

**INTERSESSIONAL PANEL OF THE UNITED NATIONS COMMISSION
ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (CSTD)**

**Geneva, Switzerland
23-25 January 2017**

Contribution of Dominican Republic

to the CSTD 2016-17 priority theme on 'New innovation approaches to support the
implementation of the Sustainable Development Goals'

**DISCLAIMER: The views presented here are the contributors' and do not necessarily reflect the views
and position of the United Nations or the United Nations Conference on Trade and Development.**



Dominican Republic



Ministry of Higher Education, Science and Technology, MESCyT

2016- 2017 Inter-sessional Panel of the United Nations Commission
on Science and Technology for Development (CSTD)

Geneva, Switzerland

23 to 25 January 2017

Dr. Plácido F. Gómez Ramírez
Viceminister for Science and Technology
Dominican Republic



Dominican Republic

DR at a glance (about 19° N 70° W)

- Independent state (1844; 1863)); Presidential democratic republic.
- Capital: Santo Domingo
- Official language: Spanish
- Area: 48,672 Km²
- Population: 10,349,741
- Population density: 212.6 hab/Km²
- Currency: Dominican Peso (DOP)
- GDP: around US\$ 60,000 mm (World Bank, 2013). Now, around US\$75,000 mm.
- HDI: between Medium and High.
- Religion: 68.9% Roman Catholics; 18.2 % Christians; 10.6% No religion

US Census – Bureau 2013



Dominican Republic

Higher Education Data (2012)

- 43 Higher Education Institutions (2012). 50 HEI (2014)
- Enrollment in Higher Education: 445,909 students
 - Senior Technical: 7,819
 - University (Undergraduate): 431, 699 (97.4%)
 - Post Undergraduate Studies: 883
 - Master's Degree: 5,425
 - Not available: 83



Dominican Republic

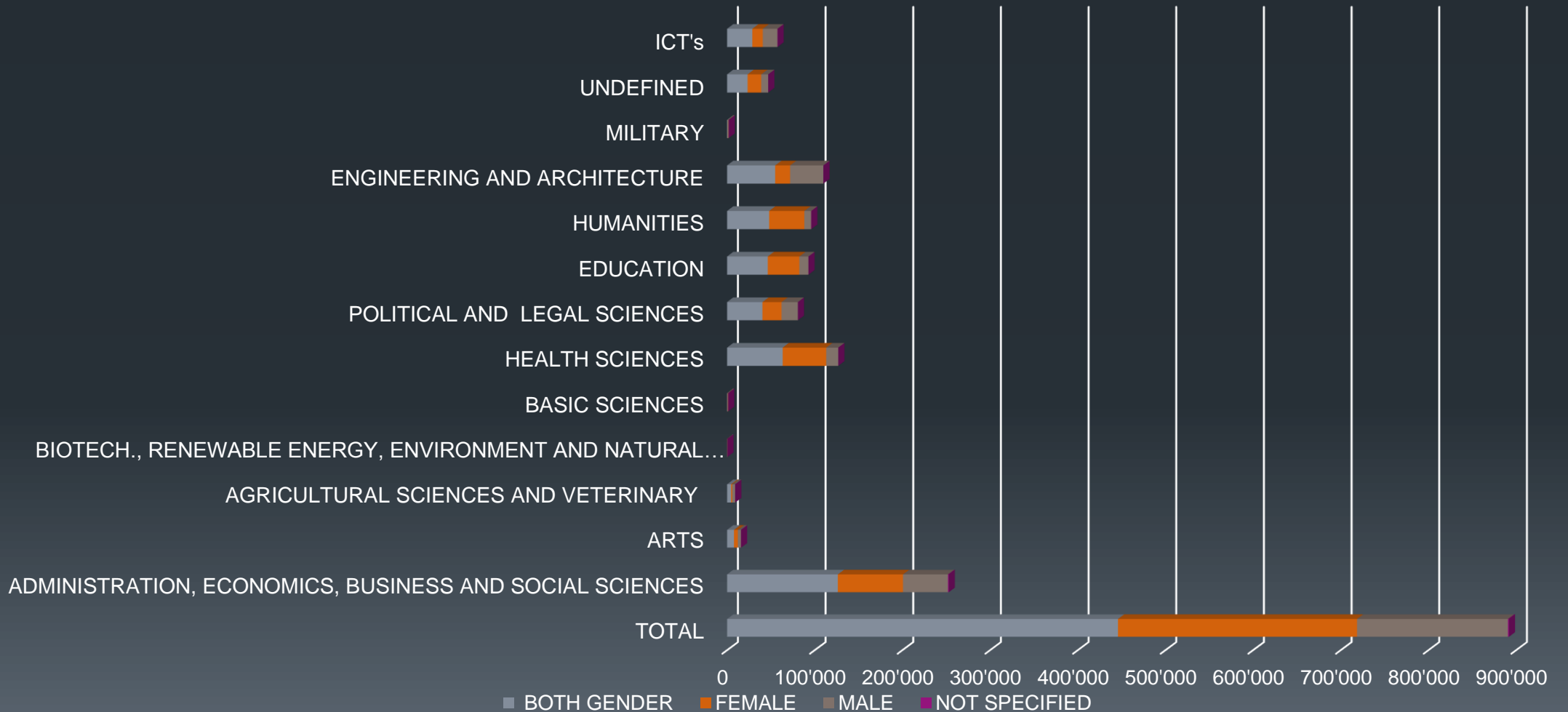
Number of Students Enrolled, by Gender and Knowledge Area, 2012-1

KNOWLEDGE AREA	GENDER			
	BOTH GENDER	FEMALE	MALE	NOT SPECIFIED
TOTAL	445,909	272,660	172,122	1,127
ADMINISTRATION, ECONOMICS, BUSINESS AND SOCIAL SCIENCES	126,378	74,333	51,238	807
ARTS	7,946	4,377	3,569	0
AGRICULTURAL SCIENCES AND VETERINARY	4,620	1,263	3,357	0
BIOTECHNOLOGY, RENEWABLE ENERGY, ENVIRONMENT AND NATURAL RESOURCES	181	67	114	0
BASIC SCIENCES	547	281	266	0
HEALTH SCIENCES	63,404	49,693	13,711	0
POLITICAL AND LEGAL SCIENCES	40,388	21,796	18,535	57
EDUCATION	46,407	36,037	10,316	54
HUMANITIES	47,999	40,078	7,837	84
ENGINEERING AND ARCHITECTURE	54,903	17,029	37,859	15
MILITARY	876	272	604	0
UNDEFINED	23,465	15,482	7,983	0
INFORMATION TECHNOLOGY AND COMMUNICATIONS	28,795	11,952	16,733	110



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Knowledge Area of High Demand in HEI





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Some Largest Issues and Problems, Baseline 2010

- Poor Quality of Education
- Articulated Economy, Innovative and Environmentally Sustainable
- Competitive and Innovative in a Favorable Environment
- Low Employment opportunities
- Well Structure Productive Areas, Competitive in a Global Economy



Dominican Republic

National Goals



Dominican Republic

National Development Strategy 2030 of the Dominican Republic

Vision of the nation for the long term

The National Development Strategy 2030 (NDS) states:

“Dominican Republic by 2030 wants to be a prosperous nation, where people live with dignity, attached to ethical values in the context of a participatory democracy that guarantees the social and democratic state and promotes equality, **social justice**, equal opportunities, that utilized and uses its resources to develop in an innovative way, sustainably and geographically balanced, integrated and competitively introduced into the global economy”.



Dominican Republic

One Strategic Component

A social and democratic state, institutions that act with ethics, transparency and efficiency in the service of a responsible and participatory society, which ensures safety and promotes equity, governance, peaceful coexistence and national and local development.



Dominican Republic

Two Strategic Component

- A society with equal rights and opportunities, in which the entire population has guaranteed education, health, decent housing and basic services and promoting progressive poverty reduction, social and regional inequality.



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Three Strategic Component

- A territorial and sectorial integrated, innovative, diversified, pluralistic economy, quality-oriented and environmentally sustainable, disruptive and creates wealth, generates high and sustainable growth, decent employment equity, ... and inserted competitively in the global economy.



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Four Strategic Component

- Culture of a society with sustainable consumption and production, managed equitably and effectively the risks and the protection of the environment and natural resources and promotes adequate adaptation to climate change.



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Some MESCYT Strategies and Achievements

- An Aggressive Scholarship Program (Capacity Building)
- National Fund for Innovation and S & T Development (FONDOCYT)- Research Financing, Infrastructure, Mobility of Researchers, Networking.
- Strategic Plan for S&T (PECyT 2008-2018).
- International Congress of Scientific Research (annually). 12th Congress, June 2016. Around 300 oral and posters presentations, more than 150 researchers from 31 countries, including a Physics Nobel Prize laureate from USA.



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■ **Scholarships Programs**

- The MESCYT has programs of national and international scholarships for undergraduate and graduate degrees, (masters and doctorates), in response to country priorities. Calling for international scholarships in S&T areas: basic sciences, engineering, computer sciences, nanotechnology, biochemistry, biotechnology, agriculture, agribusiness, biomedical, microelectronics, mechatronics, among others.



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MESCyT International Scholarships

STI Scholarships Expenditure 2012-2015

Area	Scholarship per Year				
	2012	2013	2014	2015	Totales
Engineering and Architecture	350	482	284	234	1,350
Information and Communications Technologies	113	99	144	23	379
Sciences	46	42	9	14	111
Veterinary and Agronomical Sciences	18	19	32	44	113
Medical Sciences	215	371	278	229	1,093
Total	742	1,013	747	544	3,046
Total Expenditure	21,947,313	26,543,740	13,924,498	12,046,936	74,462,487

3,046 scholarships in STI areas in 2012-2015 and USD\$74,462,487 spent



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Ph. D. Scholarships awarded annually in S & T and Innovation (2005-2013)

Año	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Cantidad	23	13	6	10	6	12	26	14	18	128



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FONDOCyT: 336 Projects Approved (2005-2015)

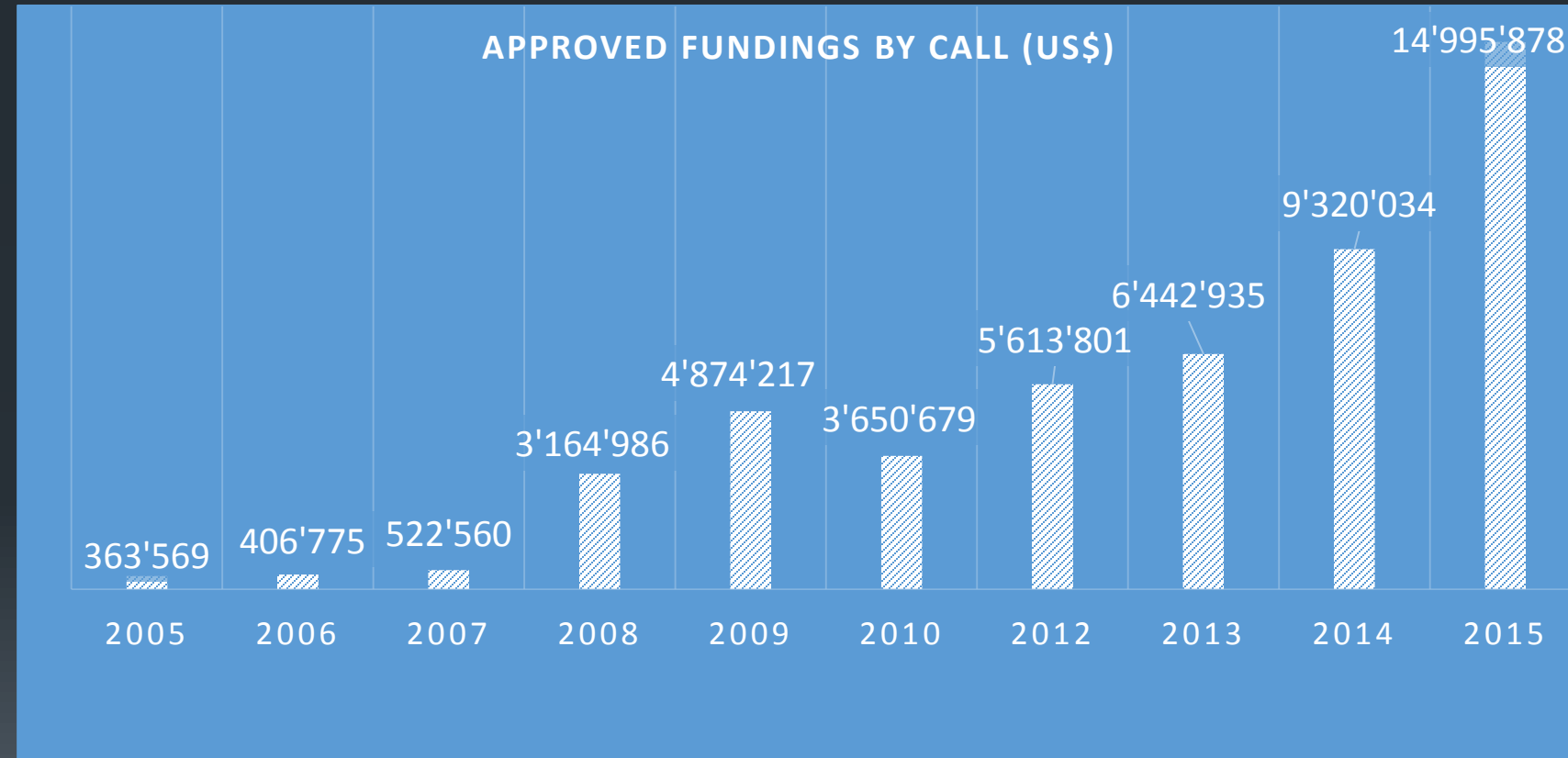
Call	Quantity	Amount (RD\$)
2005	14	16,724,196.00
2006	16	18,711,629.00
2007	13	24,037,771.00
2008	32	145, 589,375.00
2009	36	224,213,973.00
2010	24	167,931,216.00
2012	32	251,174,612.00
2013	33	289,362,904.00
2014	58	436,545,623.39
2015	78	689,810,396.47
TOTAL	336	2,118,512,320.86



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Approved Fundings by Call (2005-2015), USD

Call	Amount (USD)
2005	363,569
2006	406,775
2007	522,560
2008	3,164,986
2009	4,874,217
2010	3,650,679
2012	5,613,801
2013	6,442,935
2014	9,320,034
2015	14,995,878
TOTAL	49,355,435





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FONDOCyT: 335 Projects by Area (2005-2015)

- 127: Biotechnology and Genetic Resources, Sustainable Production, and Food Security
- 82: Basic Sciences and Nanosciences
- 61: Health and Biomedicine
- 33: Environment and Natural Resources
- 32: Software Development, Mechatronics, Services and Transportation, Engineering, and Biofuels

No. of Projects Approved by Institution (2005-2015)

No.	Institución	Cantidad
1	UASD	95
2	PUCMM	33
3	IIBI	33
4	ISA	30
5	INTEC	26
6	IDIAF	16
7	UTESA	14
8	UNEV	11
9	CINBIOCLI	7
10	SGN	6
11	UAFAM	6
12	UNAPEC	6
13	UNIBE	6
14	UNPHU	6
15	IEESL	5
16	UCE	5
17	Jardín Botánico Nacional	4
18	INDRHI	3

No.	Institución	Cantidad
19	DGA	2
20	ISEO	2
21	ITLA	2
22	LAVECEN	2
23	Museo Nacional de Historia Natural	2
24	Acuario Nacional	1
25	ALIMENTEC, S.A.	1
26	CATIE	1
27	CEDIMAT	1
28	Gabinete de Políticas Sociales de la Presidencia	1
29	Grupo Jaragua	1
30	HOMS	1
31	IDIAF / ISA	1
32	IGLOBAL	1
33	Museo del Hombre Dominicano	1
34	O&M	1
35	ONAMET	1
36	UCATECI	1
	Total	335



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DR Scientific Community-Significant Growth

- According to international organisms, in 2003, no more than 300 researchers in DR, including Humanities and Social Sciences.
- 231 PI's y 527 Co-PI's in FONDOCyT (2005-2015).
- 758 researchers, just S & T and Engineering areas. And, more than 250 students as Research Assistants.



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Research Assistants in HEI, the future

Institution	Quantity
UASD	74
PUCMM	39
ISA	34
SGN	28
IDIAF	22
Acuario Nacional	13
INTEC	9
CATIE	8
UAFAM	8
IEESL	5
IIBI	3
UNAPEC	3
UTESA	3
UNEV	2
INDRHI	1
UNIBE	1
UNPHU	1



About **254** Researchers Assistants, in 17 institutions 2016.

Number of Dominican Publications in Scopus

Year	Dominican Republic
1996	35
1997	27
1998	22
1999	32
2000	32
2001	19
2002	20
2003	28
2004	37
2005	42
2006	45
2007	58
2008	69
2009	57
2010	57
2011	81
2012	86
2013	118
2014	99



Font: SCImago

SCImago is a Research Group from "El Consejo Superior de Investigaciones Científicas (CSIC)", Granada University, Extremadura, Carlos III (Madrid), dedicated to the analysis of information, representation and compilation for visualization techniques.



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Patents from Higher Education Institutions

- A new technology for Carbon Nanotubes, PUCMM. US Patent and Trademark Office (Submitted 2012; registration 2016).
- Student's Patent. INTEC. National Office of Industrial Property (ONAPI); 2016.



Dominican Republic

Research and Innovation Projects in Cooperation University-Industry

Proyecto	Institución	Institución del sector productivo	Objetivos de la Institución dentro del Proyecto
9 Proyectos en 2012			
Estudio de confiabilidad estructural de puentes en República Dominicana.	Instituto Tecnológico de Santo Domingo (INTEC)	NDT CIG ENTERPRISES, USA	Provide technical support to the project
		Gradient Technology, R. D.	
Cambio climático y biodiversidad costero marina, litoral norte de Samaná, R.D.	Universidad Autónoma de Santo Domingo (UASD)	Fundación MAMMA Inc., R. D.	Make an estimate based on climate change scenarios of the variations in ecosystems and biodiversity that will occur in the coming decades due to Climate Change.
Uso del abejón nativo Dominicano (<i>Xylocopa mordax</i>) como agente polinizador del cultivo de tomate en Invernaderos: una alternativa local y potencial a la introducción de abejorros del género <i>Bombus</i> .	Universidad Agroforestal Fernando Arturo de Meriño (UAFAM)	El Clúster de invernaderos de Jarabacoa, R. D.	Use of Abejón Nativo Dominicano (<i>Xylocopa mordax</i>) as an efficient tomato pollinator
Estudio fitoquímico de <i>Elekmania buchii</i> .	Universidad Autónoma de Santo Domingo (UASD)	Laboratorio BIOLAB, en Tenerife, Islas Canarias, España	Impulse of knowledge of these topics
Estudio Estructural y Farmacológico de Acetogeninas y Otros Metabolitos Antineoplásicos Presentes en Algas del Género <i>Laurencia</i> del Ecosistema Marino Dominicano.	Universidad Central del Este (UCE)	Laboratorio de Productos Naturales Marinos del Instituto Universitario de Bio-Orgánica (IUBO), La Laguna España	Provide technical support to the project
		Laboratorio BIOLAB, en Tenerife, Islas Canarias, España	
“Introducción del gen <i>FecB</i> (<i>Booroola</i>) y su efecto en la prolificidad y parámetros productivos de ovejas Katahdin”	Universidad Central del Este (UCE)	Centro para el Desarrollo Agropecuario y Forestal, Inc. (CEDAF), R. D.	Obtain a breeding system with more prolific sheep
Determinación del índice de estrés oxidativo en el grupo poblacional del adulto mayor con diabetes o hipertensión arterial en República Dominicana	Universidad Nacional Evangélica (UNEV)	Oxinat, SRL, R. D.	Participates as a Commercial Company for the exit to the market of the results of the project
Desarrollo de Sistema de traducción automática Japonés-Español Usando Inglés como lengua intermedia.	Universidad Iberoamericana (UNIBE)	Instituto de Ciencia y Tecnología de Nara (Japón)	Make use of the resulting translation system
Diagnóstico del <i>M. tuberculosis</i> multirresistente por PCR en tiempo real un método rápido de laboratorio para países de recursos limitados.	Universidad Tecnológica de Santiago (UTESA)	Centro de estudios moleculares (CEM), R. D.	Promotion of knowledge of these topics through training and personnel training in molecular biology

Proyecto	Institución	Institución del sector productivo	Objetivos de la Institución dentro del Proyecto
7 Proyectos en 2013			
Estandarización del manejo de las biopsias endoscópicas y Citología de Pulmón para el diagnóstico de Cáncer, con fines de medicina personalizada.	Universidad Tecnológica de Santiago (UTESA)	MEDIPATH, R. D.	Standardize the management of endoscopic biopsies and pulmonary cytologies for the diagnosis of cancer in order to achieve personalized therapy
Multiplicación in vitro e inducción de vernalización de tres genotipos de fresa (<i>Fragaria</i> spp.) para aumentar la producción de flores y esolones empleando ácido giberético.	Universidad Agroforestal Fernando Arturo de Meriño (UAFAM)	Clúster Hortícola Constanza, R. D.	Implement and benefit from the increase in flower production
Biología reproductiva y desarrollo morfológico del trogón de la Hispaniola (<i>Priotelus roseigaster</i>) en la reserva científica de "Ébano verde".	Universidad Iberoamericana (UNIBE)	Fundación Progressio, R. D.	Contribute to the conservation of the Trogon de la Hispaniola (<i>Priotelus roseigaster</i>)
Obtención y evaluación de novillos mestizos (<i>B. taurus</i> x <i>B. indicus</i>) con mayor calidad de carne mediante selección asistida de marcadores moleculares.	Universidad Nacional Evangélica (UNEV)	Centro para el Desarrollo Agropecuario y Forestal (CEDAF), R. D.	Disseminate project results and gain benefits from improved meat quality
		Hacienda La Perseverancia, R. D.	
Producción de sirope con alto contenido de fructosa a partir del jugo de caña (<i>Saccharum officinarum</i>).	Universidad Autónoma de Santo Domingo (UASD)	Cooperativa Cañera de Servicios Múltiples (Coopcaña), R. D.	Release the results of the project
Aislamiento biodirigido y caracterización química de sustancias antimicrobiales y citotóxicas en plantas de uso medicinal en República Dominicana.	Universidad Autónoma de Santo Domingo (UASD)	Laboratorio BIOLAB, en Tenerife, Islas Canarias, España	Provide technical support to the project
Bioprospección anticancerígena en plantas endémicas y nativas dominicanas de la familia Asteraceae.	Universidad Autónoma de Santo Domingo (UASD)	Universidad de Las Palmas, Gran Canaria, España	Impulse of knowledge of these topics
		Laboratorio BIOLAB, España	

Proyecto	Institución	Institución del sector productivo	Objetivos de la Institución dentro del Proyecto
5 Proyectos en 2014			
Propagación in vitro de Ébano Verde (<i>Magnolia pallescens</i>) Por Técnicas Biotecnológicas y Evaluación de su Adaptación en la Cuenca del Río Yaque del Norte de La República Dominicana	Universidad Agroforestal Fernándo Arturo de Meriño (UAFAM)	Clúster Hortícola Constanza, R. D.	Propagate in vitro the Green Ebony (<i>Magnolia pallescens</i>) by somatic embryogenesis.
Evaluación y cría masiva de enemigos naturales para su uso en el control de plagas en producción bajo ambiente protegido.	Universidad Agroforestal Fernándo Arturo de Meriño (UAFAM)	El Clúster de invernaderos de Jarabacoa, R, D,	Evaluate native natural enemies for use in Biological Control programs of pests in agricultural crops under controlled environment
Estudio Fitoquímico de <i>Vernonia acuminata</i>	Universidad Autónoma de Santo Domingo (UASD)	Laboratorio BIOLAB , Tenerife, Islas Canarias, España.	Impulse of knowledge of these topics
Cambios electrofisiológicos y de habilidad lectora a partir del uso de una aplicación para celulares inteligentes de apoyo a la post-alfabetización	Universidad Iberoamericana (UNIBE)	Haskins Laboratories (Connecticut)	Impulse of knowledge of these topics
Epidemiología y caracterización molecular del Virus chikungunya en la Epidemia del 2014 en República Domicana.	Universidad Tecnológica de Santiago (UTESA)	Centro de estudios moleculares (CEM), R. D.	Promotion of knowledge of these topics through training and personnel training in molecular biology

Proyecto	Institución	Investigador principal	Institución del sector productivo	Objetivos de la Institución dentro del Proyecto
8 Proyectos en 2015				
Alternativas Tecnológico-Financieras para la Renovación, Rehabilitación y Fomento de Cafetales en República Dominicana	Centro Agronómico Tropical de Investigación y Enseñanza (CATIE)	Ramón Ovidio Sánchez Peña	Consejo Dominicano del Café (CODOCAFE)	Develop the national coffee sector
			- Federaciones y Asociaciones de Caficultores.	
Desarrollo de Materiales Autosensorizados Basados en Micro/Nanomateriales para la Vigilancia de Infraestructuras Civiles y de Transporte	Dirección General de Aduanas (DGA)	Jesús Olivera Cabo	Tamag Iberica SL, San Sebastián, España	Provide technical support to the project
Evaluación de los Impactos del Desarrollo de la Cadena de Valor del Cacao (Theobroma cacao, L.) en República Dominicana	Instituto Dominicano de Investigaciones Agropecuarias y Forestales (IDIAF)	César Martínez	Clúster de Cacao Dominicano	Develop cocoa production and identify possibilities for inclusion in agroindustrial processes
Evaluación de cepas nativas de Trichoderma spp. en el control de hongos fitopatógenos de suelo bajo ambiente protegido.	Instituto Dominicano de Investigaciones Agropecuarias y Forestales (IDIAF)	Elpidio Avilés Quezada	El clúster de Invernaderos de Jarabacoa	To know the current situation of use of the technology with Trichoderma in controlled environment
Investigación y desarrollo de formulaciones orgánicas enriquecidas con microorganismos promotores de crecimiento e inductores de resistencia a la Roya del Café (Hemileia vastatrix) para el aumento de la competitividad del sector cafetalero	Instituto Dominicano de Investigaciones Agropecuarias y Forestales (IDIAF)	José Efraín Camilo Santos	La Federación de Caficultores y Agricultores para el Desarrollo de San Juan Inc. (FECADESJ)	Obtain designation of origin for Dominican products
Investigaciones e Innovaciones tecnológicas para el desarrollo de la Apicultura Dominicana ante los retos del cambio climático	Instituto Dominicano de Investigaciones Agropecuarias y Forestales (IDIAF)	Niyra Castillo Ramirez	Cooperativa Apícola Salvador Ferrer, Guayubín, Monte Cristi	Integrate the knowledge and technologies that allow to increase the competitiveness and to favor the sustainability of the apicultural production sector of RD
Geología y servicios ambientales de los humedales del Ozama, República Dominicana	Servicio Geológico Nacional (SGN)	Yenny Rodríguez Encarnación	Fundación Ozama RD Verde	Evaluate the ecosystem services of the wetlands of PNHO and analyze the role of groundwater in these services
Sistema integrado de educación y vigilancia entomológica para la prevención y el control de enfermedades vehiculizadas por mosquitos (Diptera, Culicidae) en dos polos turísticos de República Dominicana.	Universidad Agroforestal Fernando Arturo de Meriño (UAFAM)	Pedro María Alarcón Elbal	Asociación de Hoteles del Este	Ensure that disease control helps the flow of tourists



Plan Piloto de Innovación (PPI)

- The PPI is a financing mechanism for productive innovation projects, defined in the "Technical Assistance Project for the Competitiveness Policy Support Program II", which is jointly developed by the National Competitiveness Council (CNC) and Ministry of Higher Education, Science, and Technology (MESCYT).
- PPI financing comes from the IDB.



European Research Area (ERA)
Latin American and the Caribbean (LAC)

2nd ERANet-LAC Call 2016
A significant Dominican participation
Networking

Titulo del Proyecto en Español	Titulo del Proyecto en Inglés y Código	PI e Institución en RD	Monto a financiar MESCyT
Optimización de pequeñas turbinas de viento y promoción de mercado	SWTOMP: Small Wind Turbines Optimization and Market Promotion ELAC2015/T05-0682	Ing. Alexeis Fernández Bonilla, INTEC	2,545,000.00
Elaboración de sistemas novedosos de enfriamiento/calefacción para edificaciones con la aplicación de células fotovoltaicas, colectores solares y acumuladores de calor	ACCUSOL: Elaboration of the novel cooling/heating system of buildings with the application of photovoltaic cells, solar collectors and heat accumulators ELAC2015/T06-0523	Dr. Juan Faxas-Guzmán, PUCMM	6,045,362.46
Diseño e implementación de un sistema inteligente de bajo coste para el pre-diagnóstico y teleasistencia de enfermedades infecciosas en las personas de edad avanzada	SPIDEP: Design and implementation of a low cost smart system for prediagnosis and telecare of infectious diseases in elderly people ELAC2015/T09-0819	Dra. Gloria Sención Martínez, UASD	3,560,964.00
Alianza de investigación entre la Unión Europea y el Caribe para la mejora en la Gestión de Residuos	CARE4WASTE: Carribbean European Union Research Alliance 4 Better Waste Management ELAC2015/T02-0776	Ing. Eurípides Amaro García, UFHEC	7,552,465.65
Valorización de residuos agro-alimentarios por tecnología de insectos	EntoWASTE: Valorisation of agrifood residuals with insect technologies ELAC2015/T03-0580	Dr. Alberto J. Núñez Sellés, UNEV	9,010,928.80
Asistencia Europea, Latinoamericana y del Caribe para el Páncreas Artificial	ELCAP: The European, Latin American & Caribbean Artificial Pancreas Assistant ELAC2015/T09-1038	Dr. Ammar Ibrahim, UNIBE/INDEN	12,731,871.50

41,446,592.41



Dominican Republic

Accreditation

- The Institute for Innovation in Biotechnology and Industry (IIBI) has achieved accreditation on almost 40 essays in the areas of microbiology, mineralogy, chemistry, physics, and chromatography, wastewater. Certification ISO 9001: 2008 and accreditation and ISO / IEC 17025: 2005.
- The Technological Institute of Las Americas (ITLA) has international certifications CISCO Networking Laboratory; Mechatronics under Asian standards (Taiwan); for software and multimedia: standards of Adobe, Oracle, Microsoft and Free Software.



Dominican Republic

Funds for Research in HE Institutions

- There are institutional and regulated funds, in various HEI, including: UASD, PUCMM, INTEC, UNIBE, UNPHU. Other HEI research component included in improvement plans.



Dominican Republic

- There has been introduced the category of "Research Professor" at several universities (UASD, INTEC, PUCMM, UNPHU, UNEV, ISA among others), as a direct result of the effectiveness and success of FONDOCYT.
- We have designed the National Career of Researchers in S & T areas, including the criteria and indicators required to become a member of the System. Under consideration by The National Council for Higher Education, S & T (CONESCyT), and approval expected at the beginning of 2017.

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- ***Thanks for your attention!***