed regarding de harmonization of the interests and efforts of the different actors. The improvement of management procedures for a fast funds’ release and burocratic inconveniences affect researchers and entrepreneurship groups in keeping high enthusiasm and a good pace on their activities.

Opportunities for international collaboration should be maximized in the sense that existing and on-coming relationships should be effectively directed to reach the fulfillment of national innovation and competitiveness objectives.

7.4.References

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LEY No.25 De 4 de junio de 2001 Que dicta disposiciones sobre la política nacional para la transformación agropecuaria y su ejecución http://www.asamblea.gob.pa/legispan/Pdf_LEY/2000_LEY/2001_LEY/2001_PDF/2001_025_LEY.pdf

Constitución República de Panamá www.asamblea.gob.pa/asamblea/constitucion

City of Knowledge - www.ciudadelsaber.org

Sistema en línea de propiedad industrial www.digerpi.gob.pa

Ley N° 35 de 10 de mayo de 1996 por la cual se dictan Disposiciones sobre la Propiedad Industrial <http://www.wipo.int/wipolex/es/details.jsp?id=3387>

Registro de marcas en Panamá www.marcas-panama.com/

Plan para el Desarrollo Científico-Tecnológico de la Innovación en Panamá

<http://www.senacyt.gob.pa/media/planesComisionesSectoriales/PLANTransversalInnovacion.pdf>

5thMay Last Access date for the abovementioned links

7.5.List of Acronyms / Definitions

AMPYME: Autoridad de la Micro, Pequeña y Mediana Empresa.

CICYT: Consejo Interministerial de Ciencia y Tecnología

CONACYT: Comisión Nacional de Ciencia y Tecnología

SENACYT: Secretaría Nacional de Ciencia, Tecnología e Innovación

SIDEP: Sistema de Incubadoras para el Desarrollo Empresarial de Panamá

UNACHI: Universidad Autónoma de Chiriquí

UTP: Universidad Tecnológica de Panamá