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2014 International Conference

UNESCO CHAIR IN TECHNOLOGIES FOR DEVELOPMENT: WHAT IS ESSENTIAL?

4-6 June 2014 | EPFL, Lausanne, Switzerland

CALL FOR ABSTRACTS: 14 OCTOBER 2013

<http://cooperation.epfl.ch/2014Tech4Dev>

The UNESCO Chair in Technologies for Development hosted by the Cooperation and Development Center (CODEV) is pleased to announce that the third **International Conference on Technologies for Development: What is Essential?** will take place at the Ecole Polytechnique Fédérale de Lausanne in Switzerland on 4-6 June 2014.

Innovative technologies have a central role to play in the effort to alleviate poverty in this world. Innovative technologies should also mean appropriate technology in the sense that they should be socially, culturally, environmentally and economically accepted by the stakeholders. However, what are the key factors that will determine whether or not a technology succeeds in its intended role to reduce poverty?

It has been argued that success depends on developing an entire value chain from the technical design to the deployment business model, including manufacturing, logistics, commissioning, usage, maintenance, waste and recycling. This requires an interdisciplinary approach and partnerships with global and local players in the private sector and with public authorities and civil society. However, it is inevitable that a compromise will have to be found between the adaptation of a technology to a specific local context and the objective of large-scale deployment. This leads us to the key question of the third UNESCO Technologies for Development Conference: **What is Essential?** Is it the invention and development of appropriate technologies? Is it the creation of value chains? Is it local capacity building? Is it the partnership between key stakeholders? Or most likely a combination of several factors?

The conference – held in English – will offer a high-level platform to take part in cutting-edge discussions in the field of technologies for development, to share information and to network.

Call for Abstracts

The UNESCO Chair invites authors from research, industry, policy or civil society to submit their abstracts under one of the **three guiding questions** of the conference.

1. What are the needs for essential technologies?

How can we define essential technologies? Why are they essential? Are essential technologies those that meet the basic needs of the poorest segments of the population? What kind of needs require what kind of technologies? Who defines the needs and who will have access to these technologies? What are the technical challenges?

2. What are successful processes to develop and deploy essential technologies?

Successful innovation for development will move closer to the context of Base of the Pyramid (BoP) users. Do successful processes consist of co-creating products and services by developing and testing them in the local context of developing countries, which is often characterized by poor infrastructure, unreliable energy supply, no water, bad transport or limited digital access? Are *Living Labs* the key to success? What frameworks, incentives, catalysts and policies are needed to foster the required innovations and collaborations at all levels of the value chain?

3. How can we evaluate the impact of technologies? How does impact measurement drive innovation?

How can we evaluate the impact of technologies on the ground? To what extent did they contribute to poverty reduction? What are the methodologies available? What process will be used to collect data and measure impact? What are the deciding factors for technological breakthrough? What can we learn from failures? What is the role of impact funding in sustainable development?

Submitted abstracts must focus on one of the three main questions and on one of the following core areas:

- Technologies for sustainable development of habitat and cities
- Information and communication technologies for the environment
- Science and technology for disaster risk reduction
- Technologies for sustainable energy
- Medical technologies

The abstracts can either offer good examples and pilot experiences of concrete applications or provide reflections on these issues. Abstracts need to be based on North-South or South-South collaborations. Abstracts in English of a maximum of 500 words using the prescribed template have to be submitted online no later than **14 October 2013**.

Some level of financial assistance may be available for authors from developing or emerging countries.

Instructions and guidelines for the submission of abstracts and the application for financial assistance can be found on the conference website: <http://cooperation.epfl.ch/2014Tech4Dev>

A selection of the best papers presented at the conference will be subject to further peer-review as we aim to publish an edited volume with Springer-Verlag.

Key Dates for Abstract Submission

Deadline for abstract submission + grant application (if applicable)	14 Oct 2013
Decision notified to authors along with guidelines for full paper submission and poster specifications	11 Nov 2013
Deadline for submission of full papers	13 Jan 2014
Final notification of acceptance, including financial assistance (if applicable)	10 Mar 2014
Deadline for early bird registration and accepted authors of full papers/posters	30 Apr 2014
Deadline for submission of PowerPoint presentations by accepted authors of full papers	25 May 2014

General Information

- Authors are invited to submit brief abstracts for paper and/or poster presentations relevant to the Conference Themes. For paper presentations, presenters will be requested to give a 15 minute presentation at the conference, followed by a discussion. For poster presentations, presenters will be requested to be available to discuss their work during refreshment breaks.
- The selection of papers for presentation at the conference will follow a two stage process: (i) initial screening based on submitted abstracts; a conditional acceptance will be issued and (ii) final selection based on full manuscript, in accordance with guidelines to be distributed at time of notification of conditional acceptance.
- The selection of posters will be based on the submission of an abstract only. Poster presenters are not eligible for any form of financial assistance.
- The Scientific Committee cannot guarantee that the authors will be granted their preferred choice of presentation. The decision of the Scientific Committee is final and no correspondence will be entered into.
- All presenting authors who are accepted for either a full paper or poster presentation **MUST** be registered and the conference fees fully paid up (if applicable) **no later than 30 April 2014**.
- If for whatever reason an abstract must be withdrawn, please contact the Conference Secretariat.

Notification of Acceptance

- Receipt of abstract submission will be acknowledged via an automated email.
- The Scientific Committee will review all abstract submissions. Abstracts will be evaluated according to the following criteria:
 - Relevance to the conference themes;
 - Innovative concept and research questions versus an extension of existing work;
 - Originality of the methodology including North-South, South-South partnership;
 - Contribution to the discipline as a whole;
 - Clarity and understandability.
- Successful authors will be invited to submit a full paper by **13 January 2014**, in accordance with full paper guidelines to be distributed when the time comes.
- Poster presenters will be notified by **11 November 2013** along with technical specifications.



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SESSION DETAILS

THEME 1: What are the needs for essential technologies?

Core Area: Habitat

[TH1-SE01-01] Water and Sanitation Technologies for Sustainable Urban Development

Session Leader: Dr. Christian Zurbrugg, Department of Water and Sanitation in Developing Countries (SANDEC), Eawag: Swiss Federal Institute of Aquatic Science and Technology / Co-Session Leader: Dr. Hung Nguyen-Viet, Center for Public Health and Ecosystem Research (CENPHER), Hanoi School of Public Health, Vietnam

Water treatment and sanitation technologies are undoubtedly essential. Nevertheless provision of is not always successful when moving from pilot facilities to widespread scaling up. This session will cover the entire chain of technology innovation from initial lab-based research work, to field-testing and highlight ways on how to provide proof of concept for radical technology innovations in the field of water and sanitation. The breakout session will focus on point-of-use treatment options, scalable low-cost user interfaces and low maintenance waste treatment processes.

[TH1-SE01-02] What Technologies are Essential for Megacities of the Future to be Sustainable?

Session Leader: Dr. Justin Bishop, Department of Engineering, University of Cambridge, United Kingdom

Over half the global population lives in an urban environment. There are significant socio-economic promises which stimulate migration to the city. However, the urban impoverished suffer from poor housing, infrastructure and job prospects. What technologies exist or are necessary for cities of the future to deliver social equity and economic prosperity to its poorest residents?

Core Area: Energy

[TH1-SE01-03] Identifying Opportunities and Constraints for Women in the Renewable Energy Sector

Session Leader: Dr. Bipasha Baruah, Department of Women's Studies and Feminist Research, University of Western Ontario, Canada / Co-Session Leader: Dr. Mini Govindan, Social Transformation Division, The Energy and Resources Institute (TERI), India

The overarching theme of the session will be "Identifying the opportunities and constraints women face in accessing technologies and finding quality employment in the renewable energy sector in developing countries and emerging economies". Within this theme there will be three sub-topics: 1) Access to technology and resultant employment opportunities; 2) Advancing the leadership of women in the renewable energy sector and 3) Gender dimensions of renewable energy policies and programs.

[TH1-SE01-04] Essential and Sustainable Energy in the Fields of Agriculture and Livestock for the BoP in the Developing World

Session Leader: Mr. Hervé Azemtsa Fofack, S2 Services Sarl, Cameroon

The session will have two main parts. In the first part, the speakers will focus on the innovations possibilities in using more green energy as an enabler in the fields of agriculture and livestock for the BoP, discuss their importance and why they are essential, and lay out the ground for the next session by mentioning the different hurdles in their design and their implementation within their target groups. The second part will focus on framework, incentives, catalysts and policies, north-south and south-south cooperation models in response to the hurdles mentioned in the previous part. In each of the two parts, one speaker will talk about the general situation, facts and figures and the two other speakers will discuss field practices or evidences from examples of what has succeeded or what is in the good path of success in the developing world.

THEME 2: What are the successful processes to develop and deploy essential technologies?

Core Area: Disaster Risk Reduction

[TH2-SE02-01] Developing Appropriate Contexts for Successful Deployment of Essential Technologies for Disaster Risk Reduction

Session Leader: Ms. Marie-Valentine Florin, International Risk Governance Council (IRGC), Switzerland

Understanding the context in which technologies are implemented and mobilizing appropriate governance cultures are important factors for improving the effectiveness of disaster risk reduction. The session will aim to identify what are the prerequisite for essential technologies to succeed in difficult context conditions, for example when: a) the perception of the technology and how it can contribute to increasing welfare is not favorable; b) infrastructures are lacking; c) regulatory framework and incentives are weak; and d) interested and affected parties do not agree on the need or ways to implement a technology and the resources to be allocated to their deployment.

[TH2-SE02-02] Politics, Society, and Technology Integration: How Does Policy Making Affect Governmental and Local use of ICTs for Disaster Risk Reduction?

Session Leader: Dr. Paula Lyttle, The World Bank / Co-Session Leader: Mr. Charles Martin-Shields, Ministry of Communications and Information Technology, Independent Samoa

Rapid increases in technology development and access have made mobile phones and computing increasingly ubiquitous in the developing world. This session aims to answer three related questions about DRR: 1) Which technologies are allowing governments to be more transparent and connected to local populations? 2) What technologies are helping local actors share information with their governments and among each other? 3) What policies are being put into place to encourage local-to-national information sharing for DRR? Papers that integrate more than one of these topics are encouraged, and can feature case studies, statistical and policy analysis, and mixed method approaches. Authors should explain the technology or policy process, frame it in a social or development theory, and explain the observed or intended outcome of the technology or policy.

Core Area: Energy

[TH2-SE02-03] Up-Scaling and Mainstreaming Renewable Energy Technologies for Energy Security, Climate Change and Economic Development

Session Leader: Dr. Pankaj Agarwal, Panitek AG, Liechtenstein / Co-Session Leader: Dr. Kinsuk Mitra, InsPIRE Network for Environment, India

How can we Facilitate Deployment and Access to Renewable Energy through Technology and Infrastructure Development? The session will cover the following key thematic areas: Power Technology and Infrastructure; Heating and Cooling Technologies; Buildings and Transport.

[TH2-SE02-04] Catalyzing Innovation through Targeted Scientific Training and Capacity Building

Session Leader: Prof. Federico Rosei, UNESCO Chair in Materials and Technologies for Energy Conversion, Saving and Storage, Institut National de la Recherche Scientifique (INRS), University of Quebec, Canada

Leading question: How can capacity building in scientists and students from low and medium income countries be leveraged to accelerate the development and deployment of technologies within these countries? Underlying concept: Training a new generation of scientists and engineers who focus on adaptable technologies that can be transferred to developing regions has the potential to make an impact in bridging the knowledge and technology gap between north and south.

[TH2-SE02-05] Up-Scaling Sustainable Pro-Poor Energy Solutions: Addressing Stumbling Blocks

Session Leader: Dr. Albrecht Ehrensperger, Centre for Development and Environment, University of Bern, Switzerland / Co-Session Leader: Mr. Paul Gacheru Chege, Practical Action Eastern Africa

The session aims at analyzing efforts in up-scaling cleaner and more efficient energy solutions for poor people in developing countries by addressing the following questions: What are factors along the whole value chain and in the institutional, social, but also environmental space that enable up-scaling of improved pro-poor technologies? Are there differences between energy carriers or in different contexts? What are most promising entry points for up-scaling?

[TH2-SE02-06] What are the techno-socio-economic aspects that are influencing the success of the development, implementation, and maintenance and spreading of appropriate technologies for access to energy?

Session Leader: Mr. Bertrand Klaiber, Cooperation & Development Center (CODEV), Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

The session aims to explore key leanings and success factors to provide access to energy to remote or resource-poor communities in a global perspective. This involves considering a large panel of appropriate technologies from energy production, distribution and storage to safe and efficient usage. The comprehensive outlook requires considering the whole life cycle of the products and solutions as well as the entire value chain including all the stakeholders, from global to local players in the private sector, public authorities and civil society alike.

Core Area: Habitat

[TH2-SE02-07] Community-Driven Innovation: Communicating Living Labs Essentials in the Developing World

Session Leader: Ms. Tunde Kallai, Prolog GmbH, Switzerland, Founder of the European Network of Living Labs (ENoLL) / Mr. Konte Papa Amadou, Dakar City Municipality, Senegal

The members of urban, rural and remote communities need sustainable development support in order to create jobs alleviate poverty, to improve the human skills, to use the technological innovations and communication platforms/systems and services if possible by the cheapest way. In order to do so they need an open multidisciplinary platform and system, thinking and supporting their living environment which can be facilitated by the Living Labs. The Living Lab approach provides its user group with an opportunity to develop a much deeper understanding of how the various components in their functional environment operate and interrelate. Living Lab leaders from various countries are invited to describe and explain by their experiences, which frameworks, incentives, catalysts and policies they developed or they are using. In summary: What are successful processes to develop and deploy essential technologies?

[TH2-SE02-08] Implementing Living Labs Concepts to Strengthen the Innovation Ecosystem for Social Innovation in Rural Areas and Cities

Session Leader: Dr. Hans Schaffers, School of Business, Centre of Knowledge and Innovation Research (CKIR), Aalto University, Finland & Adventure Research, The Netherlands

The leading question is: how can the living lab concept be made effective for the purpose of accelerating sustainable urban and rural development in developing countries. Related questions are: What are the limits

and opportunities and practical implementation approaches of the concept. How will the concept be useful for development and exploitation of new technologies for sustainable development, and how can entrepreneurship and development be boosted along social innovation and empowerment. How can the newer platform technologies and mobile applications be applied to accelerate sustainable development.

Core Area: ICT for the Environment

[TH2-SE02-09] Low Cost Data Communications for Sustainable and Environment Sound Development

Session Leader: Prof. Ermanno Pietroseoli, Abdus Salam International Centre for Theoretical Physics, Italy & Fundación "EsLaRed", Venezuela / Co-Session Leader: Dr. Chomora Mikeka, Chancellor College, University of Malawi

What are the most cost effective and environment friendly technologies to provide data services in underserved areas? Data communications is intensively used for environmental data gathering, disaster prevention and mitigation, health provisioning, education and training as well as productivity enhancement. They are also used to collect environmental sensors data. Yet the traditional techniques used in affluent countries are not always the best solutions to apply in developing countries, in which the limitations of the existing infrastructure and limited resources pose severe challenges. Wireless has proved to be the most cost effective telecommunications solution for voice, but to provide reasonable data throughput using 3G or 4G technologies would require such a great number of base stations that make this solution unaffordable in developing countries besides placing an additional burden in the already taxed energy provisioning infrastructure.

[TH2-SE02-10] Low-Cost, High-Tech and Crowd-Sourced Solutions for Better Water Management – Opportunities and Challenges

Session Leader: Dr. Tobias Siegried, hydrosolutions Ltd., Switzerland / Co-Session Leader: Mr. François Mürger, SDC - Swiss Agency for Development and Cooperation | Corporate Domain Global Cooperation

Submissions from the following relevant fields are welcomed: Operational water resources management, including hydrometeorology, also and especially in the context of dryland irrigation agriculture in the semi-arid and arid regions; Public health and livelihood improvements with regard to access to safe water, e.g. for regions affected by geogenic groundwater contamination; Disaster risk reduction through early warning and forecasting with a focus on hydro-meteorological extremes, including floods, mudflows, droughts, etc.; Payments for water services for improved accountability of water through remote metering and permitting / controlling. Together with the Swiss Agency for Development and Cooperation Global Water Programme Initiatives, the aim is to organize a session that is broad in the sense that it provides insights into recent development around these topics while inviting a wide range of contributions from all fields mentioned above and across disciplines, including from natural and social sciences and humanities.

[TH2-SE02-11] The Openness Paradigm: How Synergies between Open Access, Open Data, Open Science, Open Source Hardware, Open Drug Discovery Approaches Support Development?

Session Leader: Dr. Sachiko Hirose, Ecole Polytechnique Fédérale de Lausanne, Switzerland / Co-Session Leader: Dr. Denisa Kara, National University of Singapore

This panel will bring together pioneers and practitioners of various open approaches in science and technology to discuss the opportunities, challenges and synergies in supporting South to South and South to North cooperation for development. Citizen science activities in Yogyakarta (Indonesia) and Bangalore (India) for environmental monitoring, projects, such as the Open Drug Discovery for malaria (Australia) and Open Genomic Data for disaster response (China), but also Open Hardware innovation for affordable laboratory equipment around the world (DIYbio and hackeria networks) define a new paradigm, which needs reflection and evaluation. One of the aims of this panel is to create visibility for these projects, which are successful in their local context, but would benefit from more feedback and support by the international community. They offer a new paradigm for defining an International Development agenda for science and technology cooperation, which involves the Global South as an equal partner. The panel will map and reflect upon these initiatives and case studies. We would like to understand the opportunities and problems these initiatives

and networks face and define best practices as well as policy recommendations to support these trends. While some projects concentrate on building research infrastructure and networks around open source technologies, other emphasize the power of crowdsourcing and various e-science and citizen science models of work, which involve the citizens in various data collection practices. These initiatives and projects offer unique opportunities not only for developing countries, but also original models for global scientific collaborations.

[TH2-SE02-12] Frugal Innovation for Humanity

Session Leader: Dr. Radha Basu, Frugal Innovation Lab, Santa Clara University & iMerit, USA
What methodologies can be utilized that leads to the design, prototyping, and implementation of a sustainable, applicable, affordable, adaptable, and accessible solution for bottom of the pyramid consumers?

[TH2-SE02-13] How can we co-design technologies with (and not for) vulnerable and poor communities?

Session Leader: Dr. Andrés Felipe Valderrama Pineda, Aalborg University, Denmark / Co-Session Leader: Dr. María Catalina Ramírez, Universidad de los Andes, Colombia

The session focuses on the processes by which teams of students and professors from rich universities collaborate with communities. This is a focus on the dynamics of innovation, which place equal weight on the result (a technology to solve a specific problem) and the process by which that result is obtained (which knowledge is brought in and how, how does the involvement of the community guarantees their ownership over the solution and thus makes it sustainable). Additionally, we would like to encourage authors to think on the ways and dynamics by which a specific process in one community can produce knowledge for other communities. In this we will privilege those cases in which we can see that the knowledge production process is guided or at least involves significantly the members of the community.

Core Area: Medical Technologies

[TH2-SE02-14] Technology in Global Health: Exploring New Paradigms

Session Leader: Dr. Leo Anthony Celi, Laboratory of Computational Physiology, Division of Health Science and Technology, Harvard Medical Institute, Massachusetts Institute of Technology, USA

With increased participation in global health among clinicians, public health workers, engineers and computer scientists, the risk of fragmentation of purpose and redundancy of effort is increased. The lack of coordinated and tailored delivery onto an organized framework persists as a major obstacle to progress. Currently, healthcare initiatives are often developed by the donor country; subsequent isolated ad hoc implementations may result in insufficient consideration for the specific needs of the population and/or critical factors of social, cultural and political context. Though technological solutions such as mobile health or mHealth are appealing in theory, when applied indiscriminately to a weak healthcare infrastructure they often result in insignificant or short-lived impact.

[TH2-SE02-15] Facilitating and Stimulating Inclusive Design and Innovations

Session Leader: Prof. Prabhu Kandachar, Faculty of Industrial Design Engineering, Delft University of Technology, The Netherlands

This session is set at the intersection of healthcare and technology, focusing on medical devices. The session is built around the following interdependent themes: 1) Design and innovations which are socially responsible; 2) Less is More: Design for sustainability - ecological economic and social implications; 3) The role of private sector in creating sustainable and inclusive designs and innovations; 4) The role of social entrepreneurs, NGO's, local organizations and academic institutions in supporting inclusive design and innovations; 5) Predicting the health trajectories and appropriate policy interventions; 6) Evaluation of interventions.

[TH2-SE02-16] Strategies for the Successful Implementation of Mobile Health (mHealth) in Low-Resource Settings

Session Leader: Dr. Walter Karlen, Stellenbosch University, South Africa & University of British Columbia, Canada

In this session, participants will discuss the challenges in scaling up mHealth. We will identify essential methods required for successful development and deployment of mHealth. For this we will bring together engineers, mHealth developers, social entrepreneurs, policy makers, and researchers from social, business and basic sciences to present and discuss their research and experience with mHealth and its implementation. This interdisciplinary dialog is very important; the earlier scale-up and implementation questions are considered in the design process, the easier the implementation can become. At the end of this session, we will have gathered a portfolio of essential features that people can take home and include in their design and decision process.

[TH2-SE02-17] Appropriate Medical Devices: From Lab to Bedside in Resource-Constrained Contexts

Session Leader: Dr. Klaus Schönenberger, EssentialTech Programme, Cooperation & Development Center (CODEV), Ecole Polytechnique Fédérale de Lausanne (EPFL)

What are the key factors of success in developing, deploying and scaling-up essential medical technologies, for a sustainable impact on public health? For this session, participants are invited to reflect on innovative strategies and key factors of success, as well as the main roadblocks and difficulties undermining the process of developing and deploying essential medical devices in a sustainable way. Four phases can be identified in the process, which are in close interaction with each other. The subject of private sector involvement is pervasive in all these phases and should serve as a common thread: 1) Ideation; 2) Research & Development; 3) Deployment and 4) Scaling-up. Last but not least, discussing failures may be highly interesting! Case studies and lessons learnt from failures may bring a unique value to the debate.

[TH2-SE02-18] Medical Devices for the Base of the Pyramid: Where are they?

Session Leader: Mr. Zach Friedman, LIGTT, Institute for Globally Transformative Technologies, Lawrence Berkeley National Lab (LBNL), USA

Medical devices for the poor have been an area of increasing attention in the past decade, as many of the world's largest drivers of mortality and morbidity can be addressed with relatively straightforward technological devices. We have increasingly simple and effective ways to diagnose anemia, treat infants born pre-term, diagnose tuberculosis and measure CD4 counts. These devices are in many cases inexpensive and designed for low resource settings, and appear as if they should be a major factor in the reduction of mortality in developing countries. Yet despite the proliferation of several promising technologies, very few have reached scale, and such devices still remain out of reach for the vast majority at the base of the pyramid. This session will explore these challenges, focusing both on the technologies and the broader ecosystem in which these technologies are delivered.

THEME 3: How can we evaluate the impact of technologies? How does impact measurement drive innovation?

Core Area: ICT for the Environment

[TH3-SE03-02] Tools and Techniques for Measuring Technology Impact: From Wireless Sensors to Experimental Field Trials

Session Leader: Prof. Ashok Gadgil, Lawrence Berkeley National Laboratory (LBNL), University of California Berkeley, USA

Presenters will be asked to describe new or ongoing work to demonstrate causal linkages between a technological intervention (such as an improved cookstove) and potential health, income, social, or behavioral outcomes. The focus will be techniques and tools used to measure impact, as well as the ways that experimental data are fed back into the redesign of pro-poor innovations.

Core Area: Medical Technologies

[TH3-SE03-03] Evaluating the Impact of Robust Diagnostics for High Impact Health Challenges

Session Leader: Prof. Muhammad H. Zaman, Departments of Biomedical Engineering and Medicine, Boston University, USA

The topics will address technologies, implementation, impact and strategies for sustainability. The topics discussed will include development of new devices and diagnostics aimed at addressing healthcare challenges in resource limited countries including new developments in disease diagnosis, development of technologies to test substandard and counterfeit drugs and technologies that have already been developed and piloted and are now in the next stage of implementation. We will emphasize not just successes but failures in design, development and implementation in order to provide key lessons learned and learning outcomes for future strategies and success and analyze what are the best metrics for success and impact.