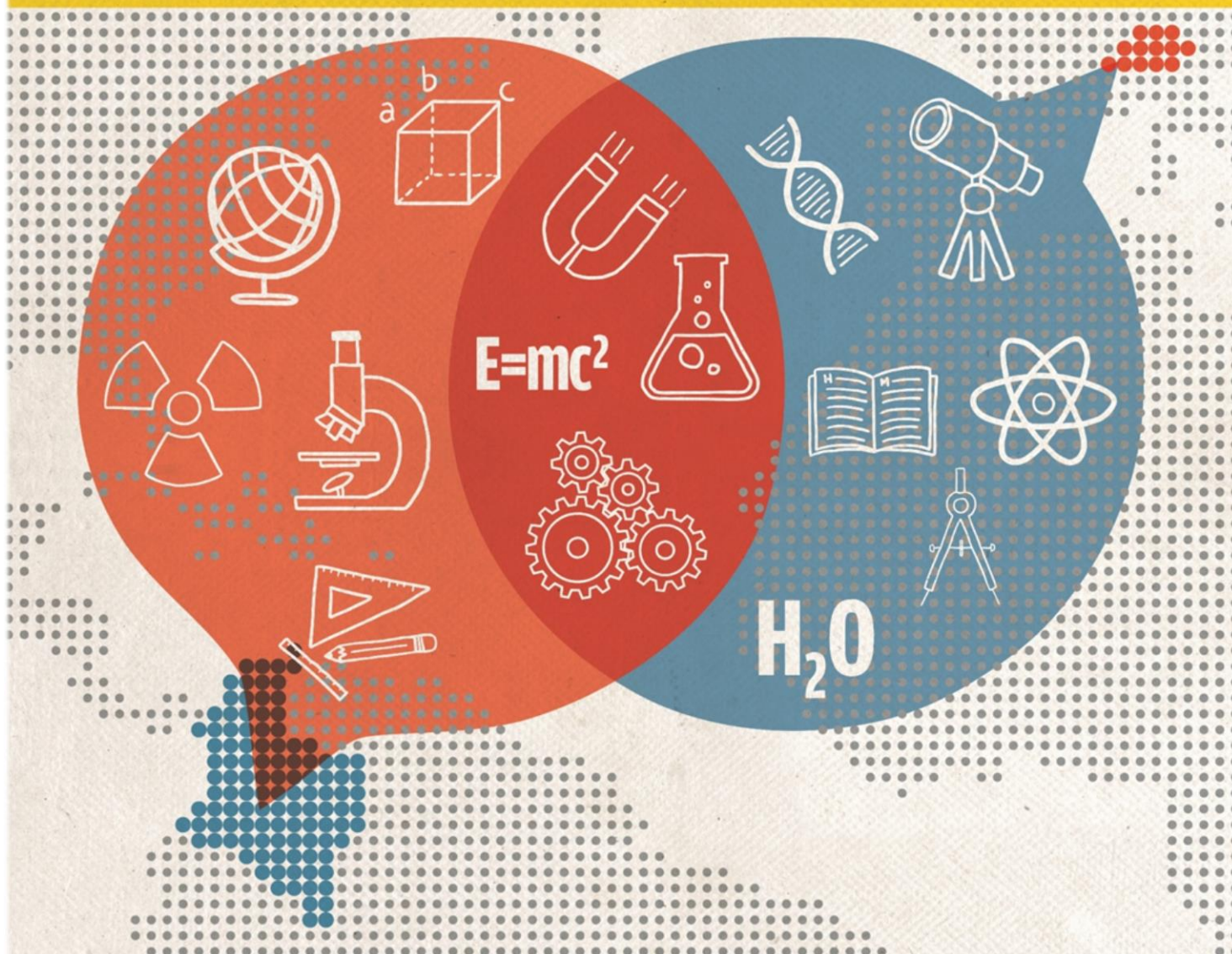


SYMPOSIUM

SCIENCE AND DEVELOPMENT, SWISS-COLOMBIAN BILATERAL RELATIONS ABOUT SCIENTIFIC EXCHANGE

November 02nd and 03rd of 2012 / Lausanne, Switzerland



ACIS

ASOCIACIÓN
COLOMBIANA DE
INVESTIGADORES
EN SUIZA



ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE



Embajada de Colombia en Suiza
Ministerio de Relaciones Exteriores



Departamento Administrativo de
Ciencia, Tecnología e Innovación
Colciencias
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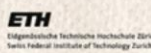
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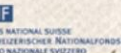
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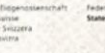
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CERN



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Materials Science & Technology



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SCIENCE AND DEVELOPMENT,
SWISS-COLOMBIAN BILATERAL
RELATIONS ABOUT SCIENTIFIC
EXCHANGE
November 2nd& 3rd, 2012 - Lausanne, Switzerland

Science and Development, Swiss-Colombian Bilateral Relations about Scientific Exchange

SYMPOSIUM PROCEEDINGS

ACIS – The Colombian Association of Researchers in Switzerland

November 2nd& 3rd, 2012

Lausanne, Switzerland





SCIENCE AND DEVELOPMENT,
SWISS-COLOMBIAN BILATERAL
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November 2nd& 3rd, 2012

Lausanne, Switzerland

Edited by

Adriana COBA

Nicolas MORA

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CONFERENCE CHAIR MESSAGE

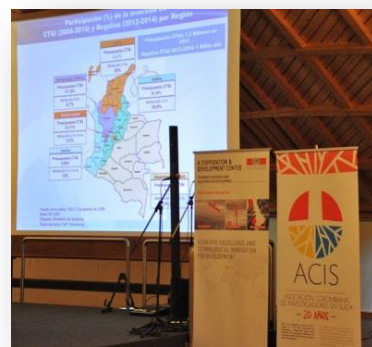
On behalf of the ACIS board it is for me an honor to write the welcome message of the ACIS symposium 2012 proceedings. I am myself a witness of the hard work of ACIS and its members for the survival and transfer of their legacy to younger generations of Colombian scientists. The last 20 years of this association definitely trace a milestone on bilateral relations between Switzerland and Colombia in Scientific matters.

Swiss-Colombian scientific relations seem to have started in 1910 as can be seen in a publication called – “*expedición Helvética*”¹ the first scientific fact-finding mission in Colombia. However, it was until 1967 that, for the first time, Colombia and Switzerland concluded an agreement on technical and scientific cooperation². Since then, many efforts have been made in this matter. For instance, one of the most significant contributions of the Colombian scientific community is undoubtedly, the foundation of the Colombian

Association of Researchers in Switzerland (ACIS- from the Spanish “Asociación Colombiana de Investigadores en Suiza”) founded as the first association of Colombian researchers in Switzerland since 1992.

The main goal of ACIS in 1992 was primarily to be a meeting point for individual efforts

between professors, research groups, and/or exchange students. Today, ACIS is a key bridge platform; a solid association which offers support in identifying main actors and factors on both sides of a scientific cooperation, and at crossing and minimizing cultural barriers in a wide range of scientific and artistic fields. ACIS is a good mixture between experienced professors and young researchers who are located at the different research institutions and universities across Switzerland and Colombia, and we are confident that you will notice it by reading these symposium proceedings.



1 Expedición Helvética, the first scientific fact-finding mission in Colombia between 1910 and 1914 by Otto Fuhrmann and Eugène Mayor, edited by Alberto Gómez Gutierrez. Editorial U. Javeriana

2 On February 1st, 1967, the first agreement for technical and scientific cooperation between the nations was signed. (See, <http://apw.cancilleria.gov.co/tratados>)



Since 1992, many different projects have taken place between both countries; some of them grew from individual projects to be a part of broad/er cooperation programs. For example, the EPFL-UNIVALLE program executed 10 projects with a budget around 6-7 million CHF, formed 25 PhD, 35 master, and 40 undergraduate students, along with numerous publications in prestigious peer-reviewed journals. Another of the examples is the HEIG-VD & BIOTEC-CIAT-CENICAÑA agreement, a key research for artificial intelligence tools with the aim of increasing the efficiency and sustainability of the Colombian agro-industry. As a natural consequence, these programs now provide a funded platform for a project-based academic exchange and have been extended to other fields. These two programs were presented in the symposium as successful examples of scientific cooperation.

In the last years the progress made in the scientific cooperation between Switzerland and Colombia is significant. The visit of high-level Swiss officials to Colombian research



institutions in 2011³, in good will of prospective academic collaborations, together with the 20th anniversary of ACIS made 2012 the perfect year for reinforcing the mission of ACIS and launching the new views and image of the association with a symposium.

This symposium contemplated several goals, i.e. to demonstrate to the scientific community and to all possible supportive instances, the richness of our academic background and the capacity of our researchers to build up significant and important collaborations with the Swiss counterparts. With this, we aimed to belong to the selected group of priority countries for Switzerland in scientific collaboration and technological exchange matters planned for 2015⁴.

It is important to notice that ACIS philosophy foresees that bilateral projects should be beneficial for both countries, in that sense, we wanted also to generate spaces for reflexion about the challenges that our researchers

3 In 2011 a commission headed by State Secretary for Education and Research, Mauro Dell'Ambrogio visited Colombia. They focused on establishing contact with potential research partners in the leading universities of the country and their research funding organizations. See <http://www.news.admin.ch/message/?lang=en&msg-id=40965>

4 The Swiss government expressed their wishes of reducing the number of priority countries and favor instead inter-agency cooperation during the symposium. In that sense, the Univalle-EPFL program, presented in one of the conferences, can be shown as a role model for this kind of agreements. This topic was debated on the round-table of this symposium.



have to face to find the right balance between top level science, and the implications of it to the development in our country. On the other hand, we wanted to encourage the direct contact between the different actors in research, namely, professors, students, post-docs, Swiss/Colombian institutions interested in cooperation, and private companies who value the scientific research in pro of human and social development.

We are certain today to have achieved these goals and far beyond, with over 100 attendees, 29 oral presentations, 19 of which were invited and 10 contributed, and three poster sessions including 22 research projects. The topics covered the broad areas of natural sciences, engineering and technologies; life sciences; social sciences; humanities; management; architecture and arts. In addition, a global discussion followed by a round table of institutional and scientific stakeholders from Colombia and Switzerland was held. This entire program was exquisitely accompanied by an exhibition of Colombian painters during the two days of the event.

The reach of the symposium was not limited to the present attendees at the Polydôme of the EPFL where the symposium took place, additionally we were connected via live-streaming with three cities in Colombia: Bogota, Medellin and Bucaramanga (through the channels of UNIANDES/UNAL, UPBM

and UIS) and which served as hubs for connection to other universities in Colombia. We are very glad about the high demand of participants from both countries, and we deeply regret the posters and talks that for time reasons were not presented. This opens the door to new opportunities, and shows the need for more spaces dedicated to scientific meetings.

Many important conclusions were drawn from this meeting, some of them are e.g. that Colombia is now prepared for one-to-one collaborations in many aspects, leaving behind the image of a receptor of technologies to become a top class world developer. This includes the outstanding quality of researchers, and the Colombian financial support for research (many of the projects presented during the symposium accounted on an extensive Colombian funding).

Another relevant aspect is that ACIS could serve as intermediary in the peer-review process of the scientific quality of some of the new projects under the National Development Plan 2010-2014. There is a significant share of royalties from mineral





and hydrocarbon extraction⁵ that will be allocated to new research projects. These funds will be directly managed by regional entities that often lack of adequate project management and academic infrastructures. Therefore, ACIS can play a significant role in the correct academic assessment of the projects through our best international collaborations and competent teams in the correspondent areas. Furthermore, topics and areas such as Latin-American studies, languages, emerging markets, and the application of biotechnological research in agriculture resulted very actual, trendy and attractive areas of research for the Swiss scientific community. In this sense ACIS wants to take the advantage of existing platforms and will start promoting these initiatives.

Finally, we would like express our warmest thanks to our Swiss-Colombian partners, sponsors, collaborators, universities, attendees, and the members of the local organizing committee and the scientific advisory board of this meeting for the outstanding quality of the symposium. Special thanks to the "consejo de sabios" of ACIS (the *council of experts* in English) and to the ACIS board for the hard work, before, during, and after the achievement of the symposium. This undoubtedly changed our own

perspectives, your efforts made of the ACIS Symposium 2012 a real success and it was a great pleasure to work with you all.

We hope then, that this meeting has opened the window to a new era in the Swiss-Colombian bilateral relations about science and technological exchange and that the shared knowledge and experiences will help to find the keys to improve our scientific cooperation.

We, the new generations of Colombians in ACIS firmly believe that this is our best way to contribute to a better world, and to a better country always guided by the ways of peace, progress, and education.

Zurich, September 02nd, 2013

Tania PEÑUELA

Chair of the 2012 ACIS Symposium⁶

⁶ Tania PEÑUELA is a researcher in Astrophysical Sciences at the ETHZ, Zurich. She holds a Master degree in Astronomy from the State University of St. Petersburg, Russia, and has worked in many prestigious universities and institutions in Europe including the Max Planck Institute for the Solar System Research and the European Southern Observatory (ESO). Some of her awarded scholarships include ICETEX and COLCIENCIAS grants. She is about to receive a PhD. degree from the Ludwig Maximilian University of Munich, and carries out her research in observational Cosmology at the ETHZ, Zurich. She was the vice-president of ACIS board during 2012 and chair of the 2012 ACIS symposium.

⁵ See talk of Pablo PATIÑO of COLCIENCIAS



2012 ACIS SYMPOSIUM COMMITTEE



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SPONSORS AND COLLABORATORS

Conference Organizer



Asociación Colombiana de Investigadores en Suiza – ACIS
(Colombian Association of Researchers in Switzerland)

www.acis.ch

The Colombian Association of Researchers in Switzerland (ACIS) is a non-profitable and multidisciplinary organization, founded in 1992, which aims at grouping Colombian researchers and highly skilled professionals, who are interested in a Swiss-Colombian scientific and technological exchange.

Main Partners

COOPERATION & DEVELOPMENT CENTER



EPFL Cooperation & Development Center-CODEV
cooperation.epfl.ch

The Cooperation & Development Center (CODEV) is attached to the EPFL Vice-Presidency for Academic Affairs. CODEV's mission is to promote and coordinate scientific cooperation activities at EPFL. EPFL thereby aims to contribute to offering a response to the most pressing world challenges by encouraging scientific partnerships, research and education that can help adapt technologies and innovations to the context of developing countries.



Libertad y Orden

Ministerio de Relaciones Exteriores
República de Colombia

Colombian Ministry of International Affairs

suiza.embajada.gov.co

The Colombian government recognizes the high academic and professional level of the Colombian diaspora in Switzerland and seeks to stimulate the cooperation projects to have a positive impact in the country. Therefore, the Colombian Embassy in Bern has been working actively with ACIS for this purpose.



Libertad y Orden

Departamento Administrativo de
Ciencia, Tecnología e Innovación
Colciencias

República de Colombia

COLCIENCIAS -Colombian Science and Technology Department

www.colciencias.gov.co

COLCIENCIAS is the Colombian Administrative Department of Science, Technology and Innovation. It promotes public policies to encourage the development in science and technology in Colombia. Among its activities are the arrangement of policies and funding to promote the production of knowledge and to build capacity for science, technology and innovation.



Collaborators



EPFL Reconfigurable Digital Systems Group (RDsg) *rdsg.epfl.ch*

The Reconfigurable Digital Systems Group of EPFL is a research team headed by Prof. Eduardo SANCHEZ dedicated to the study and development of embedded systems and reconfigurable circuits.



EPFL Advanced Oxidation Processes Group (GPao) *gpao.epfl.ch*

The Advance Oxidation Processes Group of EPFL is a research team headed by Prof. Cesar PULGARÍN dedicated to the study and development of new processes for the destruction of bio-recalcitrant compounds and pathogenic microorganisms present in water and air.



Association Colombia Vive
www.colombiavive.com

Colombia Vive is an association that participates and promotes the integration of Colombian culture and arts and Swiss culture.



Participants

From Colombia

- ICETEX, Colombian Institute for Educational credits and Studies Abroad.
- COLFUTURO, Colombian Institute for credit and grants for Education and research
- Universidad Nacional de Colombia
- Universidad del Valle

From Switzerland

- SER-The State Secretariat for Education and Research
- SNSF-Swiss National Science Foundation
- Swiss Federal Laboratories for Materials Science and Technology- EMPA
- École Polytechnique Fédérale de Lausanne- EPFL
- Eidgenössische Technische Hochschule Zürich – ETHZ
- European Organization for Nuclear Research – CERN
- Università della Svizzera Italiana
- Haute Ecole d'Ingénierie et de Gestion du Canton de Vaud- HEIG-VD
- University of St. Gallen
- University of Lausanne
- Lucerne University of Applied Sciences

From Liechtenstein

- University of Liechtenstein

From France

- Institute of Research for Development, France
- University of Strasbourg, France



2012 ACIS SYMPOSIUM AT A GLANCE

Architecture and Arts
Mini forums & roundtable
Natural Sciences, Engineering, Technology and Life Sciences

Social Sciences, Humanities and management
Structural framework of scientific cooperation between Colombia and Switzerland
Successful examples

First Day 02.11.12

09:00	Welcome	
09:15	Prof. Eduardo Sánchez – Dean of the Faculty of IC HEIG-VD <i>ACIS History and Legacy, President of ACIS 1992</i>	
09:45	Claudia Turbay Quintero – Colombian Ambassador <i>"Swiss – Colombian Scientific Cooperation Agreements"</i>	
10:00	Dr. Silvia Hostettler- Deputy Director Cooperation and Development Center – EPFL <i>Introduction, CODEV EPFL & Colombian universities</i>	
10:10	Prof. Cesar Pulgarín – Institute of Chemical Sciences and Engineering EPFL <i>Cooperation program in Environmental sciences between EPFL and Uni-valle</i>	
10:40	Dr. Félix Vega – Universidad Nacional de Colombia – EPFL <i>Application of High Power Electromagnetics to Human Safety</i>	
11:10	Coffee break	
11:25	Pablo Patiño- Director for Research Promotion- COLCIENCIAS <i>Colombian Government science and Technology Department</i>	
11:45	Olivier Brighenti – Head of the Secretariat of the Federal Commission for Scholarships for Foreign Students, SER. <i>The Swiss Government Scholarships: A Tool to reinforce International Academic Cooperation</i>	
12:05	Edith Cecilia Urrego– Finance Director ICETEX <i>The Colombian Institute for educational credit and scholarships for international Programs</i>	
12:25	Elisabeth Schenker– Scientific Officer International Cooperation SNF <i>The Swiss National Science Foundation</i>	
12:45	Lunch	
13:30	Cecilia Salgado de Huertas – Finance Director COLFUTURO <i>The Colombian private industry view</i>	
13:50	Dr. Luc Patiny– Director of Chemical Information EPFL <i>Bi-annual program Univalle –EPFL From the seed to the forest</i>	
14:10	Prof. Pedro Romero – Ludwig Center for Cancer Research UNIL <i>ACIS and Swiss – Colombian exchanges in biomedical research: opportunities and challenges</i>	
14:25	Daniel Ott - Programme Officer for Latin America, Swiss Federal Institute for Materials Science and Technology EMPA <i>Scaling up the recovery of secondary resources in Colombia</i>	
14:45	Poster session 1	
15:20	Mini forums	Group 1: Natural Sciences, Engineering and Technology
		Group 2: Life Sciences
		Group 3: Humanities and Social sciences
		Group 4: Architecture & Arts
16:20	Coffee break	
16:40	Conclusions of the Mini forums	
17:10	Round table	
18:30	Cultural activity: William Fierro & Quartet	



Second Day 03.11.12

09:00	Juan David Villegas – EPFL-UNIVALLE-UAO <i>Sustainable Biofuels for North Andean Countries</i>
09:20	Prof. Andrés Pérez – HEIG-VD (University of Applied Sciences of Western Switzerland) <i>Precision agriculture and the construction of field-crop models for tropical fruits</i>
09:40	Poster session 2
10:20	Coffee break
10:40	Miller Ramirez – Colombian Artist <i>Made in Suiza</i>
11:00	Prof. Patrick Renz – Hochschule Luzern & AID Governance Foundation <i>Management tools for self-improving impact – Partnership Proposal: Dual degree CAS and Swiss-Colombian research</i>
11:20	Prof. Yvette Sánchez – Spanish Language and Literature, University of St.Gallen <i>Water and Light</i>
11:40	Prof. John Ellis – Particle Physics Professor, CERN <i>To Higgs or not to Higgs?</i>
12:00	Prof. Pierre Frey – ENAC EPFL <i>The work of Simón Vélez, a Colombian Architect</i>
12:20	Prof. Hans Joerg Hilti – Architecture Faculty, University of Liechtenstein <i>Recent agreements between Uni-Liechtenstein y UPBM</i>
12:40	Lunch
13:40	Prof. Jean Baptiste Meyer – Institut de recherche pour le développement (IRD, Paris) <i>ACIS in perspective : 20 years of brain gain diaspora networks around the world</i>
14:00	Prof. Ian Sanders – Evolutionary Biology Department, UNIL <i>Cassava for food security and sustainability in Colombia: Biotechnological application of mycorrhizal fungi</i>
14:20	Isabella Rega – Executive director of the NewMinE Lab, Università della Svizzera italiana <i>Telecentres as Learning Places: successful cases in Colombia</i>
14:40	Prof. Alain Clappier - Strasbourg University <i>10 years of projects to study Air Quality in Bogota</i>
15:00	Prof. Nicolas Fasel – Director Biochemistry department UNIL <i>Metastatic Leishmaniasis in South America</i>
15:20	Ronnie Juraske - Institute of Environmental Engineering Ecological Systems Design ETHz <i>Life Cycle Human Exposure and Risk Assessment of Pesticide Application on Agricultural Products in Colombia</i>
15:40	Poster Session 3
16:00	Coffee break
16:20	Dr. Ricardo Chavarriaga – Defitech Foundation Chair in Non-invasive Brain-machine Interface, EPFL <i>Neuroprostheses for motor rehabilitation: State of the art and preliminary tests with patients in Cali, Colombia</i>
16:40	Prof. Jean-Claude Bolay – Director of Cooperation and Development (CODEV) –EPFL <i>Cooperation for development – The Colombian case from the Swiss perspective</i>
17:00	ACIS Conclusions & Wrap up



TECHNICAL PROGRAM

Technical program welcome

The main aim of this symposium was the holistic evaluation of the status quo of research supported and performed by the two countries. For this goal, we have divided the symposium into two main parts: The structural framework of scientific cooperation between Colombia and Switzerland, and the scientific content itself.

The first part was addressed to identify, get to know, and criticize the possible outflows of research potential due to administrative issues. This included the governmental organs involved in the development of mechanisms, the institutions for grants, and other state and private institutions committed with the exchange of knowledge through combined projects, grants and scholarships.

From the Swiss side, the major organ for education, the secretariat for education and research (SER), and from the Colombian side, the major organ for research and innovation (COLCIENCIAS) met at this event. With the participation of these institutions we aimed at evaluating directly the perspective of the governments of both countries in education matters, the level of

completeness of information to the scientific community, and the plans, channels and funding available for present and future collaborations.

Other major organs such as the Swiss National Science

Foundation (SNF) were in charge of explaining the

new trends, programs and requirements to obtain funding through the Swiss system; whereas, COLCIENCIAS and the Colombian Institute for Educational Credit and Studies Abroad (ICETEX) presented this topic from the Colombian perspective. The participation of representatives of funding institutes such as COLFUTURO presented a careful compilation of ways to access scholarships and credits for Colombian students.

Our host institution, the EPFL presented a dedicated program and balance of partnership between the countries through their Center for Cooperation and Development CODEV. Other





participant universities did it as well, along individual programs in the second part of this meeting.

Furthermore, we have organized a session of mini-forums and canalized them into a final round-table with representatives of academia, governments, universities and other institutes of research, and funding agencies to discuss more concrete points and find solutions to actual problems. Some of the problems tackled at this meeting were e.g. the identification of partners from side,

funding, training, outreach, cultural barriers, political views, and the mechanisms for the measurement of success of academic collaborations.



The second part of this meeting was entirely dedicated to the scientific projects. We have divided the wide variety of topics into four main areas, which defined the scientific line of the conference. Namely: (i) natural sciences, engineering and technologies, (ii) life sciences, (iii) social sciences, humanities and management, (iv). architecture and arts.

In these categories, interesting results obtained by several groups of most important universities of both countries, were presented and discussed. Some of

the specific topics were e.g. the application of high power electromagnetics to human safety, the recovery of secondary resources in Colombia and a sustainable ways of processing the waste, sustainable bio-fuels, precision agriculture with field crop models, biotechnological applications for food security, clinical diseases such as leishmaniasis, risk assessment of pesticide application on agricultural products, and neuro-prostheses for motor rehabilitation, among many others.

In conclusion, this part included 14 scientific talks and three poster sessions, which discussed 22 collaborating projects for a total of 36 purely scientific projects presented in the symposium.

Although the meeting covered a very broad spectrum of topics, the specific goals of identifying ways, tools and potentials for scientific collaborations, and the evaluation the status of the existent scientific collaborations between Switzerland and Colombia was successfully reached. We are confident that the governments and institutions have seen the need of this kind of meetings, and those will be introduced as a part of the regular program of both governments together with universities and other institutions.

We wish you a good reading,

The Scientific Advisory Committee
2012 ACIS Symposium



Presentations Part I – Swiss-Colombian scientific cooperation

The structural framework of scientific cooperation between Colombia and Switzerland

1) Welcome words from the founder and ACIS First President

Prof. Eduardo Sanchez, Swiss Federal Institute of Technology (EPFL), Switzerland & Haute Ecole d'Ingénierie et de Gestion du Canton de Vaud (HEIGVD), Switzerland.

2) Swiss – Colombian Scientific Cooperation Agreements

Claudia Turbay Quintero, Colombian Ambassador in Switzerland.

3) Cooperation for development – The Colombian case from the Swiss perspective

Prof. Jean-Claude Bolay, Director of Cooperation and Development (CODEV) – Swiss Federal Institute of Technology in Lausanne (EPFL), Switzerland.

4) The Colombian Government science and Technology Department (COLCIENCIAS)

Pablo Patiño, Director for Research Promotion at COLCIENCIAS, Colombia.

5) The Swiss Government Scholarships: A Tool to reinforce International Academic Cooperation

Dr. Olivier Brighenti, Head of the Secretariat of the Federal Commission for Scholarships for Foreign Students (SER), Switzerland.

6) The Swiss National Science Foundation (SNF)

Dr. Elisabeth Schenker, Scientific Officer for International Cooperation at the SNSF, Switzerland.

7) The Colombian Institute for educational credit and scholarships for international programs

Edith Cecilia Urrego, Finance Director ICETEX, Colombia.

8) The Colombian private industry view of scientific cooperation

Cecilia Salgado de Huertas, Finance Director COLFUTURO, Colombia.

9) CODEV EPFL & Colombian universities

Dr. Silvia Hostettler, Deputy Director Cooperation and Development Center – Swiss Federal Institute of Technology in Lausanne (EPFL), Switzerland.



Successful examples: the links between EPFL and Univalle

10) **Cooperation program in Environmental sciences between EPFL and Univalle**

Prof. Cesar Pulgarin, Institute of Chemical Sciences and Engineering- Swiss Federal Institute of Technology in Lausanne (EPFL), Switzerland.

11) **-Bi-annual program Univalle –EPFL: From the seed to the forest**

Dr. Luc Patiny– Director of Chemical Information – Swiss Federal Institute of Technology in Lausanne (EPFL) Switzerland.

Presentations Part II – Research projects

Natural Sciences, Engineering, and Technology

1) **Application of High Power Electromagnetics to Human Safety**

Dr. Felix Vega, National University of Colombia – Swiss Federal Institute of Technology in Lausanne (EPFL), Switzerland.

2) **Neuroprostheses for motor rehabilitation: State of the art and preliminary tests with patients in Cali, Colombia**

Dr. Ricardo Chavarriaga, Defitech Foundation Chair in non-invasive brain-machine interface- Swiss Federal Institute of Technology in Lausanne (EPFL), Switzerland.

3) **Precision agriculture and the construction of field-crop models for tropical fruits**

Prof. Andrés Pérez, University of Applied Sciences of Western Switzerland (HEIG-VD), Switzerland.

4) **To Higgs or not to Higgs?**

Prof. John Ellis, Kings College & The European Organization for Nuclear Research (CERN), Switzerland.



Life Sciences

5) **ACIS and Swiss – Colombian exchanges in the biomedical research domain: opportunities and challenges**

Prof. Pedro Romero, Ludwig Center for Cancer Research- University of Lausanne (UNIL), Switzerland.

6) **Cassava for food security and sustainability in Colombia: Biotechnological application of mycorrhizal fungi**

Prof. Ian Sanders, Evolutionary Biology Department- University of Lausanne (UNIL), Switzerland.

7) **10 years of projects to study air quality in Bogota**

Prof. Alain Clappier, Strasbourg University, France.

8) **Metastatic Leishmaniasis in South America**

Prof. Nicolas Fasel, Director Biochemistry department- University of Lausanne (UNIL), Switzerland.

9) **Life Cycle Human Exposure and Risk Assessment of Pesticide Application on Agricultural Products in Colombia**

Ronnie Juraske, Institute of Environmental Engineering Ecological Systems Design- Swiss Federal Institute of Technology in Zurich (ETHZ), Switzerland.

10) **Scaling up the recovery of secondary resources in Colombia**

Daniel Ott, Program officer for Latin America, Swiss Federal Institute for Materials Science and Technology EMPA, Switzerland.

11) **Sustainable Biofuels for North Andean Countries**

Juan David Villegas, Swiss Federal Institute of Technology in Lausanne (EPFL) - Switzerland, Universidad del Valle (Univalle) -Colombia, Universidad Autónoma de Occidente (UAO).



Social Sciences, Humanities and management

12) **Management tools for self-improving impact – Partnership Proposal: Dual degree CAS and Swiss-Colombian research**

Prof. Patrick Renz, Hochschule Luzern & AID Governance Foundation, Switzerland.

13) **Water and Light**

Prof. Yvette Sánchez, Spanish and Literature Department-University of St.Gallen, Switzerland.

14) **Telecenters as Learning Places: successful cases in Colombia**

Isabella Rega, Executive director of the NewMinE Lab-Università della Svizzera Italiana, Switzerland.

15) **ACIS in perspective: 20 years of brain gain diaspora networks around the world**

Prof. Jean Baptiste Meyer, Institut de recherche pour le développement (IRD), France.

Architecture and Arts

16) **Made in Suiza**

Miler Ramirez, Colombian Artist, Switzerland. Peripherie Arts.

17) **The work of Simón Vélez: a Colombian Architect**

Prof. Pierre Frey – ENAC, Swiss Federal Institute of Technology in Lausanne (EPFL), Switzerland.

18) **Recent agreements between Uni-Liechtenstein y UPBM**

Prof. Hans Joerg Hilti – Architecture Faculty, University of Liechtenstein.



Poster Sessions

1) Terra-i: an eye on habitat change

Prof. Andres PEREZ-URIBE, Julien REBETZ : Haute Ecole d'Ingénierie et de Gestion du Canton de Vaud (HEIGVD), Switzerland ; Louis REYMONDIN, Edward GUEVARA, Andrew JARVIS, Alejandro COCA, Karolina ARGOTE : International Center for Tropical Agriculture (CIAT), Colombia ; Jerry TOUVAL : The Nature Conservancy, United States of America; Mark MULLIGAN: King's College, United Kingdom.

2) Lowering environmental costs of oil-palm expansion in Colombia

John GARCIA-ULLOA: Swiss Federal Institute of Technology in Zurich (ETHZ) & Centre for International Forestry Research (CIFOR), Indonesia; Sean SLOAN: James Cook University, Australia & The University of Melbourne, Australia; Pablo PACHECO: Centre for International Forestry Research (CIFOR), Indonesia; Jaboury GHAZOU: Swiss Federal Institute of Technology in Zurich (ETHZ), Lian PIN KOHA: Swiss Federal Institute of Technology in Zurich (ETHZ) & National University of Singapore, Singapore.

3) An emissions inventory of air pollutants for the city of Bogotá, Colombia

Jan Philipp ROBRA, Prof. François GOLAY: Swiss Federal Institute of Technology in Lausanne (EPFL), Switzerland; Dr. Alain CLAPPIER : University of Strasbourg, France; Prof. Nestor Y. ROJAS: Universidad Nacional de Colombia.

4) Les dynamiques associatives des migrants qualifiés latino-américains et la politique migration développement des Etats

Caroline CAPLAN : Université de Montpellier, France ; Prof. Jean-Baptiste MEYER: Institut de Recherche pour le Développement (IRD), France.

5) The role of mobility and public space in urban planning and their impact on social issues

Yafiza ZORRO MALDONADO: Swiss Federal Institute of Technology in Lausanne (EPFL), Switzerland.



6) **Delignification of post-harvest residues of sugarcane using ethanol**

Yesid Fabián ZAMBRANO, Jorge Enrique LÓPEZ GALÁN: Universidad del Valle, Colombia.

7) **A sustainable production of algal biomass integrating wastewater treatment and bioenergy generation**

Cèline TERRETTAZ, Mariluz BAGNOUD-VELÁSQUEZ, Christian LUDWIG: Swiss Federal Institute of Technology in Lausanne (EPFL), Switzerland; Alejandro ACOSTA CARDENAS: Swiss Federal Institute of Technology in Lausanne (EPFL), Switzerland & Universidad de Antioquia (UdeA), Colombia.

8) **Modeling computer waste flows in the formal and the informal sector, a case study in Colombia**

Juliana LEÓN, Christian LUDWIG: Swiss Federal Institute of Technology in Lausanne (EPFL), Switzerland; Daniel OTT, Heinz BÖNI: Technology and Society Laboratory, Swiss Federal Laboratories for Materials Science and Technology (EMPA), Switzerland.

9) **Photo-Fenton Process Modified At Basic pH For Resorcinol Degradation In Water**

Jose Fernando BARONA, Norberto BENÍTEZ: Universidad del Valle, Colombia; Cesar PULGARÍN: Swiss

Federal Institute of Technology (EPFL), Switzerland.

10) **El canto como potencial figurativo en las dinámicas de transformación del conflicto**

Pilar RAMÍREZ GRÖBLI: University of St.Gallen, Switzerland.

11) **La protección de las lenguas indígenas en el derecho internacional y en Colombia**

Claudia GAFNER-ROJAS: Universidad de St.Gallen, Switzerland.

12) **Migration and development: qualitative analysis from transnational below practices of Latin-American postgraduate students in the university belong to Madrid and their contribution to the development**

Viviana Sigrid CÁRDENAS CARDONA: Universidad Autónoma de Madrid, Spain.

13) **Holocene climate variability in tropical South America : case history from a high-mountain wet zone in NW Colombia**

Paula MUÑOZ, Georges GORIN, Marcela JOJOA: University of Geneva, Switzerland; Cesar VELÁSQUEZ, Norberto PARRA: Universidad Nacional de Colombia sede Medellín, Colombia.



14) **Effects of AMF-genetic variation on Cassava (*Manihot esculenta*) phenotype**

Ivan MATEUS: University of Lausanne (UNIL), Switzerland.

15) **Light for Development: Colombia on the Focus Point**

Diana Camila URBANEK: The Institute of Photonic Sciences (ICFO), Spain.

16) **Epithelial-cell conditioned Media strongly modulates the function and differentiation of monocytes and Dendritic cells towards regulatory cells**

Carolina OBREGON, Valérie CESSON, Laurent P. NICOD: Pneumology Service, CHUV, Lausanne Switzerland.

17) **Comparative Impact of Helio-photo-Fenton Reagent and TiO₂ Photocatalysis on Bacterial Cell wall during E. coli Inactivation**

Prof. Cesar PULGARÍN, Cristina RUALES-LONFAT: Swiss Federal Institute of Technology (EPFL), Switzerland; Norberto BENÍTEZ: Universidad del Valle, Colombia.

18) **Development Of Iron-Catalyzed Low-Cost Solar Process For Drinking Water Disinfection In Rural Areas From Colombia**

Prof. Cesar PULGARÍN, Cristina RUALES-LONFAT: Swiss Federal Institute of

Technology (EPFL); José Fernando BARONA, Angélica VARÓN LÓPEZ, Norberto BENÍTEZ: Universidad del Valle, Colombia.

19) **Colombia Development of a coupled solar-biological system for elimination of organic contaminants in waste waters in rural areas from Colombia, (Biosolar-Detox)**

Prof. Cesar PULGARÍN: Swiss Federal Institute of Technology (EPFL), Switzerland; Janeth SANABRIA, Fiderman MACHUCA, Luz Edith BARBA, Norberto BENÍTEZ: Universidad del Valle, Colombia.

20) **Cooperation program in the environmental field between the Swiss federal institute of technology in Lausanne (EPFL)-Switzerland, Univalle and other Colombian institutions**

Prof. Cesar PULGARÍN: Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland.

21) **Scientific development through diaspora knowledge networks: Insights from the study of Colombian scientists in Switzerland**

Dr. Gabriela TEJADA: Cooperation and Development Center – Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland.



Split Forums

Description

Taking into account that the main goal of a Swiss-Colombian scientific program is to strengthen the scientific capacity of the involved institutions through the consolidation of research groups, hopefully of equally distributed amount of researchers from both countries and also funded by both sides of the cooperation and governments, it is very important to examine in detail the instruments that lead to the achievement of this goal. Among them, research visits, post-doctoral fellowships, Ph.D. programs, master and undergraduate studies, carried out in both countries, are perhaps the most relevant to be addressed.

The symposium attendees were invited to conform debate groups according to their professional interests into 4 groups: Natural Sciences and Engineering, Social Sciences, Life Sciences and Environment, and Architecture and Arts. Each of the groups discussed about the following topics regarding scientific cooperation, and tried to derive some relevant conclusions according to their experience in the different subjects:

a. Key Steps for a successful cooperation program:

- Identification of the partners
- Definition of realistic objectives
- Identification of financial resources and management
- Training and dissemination of information

b. Main criteria for establishing a cooperation program

Differences and similarities between Switzerland and Colombia regarding:

- Size and quality of the scientific community
- Political and financial scenario for cooperation within the North-South frame

c. Difficulties and new opportunities in cooperation

- Financial and political points of view
- Funding institutions and policies for strengthening the bilateral scientific cooperation



d. Indicators of a successful research cooperation project

- Measurement of the success of a research, how has it been measured in the past (e.g. number
-

of publications, rankings, etc...) and how it can be compared to other indicators

- What is the impact of working with a *southern* partner?

Debate group leaders and reporters

- Natural Sciences and Engineering

Leader: Prof. Eduardo SANCHEZ

Reporter: Nicolas MORA

- Social Sciences

Leader: Prof. Yvette SANCHEZ

Reporter: Adriana COBA

- Life Sciences and Environment

Leader: Prof. Cesar PULGARIN

Reporter: Juliana LEON

- Architecture and Arts

Leader: Miller RAMIREZ

Reporter: Julian SOTO

Conclusions

The debate groups discussed about some key issues to be tackled in the generation of successful cooperation programs between Switzerland and Colombia. Each of the debate groups had a leader in charge of proposing the debate questions, and moderating the participants. All the conclusions of each debate group were gathered by a reporter whom at the end of the discussions presented the conclusions to the plenary. Among the many opinions expressed during the discussions there are some highlights that could be summarized as follows:

1) Key Steps for a successful cooperation program

- Colombian scientists are not anymore unilateral-passive receptors of knowledge and technology. Colombia should not be regarded as the place where many of the foreign developments are being tested. Colombian scientific community has been demonstrating that has a potential as a key research partner, leader, and developers.
- The process should be guided by a very careful choosing of the partner that could permit the continuation of the projects once the students come back to their home-cities.
- For choosing the correct partner, research should be focused in hot-



topics that are going to be developed in Colombia (if possible) by industry and/or by the students themselves. This will avoid the fact that students won't be encouraged to come back once they finish their studies.

- Projects are often successful if both partners (in this case form Switzerland and Colombia) already knew each other before. Friendship among the partners can be useful, but more important is to find a partner with a high scientific level.
- People who completed their PhD in Europe and returning to Colombia (former members of the diaspora) can be ideal partners because their experience will enable an efficient collaboration between both teams.
- It appears that much of the funding is spent in the generation of good indicators rather than a long lasting research activity on the priority topics. The question of why are we sending students abroad should be answered by Policy making entities before spending their money.



- We must learn the efficient mechanisms to prepare calls for grants and funding. We are very bad in such topics.

2) Main criteria for creating cooperation programs and defining their objectives

- To choose priority areas, foreseeing the evolution of Colombia in 10-20 years. In Colombia we have a lack of focus in identifying the needs and in this context, it may be very difficult to compete with students and researches from other parts of the world (e.g. Chinese and Indian).
- Excellence: meaning not only good academic performance but also, punctuality, seriousness and good quality redaction of projects and results.
- Give some priority to projects that diminish the amount of administrative work.
- As we are all in competition for funding, it is important to define very well and in a clear manner the aims of the project with simple messages and phrasing.

3) New opportunities and difficulties in the Colombian-Swiss scientific cooperation

- There is an increase of opportunities for research in



Switzerland due to the lack of Swiss citizens willing to pursue Ph. D. degrees because the industry are not hiring them as they did before. These opportunities can be profited by Colombian nationals with the creation of solid partners among both countries.

- There are many funding mechanisms for cooperation projects with the South. Therefore, it is possible to obtain the financing if good projects are proposed (well defined and with good partners).
- Each country has its know-how and its own identity, and this is a strength that should be used in the generation of successful research projects.
- To geographically concentrate the Colombian research efforts in particular cities (e.g. in Lausanne) provides with better visibility, but it could be also a disadvantage in terms of the diversification of research areas that may be found in other cities of Switzerland.
- Initiatives like the 2012 ACIS Symposium are good opportunities to bring together the research



efforts happening in other cities around Switzerland.

- In Latin American countries, governments are not aware of the importance of research in the medium-term development. Therefore, the low available funding coming from national resources.
- In general, there exist asymmetries in the importance given to the research in Social Sciences. Typically, we have seen that more importance is given to natural sciences.
- In Switzerland, there exists a lack of interest in Latin American studies. There are not specific programs for Latin American studies other than the Latin-American-Swiss Center of the University of St. Gallen.
- In general, there is a lack of interest for artistic cooperation, and there are very little funding resources available for the exchange.
- There are sometimes cultural asymmetries that may slow down the cooperation process. Fortunately, this does not make any difference in the contributions that can be provided for the creation of knowledge.

4) Indicators for a successful research

- The quantitative indexes (H-index, publications) may not be



a good source of information being cooperation a very interdisciplinary and applied exercise.

- A mechanism to measure the social impact of projects based on short-term results should be defined. This mechanism may be a qualitative indicator that measures the ability of projects to be continued, or the possibility of initiating sustainable and

profitable activities from the results.

- In Colombia we do not have a publication and ranking culture and this should be improved in order to give a good visibility to the projects.
- Colombian researchers' visibility should be improved at international conferences so that the prestige is improved and the publication in top reviews could be easier.

Plenary Round Table

Description

After having debated in separate groups the key factors enabling a successful cooperation, we gathered representatives of academia, government, and funding agencies, to discuss in a round table the possible strategies to reduce asymmetries in the cooperation, to scale up the diversification of research projects between Colombia and Switzerland, and the overtaking of cultural barriers.

The round table was moderated by Prof. Yvette SANCHEZ from the University of St. Gallen and all the speakers spent some minutes talking about several topics including:

- How to underline the change of paradigm of Colombia not anymore being a passive receptor of technology to become a laboratory for a new kind of cooperation that avoids paternalism and favors symbiosis and complementarities.
- How to scale up the amount of available resources for doing cooperation between the two countries, and move forward towards making Colombia one of the priority countries for scientific cooperation for the Swiss government.



- Identify the origin of the so called asymmetries in the cooperation exercise between Switzerland and

Colombia, and find new ways to tackle them.

Speakers

- Claudia TURBAY, Colombian Ambassador in Switzerland
- Jürg BURRI, Deputy Director of the Swiss State Secretary for Education and Research
- Elisabeth SCHENKER, Scientific Officer for International Cooperation at the SNSF
- Prof. Eduardo SANCHEZ, Swiss Federal Institute of Technology (EPFL)
- Prof. Cesar PULGARIN, Swiss Federal Institute of Technology (EPFL) *
- Prof. Yvette Sánchez, Spanish and Literature Department-University of St.Gallen, Switzerland *
- Prof. Farhad RACHIDI, Swiss Federal Institute of Technology (EPFL)
- Prof. Jean Baptiste Meyer, Institut de recherche pour le développement (IRD, Paris)

* Roundtable Moderators

Conclusions

The round table started with the debate of the speakers around the key questions asked by the moderator, and was followed by the interaction of the panelists and the public.

In the first part of the debate, the representative of the Colombian government (the Ambassador) and the deputy of the Swiss State secretary for education talked about the

strategies for scaling up the number of research activities and cooperation projects in the Colombian scenario. For the Colombian Ambassador, we have forgotten the role played by private enterprises as main consumers of our capacities as researchers. The stimulation of international and local private investment for development could increase the joint efforts for the development (e.g. the pharmaceutical laboratories). In the



Swiss-Colombian relationships there are other cooperation processes having place at economical and humanitarian levels that could also lead to the creation of research opportunities.

The Swiss research landscape is open to any good effort coming from other countries. They focus their exercise through their funding agencies (i.e. SNSF, CTI, ETH) so that they have the enough resources to interact with whoever they find interesting. There are very good framework conditions already established for international cooperation, and Switzerland is providing infrastructures for international use which can bring visitors students and scientist from abroad (e.g. CERN or the supercomputers in Ticino). All these available resources create a dynamic of scientific interactions and the baseline for stronger cooperation in the future.

The scientific focus of Switzerland in South America was renewed in 2010 and they have chosen Chile and Brazil as priority countries. They have established cooperation programs with these two countries in which each side of the participants funds its own institutions. In the near future, Brazil will be the only country left as priority. The exchange with the other South-American countries like Colombia is encouraged through the inter-agency cooperation. During the

last visit of the Swiss ministry of education to Colombia, a letter of intention to strengthen cooperation was signed between both countries. COLCIENCIAS is invited to interact with the SNSF and other agencies through the usual funding calls published during the year.

A second discussion was given around the cooperation asymmetries in the daily business of the speakers. Prof. Farhad Rachidi from EPFL, who has established cooperation activities since 2007 with the National University of Colombia and Los Andes University in the frame of a humanitarian demining project, argued that there is a wrong perception of a unilateral reception of knowledge and technology. According to his experience, it is thanks to the Colombian researchers that many scientific competences of his laboratory have been created. Today his team is benefiting from two new projects with European and Swiss funding that were originated after working with the Colombian team. The role of the Cooperation and Development Center of EPFL (CODEV) has been crucial in the definition of the working and funding strategies to avoid asymmetries between the two teams.

There is sometimes skepticism about the success of cooperation projects due to cultural barriers involving time management, and administrative



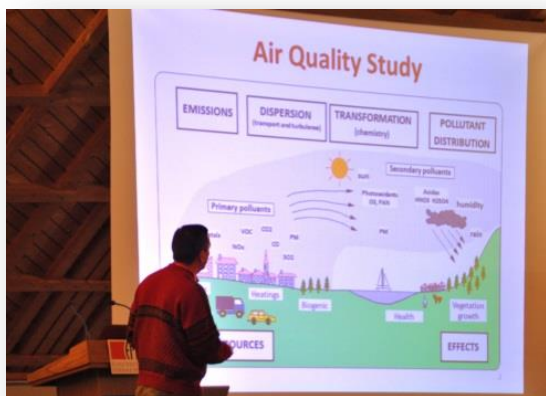
paperwork. Prof. Cesar PULGARIN believes that punctuality and order are key cultural factors determining the fruitful collaboration between both countries, and the best way to strengthen these skills is to enable team meetings and develop human relationships to be able to understand each other. Being Colombia a very westernized society, many of the cultural barriers are very easy to tackle when coming to the Swiss scenario. A good motivation and/or pressure mechanism to achieve a good timing of the projects is the funding release after reporting.

The observation of Diasporas through time has shown Prof. Meyer from the IRD (Paris) that the evolution of communication technologies provide today with plenty of ways to combine joint research efforts without succumbing in the constraints imposed by the cultural barriers. A good example that was highlighted is the existence of Knowledge Networks like the "RedC" in Colombia. These

kinds of new conformations of cooperation among individuals are likely to be less asymmetrical.

It was proposed by several members of the table that perhaps the main asymmetry for cooperation with Colombia is its local education policy. A picture of this is the fact that good elementary, high school, and university education in Colombia is becoming very expensive (and private) whereas basic education is free, and top universities are very low price in Switzerland. For Mrs. Schenker, there is still a long way to run in order to have equal research systems and qualities between Colombia and Switzerland. The only way to boost it up is to encourage Colombian government to invest in education and research. The total budget for research in Colombia is comparable to the budget of only two buildings at EPFL; on the other hand, there is a lot of investment in defense in Colombia.

Finally, during the exchange between the public and the panelists, the fact that researchers and professionals working abroad have difficulties and little motivations to come back to Colombia was addressed. For Prof. Eduardo Sanchez of EPFL, this is the effect of having researchers working in topics that are not fundamental in the Colombian science and technology agenda. As it was mentioned during the split-forums, it is very important to define priority topics to educate





researchers so that they can easily come back after their training. For COLFUTURO, these training programs should be coordinated in strong connection with Colombian universities and agencies so that professionals come back with already

established links with the local scientific community. COLCIENCIAS argued that it is still very difficult since there is practically not any research-based university or institution in Colombia.



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