



DELIVERABLE REPORT

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1. EXECUTIVE SUMMARY

The objective of this report is to provide a brief overview of the Innovation Performance in Central America utilizing the available innovation indicators. The report particularly focuses on a set of innovation indicators addressed for Central American countries. The data were collected in order to be aligned with the Innovation Union Scoreboard (IUS) which includes indicators and trend analyses for the EU27 Member States and some additional countries.

All of the presented information is coming from trustworthy international organizations such as the World Bank, and the World Intellectual Property Organization, however, due to a certain level of dissimilarity in data and measurement (i.e. the majority of the countries use their own statistical indicators without following a common measurement approach to assess innovation performance, data are available in different years), the report covers only a fraction of the IUS indicators. Thus, in order better assess the innovation capacity of the region, we are also presenting other relevant innovation indicators, which are available for the majority of the CA countries.

Main Findings

- While being engaged in serious efforts towards macroeconomic stability, social inclusion, increased participation to all levels of education and attracting foreign investments over the last two decades, Central American countries continue to seriously underperform -with the notable exception of Costa Rica, and in some cases Panama- regarding innovation.
- Innovation in the Central America region remains indeed low and it has been further affected by the global financial crisis. This has also been the case for EU Member States or candidate countries as evidence from the Innovation Union Scoreboard indicates.
- Within the Central America region the situation is heterogeneous with Nicaragua, Honduras Guatemala and El Salvador seriously lagging behind



while Panama and notably Costa Rica are better performing. This difference in favour of Panama and Costa Rica could be attributed to better framework conditions regarding the more stable political, economic and social environment and to better performances when it comes to completion of secondary school and university enrolment.

- Costa Rica is the regional leader in Central America in innovation as investment in education, environmental sustainability and political stability, place the country at a position that is similar to the group of EU countries that form the Moderate Innovators group according to the IUS.
- Main reasons for Central America's weak innovation performance could be considered the political instability in most of them, severe lack of finance, low levels of education and ineffective IPR policies.
- Central America's innovation gap can be decreased by improving the region's education system, generally ranked at the low-end of the scale when compared with other regions of the world, including Latin America.
- To enhance their human capital development, CA countries should redouble efforts to expand coverage of secondary and tertiary education while also improving the quality of education.
- Overall either as a symptom or as an innovation barrier low-productivity in important economic sectors such as manufacturing, services and agriculture remains a key issue.



2. ABBREVIATIONS

CA	Central America
EU	European Union
GERD	Gross Expenditure on R&D
GDP	Gross Domestic Product
GII	Global Innovation Index
IUS	Innovation Union Scoreboard
R&D	Research and Development
PCT	Patent Cooperation Treaty
PPP	Purchasing Power Parity
WIPO	World Intellectual Property Organization



3. BACKGROUND

The Central American Region is geographically located between North and South America as well as between the Pacific Ocean and the Caribbean Sea. It consists of seven countries namely, Belize, Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica and Panama. Guatemala, Honduras and Nicaragua occupy the largest territory in the Region with 2/3 of Central Americans coming from these countries. Together with El Salvador, they account for 80% of the Region's population.

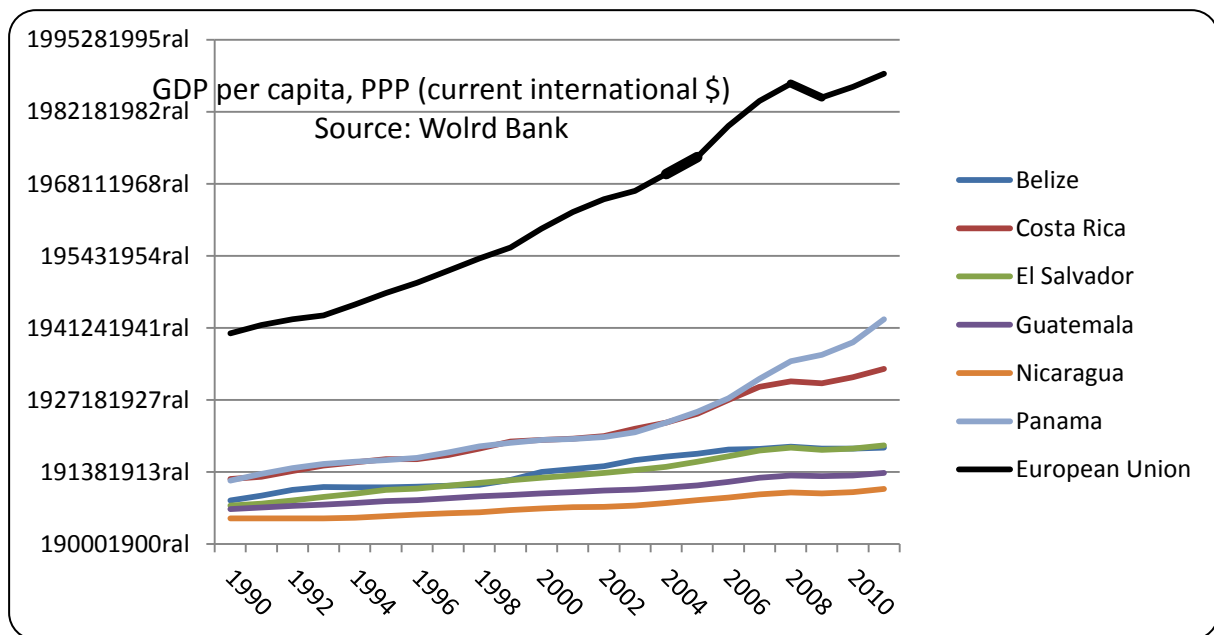
The Central American Region is according to the "Cuarto Informe Estado de la Región en el Desarrollo Humano Sostenible" a quite vulnerable region prone to fragmentation. The Region mainly exports agricultural products with main trading partners USA and Europe. However, it does not present particular strategic advantages in terms of producing adequate commodities of global demand such as petroleum, gas and food.

Generally, the Region faces certain external and internal threats critical to its future. Internal threats can be the political instability experienced by the States with the largest territorial occupation and the social exclusion of a significant part of the population leading to social violence, limited access to employment, social welfare programmes and education. As external threats could be considered the Region's exposure to international trade which is now suffering the effects of the global crisis and its vulnerability to climate change and to extreme meteorological phenomena. A source of opportunities would be the possible diversification of agriculture, reinforcement of rural areas, increase of production of sustainable energy, form strategic alliances with Asian markets, increase the access of young and qualified people to employment and enhance intraregional commerce.

In several Central America countries such as Nicaragua, Honduras, Guatemala, and El Salvador, half of the population lives in poverty while the economic situation is better off in Costa Rica and Panama which enjoy higher Human Capital Development, higher per capita income, more university graduates, low

unemployment, better macroeconomic framework conditions that results among else to lower unemployment that overall remains a critical issue for the region.

In general terms, during the years 2004-2007, the Region experienced growth rates (see following graph), while between 2008-2011, due to the global crisis, the reverse happened. During the period of growth, the CA countries invested more funds in social welfare in order to fight social exclusion of population. Amongst the positive developments could be noted the increase of life expectancy of adults (<70 years of age), the reduction of infant mortality as well the increased access to education of many social groups.



In the political scene, the realisation of the major political goal of convergence and integration has not been possible due to the above-mentioned external and internal factors. It seems to be a lack of interest for all states of the Region to jointly face global challenges and to develop linkages among them, such as the intraregional commerce. This can be the source for many social asymmetries, which could lead to the regional fragmentation of the region. Furthermore, the fragile political situation in Guatemala, Honduras and Nicaragua aggravate the issue of regional convergence.



In the social scene, according to the Cuarto Informe, it seems that Central America is dealing with an aging population and with an increasing number of inactive population (>25%). The working population is between 15-65 years of age. Projections foresee for Costa Rica and Panama that there will be 40 adults for every 100 youngsters (less than 15 years of age) In terms of access to education, in Honduras and Guatemala (2008), 90% of children has access to primary education, while for the access to secondary education, the rate drops to less than 70% for all Central American countries. Furthermore, a large portion of the population suffers from social exclusion. More specifically, in El Salvador, 40% of families are socially excluded, in Panama 30% and in Costa Rica 10%. Moreover there is a great disparity in the standard of living between rural and urban areas. Infants' malnutrition is also commonplace. Regarding infants below 5 years of age, in Guatemala account for 50%, Panama, Honduras, El Salvador, 23-31%, Nicaragua, 19% and Costa Rica, 2%. This is directly linked to the issue of social exclusion, which in turn is closely related to the amount spent by the States in social welfare. More particularly, Costa Rica's social expenditures during 2008, averaged approximately 1000 US\$ per person, while in Guatemala, Honduras and Nicaragua, approximately 160 US\$. Inevitably, money spend for private health care services is triple the public spending in the above mentioned countries including El Salvador, whereas in Costa Rica public spending in health care is larger than the private.

Nonetheless, the Region has undertaken certain initiatives in order to fight the crisis and promote its welfare through convergence. The CA countries, together with the Dominican Republic, have jointly agreed to buy medical supplies in order to obtain better prices. Moreover, other important initiatives are the interconnectivity of the electric power system embracing almost all the Region together with some territories of Mexico and Colombia, the International Network of Highways Mesoamericanas (RICAM) which has busted the construction sector and enhanced regional infrastructures, and the Programme Unidad de Seguridad, aiming to protect witnesses crucial to various judicial cases. On an external level,



since 2010, the CA countries signed a memorandum of cooperation with the European Union.

Concerning cooperation in Science & Technology (S&T), European research organisations have been continuously opening new areas of cooperation and developed new international cooperation approaches. The 7th Framework Program was broadly open to almost all the countries outside Europe, including all CA countries. However the participation of CA organisations has remained relatively low for several reasons (limited capacity, poor networking, lack of knowledge, etc). In order to facilitate cooperation with third countries, the EU has established International Cooperation Networks (INCO-Nets), which are coordination platforms that help to bring together the EU with policy makers and stakeholders of one target region. The main objectives of these platforms are to promote, organise and contribute to the participation of third countries in the activities of FP7. The purpose would be to promote regional integration and consequently would lead to the identification and prioritisation of common research areas of mutual interest and benefit. It would also facilitate the uptake and use of common identified research areas and the monitoring of performance and impacts of international S&T cooperation across the Specific Programmes of FP7. The Project *Enhancing Scientific Cooperation between the European Union and Central America* (ENLACE), was conceived as an INCO-Net, and its specific objectives contribute to the broad INCO-Net projects goals.

Scientific Output

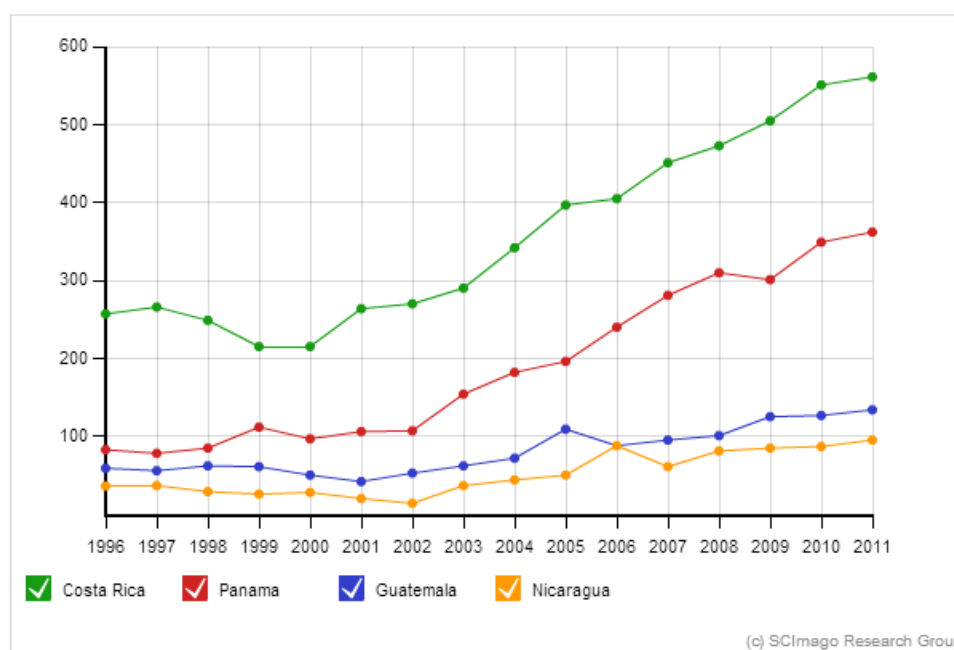
The scientific output of the Central American countries is briefly presented in **ANNEX 1**, however a quick look on the basic data reveals the scientific capacity of the area.

The following table presents the volume of scientific papers produced by country, the total number of Citations, and the citations per document which is a strong indicator demonstrating the scientific quality of the publication. It is clear that Costa Rica has the bigger scientific output followed by Panama and Guatemala, while Panama enjoys the most citations per documents.

Country	Documents	Citations	Citations per Document
Costa Rica	5,711	75,741	15.26
Panama	3,043	64,512	29.12
Guatemala	1,296	13,153	12.08
Nicaragua	818	8,438	13.13
El Salvador	768	4,961	8.14
Honduras	595	6,301	12.3
Belize	199	1,946	12.92
Source: SCImago Journal and Country Rank, Period 1996-2011			

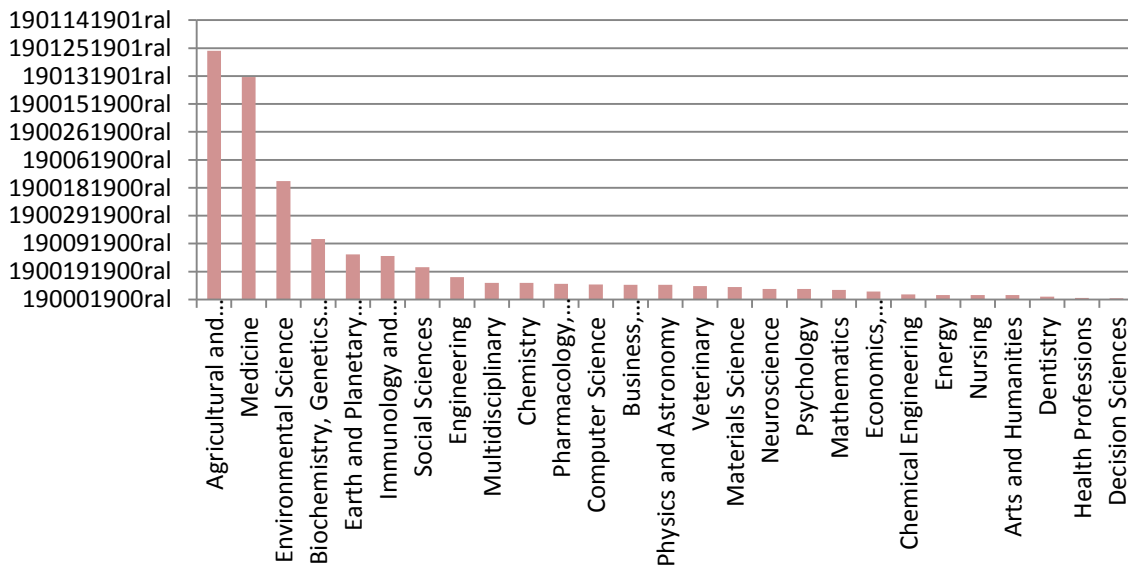
It is also interesting to note (see following graph) the rapid increase of scientific publications in Costa Rica and Panama (especially after 2002), demonstrating the rapid growth of these two Central American countries and the increasing focus on the knowledge economy. However, the strongest academic areas (check ANNEX 1) and most of the scientific publications (graph follows) from all the CA countries are coming from the areas of Medicine, Environment and Agriculture.

Scientific Publications per year for the top Central American performers
(Source: SCImago Journal and Country Rank, Period 1996-2011)



Central America Scientific Publications per Thematic Area (2011)

(source: SCImago Journal & Country Rank)





4. CENTRAL AMERICA INNOVATION INDICATORS

The principal aim of the report was however not the scientific output but to understand the innovation capacity of the region, by using the **Innovation Union Scoreboard (IUS)** methodology and the related innovation indicators.

However, due to the lack of information for most of the innovation indicators for the CA countries, additional indicators have been selected for presentation, in order to get a quick insight of the innovation capacity in Central America.

All the data have been collected by trustworthy sources like the **World Bank**, and the **Global Innovation Index**, and the **International Monetary Fund (IMF)**.

4.1 The Innovation Union Scoreboard (IUS)

The **IUS** is a tool meant to help monitor the implementation of the Europe 2020 Innovation Union flagship by providing a comparative assessment of the innovation performance of the EU27 Member States and the relative strengths and weaknesses of their research and innovation systems.

The IUS includes innovation indicators and trend analyses for the EU27 Member States, as well as for Croatia, Iceland, the Former Yugoslav Republic of Macedonia, Norway, Serbia, Switzerland and Turkey. It also includes comparisons based on a reduced set of indicators between the EU27 and 10 global competitors.

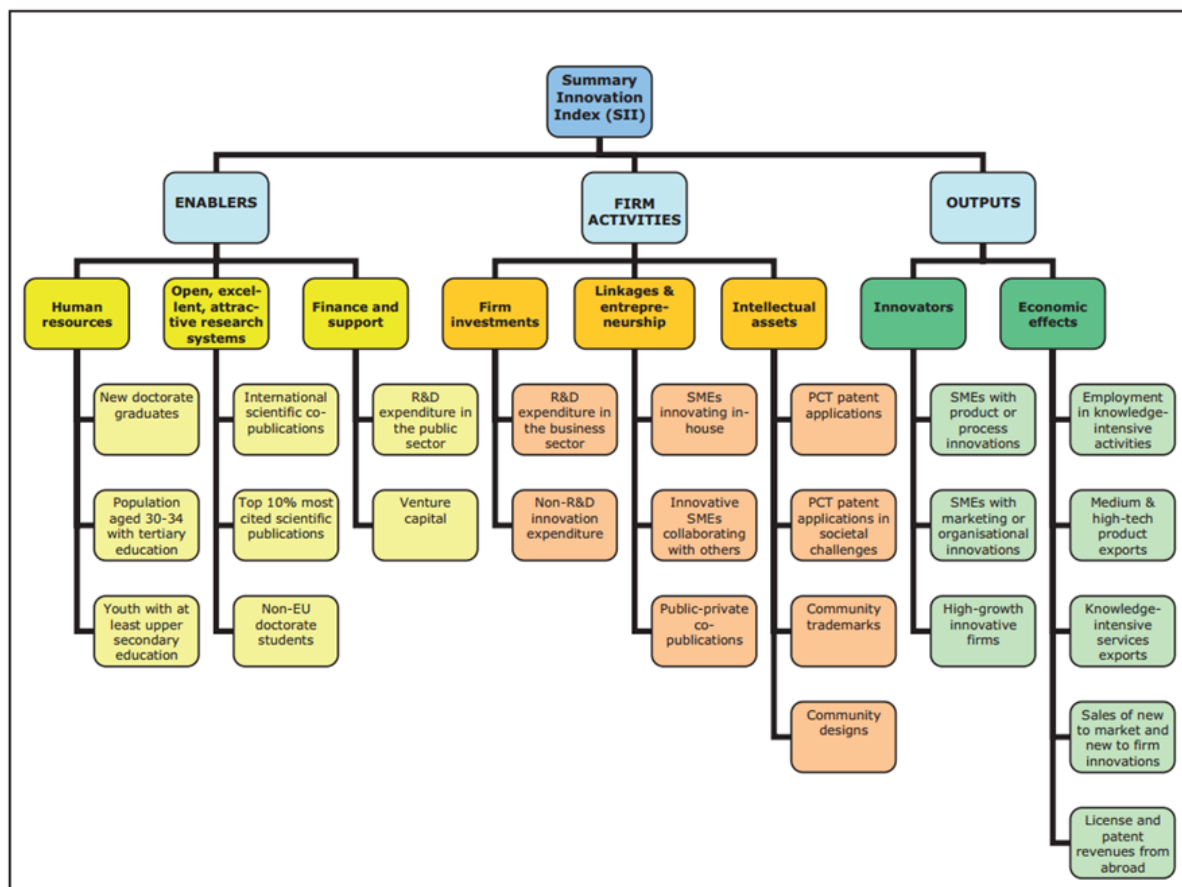
In terms of structure the IUS 2011 distinguishes between 3 main types of indicators and 8 innovation dimensions, capturing in total 25 different indicators.

- The **Enablers** capture the main drivers of innovation performance external to the firm and cover 3 innovation dimensions: 'Human resources', 'Open, excellent and attractive research systems' as well as 'Finance and support'.

- **Firm activities** capture the innovation efforts at the level of the firm, grouped in 3 innovation dimensions: 'Firm investments', 'Linkages & entrepreneurship' and 'Intellectual assets'.
- **Outputs** cover the effects of firms' innovation activities in 2 innovation dimensions: 'Innovators' and 'Economic effects'.

Each innovation indicator gives rise to further sub-categories, comprising in total 25 indicators (see figure below). Unfortunately, trustworthy data were found only for some of the CA countries and for a limited number of Indicators (check ANNEX 2).

FIGURE 1: FRAMEWORK OF THE INNOVATION UNION SCOREBOARD



Source: Innovation Union Scoreboard 2011



Main type / innovation dimension / indicator
ENABLERS
Human resources
1.1.1 New doctorate graduates (ISCED 6) per 1000 population aged 25-34
1.1.2 Percentage population aged 30-34 having completed tertiary education
1.1.3 Percentage youth aged 20-24 having attained at least upper secondary level education
Open, excellent and attractive research systems
1.2.1 International scientific co-publications per million population
1.2.2 Scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country
1.2.3 Non-EU doctorate students ¹ as a % of all doctorate students
Finance and support
1.3.1 R&D expenditure in the public sector as % of GDP
1.3.2 Venture capital (early stage, expansion and replacement) as % of GDP ²
FIRM ACTIVITIES
Firm investments
2.1.1 R&D expenditure in the business sector as % of GDP
2.1.2 Non-R&D innovation expenditures as % of turnover
Linkages & entrepreneurship
2.2.1 SMEs innovating in-house as % of SMEs
2.2.2 Innovative SMEs collaborating with others as % of SMEs
2.2.3 Public-private co-publications per million population
Intellectual assets
2.3.1 PCT patents applications per billion GDP (in PPSE)
2.3.2 PCT patent applications in societal challenges per billion GDP (in PPSE) (climate change mitigation; health)
2.3.3 Community trademarks per billion GDP (in PPSE)
2.3.4 Community designs per billion GDP (in PPSE)
OUTPUTS
Innovators
3.1.1 SMEs introducing product or process innovations as % of SMEs
3.1.2 SMEs introducing marketing or organisational innovations as % of SMEs
3.1.3 High-growth innovative firms
Economic effects
3.2.1 Employment in knowledge-intensive activities (manufacturing and services) as % of total employment
3.2.2 Medium and high-tech product exports as % total product exports
3.2.3 Knowledge-intensive services exports as % total service exports
3.2.4 Sales of new to market and new to firm innovations as % of turnover
3.2.5 License and patent revenues from abroad as % of GDP



4.2 Central America Innovation Indicators

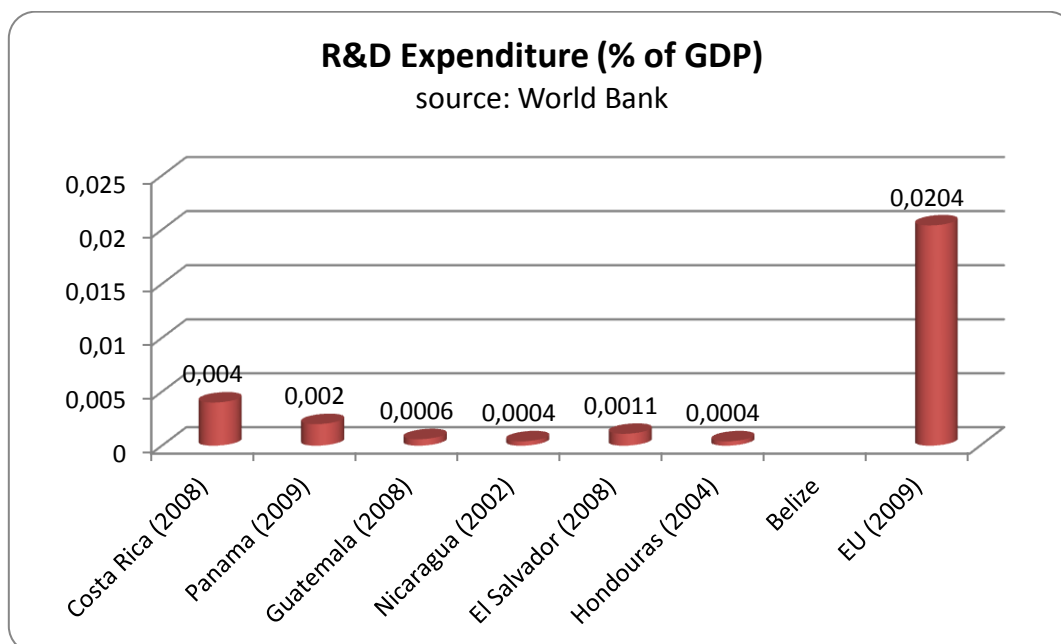
The main milestone was to identify comparable data and present them in a meaningful way in order to understand the relative innovation status of the CA countries. A useful piece of information before the presentation of any table, graphs, or trend analysis is to underline the CA country ranking in terms of GDP per capita. According to the figures of the International Monetary Fund (IMF), Costa Rica ranks 66th, followed by Panama in 67th rank. Belize ranks 99th, El Salvador 102nd, Honduras 129th and Nicaragua ranks last, filling up the 145th position.

This short analysis that is following utilised mainly information published in the World Bank indicators, the Global innovation Index (GII), and the International Monetary Fund (IMF). Furthermore, elements from OECD studies on Innovation policies have been also considered in the presentation of the indicators. Unfortunately due to lack of data available for the CA countries, the analysis is focusing on a small fraction of innovation indicators (ANNEX 2).

R&D EXPENDITURE: Research and development expenditures are (both public and private) current and capital expenditures on creative work undertaken systematically to increase knowledge, including knowledge of humanity, culture, and society, and the use of knowledge for new applications.

According to the index that covers basic research, applied research, and development up to the pro-commercialization stage EU27 has naturally the highest R&D spending (2.04%). In the CA region, Costa Rica has the leading role in R&D expenditure followed by Panama. It is worth mentioning the wide gap in R&D spending between the EU and the CA countries, on the other hand the gap is much smaller if we compare the top performer Costa Rica with specific EU countries, for example Greece (0,58%), Italy (1,27%), Spain (1,38%), Hungary (1,15%).

No data were available for Belize.

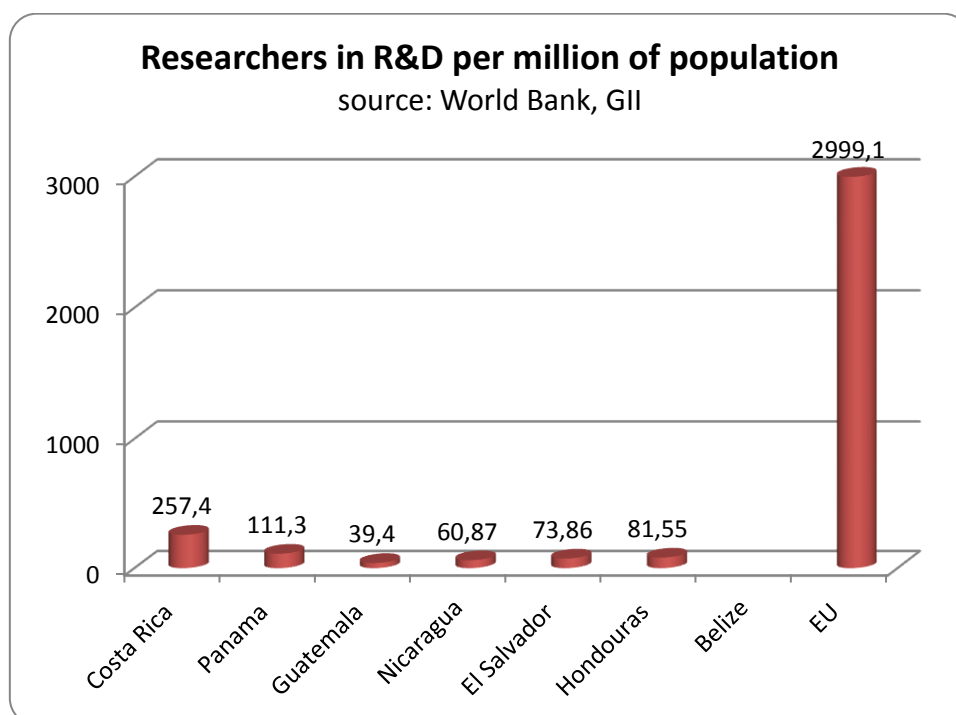


RESEARCHERS IN R&D (researchers per million of population, headcounts):

Researchers in R&D are professionals engaged in the conception or creation of new knowledge, products, processes, methods, or systems and in the management of the projects concerned. Postgraduate PhD students engaged in R&D are included.

Costa Rica accounted 257,4 researchers in R&D (per million of population) in 2008 while Panama and Honduras accounted 111,3 and 81,6 respectively. The majority of the data are coming from the World Bank, while the data for Nicaragua and El Salvador are coming from the Global Innovation Index (2012). No data were available for Belize.

The indicator clearly demonstrates the results of overall better functioning education system at every consequent education level but also it is also related with the modalities of every national research system and the opportunities that it provides for skilled research personnel.



HIGH TECH EXPORTS: High-technology exports are products with high R&D intensity, such as in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery.

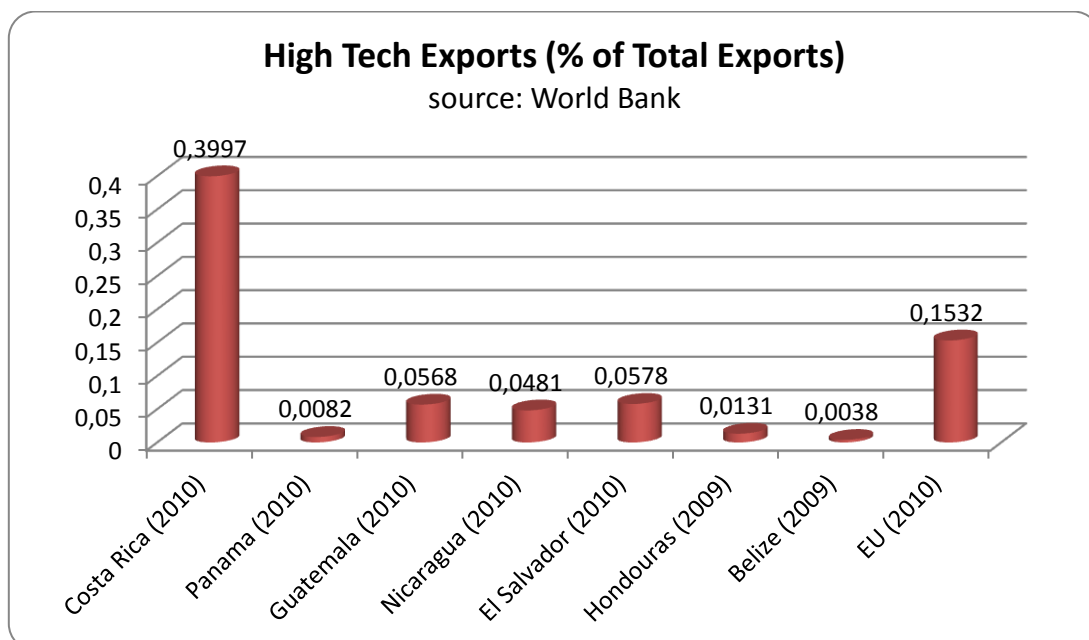
Costa Rica appeared to have the strongest exporting activity in high tech exports (39.97% of total national exports) which is more than triple of the EU figure (15,32%), while the other CA countries represented a much lower performance with percentages less than 6 %.

The phenomenon of developing countries such as Costa Rica that are increasingly becoming exporters of high-tech products has to be further considered as it does not automatically reflex the full pictures of the national technological capabilities.

The phenomenal specialization in high-tech exports typically does not come in agreement with indigenous technological capabilities in those countries. The analysis of intra-product imports suggests that the bulk of high-tech exports can actually be attributed to the effect of the increasingly international fragmentation

of production systems in electronics on trade statistics. For example, the leading chipmaker, Intel, has large manufacturing plant based in Costa Rica.

It is indeed generally confirmed in an econometric framework that while domestic technological capabilities have some influence on export performance in electronics, it is the propensity to import electronics components that accounts for by far the largest proportion of cross-country differences in specialization in electronics exports.

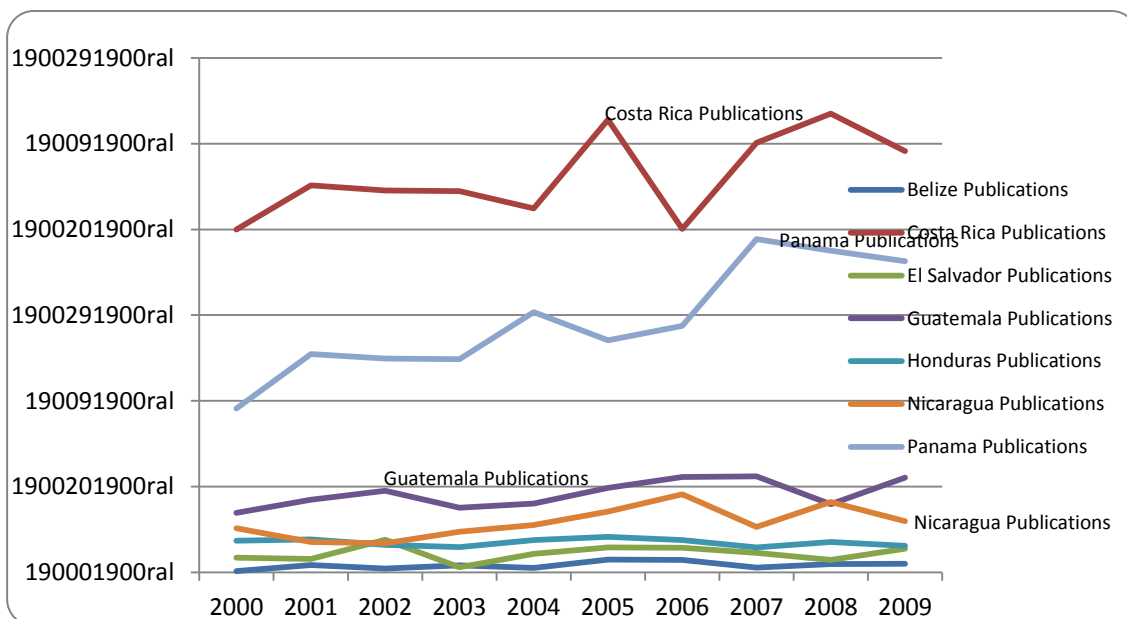


In a similar situation is in Europe, Hungary, a major components manufacturer, also performs well in the high tech exports area with a high percentage (24,23%) of high tech exports, while in the same time the performance of Italy is 7,2%, of Spain 6,36% and of Germany 15,25%.

Nevertheless, export of high technology end products entails greater development opportunities because of economies of scale and scope; export diversification and typically higher skills and technological intensity, compared with exports based on exploitation of natural endowments.

SCIENTIFIC AND TECHNICAL JOURNAL ARTICLES: Scientific and technical journal articles refer to the number of scientific and engineering articles published in the following fields: physics, biology, chemistry, mathematics, clinical medicine, biomedical research, engineering and technology, and earth and space sciences.

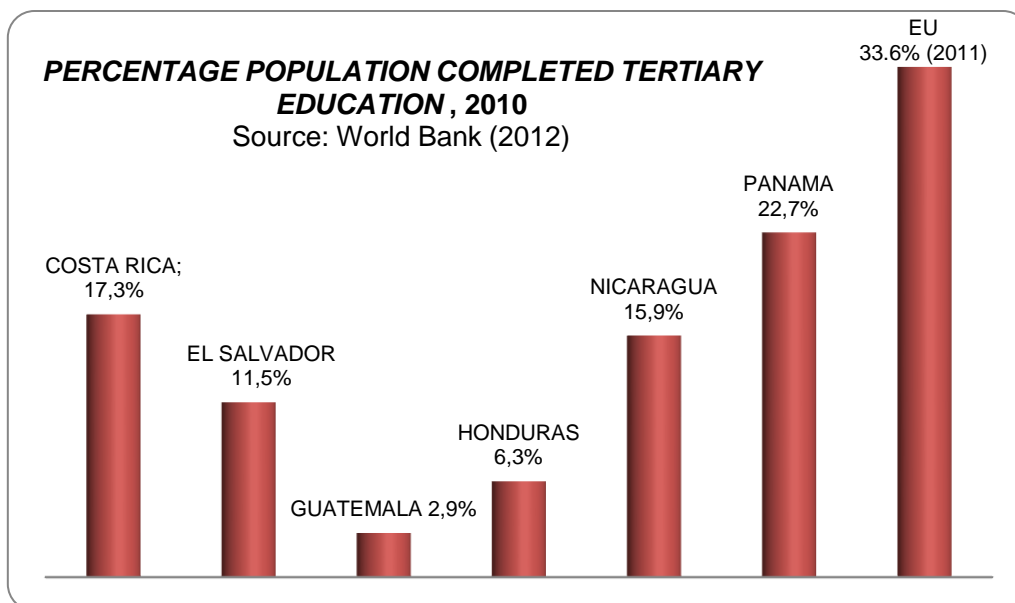
The data presented here are coming from the World Bank, and differ from those presented in chapter 3 and in ANNEX 1 (coming from Scopus). The difference in the statistics is related to the different pool of international scientific publications taken into account by Scopus and the World Bank and the consideration of co-publications.



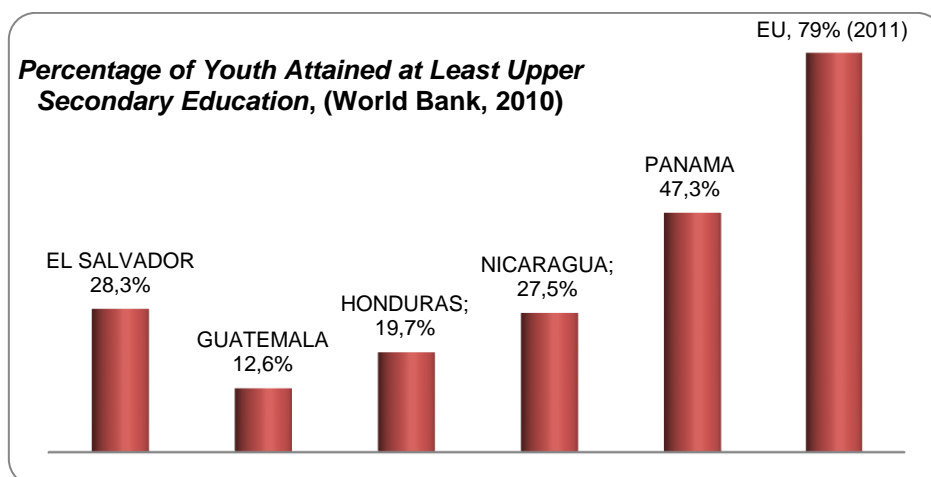
As it is expected the top ranking country is Costa Rica (98,9) followed by Panama (72,6), Guatemala (22,1) and Nicaragua (11,6). The level of publications is well below the number publications from EU countries.

POPULATION - TERTIARY EDUCATION: The percentage of population that has completed tertiary education in 2010 was higher in Panama (22.7%) followed by Costa Rica (17.3%), Nicaragua (15.9%) and El Salvador (11.5%). Guatemala and Honduras appeared to have the lowest percentages (2.9% and

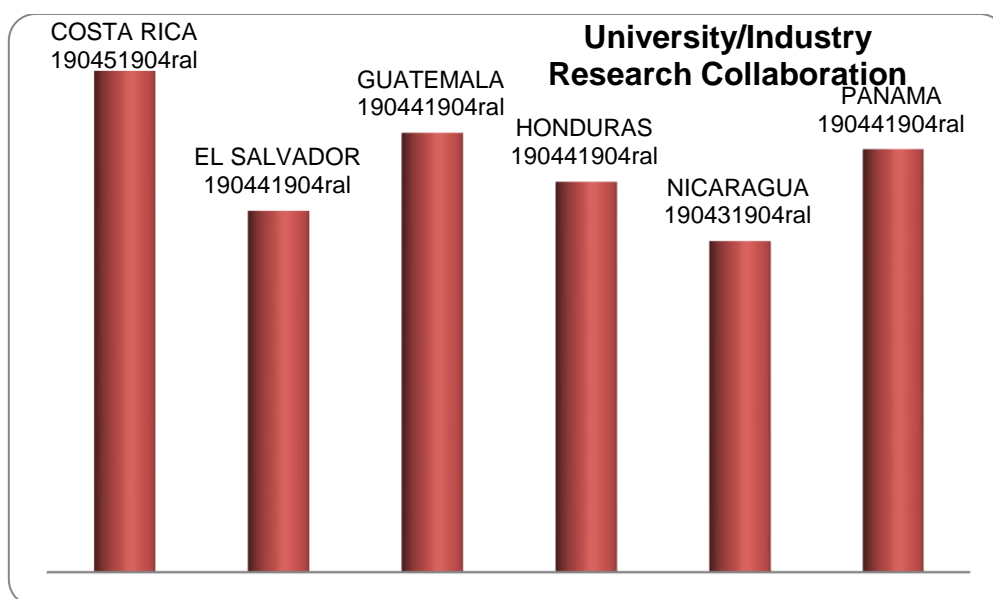
6.3% respectively). The numbers are well behind the EU27 percentage which is estimated to 33.6% for 2011.



POPULATION – SECONDARY EDUCATION: In terms of the percentage of youth that attained at least upper secondary education in 2010, Panama and Costa Rica hold the first and second positions (47.3% and 36.7% respectively). Nicaragua and El Salvador represent more or less the same proportion, while Guatemala and Honduras have each less than 20%. EU27 appears to have the higher percentage in 2011 estimated to 79%.



UNIVERSITY/INDUSTRY COLLABORATION: In this qualitative indicator of the Global Innovation Index (GII, 2012) the strongest relation between university and industry research collaboration in 2012 appeared in Costa Rica, followed by Guatemala, Panama and Honduras.

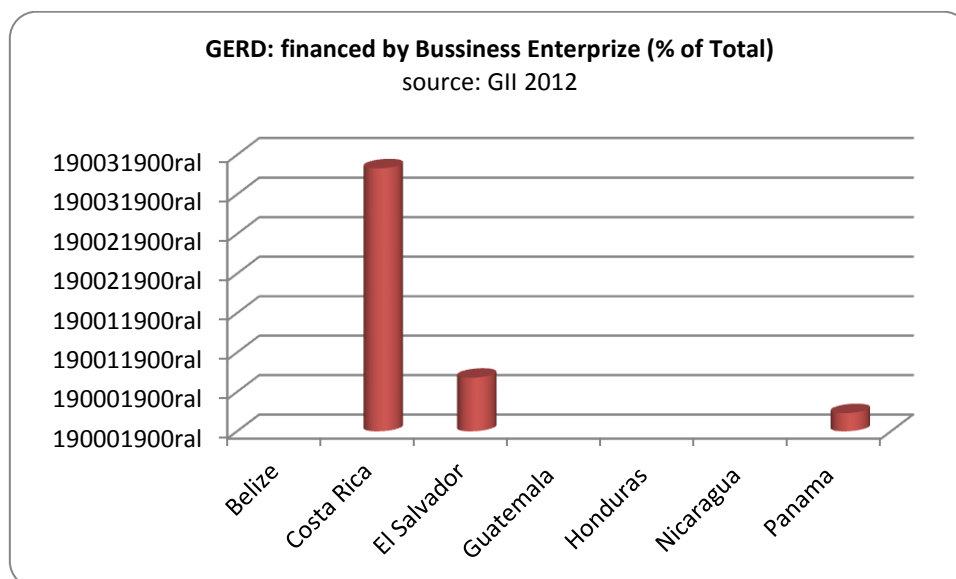


Source: Global Innovation Index 2012

(1 = do not collaborate at all; 7 = collaborate extensively)

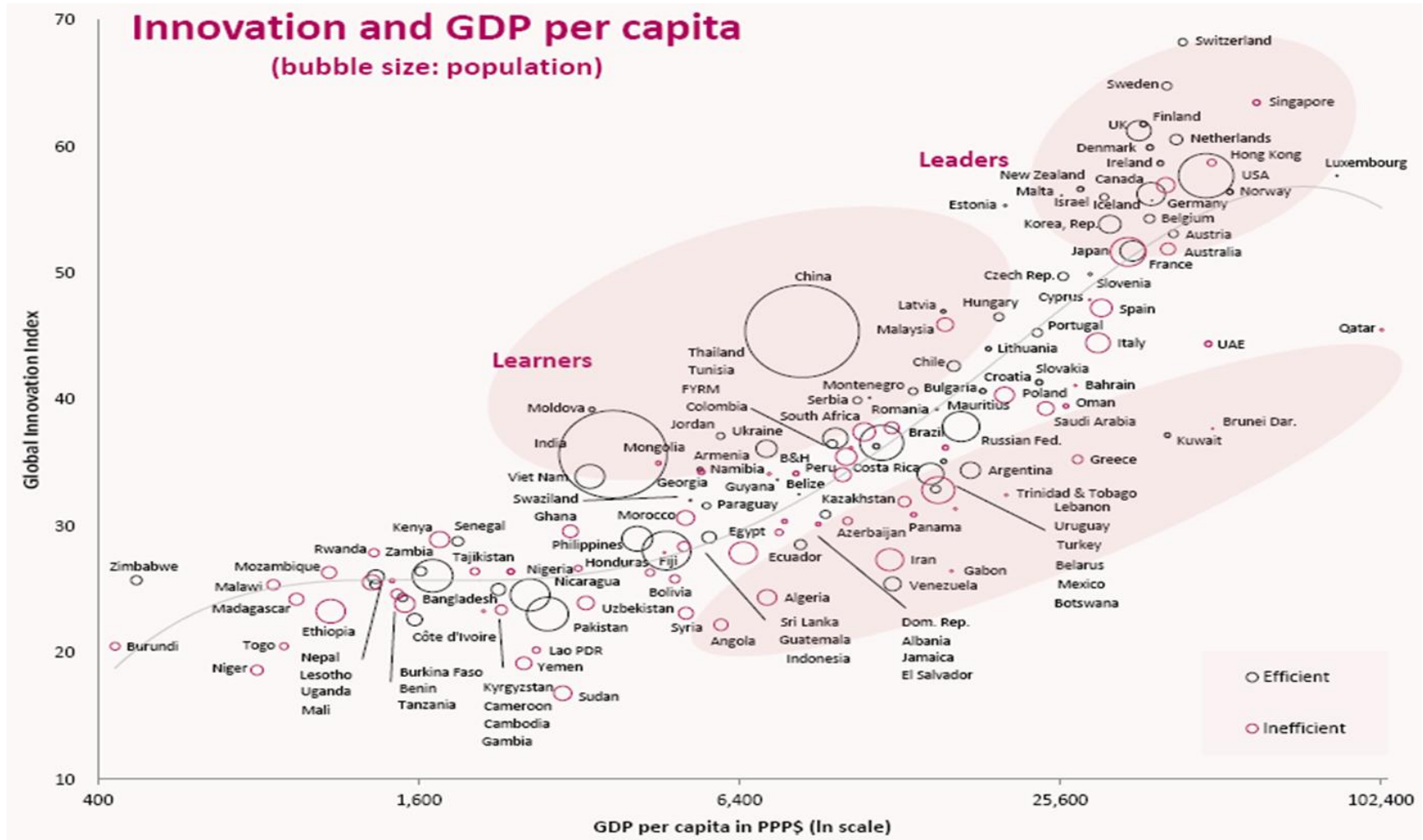
BUSINESS FINANCED R&D: It is a particularly important indicator demonstrating the formal creation of new knowledge within firms. This aspect proved to be one of the weakest aspects of the innovation environment in Central America.

As it is presented, in the following graph, the Central American enterprises are hardly investing on R&D. The private sector in Costa Rica is responsible only for the 3,3% of the Gross Expenditure on R&D, 0,68% in El Salvador, and 0,23% in Panama. On the other side of the Atlantic, in Europe, the private sector has a an important contribution on the GERD. For example, German businesses are responsible for the 67,27% of the GERD, Italians for the 45,17%, Spanish for the 44,95%, Hungarians for the 46,43%, and Greeks for the 31,06%.



Global Innovation Index: The ranking in GII is compiled by the World Intellectual Property Organization and INSEAD (the name was formerly an acronym for the French "Institut Européen d'Administration des Affaires" or European Institute of Business Administration) and it analyses the importance of innovation as a driver of economic growth and acknowledges the need for a broad horizontal vision of innovation that is applicable to both developed and emerging economies, with the inclusion of indicators that go beyond the traditional measures of innovation such as the level of research and development in a given country.

By observing this analysis, Central American counties are positioned at the low to middle income range (x axis), while the innovation performance (y axis) of Costa Rica, Belize, Honduras and Nicaragua, and the overall innovation performance of Panama, Guatemala and El Salvador is below the trend line falling into the category of "underperformers".





For indicative benchmarking purposes, we could attempt to compare the CA countries EU and non EU member States that tend to be moderate innovators (according to Innovation Union Scoreboard) or underperformers (according to Global Innovation Index). Basis for comparison is their relative proximity in the trend map.

When it comes to innovation, Costa Rica is the regional leader as investment in education, environmental sustainability and political stability, place Costa Rica in 60th place worldwide, behind only Chile (39th) among the Latin countries. In Central America, Panama is the second in 87th place, while Honduras is last, at the 111th place. The figures in parentheses represent the position of each country in the global index

1. Costa Rica (65)
2. Panama (87)
3. El Salvador (93)
4. Guatemala (99)
5. Nicaragua (105)
6. Honduras (111)

4.3 General Observations

Summarizing the picture drafted from the innovation indicators, the following points are highlighted:

- While the overall picture is indeed heterogeneous, Costa Rica and Panama are performing substantially better compared to the rest of the region in most benchmarking scoreboards and achieving to secure a place similar to the moderate or modest group of innovators of EU or candidate countries.
- it is clear the underperformance of some EU or candidate countries, besides the fact that they participate in a much more harmonized transnational research and



innovation area compared to the area in CA, where regional cooperation is in the early developing stage.

- The performances of Costa Rica and Panama can be considered as an advancement of their national innovation performance but do not necessarily reflect adoption of innovation across the board of their economies. There are still much to be done to increase adoption of technology, research spillovers from established high technology facilities, university - industry cooperation and translation of intellectual assets into new products and services in the markets.
- The correlation between more efficient education systems in terms of more University graduates and better innovation performance is again confirmed. CA countries need to work more systematically towards higher university enrollments and more high skill jobs in their national economies as this could pave the way for more social inclusion and decreased disparities that are in turn important factors for better innovation framework conditions.
- Regarding all the CA countries a number of suggestions could be extracted such as:
 - Further consolidation of all research and innovation actors within the national innovation systems and reinforcement of the legal frameworks
 - Special attention should be given towards the IPR policies in line with the WIPO guidelines that will encourage increase of domestic patents and translation of intellectual work into new products and markets.
 - Development of projects that will functionally link universities, research centers and local industries –multinational conglomerates and could be highlighted as success stories for further encouragement of cooperation.
 - Attention should be given to engage SMEs that are lagging behind in terms of adoption of technology while they are an integral part of the local development and contributors of work places.
 - Creation and dissemination at regional level of best practices as CA countries could learn a lot from each other in terms of comparability,



sustainability and transferability of effective practices that deliver results in similar cultural and social-economic environments.

- There is a high need for specific funding programs such as the Development Banking System as it is the case in Costa Rica which will encourage financial support for innovative ventures.
- Opportunities for international and regional collaboration should be maximized as national innovation systems could be positively affected while the research infrastructures and the pool of researchers will be exposed to international and regional paradigms. Synergies and cost effective cooperation could be established while both the components of each national innovation system and the system itself could be more extrovert in a continuously globalized economy. That eventually serves in claiming a place in parts of the global value chains with serious positive impact on the local and regional economies.

ANNEX 1: COUNTRY PROFILES

COSTA RICA



Official name: Republic of Costa Rica

Capital: San José

Official language: Spanish

Currency: Costa Rica Colón

Territorial extension: 51.100km²

Population: 4.451.205

Population density: 87 habitants/km² (as of 2008)

GDP: \$40.87 billion (World Bank, 2011)

GNI per capita: US\$7,660 (World Bank, 2011)

Main exports: Coffee, bananas, sugar, textiles, electronic components, electricity

Unemployment rate: 7,8%(2009)

Poverty rate: 24.8% (World Bank, 2011)

Internet Users per 100 people): 42.1 (2011)

Life expectancy: 77 years (men), 82 years (women) (UN)

Population literacy rate: 94.9%

Primary education: 84%

Secondary education: 66.2%

Tertiary education (superior): 28%

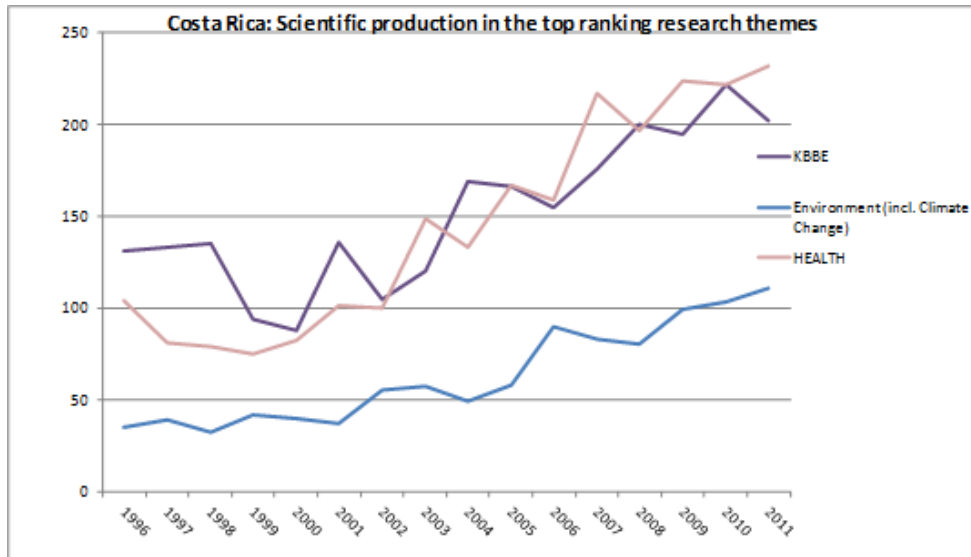
Scientific Output (1996-2011)

Documents: 5.711

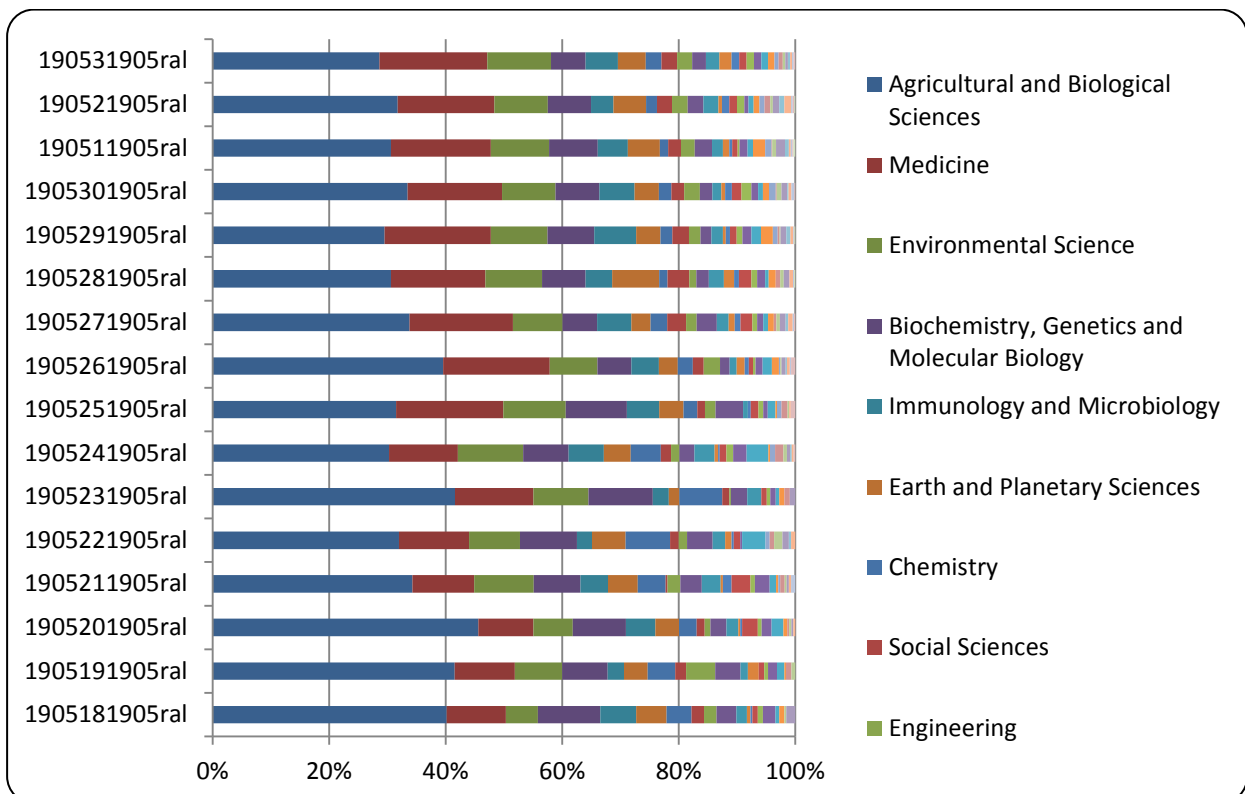
Citations: 75.741

Citations per Document: 13,26

An analysis of the scientific publications per thematic area, reveals that the Costa Rica's strongest scientific areas are the **Agricultural & Biological Sciences** (28,61% of total publications), **Medicine** (18,56% of total) and **Environmental Science** (10,91% of total).



Costa Rica: Percentage of Scientific Publications per Thematic Area
(source: SCImago Journal & Country Rank)





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Costa Rica, Scientific Publications (source: SCImago Journal & Country Rank)																
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	256006	2007	2008	2009	2010	2011
Agricultural and Biological Sciences	131	133	135	94	88	136	105	120	169	166	155	176	200	195	222	202
Arts and Humanities	-	-	1	1	2	-	1	1	2	4	3	3	3	2	8	2
Biochemistry, Genetics and Molecular Biology	35	25	27	22	27	36	27	40	25	29	38	48	45	53	52	42
Business, Management and Accounting	2	6	1	1	3	-	2	-	6	5	9	3	4	7	4	15
Chemical Engineering	-	-	-	1	2	-	3	3	1	-	-	5	7	7	6	5
Chemistry	14	15	9	13	21	24	18	9	11	14	7	12	13	9	13	19
Computer Science	1	-	1	4	1	-	1	2	3	5	4	4	7	3	9	9
Decision Sciences	-	-	-	2	-	-	-	-	1	1	1	1	3	2	2	2
Dentistry	-	-	-	-	-	-	1	3	3	1	-	-	1	1	2	2
Earth and Planetary Sciences	17	13	12	14	16	6	16	16	14	16	41	25	25	35	39	34
Economics, Econometrics and Finance	1	2	1	1	4	-	2	1	1	3	3	1	5	4	3	3
Energy	-	3	1	2	2	3	5	4	-	2	4	2	1	1	7	5
Engineering	7	16	3	6	4	1	5	7	12	9	6	12	16	15	19	18
Environmental Science	18	26	20	28	24	31	39	41	35	42	49	58	55	64	64	77
Health Professions	-	-	-	-	-	-	-	-	-	-	1	1	-	2	1	-
Immunology and Microbiology	20	9	15	13	7	9	21	21	20	29	23	43	36	33	27	39
Materials Science	2	4	6	3	11	2	13	5	7	4	3	10	5	6	6	8
Mathematics	3	3	8	9	3	3	4	5	3	10	11	7	10	6	9	9
Medicine	33	33	28	29	33	44	41	70	78	87	82	109	97	109	116	131
Multidisciplinary	3	2	2	2	-	2	4	3	2	4	5	6	10	2	9	9
Neuroscience	5	-	1	1	3	3	2	-	3	5	5	6	6	10	8	3
Nursing	-	-	-	-	1	-	1	-	1	2	-	4	1	4	6	3
Pharmacology, Toxicology and Pharmaceutics	11	14	8	10	12	9	9	18	7	17	11	11	13	19	19	17
Physics and Astronomy	6	4	6	9	6	8	12	3	5	10	13	12	9	12	18	16
Psychology	3	1	2	1	-	3	1	1	5	5	6	12	6	13	7	8
Social Sciences	7	6	4	1	4	4	6	5	8	16	19	17	13	14	18	19
Veterinary	7	5	5	7	1	3	8	3	5	5	7	9	7	9	5	9

PANAMA



Official name: Republic of Panama

Capital: Panama City

Official languages: Spanish

Religion: Roman catholicism

Territorial extension: 78.200 Km²

Population: 3. 187.883.87

Population density: 40.8 habitants/km² (as of 2008)

GDP : 26.778 Mill.US\$ (2011)

GDP per capita: US \$6,970 (World Bank, 2010)

Main exports: Bananas, fish, shrimp, petroleum products

Unemployment rate: 6.5% (2010)

Life expectancy: 74 years (men), 79 years (women) (UN)

Internet Users per 100 people): 42.7 (2011)

General Education index: 91.9%

Labor force with primary education (% of total) (est. 2008): 42.8%

Labor force with secondary education (% of total) (est. 2008):30.2%

Labor force with tertiary education, female (% of female labor force) (est. 2008): 35%

Labor force with tertiary education, male (% of male labor force) (est. 2008): 18%.

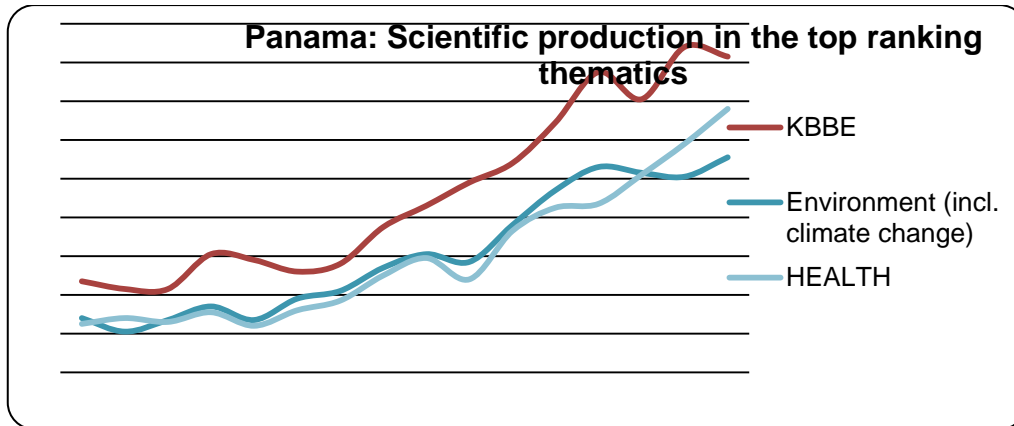
Scientific Output (1996-2011)

Documents: 3043

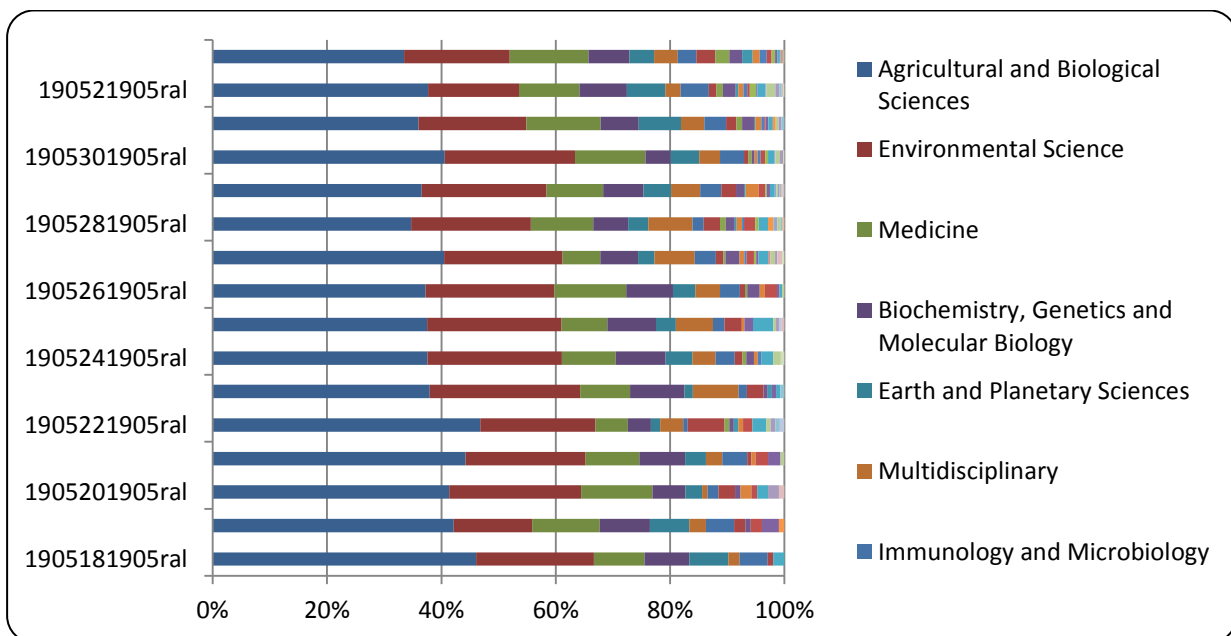
Citations: 64.512

Citations per Document: 21,20

An analysis of the scientific publications per thematic area, reveals that the Panama's strongest scientific areas are the **Agricultural & Biological Sciences** (33,47% of total publications), **Environmental Science** (18,48% of total) and **Medicine** (18,56% of total).



Panama: Percentage of Scientific Publications per Thematic Area
(source: SCImago Journal & Country Rank)





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Date: 27/12/2012

Panama, Scientific Publications (source: SCImago Journal & Country Rank)																
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Agricultural and Biological Sciences	47	43	43	61	58	52	56	75	86	98	108	129	155	141	168	163
Arts and Humanities	-	-	2	-	1	-	-	1	-	1	-	1	2	2	3	-
Biochemistry, Genetics and Molecular Biology	8	9	6	11	5	13	13	17	19	16	19	25	17	26	37	35
Business, Management and Accounting	-	1	-	-	-	-	-	-	-	-	3	-	-	2	-	1
Chemical Engineering	-	-	-	-	1	1	-	-	-	-	1	1	-	2	2	-
Chemistry	-	2	1	3	2	-	-	-	5	3	6	4	3	1	2	4
Computer Science	-	-	-	-	1	-	1	-	1	1	3	-	2	4	5	12
Decision Sciences	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-
Dentistry	-	-	-	-	1	-	-	1	-	-	-	1	-	-	-	-
Earth and Planetary Sciences	7	7	3	5	2	2	7	7	9	7	11	17	19	29	30	21
Economics, Econometrics and Finance	-	-	1	-	-	-	-	1	-	2	-	-	-	-	1	-
Energy	-	-	-	-	-	-	-	-	-	-	2	1	1	-	1	1
Engineering	-	1	1	-	1	1	2	-	5	6	5	5	2	8	10	11
Environmental Science	21	14	24	29	25	36	35	47	52	50	65	77	87	74	71	90
Health Professions	-	-	-	-	-	-	1	-	-	1	-	-	1	-	1	-
Immunology and Microbiology	5	5	2	6	1	2	5	4	8	9	6	13	16	15	22	16
Materials Science	-	3	-	3	-	1	-	3	1	1	-	2	-	2	1	2
Mathematics	-	-	-	-	-	-	-	-	-	1	2	1	2	-	5	3
Medicine	9	12	13	13	7	12	14	16	29	16	34	35	47	51	47	67
Multidisciplinary	2	3	1	4	5	11	6	13	10	17	24	18	14	16	12	20
Neuroscience	1	2	3	1	8	4	2	6	2	3	9	9	3	7	6	16
Nursing	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Pharmacology, Toxicology and Pharmaceutics	2	-	2	-	3	1	3	7	1	4	5	3	4	3	6	2
Physics and Astronomy	-	-	-	1	1	-	2	1	1	2	2	1	3	2	7	1
Psychology	-	-	-	-	1	1	-	-	-	-	1	1	-	1	2	9
Social Sciences	-	-	2	1	1	-	1	1	2	2	3	8	2	4	4	6
Veterinary	-	-	-	-	-	-	1	-	-	1	1	-	2	2	3	6

GUATEMALA



Official name: Republic of Guatemala
Capital: Guatemala City
Official languages: Spanish
Religion: Roman catholicism, indigenous Mayan beliefs
Currency: Quetzal

Territorial extension: 108.889 Km²
Population: 14.361,655
Population density: 131 habitants/km² (as of 2008)
GDP (2008): 46.900 (est. 2006) Mill.US\$
GDP per capita (2010): 3178,1 US\$
Unemployment rate: 1,8% (est. 2010)
Poverty rate: 53,7%

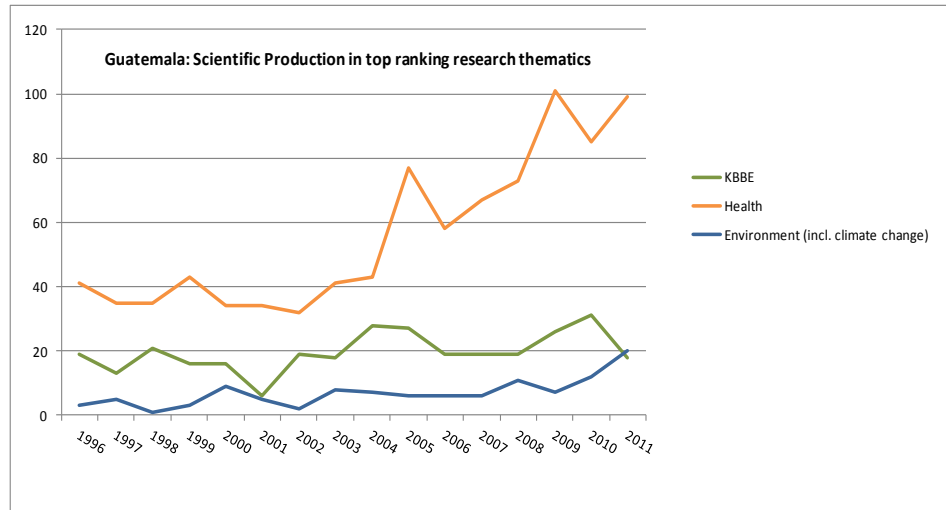
Life expectancy: 68 years (men), 75 years (women) (UN)
Literacy rate: 69.1%
Population with primary education: 84%
Population with secondary education: 31.2%
Population with university or technical education: 0.01%

Main exports: Coffee, sugar, bananas, fruits and vegetables, meat, petroleum, cardamom

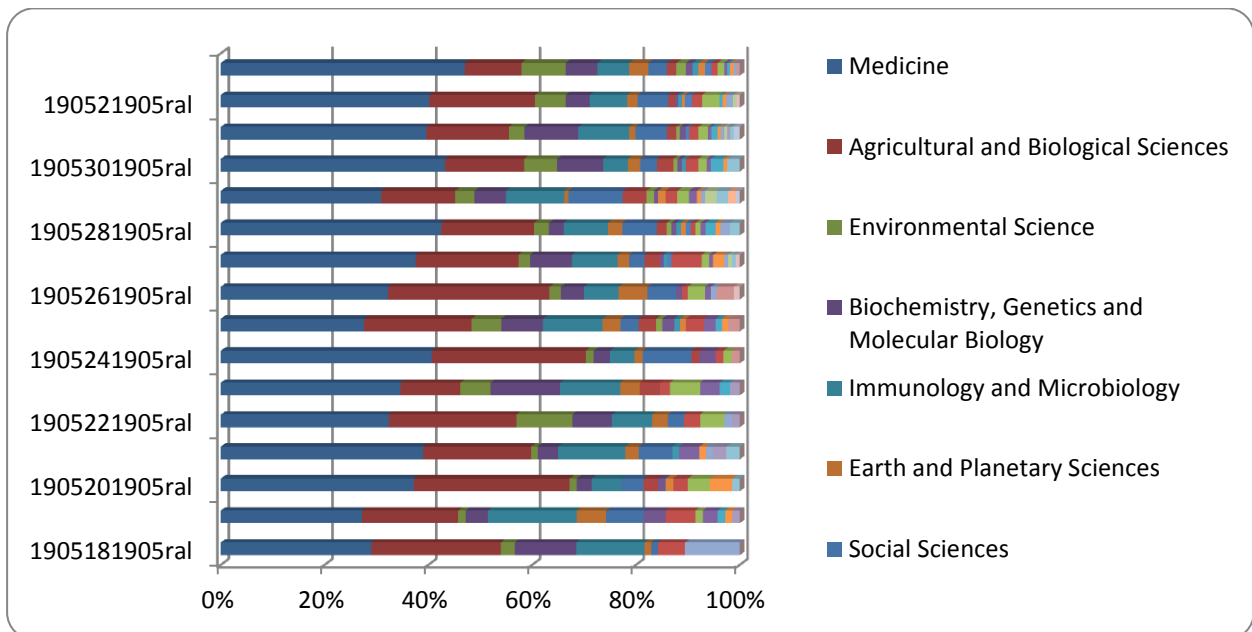
Scientific Output (1996-2011)

Documents: 1296
Citations: 13.153
Citations per Document: 10,15

An examination of the scientific publications per thematic area, reveals that the Panama's strongest scientific areas are the **Medicine** (46,95% of total publications), **Agricultural & Biological Sciences** (10,98% of total), and **Environmental Science** and (8,54% of total).



Guatemala: Percentage of Scientific Publications per Thematic Area
(source: SCImago Journal & Country Rank)





Guatemala: Scientific Publications (source: SCImago Journal & Country Rank)																
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Agricultural and Biological Sciences	19	13	21	16	16	6	19	18	28	27	19	19	19	26	31	18
Arts and Humanities	-	3	1	-	-	-	2	2	1	1	1	1	1	2	1	2
Biochemistry, Genetics and Molecular Biology	9	3	2	3	5	7	2	7	4	11	3	8	11	17	7	10
Business, Management and Accounting	-	-	-	1	-	-	-	1	-	1	1	-	1	-	1	2
Chemical Engineering	-	-	-	-	-	-	-	-	-	1	-	3	-	1	1	-
Chemistry	-	2	-	3	-	2	-	2	1	1	1	2	1	1	-	1
Computer Science	-	-	1	-	-	-	-	1	-	-	1	2	-	-	1	2
Dentistry	-	-	2	-	-	2	1	3	-	4	2	6	4	3	2	3
Earth and Planetary Sciences	1	4	-	2	2	2	1	3	5	3	3	1	3	2	3	6
Economics, Econometrics and Finance	-	-	-	-	-	-	-	1	-	-	1	2	1	1	-	3
Energy	-	1	-	2	1	1	-	-	-	-	-	-	-	1	-	-
Engineering	-	-	1	2	-	-	-	-	-	1	2	3	3	1	-	-
Environmental Science	2	1	1	1	7	3	1	5	2	3	3	5	8	5	9	14
Health Professions	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
Immunology and Microbiology	10	12	4	10	5	6	3	10	6	12	9	15	6	16	11	10
Materials Science	-	-	-	-	-	-	-	-	-	-	-	1	-	2	-	-
Mathematics	-	-	-	-	-	-	-	-	-	1	1	-	-	1	2	2
Medicine	22	19	26	30	21	18	26	24	29	51	45	41	54	65	61	77
Multidisciplinary	-	1	-	-	-	1	-	1	-	-	2	-	3	2	1	1
Neuroscience	-	-	-	-	-	-	-	-	1	1	-	-	-	-	1	-
Nursing	4	4	2	-	2	1	1	3	1	8	1	3	3	3	3	2
Pharmacology, Toxicology and Pharmaceutics	-	1	3	-	3	3	1	-	3	2	1	3	2	3	5	2
Physics and Astronomy	-	1	3	1	-	-	-	1	-	3	1	1	1	1	1	1
Psychology	8	-	-	1	1	-	-	-	1	1	2	1	-	1	2	1
Social Sciences	1	5	3	5	2	-	6	3	5	4	7	14	4	10	9	6
Veterinary	-	-	-	-	-	-	1	2	3	-	-	-	-	-	-	1

HONDURAS



Official name: Republic of Honduras

Capital: Tegucigalpa

Official language: Spanish

Main religion: Roman Catholicism, Protestantism

Currency: Lempira

Territorial extension: 112.492 Km²

Population: 7.706.900

Population density: 68.5 habitants/km²

GDP: 17.426 Mill.US\$ (2011)

GDP per capita: 2247 US\$

GNI per capita, Atlas method: \$1,980

Unemployment rate: 2,9% (% of labor force)

Poverty (% of population):66,2%

Life expectancy: 71 years (men), 76 years (women) (UN)

Literacy rate: 82%

Population with primary education: 1.300.727

Population with secondary education: 394.,651

Population with university or technical education: 148.563

Main exports: Coffee, bananas, shellfish, meat, timber, gold and other minerals

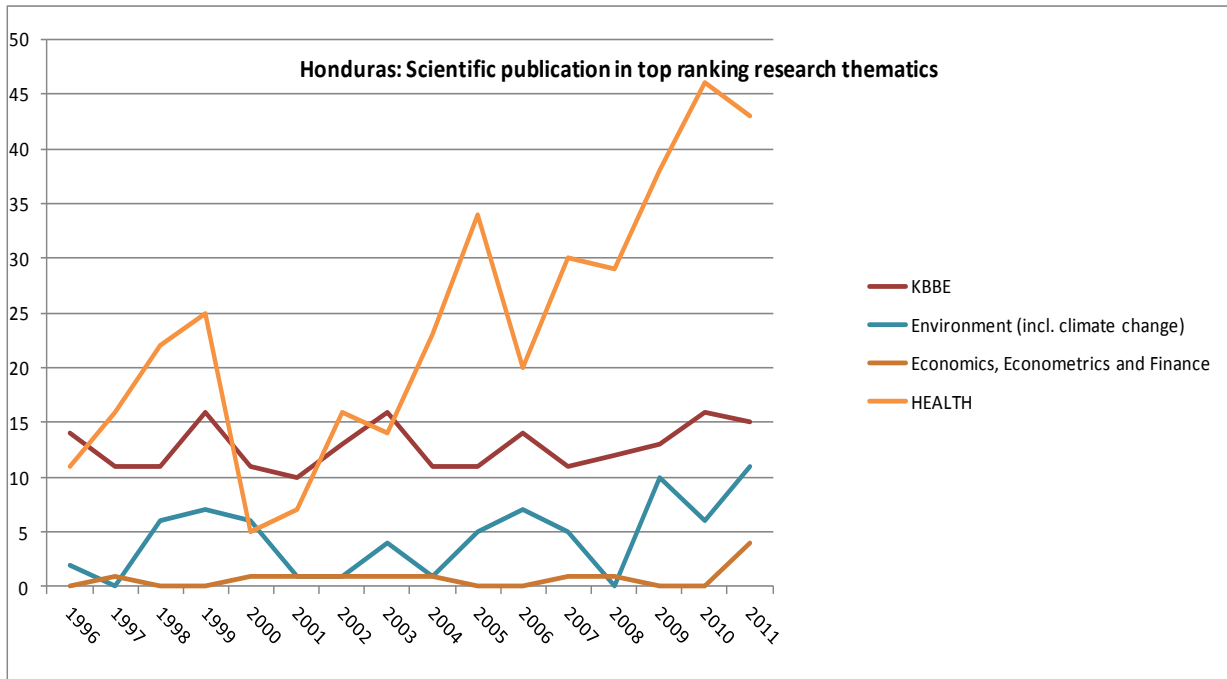
Scientific Output (1996-2011)

Documents: 595

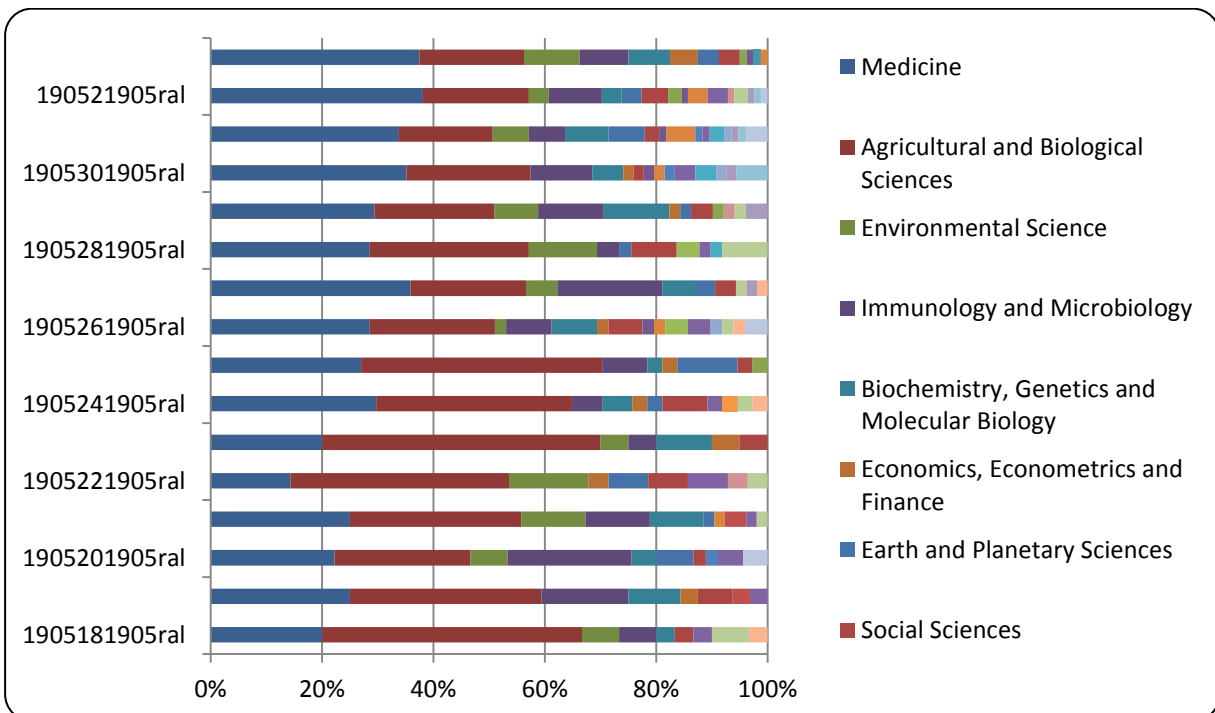
Citations: 6.301

Citations per Document: 10,59

An examination of the scientific publications per thematic area, reveals that the Honduras's strongest scientific areas are the **Medicine** (37,5% of total publications), **Agricultural & Biological Sciences** (18,75% of total), and **Environmental Science** and (10% of total).



Honduras: Percentage of Scientific Publications per Thematic Area
(source: SCImago Journal & Country Rank)





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Date: 27/12/2012

Honduras: Scientific Publications (source: SCImago Journal & Country Rank)																
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Agricultural and Biological Sciences	14	11	11	16	11	10	13	16	11	11	14	11	12	13	16	15
Arts and Humanities	-	-	1	-	-	-	-	-	-	-	-	-	1	1	-	-
Biochemistry, Genetics and Molecular Biology	1	3	2	5	-	2	2	1	4	3	-	6	3	6	3	6
Business, Management and Accounting	-	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-
Chemical Engineering	-	-	-	-	-	-	-	1	-	-	-	1	-	-	2	1
Chemistry	-	-	-	-	-	-	-	-	2	-	2	-	-	-	-	-
Computer Science	-	-	-	-	-	-	-	-	1	-	-	-	1	1	1	1
Earth and Planetary Sciences	-	-	3	1	2	-	1	4	-	2	1	1	-	5	3	3
Economics, Econometrics and Finance	-	1	-	-	1	1	1	1	1	-	-	1	1	-	-	4
Energy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Engineering	1	1	2	1	2	-	1	-	2	-	1	-	2	1	3	-
Environmental Science	2	-	3	6	4	1	-	-	1	3	6	4	-	5	3	8
Health Professions	-	-	-	-	-	-	-	-	-	-	1	-	2	2	-	-
Immunology and Microbiology	2	5	10	6	-	1	2	3	4	10	2	6	6	5	8	7
Materials Science	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Mathematics	-	-	-	-	-	-	-	-	1	-	-	-	1	1	-	-
Medicine	6	8	10	13	4	4	11	10	14	19	14	15	19	26	32	30
Multidisciplinary	-	-	-	-	1	-	-	-	-	-	-	1	-	-	1	-
Neuroscience	2	-	-	1	1	-	1	-	1	1	4	1	-	-	2	-
Nursing	-	-	-	1	-	-	-	-	1	-	-	-	1	4	3	1
Pharmacology, Toxicology and Pharmaceutics	-	-	-	-	-	-	-	-	-	1	-	2	1	1	1	-
Physics and Astronomy	-	-	-	-	-	-	-	-	-	-	-	-	3	1	1	-
Psychology	1	-	-	-	-	-	1	-	1	1	-	-	-	-	-	-
Social Sciences	1	2	1	-	2	1	3	1	3	2	4	2	1	2	4	3
Veterinary	-	-	2	-	-	-	-	-	2	-	-	-	-	3	1	-

NICARAGUA



Full name: Republic of Nicaragua

Capital: Managua

Main languages: Spanish, English as well as certain regional recognised languages.

Major religion: Roman catholicism

Life expectancy: 74 years

Monetary unit: Córdoba

Territorial extension: 130.373Km²

Population: 6.100. mil.

Population density (as of 2012): 51 habitants: /km²

GDP : 18.878 Bill.US\$ (2011)

GDP per capita: 3.205 US\$ (2011)

GNI per capita: 1.170 US\$ (2011)

Main exports: Coffee, meat, shellfish, sugar, tobacco, cattle, gold

Literacy rate: 78%

Labor force total (population): 2374649.562

Employment to population ratio (15+ years of age): 59%

Labor force participation rate, male (% of male population ages 15-64): 80%

Labor force participation rate, female (% of male population ages 15-64): 46%

National spending on R&D as % of GDP: 0.045% (2002)

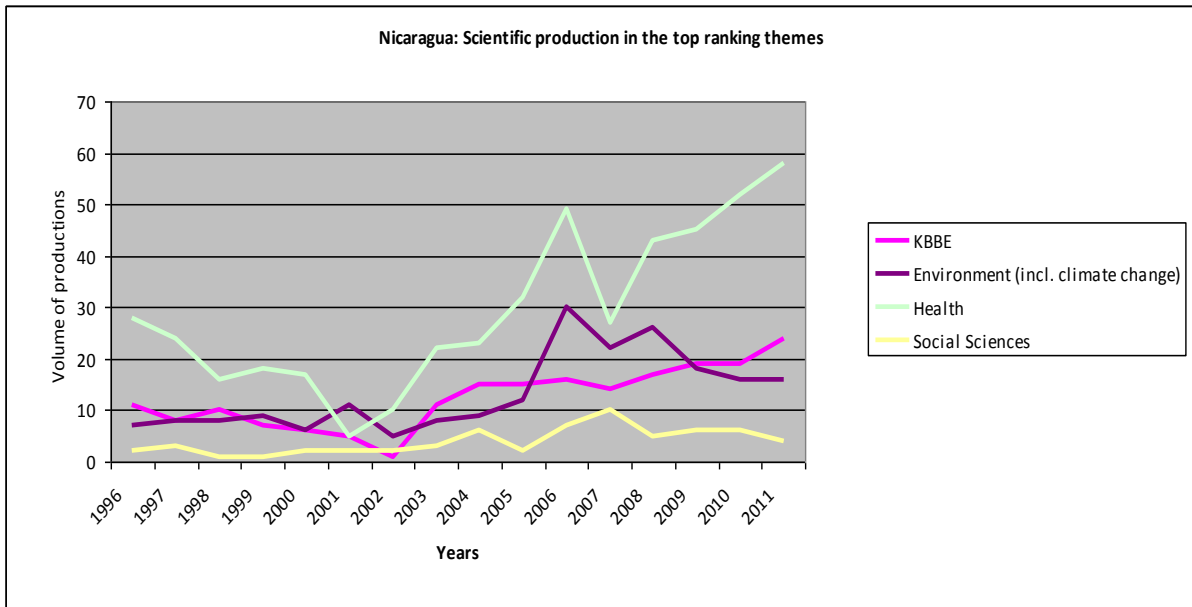
Scientific Output (1996-2011)

Documents: 818

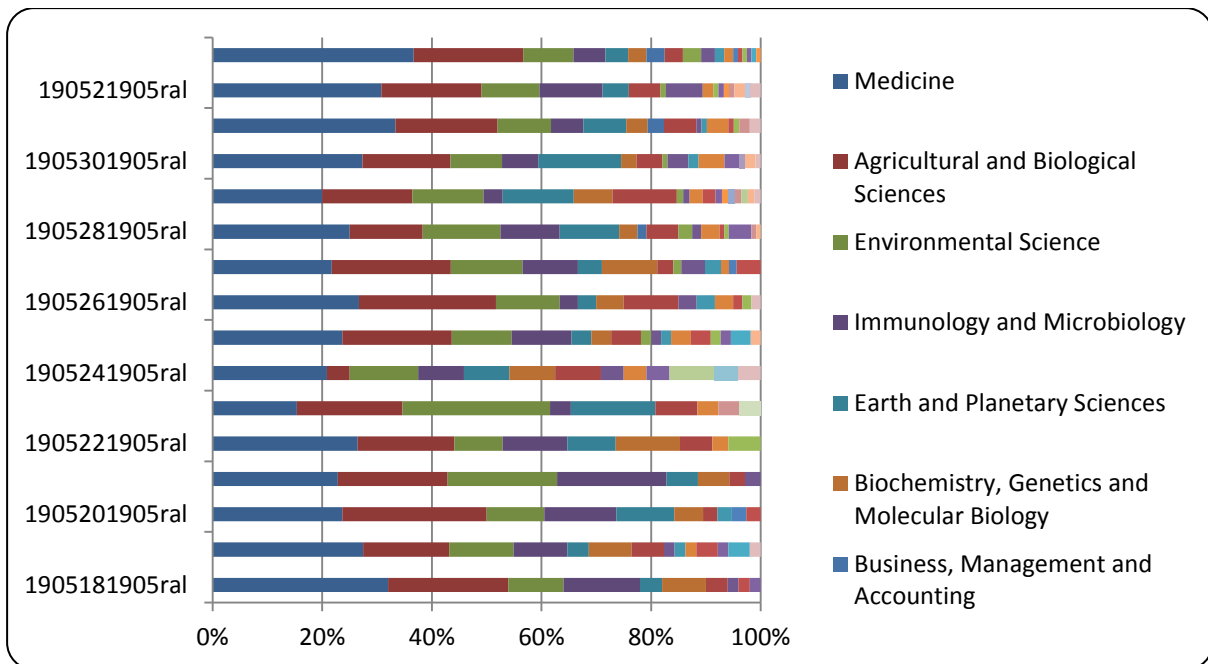
Citations: 8.438

Citations per Document: 10,32

An examination of the scientific publications per thematic area, reveals that the Honduras's strongest scientific areas are the **Medicine** (36,67% of total publications), **Agricultural & Biological Sciences** (20% of total), and **Environmental Science** and (9,17% of total).



Nicaragua: Percentage of Scientific Publications per Thematic Area
(source: SCImago Journal & Country Rank)





Nicaragua: Scientific Publications (source: SCImago Journal & Country Rank)																
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Agricultural and Biological Sciences	11	8	10	7	6	5	1	11	15	15	16	14	17	19	19	24
Arts and Humanities	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	1
Biochemistry, Genetics and Molecular Biology	4	4	2	2	4	-	2	2	3	7	4	6	3	4	-	4
Business, Management and Accounting	-	-	-	-	-	-	-	-	-	-	2	-	-	3	-	4
Chemical Engineering	1	2	1	-	-	-	-	2	1	3	1	2	-	1	-	1
Chemistry	-	1	1	-	-	-	-	1	2	2	-	-	2	1	-	2
Computer Science	-	-	-	-	-	1	-	-	-	-	1	1	-	2	1	-
Decision Sciences	-	-	-	-	-	-	2	-	-	-	-	1	-	-	-	-
Dentistry	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Earth and Planetary Sciences	2	2	4	2	3	4	2	2	2	3	13	11	16	8	5	5
Economics, Econometrics and Finance	-	-	-	-	2	-	-	1	1	-	1	-	-	1	1	1
Energy	1	1	-	-	-	-	1	1	-	-	5	1	3	-	1	1
Engineering	-	1	-	-	1	1	1	2	2	1	4	2	5	4	2	2
Environmental Science	5	6	4	7	3	7	3	6	7	9	17	11	10	10	11	11
Health Professions	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Immunology and Microbiology	7	5	5	7	4	1	2	6	2	7	13	3	7	6	12	7
Materials Science	-	2	-	-	-	-	-	2	-	-	-	-	-	-	-	1
Mathematics	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Medicine	16	14	9	8	9	4	5	13	16	15	30	17	29	34	32	44
Multidisciplinary	-	-	-	-	-	-	-	1	-	-	1	1	2	-	2	-
Neuroscience	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Nursing	-	1	-	-	-	-	1	-	1	-	-	1	1	2	2	-
Pharmacology, Toxicology and Pharmaceutics	1	1	-	1	-	-	1	1	2	3	2	1	4	1	7	3
Physics and Astronomy	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Psychology	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	1
Social Sciences	2	3	1	1	2	2	2	3	6	2	7	10	5	6	6	4
Veterinary	-	-	-	-	-	-	-	1	-	1	3	1	1	-	1	4

BELIZE



Full name: Belize

Capital: Belmopan

Official languages: English

Major religions: Roman Catholicism and Protestantism

Life expectancy: 77 years

Monetary unit: Belize dollar

Territorial extension: 22.966Km²

Population: 312.698

Population density : 13.4 habitants: /km²

GDP: 1447 Mill.US\$ (2011)

GDP per capita: 4059 US\$(2011)

GNi per capita: US\$3,690 (World Bank, 2011)

Main exports: Sugar, bananas, citrus fruits, oil, clothing, fish products, molasses, wood

Literacy rate: 70% (estimate of 1990)

Labor force total (population): 144.868

Labor force with tertiary education: 12,4% (as of 2005)

Employment to population ratio: 8,2%

National spending on R&D as % of GDP: 0.04% (2008)

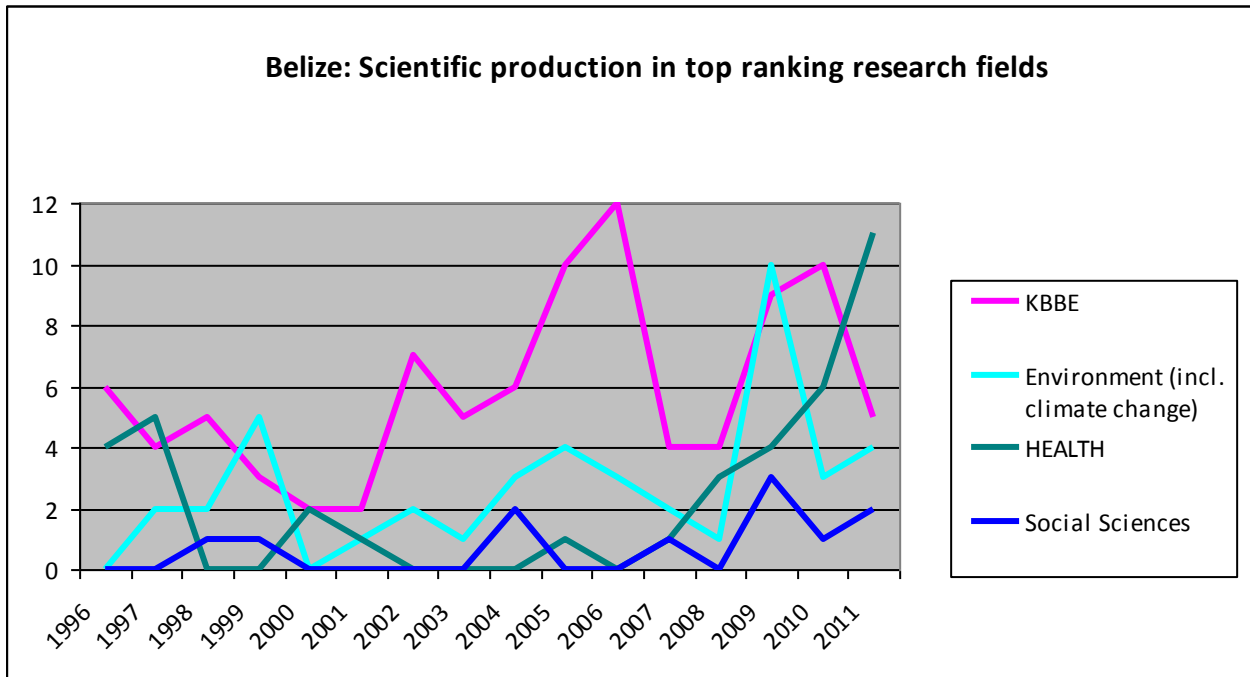
Scientific Output (1996-2011)

Documents: 199

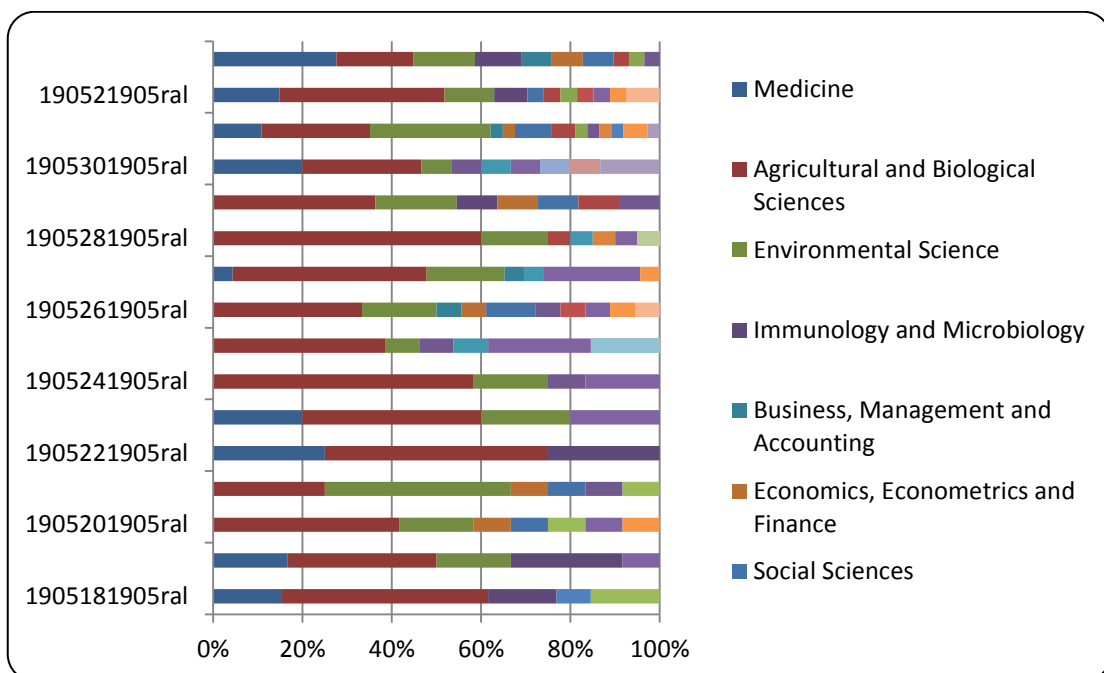
Citations: 1.946

Citations per Document: 9,78

An examination of the scientific publications per thematic area, reveals that Belize's strongest scientific areas are the **Medicine** (27,59% of total publications), **Agricultural & Biological Sciences** (17,24% of total), and **Environmental Science** and (13,79% of total).



Belize: Percentage of Scientific Publications per Thematic Area
(source: SCImago Journal & Country Rank)





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Date: 27/12/2012

Belize: Scientific Publications (source: SCImago Journal & Country Rank)																
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Agricultural and Biological Sciences	6	4	5	3	2	2	7	5	6	10	12	4	4	9	10	5
Arts and Humanities	-	-	-	-	-	-	-	-	-	-	1	1	-	2	1	1
Biochemistry, Genetics and Molecular Biology	-	-	-	-	-	-	-	1	-	1	1	-	1	-	-	-
Business, Management and Accounting	-	-	-	-	-	-	-	-	1	1	-	-	-	1	-	2
Chemical Engineering	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-
Chemistry	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Computer Science	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-
Dentistry	2	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-
Earth and Planetary Sciences	-	1	1	-	-	1	2	3	1	5	1	-	1	-	1	-
Economics, Econometrics and Finance	-	-	1	1	-	-	-	-	1	-	-	1	-	1	-	2
Energy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Engineering	-	-	1	-	-	-	-	-	1	1	-	-	-	2	1	-
Environmental Science	-	2	2	5	-	1	2	1	3	4	3	2	1	10	3	4
Health Professions	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Immunology and Microbiology	2	3	-	-	1	-	-	-	-	-	-	1	-	-	2	3
Materials Science	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1
Mathematics	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Medicine	2	2	-	-	1	1	-	-	-	1	-	-	3	4	4	8
Multidisciplinary	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Nursing	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-
Pharmacology, Toxicology and Pharmaceutics	-	-	-	1	-	-	1	1	1	-	-	1	1	1	-	1
Physics and Astronomy	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
Social Sciences	-	-	1	1	-	-	-	-	2	-	-	1	-	3	1	2
Veterinary	-	-	-	-	-	-	-	-	1	-	-	-	-	-	2	-

EL SALVADOR

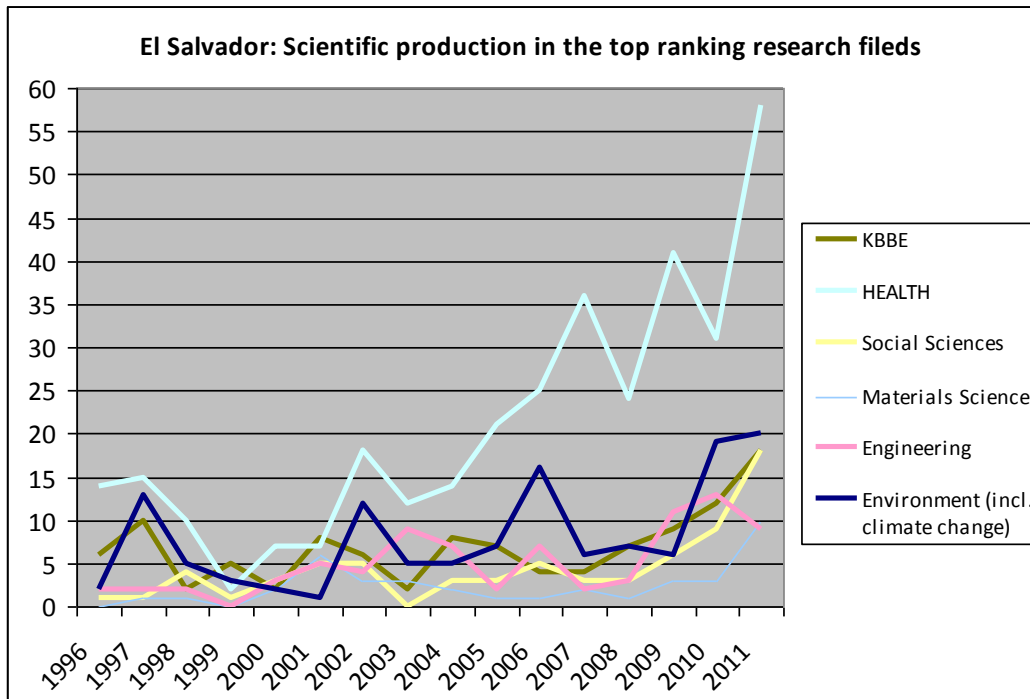


Full name: Republic of El Salvador
Capital: El Salvador
Official languages: Spanish
Major religions: Roman Catholicism and Protestantism
Life expectancy: 76 years
Monetary unit: US Dollar
Territorial extension: 21.040Km²
Population: 6.134. mill.
Population density : 341.5 habitants: /km²
GDP: \$23.05 billion (2011)
GDP per capita (2011): 7.549 US\$
GNI per capita: 3.710 US\$
Literacy rate: 84% (estimate of 2010)
Poverty rate: 42,5%
Labor force total (population): 2594719.4
National spending on R&D as % of GDP: 0.1%

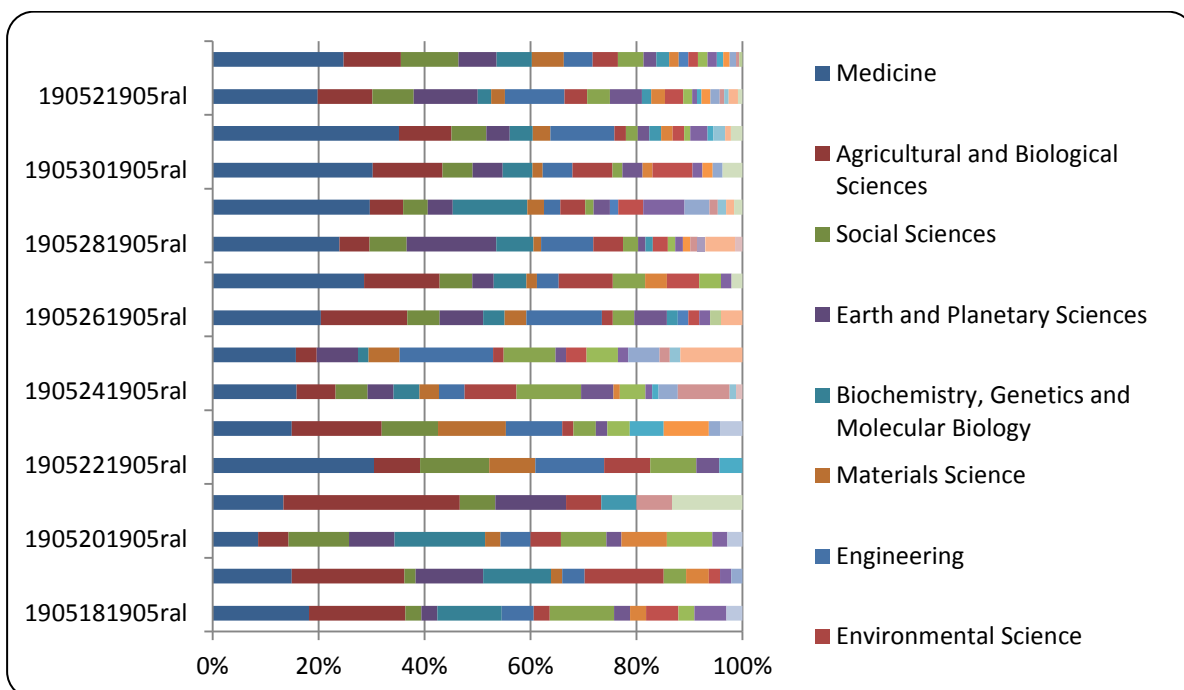
Scientific Output (1996-2011)

Documents: 768
Citations: 4.961
Citations per Document: 6,46

An examination of the scientific publications per thematic area, reveals that El Salvador's strongest scientific areas are the **Medicine** (27,59% of total publications), **Agricultural & Biological Sciences** (17,24% of total), and **Environmental Science** and (13,79% of total).



El Salvador: Percentage of Scientific Publications per Thematic Area
(source: SCImago Journal & Country Rank)





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El Salvador: Scientific Publications (source: SCImago Journal & Country Rank)																
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Agricultural and Biological Sciences	6	10	2	5	2	8	6	2	8	7	4	4	7	9	12	18
Arts and Humanities	-	-	-	-	1	3	1	-	-	-	-	-	-	1	1	2
Biochemistry, Genetics and Molecular Biology	4	6	6	-	-	-	4	1	2	3	5	9	3	4	3	11
Business, Management and Accounting	-	-	-	-	-	4	-	-	-	-	1	-	1	-	2	2
Chemical Engineering	-	1	-	-	-	1	3	3	-	-	-	3	1	-	2	2
Chemistry	1	-	1	-	1	1	5	1	3	-	1	2	2	2	7	4
Computer Science	1	2	3	-	-	-	1	-	-	2	-	-	1	2	3	3
Decision Sciences	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Dentistry	-	-	-	-	-	-	1	1	-	-	-	1	-	2	1	-
Earth and Planetary Sciences	1	6	3	2	-	-	4	4	4	2	12	3	3	4	14	12
Economics, Econometrics and Finance	-	-	-	1	-	-	8	1	-	-	1	1	-	-	1	1
Energy	-	-	-	-	-	-	-	6	2	-	4	1	-	1	2	-
Engineering	2	2	2	-	3	5	4	9	7	2	7	2	3	11	13	9
Environmental Science	1	7	2	1	2	1	8	1	1	5	4	3	4	2	5	8
Health Professions	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	3
Immunology and Microbiology	2	1	-	-	-	-	-	2	1	3	2	3	4	2	4	3
Materials Science	-	1	1	-	2	6	3	3	2	1	1	2	1	3	3	10
Mathematics	1	-	3	-	-	2	4	3	-	2	1	-	-	1	2	3
Medicine	6	7	3	2	7	7	13	8	10	14	17	19	16	32	23	41
Multidisciplinary	1	-	1	-	-	2	-	-	-	-	-	-	-	-	-	-
Neuroscience	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-
Nursing	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Pharmacology, Toxicology and Pharmaceutics	2	1	1	-	-	-	1	1	1	1	1	5	1	3	1	3
Physics and Astronomy	4	2	3	-	2	2	10	5	2	3	2	1	1	2	5	8
Psychology	-	-	-	2	-	-	-	-	-	1	-	1	2	2	1	-
Social Sciences	1	1	4	1	3	5	5	-	3	3	5	3	3	6	9	18
Veterinary	-	-	-	1	-	-	-	-	1	-	1	-	-	2	2	4



ANNEX 2: IDENTIFIED INDICATORS

Only a small fraction of the indicators used in Innovation indicators Union Scoreboard (IUS) are available for some of the CA countries.

Innovation Indicators identified for the analysis			
Main type/Indicator	Data Source	Year	Data available for:
ENABLERS			
Finance & Support			
1.3.1 R&D Expenditures (%GDP)	World Bank, 2012	2003, 2005, 2008, 2009	Costa Rica (CR), Panama (PA), Guatemala (GT), Honduras (HN)
Human Resources			
1.1.2. % population having completed tertiary education	World Bank, 2012	2010	CR, El Salvador (SV), GT, HN, Nicaragua (NI), PA
1.1.3 % youth having attained at least upper secondary education	World Bank, 2012	2010	CR, SV, GT, HN, NI, PA
International Scientific Publications	World Bank, 2012, SCOPUS	2009	CR, SV, GT, HN, NI, PA
Researchers in R&D (per million of population)	World Bank, 2012	2004, 2005, 2006	CR, PA, GT
FIRM ACTIVITIES			
Firm Investments			
2.1.1. R&D Expenditure in the business sector	Global Innovation Index, 2012		CR, SV, PA
Linkages & Entrepreneurship	Global Innovation Index, 2012		CR, SV, GT, HN, NI, PA
2.2.2. Innovative SMEs collaborating with others	Global Innovation Index, 2012		CR, SV, GT, HN, NI, PA
Business financial investment on R&D (% of Total expenditure on R&D)	Global Innovation Index, 2012		CR, PA, SV
OUTPUTS			
Economic effects			
3.2.2. Medium & high-tech product exports	World Bank, 2012	2008	PA, HN, GT, SV, NI, CR



ANNEX 3: SOURCES - LITERATURE

- Innovation Union Scoreboard (2011):
http://ec.europa.eu/enterprise/policies/innovation/files/ius-2011_en.pdf
- Global Innovation Index:
<http://www.globalinnovationindex.org/gii/main/fullreport/index.html>
- SCImago Journal & Country Rank: <http://www.scimagojr.com/>
- The World Bank: <http://data.worldbank.org/>
- Cuarto Informe Estado de la Región en el Desarrollo Humano Sostenible:
www.estadonacion.or.cr
- International Monetary Fund: <http://www.imf.org/external/data.htm#data>
- ENLACE project reports & studies: <http://www.enlace-project.eu/>
- "High-tech exports from developing countries: A symptom of technology spurts or statistical illusion?", Martin Srholec, Centre for Technology, Innovation and Culture (TIK), University of Oslo, http://www.sv.uio.no/tik/InnoWP/0512_TIKwpINNOV_Srholec.pdf
- "Climbing Up the Technology Ladder? High-Technology Exports in China and Latin America", Center for Latin American Studies, University of California, Berkeley, Kevin P. Gallagher & Roberto Porzecanski, January 2008, Paper No. 20, <http://www.ase.tufts.edu/gdae/Pubs/rp/HighTechChKG.pdf>