PROGRAMMES

MANAGEMENT

SCIENTIFIC

SUSTAINABILITY

ENVIRONMENT

RESEARCH

COLLABORATION

MIGRATION

→ CODEV 2015
Cooperation & Development Center
http://cooperation.epfl.ch
Dear Reader,

2015 has been a year of rising global challenges, with growing concern regarding the effects of climate change, increasing conflict leading to mass migration and a more urgent analysis of the effects of unsustainable development. One question that caught our attention was whether our focus should be as much on ending extreme wealth as on ending extreme poverty.

In parallel, several groundbreaking agreements were concluded. The Sustainable Development Goals were adopted by the UN in New York on 27 September 2015, setting the development agenda for 2015-2030 and bringing together more heads of state at the UN headquarters in New York than at any time before. In Paris, the COP21 Climate Conference resulted in the adoption of the first universal, legally binding global climate agreement in history by 195 countries. In Sendai, Japan, the first major agreement for Disaster Risk Reduction was concluded.

Unquestionably, another highlight of 2015 for CODEV was an invitation to its Deputy Director, Dr. Silvia Hostettler, to give a presentation on “Technologies for Sustainable Development” at the UN in New York. The Skills & Technology Accelerating Rapid Transformation Conference Series focuses on harnessing the power of emerging technologies to help meet the Sustainable Development Goals.

In September, the International Committee of the Red Cross (ICRC) decided to join forces with EPFL in the creation of a Humanitarian Tech Hub at CODEV. This Hub aims to foster collaboration between the humanitarian sector, scientists and other stakeholders to develop technologies able to meet today’s humanitarian challenges.

Another highlight was the launch of EssentialTech program’s first spin-off, PRISTEM. PRISTEM aims to provide sustainable and universal access to high-tech, robust and inexpensive medical equipment, such as an x-ray device for developing and emerging markets. The young company has already won several awards, including the PricewaterhouseCooper “Future Trends” Prize at the Seif Awards 2015, and likewise competed in the second round of the Venture Kick Competition.

We would like to thank you for your support and look forward to our ongoing collaboration.

Dr. Silvia Hostettler
Deputy Director / Cooperation & Development Center

Prof. Jean-Claude Bolay
Director / Cooperation & Development Center
CODEV’S MISSION

To promote innovative technologies to support social, environmental and economic development in the Global South.

We implement our mission through excellence in research, education and training and through strategic partnerships.

- We help strengthen research institutions through joint research projects and education programs;
- We encourage and support researchers at EPFL in developing scientific cooperation projects, and advise the EPFL Presidency concerning cooperation with the global South;
- We create and promote innovative technologies aimed at poverty reduction and sustainable development;
- We offer courses in development engineering and sustainable development in the Global South to undergraduate and graduate students at EPFL and elsewhere.

OUR VALUES

High level education and scientific excellence are necessary prerequisites for sustainable development.

Innovation in appropriate technologies is a way to alleviate poverty in the Global South.

North-South and South-South scientific partnerships contribute to address the most pressing global challenges.
This year, CODEV organized three EssentialTalks, drawing large numbers of students, EPFL researchers and outside guests.

From viruses to public health: lessons from Ebola
The Ebola outbreak in West Africa is slowing but is not yet forgotten. The epidemic took unprecedented proportions and became a major public health crisis, not only in Africa but also in Western countries.

Our guest speakers, Prof. Laurent Kaiser, from the Geneva University Hospital, and Dr. Elhadj Ibrahima Bah, from MSF’s Centre for Ebola Treatment (Conakry, Guinea) helped the audience better understand the basic mechanisms underlying epidemics of emerging viruses by drawing on lessons from this crisis.

Ms. Anja von der Ropp, our guest speaker from the World Intellectual Property Organization (WIPO), explained the role of intellectual property and technologies for development in emerging economies. She presented main arguments for the development and use of IP systems, as well as the features of an effective IP system. She also explained the role of IP in innovation, access and technology transfer, and development using examples from the field of clean technology.

From the EPFL to Live-in Labs in India: AMRITA University Programs and Research Centers
Prof. Ramesh and Prof. Rao presented the Live-in Labs Program at AMRITA University, one of the top 200 universities in BRICS countries. AMRITA University developed the Live-in Labs Program, which focuses on a variety of areas including energy, water, healthcare, education, waste management, ICT and skill building. Many EPFL students took this opportunity to get a hands-on learning opportunity by spending anywhere from two weeks to a semester in one of the Live-in Labs in India.
Info4Dourou 2.0

Assisted irrigation for African farmers

In a context of growing pressure over water resources, North and South partners from the private and academic sectors are working together to develop an assisted irrigation system in Burkina Faso, in collaboration with local micro-irrigation farmer associations.

Technology

A robust, autonomous wireless-sensor technology adapted to extreme climatic conditions allows for automatic collection and use of agro-hydrological data via a soil-water-plant-atmosphere model. This new technology uses the mobile phone network (GPRS) to send data to a server via the Internet.

The system makes the information available to the local community using a simple technique: when the soil becomes too dry for the plants, producers receive a text message alerting them that irrigation is needed. The data is also available on the web for remote users. The technology has been tested across Burkina Faso since 2012 and has received positive critiques from growers, as it has allowed for significant water savings while increasing production.

Experiments are still underway to consolidate the data on the irrigation management system as a way of improving food security, contributing to the sustainable management of groundwater resources and adapting to climate change scenarios.

Prospects

- Adapting “Swiss made” technology to a solution tailored to the specific needs of users and designed locally for affordability.
- Creating a local company to disseminate the technology and promote its use by local actors for long-term sustainability.

Achievements

- Successful applications of the technology which allows for significant water savings (up to 20%) while increasing crop production (up to 37%).

“Together, the Swiss and Burkinabe teams successfully developed a diversified network of partners composed of local producers, technical and research institutes and public and private institutions. Such an approach is proof of co-construction, which allows for the development of a technology for better water management adapted to all stakeholders and producers in particular, in view of the urgency of modernizing family farming to meet the challenges of achieving food security and increasing revenues, innovative technologies play an important role. We posit that the hydro-meteorological stations developed as a result of the Info4Dourou2.0 project will greatly contribute to improving agriculture in Burkina Faso, notably by making irrigation more rational and efficient.”

Dominique Crivelli, Deputy Director of the Swiss Agency for Development and Cooperation (SDC) in Burkina Faso.
"The potential role of diasporas in facilitating development has attracted the attention of researchers, governments and international organizations".

A. Chikanda, J. Crush and M. Walton-Roberts, Balsillie School of International Affairs, Canada

"Migrants are active agents who transform not only the societies where they reside but impact equally the societies of their origin. They do so by exchanging their knowledge and ideas with their families and friends in these countries. In this way, they constitute an integral part of Europe’s global connection, and globalize Europe from within”.

M. Nowicka and V. Serbedzija, Humboldt Universität zu Berlin

Research on Scientific Diasporas, Migration and Development

Spotlight on the Moldovan scientific diaspora
G. Tejada was invited speaker at the “25 Years of Scientific Collaboration with Eastern Europe” workshop, organized by the SNF in Bern, on 20 January 2015. Her talk “From brain drain to brain circulation: challenges and opportunities of scientific diasporas engagement” collected evidence from our SCOPES project with the Academy of Sciences of Moldova.

Indian skilled migration and development
G. Tejada was keynote speaker at the “Potential of migration: migration from India to Germany” conference, organized by the German Federal Office for Migration in Nuremberg on 22 September 2015, with the presentation “Indian skilled migration to Germany: host country experiences and home country engagement”.

Exploring new research avenues
- Exchanges with the Laboratory of Digital Cultures and Humanities (LaDHUL) of the University of Lausanne and LIDIAP Research Institute at EPFL, aiming at initiating new research on the intersection between scientific mobility, digital technologies and diasporas’ driven development.
- Preparation of the proposal for Horizon 2020 on migration and post-migration management technology (MIGTECH) relative to skills and competences recognition and to mobility across the EU and back to local contexts. The consortium brings together researchers from Portugal, Italy, France, Lithuania, Poland and Switzerland.

Recent publications
Urban Research

Ongoing Research Projects

HAITI: “Port-au-Prince: between Urban Vulnerabilities and Growth, building a Caribbean Metropolis”. Partners: University of Paris 8, State University of Haiti and University Quisqueya Haiti (European Union funding).


Related workshops
• Paris: Seminar “Research Programs in Urban Development”
• Belgrade: Expert and Student Seminars “SPUDS – Support to Process of Urban Development in Serbia”

Conferences
Jean-Claude Bolay
• Latin Lab Program, Graduate School of Architecture, Planning and Preservation, Columbia University (New York)
• Workshop Info4Dourou (Ouagadougou)
• University of Quisqueya, Doctoral School Seminar (Port-au-Prince)

Marija Cvetinovic / Abigaïl-Laure Kern
• European Consortium for Political Research ECPR’s General Conference (Montreal)

News
EPFL doctorate Award 2015 Finalist - Fernanda Maria Lonardoni “Within the limits and opportunities of informal rental housing: Tenants and livelihood in Brazilian favelas”. Thesis directors: Prof. J.-C. Bolay, Prof. M. I. Sugai. Fernanda is now Housing Policy Advisor at UN-Habitat.

Publications

EssentialTech

The EssentialTech program combines technology development with the elaboration of innovative business models for a sustainable impact on poverty at a large scale.

2015 started with the public introduction of the world’s first radiology system prototype designed specifically for the Global South (GlobalDiagnostiX), with over 400 persons attending, this was a major milestone. As a result, EssentialTech has since launched its first spin-off company to industrialize GlobalDiagnostiX, predominantly in low- and middle-income countries. In order to spread the EssentialTech approach - and to foster improvement through critique - preparation of a MOOC on “innovation and technology development to fight poverty” is now underway.

Two new research projects have also been launched, one aiming to develop a biosafety cabinet (SafeMicroLab) and another to resolve the issue of the poor access to drinking water in primary healthcare (H2O Hospitals).

The program’s success has prompted EPFL to designate it a ‘school project’ for the 2017-2020 period, which will give it additional visibility and traction.

GlobalDiagnostiX

Radiology is essential for diagnosing important health problems such as tuberculosis and trauma injuries. The goal of the project is to make radiology available in primary healthcare structures worldwide. The project aims to develop a system adapted to the context of low income countries.

EssentialTech is heading this complex project, which involves over 40 researchers in Switzerland and Africa. After four years of research and development, the first feasibility prototype was presented to the public. This important achievement has received attention in renowned national and international media.

In December 2015, PRISTEM SA, EssentialTech’s first spin-off, was launched. The company will use its innovative business model for the sustainable and large-scale deployment of its radiology system. Ongoing research continues to improve this technology. In particular, solutions allowing for remote diagnosis (teleradiology) will be explored.

“Speaking as a health professional, I am deeply concerned that many health care facilities still lack access to even basic water, sanitation and hand-washing facilities, and I have committed WHO to support partners to overcome this problem.”

Margaret Chan, WHO Director General
H2Ospital
In low and middle-income countries, 1/3 of all healthcare facilities lack a safe water source (WHO/UNICEF). Water-borne diseases and hygiene conditions are particularly problematic given the fact that patients are already ill, fragile and vulnerable.

The goal of the project is to design a water treatment “kit” and deployment model that incorporates the concept of sustainable maintenance but is tailored to the needs of district hospitals. This is a collaborative project between EPFL, the Asian Center for Water Research in Vietnam, EAWAG and EssentialMed Foundation.

Through improved access to safe water, the project will reduce water-borne diseases and hospital-acquired infections, as well as provide access to a better quality of care.

SmartPPE
The recent Ebola outbreak showed how essential it is for healthcare workers to have access to appropriate personal protection equipment (PPE), to prevent the spread of diseases. Unfortunately, the existing PPE is difficult to use, which can lead to an increased risk of self-infection. The equipment is also poorly ventilated (which is particularly important in tropical countries), and is logistically restrictive due to the fact it can only be used once, which is problematic both in terms of procurement and disposal.

EPFL is partnering with the University of Geneva, Geneva University Hospitals and Médecins Sans Frontières to develop appropriate PPE against deadly emerging viruses. Its design, which will be adapted to field work by incorporating innovative technology for improved efficiency, will allow health systems to be better prepared for future outbreaks.

Detailed specifications for the equipment were established based on input from the various stakeholders in the fields of virology, emergency action, public health, engineering and industry. An initial prototype was built to address the design issues that hamper the existing equipment.
RESEARCH PROJECTS

GlobalNeoNat
Neonatal mortality is still unacceptably high in the Global South: almost 3 million newborns die each year – many due to hypothermia. This project aims to completely revolutionize the infant incubator, taking into account the multifaceted dimensions of context. A thermal energy storage system was developed to palliate electricity shortages. This innovative, highly durable, low-cost solution does not require bulky, disposable batteries or additional electronics. Brought to Cameroon in 2015 for integration with a local incubator prototype, this project strengthens the collaboration between Swiss and Cameroonian students and researchers.

CURES
A stable and reliable electrical supply is still not universally accessible in the Global South. The Energy for Healthcare Center (CURES), a joint research lab, was inaugurated in Yaoundé, Cameroon in early 2013. 2015 was an important transitional year for CURES, as its management became 100% local, with the departure of the former EssentialTech expatriate. In R&D, two Cameroonian students and two Malagasy PhD candidates conducted 5 and 6 month internships respectively. A new project was launched with the Distributed Electrical Systems Laboratory at EPFL to develop a simulation tool for energy management in hospitals. CURES has perfected its tools for auditing, analyzing and optimizing electrical networks, and is now successfully using them to optimize the electrical networks of two district hospitals in Cameroon. CURES also organized a training workshop on power quality, electrical safety and energy efficiency, which was attended by 25 participants from various African countries.

SafeMicroLab
SafeMicroLab is a new project designed to develop a mobile, highly biosecure (P4) diagnostic laboratory that can safely handle viral, bacterial and parasitological pathogens, as well carry out various biological tests. The urgent need for such equipment was highlighted by the unprecedented number of infections and deaths among healthcare workers during the recent Ebola epidemic due to lack of safe procedures and equipment for handling dangerous pathogens. User needs and product features have been closely investigated to ascertain that the Lab will be effective in environments with high temperatures, humidity, dust and irregular power supply. The project plan and budget were established as far as a final prototype. An affordable, robust, biosecure cabinet like the one proposed here is critical for strengthening healthcare systems in vulnerable countries.

Acknowledgements
EssentialTech wishes to thank all its partners, whose collaboration was essential to the progress made to date. EssentialTech is also very grateful to its sponsors: the Symphasis Foundation, the Commission des Affaires Humanitaires of the HUG, the Dragon Bleu Foundation and other sponsors who wish to remain anonymous.

“The infections and deaths of healthcare workers have three major consequences. First, they diminish one of the most important assets for response to any outbreak. Second, they can lead to the closure of hospitals and isolation wards, especially when staff refuse to come to work. Third, they drive fear, already high, to new extremes. The general public is asking: if well-trained doctors and nurses are getting infected, what hope is there for us?”

Dr. Margaret Chan, Director-General of WHO, Briefing to the UN on the Ebola Outbreak, Geneva, Switzerland, 12 August 2014.
Humanitarian Tech Hub

An innovative new partnership between the International Committee of the Red Cross (ICRC) and EPFL led to the launch of the Humanitarian Tech Hub in 2015. The Hub, based at CODEV’s EssentialTech Program, will bring together humanitarian actors, researchers and other players interested in mobilizing cutting-edge research to address today’s humanitarian challenges.

The Hub aims to develop and deploy innovative and appropriate solutions for humanitarian action. The objectives are to:

• Launch and facilitate joint research projects to provide comprehensive, tailored solutions for technical challenges in humanitarian work
• Mobilize EPFL community expertise to support humanitarian operations
• Promote the research and development of innovation useful to humanitarian action
• Share knowledge for the benefit of humanitarian action

As the name “hub” indicates, the program aims to foster interaction between experts from a variety of disciplines and regions, to ensure that the solutions developed are effective, scientifically valid and appropriate to the reality in the field.

In 2015, a project for developing an advanced orthopedic foot after amputations and for monitoring of water resources via mobile phone (GPRS) network have been initiated by the hub.

“Our collaboration with EPFL reflects our ambition to respond appropriately and effectively to the evolution of humanitarian needs. It is through innovative approaches, working together, we can better assist the most vulnerable.”

Pascal Hundt Head of the Assistance Division, ICRC
UNESCO Chair in Technologies for Development

From Innovation to Social Impact

CODEV has been host to the UNESCO Chair in Technologies for Development at EPFL since 2007.

The UNESCO Chair functions as an international networking platform, building bridges between disciplines and sectors.

The Chair, in collaboration with partners in emerging and developing countries, creates and promotes innovative technologies aimed at poverty reduction and sustainable development.

Research and Education

The Chair fosters multidisciplinary research and education in four priority research fields:

- Technologies for sustainable habitat and cities
- Information and communication technologies for development
- Science and technology for disaster risk reduction
- Technologies for sustainable access to energy

Flagship Event

We hope to see you on campus at our 4th International Conference on Technologies for Development, 2-4 May 2016, at the Swiss Tech Convention Centre! This unique multidisciplinary platform for technological innovation brings together over 400 participants from 60 countries.

Tech4Dev 2016 provides an opportunity to:

- Promote programs and approaches for inclusive social and economic development in the Global South
- Reinforce collaboration among key stakeholders (academics, entrepreneurs, innovators, field practitioners, policy makers and private sector professionals) for a holistic approach to technology development
- Build capacity among students to engage in multidisciplinary problem-solving for social impact

The focus of Tech4Dev 2016 is “From Innovation to Social Impact”.

Publications


UNESCO CHAIR

“Your commitment undoubtedly contributes to strengthening collaboration between stakeholders from different horizons, and enables an unprecedented multidisciplinary approach to technological innovation to promote inclusive and economic development in the Global South. It also provides positive visibility for UNESCO, for which we are very grateful.”

Nicolas Mathieu, Secretary General, Swiss Commission for UNESCO
Train engineers to become facilitators of sustainable development

As UNESCO Chair in Technologies for Development, CODEV aspires to develop formal academic and training courses relative to technologies for development. CODEV strongly believes in offering an interdisciplinary, project-based curriculum with courses designed to meet the needs of EPFL engineers, researchers and professionals from Switzerland and abroad. These courses strive to strengthen the capacity to develop technologies that are appropriate, affordable, robust and - most importantly - that contribute to sustainable development.

2015 was a remarkable year for CODEV’s Education Program. CODEV set the stage to significantly expand its Education Program to include its new flagship Minor, Development Engineering in the Global South, as well as two Massive Open Online Courses (MOOCs), Science and Technology for Disaster Risk Reduction and Innovation and Technology Development for Poverty Reduction.

New Minor in Development Engineering in the Global South!
This Minor, which is presented by CODEV in collaboration with the Environmental Engineering Section (ENAC-SIE), is the first of its kind to be offered in Europe. Based on the experience of the University of California, Berkeley, the Minor in Development Engineering in the Global South aims to train EPFL engineers to resolve global challenges by teaching them how to work efficiently and develop solutions in complex economic, social and environmental contexts. As a multidisciplinary problem-solving program with field immersion in the Global South, the Minor includes two key courses, the Masters Level Course in Development Engineering and the Master Level Project in Development Engineering.

First edition: September 2016!

Our Massive Open Online Courses (MOOCs)
Developed to extend beyond EPFL to reach the larger community, these MOOCs aim to familiarize participants with existing and emerging science and technology for sustainable development.

“We are convinced that this new Minor in Development Engineering will be a cornerstone of the portfolio of courses offered to EPFL engineers interested in the Global South.”

Comité Ingénieurs du Monde, 09.11.2015

“Development engineering is a new interdisciplinary field that we define as creating solutions that improve human development in low-resource settings at a scale for large positive impact.”

Indo-Swiss Collaboration in Biotechnology (ISCB)

ISCB is a longstanding bilateral research and development programme jointly funded and steered by the Department of Biotechnology (DBT), an Indian government department under the Ministry of Science and Technology and the Swiss Agency for Development and Cooperation (SDC). The overall goal of ISCB is to help ensure food security for small and marginal farmers in India. ISCB strives to develop and validate innovative biotechnological products and processes to support sustainable and climate-resilient agriculture.

In this, Phase IV of the ISCB programme (Jan 2013 – Dec 2016), four networks, each consisting of biotechnologists, plant breeders and socio-economists, are funded to explore pest resistance, yield improvement and climate-resistance for three crops (cassava, finger millet, pigeon pea) and to maximize the use of bio-fertilizer:

- BIOFI Network: Bio-fertilization and “bio-irrigation” for sustainable mixed cropping of pigeon pea and finger millet (launched in 2014).

In a two-day ISCB Methodology Workshop in 2015, the socioeconomic partners of the four networks discussed the socioeconomic challenges within and between the networks that are driven by biotechnology.

The participants identified synergies, discussed their experience with different methodologies and developed initial approaches.

“The collaborative effort of a multidisciplinary team consisting of biotechnologists, plant breeders and socioeconomists leads to mutual benefit and ultimately helps to effectively solve the problem faced by farmers. Working in this network project really motivates me.”

An Indo-Swiss Cassava Network member’s response in a network survey, Sept. 2015
Indo-Swiss Joint Research Programme (ISJRP) and Brazilian-Swiss Joint Research Programme (BSJRP)

Academia-Industry Training (AIT) – Brazil and India

The AIT programme is designed to enhance the entrepreneurial knowledge and skills of young Brazilian, Indian and Swiss researchers, improve the business case for their applied research, and facilitate partnerships with the industry and/or the creation of their own start-ups.

After two training camps (one in India and one in Brazil), a Swiss AIT camp was organized in 2015, as part of the first AIT cycle. The camp, co-organized with venturelab, swissnex Brazil and swissnex India and designed to promote entrepreneurship and tech transfer, had over 20 participants from Brazil, India and Switzerland. Three participants were awarded the AIT Innovation Grant.

In the third quarter of 2015, the 2nd cycle of AIT was launched. A business case study and a one-week training session in Brazil were organized in collaboration with venturelab, swissnex Brazil and swissnex India.

Flash Research Programme – Brazil and India

The FLASH Research Programme is a funding mechanism that allows researchers to react to exceptional events (environmental, political or societal) in real time by setting up joint research projects. It aims at strengthening cooperation between Swiss scientists and their Indian and Brazilian partners by supporting research based on rare information that would be impossible to gather under normal circumstances. A call for projects was launched in 2015. Ten projects received grants; seven in collaboration with Indian scientists and three in collaboration with Brazilian scientists.

Seed Money Grants – Brazil

Seed Money grants seek to promote research cooperation between Switzerland and Brazil by encouraging new scientific partnerships in areas of mutual interest. A call for projects for research activities and workshops in all scientific disciplines was launched in 2015. A total of 14 projects received grants – seven research projects and seven workshop projects.

Indo-Swiss Joint Research Programme (ISJRP)

For its 10th anniversary, a seminar organized by the ISJRP aimed to take stock of cooperation initiatives in the fields of science and technology. Different funding instruments were presented, and researchers likewise presented their grant-funded projects and discussed their experiences with participants.

“AIT was a great opportunity to validate our business model and product prototypes in a different and more diverse market than Switzerland. The camp allowed us to strengthen our market and business knowledge and find potential partners and investors.”

An AIT 2014-15 participant
Exploratory Mandate for Latin America and Vietnam

Latin America
The exploratory mandate for Latin America aims at expanding bilateral cooperation through new strategic partnerships with Argentina, Chile, Colombia, Mexico and Peru.

A call for Seed Money grants designed to initiate and consolidate research collaboration was launched in 2015. A total of 119 proposals from 25 institutions around Switzerland were received; 28 proposals were selected.

As part of the effort to develop partnerships between universities, a visit from a scientific delegation from the Universidad Nacional de San Martin (UNSAM) from Argentina was organized.

Vietnam
The exploratory mandate for Vietnam aims at expanding bilateral cooperation through new strategic partnerships. A call for Seed Money grants for projects with selected Asian countries was launched in 2015 in collaboration with ETHZ. Of the 61 proposals received, 20 projects have been accepted, three of which are health-oriented projects with partners in Vietnam.

“The workshop was a great success, opening new perspectives for all participants and enhancing collaboration projects between universities in Vietnam and Switzerland. Knowledge and experience sharing will continue and common research projects are planned”.

Dr. Ha-Vinh Leuchter, UNIGE, recipient of Vietnam Seed Money Grant 2014-15
In 2015, a number of EPFL and Univalle students had the opportunity to earn research experience in Colombia and Switzerland respectively. For this year’s report, we thought it would be interesting to hear what one exchange student had to say about his experience:

**Cooperation with Universidad del Valle - Colombia**

**Internship in Mechanical Engineering at EPFL**

“My name is Gustavo A. Orozco, I am a master student in Mechanical Engineering at Universidad del Valle. I have been working at the Biomechanics research group from Univalle led by Prof. José Jaime García. The research group has worked in topics related with orthopedics and tissue engineering, particularly developing external fixators to enhanced treatment of bone fractures.

Through the EPFL-Univalle collaboration, I arrived on the 2nd of January in Lausanne, Switzerland, to work on a computational model of total knee replacement (TKR) to replicate the chair rising movement. This project, led by Professors Dominique Pioletti and Alexandre Terrier from the Laboratory of Biomechanical Orthopedics from EPFL, aims to predict strain state of the patellar bone after TKR. The numerical modeling may help in understanding and preventing such complications in each specific patient. I consider this project as a great opportunity to create a stronger cooperative relationship between the two research groups to work in problems that enhance the life quality of the Latin-American people. In order to take full advantage of my stay, I started to work as soon as I arrived in Lausanne. The first week, I was dedicated to get familiar with the numerical model details, understanding the kinematics of the movement, and search clinical information to include into the computational model. Also, I could meet the research group, they are friendly and helpful people, I felt very welcomed. It is a multicultural group, where there are people from Switzerland, France, Germany, Iran, Russia, United States, and China.

The last weekend, I went to the city center to know the typical places and walking around the Leman Lake. I could see the reflection of the mountains on the water. It was a really wonderful view.

It has been almost one month and a half in Lausanne. In general, I have advanced very well in the project tasks. Perhaps, I have identified the kinematics during this movement to include in the numerical model, based on in-vivo literature of clinical studies. The idea is calibrate the model with experimental curves and estimate properly the forces in the components of the implant and the patella strain to give recommendations to improve the surgeries and possibly reduce complications after clinical intervention.

It has been two months since I arrived in Lausanne. I have incorporated the kinematics of chair rising movement into the model to establish the mechanical response of the patella. Now, the next is including a real variation of the load ratios of the knee muscles and determine the relevance on biomechanical response of the patella configuration.

Last week I went to Bern, the capital of Switzerland. It is a beautiful city located in the north of the country. I visited the old city and ‘The Einstein’s museum’, where there are permanent exhibition about how Albert Einstein developed the theory of the relativity. Also, I have had the opportunity to visit ‘The Zytglogge clock tower’, a special place which is a UNESCO World Heritage Site.”

Seed Money Programme

Seed Money projects impacting local development in the Global South

A new call for Seed Money projects in 2015 gave EPFL researchers the opportunity to establish and/or strengthen partnerships with researchers from the Global South. Funding in the amount of 94,500 CHF was granted to the 8 projects selected. The grants enabled researchers to explore new areas of investigation and geographic regions, testing potential long-term partnerships for a one-year period. The projects were carried out in various regions in Africa (Ethiopia and Namibia), Asia (India and Vietnam) and Latin America (Chile, Colombia, Mexico and Venezuela), and promoted innovative methods and technology applications to address local development challenges.

Since 2007, our Seed Money Program has funded 81 projects by EPFL researchers, with partners in more than 35 countries in Africa, Asia, Latin America and Eastern Europe, in the amount of 815,912 CHF.

“Seed Money projects funded in 2015”

- “Phylogeny and drug resistance of Mycobacterium leprae in Ethiopia”, by S. COLE, Cole Lab-Chair of Microbial Pathogenesis, SV (http://cole-lab.epfl.ch/)
- “Antibiotics in sediments and antibiotic resistance genes in the intensive shrimp's farms in Southern Vietnam”, by LF. DE ALENCASTRO, Central Environmental Laboratory, ENAC (http://gr-cel.epfl.ch/)
- “A multigenerational framework to study urban awareness through mobile sensing and collaborative action”, by D. GATICA-PEREZ, IDIAP Research Institute, STI (http://idiap.epfl.ch/ - http://www.idiap.ch/project/sensecityvity/)
- “Near real-time ultra-high-resolution imaging from unmanned aerial vehicles for sustainable land use management and biodiversity conservation in semi-arid savanna under regional and global change”, by S. JOOST, Laboratory of Geographic Information Systems, ENAC (http://lasig.epfl.ch/)
- “Campus-level Smart Grid demonstration project at Austral University”, by M. PAOLONE, Distributed Electrical Systems Laboratory, STI (http://desl-pwrs.epfl.ch/)
- “Vertical slums/versatile cities: recherche interdisciplinaire sur l’urbanisme hybride et la fabrication de la ville contemporaine - Contre-enquête sur la Torre David, Caracas”, by Y. PEDRAZZINI, Urban Sociology Laboratory, ENAC (http://lasur.epfl.ch/)
- “Use of high-power pulsed microwave sources for clearance of improvised explosive devices”, F. RACHIDI, Electromagnetic Compatibility Laboratory, STI (http://emc.epfl.ch/)
- “Technology-enabled innovative business models for participatory irrigation management in Uttar Pradesh”, by A. WEGMANN, Laboratory for Systemic Modeling, IC (http://lams.epfl.ch/)

“The seed money helped us address the problem of environmental pollution from the antibiotics used in ‘shrimp farms’ in Vietnam. We plan to continue research on the construction of wetland treatment of antibiotics and antibiotic resistance genes generated by intensive shrimp farming.”

Dr. Luiz Felipe De Alencastro
The Network of Excellence in Engineering Sciences of the French-speaking Community (RESCIF) was created in 2010. It establishes innovative, targeted and sustainable partnerships among 15 technological universities in Africa, the Americas, Asia, Europe and the Middle East while addressing key issues in emerging and developing countries. CODEV, which is responsible for managing the network, leads this project for EPFL.

The main objectives of RESCIF are:

- **Promoting research** that will be useful to the development of emerging countries, specifically in the fields of water, energy, health, nutrition and food security, urban issues and entrepreneurship;
- **Encouraging the training** of young researchers from emerging institutions in cutting-edge technologies;
- **Implementing an innovative cooperation system** within this North-South network.

**Main activities in 2015:**

- Ongoing development of the two joint laboratories within the network:
  - CARE: Centre Asiatique de Recherche sur l’Eau (Asian Centre for Water Research) in Ho Chi Minh City, Vietnam;
  - CURES: Centre Universitaire de Recherche sur l’Energie pour la Santé (Centre for Research on Energy for Health) in Yaoundé, Cameroon
- Expanding of the Massive Open Online Courses program, in which EPFL is highly involved for Africa: using existing MOOCs in partners’ education programs; collaborative MOOCs: five launched, eight forthcoming; training of more than 50 African partners in the creation and use of MOOCs.
- Different projects with Haiti to boost research on urban issues;
- RESCIF meetings held in Beirut and Montreal.
- Organization of a researcher-led seminar on energy at EPFL.
- Growth of Etu-RESCIF’s traineeship program (RESCIF’s student network)

“My courses at the polytechnic level have greatly improved since I became interested in MOOCs.”

Prof. Paul Salomon Ngoe Ekam, ENSP Yaoundé
Ingénieurs du Monde (IdM)

2015 marked the beginning of a new era for Ingénieurs du Monde! A brand new committee with brilliant ideas about how to raise awareness regarding challenges in the Global South has been elected. We increasingly use social media and started a series of short interviews on the EPFL campus on current issues compiled in fun videos. Also, EPFL students who received an IdM grant, now have the possibility to make a short video on their experience.

We have also started collaborating with Engineers without Borders to share their contact network. Finally, we recently revamped our website giving more visibility to our internship platform.

Our members went abroad in order to form new partnerships with different NGOs. IdM president, Justine Gay-des-Combes, traveled to Madagascar to organize a new project whereby Ingénieurs du Monde will dig wells in two villages. In parallel, IdM vice-president Sashidar Jonnalagedda went to Cameroon for an internship in the area of hospital electrification. Finally, Paul Kablan-Huberson, IdM event manager, went to the Ivory Coast in search of new contacts there.

Ingénieurs du Monde is proud of the achievements of this past year! With the expanded scope of our activities, we hope that many new members will join us in 2016. Please feel free to stop by our office at EPFL anytime for a cup of coffee!

“Participating in various Red Cross projects allowed me to discover Togo, meet some great people and understand the rigorous organization of this NGO. After nearly three months of immersion in Togolese daily life, I learned a lot about this culture. This internship taught me a lot, from both a technical and cultural point of view.”

A student who went to Togo with an internship grant from Ingénieurs du Monde
“I am delighted and honored to contribute to the Advisory Board of the Minor in Development Engineering in the Global South since ABB’s commitment to innovation and tech young talent is a big priority for us. We employ more than 8,500 researchers and developers around the world and invest around $1.5 billion in R&D every year.”
Adrian Timbus, Technology and Solutions Manager, Smart Grids and Wind Power at ABB. 11.11.2015

Pristem - the first spin-off of CODEV’s EssentialTech program launched
Pristem aims to provide sustainable and universal access to essential medical technologies desperately needed in developing countries. The company, founded in December 2015, tackles global health problems with a unique approach that combines Swiss quality and innovation to provide high-tech, robust, inexpensive medical equipment. The young company has already won several awards, including the PricewaterhouseCooper “Future Trends” Prize at the Seif Awards 2015, and likewise competed in the second round of the Venture Kick Competition.

Entrepreneurship training for 18 young scientists in Brazil
Based on an EPFL Leading House initiative “Academia Industry Training (AIT)”, swissnex Brazil welcomed 10 Swiss and eight Brazilian researchers to Rio de Janeiro to offer them an overview of entrepreneurship in general and opportunities in Brazil in particular.

Launch of the Humanitarian Tech Hub: An innovative ERC-EPFL initiative
In 2015, the International Committee of the Red Cross (ICRC) decided to join forces with EPFL in creating the Humanitarian Tech Hub at CODEV. This Hub will work closely with the EssentialTech Program to foster collaboration between the humanitarian sector, scientists and other stakeholders in order to develop and deploy technologies to respond to today’s humanitarian challenges.

EPFL hosts visit from an Argentinian scientific delegation
A scientific delegation from Universidad Nacional de San Martín (UNSAM) comprised of 10 scientists visited the EPFL campus on 26 November 2015.

CODEV at the United Nations, New York
Dr. Silvia Hostettler, Deputy Director of CODEV was invited to give a presentation on technologies for development at the United Nations in New York on 8 July 2015. The “Technology for Sustainable Development” Conference was organized by the United Nations Academic Impact (UNAI) Initiative and Amrita University as part of the UNAI-START (Skills & Technology Accelerating Rapid Transformation) Conference Series. More than 900 people attended the event. Speakers included researchers from Stanford University, Oxford University, Monash University, Cambridge University, the National University of Singapore and Twente University in the Netherlands. The UNAI Initiative focuses on harnessing the power of emerging technologies to help meet the Sustainable Development Goals.

October 5 – 9, 2015 in São Paulo, Brazil
ENTREPRENEURSHIP TRAINING FOR 18 YOUNG SCIENTISTS IN BRAZIL
Based on an EPFL Leading House initiative “Academia Industry Training (AIT)”, swissnex Brazil welcomed 10 Swiss and eight Brazilian researchers to Rio de Janeiro to offer them an overview of entrepreneurship in general and opportunities in Brazil in particular.

Entrepreneurship training for 18 young scientists in Brazil

Pristem aims to provide sustainable and universal access to essential medical technologies desperately needed in developing countries. The company, founded in December 2015, tackles global health problems with a unique approach that combines Swiss quality and innovation to provide high-tech, robust, inexpensive medical equipment. The young company has already won several awards, including the PricewaterhouseCooper “Future Trends” Prize at the Seif Awards 2015, and likewise competed in the second round of the Venture Kick Competition.

Pristem - the first spin-off of CODEV’s EssentialTech program launched

The Brazilian educational initiatives are the backbone of Swissonovation and thus one of the core strategic priorities of CODEV. In recent years, CODEV has organized a number of entrepreneurship training programs in Brazil. These programs aim to foster the development of young scientists and entrepreneurs and to support their business activities.

The one-week program provided a solid introduction to entrepreneurship through workshops in business plan writing, market entry scenarios, funding strategies and pitching classes. It also provided a deeper understanding of the Brazilian market through visits to institutions in Rio, such as the technological park, and a gathering for Swiss and Brazilian entrepreneurs, who offered each other tips and shared key lessons.

Entrepreneurship training for 18 young scientists in Brazil

Based on an EPFL Leading House initiative “Academia Industry Training (AIT)”, swissnex Brazil welcomed 10 Swiss and eight Brazilian researchers to Rio de Janeiro to offer them an overview of entrepreneurship in general and opportunities in Brazil in particular.

Entrepreneurship training for 18 young scientists in Brazil

Entrepreneurship training for 18 young scientists in Brazil

Entrepreneurship training for 18 young scientists in Brazil

Based on an EPFL Leading House initiative “Academia Industry Training (AIT)”, swissnex Brazil welcomed 10 Swiss and eight Brazilian researchers to Rio de Janeiro to offer them an overview of entrepreneurship in general and opportunities in Brazil in particular.

October 5 – 9, 2015 in São Paulo, Brazil
Entrepreneurship training for 18 young scientists in Brazil

Based on an EPFL Leading House initiative “Academia Industry Training (AIT)”, swissnex Brazil welcomed 10 Swiss and eight Brazilian researchers to Rio de Janeiro to offer them an overview of entrepreneurship in general and opportunities in Brazil in particular.

Entrepreneurship training for 18 young scientists in Brazil
One Team, creativity and innovation for sustainable change

CODEV is a multidisciplinary team, whose competencies cover a wide range of areas including: engineering, urban technologies, information and communication technologies, medical technology, scientific diasporas, disaster risk management, environmental science, management, social entrepreneurship, economics, social and political sciences. CODEV’s experience and know-how are available to both EPFL’s scientific community and its external partners.

Jean-Claude Bolay Director of CODEV
Silvia Hostettler Deputy Director
Costine Waridel Administration & Communication Manager
Yuri Changakulov General Secretary – RERCF
Eileen Hanbou Coordinator – UNEBO Chair
Marina Cracco Coordinator – Education Programmes
Gabriela Tejeda Programme Manager – ISER Research Programmes, Scientific Diasporas, Seed Money Programme
Julien Estillier Programme Manager – ISER Research Programmes
Sabine Sperti-Crawford Administrative Assistant – ISER Research Programmes
Caroline Cheripiloid Former Administrative Assistant – ISER Research Programmes (until 31.12.2015)
Fiona Whitehead Administrative Assistant – Scientific Diasporas, ISER Research Programmes
Clemente Boucle Project Manager – Info4Dourou 2.0 project
Tom Müller Project Manager – Info4Dourou 2.0 project
Abigail Kern Programme Manager – Urban Research
Klaus Schönenberger Programme Leader – EssentialTech
Solomzi Malinhlilo Deputy Programme Leader – EssentialTech
Romain Siba Project Manager – EssentialTech
Matthieu Gani Project Manager – EssentialTech
Nicolas Duriaux Project Manager – EssentialTech
Olivier Gobet Project Manager – EssentialTech
Bertrand Klaiber Former Project Manager – EssentialTech (until 30.6.2015)
Nicolas Crettenand Former Project Manager – EssentialTech (until 30.6.2015)
Christina Dupuy Administrative Assistant – Info4Dourou 2.0, EssentialTech, RERCF, ISER Research Programmes
Dikolela Kuhbi Programme Manager – Humanitarian Tech Hub
Lilian Gilgen ISC Programme Manager
Damaris O’Brien Administrative Assistant – ISC Programme
Marija Cvetinovic PhD student

Not on the picture:
In 2015, the multidisciplinary CODEV team consisted of 24 members, including three PhD students.

The team generated third-party investments of approximately 4 million CHF (1.2m more than in 2014), including research activities, program management, education and human resources.

As Leading House for bilateral science and technology cooperation programs with Brazil and India, CODEV receives funding for its mandates from the State Secretariat for Education, Research and Innovation (SERI).

The Swiss Agency for Development and Cooperation (SDC) provides funding support to the Indo-Swiss Collaboration in Biotechnology (ISCB), the Info4Douara 2.0 project in Burkina Faso and the UNESCO Chair Conference on Technologies for Development.

As part of our partnership with the International Committee of the Red-Cross (ICRC), the Humanitarian Tech Hub was launched in 2015 with funding from ICRC and a private foundation.

With regard to fundraising activities, the EssentialTech program became an EPFL school project and received major funding from private sector industries and foundations, one embassy, Geneva University Hospital and the Universities of Applied Sciences of Western Switzerland.

We would like to take this opportunity to thank these partners and others who wish to remain anonymous for their financial support.
## PARTNERS AND SPONSORS

<table>
<thead>
<tr>
<th>Academy of Sciences of Moldova (ASM)</th>
<th>International Labour Office (ILO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACERD sàrl, Ouagadougou</td>
<td>Jawaharlal Nehru University (JNU)</td>
</tr>
<tr>
<td>Centre d’études de l’Inde et de l’Asie du Sud (CEIAS), France</td>
<td>National Council of Technological and Scientific Development (CNPq)</td>
</tr>
<tr>
<td>Centre Hospitalier Universitaire Vaudois (CHUV)</td>
<td>Paul Sieber Institute (PSI)</td>
</tr>
<tr>
<td>Commission pour le partenariat scientifique avec les pays en développement (CPPS)</td>
<td>Polytechnique Montréal</td>
</tr>
<tr>
<td>Department of Biotechnology - Ministry of Science &amp; Technology - Government of India</td>
<td>Pristem S.A.</td>
</tr>
<tr>
<td>Department of Science &amp; Technology - Ministry of Science &amp; Technology - Government of India</td>
<td>Sensorscope Sàrl</td>
</tr>
<tr>
<td>Ecole d’Ingénieurs de Rennes</td>
<td>State Secretariat for Education, Research and Innovation (SRSB)</td>
</tr>
<tr>
<td>Ecole nationale Supérieure Polytechnique de Laval (ÉNSP)</td>
<td>Swiss Agency for Development and Cooperation (SDC)</td>
</tr>
<tr>
<td>Ecole Normale Supérieure de Lyon (ENS)</td>
<td>Swiss National Science Foundation (SNSF)</td>
</tr>
<tr>
<td>Ecole Supérieure Polytechnique - Université Cheikh Anta Diop</td>
<td>Swiss Network for International Studies (SNIS)</td>
</tr>
<tr>
<td>EssentialMed Foundation</td>
<td>Swiss Tropical and Public Health Institute (Swiss TPH)</td>
</tr>
<tr>
<td>Grenoble INP</td>
<td>Symphasis</td>
</tr>
<tr>
<td>Haute école Spécialisée de Suisse occidentale (HES-SC)</td>
<td>UNESCO World Heritage</td>
</tr>
<tr>
<td>Hôpitaux Universitaires de Genève (HUG)</td>
<td>Universidad del Valle (univalle)</td>
</tr>
<tr>
<td>Ingeinieurs du Monde (IEM)</td>
<td>Université catholique de Louvain (UCL)</td>
</tr>
<tr>
<td>Institut ParisTech</td>
<td>Université de Genève (UniGe)</td>
</tr>
<tr>
<td>Institut Polytechnique de l’École Normale Supérieure de Paris</td>
<td>Université de Lausanne (UniL)</td>
</tr>
<tr>
<td>Institut de la Recherche pour le Développement (IRD)</td>
<td>Université d’état d’Haïti</td>
</tr>
<tr>
<td>Institute of Development Studies Kolkata (IDSK)</td>
<td>Université Quisqueya (UNIQ)</td>
</tr>
<tr>
<td>International Institute for Water and Environmental Engineering - ZIK</td>
<td>Université Saint-Joseph de Beyrouth</td>
</tr>
<tr>
<td>Velux Stiftung foundation</td>
<td>Xi’an Jiaotong-Liverpool University</td>
</tr>
</tbody>
</table>
OUTLOOK 2016

IN JANUARY, the second Academia-Industry Training will be taking place in Bangalore, to support scientists from top Swiss & Indian universities in turning their research into marketable products market application and discovering their entrepreneurial potential.

IN FEBRUARY, we will be recording the first session of the Resilient Future: Science and Technology for Disaster Risk Reduction MOOC.

IN MARCH, we will be participating in the Global Partnership for Humanitarian Impact and Innovation Conference: ICRC President Peter Maurer will likewise be visiting the EPFL on March 8th.

IN APRIL, the EssentialTech team will be promoting their unique approach to technology development at the Geneva Health Forum (18-21 April), and be traveling to Senegal for the Journées de radiologie de l’Afrique Noire Francophone (13-17 April).

IN MAY, our UNESCO Chair Conference on Technologies for Development: From Innovation to Social Impact will be taking place on the EPFL campus 2-4 May 2016. We’re very excited about this year’s focus on humanitarian engineering.

IN JUNE, the Swiss partners of the Indian-Swiss Collaboration in Biotechnology will be traveling to New Delhi to meet with their Indian counterparts to discuss the new program strategy 2017-2020.

IN JULY, despite the tempting summer weather, we will be slaving away for the next UNESCO publication based on the best papers from the May Conference.

IN AUGUST, it will definitely be too hot to be in a tiny, airless studio recording the Innovation and technology development for poverty reduction MOOC—but we’ll be doing it anyway!

IN SEPTEMBER, our new Minor in Development Engineering in the Global South will be offered for the first time to EPFL Masters students.

IN OCTOBER, we’ll be organizing the Seed Money Program Conference, to showcase the innovative research being done by EPFL labs, in collaboration with a partner institution in the Global South.

IN NOVEMBER, luckily the weather will be foggy and miserable, so we won’t mind working round the clock to get the MOOCs finished. Champagne, or no champagne?—That is the question.

IN DECEMBER…what do you mean 2016’s already over?