COOPERATION & DEVELOPMENT CENTER

UNESCO Chair in Technologies for Development



UNESCO Chair in Technologies for Development 2012 INTERNATIONAL CONFERENCE

TECHNOLOGIES FOR SUSTAINABLE DEVELOPMENT : A WAY TO REDUCE POVERTY ?

29-31 MAY 2012 EPFL, LAUSANNE SWITZERLAND

http://cooperation.epfl.ch



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CONFERENCE VENUE



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Welcome by Philippe Gillet Vice-President of Academic Affairs, EPFL

Science and technology have always been the driving forces of economic growth and social progress. Since the end of the 20th century, they have also constituted the most promising instruments to fight against two ills undermining the balance of our planet – the deterioration of environmental balances and the ensuing climate change; and global challenges, including poverty, which today still affects around 20% of the world population.

When we know that, according to World Bank statistics, more than 1.4 billion individuals live in poverty with less than US\$ 1.25 per day, it is not possible to think that this reality is of no concern to us. And when we become aware that more than half of the world population lives in cities and their suburbs, and that 95% of this growth will continue its course over the next few decades in emerging and developing countries, it becomes evident that each of us is concerned, wherever we are, with our knowledge, expertise and the desire to contribute to improving living conditions on our planet, for the benefit of all.

Scientists, researchers and teachers are not immune to this commitment. For too long, we have been accused of living in an ivory tower. But this fails, all too guickly, to take into account that many scientific inventions, technological innovations and studies have allowed the implementation of products that promote sustainable development, with a positive impact in environmental, social and economic terms: take solar energy, already widely spread across the world and constantly improving, think of telecommunications which have led some authors to say that we now live in a "global village". Well, this is true. Yet, if at EPFL, we are convening this conference, it is because we are fully aware that the stakes are tremendous at global level; inequalities remain and even tend to expand in some parts of the world. As academics, we work at the earliest stages of achievements, which, one day, will change the lives of our fellow citizens, and we know that sometimes it will be many years between laboratory discovery and implementation in the field. It is thus quite naturally that we aim to strengthen working relationships between stakeholders; between researchers and decision-makers; between scientists and industrial sectors; between academics and the population; because it is from this dialogue that the best adapted solutions to social demands and recognized needs shall emerge. This calls for education - and therefore higher education – health, and all the technologies that foster a healthy and harmonious living environment.

This dedication to excellence in education and research, to the globalization of our contacts and projects and to international solidarity have long guided EPFL - and in a successful manner.

The 2012 Conference of the UNESCO Chair in Technologies for Development is here to remind us that "planning and acting together" is a goal that stretches beyond the campus. This concern will be a focal point of our discussions. And this through three leading questions, which will steer the work of the conference:

- What is an appropriate technology? The aim is to better determine needs, focus this theme on how to ensure that technologies for sustainable development are more effectively appropriated whilst responding to the social needs and the realities of the beneficiaries;
- How to ensure a sustainable integrated development? Discussing interdisciplinary research and the establishment of partnerships in a cross-disciplinary way (i.e. involvement of stakeholders from diverse sectors: civil society, international organizations, decision makers, private sector, etc.);
- What are the conditions for the co-creation and transfer of such technologies? This will allow us to reflect on which methods and instruments are the most appropriate to guarantee the sustainability of the transfer; analyze its impact on society and what can be done to promote the exchange of knowledge.

I am delighted to have the opportunity to welcome participants who have come from all over the world to discuss these issues and who share the same desire to work together in the interests of the common good, and to bring ever-closer together researchers, professionals and the population.

Welcome by Jean-Claude Bolay Director, Cooperation & Development Center (CODEV), EPFL

EPFL has been active in cooperation for development for decades, in various and complementary ways: admission of students from the South, partnerships with universities and research centers in Africa, Asia and Latin America, and numerous internationally-recognized scientific and technological productions. This work was made possible, and is currently expanding, through, first of all, the commitment of many researchers and students, but also long-established relations of trust with the Swiss Agency for Development and Cooperation (SDC), the State Secretariat for Education and Research (SER), private foundations, NGOs, without forgetting international organizations, among which UNESCO should be highlighted as, in 2007, it bestowed upon us the Chair in Technologies for Development.

The UNESCO Chair in Technologies for Development is actively engaged in three areas:

- In research, through the promotion of projects which aim to adapt technologies to the context of developing countries, by bringing together EPFL laboratories and foreign partners, on priority issues for their countries – although not exclusively – such as: Technologies for the sustainable development of habitat and cities; Information and communication technologies for the environment; Science and technology for disaster risk reduction and Technologies enabling the production of sustainable energy;
- In continuing education, with two certificates of advanced studies: one in management of development projects, and the other in disaster risk reduction; both promoting a transdisciplinary approach with a view to finding innovative solutions for sustainable development;
- A platform to exchange knowledge and expertise in a spirit of international solidarity, and this primarily by convening biennial international conferences that bring together researchers, professionals and decision-makers from around the world, and highlighting the results achieved, learned lessons and recommendations which promote science for the benefit of development.

Three current initiatives epitomize, in my view, our ambitions and the methods used to reach our goals:

Info4Dourou is an excellent example of what can be done within the frame of an Inter School Project, working with 2 labs of EPFL, EFLUM (hydrology) and LCAV (audiovisual communication) and 2 technical partners in Burkina Faso (2IE + PRCCU):

- First phase: a research project that enables innovative information and communication technologies for the management of the natural resources of the Dourou-Singou watershed and supports the local community in their natural resource management (funded by private foundations);
- Second phase (since 2012): Application Phase 2.0 will have as a core objective to develop a soil humidity management system, in favor of irrigation perimeters in the rural regions of Burkina Faso (with the support of SDC and the Velux Foundation);
- In the long-term, if our assumptions are fulfilled, farmers in Burkina Faso will be informed, in real time, of changing weather conditions and could adapt their irrigation system to rainfall, potentially saving up to 40% of water used for this purpose.

As for **RESCIF**, it is a Francophone Network of Excellence in the Engineering Sciences, founded on the occasion of the latest Summit of the French-speaking community held in Montreux in September 2010, on the initiative of the Swiss government. It comprises 14 technological universities from Europe, Canada, Haiti, Africa, the Middle East and Vietnam. In terms of its objectives and scope, it is focused on four priority areas:

- Creating an enduring partnership between "emerged" and "emerging" universities;
- Using the French-speaking culture as a tool for innovation in science and technology;
- Promoting international cooperation in four main sectors: water, nutrition and food security, energy and sustainable development;
- Fostering partnerships with the "Global Leaders University Forum" (GULF) and the "Agence universitaire de la Francophonie" (AUF) (Francophone University Agency).

To this end, 4 main lines of action are followed:

- Creating joint laboratories in the universities of the emerging countries which form part of the network;
- Setting-up joint educational programs and student exchanges;
- Developing partnerships with industry;
- Fostering a solidarity action with two universities in Haiti.

It is a challenge, that of further advancing science, to increase its performance and adapt it to the needs of emerging and developing countries, by involving high-standard institutions from all continents that genuinely work together, with their own resources and the contributions of private and public sectors.

The final example, **Essential.***, is the most recent program launched by EPFL in order to foster the development of technologies which are most essential for development and can significantly promote and/or accelerate the reaching of one or several of the 8 Millennium Development Goals. It stems from collaboration with the EssentialMed foundation, a partner of EPFL. We have adopted their principles and methods and shall extend them to all EPFL's key areas of focus.

The fundamental philosophy guiding the development of appropriate essential technology is the following:

- The technology or product must be affordable to acquire and maintain;
- The technology or product must be durable and sustainable;
- The technology or product must be adapted to the context;
- The technology or product must be scientifically sound.

All these examples show how EPFL envisions the future in a globalised society, in which our responsibilities, as scientists and more broadly as academic institutions, consist in producing knowledge, innovative technologies, and high-level graduates that are aware, adapted to global challenges as well as equipped to cooperate with our colleagues from the four corners of the world, especially where serious problems of survival, development and progress remain to be solved.

The heart of an urban area of more than 300,000 inhabitants and Switzerland's fourth city, Lausanne enjoys an excellent location on the shores of Lake Geneva. Bordered to the east by the Lavaux vineyards, to the north by a mosaic of fields and forests and to the west by an ever-changing urban environment, Lausanne offers a quality of life that attracts a cosmopolitan population.

A small city by comparison to many, Lausanne nevertheless prides itself on being one of the great cities of the world on more than one count. As the "Olympic Capital", a world centre of sports administration, a research and training centre of world renown, a city that believes firmly in sustainable and balanced growth and a city of culture, Lausanne wants to draw attention to its many assets for the benefits of both its inhabitants and its partners.

City of knowledge

Lausanne has been a center of education and research since 1537, its university's founding year. The city boasts numerous higher education institutions, many of which, such as the École Polytechnique Fédérale de Lausanne, enjoy leading reputations.

Knowledge is essential to the dynamic development of the city. The higher education institutions constitute a key resource by the innovation they provide for business and industry, the youthful vigour they bring into the citylife and the international visibility they provide. Sustainable development, for example, is a major sphere of collaboration between the City and its academic partners. Should Lausanne decide to create a new and sustainable district offering 3,000 jobs and a home for nearly 5,000 people, it can do so by calling upon the very latest technology – in particular in the field of energy – developed on the Lausanne campus. Lausanne also aims to become a genuine center of competences in sport by promoting research and training, for example taking sustainability into account in the organisation of major sporting events and in the management of the international sporting movement.

Lausanne has its heart set on establishing further links between the city and the activities of its research and training centres in order to keep developing to the benefit of all.



Deux patrimoines essentiels nous ont été confiés. L'un, que nous partageons tous, nous rend responsable de l'équilibre de notre planète. L'autre est celui que vous nous avez précieusement confié. Le plus ancien Banquier privé de Suisse romande



ancre sa philosophie et sa responsabilité dans le pur respect d'une éthique durable. Ecouter. Anticiper. Agir sur votre patrimoine. En toute transparence. Et ainsi contribuer à le magnifier pour le remettre aux générations suivantes.

Une histoire de durée. Depuis 1780.

Une histoire de gestion. Qui dure depuis 1780.

Ancrée à l'EPFL, et créée à l'initiative de Pierre Landolt, associé de Landolt & Cie, la Chaire Landolt & Cie « Stratégies innovatrices pour un futur durable » a pour but de favoriser la formation et l'émergence de nouvelles approches. Et ainsi peut-être faire naître et progresser, dans une vision stratégique modifiée, une nouvelle façon de penser et d'agir qui favorise un sens collectif solidaire.



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Scientific Cooperation for Development at the EPFL

The Ecole Polytechnique Fédérale de Lausanne (EPFL) is one of Switzerland's leading technological and scientific institutions and enjoys a worldwide reputation¹. With its visible international orientation, it attracts top scientists, teachers and promising students, many of whom come from foreign countries, including developing countries. Over 120 nationalities are represented on campus and one third of the students and half the teachers are from abroad. The EPFL offers internationally recognized research; programs for preparation courses, Bachelor and Master Degrees, a Doctoral School and continuing education; possibilities to create a start-up; as well as a multitude of opportunities to collaborate with international partners.

The tradition of cooperation for development at the EPFL goes back more than 40 years. In fact, it embodies this institution's open approach to the world: an approach where humanist values and a scientific spirit combine to produce outstanding research that is guided by a sense of responsibility towards the major problems faced by people living in emerging and developing countries. It reflects the long-established ties between Switzerland and other countries, and these ties find their expression in the large numbers of teachers, researchers and students who are active in this area at the EPFL. Cooperation also complements Swiss government policies and relevant national legislation. Over the past few years, it has become a major scientific priority for the State Secretariat for Education and Research (SER).

Scientific cooperation for development means that the major issues of the contemporary world are dealt with scientifically through research and teaching within the EPFL itself, as well as in conjunction with its partners in emerging and developing countries. This also allows the results of this work to find their expression through effective and positive changes in world societies, which counter the growing inequalities between rich and poor countries as well as inequalities within individual communities.

Cooperation & Development Center (CODEV)

CODEV² was created in 2005 to promote and coordinate scientific cooperation activities within the EPFL. Attached to the Vice-Presidency for Academic Affairs (VPAA), CODEV is led by Prof. Jean-Claude Bolay. Comprising a team of 20 people, whose competencies cover a wide range of areas, CODEV's mission is to contribute to offering a response to the most pressing world challenges by encouraging scientific partnerships, research and education that can help adapt technologies to the context of developing countries. This is achieved through excellence in research, education and training, scientific services based on a scientific cooperation for development approach and encouraging North-South research partnerships.

Based on interdisciplinarity and work in international networks, CODEV seeks to promote the application of state-of-theart technologies to real social, environmental and economic needs in order to provide a response to the most pressing world challenges and to contribute to a reduction of poverty. As such, CODEV proposes a truly innovative methodological approach to the main problems that currently affect our societies.

UNESCO Chair in Technologies for Development, CODEV

The UNESCO Chair in Technologies for Development was established in 2007 at EPFL, becoming one of Switzerland's three UNESCO Chairs. The Chair operates as an international cooperation platform, building bridges among disciplines and sectors. In collaboration with partners in emerging and developing countries, it aims to find adapted technology solutions to bring sustainable development to the greatest number of people.

RESEARCH in Four Priority Sectors

Foster multidisciplinary research to adapt technology to the context of developing countries

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

EDUCATION and Training

Encourage innovative solution for technology for sustainable development

- · Certificate of Advanced Studies in Management of Development Projects (MaDePro)
- · Certificate of Advanced Studies in Disaster Risk Reduction (CDRR)

EXCHANGE Platform

Promote capacity-building through knowledge exchange in a spirit of solidarity

- Organization of a biennial international conference >> Tech4Dev 2010, Tech4Dev 2012
- Roundtables/Debates
- Publications >> Technologies and Innovations for Development, Springer-Verlag, 2012
- · Strategic support to stimulate new projects in EPFL faculties

¹ Further information on the EPFL can be found at: <u>http://www.epfl.ch</u>

² Further information on CODEV can be found at: <u>http://cooperation.epfl.ch</u>

Conference Organizing Committee

Conference Logistics HAZBOUN, Eileen, **UNESCO Chair Administrator**

Scientific Conception

BOLAY, Jean-Claude, Prof. **Director of Cooperation**

RIZZOTTI, Nathalie **UNESCO** Chair Coordinator

With the support of -

AUBRY-Dutoit, Sonia CHANGKAKOTI, Yuri CHERPILLOD, Caroline CVETINOVIC, Marija DUPUY, Céline HERCOG, Metka HERRMANN, Doris JACOT-DESCOMBES, Valérie KERN, Abigail KLAIBER, Bertrand PANTANETTI, Serena **REPETTI**, Alexandre RODER, Ursina SCHMID, Magali SCHONENBERGER, Klaus TEJADA, Gabriela WARIDEL, Corinne WHITEHEAD, Fiona



Cluster

Your entry point to cleantech in Western Switzerland



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Program

DAY 1 - Tuesday 29 May 2012

Time	Session	Program / Details / Key persons	Place / Rooms
09:30 onwards		Registration opens	Hall Polyvalente
11:00 - 12:00		Welcome Aperitif / Standing Lunch Poster session	Hall Polyvalente
12:00 - 14:00	PLENARY	Opening Ceremony Prof. Philippe Gillet (Vice-President for Academic Affairs, EPFL) Dr. Jean-Bernard Münch (President, Swiss Commission for UNESCO)	Polyvalente
	KEYNOTE	Keynote Speaker Introduction by Prof. Jean-Claude Bolay (Director, CODEV, EPFL) Dr. Lidia Brito (Director, Division of Science Policy and Sustainable Development, UNESCO and former Minister of Higher Education, Science and Technology in Mozambique)	
	SESSION 1	"Appropriate Technology"? Needs and Participation <u>Chairpersons and Coordinators/rapporteurs per workshop</u> For each workshop: 6-7 presentations (20 min. each) + synthesis/quest. Coffee Break (16:30-17:00)	
14:00 - 18:30	Workshop 1	ICT, Resource Management and Sustainability Dr. Barbara Becker (Managing Director, North-South Centre, ETHZ) Dr. Alexandre Repetti, Mr. Yuri Changkakoti (CODEV, EPFL)	CO 010
	Workshop 2	Water and Sanitation Mr. Christian Zurbrügg (Head of Department SANDEC, EAWAG) Dr. Klaus Schoenenberger, Ms. Metka Hercog (CODEV, EPFL)	CO 011
	Workshop 3	Human SettlementMr. Peter Brey (CEO, Terre des Hommes)Ms. Abigail Kern, Ms. Magali Schmid (CODEV, EPFL)	CO 015
	Workshop 4	Energy and Climate Change Prof. Edgard Gnansounou (Director, Bioenergy and Energy Planning Research Group, EPFL) Dr. Doris Herrmann, Dr. Bertrand Klaïber (CODEV, EPFL)	CO 016
	Workshop 5	Energy and Rural Solutions Dr. Anna Crole-Rees (Consultant, CRC4change) Dr. Gabriela Tejada, Ms. Ursina Roder (CODEV, EPFL)	CO 017
19:00 - 20:00	SPECIAL EVENT	Book Launch - Tech4Dev 2010 Introduction by Dr. Jean-Yves Pidoux (City Councilor, City of Lausanne) Prof. Jean-Claude Bolay (Director, CODEV, EPFL) Aperitif offered by the City of Lausanne	Polyvalente Hall Polyvalente

DAY 2 - Wednesday 30 May 2012 (Morning)

Time	Session	Program / Details / Key persons	Place / Rooms
7:30 onwa	ards	Onsite registration Welcome Coffee	Hall Polyvalente
08:30 - 09:30	PANEL DISCUSSION	Research that Considers the Real Needs of the Forgotten Poor Synthesis and Discussion (*)	Polyvalente
09:30 - 11:00	KEYNOTES	Keynote Speakers Introduction by Prof. Jean-Claude Bolay (Director, CODEV, EPFL) Dr. Martin Dahinden (Director General, SDC) Prof. Miguel Nicolelis (Founder and Scientific Director, Edmond and Lily Safra International Institute for Neuroscience Natal)	Polyvalente
11:00 - 11:30		Coffee Break	Hall Polyvalente
	SESSION 2	Towards Sustainable Integrated Development? Partnerships and Systems Chairpersons and Coordinators/rapporteurs per workshop For each workshop: 3-4 presentations (20 min. each) + synthesis/quest.	
11:30 - 13:00	Workshop 1	Energy Mr. Arun Sam Amirtham (Executive Director, Swiss Mango) Dr. Doris Herrmann, Dr. Bertrand Klaïber (CODEV, EPFL)	SV 1717A
	Workshop 2	ICT, Resource Management and Sustainability Mr. Reinhard Scholl (Deputy Director, ITU Telecom. Standard Bureau) Dr. Alexandre Repetti, Mr. Metka Hercog (CODEV, EPFL)	Polydôme
	Workshop 3	Human Settlement Chair to be confirmed Ms. Abigail Kern, Ms. Magali Schmid (CODEV, EPFL)	Polyvalente
	Workshop 4	Health and Environmental Risks Dr. Beat Stoll (University of Geneva, Institute for Social and Preventive Medicine, Co-founder and Chief Medical Officer, EssentialMed) Dr. Klaus Schoenenberger, Ms. Ursina Roder (CODEV, EPFL)	SAS Polydôme
13:00 - 15:00		Standing Lunch	Hall Polyvalente

(*) Moderators:

Mr. J. Ledgard, Journalist, The Economist Mr. N. Guérin, Journalist, EPFL

DAY 2 - Wednesday 30 May 2012 (Afternoon)

Time	Session	Program / Details / Key persons	Place / Rooms
13:30 - 15:00	SIDE EVENT [IDE-E/MI]	Beyond Technology Investment for Investors only: How to Ensur Benefits for Local Economies and Populations? Institute for Dev., Environmental and Energy and Millennium Institute	CO 216
O P	SIDE EVENT [TdH]	Software Platforms for Humanitarian Contexts Terre des Hommes	CM 1368
T I O N	SIDE EVENT [UPC]	Challenges for Local Authorities: Planning Adaptation to Confront Extreme Weather Events UNESCO Chair on Sustainability, Polytechnic University of Catalonia	CM 1468
A L	SIDE EVENT [LK-FpH]	Living Knowledge: The International Science Shop Network - Creating Public Access to Research The International Living Knowledge Network and Fondation "Sciences Citoyennes"	Cosandey
	SESSION 2	Towards Sustainable Integrated Development? Partnerships and Systems Chairpersons and Coordinators/rapporteurs per workshop For each workshop: 3-4 presentations (20 min. each) + synthesis/quest.	
15:00 - 17:00	Workshop 1	Energy Mr. Arun Sam Amirtham (Executive Director, Swiss Mango) Dr. Doris Herrmann, Dr. Bertrand Klaïber (CODEV, EPFL)	SV 1717A
	Workshop 2	ICT, Resource Management and Sustainability Mr. Reinhard Scholl (Deputy Director, ITU Telecom. Standard Bureau) Dr. Alexandre Repetti, Mr. Metka Hercog (CODEV, EPFL)	Polydôme
	Workshop 3	Human SettlementChair to be confirmedMs. Abigail Kern, Ms. Magali Schmid (CODEV, EPFL)	Polyvalente
	Workshop 4	Health and Environmental Risks Dr. Beat Stoll (University of Geneva, Institute for Social and Preventive Medicine, Co-founder and Chief Medical Officer, EssentialMed) Dr. Klaus Schoenenberger, Ms. Ursina Roder (CODEV, EPFL)	SAS Polydôme
16:30 - 17:30		Coffee Break Poster Session	Hall Polyvalente
17:30 - 18:30	PANEL DISCUSSION	Can Technology Trump Politics Synthesis and Discussion (*)	Polyvalente

(*) Moderators:

Mr. J. Ledgard, Journalist, The Economist Mr. N. Guérin, Journalist, EPFL

DAY 3 - Thursday 31 May 2012 (Morning)

Time	Session	Program / Details / Key persons	Place / Rooms
7:30 onwards		Onsite registration Welcome Coffee	Hall Polyvalente
08:30 - 10:00	KEYNOTES	Keynote Speakers Introduction by Prof. Jean-Claude Bolay (Director, CODEV, EPFL) Prof. Luc Soete (Director, United Nations University, Economic and Social Research Institute on Innovation and Technology) Dr. h.c. Pierre Landolt (Associate Landolt & Cie, Swiss Private Bankers)	Polyvalente
10:00 - 10:30		Coffee Break	Hall Polyvalente
	SESSION 3	Technology Transfer or Co-creation? Knowledge Sharing and Empowerment Chairpersons and Coordinators/rapporteurs per workshop For each workshop: 3-4 presentations (20 min. each) + synthesis/quest.	
10:30 - 12:00	Workshop 1	Education and Cooperation Dr. Rudolf Dannecker (Board Member, HELVETAS Intercooperation) Dr. Gabriela Tejada, Ms. Metka Hercog (CODEV, EPFL)	SAS Polydôme
	Workshop 2	ICT, Resource Management and Sustainability Mr. Yves Habumugisha (Burundi Country Dir., Food for the Hungry) Dr. Alexandre Repetti, Mr. Yuri Changkakoti (CODEV, EPFL)	Polydôme
	Workshop 3	Technology and Innovation Mr. Enrico Chesta (Head of Technology and IP Mgmt. Section, CERN) Dr. Doris Herrmann, Ms. Ursina Roder (CODEV, EPFL)	CO 2
	Workshop 4	Human Settlement Prof. Paolo Tombesi (Chair of Construction, University of Melbourne) Ms. Abigail Kern, Dr. Bertrand Klaïber (CODEV, EPFL)	Polyvalente
12:00 - 14:00		Standing Lunch	Hall Polyvalente

DAY 3 - Thursday 31 May 2012 (Afternoon)

Time	Session	Program / Details / Key persons	Place / Rooms
12:30 - 14:00 P T I O N A L	SIDE EVENT [RITIMO- FpH]	CITEGO: Sustainable Earth International University Foundation Charles Léopold Mayer pour le Progrès de l'Homme and RITIMO	CO 216
	SIDE EVENT [S2/TNS)	Participatory Dialogue using the Art of Hosting and TNSMethodologiesS2 Sustainability Strategies/The Natural Step (TNS)	CM 1468
	SIDE EVENT [REPIC]	Renewable Energies and Energy Efficiency with Poverty Reduction Renewable Energy & Energy Efficiency Promotion in International Co- Operation	CM 1368
	SESSION 3	Technology Transfer or Co-creation? Knowledge Sharing and Empowerment <u>Chairpersons and Coordinators/rapporteurs per workshop</u> For each workshop: 3-4 presentations (20 min. each) + synthesis/quest.	
14:00 - 16:00	Workshop 1	Education and Cooperation Dr. Rudolf Dannecker (Board Member, HELVETAS Intercooperation) Dr. Gabriela Tejada, Ms. Metka Hercog (CODEV, EPFL)	SAS Polydôme
	Workshop 2	ICT, Resource Management and Sustainability Mr. Yves Habumugisha (Burundi Country Dir., Food for the Hungry) Dr. Alexandre Repetti, Mr. Yuri Changkakoti (CODEV, EPFL)	Polydôme
	Workshop 3	Technology and Innovation Mr. Enrico Chesta (Head of Technology and IP Mgmt. Section, CERN) Dr. Doris Herrmann, Ms. Ursina Roder (CODEV, EPFL)	CO 2
	Workshop 4	Human Settlement Prof. Paolo Tombesi (Chair of Construction, University of Melbourne) Ms. Abigail Kern, Dr. Bertrand Klaïber (CODEV, EPFL)	Polyvalente
15:30 - 16:30		Coffee Break	Hall Polyvalente
16:30 - 18:00	PANEL DISCUSSION	Bridging Innovation to Scale. Ways to Improve Integration of Research and Practice Synthesis and Discussion (*)	Polyvalente
18:00 - 18:30		Closing Ceremony Dr. Adrienne Corboud Fumagalli (Vice-President for Innovation and Technology Transfer, EPFL)	Polyvalente

(*) Moderators:

Mr. J. Ledgard, Journalist, The Economist Mr. N. Guérin, Journalist, EPFL

Conference Overview

Before Rio+20, the UNESCO Chair in Technologies for Development felt it was important to gather people together in an international conference to reflect on the question of the scientific-professional partnership in order to achieve integrated and sustainable development with developing and emerging countries.

Whilst scientific research can be crucial in guiding innovation and development throughout the world, it remains often too detached from reality, particularly in developing and emerging countries. Thus, the challenge is to link scientific research and development practices in order to develop a win-win situation in which science and technologies can assist practitioners as well as reply to social needs.

The conference will look at how science and technologies can support both sustainable development in developing and emerging countries and the MDGs as defined by the United Nations in 2000. It will bring researchers and practitioners together in order to bridge the gap between the two communities, focusing on collaboration, methodologies, instruments and policies that could be used and/or encouraged.

The conference will offer unique opportunities for the acquisition of skills, information sharing and networking and will be conducive to:

- Improving research adapted to the beneficiaries;
- Enhancing research practices;
- Developing better integrated and interdisciplinary research;
- Involving professionals and practitioners in these efforts.

Objectives

- To allow new multidisciplinary and international partnerships among researchers and knowledge users (including NGOs, private sector, public collectivities, international organizations, etc.).
- To drive new research projects and training programs with a focus on improving the appropriation of technologies for sustainable development and poverty reduction.
- To increase the awareness of knowledge exchange and participatory approaches by bringing researchers and knowledge users together at the initial stages of the definitions of research questions.
- To set new directions for research, knowledge and capacity development needs related to sustainable technologies.

Outcomes

- Identification of 10 gaps and needs for field applications to allow more effective exchange of knowledge. A statement will be finalized in the last session and published on the webpage of the UNESCO Chair.
- Identification/valorization of flagship research projects as best practices/examples to show how both the advancement of development and science can be inclusive – (best practices in terms of their added value regarding methods, multidisciplinary approach, development impact, innovation, establishment of partnerships in a transdiciplinary way - i.e. involvement of stakeholders from diverse sectors such as civil societies, international organizations, decision makers, private sector, etc.).
- A selection of the best papers presented at the conference will be subject to a further peer-review with a view to publication in an edited volume by Springer-Verlag.

Conference Themes

Theme 1: "Appropriate Technology"? Needs and Participation

This theme will focus on how to ensure that technologies for sustainable development are more effectively appropriated whilst responding to the social needs and the realities of the beneficiaries.

- What defines "appropriate" technology?
- How did the research support the development of such an appropriate technology?
- How were the beneficiaries involved in the development of the technology?
- How did the beneficiaries accept to use the technology?
- How did the research take into account the social and beneficiaries needs?
- How do we ensure participation of the concerned stakeholders?
- How can research be better adapted to contexts?

Theme 2: Towards a Sustainable Integrated Development? Partnerships and Systems

This theme will discuss interdisciplinary research and the establishment of partnerships in a cross disciplinary way (i.e., involvement of stakeholders from diverse sectors: civil society, international organizations, decision makers, private sector, etc.).

- What kind of system can be developed to encourage and implement an interdisciplinary approach?
- How can these partnerships help new directions for research, knowledge and capacity development needs related to sustainable technology?
- What kind of mechanism can support a multidisciplinary implementation and sustainable development?
- What kind of partnership can ensure economic, social and environmental longterm system supported by technologies?

Theme 3: Technology: Transfer or Co-creation? Knowledge Sharing and Empowerment

This theme will explore ways of improving transfer and supporting co-creation of technologies. It will reflect on which methods and instruments are the most appropriate to guarantee the sustainability of the transfer; analyze its impact on society and what can be done to promote the exchange of knowledge.

- What can be done for a better co-creation of technology?
- How can we better exchange North-South and South-South knowledge?
- How can local knowledge be valorized in scientific research?
- How can we improve intellectual cooperation and information diffusion?
- What can be done to exchange best practices?

Scientific Committee

BOLAY, Jean-Claude

Appointed Director of Cooperation at EPFL in 2001, Jean-Claude Bolay has headed what recently became the Cooperation & Development Center (CODEV) since 2005. A sociologist by training, he specialized in urban issues in Latin America. Asia and West Africa. He prepared his PhD in Political Sciences at El Colegio de Mexico, then at UC Berkeley, USA. Before joining EPFL in 1989, he worked for the Swiss Agency for Development and Cooperation (SDC) both in Switzerland and in Cameroon. He has carried out many international research projects in Vietnam and Latin American countries in particular, looking at social practices in urban societies, sustainable urban development and poverty reduction in developing countries. He was a scientific advisor and evaluator for the Swiss State Secretariat for Education and Research, the Belgian Universities' Commission for Development and the French Ministry of Foreign Affairs, among other institutions. At EPFL, he has directed postgraduate courses on development in Africa and India. A member of the executive and advisory boards of a range of institutions including the North-South NCCR, KFPE, and the Swiss Centre for Scientific Research in Abidjan, he can draw on his vast experience of North-South scientific development cooperation. In parallel to his position as Director of CODEV, he was appointed Adjunct Professor in 2005 in the Laboratory of Urban Sociology of the Natural, Architectural and Built Environment School.



CORBOUD FUMAGALLI, Adrienne

The Vice President for Innovation and Technology Transfer at EPFL, Adrienne Corboud Fumagalli focuses on the development of both industrial partnerships and EPFL's "Innovation Square". She is also involved in Technology Transfer and chairs two foundations that provide support to start-ups. A background in Telecommunications and Media Technology led to a career in New Business Development, with emphasis on Mergers & Acquisitions, for Swisscom in Bern (1996-2000) and Kudelski in Cheseaux (2000-2008). As Executive Vice President in charge of Business Development at Kudelski, she piloted several M&A projects and launched the MobileTV Business. She started her career as a researcher, lecturer and consultant in the field of media and information technology policies at various institutes (University of Fribourg, DAMS Bologna, CNRS Paris and McGill University, Montreal, Loughborough University) after completing a PhD in Economics and Social Sciences.



DANNECKER, Rudolf

Rudolf Dannecker holds a PhD in European History from the University of Basel, Switzerland. He has worked on many different assignments in international development cooperation. He was the coordinator for the Swiss Agency for Development and Cooperation (SDC) in East Africa and the Head of the Eastern Africa Department in Bern. He also coordinated SDC in India and Bangladesh. He was the founder and first director of Intercooperation, a Swiss NGO specializing in rural development and forestry, animal husbandry and microcredit systems. As Vice Director of SDC, he was responsible for personnel, training, evaluation and administration and from 1992 onwards, for bilateral development cooperation of SDC. Following his retirement in 2003, he is active in a number of Swiss development organizations (Board Member of Helvetas Swiss Intercooperation, Chairman of the Board of cinfo) and has worked on a number of mandates and assignments. He has travelled widely in Africa, Asia and Latin America on duty missions. He has a large practical knowledge of general issues of development cooperation, of program design and management, implementation, monitoring and evaluation of development programs.



FINGER, Matthias



Matthias Finger is Professor of Management of Network Industries at EPFL since 2002; he also directs the transport area of the Florence School of Regulation since 2010. He holds a PhD in political science from the University of Geneva and has been an assistant professor at Syracuse University (New York), an associate professor at Columbia University (New York) and Professor of Management of Public Enterprises at the Swiss Federal Institute of Public Administration. He is also a member of both the Swiss railways and Swiss electricity regulatory authorities. His main research interest is on the liberalization, re-regulation, and governance of infrastructures in the transport, energy, and communications sectors. He is the co-editor-in-chief of the Journal Competition and Regulation in Network Industries.



GESLIN, Philippe

Philippe Geslin is Professor and Laboratory Manager of the EDANA Anthropotechnological Laboratory at the University of Applied Sciences in Switzerland, specialization Industrial Design Engineer. He is Associate Professor at the Institute of Ethnology, University of Neuchâtel, where he is in charge of the anthropotechnological specialization. Philippe Geslin was educated at the Sorbonne University and the Ecole des Hautes Etudes en Sciences Sociales in Paris. He is the author of a PhD in social anthropology and ethnology conducted under the direction of Maurice Godelier. During the preparation of his first Master Degree, he spent a year at Columbia University in New York. Alongside his second Master Degree, he was trained in ergonomics at the Conservatoire National des Arts et Metiers in Paris under the direction of Alain Wisner which he was the assistant. He completed a post doctorate in cognitive science at the School of Cognitive Sciences, University of Sussex at Brighton, UK. For 20 years he developed the anthropotechnology field research and operates in different countries, mainly on environmental projects in Africa, Latin America, Europe and Greenland.



JAUBERT, Ronald

Professor at both Geneva's Graduate Institute and Lausanne University's Faculty of Geosciences and Environment, Ronald Jaubert is also associate researcher at the Mediterranean and Orient Research Centre (CNRS-University Lumière Lyon 2). He researches agricultural policies, water management, desertification and pastoralization in the Middle East, North and West Africa. Among others, he co-edited Les marges arides du Croissant fertile. Peuplements, exploitation et contrôle des ressources en Syrie du nord (2006).

MICHEL, Claudia

Claudia Michel is Coordinator for Knowledge Sharing and Learning at the National Centre for Competence in Research (NCCR) North-South. This involves acting as an agent between researchers, policymakers, and practitioners in order to transfer the most important research results into practice. She developed a monitoring and learning instrument for better understanding the effectiveness of NCCR North-South research. As a Senior Research Scientist at the Centre for Development and Environment (CDE) of the University of Bern, she is concerned with the issue of innovation in sustainable development. She holds a PhD in Geography (Social and Political Geography) and was a member of the Swiss Graduate School in Gender Studies 2002–2005. Her field experiences include two years of collaboration on a Bolivian project under the Swiss Agency for Development and Cooperation SDC (Watershed Management, Cochabamba, 1994–1997).

MORAND, Catherine

A journalist, Catherine Morand worked for several years in West Africa, based in Abidjan, as the correspondent of Swiss and international media. Upon her return to Switzerland, she joined the Information and Communication team of the Swiss section of Amnesty International and took part in several international missions. Since 2005, she is a member of the managing committee of SWISSAID, a Swiss aid organization active in cooperative development, and manages its French-speaking branch in Lausanne. She can still be regularly found in the field and writes articles and chronicles for various media.



SCHNEIDER, Daniel

Daniel Schneider is a qualified civil engineer HES, HEIG-VD in Yverdon-les-Bains. After 3 years in the Swiss private construction industry, he attended a specific education in cooperation development by CEAS. He spent 4 years in Burkina Faso as a volunteer and developed workshops focusing on the promotion of renewable energies and production of appropriable technologies. Back in Switzerland in 1987, he assumed the role of project manager and has been the director of the CEAS – Foundation of the Albert Schweitzer Ecological Center of Neuchâtel, an international NGO since 1996. Member of the Technical Committee of FEDEVACO for fifteen years, he currently chairs the Technical Committee of Latitude 21, the Federation of Cooperation in Neuchâtel, of which he is also member of the board. In 2010, he co-authored with Patrick Kohler of the "Anti-Poverty Innovation Guide" published by Editions Favre.



STOCKLI, Bruno

For the past 20 years, Bruno Stöckli has worked in various areas pertaining to both development cooperation and research partnerships. He received his doctorate at the Institute of Agricultural Economics of the Swiss Federal Institute of Technology, Zurich, and was involved in research work in West Africa for several years. As part of his activity as a consultant, Bruno Stöckli addressed a number of macroeconomic and research policy issues. During ten years he was heading a team at the Swiss Coalition of Development Organizations which is responsible, on behalf of the Swiss Confederation, for debt relief programs in developing countries. He is actually following and analyzing development topics with an emphasis on poverty reduction, civil society participation and development effectiveness. From 2005 until the end of 2001, Dr. Bruno Stöckli shared the presidency of KFPE.



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Speakers

BRITO, Lidia

Lidia Brito holds an undergraduate degree in Forest Engineering by Eduardo Mondlane University (Mozambique) and MSc. and PhD degrees in Forest Sciences from Colorado State University (USA). As the first Minister of Higher Education, Science and Technology of Mozambique (2000 – 2005) and Deputy Vice-Chancellor of Eduardo Mondlane University (1998-2000) she accumulated extensive experience in the fields of Higher Education, Science and Technology, ICT and innovation policies and programs. In the last year and half Lidia Brito has served as the Advisor of the Mayor of Maputo for Strategic Planning and External Relations.

She has more than twenty years working experience in the field of Forestry, Traditional energy (Biomass and charcoal), Wood Science and Technology as a University lecturer, researcher and consultant for Eduardo Mondlane University and other national and international institutions, combining academic with hands-on experience in promoting sustainable development, and community–based management and community development both in Mozambique and in Africa in general.

Extensive diverse experience working with local, national, and international organizations mainly in technical expertise and political support in good governance issues, energy, higher education, science and technology, ICT and their impact on social development. She has served as member of many boards, such as the IHE-UNESCO Governing Board (on going), UNESCO-NEPAD High Level group; United Nations University Council (on going), of the Advisory Board of the Community Development Carbon Fund, Steering Committee for the program on Sustainable Management of Forests in Africa (on going) and Board of Directors of the Development Gateway Foundation, and recently Member of the Board of Trustees for SciDev and member of the review panel for ESSP.



Director, Division of Science Policy and Sustainable Development, UNESCO and former Minister of Higher Education, Science and Technology in Mozambique

DAHINDEN, Martin

Martin Dahinden took over the position of Director-General at Swiss Agency for Development and Cooperation (SDC), Federal Department of Foreign Affairs in 2008.

Prior to this, Martin Dahinden headed the FDFA's Directorate of Corporate Management (from 2004), after having worked as Director of the Geneva International Centre for Humanitarian Demining (from 2000 to 2004).

Martin Dahinden entered the diplomatic service in 1987. During his career, he held assignments in Geneva as member of the Swiss Delegation to GATT, at the Swiss Embassy in Paris, as Deputy to the Swiss ambassador in Nigeria, and was temporarily posted at the Swiss Mission to the UN in New York. At the Head Office in Bern, he worked at the FDFA's Service for Disarmament Policy and Nuclear Issues, as Head of the OSCE Service of Political Affairs Division I, and held the post of Deputy Head of the OSCE Coordination Unit during the Swiss Chairmanship of the OSCE in 1996. The following year, he was sent abroad as Deputy Head of the Swiss Mission to NATO in Brussels.

Before entering the diplomatic service, Martin Dahinden studied Economics (Business Administration) at the University of Zurich. He worked as a post-graduate assistant at the University, and subsequently was employed with a bank and later with a publishing house.



Director General, Swiss Agency for Development and Cooperation

GILLET, Philippe



Vice-President of Academic Affairs, EPFL

Philippe Gillet completed his undergraduate studies in Earth Science at Ecole normale supérieure de la rue d'Ulm (Paris). In 1983, he obtained a PhD in Geophysics at Université de Paris VII and joined Université de Rennes I as an assistant. Having obtained a State Doctorate in 1988, he became a Professor at this same university, which he left in 1992 to join Ecole normale supérieure de Lyon.

The first part of his research career was devoted to the formation of mountain ranges – particularly of the Alps. In parallel, he developed experimental techniques (diamond anvil cells) to recreate the pressure and temperature prevailing deep inside planets in the lab. These experiments aim at understanding what materials make up the unreachable depths of planets in the solar system.

In 1997, Gillet started investigating extraterrestrial matter. He was involved in describing meteorites coming from Mars, the moon or planets which have disappeared today and explaining how these were expelled from their original plant by enormous shocks which propelled them to Earth. He also participated in the NASA Stardust program and contributed to identify comet grains collected from the tail of Comet Wild 2 and brought back to Earth. These grains represent the initial minerals in our solar system and were formed over 4.5 billion years ago. He has also worked on the following subjects:

- Interactions between bacteria and minerals.
- Solid to glass transition under pressure.
- Experimental techniques: laser-heated diamond anvil cell, Raman spectroscopy,
 X-ray diffraction with synchrotron facilities, electron microscopy.

Philippe Gillet is also active in science and education management. He was the Director of the CNRS Institut National des Sciences de l'Univers (France), the President of the French synchrotron facility SOLEIL and of the French National Research Agency (2007), and the Director of Ecole normale supérieure de Lyon. Before joining EPFL, he was the Chief of Staff of the French Minister of Higher Education and Research.

LANDOLT, Pierre

Pierre Landolt has been a member of the Board of Directors at Novartis AG since 1996. He qualifies as an independent Non-Executive Director. He is a member of the Corporate Governance and Nomination Committee. Mr. Landolt is currently Chairman of the Sandoz Family Foundation and oversees the development of the foundation in several investment fields. He is a Director of Syngenta AG. He is a partner with unlimited liabilities of the Swiss private bank Landolt & Cie. In Brazil, Mr. Landolt serves as President of the Instituto Fazenda Tamanduá, the Instituto Estrela de Fomento ao Microcrédito, AxialPar Ltda and Moco Agropecuaria Ltda. In Switzerland, he is Chairman of Emasan AG and Vaucher Manufacture Fleurier SA, Vice Chairman of Parmigiani Fleurier SA, and is on the Board of the Syngenta Foundation for Sustainable Agriculture, Switzerland. He is a Director of EcoCarbone SA, France, and Swiss Amazentis SA. He is also Vice Chairman of the Montreux Jazz Festival Foundation in Switzerland.

Mr. Landolt graduated with a bachelor's degree in law from the University of Paris-Assas. From 1974 to 1976, he worked for Sandoz Brazil SA. In 1977, he acquired an agricultural estate in the semi-arid Northeast Region of Brazil and, over several years, converted it into a model farm in organic and biodynamic production. Since 1997, Mr. Landolt has been Associate and Chairman of AxialPar Ltda, Brazil, an investment company focused on sustainable development. In 2000, he cofounded EcoCarbone SA, France, a company active in the design and development of carbon-sequestration processes. In 2007, he co-founded Amazentis SA, Switzerland, a startup company active in the convergence space of medication and nutrition.



Associate of Landolt & Cie, Swiss Private Bankers

MUNCH, Jean-Bernard

An international consultant, Jean-Bernard Münch has worked in the field of broadcasting all his life. He obtained a PhD in political sciences from the Institut Universitaire de Hautes Etudes Internationales in Geneva. He then studied financial management at Oxford and St-Gallen.

He started at the SRG SSR (Swiss Radio and Television) in 1969 as assistant to the director of the Télévision Suisse Romande. He rose within the ranks to become director of finances and management in 1981. From 1990 until 2002, he was the General Secretary of the European Broadcasting Union, an association of national broadcasters. Appointed president of the SRG SSR in 2002, he occupied that position until 2011. As of 1st January 2012, he is the president of the Swiss Commission for UNESCO.

Jean-Bernard Münch defends broadcasting in a highly competitive market. He has advised many organizations, amongst others in central and eastern Europe, as well as in Africa. He also represents the Eurosport Consortium. He has always committed himself to ensuring a strong cultural offer in the media and to promoting cultural diversity, as much at the national as international levels.



President, Swiss Commission for UNESCO

NICOLELIS, Miguel

While Dr. Nicolelis is best known for his achievements in developing Brain Machine Interfaces (BMI) and neuroprosthetics in human patients and non-human primates, he has also developed an integrative approach to studying neurological and psychiatric disorders including Parkinson's disease, epilepsy, schizophrenia and attention deficit disorder.

Dr. Nicolelis' research has been highlighted in MIT Review's Top 10 Emerging Technologies. He was named one of Scientific American's Top 50 Technology Leaders in America and is a recipient of the Whitehead Scholar Award; Whitehall Foundation Award; McDonnell-Pew Foundation Award; the Ramon y Cajal Chair at the University of Mexico and the Santiago Grisolia Chair at Catedra Santiago Grisolia. In 2007, Dr. Nicolelis was honored as an invited speaker at the Nobel Forum at the Karolinksa Institute in Sweden – returned in 2011 as a featured speaker at the first Nobel symposium to highlight brain machine interface research. He was awarded the International Blaise Pascal Research Chair from the Fondation de l'Ecole Normale Supérieure and the 2009 Fondation IPSEN Neuronal Plasticity Prize. Dr. Nicolelis is a member of the French and Brazilian Academies of Science and has authored over 180 manuscripts, edited numerous books and special journal issues, and holds three US patents.



Founder & Scientific Director, Edmond and Lily Safra International Institute for Neuroscience Natal

SOETE, Luc

Luc Soete (15 September 1950, Brussels) is Director of the United Nations University research and training institute: UNU-MERIT located in Maastricht, The Netherlands and Professor of Internal Economic Relations and Director-Dean of the Maastricht Graduate School of Governance (MGSoG) at Maastricht University. He is a member of the Advisory Council for Science and Technology Policy (AWT) and the Royal Dutch Academy of Science (KNAW).

Luc Soete graduated in economics from Ghent University, Belgium. He obtained a DPhil in economics from Sussex University where he worked as senior research fellow at the Science Policy Research Unit in the late 70's and 80's. From 1984 until 1985, he was visiting associate professor at the Department of Economics at Stanford University, USA. In 1986, he joined the new Faculty of Economics and Business Administration (now called the School of Business and Economics) at Maastricht University as professor of International Economic Relations. In 1988 he set up the research institute MERIT (Maastricht Economic Research centre on Innovation and Technology) which merged under his direction in 2005 with UNU-INTECH to become UNU-MERIT. In 2010, he became Director-Dean of the Maastricht Graduate School of Governance of Maastricht University. He is a member of the Board of the Maastricht School of Management (MSM) and the Belgian media company Concentra.



Director, United Nations University, Economic and Social Research Institute on Innovation and Technology

Side Events

Beyond Technology Investment for Investors only – How to Ensure Benefits for Local Economies and Populations?

Institute for Development, Environment and Energy and Millennium Institute

Traditionally, sustainable energy development cooperation has often been donor-driven, project-focused, and exclusively investor-oriented. This Workshop attempts to challenge conventional approaches to clean tech development, by addressing the fundamentals of public policy as a process that should be at the service of local economies and populations, beyond the perspective of projects. Participants will be asked to focus on how to strengthen local capacities to assess, plan, implement, facilitate, monitor and evaluate sustainable energy planning, based on:

- The use of customized Assessment and Simulation Tools, such as the IDE-E Public Policy Framework[™] for Sustainable Energy Development and the MI's Integrated Planning Tools designed to inform policy decision makers on the potential outcomes of policies.
- Practical examples drawn from experience in the field (Case study: A Territorial Approach to the development of Renewable Energy and Energy Efficiency in Morocco).

Governments around the world have increasingly recognized the potential socio-economic benefits from renewable energy technology (RET) development and energy efficiency management. The benefits most often cited include reduced dependency on imported fuel, increased local manufacturing and value generation, job creation and local entrepreneurship, knowledge transfer, extended access to (clean) electricity, desalination and extended access to clean water.

Beyond the right choice of technology, however, some of the key challenges for developing countries to access clean technology markets have found to be: relatively high upfront costs, rates of returns that exceed the timeframe poor households are able to project on, the lack of financial products to stimulate demand, lacking trust in new technologies, lacking awareness, the lack of service providers for adequate maintenance, among others.

Thus, local actors have a certain playing ground to promote and purchase clean technology. In many regards, however, their opportunity to do so and the extent to which they actually benefit from clean technology deployment will depend on the existence of an adequate policy environment.

Over the last years, increasing efforts have attempted to assess the potential socio-economic benefits from clean energy deployment. Also, there is an increasing recognition of the need to provide countries with the tools and knowledge required to establish adequate policy conditions for renewable energy deployment and management. Traditionally, however, such policy considerations have focused on financial and technical aspects, mainly tailored to potential investors. Studies commissioned by donors and cooperation agencies have often viewed 'policy' as a static set of instruments, regulations and government-sponsored programs. Support for local initiatives has been donor-driven, and often focused on projects, while disregarding the importance of public policy as a process.

The approach adopted by IDE-E, the Millennium Institute and their international partners considers the public policy process as that through which local priorities are established and resources allocated, based on the engagement of public, private and civil society stakeholders, across multiple policy levels and jurisdictions, with the purpose to serve national development goals and the needs of local populations.

Side Event IDE-E/MI Day 2 - 30 May 2012 13:30-15:00

Room CO 216

Software Platforms for Humanitarian Contexts

Terre des Hommes

Side Event TdH Day 2 - 30 May 2012 13:30-15:00 Room CM 1368 Terre des Hommes (TdH) has used information technologies to address and solve development issues in many of its countries of intervention. After developing tailor made solutions for specific contexts for a few years, TdH decided to collaborate with specialized companies and foundations in order to build software frameworks providing standardized, yet customizable, solutions to its programs on the field and to governmental institutions. This change of approach is made possible by the standardization the interventions models aiming to improve TdH ability to measure the results of its projects efficiently.

We will present the two software platforms in which Tdh has been actively involved:

- Pillango developed in the framework of a consortium with the software development company Wopata (Bordeaux, France)
- Kaikaia developed in collaboration with the Tutator Foundation (Aubonne, Switzerland)

The participants will have direct access to applications built with these platforms and will be able to exchange with TdH staff and its partners. In addition, we will also expose ad-hoc software solutions developed over the years in order to show how we have built our know-how leading to the development of these platforms.

The tools we will present are currently in use in project in Africa, Central America, Europe and the Middle East. They cover a wide range of thematics such as Social Work, Juvenile Justice, Mother-Child Health and Advocacy. The end-users are TdH workers as well as government employees. All these tools are web applications but are packaged in different ways in order to fit the needs and constraints of the contexts in which they are deployed.

The event will start with a short presentation (15 minutes) of the software platforms and applications that will be exposed followed by an "open testing" for the rest of the allocated time. We will install testing booths for each of the applications with a computer for the participants to use. Demo videos of the applications will also be shown.

Challenges for Local Authorities: Planning Adaptation to Confront Extreme Weather Events

UNESCO Chair on Sustainability, Polytechnic University of Catalonia

Traditional knowledge on adaptation to land use in seasonal climate behavior has progressively been forgotten from people's memory and from institutional territorial planning. In Colombia, as in other Latin American and Caribbean localities, global climate change and extreme rain effects produced by La Niña during 2010-2011, arrived in force few months later after El Niño, which caused severe draught events in the country. Inter-tropical events have highlighted the need to strengthen local institutional prevention and risk management arrangements in the planning process, to cope with vulnerabilities and the uncertainty generated by natural and anthropic origin disasters.

One of the challenges for sustainability is to build up environmental planning models after disasters, strengthening cultural adaptation systems, early warnings, establishing boundaries in high-risk areas and information systems to communities on vulnerabilities of local and regional ecosystems. Prompt responses to these challenges should contribute to reduce carbon emissions and mitigate risks originated by deforestation, river and coastal sedimentation, housing located in high risk areas, uncontrolled pasturing, legal and illegal mining, extensive agriculture and deficiencies in the coordination of infrastructure. A multi-threat approach in local planning should permit to prevent another humanitarian crisis and avoid population displacement.

The proposed side event will present case studies where we will debate southsouth and north-south exchange opportunities to build up a Training Program for Local Authorities. There is a need of strengthening relationships between academia and local authorities to introduce risk management and prevention methodologies and tools in territorial planning.

The Adaptation to Climate Change experiences presented in the side event panel will be useful to identify the main conceptual arguments to invite participants to join this initiative. Side Event UPC Day 2 - 30 May 2012 13:30-15:00

Room CM 1468

Living Knowledge: The International Science Shop Network - Creating Public Access to Research

The International Living Network and Foundation "Sciences Citoyennes"

Side Event LK-FpH Day 2 - 30 May 2012 13:30-15:00

Room Cossandey

In addition to the demands made on research and development by commerce and industry, civil society organizations have their own research needs. Diffusion of knowledge often focuses on communication from researchers to society, but increasingly there is a demand for communication from society to researchers. Different types of interfaces exist between researchers and society, one of which are the 'Science Shops', organizations created as mediators between citizen groups (trade unions, pressure groups, non-profit organizations, social groups, environmentalists, consumers, residents association etc.) and research institutions (universities, independent research facilities). It provides independent, participatory research support in response to concerns experienced by civil society. The term 'science' is used in its broadest sense, incorporating social and human sciences, as well as natural, physical, engineering and technical sciences.

Greater social participation enhances the quality of research by promoting analysis and debate about the norms, values and bodies of knowledge which exist in wider society. At the same time, knowledge about the research process is disseminated outside the science system. The participation of citizens and citizens' organizations in developing research issues, in the research process itself and in the debate about its findings therefore will be key factors determining the success of the transformation process.

The event will describe this specific approach of Science Shops and Community Based Research and show its benefits for society and the research community. It will discuss what innovation is needed to guide research towards public concerns and public goods and how civil society can fully participate in the co-creation of knowledge. The presentation addresses scientists, science communicators, community leaders, NGO representatives, graduate students, PhD students, and others who are interested in the Science Shop methodology or want to learn about Community-Based Research projects. The presentation will be given by Science Shop coordinators with a long experience, from France and Germany.

CITEGO: Sustainable Earth International University

Foundation Charles Léopold Mayer pour le Progrès de l'Homme and RITIMO

CITIES AND SUSTAINABLE DEVELOPMENT: WHERE are the significant experiments? WHO is doing WHAT?

All cities are unique, yet at the same time they all face similar challenges.

www.citego.info is an international documentary resource site to exchange, showcase innovation and highlight significant experience in the field of urban governance. The access is totally open, respecting the "creative commons" principles.

All over the world, in spite of the obvious differences of context, city-dwellers are facing the same challenges: lack of housing, ecological crises, saturated labor markets, need for integrated policies and participatory processes...

Innovative solutions are, however being developed, and are making headway. Cities are as much laboratories where to experiment more sustainable and responsible models, involving local populations. They can contribute to building a holistic approach to cities.

How to organize the exchange of experiments between these "citieslaboratories"? This is a challenge that CITEGO wants to address, contributing to the defragmentation of the different sectorial approaches, in a way that will reach beyond the specificities and meet the challenges of this century.

The web database gathers short texts (2-6 pages) classified by thematic folders as urban governance, mobility, urban networks, energy, housing, citizens participation. The articles can either be analyses, or case studies, proposals, book's summaries. The authors indicate the links towards further information about their article's topic.

Authors are university researchers, city networks, NGO, experts and practitioners in the field of town planning and management. They are selected by an editorial committee and can propose other contributors of their contacts... to collectively and gradually answer the question: WHERE are the significant experiments?

A part of the website is dedicated to a web portal, making visible the different stakeholders and organizations working on the contemporary urban issues, answering to the question: WHO is doing WHAT?

Finally, paper publications complete the web tools, giving opportunity for different authors to be published in several languages.

The objectives of this workshop are:

- to present the different aspects of the CITEGO project: web database, web portal, paper publications
- to receive propositions from potential contributors that are interested to publish their articles on CITEGO
- to initiate a debate on this project with different stakeholders from universities, NGO, state and international organizations, various experts: utility, pertinence, adaptations

Side Event RITIMO-FpH Day 3 - 31 May 2012 12:30-14:00

Room CO 216

Participatory Dialogue using the Art of Hosting and TNS Methodologies

S2 Sustainability Strategies and The Natural Step (TNS)

Side Event S2/TNS Day 3 - 31 May 2012 12:30-14:00 Room CM 1468

Join us in a Global Dialogue on The Future we Want.

The Global Dialogues brings together individuals and organizations from all backgrounds and walks of life to create an empowering new vision for what our future could be. It focuses this vision into a desire & commitment to work together to make this vision a reality, today

Global Dialogues are part of our long-term commitment of building sustainable and happy communities, globally and locally. In support of the participatory processes of the UN Conference Rio+20 in June, we also provide feedback from our Dialogues to Rio+20. At the end of each Dialogue the group feedback, knowledge and wisdom is harvested and brought together in a Country Report. An International report, combining all the country reports will be presented to the UNCSD during Rio+20 in June to guide and inspire World Leaders about the future and society that we as citizens want.

In this session the Global Dialogue Team will guide you to Connect, Envision, Engage, Reflect and Share – discover and explore what we need to learn, change and act on to create a society that is a home for all of us, and honors our planet and the future generations. At the end of the session, we will reach individual and group commitments on the actions we would like to take towards building this vision. You will also have the possibility to join this global initiative by adopting Global Dialogue methodology to tap into the wisdom of your community and start on your own journey.

Renewable Energies and Energy Efficiency for Poverty Reduction

Renewable Energy & Energy Efficiency Promotion in International Co-operation (REPIC)

The contribution to poverty reduction by introducing renewable energies and energy efficiency in developing countries is part of REPIC activities. The participation of local actors to answer the population's needs and the economic viability in a given context is of primary importance to the REPIC Platform.

REPIC is a common engagement of four federal offices (SECO, SDC, FOEN, and SFOE) in the international cooperation field. The REPIC Platform contributes to the implementation of global climate protection agreements and to a sustainable energy supply in developing and transition countries, as well as in Switzerland. The main principle for the activities and projects within the REPIC Platform is the local anchoring in the target countries, as well as an according sustainable impact. For a sustainable deployment of renewable energy and energy efficiency, socio-economical aspects like the creation of energy services, the improvement of the local infrastructure, the creation or promotion of marketing and financial structures are of particular relevance.

With the presentation and discussion of three pilot projects of different sizes supported by REPIC you are invited to exchange experiences with experts from three different institutions:

- Pierre Güntert, güntert Energieberatung: Project in Haiti: Biomass/Pyrolysis cook stoves
- Daniel Schneider, CEAS: Project in Madagascar: Pico hydro power for the rural population
- Nicole Stolz, Caritas: Project in Tajikistan: Energy efficient buildings for the rural population

The answers of those experts to the following questions are the main contribution to this side event: How were/are the beneficiaries involved in the development of the technology? How did/do the beneficiaries accept to use the technology? What can be done for a better co-creation of technology? You are welcome to ask further questions and take part in the discussions and exchange your ideas.

Side Event REPIC Day 3 - 31 May 2012 12:30-14:00 Room CM 1368



Abstracts

Day 1 - Tuesday 29 May 2012

"APPROPRIATE TECHNOLOGY?" NEEDS AND PARTICIPATION

ICT, Resource Mgmt. & Sustainability - 29 May 2012 - [CO 010] - 14:00-18:30						
14:00- 14:20	Kiran Kaphle	NP	Nepal Commerce Campus	185	Low Cost Technologies for Sustainable Development: A Way to Reduce Poverty In Rural Villages Using Low Cost Irrigation System	
14:20- 14:40	Ravinder Malik	IN	International Water Management Institute	123	Technologies for Smallholder Irrigation Appropriate for Whom – Promoters or Beneficiaries?	
14:40- 15:00	Theophile Mande	BF	Ecole Polytechnique Fédérale de Lausanne	160	Towards a New Approach for Hydrological Modeling: A Tool for Sustainable Development in a Savanna Agro-System	
15:00- 15:20	Sambit Mallick	IN	Indian Institute of Technology Guwahati	72	Proprietary Technology in Agriculture in India: Issues of Sustainability	
17:00- 17:20	Bassey Ubong	NG	Federal College of Education (Technical), Omoku	104	Essential Technology for Development: Towards A Pyramidal Paradigm	
17:20-	Benjamin Fiafor	GH	Farm Radio	324	Participatory Radio Campaigns: How Radio Can	
17:40			International		Be an Interactive Sustainable Development Tool	
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DAY 1 - TUESDAY 29 MAY 2012 SESSION 1: « Appropriate Technology? » Needs and Participation

14:00-18:30 ICT, Resource Management and Sustainability

Room CO 010

14:00-14:20 [185] Low Cost Technologies for Sustainable Development: A Way to Reduce Poverty in Rural Villages Using Low Cost Irrigation System

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Biography of presenting author: I am Kiran Raj Kaphle born in Palpa, Rupse Village Development Committee of western hilly region of Nepal. I completed M.A (Economics) in 1993 from Tribhuvan University. I worked as a Research Assistant for International Irrigation Management Institute/Agriculture University, Netherlands. From August 1992 I have been a lecturer at Nepal Commerce Campus, Kathmandu, Nepal. I have also published few textbooks of Economics. I have a keen interest in learning about low-cost agricultural technologies and systems which have direct influence in the economy of country like Nepal.

Abstract: Low-Cost Irrigation System is an appropriate technology for the sustainable economic development of developing countries like Nepal. Baduwa Low-Cost Irrigation System is an example of such irrigation system of Nepal on small scale. This surface irrigation system show, how barren land of the hilly areas can be productive, using the sources of stream water to enable the farmers to produce up to three crops in one year with increased output.

This study uses Primary data generalized interviewing 31 households from the field using simple statistical tools and secondary data collected through the concerned ministries, Departments, District Soil Conservation and Watershed Management Office, publication from the International Irrigation Management Institute, Agriculture Development Bank, Irrigation Management Project, and Water Uses Association of Baduwa low-cost irrigation system.

This system has given commendable performance in the command area. It might be due to the ownership feelings among the farmers as they have participated in all aspects of the system. And have developed a means to take care of the system which is based on need and problem resolution. This has played a crucial role in getting farmers to partake in a local Canal Committee. It is effective in creating favorable impacts on water utilization, operation and maintenance of the system, water allocation and conflict reduction.

Although government spends millions of rupees for the construction of irrigation system, its impact on production is not that effective. So the existing farmer's system and adopted practices should be identified and analyzed. Successful implementation this system has encouraged local people to participate other development works. People's participation in the maintenance can be mobilized in scientific way through the active role of WUG. Programs on crop diversification should be encouraged in a gradual manner so that the economic development of farmers could take place faster in a sustainable way. The importance of such type of system should be known by the farmers of developing countries. Government also should give first priority for the preservation and conservation of these systems for the sustainable economic development of the country.

Keywords: Ownership feelings, water users groups, barren land, appropriate technologies, preservation and conservation, sustainable development, appropriate technology

14:20-14:40 [123] Technologies for Smallholder Irrigation Appropriate for Whom – Promoters or Beneficiaries?

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Biography of presenting author: R.P.S. Malik works as a Senior Researcher-Economics with International Water Management Institute based in New Delhi office. He holds a PhD in Economics from University of Delhi. He has earlier been associated with several other organizations – University of Delhi, the World Bank, the World Resources Institute, Afro-Asian Rural Development Organization. He has published extensively on various issues related to water and agricultural economy. He is co-author of five books - three on water resources and two on agricultural economies. **Abstract**: The successful introduction of low cost irrigation technologies such as treadle pumps in Bangladesh during the 1980s and 90s encouraged NGOs, with substantial financial backing from donors, to replicate this success story in neighboring North Bengal region in India. Fifteen years after the first introduction of treadle pumps the socio-economic and technological landscape in study region has changed dramatically. Revisiting factors that contributed to its initial success this paper assesses if treadle pumps are an appropriate technology in the changed setting.

The results suggest that treadle pumps were successful because of a near technological vacuum and high cost of alternative technologies. Over the years significant changes have taken place. With the advent of small affordable diesel engines, motorized pumps became widely available and a large rental market for pumping equipment emerged. Availability of electricity in villages facilitated the installation of electric tube wells and the emergence of water markets. Rising labor wages and increasing concerns over drudgery hampered the uptake of labor-intensive technologies such as treadle pumps. With the availability of affordable alternatives, farmers started abandoning treadle pumps.

This study reaffirms that technology adoption is a dynamic process. Technologies that are appropriate at one point in time and under certain conditions may not be appropriate at other times under different conditions. The adoption of technology does not necessarily follow a linear path from simple manual technologies to 'advanced' motorized technology. Low cost is not always the determining factor in farmers' willingness to invest. The availability of affordable alternatives such as rentals, water markets and other sharing arrangements may facilitate access to those who cannot afford to own equipment.

The study underlines the need for regularly revisiting technology choices and independent monitoring to better understand changing landscapes of smallholder irrigation. This will ensure that the technologies desired most by beneficiaries -not just by promoters- get the support and promotional backing of the donors and governments for effective poverty reduction.

Keywords: Treadle pumps, smallholder, irrigation, appropriate, technology

14:40-15:00 [160] Towards a New Approach for Hydrological Modeling: A Tool for Sustainable Development in a Savanna Agro-system

Theophile Mande^{1,2,4}, Natalie Ceperley^{1,2}, Steven V. Weijs¹, Alexandre Repetti², Guillermo Barrenetxea³, Hamma Yacouba³, Tyler Scott⁵, Marc B. Parlange¹

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Biography of presenting author: Theophile Mande earned a specialized master's degree in Agricultural and Community Water Supply (2iE/EPFL) and a postgraduate degree (DEA) in mathematics and operational research at the University of Ouagadougou, Burkina Faso. Since 2008, he has been a PhD candidate at EPFL and he studies the hydrological processes in a semi agricultural catchment in Burkina Faso.

Abstract: Agriculture in Tambarga, a small, remote village in the landlocked country of Burkina Faso, is dependent on the seasonally variable local hydrology. Extreme seasonal and spatial variability of rainfall significantly impacts the livelihood of farmers, who depend mainly on rainfed agriculture. This dependence on rainfed production makes them particularly vulnerable to meteorological conditions, and they continually experiencing a low level of food security.

The groundwater is promising as storage to mitigate effects of drought. Because of it interactions with all the hydrological components we need to better understand all the processes to fully assess the impact of the possible solutions. Data to address answers to these issues were collected over a two and half year period in the Tambarga basin (area = 3.5 km^2). The field studies show the major portion of storm runoff was generated in the upper savanna basin. The response of surface flow to rainfall was heavily damped by storage and evapotranspiration on the agricultural basin. The seasonal cycles of groundwater appeared to control the stream flow; thereby the continuous flows over the entire stream occurred when the water tables became interconnected and intersect the ground surface. The hydrograph changes over the season with a single runoff peak during the first rain, to double and triple peaks when groundwater rose close to surface level. The base flow appears to be mostly originating from the agricultural field. A clear relationship was observed between the diurnal cycles of groundwater outflow and the evapotranspiration. Based on this relation we define a control area that apparently contributes to evaporation. This control area is dynamic in the sense that it may vary seasonally or throughout a

storm and remained constant during dry day. Additionally this paper introduces some ideas for future research in the area of development using a simple and more comprehensive hydrological model for sustainable water management.

Keywords: Hydrology, runoff control area, evaporation, groundwater flow, Burkina Faso

15:00-15:20 [72] Proprietary Technology in Agriculture in India: Issues of Sustainability

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Biography of presenting author: Sambit Mallick is Assistant Professor at the Department of Humanities and Social Sciences, Indian Institute of Technology Guwahati, India. He obtained his PhD from the University of Hyderabad, India in 2008. He specializes in the sociology of science and technology. He has been contributing research papers to peer-reviewed journals, including IEEE Technology and Society, Asian Journal of Social Science, Perspectives on Global Development and Technology, Current Science, Social Scientist, etc., and review essays and book reviews to reputed international journals.

Abstract: India has emerged as one of the leading countries in the world in promoting local R&D in agricultural biotechnology in general and GM crops in particular. Further, it has by now a fairly long experience in the functioning of comprehensive biotechnology and biosafety regimes that regulate the introduction and commercialization of GM crops and GM products. It is against this backdrop that a critical analysis of the Indian effort and its outcome would be of considerable value. Work on the GM-categories began in the late 1980s. Although many public sector R&D institutions have been actively involved in developing a core of GM-crops, with huge government support, none of these crops have yet reached the market. Private sector involvement, spearheaded by TNC joint ventures and subsidiaries, began in the mid-1990s as part of the New Economic Policy (1991) of the Government of India. In 1995, India became signatory to the WTO agreements. The Indian regulatory authorities have approved the general release and marketing of only one GM-crop, viz. GM-cotton varieties resistant to bollworm attack developed by the private sector. In this context, it is significant to understand not only the socio-economic, politicocultural, ethical, legal, institutional and ideological factors which contribute to the transition in the methods of agricultural production in India but also the responses of civil society organizations in India to such transition. Such debate assumes greater significance in the context of the questions of sustainability. As an empirical standpoint, this paper suggests to explore the Marker-Assisted Selection (MAS) technology in agriculture of developing countries such as India.

Keywords: Proprietary technology, agriculture, sustainability, India

17:00-17:20 [104] Essential Technology for Development: Towards a Pyramidal Paradigm

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Biography of presenting author: Holds an MBA (Marketing), postgraduate certificate in business education, Masters in philosophy of education; is a doctoral student in philosophy of education. Teaches entrepreneurship education, is currently Deputy Provost of institution. Presented paper at Philosophy of Education seminar at University of Edinburgh (2010); attended training, University of Ghent, Belgium organized by the Association for Cultural Studies (2011). Has 14 published literary works used at all levels of education in Nigeria and over 40 published academic papers in Nigeria and abroad.

Abstract: Appropriate technology, if defined from the western perspective, may well be a case of false paradigm and a bottleneck in accelerated economic development of poor countries. The false paradigm model arose from the attempt by development economists to transplant and implant developed country approaches and technology in poor countries where there are several structural problems traceable to status quo economics, culture, and politics that impede adoption and, or usefulness of modern technology. The starting point should be that of research into *perceptions* on the desirability of western technology *as is,* for the development process.

A survey of academicians using a purposive sample in a College of Education in Nigeria where virtually every aspect of operation have been digitalized shows that a new approach is required in the development process. Chi square tests of significance at 95% confidence level and 3 degrees of freedom were used for data analysis.

Results revealed the perception of those currently using modern technology: cutting edge technology would aid the development of Nigeria - used here as a typical poor country - yet, abandoning local technology would reduce the speed of economic development. Conversely, improving local technology would accelerate economic development. The paper sees appropriate technology for accelerated socio-economic development as *essential technology* defined as basic technology that characterizes a system or people's way of doing particular things. Poor countries would be better served if local technology is moved upwards in a pyramidal form. At present, the paradigm is that of an inverted pyramid where cutting edge technology transfer from North to South should be the determination of the acceptance-rejection framework of the beneficiaries through research; and development effort should be holistic, encompassing economics, sociology, psychology, education, and technology.

Keywords: Essential, appropriate, technology, development

17:20-17:40 [324] Participatory Radio Campaigns: How Radio can be an Interactive Sustainable Development Tool

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Biography of presenting author: Benjamin Fiafor has been managing the African Farm Radio Research Initiative-Ghana Office since August 2007. He is currently the Regional Field Manager, incharge of English-speaking West Africa. Prior to joining Farm Radio International, he worked on local governance issues with Netherlands Development Organisation (SNV). Benjamin holds a Masters in Development Studies from ISSER - University of Ghana, Legon. He has more than ten years working experience with international NGOs in various capacities.

Abstract: Although radio is an excellent medium for reaching farmers, it is not without its limitations. Traditionally, radio is a one-way medium that reaches farmers in their homes and their fields but on its own, radio has limited means of interacting with listeners, or including them in program design. Until now, radio has also lacked the potential for listening to programs on demand – if a program is missed, typically the average listener cannot hear it again unless it is rebroadcast.

Farm Radio International recently completed a 42-month action research project entitled African Farm Radio Research Initiative (AFRRI). The action research project took place in five radio stations in each of five countries: Uganda, Mali, Ghana, Malawi and Tanzania. Together with station staff and farmer-listeners, we experimented with a variety of ICT packages, including computers, MP3 players, internet access, call-in and call-out facilities, SMS alerts, "radio agents" and satellite internet terminals (VSATs). We evaluated each of these packages for both the radio stations and the farmers in the target listening communities. For the purposes of this research, Farm Radio International designed a new methodology of delivering agricultural radio called the participatory radio campaign (PRC). This is a carefully designed package of radio programs, running over 4-6 months, produced in collaboration with farmers, extension workers, agricultural experts and radio station staff, which responds to an expressed need of the listening community.

In farming communities which were fully engaged in the research, design, monitoring and evaluation process of building the participatory radio campaigns, people listened more, and had better knowledge of the topic. Furthermore, farmers in listening areas that were not directly involved in the campaign other than simply listening also showed a high increase in knowledge of the promoted agricultural improvement. Most importantly, a much greater number of farmers actually started practicing the agricultural improvement recommended in the broadcasts. The findings from our research indicate that there is a strong correlation between listening to episodes of a radio campaign and adopting a new practice.

Through AFRRI, we discovered that, under specific circumstances, the combination of radio and ICT increases interaction, listenership, and knowledge and adoption of new practices by farmers. Low cost modern ICTs including mobile phones, multifunction MP3 recorders and interactive voice response systems can dramatically increase the ability of rural radio to help farmers improve food security in Sub-Saharan Africa. The findings stress the importance of discovering strategies to get more people to listen more often. It is important to find strategies and technologies that increase engagement, participation and listening opportunities for farmers throughout a radio campaign.

Keywords: Radio, agriculture, ICTs, Africa

17:40-18:00 [394] Fostering Water Savings through Text Message Technology

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Biography of presenting author: My name is Lina Díaz, I am 22 years old. I was born in Bogotá, Colombia, and studied economics in Universidad de Los Andes. Currently I am finishing a Master degree in Economics at the same University, and since 2010 I'm working with ISF Colombia in this project, that is also my Master's dissertation.

Abstract: According to the Millennium Development Goals traced by The United Nations, particularly Goal 7: Ensure Environmental Sustainability; teachers and students of Ingenieros Sin Fronteras Colombia (*http://isfcolombia.uniandes.edu.co*) from Universidad de Los Andes (Colombia) and Corporación Universitaria Minuto de Dios (Colombia) in collaboration with a private company called Inalambria conducted a project to foster water savings through text message technology. The principal objective of the project was to lessen the water consumption level of a group of households from a town called Guasca. This town is located in one of the most important ecosystems, in terms of water provision: the *Páramo*. One of the main features of the aforementioned ecosystem is its ability to retain the water during the wet season and release it during the dry season, regulating the water supply in the region during the whole year.

The method applied to promote water savings was the self-monitoring, through the provision of feedback to each household about their daily consumption of water. The purpose was to increase the awareness of people about their own habits and practices, in order to incentive environmentally friendly behaviors. Once people connect certain behavior with a specific amount of water, they can identify the activities that consume more water and change them, adopting better practices.

To accomplish this task it was used a simple and accessible technology: SMS [Short Message Service], particularly because in Latin America nine out of ten people have their own mobile phone. Therefore, text messages were a powerful tool to make communication possible in spite of the distance, reaching a vast majority of people in a fast and easy way. Based on Inalambria's support the project could manage a big amount of data coming from text messaging communication.

During a period of four months, a group of high school students from Guasca sent us a daily text message with the reading of their household's water meters. Half of these households received feedback about their daily consumption of water. Following the Participatory Action Research, broadly used by ISF Colombia in several projects, we used the feedback as a self regulatory mechanism, to encourage people to save water not because someone imposed certain behavior, but instead, because their own learning guide them through an environmentally friendly path. In conclusion, it is possible to foster certain behaviors in people through the provision of specific information. Mobile phones are an excellent tool to reach people in a fast, easy and effective way,

and there is a long way to go to fully use this simple technology in countries like Colombia.

Keywords: Water, text messages, environmental sustainability, self-monitoring, Participatory Action Research

14:00-18:30 Water and Sanitation

Room CO 011

14:00-14:20 [X14] Development of Iron-Catalyzed Low-Cost Solar Process for Drinking Water Disinfection in Rural Areas from Colombia

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Biography of presenting author: MSc Cristina Ruales is a Chemist from the University of Cauca Colombia, Master in environmental chemistry from University of Valle-Colombia. In her masterwork, she assessed the concentrations of aromatic hydrocarbons and pesticides in soils, fishes, water bodies around Cali. Also their impact related to congenital malformations. Since April 2011, she is a doctoral student at the EPFL where she is working in the disinfection of water using photo-Fenton reagent.

Abstract: In this project, we proposed to develop a low-cost sustainable microbiological/chemical low cost, safe process to obtain drinking water for household and communities in rural regions from Colombia. This method is based on the enhancement of the SODIS method adding small quantities of cheap, easy to purchase and non-toxic hydrogen peroxide before solar irradiation. Under solar light, this solution reacts with iron salts present in Colombian waters, by a photo-Fenton reagent generating a highly reactive [•]OH-radical efficient in bacteria inactivation.

The main pathways involved in iron-catalyzed solar water disinfection will be identified and systematically assessed for the first time. The process parameters for applying the photo-Fenton reagent at near neutral pH and ambient temperature to solar drinking water disinfection will be defined and three types of low-cost pilot scale units will be comparatively studied and best one optimized with the participation of the target community.

The results obtained in this first year of the project address the photocatalytic bacterial inactivation via photo-Fenton reagent by using a solar simulated lamp and will be later up-scaled to solar radiation using a compound parabolic collector (CPC). Promising disinfection was reached with Pance River (River in Cali–Colombia) and Leman Lake (Lake in Switzerland) water contaminated with *E. coli* K12 used as a probe. Under solar irradiation alone, total disinfection was not reached after 5h and bacterial recovery was observed during the subsequent 24 h in the dark. The addition of low quantities of Fe^{2+ or} Fe³⁺/H₂O₂ at "natural" pH accelerated the bactericide action of sunlight leading to total disinfection. No bacterial recovery was observed during 24h after stopping sunlight exposure.

These results suggest that solar disinfection by photo-Fenton reagent promoted by solar light is a promising method, to obtain drinking water.

Keywords: Solar water disinfection, photo-Fenton, low-cost technology, *Escherichia coli*, inactivation

14:20-14:40 [344] Pilot Scale Validation of a Solar Parabolic Concentrator for Drinking Water Disinfection in a Rural School in Cameroon

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Biography of presenting author: Riccardo Bigoni (Pavia, 1984), M.Sc. in Environmental Engineer, is specialized in Water and Sanitation Technologies for Developing Countries. He is currently a Ph.D. candidate at CeTAmb, University of Brescia, Italy. His main research interests are drinking water treatments in developing countries (in particular the solar water pasteurization technique) and appropriate technologies for corrosion control in drinking water systems. He has working experiences in Peru, Brazil and Cameroon.

Abstract: Up to this time, in developing countries diarrhea and pneumonia are estimated to be the cause of 3.5 million children deaths annually. This dramatic phenomenon may be prevented by an intensive water supply, sanitation and hygiene promotion, leading to a decrease of the diseases diffusion and to a general enhancement of the living conditions. Many schools, particularly those in the rural areas, completely lack in drinking water, sanitation and hand washing facilities, although children have the right to basic services and hygiene education.

Among the others, adequate water disinfection is a possible intervention able to improve health and hygiene in schools; however, a large number of relevant technical and sociological variables must be assessed to select the most appropriate devices within each particular contest.

The aim of this work is to present a Parabolic Trough Concentrator (PTC), which relies on the principle of water pasteurization and is designed as a heat-based disinfection tool for water treatment, addresses to rural facilities in developing countries. The device has been realized considering resources and competences in a rural contest: electricity supply, materials availability and prices on the local market; operating costs, maintenance and easiness of use. Preliminary tests in laboratory have been performed on different pilot-scale PTCs to observe the water heating rate under real weather conditions. Moreover, the microbiological inactivation capability, the reliability and the efficiency of the device have been investigated.

A pilot-scale PTC has then been installed in the rural school of Babone (Cameroun), as a part of a cooperation project addressed to the reaching of hygiene and health higher standards. The system is currently under testing, and so far it shows to be appropriate to satisfy both disinfection and reliability criteria. The impact of the intervention on the local population and its effectiveness and appropriateness will be analyzed and detailed as well.

Keywords: Drinking water, disinfection, pasteurization, parabolic solar concentrator

14:40-15:00 [309] Defining and Delivering Appropriate Technology for Sustainable Access to Safe Drinking Water in Un- And Under-Serviced Rural South Africa

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Biography of presenting author: Bongi is a Water, Sanitation and Hygiene practitioner with several years' experience in Southern Africa. She has a strong interest in research and the utilization of outputs for support evidence based policy and practice in development of communities. Bongi holds an MSc in Public Health from Oxford Brookes University and has skills ranging from program design, management through to information dissemination and advocacy.

Abstract: This paper presents the experiences and lessons from the Accelerating Sustainable Water Services Delivery (ASWSD) initiative that is currently being implemented in South Africa. The initiative is being spearheaded by the Department of Science and Technology in partnership with the Council for Scientific and Industrial Research (CSIR). Millions of South Africans still do not have access to safe drinking water and the rate of coverage has slowed down over the years despite sustained financial investment into the sector and development of water supply technologies. The majority of the unserved citizens are in the hard to reach rural and other second economy areas. Thus, the ASWSD initiative is seeking to harness available technologies to accelerate the sustainable access to water services by those presently without.

Over the last two years, the initiative has progressed from the conventional, to prescribed and to co-construction of technological solutions with the water service providers (municipalities) and end-user communities. This paper presents how appropriate has been jointly defined in the context of the respective stakeholders, progressively leading to safe drinking water technology interventions. This process has led to interventions that are set to foster sustainable development through:

- Interventions based on a context analysis and consultation of end users as well as their service providers; as well as
- Water service providers that:
 - Take-over (from external project teams) technologies that they have the capacity to maintain with minimal external input;
 - Have knowledge about, access to and skills to exploit the national innovation system to harvest technological innovations;
 - Appreciate of the role that technological innovation can play in sustainable delivery of services.

The participatory comprehensive options assessment that has emerged and facilitated an allstakeholder co-construction of technology packages could lead to sustainable access to safe drinking water. It is anticipated that the experiences and lessons will be utilized by the relevant line departments and service providers to facilitate sustainable social and economic development.

Keywords: Drinking water, rural, accelerating, sustainability

15:00-15:20 [131] Applying an Extended Ladder of Participation for the Development of a Community-Managed Safe Water System in a Marginalized South Asian Community

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Biography of presenting author: Morgan MacDonald is a Canadian researcher working on his doctoral degree in Environmental Engineering at the University of Guelph. He currently works as Project Coordinator for the Alternative Water Systems Project, a collaborative research effort between the University of Guelph (Ontario, Canada) and the Indian Institute of Technology (Chennai, India). The project, funded by the International Development Research Centre, aims to develop sustainable decentralized water treatment systems to reduce the burden of diarrheal disease in marginalized low-income urban/peri-urban communities.

Abstract: This research applies Bruns' model of citizen participation to community-level management of a decentralized, point-of-use water treatment system in Mylai Balaji Nagar (MBN), a marginalized low-income peri-urban community in Chennai, India. The sustainability of water treatment systems in marginalized communities in the developing world is often contingent on the formation of local management structures. Project implementers too often fail to transfer managerial control to the community in a smooth and incremental process placing at risk the sustainability of the entire effort. Bruns' 'Extended Ladder of Participation' was developed to guide the transfer of decision-making power from project implementers to local communities via institutional reform and user participation. We use it here to discuss the changes that took place at MBN leading toward more sustainable water systems management.

A learning alliance between community residents and project researchers formed the basis for collaboration on the research, design and implementation of an appropriate water treatment system. Community members with an interest in improving water supply were invited to join a newly formed committee with the mandate to maintain operations and management of the water treatment system. The committee provides technical support to 130 households using the point-of-use system including maintenance, cleaning, and water quality testing for assuring treatment effectiveness. The sustainability of the water treatment system, as well as its potential for long-term public health gains, is now dependent on the committee's ability to overcome the inherent challenges of delivering a basic service in a difficult context with unreliable revenue streams.

Ultimately, the sustainability of appropriate technologies is contingent upon the resilience of the management framework in which it is embedded. Bruns' 'Extended Ladder of Participation' encourages institutional reform and stimulates autonomous community management by guiding development program strategy and tailoring activities to meet the needs and capacities of the local people. This research corroborates the model's usefulness in guiding effective water management reform in marginalized low-income urban/peri-urban communities in the developing world.

Keywords: Participatory development, community-management, extended ladder of participation, water, appropriate technology

17:00-17:20 [292] Ensuring Appropriateness of Biogas Sanitation Systems for Prisons -Analysis from Rwanda, Nepal and the Philippines

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Biography of presenting author: Christian Lohri has a background in Environmental Sciences and is working at Eawag in the department Sandec (Water and Sanitation in Developing Countries). His main research focus is on organic waste treatment in urban areas of developing countries. He has been involved in anaerobic digestion projects on household, institutional and municipal scale in Tanzania, Ghana, Nepal and Ethiopia.

Abstract: Biogas sanitation systems are seen as a promising technology for institutional settings of developing countries as they combine effective treatment of human excreta and kitchen waste, while at the same time generating a renewable fuel source for cooking and a nutrient-rich fertilizer. The Water and Habitat Unit of the International Committee of the Red Cross (ICRC) has been involved in the realization of biogas systems in prisons for the last 10 years to improve the poor sanitary conditions in detention facilities. In partnership with local organizations, ICRC has replaced the undersized and deteriorating septic tank systems in prisons of Rwanda, Nepal and the Philippines with fixed-dome biogas systems. After at least one year of operation, the 13 implemented systems were assessed in terms of their technical performance, economic viability, environmental impacts and social acceptance. For this purpose, on-site investigations were conducted (observations, interviews, measurement of gas production and composition, and analysis of process stability, reduction of organic load and pathogen content). 11 systems were in operation at the time of evaluation and displayed satisfactory process parameters with daily biogas production ranging between 26L/person and 62 L/person (obtained in prisons where kitchen waste was added to the digester). The vast majority of detainees perceived the biogas systems positively, mainly because it provides a smoke-free source of cooking fuel that contributes to money saving, and because it improved the hygienic conditions in and around the prison.

This paper synthesizes the experiences from Rwanda, Nepal and the Philippines by grouping them into technical, operation and maintenance, economic, environmental and socio-cultural aspects.

Based on these results, it highlights important issues such as criteria for site selection, dimensioning of digester, stakeholder's responsibilities, and health risks and mitigation measures, which all need to be considered in order to ensure the appropriateness of biogas sanitation systems as sustainable solution for prisons in developing countries.

Keywords: Anaerobic digestion, prison sanitation, institutional waste management, biogas

17:20-17:40 [335] From Participatory Design to Local Appropriation: A Case Study of Waste Management in Ouagadougou (Burkina Faso)

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Biography of presenting author: Graduated in 2008 from an engineering school in Cognitive Sciences and Human Factor, Chloé Lecomte started working at a R&D company in ergonomics before starting her own business. During two years, she worked with the CEFREPADE on the Waste Reduction Strategy Project in Ouagadougou on sustainability issues of waste management in developing countries. Still between the social, the economics and the technology, she started in 2011 a PhD in Industrial Engineering on the topic of innovation for the Base of the socioeconomic Pyramid.

Abstract: Nowadays, African societies face a demand of innovative solutions that combine traditional recycling networks with new economic and technical opportunities. Thus an « Appropriate Technology » for local waste management is not only the engineering development, but also - and even more - an issue of creating a new sustainable socio-economic network based on collection, sorting, valorization and selling. However, between the technological development within a project and the global diffusion and appropriation of these technologies inside the communities, there is a methodological gap to fill.

This paper explores the case study of a research-action project of Waste Reduction Strategy in Ouagadougou (Burkina Faso), involving the local government, NGOs and academic researchers from both South and North. Different from a simple technology transfer from North to South, our approach takes roots on the User-Centered Design methods to try to gain better understanding of what the project entails and ensure its acceptability.

Three years of trials and errors, research and experimentations bring us new elements for a participative approach compared to more conventional transfer of waste management technologies for waste valorization. From this return of experience, this paper proposes a new methodology based on an agile method of co design with an integrative management to ensure a local appropriation. We will insist on the importance of rapid prototypes, firstly as 'intermediary object' for a distributed decision-making process but also as a demonstrator to construct a local embedded usage. Furthermore, this paper enlightens the role of researchers and industrials for a sustainable local development, within and after a project.

Keywords: Waste management, user-centered design, participative design

14:00-18:30 Human Settlement

Room CO 015

14:00-14:20 [215] New Vernacular Architecture as Appropriate Strategy for Housing the Poor

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Biography of presenting author: Sytse de Maat graduated in 1990 as Master of Science in Architecture at Eindhoven University of Technology, the Netherlands. After many years in international architecture practice, he focused his work on user-building relations and the phenomenon of informal settlement. His passion is the connectedness of people with their buildings and the importance of being actively 'in touch'. Since 2010 he is PhD-candidate at EPFL, researching the topic 'Building as a life form in symbiosis with its user'.

Abstract: Improving living conditions of the poor often involves a drastic change in lifestyle, in order to fit daily life into industrially produced dwellings. Slum rehabilitation programs replacing informal settlements with standardized mass housing, have often resulted in a socio-cultural mismatch of inhabitants and their built environment. Participation strategies meant to counter this problem, show little effect unless the user is in charge. What is the problem with development and participation?

This paper will discuss 'housing the poor' as a case to illustrate how industrialization and systemization are at odds with participation. We will consider two ways of producing housing: industrial mass housing, and informal settlement. The focus is on the connectedness of the user, the inhabitant, with his dwelling.

It will lead to the observation that participation aims at meeting the diversity that is natural to human beings, whereas systemization requires and produces the opposite: humanly inadequate uniformity. Moreover, the term *user-participation* implicitly states the user is an outsider participating as a guest in the developer's projects, which after all are dominated by the interests of the construction industry. The gap between the user's informal economy and the developer's capitalized economy makes many housing-the-poor projects eventually non-appropriate. A billion people live in informal settlement and appear to be able to create reasonable shelter. Their way of dealing with housing shortage deserves recognition as it shows that housing improvement by users themselves is often more effective than top-down imposed replacement. Low-intervention approaches, such as *site-and-services*, have shown the value of user-driven development.

An Appropriate Technology - approach in housing the poor would benefit from a focus on userbuilding interaction as it taps directly into people's most powerful resource: creativity. Western systemization is not the only route to improvement. Strategies based on vernacular are at least as effective, appropriate, and humanly sustainable.

Keywords: Appropriate technology, new vernacular architecture, participation, user-driven development, informal settlement.

14:20-14:40 [81] Co-mimicking Technology with the Genius African Termites for Urban Sustainability: Case of Eastgate, Zimbabwe

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Biography of presenting author: Trymore Muderere is a final (4th) year student studying towards a BSc Honors Degree in Regional and Urban planning with the University of Zimbabwe. He is a publisher and columnist, who has presented at the: 2010 UNHabitat Workshop on Reviewing and Strengthening Planning Education in Zimbabwe; 2011 International Urban Wildlife Management and Planning Conference – Austin, Texas, USA and the 2011 ZIMBUILD Conference, Harare, Zimbabwe. Much of his work focuses on building strategies for livable, resilient and sustainable urban settlements.

Abstract: The main concern of this paper is to demonstrate the relevance of learning from nature aspects to do with design of buildings for the purpose of sustainability. Central to its scope is the concern to explore further, Girardet (2007) and of late Beatly's (2011) observation mainly from the European and American Schools of Planning that, sustainable cities are a product of harmonizing urban development with the natural environment. Yet the question remains how the termite mound model provides a model of a sustainable form of design of a Shopping and Office Complex in Zimbabwe's capital, Harare. Central to the discourse is the use of an anthill analogy. It explains the basic concept of the genius termite mound used in the design of the complex and how the termite technology is an effective hedge against urban poverty that plagues many African institutions (private and public; local and central). The building which was designed by Mick Pearce in conjunction with engineers at Arup Associates, has no conventional air-conditioning or heating, yet stays regulated year round with dramatically less energy consumption using design methods inspired by indigenous Zimbabwean masonry and the self-cooling mounds of African termites. The major arguments are that urban sustainability in the developing world where local authorities are poor and tenants and property companies are struggling to balance their budgets can only be guaranteed if the design of buildings mimics nature. Resiliency and sustainability in the 21st century cities is embedded in nature. Hence, there is need to transfer technology from nature into urban forms. The replication of designs created by termites do not only provide for a sound climate control solution but also are a cost-effective way for humans to function in an otherwise challenging context. The study adopts a quasi-qualitative-cum-technical approach based on a case study approach of Eastgate Shopping and Office Complex.

Keywords: Termites, technology, urban sustainability, Eastgate

14:40-15:00 [196] Poverty, Migration and Household Environmental Problems in Thirdworld Countries - A Case Study of Slums in Bangalore Metropolitan City

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Biography of presenting author: Dr. SiddeGowda was born in Halebudanur, a village of Mandya District, Karnataka State, India and he was graduated in Civil Engineering from the Mysore University in 1988 and he obtained Master Degree in Urban and Regional Planning for University of Mysore in the Year 1991. He was awarded his PhD (Civil Engineering) degree by the Viveshwaraiah Technical University Belgaum, Karnataka in 2011. He is an Associate Member of Institute of Town Planner India and Life Member of Society for Technical Education in India.

Abstract: This paper explores poverty, rural-to-urban migration and household environmental problems in third-world countries. In order to find the association between rural-to-urban migration, income, variables of household environment and health in the slums of Bangalore Metropolitan City, a number of variables were used. Data were collected with the help of a questionnaire by surveying 4560 households selected from 120 slums in the city. The resulting data provided descriptive and analytical statistics. The study shows that the flow of rural migration to the Bangalore metropolitan city in Karnataka is due to rural-urban dichotomies, be they natural disasters, extreme poverty, employment problem or wage rate. A significantly higher percentage of migrants live in slums as compared to other places (P< 0.003). Regression analysis shows that rural-to-urban migration is influenced both by "Push" and "Pull" factors, such as extreme poverty, employment problem, natural disasters, wage rate (push factors), and higher income probability, better facilities, and joining relatives/families (pull factors). A factor analysis showed similar determinants. Population density poses a major threat to household environmental conditions. Chi-square analysis shows that income and environment conditions are significant at 1% level. The study shows that lack of basic amenities and poor living conditions increase pollutants around low-income households. The study found average incidence of dysentery compared to respiratory diseases, jaundice and malaria, the main reasons being unsatisfactory water quality, storage of drinking water in open containers, disposal of fecal matter and lack of latrine facilities. Regression analysis to assess the degree of relationship between diseases and other variables in the slums of the city shows that related variables and diseases correlate positively. Multiple regression models show that municipal collection of fecal matter and storage of water in open containers are significant variables. Further, the coefficient of determination, R^2 , shows 92.9% variation in dysentery as shown by independent variables. The most severe household environmental problems and health effects are faced by the poor, i.e., lower-income households.

Keywords: Poverty, slums, sanitation, diseases, and statistical analysis

15:00-15:20 [390] Appropriate Technology to Reduce Risks and Protect Assets – an Example from Development Cooperation in Bangladesh

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Biography of presenting author: Nicole Clot (Swiss) - licentiate in Geography (University of Basel) and MAS in DRR (EPFL/University of Bangalore) - is Advisor in DRR and Vulnerability at HELVETAS Swiss Intercooperation since 2007. Main field of expertise: DRR and its link to development, rural livelihoods and ACC; the use of tools/ methodologies and capacity building. She was selected as a reviewer for the SREX and is a Corp Member of the Swiss Humanitarian Aid of SDC of its special group "Environment and DRR".

Abstract: Recent disasters or smaller events have revealed how risks are highly linked to existing development gaps, weak and inappropriate technologies and growth in economic and population exposure. Technology choices can contribute to risk reduction, but can also significantly increase and create risks (SREX 2012). So the main question is therefore how technology can positively contribute to strengthening the resilience and thus reducing risks.

In the program in Bangladesh, especially under the two projects of Livelihoods, Empowerment and Agroforestry (LEAF), and Samriddhi of the Swiss Agency for Development and Cooperation,

HELVETAS Swiss Intercooperation as implementing agent has started to systematically apply DRR and thus the identification of appropriate technology was key.

The active participation of local stakeholders is crucial in the process of identifying appropriate technologies. For this reason, HELVETAS Swiss Intercooperation developed a basic approach with generic steps to mainstream DRR in their development initiatives. The adaptation of the community based DRR mainstreaming tool is an important instrument which allows identifying systematically possible options and elaborating a DRR action plan with measures reflecting the local needs.

Although DRR can imply an additional investment, local communities recognized the importance of investing in sound technologies. With the support of a technical advisor, innovative technologies have been developed with the community based on the following criteria: structural measures were promoted that can be implemented and replicated by the communities themselves with little external capacity input and maintained by the communities with their own means. Those activities were followed up by non-structural measures like awareness raising, capacity building and sharing of experience which were at the core of all the interventions and eventually contributed to strengthening the social resilience.

The systematic involvement of local communities and authorities as well as skills building and knowledge sharing in the process of designing and selecting appropriate DRR measures are at the core of all interventions and form the bedrock of selecting appropriate technology. In other words, technological innovation may achieve resilience, especially when combined with capacity development anchored in local contexts (SREX 2012). The experience also revealed that the understanding of the concept of DRR is a precondition for selecting appropriate technology.

Keywords: Appropriate technology, disaster risk reduction, flooding in Bangladesh, participation of the community, resilience building, indigenous knowledge and techniques

17:00-17:20 [218] Mobile Phone for Improving Birth Registration in Senegal

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Biography of presenting author: Mr. Pape Kane Diallo is Director for West Africa within a nongovernmental organization specialized in education. Pape Kane Diallo has postgraduate degrees in communication and development, obtained in France and Canada. His field's work focuses on participatory approaches for development, and community-driven development. He has worked in various countries such as Mali, Guinea, Niger, Burkina Faso, Togo, Benin, and Morocco. He worked for a NGO consortium in Senegal and within a North American institute specialized in agriculture before joining Aide et Action. He is based at Dakar in Senegal.

Abstract: Our paper aims at showing how a relevant and adapted usage of technologies can contribute to achieving MDGs. We analyze more precisely the impact of cell phones' usage for improving birth registration and strengthening implementation of relevant national policies in phase with populations' means and needs.

According to a UNICEF report, around 51 million births remain unregistered every year in developing countries. Children whose births are not registered are not able to access the basic services (health, social security, education). Birth registration is also crucial for the implementation of national policies. In Senegal, one fifth of children is not registered at birth.

In the Kolda region - one of the poorest areas of the country – the NGO Aide et Action International has initiated a pilot project for improving birth registration thanks to new technologies. Other strategies such as information campaigns or large focus groups in villages proved to be relatively vain, as no significant increase of birth registration has been observed. In this perspective, Aide et Action has conducted an important survey on the birth registration's issue, and strategies for increasing it. Based on this survey, Aide et Action has implemented an innovative project in Kolda's area.

The main strategy of the project is to draw on a geographically near, cheap, easy to use and accessible tool for improving birth registration: cell phone. Village and quarter chiefs are directly involved in the project since they are in charge of birth notification; heads of registry offices' centers have to register births; and finally, judges have to confirm provided information. This system enables to ensure information's safety (thanks to encoding and encryption systems), to provide secure data (thanks to online data storage) and to facilitate follow-up by the authorities. The implementation of the first stage of the project has concerned 70,000 persons. First results are encouraging: within two months, 100% of births have been registered.

Keywords: Birth registration, mobile phone, Millennium Development Goals, Senegal

17:20-17:40 [208] Computerization of the Medical Consult for Children under Five Years of Age in Rural Areas of Burkina Faso

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Biography of presenting author: Mr. Deflaux is a software engineer. At Terre des Hommes, he is in charge of the development of information systems for the Foundation's fields of intervention. In the past five years he has managed software development projects in various domains such as health, juvenile justice or social work in over 15 countries.

Abstract: The Integrated Management of Childhood Illness (IMCI) is a diagnostic method and strategy developed by the World Health Organization (WHO) aiming to reduce the morbidity and mortality of children under 5 years of age. Adopted by Burkina Faso, its implementation in rural areas of the country is difficult due to an insufficient number of trained health workers and because difficult working conditions increase the lack of rigor and motivation.

Terre des des Hommes Foundation partnered with the software editor Wopata to develop a diagnostic support tool based on the IMCI directly intended for health workers.

The Electronic Consult Record (Registre Electronique de Consultation - REC) guides the health professionals throughout the consult to help them strictly apply the IMCI, thus decreasing the number of diagnostic and treatment errors. It determines in real-time the illnesses of the patients as the health worker identifies the symptoms identifies the treatment associated to each diagnosed illness according to the IMCI and the medicines to be prescribed with their dosages.

The REC is a web application. The learning curve is easy thanks to an interface specially designed for users with mostly no experience with computers. Despite the lack of internet connection, backup and consolidation of data at the level of the Ministry of Health is possible thanks to a secure export and synchronization mechanism via USB drives. The REC is installed on dedicated laptops (netbooks) with a customized operating system. The operator has complete control over hardware and software environments, simplifying maintenance operations.

By integrating the REC into the health system of rural areas of Burkina Faso we are affecting all the stakeholders of the health system. We are able to participate to the improvement of patient care, to ease the work of field agents and to allow to the Ministry of Health to better monitor the implementation of its national strategies. Ultimately, to save more lives.

Keywords: IMCI, mother-child health, diagnostic support, web

14:00 - 18:30 Energy and Climate Change

Room CO 016

14:00-14:20 [327] Appropriate Technology for Household Energy Access: The Case of the Centrafricain Stove in the Logone Valley (Chad, Cameroun)

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Biography of presenting author: Graduated in 2007 in Environmental Engineering with a thesis regarding the sustainable waste management in Peru, since the same year he has been working at CeTAmb – Research Centre on appropriate technologies for environmental management in Developing Countries. Since 2009 he is PhD candidate in "Appropriate Methods and Technologies for International Development Co-operation" at the University of Brescia, supported by the Alberto Archetti Fund. His research regards the study of appropriate technologies for energy recovery from wasted biomass in low-income Countries.

Abstract: The dissemination of improved stoves can play a key role in providing poor people with an adequate energy access in contexts where biomass is the only available energy source. The use of solid fuels in inefficient and smoky stove results in a number of heavy impacts on both the

users' health and budget, and the local environment. Thus, there is an urgent need for appropriate cooking technologies that allow using biomass in a more efficient, cleaner and easier way. This paper presents an experience in the Logone Valley (Chad/Cameroun) where some improved stove models were disseminated by a project leaded by the Italian NGO ACRA. The initiatives focused on the reduction of wood consumption and the creation of income generating activities. Thus, stove models to be promoted were chosen according to local constraints. The production process had to fit to the local handicraft skills in order to guarantee the reproducibility. Moreover local cooking practices were taken in great account, in order to meet the users' needs and match their priorities. A rigorous methodology was applied to assess the technical performances of different stove models proposed using different fuels in comparison with traditional cooking systems. The Centrafricain stove, a model suggested by a local research centre, was chosen according to the good performance in terms of fuel savings but also thanks to the adaptability to local conditions. Sale rates and acceptability by the users were assessed through specific surveys addressed to the artisans trained in the stove production and to the households that adopted the improved model. Thus, project actions went step by step with the research investigations in order to carry out a practical but at the same time rigorous intervention. The development of a self-sustainable market, subsidized only in the start-up phase by the project and the users' satisfaction degree proof the validity and the appropriateness of the approach adopted in the introduction of a new improved cooking technology.

Keywords: Developing countries, biomass stoves, household energy, energy recovery of residues

14:20-14:40 [92] What's Cooking? Evaluating Context-responsive Approaches to Stove Technology Development in Nigeria and Kenya

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Biography of presenting author: Temilade Sesan recently completed her PhD in Sociology and Social Policy. Her PhD thesis investigated the socio-cultural factors contributing to low rates of uptake of improved stove technologies by poor households, despite such technologies being widely promoted as a viable solution to the problems associated with widespread reliance on solid biomass fuels in the global South. She currently works as an independent consultant to government and civil society organizations in the areas of the environment, energy, and women's empowerment.

Abstract: The relationship between technology and development is a historically complex one. While it is the case that technology plays a central role in development, its relationship to development is by no means deterministic. On the contrary, the successful application of technology for human development is contingent on specificities peculiar to the local contexts in which it is deployed. A growing emphasis on engaging local populations in North-South development processes is aimed at facilitating the identification of contextually relevant solutions for complex local settings. This is true in the case of improved stove technologies, which have been promoted in the South by Northern-affiliated organizations since the 1970s towards mitigation of health and environmental hazards associated with the widespread use of solid biomass fuels for cooking.

From the mid-1980s, context-responsive, albeit increasingly market-based, approaches premised upon appropriate technology and participatory development principles have been widely promoted to address the perceived failures of previously favored expert-led approaches to improved stove development. This paper investigates two Northern-led stove projects – the CleanCook project initiated by Project Gaia in Nigeria and the smoke alleviation program by Practical Action in Kenya – which claim to be context-responsive in their implementation. The paper evaluates the extent to which these claims to context-responsiveness were borne out in practice, analyses the impact of each approach on uptake of the stove technologies promoted, and reflects on the wider implications for technology-led development projects.

The paper shows that Project Gaia's CleanCook project in Nigeria is, in reality, an expert-led intervention that fails to connect with bottom-of-the-pyramid populations in its quest to transfer a novel technology. In Kenya, Practical Action has been more responsive to contextual realities; however, success is limited by economic constraints and cultural preferences among target populations. The paper concludes that, despite the rhetorical shift by Northern organizations from expert-led to context-responsive approaches, engagement with local realities is still limited, and a more substantive shift towards context-integrated technological solutions is required.

Keywords: Context-responsive; expert-led; improved stoves; Kenya; Nigeria

14:40-15:00 [X6] Use of Agro-industrial Residues from Sugar Cane Mills for Social Benefits

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Abstract: The SUBA project (Sustainable biofuels from agricultural residues in Andean Countries) aims to develop at laboratory scale and assess technologies for energy valorization of agricultural residues. Bio-refineries based on second generation bio-ethanol were emphasized. The case of sugarcane residues was especially studied with the goal to co-produce ethanol and animal feed. Ethanol production using lignocellulosic residues is still at Research and Development stage. This paper discusses results of the SUBA project from the viewpoint of technology Appropriateness. The concept of "Appropriate Technology" is investigated and its relevance in the framework of the SUBA project is examined. A multidimensional definition of Technology appropriateness is then proposed, including technical, economic, logistical, social and environmental dimensions. The Strengths, Weaknesses, Opportunity and Threats are analyzed with regard to each of appropriateness dimension. The SUBA project has contributed to reinforce the capacity of the partners in second generation bioethanol production from sugarcane residues. However, supplementary effort is needed to achieve the development of specific technologies. However a significant progress has been made by the participants in mastering existing technologies. The utilization of locally produces reagents, the selection of a number of efficient native microorganisms from the local ecosystem, the use of local materials for enzyme production are few promising activities developed within the SUBA project. However, the trade-off between economic and social appropriateness is not easy at commercial stage. Second generation bioethanol based bio-refinery is very sensitive to economy scale. The technology is capital intensive. Hence effort should be made in favor of employment during the development of the new supply chain of the residues. Logistics of sugarcane residues was identified as the critical segment in that sense. It is proposed the creation of cooperatives in these activities which could employ part of the poor workers such as the cutters. Environmental appropriateness of the proposed bio-refinery will mostly depend on the percentage of residues that will be left for the regeneration of the field.

Keywords: Bio-refinery, sugarcane, residues, bioethanol, appropriate technology

15:00-15:20 [80] Potentials and Limitations of Jatropha Curcas for Rural Energy Supply in East Africa: A Case Study Based Comparative Assessment in Ethiopia, Kenya and Tanzania

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Biography of presenting author: Brigitte Portner is a geographer and currently a PhD candidate at the Centre for Development and Environment (CDE), University of Bern, Switzerland. She has a particular interest in environmental governance, with a regional focus on the Horn of Africa and Central America. Her current research focuses on the governance and impacts of global biofuel feedstock demand and production.

Abstract: Access to affordable, reliable and sustainable energy sources is a key aspect of poverty reduction and rural development in many parts of the world. In recent years, second generation biofuels emerged as a possible alternative energy source. In East Africa, lots of attention was

given to jatropha curcas, a toxic oil-producing shrub, due to its ability to grow in arid areas and on poor soils. But recent research in this region has shown that commercial plot-based jatropha curcas production entails serious investment risks, bears considerable opportunity costs of land and is consequently not economically viable for smallholder farmers. However, the question remains whether jatropha curcas hedges, which are used traditionally in the region, can play a positive role in enhancing the access of rural households to locally produced energy without threatening food crop production. Based on research conducted in 7 case study areas in East Africa (Ethiopia, Kenya and Tanzania), this paper concludes that jatropha curcas hedges have a significant potential for the substitution of kerosene or paraffin for lighting. This would help rural households to save much needed cash resources or to invest them into other farm activities, or into health and education. On the other hand, using jatropha curcas hedges to substitute firewood for cooking, presents some serious challenges. Jatropha curcas oil cookers are not yet working satisfactorily, are not affordable for many households, and the quantity of oil required for cooking would necessitate more hedges than are needed to fence average plots, which might lead to pressure on land. The use, for cooking, of the jatropha curcas seed-cake - a by-product obtained through pressing the seeds - has higher potential. However, adapted high-efficiency cookers and thinning down of the seed-cake with farm residues would be needed to achieve significant contribution to the energy requirements of households. Other challenges include the preservation of existing hedges' ecology, opportunity costs of labor and initial investment requirements.

Keywords: Jatropha curcas, biofuels, energy, rural development, sustainability

17:00-17:20 [268] Access to Energy: Mini Integrated Renewable Systems for facing the Technical Problem

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Biography of presenting author: Prof. Colombo is Associate Professor at the Department of Energy, Politecnico di Milano. She works on the interrelations between Energy, Environment and Sustainability, with a special interest in Access to Energy in developing countries. As Rector's Delegate to Cooperation and Development she fosters the role of academic research and technology for global development and human promotion. She works as an international expert for UNIDO, is member of the Scientific Committee of UNIDO-ICS and Vice President of Engineers without Borders, Milano site.

Abstract: Increasing Access to Energy is an opportunity for overcoming the "development divide" and fighting against global poverty as stated by the United Nation Development Programme. The Year 2012 is the "International Year for Sustainable Energy for All" declared by the UN, and this will drive additional attention on the subject by international organizations, donors and research centers and give the international cooperation the opportunity to be fostered also from the scientific research point of view.

Currently, almost 25% of the world population has no access to electricity and 80% of them lives in remote areas of South Asia and Sub-Saharan Africa. Here population mainly relies on traditional biomass (firewood, agricultural residues, dung) burned in inefficient ways with negative impacts on social, environmental and economic dimensions, and in few cases, on popular diesel generators. The present research points out that modern energy availability would foster the local development in terms of education, health, economic development (i.e., Small Medium Enterprises, SMEs) and living standards. In most cases, a single optimum solution (one source or one technology) is not expected to be appropriate for each framework because of different needs, sources, environmental conditions and technology availability. To face this issue, three essential elements need to be considered:

- 1. Considering "Access to Energy" as a multi-objective (technical, political and cultural mainly) and multi-stakeholders (citizens, decision makers and entrepreneurs) issue, partially covered by the technical problem.
- 2. Shifting from the concept of electrification to the concept of energization.
- 3. Decoupling the concept of appropriateness in two dimensions: Need-Based Systems and Suitable Technologies.

From the technical perspective, Renewable Energy Sources (RESs) appear to be an interesting and suitable solution for many remote locations where the national electric grid has not arrived yet, where commercial fuels are scarce due to their cost and/or availability and where renewable sources are locally available.

Keywords: Access to energy, energization, need based systems, suitable technologies, multiobjectives, multi-stakeholder problems

17:20-17:40 [71] Tackling Social Housing through the Commercial Use Low Clinker Cementitious Systems. Innovation on the use of Calcined Clay as Supplementary Cementitious Material

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Biography of presenting author: head of the Laboratory of Construction Materials (LMC) at EPFL, an internationally recognized leader in the research of cementitious materials. The focus of her research effort has been to develop quantitative methods for the characterization of cementitious materials. Her ability to bridge between "high tech" fundamental studies and practical applications is highly relevant to this project and its results, in which the aim is to use fundamental understanding to support development of products using highly diverse local materials.

Abstract: Concrete is the most used material on the planet. Cement, its main component, can be considered a local material, since it can be produced anywhere in the world. Developing countries account for more than 80% of world's cement production. The social housing programs in developing countries rely on the availability of affordable cement, among other applications, to produce concrete blocks or tiles, and mortar for masonry. There is a huge potential to improve cement manufacture through reduction of production costs and improvement on the environmental profile. Supplementary Cementitious Materials, SCM, are widely used to replace clinker in cement manufacture, and are reckoned to be a viable path towards improving efficiency. However, the current approach of using pozzolans as SCMs limits clinker substitution to a maximum of 30%. Collaborative research between the Laboratory for Construction Materials from Switzerland and The Center for R&D of Structures and Materials from Cuba program, initiated in 2005, has developed a cementitious system based on the combination of clinkercalcined clays-calcium carbonate. The experimental program carried out proves that up to 60% of clinker can be substituted without compromising strength and durability of the material. The new cement can be produced with only 40% clinker, with a reduction of approximately 50% of CO₂ emissions during manufacture, twice the CO₂ reduction accomplished during the production of Portland pozzolan cements. The Cuban cement industry has identified this research result as an opportunity and has launched a program, funded with own resources, to quickly introduce the result in the large scale manufacturing facilities in Cuba. The goal is to produce cement with standard quality, but a much lower cost, that can be made available for low-income population engaged in house construction or renovation.

Keywords: Social housing, low clinker content, calcined clays

17:40-18:00 [134] Mitigating Climate Change and Small Farmers' Vulnerability through Artificial Glacier Technology: Experiences from Cold Desert of Leh in North-West Himalaya, India

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Biography of presenting author: Dr. Sudan is currently working as Associate Professor of Economics at Department of Economics, University of Jammu, India with specialization in 'Environmental and Natural Resource Economics', Climate Change Economics, and Climate Change and Sustainable Development. He is serving as the Executive Director (Honorary), Sustainable Development Foundation, Jammu and Kashmir, India and Adjunct Research Fellow, Centre for Comparative Water Policies and Laws, University of South Australia. He has been awarded various inter-disciplinary post-doctoral research projects and national and international fellowships.

Abstract: Social-dimension of climate change is no longer peripheral to science, technology and innovation (STI). Indeed, STI is being mobilized to address climate mitigation and small farmers' vulnerability. During last more than four decades, the cold desert of Leh (Ladakh) in north-west Himalaya has observed decreased and untimely snowfall and retreating glaciers due to climate change, causing declining irrigation and agricultural productivity of smallholders, domestic water use and ecological purpose and increasing livelihood vulnerability. Experiences from Leh illustrate the potential of STI to address challenges of climate change and vulnerability of small farmers through use of artificial glacier techniques. With above backdrop, an attempt had been made to

examine small farmers' vulnerability and livelihood interactions to climate change and how use of STI, especially artificial glacier technology enhance their resilience to livelihood stresses. Study is based on primary data and information collected from 675 households confined to 27 villages of Leh and reveals that 61.18% of population is driving livelihoods from agriculture and allied activities. With increased irrigation potential due to use of artificial glaciers, food security has been assured to 77.54% of households and health vulnerability has been reduced in 31% of households. Seasonal migration as livelihood diversification mechanisms has declined in nearly two-third of households, thereby improving livelihood strategies. Use of tactical adaptations by small farmers in response to persistent droughts such as selling of livestock, expanding agriculture lands, and use of relief cash and foods have declined to respectively 20.44%, 24.74% and 63% of households. However, these measures are unsustainable on long-term basis. How should policy makers and other societal stakeholders act in this context? To address livelihood challenges, role of STI is critical in a multidisciplinary approach involving multilateral collaboration among different stakeholders. The presence of social entrepreneurs, new actors on the innovation scene are necessary to bring forth social dimension. To this end, better linking science and technology policy together with other policies should be encouraged.

Keywords: Climate change, small farmers, vulnerability, artificial glacier technology

14:00-18:30 Energy and Rural Solutions

Room CO 017

14:00-14:20 [305] Are Bio-fuels an Appropriate Way to Contribute to Poverty Reduction? Introducing a Bio-fuel Production in Rural Mali

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Biography of presenting author: Martina Brecciaroli obtained a Master's degree in Development Studies from the Graduate Institute of Geneva. Her work experience with governmental bodies and International Organizations has given her insight into different policy and strategy-setting mechanisms. She became interested in rural development and sustainability during a five-month research project in Mali, where she was involved in researching how rural households were affected by the introduction of a bio-fuel production system.

Abstract: The peak in oil consumption, global warming and the food crisis are central issues in the current global debate about energy and bio-fuels. The use of bio-fuel made from edible crops raises concerns on food security. Therefore, new forms of renewable energy, based on non-edible crops, such as the Jatropha curcas, have been developed and advertised as a valuable alternative. This paper analyses the viability of the development project "ALTERRE" implemented in Mali, in the rural community of Yorosso. ALTERRE is presented as an example of a way to contribute to poverty reduction in rural areas through the introduction of technical and agricultural "innovation". Its objective is to facilitate and increase the access of local rural population to energy and improve living conditions by replacing the consumption of gasoil with the allegedly cheaper locally produced bio-fuel made out of Jatropha. The project, widely accepted among Yorosso villagers, generated a fad for planting Jatropha. By means of quantitative and qualitative fieldwork carried out in 2010 and 2011, and based on paper-guestionnaires and semi-structured interviews, the study frames farmers' practices into the broader context of local perceptions about Jatropha, as well as institutional arrangements at local and national level. By analyzing the reasons underlying the enthusiasm for Jatropha as well as the uncertainties and the potential intrinsic risks linked to the adoption of this crop, the paper highlights, on the one hand, the elements ensuring the viability of the project and on the other hand, agro-ecological, social and economic elements which are likely to undermine the success of the project. The indirect effects triggered by the Jatropha production on the local food security, the interference of foreign NGOs on local agricultural entrepreneurship and the low capacity of controlling externalities, raise questions on the appropriateness of technology transfer in this development project, as in many others, and its adaptation to local context, in particular, to the needs of its beneficiaries.

Keywords: Bio-fuel, rural development, food security, sustainability, renewable energies

14:20-14:40 [315] Biomass-based Gasifier for Sustainable Rural Energy in India

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Biography of presenting author: Pierre Jaboyedoff is a senior engineer specializing in energy efficient buildings and solar energy applications with over 30 years' experience in the field. While representing the Swiss Federal Office for Energy, he participated in many major Research and Development projects lead by the International Energy Agency. He has developed the energy concept for low-energy buildings such as the Rolex Learning Centre or the Swiss National Office for Statistics. He has been working in India on energy efficiency since the early 80s.

Abstract: Half of India's rural households have no access to electricity. In 2005, more than 96,000 villages were still un-electrified, and just over 40% of the 138 million households used electricity for lighting. Rural electrification is a key concern for India's social and economic development. Besides, rural electrification in remote areas poses considerable challenges in terms of technological applications, investment costs and paying-off potential, as the connection to the grid is found to be complex and costly, while the loads required are rather limited. For such areas, small-decentralized biomass gasification based power plants emerge as an attractive option for rural electrification provided biomass is managed locally in a sustainable manner.

During the last 3 decades, small-scale power gasifiers have been tested in many regions of the world. More recent developments have demonstrated the feasibility of 100% gas systems, but the technology has not yet reached a commercial level. Meanwhile, DTU has developed an innovative two-stage biomass gasification process, which is characterized by having pyrolysis and gasification in separate reactors with an intermediate tar cracking zone. This allows for a fine control of the process temperatures resulting in extremely low tar concentrations in the raw and produced gas.

Based on a broad partnership involving the Swiss Agency for Development and Cooperation (SDC), the Energy and Resources Institute (TERI) in India, the Indian NGO Gram Vikar, the National Thermal Power Corporation (NTPC), Sorane SA and the Danish Technical University (DTU), an initiative was launched to apply the technology to India for rural off-grid power production. Small-scale applications will range between 10 to 50 kWe. The technology developed will allow remote communities to operate the system with minimal scheduled maintenance, while making use of local material and human resources.

This project has the potential to facilitate the introduction of sustainable and reliable biomass based power generation in villages, which will allow for increased social and economic benefits for the remote rural population of India.

Keywords: Rural energy, off-grid electricity generation, biomass, gasification, India

14:40-15:00 [78] Community Bio-digesters Meeting Rural Energy Need

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Biography of presenting author: Charushree Nakarmi, MSc. in Renewable Energy Engineering and MA in Rural Development is working with BSP-Nepal, a NGO, implementing national biogas program which has implemented about 250,000 biogas plants in Nepal. Her professional experience is mainly in designing community and institutional bio-digesters fed with biodegradable waste, she is also involved municipal waste management projects integrating biogas system with decentralized wastewater treatment system in urban and peri-urban areas, where municipal waste management is one of the emerging problems.

Abstract: Reliable and sustainable supply of energy is vital for survival and economic development of any country. With 81.4% of its population living in the rural areas and 30.9% lying below the national poverty line; it is not surprising that traditional energy occupies 87.3% of the national energy consumption and 69% of the population lives without sustainable access to improved sanitation. The scenario is still worse as we move into remote districts of Nepal. One of the solutions to this overwhelming problem arising in energy and sanitation situation is adopting biogas technology. In order to widen the scope of generating biogas from biodegradable wastes and cattle dung, BSP Nepal has been promoting household and community level biogas systems.

Community level bio-digesters help not only in addressing energy problems but also in resolving problems of health and sanitation. The system can be economically viable as the production of energy is at low cost. There are enough reasons to be optimistic by introducing community biogas plants as rural poor can have access to clean energy as well bio-fertilizer, which intend to promote the use of alternative energy by discouraging localized deforestation. Bearing this in mind, BSP-Nepal constructed two community biogas plants at Mahottari and Bara, with lessons learnt during implementation and operation; it further collaborated with Livelihood Forestry Program (LFP) for implementing additional 5 community bio-digesters at Kapilvastu, Rupandehi and Nawalparasi. Large quantity of fuel wood and Guinthas, used by community has been replaced after introduction of bio-digester, which helped in reduction of forest exploitation on one hand while on the other it also generates clean energy reducing carbon emission mitigating climate change.

Keywords: Community biogas plants, rural energy, climate change, carbon emission, forest depletion

15:00-15:20 [256] Rural Cold Storage as Post-Harvest Technology System for Marginalized Agro-Based Communities in Developing Countries

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Biography of presenting author: Mahesh is a research engineer with a degree in Civil Engineering and currently working with the Department of Water Supply & Sewerage, Government of Nepal. Mahesh is credited with two different innovative clean energy technologies in water supply in high hills and food preservation for small scale farmers of rural communities in Nepal; which were awarded respectively with Gold & Silver Mondialogo Engineering Award 2009 (UNESCO & Daimler, Germany). These works have had collaborative knowledge sharing with some PhD students of North Carolina A&T State University - USA.

Abstract: The goal of the present work is to provide the framework for the implementation of sustainable Rural Cold Storage (RCS) systems for farm produce in agro-based rural communities in developing countries. Rural Cold Storage (RCS), a post-harvest technology system for farm produce is an appropriate technology for marginalized rural communities in developing countries. The need for sustainable post-harvest cold storage systems for farm produce in agro-based rural communities is very necessary in prolonging the lifespan and freshness of perishable fresh farm produce (like leafy vegetables). In rural communities where electricity is lacking, implementation of electricity-based storage systems like refrigerators for fresh farm produce is unachievable. The implementation of naturally based post-harvest storage systems therefore becomes almost the only resort. Cold storage systems for fresh farm produce constructed from local materials which use natural phenomenon based on evaporative cooling is the subject of the present work.

Rural Cold Storage (RCS) system initially analyzed on the basis of thermodynamics principle by the research group has been constructed and tested with the involvement of the local farmers in selected rural communities in Nepal. The preliminary data obtained is used to modify and advance the design and construction of RCS system for implementation in agro-based rural communities in developing countries. RCS demonstrates an innovative sustainable system that addresses the storage issues of farm produce of the indigenous farmers in developing countries. RCS is virtually a zero energy technology and is constructed with local materials such as bricks, sand, water, clay, straw and bamboo and is operated at the cost of 2 buckets of water per day. RCS can be constructed with total cost of \$120-130 for 200-300 kg of farm produce.

RCS addresses fresh farm produce storage issues in agro-based communities and inherently provides jobs for indigenous farmers therefore alleviating poverty in such rural communities. In addition, RCS is an energy independent technology which minimizes global warming and addresses climate changes issues.

Keywords: Rural Cold Storage (RCS) system, sustainable systems, post-harvest technology, rural communities

17:00-17:20 [163] Decentralized Distributed Generation to Achieve Universal Rural Electrification in South Asia

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Biography of presenting author: Kapil Narula is pursuing his PhD in 'Development Studies' at Indira Gandhi Institute of Development Research, India. IGIDR is an advanced research institute which undertakes research on development issues from a multi-disciplinary point of view and encourages researchers with diverse disciplinary backgrounds to address issues of economics, energy and environment policies. He is an electrical engineer and in the past has worked on various aspects of power generation and distribution and is also a certified 'Energy Auditor'.

Abstract: This study looks at role of Decentralized Distributed Generation (DDG) technologies for providing 'Universal Electricity Access' for rural households in the South Asian region by 2030. We discuss the problem in two parts i.e. establishing a framework to identify an appropriate technology for rural electrification and designing an implementation model for delivery of electricity from distributed renewable energy based technologies. In the first part, we carry out modeling, estimation of household electricity demand, scenario analysis, comparison of levelised cost of electricity generation for various technologies and sensitivity analysis in order to identify the least cost technology and delivery mechanisms for rural electrification. The second part involves the process of design of implementation mechanisms where we identify the role and specific needs of various stakeholders, discuss rural electrification strategy and the activities to be undertaken in different stages by the concerned actors. We propose an integrated socioeconomic development model which is a partnership between RESCO/Entrepreneur and a village based co-operative for mainstreaming of rural energy access and involves participation from concerned stakeholders. Lastly, we undertake a discussion on policy implications of promoting DDG technologies and summarize the drivers, barriers and key success enablers from various case studies. We find that the cost of delivering electricity by centralized generation and grid distribution is up to four times the cost of stand-alone and mini-grid DDG options in the case of 'minimum threshold' demand scenario. These results are robust to alternate assumptions regarding costs of technologies. Analysis of results show that kerosene lighting is up to six times as expensive as electric lighting and we conclude that public subsidy bill for kerosene can be substantially reduced if all households switch to electricity for lighting. Thus, promoting DDG options is the most suitable strategy to meet the goal of universal electrification by 2030 while attaining economic efficiency, ensuring higher environmental sustainability and achieving energy security for the region.

Keywords: Off grid, rural electrification, electricity access, entrepreneurship models

17:20-17:40 [101] Field Investigations in Cameroon towards a More Appropriate Design of a Renewable Energy Pico Hydro System for Rural Electrification

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Biography of presenting author: Bryan Ho-Yan is currently completing his Master's of Applied Science degree in Environmental Engineering and International Development at the University of Guelph. Prior to this he was an engineering consultant for an environmental firm consulting on wind load effects on the built environment for global landmark projects. He lives happily in Guelph, Canada with his wife and two daughters.

Abstract: Pico hydro (very small scale hydro less than 5 kW) is recognized as a viable electrification option from economic, environmental, and social perspectives. Cameroon has significant hydro potential, yet low electrification rates. Barriers such as inaccessibility, corruption and high trade duties inhibit pico hydro development within Cameroon. To help achieve greater rural electrification, a low head pico hydro system is being developed for local manufacture to overcome these barriers. Field studies were conducted in the West and Southwest regions of Cameroon for problem contextualization. Market research, site visits to pico hydro turbine and small wind turbine installations, collaboration with artisans, and end-user interviews were conducted.

Most required materials for turbine system fabrication were accessible. Six pico hydro and three small wind turbine sites were inspected. They included both locally fabricated and imported systems. The uses of the electricity included general lighting, small media and cellular phone charging. Workshops were also visited, with their specialization in various trades such as carpentry, metal working, and electronics. Unguided trials were conducted with craftsmen to fabricate a turbine runner and observations made on the building process, accuracy and repeatability. End-users were informally interviewed regarding their experiences with pico hydro. Pico hydro in Cameroon is in its infancy stage. Both imported and locally manufactured products have been introduced to the region. The latter alternative showed signs of being more sustainable, however feasibility depended strongly on several factors. The success and longevity of locally manufactured systems requires robust designs and the establishment of local technicians and end-user training. In the event of failures, replacement parts and skilled trades are more accessible than for imported systems. End-users recognize the high costs of fuels and recognize pico hydro as a tangible means for electrification. Capacity for the manufacture of pico hydro systems exist, however further training and resources are needed for the production of a competitive product.

Keywords: Pico hydro, local manufacture, Cameroon, rural electrification

Day 2 - Wednesday 30 May 2012 - Morning Session

TOWARDS SUSTAINABLE INTEGRATED DEVELOPMENT? PARTNERSHIPS AND SYSTEMS

Energy - 30 May 2012 - [Room SV 1717A] - 11:30-13:00						
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11:50- 12:10	Brijesh Mainali	NP	Royal Institute of Technology	389	Analysis of Sustainability Indicators for Renewable Energy Based Rural Electrification	
12:10- 12:30	Collen Zalengera	MW	Loughborough University	294	Sustainable Livelihood Approach to Renewable Energy Technology Development- Experiences from Malawi	

ICT, R	ICT, Resource Mgmt. & Sustainability - 30 May 2012 - [Room Polydôme] - 11:30-13:00						
11:30- 11:50	Marija Cvetinovic	RS	Ecole Polytechnique Fédérale de Lausanne	121	Instrumental Participation in Serbia: On-line Platform for the Dialog about Public Spaces, their Availability and Public Usage		
11:50- 12:10	Samson Katengeza	MW	United Nations Development Programme	198	Effect of Participation in ICT-Based Market Information Services (MIS) on Transaction Costs and Household Income among Smallholder Farmers in Malawi		
12:10- 12:30	Dao Ngo	VN	Urban Rural Solutions	227	The role of ECOCOM in Local Development: An Attempt to Enrich Partnerships for Sustainable Development		

Human Settlement - 30 May 2012 - [Room Polyvalente] - 11:30-13:00						
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11:50- 12:10	Tom Sanya	ZA	University of Cape Town	175	Subversion from within? Altruism, Institutional Culture and Technologies for Development	
12:10- 12:30	Maria del Pilar Mejia Echeverri	со	Foundation for Multidimensional Education	242	Community Involvement in Technology Transfers. (Re)-Discovering and Implementation of Traditional Building Techniques as a Sustainable Development Tool. Case Study: Manizales, Colombia.	

Health and Environmental Risks - 30 May 2012 - [Room SAS Polydôme] - 11:30-13:00						
11:30- 11:50	Ashoke Kumar Sarkar	IN	Birla Institute of Technology and Science	186	Quantifying Accessibility to Healthcare in Rural Areas through Participatory Approach	
11:50- 12:10	Marco Caniato	IT	University of Brescia	338	Healthcare Waste Management in Gaza Strip: Challenges and Way Forward with a Participatory Approach	
12:10- 12:30	David Christensen	DK	Aalborg University	184	Innovation in Collaborative Networks: A Waste Management Initiative in Vietnam	

DAY 2 - WEDNESDAY 30 MAY 2012 SESSION 2: Towards Sustainable Integrated Development? Partnerships and Systems

MORNING

11:30-13:00 Energy

Room SV 1717A

11:30-11:50 [202] Renewable Energy Based Village Grids in Indonesia: Techno-Economic Aspects

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Biography of presenting author: In her PhD, Nicola Blum focuses on renewable energy-based village grids in South East Asia. Her educational background is mechanical engineering and technology management (ETH Zurich, KTH Stockholm and TU Delft). In 2010/11 she was a Mercator Fellow on International Affairs and gained broad practical knowledge in the field of renewable energy in developing countries while working for E+Co Clean Energy Investments in Amsterdam and Costa Rica and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) in South East Asia.

Abstract: Isolated grids in rural areas powered by independent renewable energy sources ('village grids') are widely considered a sustainable solution for Indonesia's rural electrification challenge. However, there is limited number of realized renewable energy based village grids, but a number of conventional rural electrification solutions such as grid extension or diesel based village grids. One reason can be attributed to the lack of private sector investments, leaving the responsibility of rural electrification predominantly on the shoulders of the government. To better understand this situation; in this paper we investigate the techno-economic drivers behind this lack of private investment. Additionally, we investigate possible technological levers which may reduce the cost of renewable energy based village grids and eliminate barriers of their diffusion.

A typical Indonesian village daily demand curve is firstly estimated, considering end-users in the household, productive use and social sectors. To meet the demanded levels of electricity, a village grid supplied by three power generation options are considered. First, as baseline a diesel powered village grid is modeled. This option is then compared to two renewable energy based rural electrification options: a solar photovoltaic (solar PV) plant with battery backup and a micro hydro power plant. The levelised costs of electricity (LCOE) for all technological options are calculated. We find that the LCOE of solar PV is higher than the LCOE of diesel, while the LCOE of the micro hydro power plant is the lowest. In a second step, to investigate the effects of technical levers on the competitiveness of solar PV based village grids, two approaches are considered: (a) modeling a hybridization of the solar PV/battery power plant with a diesel generator; (b) applying three demand side management strategies, including conservation, peak clipping and flexible load shape.

Keywords: Rural electrification, LCOE, micro hydro, solar photovoltaic, diesel generator

11:50-12:10 [389] Analysis of Sustainability Indicators for Renewable Energy Based Rural Electrification

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Biography of presenting author: Brijesh Mainali is a PHD researcher at Royal Institute of Technology, Sweden. He holds a licentiate degree in Energy Engineering. He has 15 years' experience in the field of rural electrification with development agencies, NGOs and private sectors. He was also a visiting researcher at IIASA in 2011. He was editor of an energy magazine in Nepal and has published several popular science articles, presented international conference papers and peer reviewed research articles, book chapter in international publications.

Abstract: Are the renewable energy systems applied for rural electrification in developing countries sustainable? What governs the sustainability of rural electrification systems? Verifiable sustainability indicators need to be identified within technical, social, economic, environment and institutional dimensions of the system under evaluation in a given specific context. The various methods used in assessing the sustainability indicators have been briefly reviewed in this paper. The sustainability indicators within each sustainability dimension are again evaluated for each alternative that are under consideration and compared with a reference case. All the indicators do not necessarily have same importance. These indicators can have different weight based on their importance in specific context. The questionnaire survey has been conducted with the local experts to determine the weighting factor of different indicators in the local context and finally the indicators under each sustainability dimension has been aggregated into one single index based on ratio of the sustainability indicators of two objects under analysis.. This index could help to have better comparison among various off-grid technologies and enhance the feasibility study of these available alternatives. This paper specifically analyzes the sustainability of rural electrification in Nepal with the technological alternatives viz. solar home systems, wind home systems and micro-hydro comparing with fossil based technology diesel generator as reference. The analysis shows that under prevailing policy and market infrastructure in Nepal, micro-hydro technologies have strong sustainability indicators in terms of technical, economical and environmental dimensions compared to other technologies, but this technology is comparatively weaker on its institutional and social dimensions which need more attention in the project design and implementation.

Keywords: Sustainability, indicators, electrification, aggregate index, Nepal

12:10-12:30 [294] Sustainable Livelihood Approach to Renewable Energy Technology Development - Experiences from Malawi

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Biography of presenting author: Collen is a PhD researcher at Loughborough University in the United Kingdom, and works as a Lecturer in Renewable Energy Systems at Mzuzu University in Malawi. He is researching novel methods and best practices for the development of renewable energy systems to enhance sustainable livelihoods in developing countries. Collen has designed and managed a number of funded renewable energy projects in Malawi and Mozambique. He serves on national technical committees on solar and wind energy in Malawi.

Abstract: This paper discusses project development processes applied in renewable energy projects in Malawi and highlights the importance of applying the Sustainable Livelihood Framework when identifying and selecting renewable energy technologies for communities. Lessons learnt from the successes and failures of five renewable energy projects are presented. Evidence is provided that application of the Sustainable Livelihood Framework in renewable energy technology development can improve systems sustainability and enhance the positive impact of renewable energy technologies on sustainable livelihoods. Sustainable Livelihood Framework is a tool developed by the British Department for International Development (DFID). The framework is founded on the identification of strengths, weaknesses, opportunities, and vulnerabilities based on the financial, physical, natural, human and social capital of poor communities. The framework is people centered and emphasizes the important role of transforming structures and processes (such as levels of government, private sector involvement, local laws and policies, culture, and local institutions) in deciding entry points into poor communities. Participation of local communities is encouraged so that change is directed by people to generate sustainable livelihood indicators defined by them. Community participation ensures that renewable energy projects meet community expectations because long term support measures are established within local communities. Participation ensures transparent access to renewable energy systems, social equity, and synergetic interdisciplinary relationships that provide holistic solutions for poverty reduction in poor communities. The approach is robust in identifying people's needs that can be benchmarked against universal sustainable livelihood indicators such as the Millennium Development Goals; and developing long term support measures for projects. The approach can transform communities' behavior towards sustainable living patterns without compromising the cultural heritage of societies.

Keywords: Renewable energy development, sustainable livelihood approach, Malawi

11:30-13:00 ICT, Resource Management & Sustainability

Room Polydôme

11:30-11:50 [121] Instrumental Participation in Serbia: On-line Platform for the Dialog about Public Spaces, their Availability and Public Usage

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Biography of presenting author: A PhD candidate at EPFL, her research focuses on participatory processes implemented through culture and creativity, and their potential to reduce the negative effects of globalization and urbanization in different environments, while being processed through modern technological instruments (software and web). She obtained her Master degree in Architecture (University of Belgrade), has worked in architectural practices, and been involved in artistic and social activities in Belgrade which gave her a broader picture of current potentials and conflicts in developing environments.

Abstract: This paper elaborates on the collaborative on-line platform for spatial resources in Serbia. This is an existing solution for the bottom-up involvement of stakeholders and communities in the revivification of non-functioning public spaces, a hideous legacy of the communist era compounded by the transition period and today's neoliberal practices. Continual participation in consulting, directing and strategy-making is an example of self-organization that allows active citizenship and long-term social sustainability. This idea of collaboration on a virtual resources database actively uses the technological advances of modern times and enables a passive spectator-urban actor to take an active part in the creation of their environment.

This platform launched a web-site in 2009 as a community-driven initiative to challenge uniform and centralized decision-making processes regarding the availability of special resources in order to gradually and systematically change Serbian society's attitude towards institutionalized democracy, participatory processes and urban sustainability. Moreover, this campaign ensures direct cooperation among urban stakeholders and informal groups concerning data, procedures, and practices of space utilization.

Generally speaking, any built environment always reflects political and economic processes, especially in turbulent social circumstances such as the disintegration of Yugoslavia's socialist system (destabilization of the institutions and the social value system). This urban planning model therefore resulted in overlapping responsibilities, heterogeneous organization structures, and unfinished projects. This situation continued to thrive in the wake of the break between socialist and neo-liberal urban policies. A series of derailed political rights and deviant market initiatives culminated in the maximization of land use, suburbanization and the general decline of the community and its culture. Such a scenario was possible due to the disintegration of existing zoning regulations and the lack of up-to-date ones, the collapse of key urban institutions and their inability to react to rapid change during the transitional period, which finally caused the vast majority of visible urban, spatial and social conflicts.

The paper will present how this participatory, online, user-friendly activity motivates inhabitants to engage in the public life of their city and, being exposed to the proof of urban problems, realize that they should participate in the decision-making process of the city's genesis. Finally, such a tool demystifies and specifically designates social actions in the transition period. This quality makes the platform applicable to a wide range of social contexts regardless of their particular spatial characteristics.

Keywords: Online participation, active citizenship, public space, post-socialist countries

11:50-12:10 [198] Effect of Participation in ICT-Based Market Information Services (MIS) on Transaction Costs and Household Income among Smallholder Farmers in Malawi

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Biography of presenting author: Samson Katengeza is a Research Assistant for UNDP Malawi. He holds MSc. Degree in Agricultural and Applied Economics obtained in 2009. He has an experience in both qualitative and quantitative research approaches and has good experience in descriptive and econometric analyses. He has taken administrative and consultancy works in areas such as agricultural and rural development, agricultural marketing and climate change. Samson Katengeza has three publications all in 2011.

Abstract: There have been efforts in recent years to promote adoption of ICT-based market information services with the aim of enhancing smallholder farmers' access to agricultural markets. Application of such services enhances information flow among users which enables economic agents to perform economic activities faster. In turn farmers are able to enhance their welfare through reduced transaction costs which translates into improved agricultural income. In Malawi, although there have been rigorous efforts by the government and development partners to enhance application of ICT-based services, there are no known studies that have examined the impact on smallholder farmers. This paper therefore examines the effect of participation in ICT-based market information services on transaction costs and smallholder farmers' agricultural income. The paper focuses on Malawi Agricultural Commodity Exchange as an ICT-based market information service intervention. Propensity score matching technique is used to examine the impact and uses household data from 410 farmers.

The paper finds that participation in ICT-based MIS interventions such as MACE reduces transaction costs facing smallholder farmers. There is also strong evidence that provision of ICTbased market information results into increased agricultural incomes. The findings imply that development strategy that embodies ICT-based market information services presents the farmer with means of resolving market failure that arises from high transaction costs. In particular, ICTbased MIS strengthen farmer linkage to agricultural input and output markets. It therefore has the potential to help smallholder farmers escape the low-equilibrium poverty trap that is usually characterized by limited use of agricultural inputs, low participation in agricultural markets, low incomes and subsequently low input use, again. However, government's continued control in agricultural marketing especially for staples emerge as one serious threat to the success of ICTbased market interventions in Malawi. Other challenges include poor supporting infrastructures such as roads; mobile phone network coverage; lack or limited ICT tools. The paper therefore recommends that government's policies that control agricultural marketing need to be minimized. The government should also work on enhancing provision of market information, promote ICT-based market information service projects and find ways of reducing costs of ICT service provision.

Keywords: Transaction costs, household agricultural income, ICT-MIS, MACE, Malawi

12:10-12:30 [227] The Role of ECOCOM in Local Development: An Attempt to Enrich Partnerships for Sustainable Development

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Biography of presenting author: Dr. Ngo's areas of expertise and experience include: urban design, environmental management and planning, land-use planning, solid waste management, migration and poverty linkages, public involvement and community participation in local development. During the past 4 years, she led a planning project near Hoi An (a world heritage site) in which an integrated and ecological approach to development was introduced.

Abstract: The participation of social groups and organizations in the local development process has been active in Vietnam since the last 2 decades. Linking such groups in the management of urban services and environment is a triangle partnership, between government, private and civil society. This partnership represents a new approach in urban management. However, its effectiveness is still in question on how to identify an "intermediate actor" who can catalyze and activate this partnership in a sustainable and efficient way. This paper describes recent experiences of ECOCOM- a form of social enterprise working on local development activities. Three main areas that ECOCOM intervenes in local development: 1) raising awareness of local people on their tangible and intangible assets (local culture, natural environment, builtenvironment, economy...); 2) improving physical landscape and environmental sanitation; and 3) Improving local economy by introducing new professions and jobs opportunities, as well as encouraging old professions serving local eco-tourism. It will also describe the development, the current dynamic and future prospects of such an actor who can eventually stimulate government/societal interface. In addition, the paper seeks to explore the contextual limitations/challenges surrounding the problem of improved local development in a specific area (An Bang-Hoi An- Vietnam). The paper concludes with a broad treatment of how a better performance for ECOCOM could be achieved.

Keywords: Ecological community, partnership in local development, coordinating and activating actor of the development, action-research

11:30-13:00 Human Settlement

Room Polyvalente

11:30-11:50 [20] Crime Prevention through Urban and Environmental Design: A Proposal for Slum Upgrading in Korogocho-Kenya

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Biography of presenting author: Julius Oketch Julius is specialized in the fields of urban planning and disaster management with special interests in disaster vulnerability analysis for the poor. He has carried out extensive field analyses in the areas of flood and landslide susceptibility mapping aimed at identifying risk factors pre-disposing vulnerable groups to pending hazards. His vast knowledge in disaster management has seen him facilitate a number of local seminars that create awareness on poverty alleviation and contingency planning for the poor in Kenya.

Abstract: Cities inhabit the effects of globalization especially related to safety, fear of crime and changes in crime occurrence. This fact represents a great challenge for cities that are now increasingly in search of new ways to curb these kinds of problems. Nairobi city in Kenya for instance has very many illegal settlements in form of slums that have grown due to rapid urbanization and are entangled in fragile ecosystems of the city; along flood plains, wetland, volcanic shadows and many other areas which are not laid out for planning thus lack necessities of life, leaving many inhabitants caught in a spiral of increasing vulnerability to not only crime but also other man-made and naturally induced hazards. These settlements ironically serve as the most important housing delivery system for the poorest strata Nairobi's population a fact that has raised a concerted effort by urban officials to try and avert the situation, but what seems to be lacking is awareness that the human settlements can be designed to be safe as well as poverty free by integrating urban and environmental design principles and strategies.

The increased vulnerability of slum citizenry in Korogocho to insecurity through high crime rates is exposed by their exuberating poverty which reduces their socio-economic and environmental resilience to adversities associated with crime as illustrated in *Korogocho Socio-economic survey report-2010*. In this report, qualitative research technique has been used to collect data and participatory techniques applied to mobilize villagers to be part of the entire study process. On the other hand, the household survey used a conventional questionnaire and face-to-face approach to gather data from heads of households or their spouses. This study concludes that abject poverty which pre-disposes slum dwellers in Korogocho to crime incidences can be deterred by designing and upgrading the slum area to promote economic vitality hence reduction of crime incidences.

Keywords: Slum upgrading, urban and environmental design, Korogocho, crime

11:50-12:10 [175] Subversion from Within? Altruism, Institutional Culture and Technologies for Development

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Biography of presenting author: Tom Sanya is a Senior Lecturer at the University of Cape Town's School of Architecture. His main research area is Sustainable Habitat Innovations (SusHI). Using a transdisciplinary approach, he teamwork's with different academics, practitioners, government actors, civil society, small-and-medium scale enterprises and members of the general public in the search for and reflection upon (innovative) solutions for long term building and habitat sustainability. He has a PhD in sustainable architecture from the Oslo School of Architecture and Design (Norway).

Abstract: This paper reflects upon experiences from an ongoing action research in the participatory design and making of a small public space in an informal settlement in Cape Town (South Africa). The transdisciplinary research project is transdisciplinary teamwork between academics, practitioners, and a community-based company which is the implementing agent for a broader informal settlement upgrading program. The wider program, which is jointly funded by the City of Cape Town and the German Government, has achieved widely acclaimed success in many respects. The paper juxtaposes preconditions for sustainable development as expressed in contemporary institutions' overt mission statements against the operational realities at project level to assess congruency between broader normative objectives and the signals that motivate individuals' actions.

The results point to the need for some fundamental changes if ostensibly altruistic ethos espoused by many institutions is to realistically channel their employees' choices towards research endeavors for incubation of technologies to sustain present and future human generations.

Keywords: Institutions, transdisciplinarity, sustainable development, altruism, motivation

12:10-12:30 [242] Community Involvement in Technology Transfers. (Re)- Discovering and Implementation of Traditional Building Techniques as a Sustainable Development Tool. Case Study: Manizales, Colombia

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Biography of presenting author: Maria del Pilar is an architect graduated from National University of Colombia; after starting to work and research on the field of vernacular architecture, she comes to Europe to follow specialized studies in the field of timber technologies, sustainable development and cultural landscapes' management. Today, she keeps on working within the field of sustainable development through traditional building techniques. Alongside she is consultant/member to an educational foundation and a timber social housing project for flooding victims in Colombia.

Abstract: Built heritage is not only a proof of human adaptation to a territory and its challenges; it also acts as historical and cultural memory. Thus, vernacular architecture appears to be crucial for understanding basic components of any built – urban – context and a tool to deal with one of today's biggest challenge: to harmonize communities' development and sustainability. This paper intends to reflect upon local building techniques - built with timber and bamboo - as a tool for sustainable development within Colombian Coffee Cultural Landscape; and to emphasize the utility of community involvement in multidisciplinary based cultural policies, as a key to achieve sustainability while improving quality of life in developing countries. On one hand, this research was motivated by the growing disappearance of several historical buildings in the city and the vanishing of traditional building techniques in the hands of non-adapted modern technologies, which is a threat to urban memory. On the other hand, the imminent UNESCO's declaratory of the Colombian Coffee Cultural Landscape, highlighting the Outstanding Universal Value of local architecture, was a warning of the opportunity the city had to enhance development politics

linked to culture and heritage.(1) A state of the art based on the study of national and international regulation concerning Cultural Landscapes and built heritage, is made.; (2) after stating the actual position of local stake-holders concerning built heritage, pertinent new approaches to heritage management are analyzed; finally a (3) proposal of intervention, based on community involvement and (re)educational politics, towards the establishment of cultural guidelines and local sustainable economies is presented. Manifestly, education stands up as first tool to set up in this context, so protection to heritage can be guaranteed, while socio-economical and technological standards are improved. Besides, it is almost evident that the city is missing of an organism which could indeed integrate community, local administration and technology poles, for the benefit of culture and development.

Keywords: Community, sustainability, bamboo, education, vernacular architecture

11:30-13:00 Health and Environmental Risks

Room SAS Polydôme

11:30-11:50 [186] Quantifying Accessibility to Healthcare in Rural Areas through Participatory Approach

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Bibliography of presenting author: Ashoke Kumar Sarkar holds a doctoral degree in the field of Transportation Engineering and is working as a Professor in the Civil Engineering Department, Birla Institute of Technology and Science, Pilani, India. He has over thirty years of teaching and research experience and has worked in India, Canada and South Africa. His research interests are in the fields of rural accessibility, traffic engineering and pavement management systems.

Abstract: Accessibility to health care is related to the ability of a population to obtain a specific set of health care services when needed. Many factors affect any specific population's ability to access appropriate levels of health care. They are: availability, acceptability, affordability and geography. Accessibility often refers to spatial or physical accessibility and is concerned with the complex relationship between the spatial separation of the population and the supply of health care facilities. Mobility through proper road connectivity and appropriate location. This paper presents the findings of a case study conducted in a few villages spread over two districts, namely Alwar and Churu, in the state of Rajasthan in India. The study was conducted to find out whether the Prime Minister Gram Sadak Yojana (PMGSY) had facilitated the mobility of rural populace to access health care facilities. The construction of PMGSY roads has certainly improved accessibility to medical facilities. The weight values derived from the collected data clearly showed that the accessibility levels of the connected villages were quite high compared to those of the unconnected villages.

Keywords: PMGSY, accessibility, health, quantification

11:50-12:10 [338] Healthcare Waste Management in Gaza Strip: Challenges and Way Forward with a Participatory Approach

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Biography of presenting author: Marco Caniato (Milano, 1983) M.Sc. Environmental Engineer, specialized in Water and Sanitation Technologies, is currently a Ph.D. student at CeTAmb, University of Brescia, Italy. He researches on healthcare waste management in low and middle income countries. He applies participatory assessment and planning techniques for appropriate technology identification, now in Gaza Strip. He worked in Thailand, Southern Sudan, Macedonia, Kosovo, Serbia, Bosnia and Herzegovina. He managed activities about waste management, water and sanitation, construction, rural road maintenance and project proposal designing.

Abstract: Healthcare waste management (HCWM) is a particularly weak point in Gaza Strip. Operators separate only sharps, while they do not know how to recognize other hazardous waste and to deal with them. Not clear data are available, but hospital hazardous production of about 545 kg/d is estimated, excluding clinics and scattered sources. In 2010 an average of only 150-160 kg/d should have been treated by the three incinerators present in Gaza Strip, which work irregularly due to frequent breakages. Also on-site storage, on-site and off-site transport and bottom ash disposal do not follow any clear procedure. Authors assessed the system with COOPI, Italian NGO which has supported local Authorities in MSW primary collection during past years, with the purpose to identify main challenges and to find an appropriate way forward.

During a first mission, several weaknesses were identified in all the steps. Local actors showed interest and a certain concern about the situation. Specific capacity and skills are locally available, and could be addressed both to raise general awareness and to mobilize local resources and commitment for system progressive development. To achieve such goal, social network and stakeholder analysis has been applied during a second field visit, including a participatory planning with actors from different sectors.

The study is still ongoing, but preliminary results are interesting and promising. Qualitative and quantitative findings show clear mismanagement, but also suggest which aspects should be tackled first. Also a general program for a new HCWM system was drawn basing on analysis of healthcare facilities constraints and needs. It was discussed singularly with each stakeholder, receiving positive remarks, and raising interest. Moreover they defined priorities according to their knowledge, and opinions are similar besides the interviewee role.

Participatory planning is defining a small quick project of intervention, identifying the most appropriate technological solutions for the system. Furthermore, stakeholders knowledge, interest and involvement are implicitly raised, supporting any future action and increasing possibility of success.

Keywords: Healthcare waste, Gaza Strip, participatory design, social network analysis, stakeholder analysis

12:10-12:30 [184] Innovation in Collaborative Networks: A Waste Management Initiative in Vietnam

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Biography of presenting author: David Christensen is a PhD Fellow at the Department of Development and Planning at Aalborg University in Denmark. He holds a M.Sc. in Environmental Management and holds interest in issues relating to innovation processes and management, sustainability in organizational management and change, international development and technology transfer. As part of the access2innovation initiative, he is part of an interdisciplinary team of action researchers tasked with facilitating the development of multi-stakeholder commercial ventures addressing needs and challenges in developing countries.

Abstract: Since 2011, the author has been embedded as an action researcher in a current an ongoing initiative termed *access2innovation* based in Denmark, which develops and tests innovative new ways to build and implement strategic partnerships between development NGO's, businesses and academia. The objective of the initiative is to meet perceived market opportunities and challenges in developing countries by innovating sustainable technological solutions and business models through partnerships. Specific thematic areas for access2innovation are renewable energy, water and sanitation and food security. The initiative is driven forward by an interdisciplinary, network-administrating secretariat of which the author is a member specializing in technology assessment.

In the paper, a case study is presented involving the early stage development of a commercial venture addressing waste management issues in Vietnam. In the role as facilitator and mediator, the author has brought about a commercial business idea involving waste handling and management technologies. This has involved the development NGO, CARE International (in Denmark and Vietnam) as well as Danish companies operating in the waste management sector

and carbon market. Through an action researcher's perspective and utilizing participatory methods, the author has sought to align objectives among the 'strange bed fellows' in the partnership. In managing the disparate actors involved in the partnership, a *constructive technology assessment* approach has been utilized. The idea of this approach has been to reduce learning costs in the conception of new technologies by way of anticipating impacts and feeding insights into decision-making.

In the case, it is shown that going from an initial needs assessment towards garnering commercial interest and crystallizing a business idea is not easy, even for a dedicated network-administrating secretariat. Some keys to success lie in providing actors with a sound base for decision-making, as well as active bilateral and multilateral negotiations. As a novel experiment, the case study shows that an institutional infrastructure like access2innovation can provide a platform conducive to network-based technological innovation for development.

Keywords: Innovation, multi-stakeholder partnerships, technology assessment, Vietnam, waste management

Day 2 - Wednesday 30 May 2012 - Afternoon Session

TOWARDS SUSTAINABLE INTEGRATED DEVELOPMENT? PARTNERSHIPS AND SYSTEMS

Energy - 30 May 22 - [Room SV 1717A] - 15:00-17:00						
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15:20- 15:40	Soojin Kim	KR	Yale School of Forestry & Environmental Studies	384	An Effective Public-Private Partnership for Emerging Asian Economies in End-Use Energy Technologies: Lessons Learned from Refrigerator Replacement Program in South Korea	
15:40- 16:00	Pierre Jaboyedoff	СН	SORANE	316	Integrated Design Charrettes for Sustainable Development in India's Soaring Building Sector	

ICT, Resource Mgmt. & Sustainability - 30 May 2012 - [Room Polydôme] - 15:00-17:00						
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15:20- 15:40	Sergiy Smetana	UA	Ukraine National Academy of Sciences	251	Environmentally Safe and Economically Friendly Multidisciplinary Industrial Technologies as Innovative Approach towards Sustainable Development	
15:40- 16:00	Guéladio Cissé	MR	Swiss Tropical and Public Health Institute	380	Exploring Partnerships in Sustainable Development-oriented Research: Lessons and Challenges	
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15:20	Sutandyo- Buchholz		Indonesia		Knowledge: an Alternative to Sustain Urban Future?		
15:20-	Innocent Chirisa	ZW	University of	30	Peri-Urbanisation and the Question of		
15:40			Zimbabwe		Appropriate Technology in Harare Zimbabwe: Putting the Grassroots Housing Model to Task		
15:40-	Al Moataz	PS	United Arab	X4	Impacts of Rubble Removal Project on Gaza		
16:00	Hassan		Emirates University		Sustainable Urban Development: A Critical Assessment		
16:00- 16:20	Abigail Kern	FR	Ecole Polytechnique Fédérale de Lausanne	340	Participative Processes and Urban Development Projects: Methodological Debate on Caoyang Workers Village of Shanghai		

Health and Environmental Risks - 30 May 2012 - [Room SAS Polydôme] - 15:00-17:00						
15:00- 15:20	Yolanda Leyel	СН	University of Applied Science Rapperswil	189	Change of Paradigm for the Sustainable Development of the Ilha de Moçambique	
15:20- 15:40	Gary S. Prinz	US	Ecole Polytechnique Fédérale de Lausanne	X12	On Fast Transitions Between Shelters and Housing after Natural Disaster In Developing Regions	
15:40- 16:00	Michael W. Musa	NG	Ahmadu Bello University	100	Indigenous Resource Management Technologies from Northern Nigeria: New Frontiers for Research in Poverty Reduction and Sustainable Rural Development	

AFTERNOON

15:00-17:00 Energy

Room SV 1717A

15:00-15:20 [13] Fighting the Cycle of Poverty: Solar Lanterns and Unique Partnerships

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Biography of presenting author: Joseph Nganga is the CEO of Renewable Energy Ventures (REV), a renewable energy and energy efficiency project development and advisory firm. He has worked as an Investment banking analyst at Bank of America, as a renewable energy consultant at various organizations including the World Bank and currently sits on the steering committee of the Africa Renewable Energy Alliance. He holds a BA in Finance and Marketing from Queens University of Charlotte.

Abstract: In 2010, Renewable Energy Ventures (REV) founded a project called the Solanterns Initiative. Solanterns seeks to provide clean, affordable light to underserved and un-served communities in Kenya. The overall aim of this project is to replace one million hazardous, polluting kerosene lanterns with clean, efficient solar lanterns in Kenya. The fundamental objective of this micro-enterprise model is to create employment Solanterns creates partnerships with local organizations, youth, and women entrepreneurs to improve the environment, health, and socioeconomic conditions of Kenyans. REV has successfully implemented this model, distributing over 6,000 solar lanterns and aiming to create over five hundred micro-enterprises by the end of 2012 using this innovative and award winning rental model.

Keywords: Solar, renewable energy, entrepreneurship, solar lanterns, microfinance, partnerships

15:20-15:40 [384] An Effective Public-Private Partnership for Emerging Asian Economies in End-Use Energy Technologies: Lessons Learned from Refrigerator Replacement Program in South Korea

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Biography of presenting author: Soojin Kim is special consultant to United Nations Institute for Training and Research focusing on Rio+20 Earth Summit. She holds a master of environmental management at Yale School of Forestry and Environmental Studies with an emphasis on energy policy and international development. Prior to Yale, she spent two years developing climate mitigation projects in energy demand-side with LG Electronics. She managed carbon mitigation project from manufacturing energy efficient refrigerators working with local subsidiaries in India and she collaborated on refrigerator replacement projects for low-income families in South Korea.

Abstract: Demand-side energy management (DSM) technologies can bring better social and economic benefits to sustainable development than supply-side technologies in developing countries. This study analyzes effective private-public partnerships in technology deployment and green business development through DSM technologies and products. Best partnership practices are focused on emerging Asian economies where urban poor pays significant portion of income for energy services.

Despite potential benefits of DSM for poverty reduction, several challenges impede implementation of end-use energy efficiency due to lack of information and demands in market. A refrigerators replacement project for low-income families in South Korea demonstrates how public-private partnership model effectively addressed challenges in deploying DSM technologies. A multi-disciplinary, public-private partnership attempted to address market barriers of energy efficient refrigerators: a consortium of Korea Energy Foundation, Seoul Development Institute and LG Electronics. This partnership utilized a multi-disciplinary research focusing on refrigerator replacement needs based on energy consumption trends of low-income households in Seoul. The replacement project achieved measurable success including 4,600 refrigerators replacement and annual average 800 metric tons of CO_2 emissions reductions through 3,000 registered refrigerators. Moreover, it generates co-benefits including cutting energy bills for low- income families, improving air quality by reducing power use from fossil fuel, and welfare benefits associated with ownership of new appliances. Key findings of the study include the following: public-private sector partnerships can effectively share knowledge through multi-disciplinary study and common understanding in policy goals. Government's financial support can promote green technologies' market penetration by facilitating private sector investment and removing market risks. Linking technologies to broader global environmental management scheme such as international carbon trading system can create synergy by improving accountability of projects. Finally, effective monitoring, reporting and verification scheme is crucial in order to evaluate the energy performance of projects. We envision this partnership as an effective tool for places where power price per income, transmission and distribution loss, number of low-income families and electrification rate are high.

Keywords: Public-private partnership, technology deployment, demand-side energy management, refrigerator replacement, low-income families

15:40-16:00 [316] Integrated Design Charrettes for Sustainable Development in India's Soaring Building Sector

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Biography of presenting author: Pierre Jaboyedoff is a senior engineer specializing in energy efficient buildings and solar energy applications with over 30 years' experience in the field. While representing the Swiss Federal Office for Energy, he participated in many major Research and Development projects lead by the International Energy Agency. He has developed the energy concept for low-energy buildings such as the Rolex Learning Centre or the National Office for Statistics. He has been working in India on energy efficiency since the early 80s.

Abstract: During the last 15 years, the sustained economic growth in India has generated considerable increases in energy demand. The country struggles to meet its ever-increasing electricity demand. Moreover, while the building sector already accounts for 33% of the country's electricity demand, and while the building stock is expected to increase twofold at least by 2030, the issue of energy efficiency in buildings becomes a matter of primary concern for the nation's continued social and economic development.

In an attempt to respond to this challenge and to contribute to reducing energy consumption in new buildings, an agreement for was signed between the Swiss and the Indian government to launch a Building Energy Efficiency Project. One of the main components of this project consists in performing and promoting the practice of *Integrated Design Charrettes* for large projects.

Integrated Design Charrettes appear to be an adapted mechanism to bring about change in building practices in India at a time when the Indian building sector is undergoing unprecedented growth, which presents considerable challenges for energy demand management and sustainable development. The objectives are twofold, first, to create best practice in India's large commercial building projects and to build the capacity of Indian practitioners to develop energy efficient and climate responsive building concepts.

Room Polydôme

Keywords: Sustainable buildings, energy, integrated design, sustainable development, India

15:00-17:00 ICT, Resource Management & Sustainability

15:00-15:20 [313] Water, Broadband and Lighting: A Sustainable Delivery Model for Rural and Sub-urban Communities

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Biography of presenting author: Santosh is a co-founder of WellSpring, a startup designing innovative solutions for sustainable delivery of public services to unserved urban and rural communities. Santosh has over sixteen years of practical experience in both government and commercial establishments and has held a variety of positions in program management, research and development, market analysis and business development. Santosh holds an MBA degree from the University of Maryland, College Park and an M.S in Electrical Communications from the Indian Institute of Science, Bangalore.
Abstract: In India, there is wide disparity in the state of public service delivery infrastructure between urban and rural areas for basic amenities. Approximately two lakh villages have no access to safe drinking water, over 45% of the rural population is deprived of electricity and broadband penetration in the country is less than 3%. In this paper, we present a decentralized approach to integrated delivery of water, broadband and lighting with a "pay-per-use" service model. The model is optimally designed to support mixed rural and peri-urban settlements.

WellSpring's approach is to establish a network of POPs (point of presence) that combine smallformat Reverse Osmosis (RO) based desalination systems with micro-ISP (Internet Service Provider) facilities. Part of the water produce is sold in twenty liter packaged bottles to city-based distributors and sub-urban residents. Residual quantity is sold in small consumption units that are affordably priced for rural households and sold through village resource centers. Broadband and lighting services are delivered in a bundled form with "pay as you go" tariffs, using an innovative energy-efficient LED device that can potentially operate on solar power. The techno-economic feasibility of this approach was first studied using a Discounted Cash Flow (DCF) analysis for nine simulated scenarios over an eight year period. The results established the commercial viability of this model with payback in an economically feasible period varying between 1.9 years and 5.7 years.

Based on the encouraging results from this study and expected positive social and environmental outcomes, a pilot deployment is being undertaken in a rural community near Vishakhapatnam, situated on the Eastern coast of India. Preliminary results from the WellSpring pilot point to a good working model that combines appropriateness of proposed technologies, sustainability of the enterprise through strong local ownership and effective knowledge transfer from international technology partners. The proposed model can be self-sustaining by carefully tuning the demand and tariff models to profitably represent the needs of a hybrid community.

Keywords: Desalination, broadband, Light Emitting Diode (LED), Sustainability, Public-Private Partnership

15:20-15:40 [251] Environmentally Safe and Economically Friendly Multidisciplinary Industrial Technologies as Innovative Approach towards Sustainable Development

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Biography of presenting author: Studied environmental science and management in University of Wisconsin – Richland Center, USA (earned Certificate), Dnipropetrovsk National University, Ukraine (earned Bachelor's and Master's Degrees). Has been working as a leading engineer for research institution specialized on sustainable development strategy development and environmental issues for 5 years. Has more than 100 published works and has been honored with Grant of Ukraine President for Gifted Youth, Award of Ukraine President for Young Scientists, Grants and Scholarships of Ukraine National Academy of Sciences.

Abstract: The collapse of USSR caused Ukraine industries to go down and societies to deal with very expensive technologies of environment restoration. Mining destructed lands, overexploited soils, water, air and soil contamination are still unable for rehabilitation by industrial companies. Such conditions required to unite science, industry and society in multifunctional environment rehabilitation technologies development, which would result in improvement of economical situation in industrial regions as well. This paper presents some approaches for environmentally safe and economically friendly industrial technologies development oriented to satisfy social needs.

The creation and design of industrial technologies innovative approaches construction was performed during the completion of state funded projects series in 2006-2011 in Dniproeptrovsk and Donetsk Regions (Ukraine). They have common methods of field ecosystems examinations, well known methods of industrial technologies design and sustainable development criteria (indisies) estimation (recommended by UNCSD). We categorized performed projects into 3 main groups: industrial sites rehabilitation and management, quality of environment estimation and agricultural lands damages determination.

Industrial sites rehabilitation and management projects resulted in industrial sites ecosystems management development, specific post operation mining landscape management techniques which include usage of sewage water wastes, seeds and lithogeochemical flows. Industries, using proposed techniques, were able to rehabilitate environment whereas society received forest and recreational areas, pastures and biodiversity preservation sites. Estimation of potential industrial

sites environmental quality resulted in gained data usage for nature parks and preservation areas creation. Requested by public prosecutors expertise of agricultural areas damage due to lefover fields fires or specific pollution allowed preservation of soil fertility and social awareness principles development.

In conclusions, our technologies include not only specific environment rehabilitation innovative methods, but also techniques of social needs consideration and results presentation via mass media and publications. The stated approach implementation allowed technologies to be highly effective in reaching the criteria of sustainable development and therefore they were awarded a few grants and prizes at the national level.

Keywords: Industrial rehabilitation technologies, multidisciplinary approach, sustainable development.

15:40-16:00 [380] Exploring Partnerships in Sustainable Development-oriented Research: Lessons and Challenges

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- ² NCCR North-South Regional Coordination Office for South Asia
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Biography of presenting author: Guéladio Cissé, sanitary engineer, holds a Master in environmental sciences and a PhD from the Swiss Federal Institute of Technology in Lausanne (EPFL). He has been coordinating research partnership teams and projects in West Africa for over 17 years. He served at the International Institute of Engineering and Technology in Burkina Faso and at the Swiss Centre for Scientific Research in Côte d'Ivoire. He was the Regional Coordinator of the NCCR North-South programme in West Africa from 2001 to mid-2009.

Abstract: The NCCR North-South programme was set up in 2001 to conduct developmentrelevant research in the North and in the South. The geographical focus of North–South activities has been in nine regions worldwide, with Regional Coordination Offices for each of these partnership regions. To assess the effectiveness of the partnerships and of the NCCR North-South's approach from an inside perspective, the Regional Coordinators launched a study in 2008 and explored the partnership dynamics as experienced after eight of twelve programme years.

The study was conducted in 21 countries in Asia, Africa, and Latin America. Data were gathered in a decentralized way through interviews and questionnaires. Among the 104 individual respondents from both the South and the North, there were PhD candidates, PhD graduates (alumni), and senior researchers and post-doc scholars, representing the range of researchers involved in the NCCR's research partnerships. In addition, 13 seniors from the North occupying management functions were asked to respond to an open questionnaire. The institutional respondents were representatives of both academic and non-academic partner institutions. The data collected were analyzed by a core group and interpreted against the background of a broad review of the literature on North-South research partnerships, in order to draw lessons from the achievements perceived by respondents and the challenges encountered during partnership activities.

The most important factors found to have enabled the partnerships were: a willingness to deal with power issues, a judicious choice of partners, sufficient resources to build capacity, a commitment of research partners to engage with society, a sound transdisciplinary approach, the creation of stable regional bodies, and common guidelines and procedures.

The major challenges identified were: a continued need to invest in capacity development, the need to utilise locally available resources and ensure diversification of the resource base, the difficulty of fulfilling diverging expectations, the difficulty of linking research, policy and practice, and the difficulty of dealing with power asymmetries.

Keywords: Partnerships, capacity development, transdiciplinary research, global issues, sustainable development

16:00-16:20 [X28] Technology and institutions: Theoretical aspects of institutional innovation and its deficiency in Haiti

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Biography of presenting author: Dr Bénédique Paul is economist. He studied Agro-economics at Haiti State University, Projects Management at Montpellier Mediterranean Agronomic Institute, Organizations and Institutions Sciences at Montpellier 3 University, before his PhD in Institutional Economics at Montpellier 1 University. Dr Paul is currently Teacher-Researcher at the Faculty of Economics Business of Quisqueya University (Haiti) where he is Assistant Director of the Management and Economic Development Research Centre (CREGED, in French). His fields of interest are Innovation, Entrepreneurship and Institutional Economics.

Abstract: In the recent decades, in Haiti, a growing propensity to accept new technologies is observed. More than ever, the national market represents a potential advantage, as well as the cheapness of the labor force. Meanwhile, the country cannot take plenty advantage of its technological development potential in order to stimulate the economic growth. The paper analyzes the disadvantage factors. The conclusion show that in addition to the low level of education and the expatriation of skilled human resources, institutional characteristics may help to understand the ineffectiveness of economic development strategies implemented in Haiti in recent years. Then, we propose institutional innovation as both an analytical framework and a challenge to understand and foster economic development through technology in Haiti.

Keywords: Technology, institutional innovation, institutional capital, institutional deficiency, Haiti

15:00-17:00 Human Settlement	Room Polyvalente
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15:00-15:20 [269] Gotong-royong in Urban Settlement as Local Knowledge: an Alternative to Sustain Urban Future?

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Biography of presenting author: Adiyanti Sutandyo-Buchholz is a lecturer at the Department of Urban and Regional Planning at Institut Teknologi Indonesia (ITI), close to Jakarta, with status Lecturer on Unpaid Leave. She holds a bachelor degree in urban and regional planning from ITI, and a doctoral degree in the same field from Technical University Hamburg-Harburg in Germany. Her fields of interests are community development, housing for the poor, gender study, and development of peri-urban areas. Currently, she is living in Germany.

Abstract: *Gotong-royong* an Indonesian term for traditional voluntarily mutual act which the result is equally benefited has developed as a local knowledge through generations.

In urban settlements togetherness in a community level (another connotation of *gotong-royong*) can be implemented i.e. through cleaning the neighborhood environment. The urban settlements in this paper will focus on *kampung-kota* in Indonesia as an unorganized settlement. Based on social characteristic, *kampung* is a domain with a dynamic and good relationship among the residents in a city (*kota*).

Reducing urban poverty has the goal of keeping urban future sustainable. Although the *kampung-kota* is poorly managed and often accused of causing poverty, the spirit *of gotong-royong* among the residents still exists. Hence, through this activity, theoretically, the capacity of *gotong-royong* to stimulate a neighborhood as the smallest part of urban civil society through its solidarity is highly estimated.

Yet, the *kampung-kota* has been affected through physical, economical, and social transformations in the urban area, the application of the term *gotong-royong* could be shifted beyond the "original sense" depending on which context. Therefore, it is questionable whether *gotong-royong* is still ongoing in the *kampung* settlements as a model for solidarity or it has already watered down like its existence in other (organised) urban settlements such as in housing estate areas.

It will be assessed what kind of "traditional principle" *gotong-royong* has in influencing urban life. Whether *gotong-royong* as a local knowledge answers the alternative to sustain urban future will be further observed through the following questions: Is the government able to be involved in this

traditional way, since *gotong-royong* as a part of Indonesian culture does play a role in democratization? Can this traditional approach function as an alternative to reduce poverty, and how? Can the *gotong-royong* activity in the *kampung-kota* be reflected to the urban society through for example activities based on community-driven development? The study will be done through literary methods of theories and practices of *gotong-royong*.

Keywords: Gotong-royong, local knowledge, (urban) community, (urban) society, kampung

15:20-15:40 [30] Peri-Urbanization and the Question of Appropriate Technology in Harare Zimbabwe: Putting the Grassroots Housing Model to Task

Innocent Chirisa

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Biography of presenting author: Innocent Chirisa is a Senior Lecturer in the Department of Rural and Urban Planning at the University of Zimbabwe. Peri-urban housing is the chief focus of his research.

Abstract: Peri-urbanization is a highly sensitive technical area in which a 'carrot and stick' approach would be needed if the poor are to house themselves in the long run. However, they are often left to a great disadvantage in this endeavor as they often hold onto un-serviced plots. As such having stands is by no means a guarantee for adequate shelter. In effect, this hold has tended to produce a quagmire of reality of which the question then becomes: To what extent should appropriate technology for peri-urban dwellers be a priority in research and policy so that through the grassroots initiatives sustainable healthy habitats are produced, enhanced and advanced? The present study examines the shelter and land development in peri-urban Harare. This is achieved by way of interrogating the Alexander (1973)'s Grassroots Housing Model which views, as a way to go, collective action by the poor households in solving their housing development needs. By way of five selected case studies of peri-urban settlement (Nehanda, Dzivaresekwa Extension, Magada in Epworth, Harare South and Whitecliffe) experiences, this study interrogates the housing poverty situation in peri-urban Harare. The findings are leveled against the provisions of the Grassroots Model, the idea being to answer the grassroots-human settlements' sustainability trepidation. Data has been gathered mainly through key informant interviews and observations. Peri-urban Harare has had a host of grassroots initiatives for housing and habitat development in the past decade or so. It is the incrementalist approach that has shaped most peri-urban habitats. The initiative has largely been advocated for many grassroots advocacy groups in conjunction with the communities themselves. In certain or most cases superstructures have been built yet the availability of modern urban infrastructure (water and sanitation, electricity and paved roads) remain out of the reach of many. This has posed a lot more danger (for example the risk of cholera, dysentery and typhoid outbreaks) to the dwellers than perhaps when they did not yet have any roof over their head. Peri-urbanization in Zimbabwe (as elsewhere) is becoming a menacing reality today, yet the issue of appropriate technology for the peri-urban dwellers and improving their habitats (in the case of the poor) remains scantily discussed in academic and policy discourse. To a great extent, the principles of the Grassroots Housing Model, while appealing for inclusive development for the poor. This has produced an anachronistic urban landscape in the intervening time, which is repellent of the expected town planning minimum standards. The dilemma of the poor remains chiefly unresolved.

Keywords: Incrementalism, housing poverty, minimum standards, collective action, investment, appropriate technology

15:40-16:00 [X4] Impacts of Rubble Removal Project on Gaza Sustainable Urban Development: A Critical Assessment

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Biography of presenting author: Dr. Al Moataz Hassan is an Assistant Professor at the United Arab Emirates University. Until recently he was a Senior Research Fellow in Urban Sustainability at Oxford Institute for Sustainable Development (UK). He has an extensive experience with consultancies and international agencies including the UNDP and DFID. His teaching and publishing interests include sustainable urban development, community-based planning, urban poverty, and post-conflict development. He also has extensive research in environmental planning and management, climate change and urbanization, and eco-cities.

Abstract: In 2008, Gaza experienced an Israeli-Palestinian armed conflict. The conflict has resulted in mass physical destruction and deteriorating quality of life. The local authorities prepared plans for reconstruction in order to restore the living environment for the affected population. To achieve this target, several projects have been proposed including the rubble removal project. The significance of the rubble removal project extends beyond the removal of debris. While the project has accomplished the short-term relief objective in the targeted communities, it influenced the long-term development goal towards sustainability and better quality of life. Using a qualitative dominant approach, this paper examines the socio-economic, physical, political, and environmental impacts of the rubble removal process. It demonstrates the significant role of partnership and the use of the appropriate technology in building the local capacity towards poverty alleviation and sustainable livelihoods. It argues that, despite the Israeli blockade, local development in Gaza may be possible through partnership and self-dependency, mobilization of the local resources and empowerment. The paper concludes with a set of guidelines towards the successful implementation of community-driven initiatives in Gaza.

Key Words: Gaza Strip, partnership, capacity building, poverty, urban development,

16:00-16:20 [340] Participatory Processes in Urban Development Projects: Methodological Issues using the Example of Caoyang Village, Shanghai

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Biography of presenting author: A scientific advisor for the Cooperation & Development Center at EPFL, Abigaïl Kern is in charge of the "sustainable habitat and cities" priority research area of the Unesco Chair Technologies for Development. She also manages two (Brazil, Chile) of the eight bilateral cooperation programmes in science and technology between Switzerland and extra European countries. She holds a Bachelor Degree in Sociology and two Master Degrees (Political Sciences and Public Policies). This year, she starts a PhD at EPFL.

Abstract: After a quarter of a century of practical application and abundant literature, participatory approaches are still prone to wide criticism, some of which appears particularly relevant when its focus is on the impact such approaches may have on a social context that is both complex and difficult to apprehend. This view is also shared by most advocates of participation, who recognize that the main conditions for their success are based on local social, institutional, political and cultural factors over which they feel they little control. Yet, it seems possible "to take greater account of these criticisms by explicitly thinking of participation as a strategy in terms of an entire local social context rather than a method merely focused on conducting consultation workshops" (Aquino, 2009). Indeed, all these questions surrounding participatory approaches form part of what Giddens (1994) refers to as overmodernism. Societies in industrialized countries have become largely reflexive, meaning that we increasingly challenge how we do things. Thus, the process used to reach a result has become as important - if not more - as the result itself. In this context, we observe a shift from decision support tools to decision support processes (Thuillier, 2002). In this light, it is interesting to question the decision support process – a product of developments in the governance of industrialized countries – and to place it within a specific local social context to highlight some of the basic constraints and prerequisites for minimum efficiency of citizen participation in public decision-making.

The chosen case study is the urban development project of Caoyang Workers' Village, in Shanghai, China, where it is one of the first times that citizen consultation has been officially enshrined in the city's five-year plan by the local authorities. Without claiming to present an exhaustive study of Chinese governance, this paper aims to study the case of including citizens in an urban development project in China and to discuss possible avenues to sustain the process in this specific local context over the long-term.

Keywords: Urban, conservation, China, sustainable, development

15:00-15:20 [189] Change of Paradigm for the Sustainable Development of the Ilha de Moçambique

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Biography of presenting author: Yolanda was born in Xai-Xai, Mozambique, in 1975. She studied spatial planning in the capital city Maputo and worked in the provincial office of Gaza Province after graduation. In 2000, she married the Swiss architect Andrew Leyel and they jointly founded an architecture and construction company in Mozambique. In 2003, they resettled in Switzerland. She graduated in spatial planning at the UAS Rapperswil in 2008. Her diploma thesis was dedicated to the informal settlements of the Ilha de Moçambique.

Abstract: The World Heritage Site *Ilha de Moçambique* is an island port on the ancient Portuguese trading routes and the former capital of Mozambique. The city is divided into Stone Town with ornate colonial buildings and Macuti Town with traditional wattle and daub walls and palm-leaf roofs. As the economic basis has been lost, the whole island is extremely impoverished. Housing conditions are miserable and public hygiene practically does not exist. In addition Macuti Town is heavily overpopulated.

The island still exercises a symbolic influence on the self-perception of the people and government of Mozambique. However, implementing the Millennium Development Goals requires a change of paradigm and a departure from the current focus on conservation of historic monuments. The potential for development based on the unique heritage can only be released, if the plight of the local population is prioritized and their livelihood is placed on a sustainable foundation.

A two year research project applied a bottom-up and participative planning approach to the island situation. In a series of workshops, with participants from the local population, their immediate representatives and the national planning authorities, the most pressing issues were sounded. The City Council mandated the nation planning directorate to address the issues of water management, land tenure and property rights. Within the research project a solution for wastewater management was proposed, based on a multi-purpose treatment centre, the "Macuti Centre". This centre provides market, sports and recreation facilities above a sewage treatment plant. The structure is designed to optimize the public space, provide adequate shade and protection from the environment and relate to the traditional building materials and technologies.

The World Engineers Convention (WEC) in September 2011 in Geneva offered the opportunity to further pursue the project with an international team and to elaborate the impact on the relevant sub-systems of energy, water, sewage and urban structure and management. The project was awarded the second prize of the Young Engineer's venue.

Keywords: Informal settlement, participative planning, water management

15:20-15:40 [X12] On Fast Transition between Shelters and Housing after Natural Disasters in Developing Regions

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Biography of presenting author: Dr. Gary Prinz is a postdoctoral researcher in the Steel Structures Laboratory (ICOM) at the Ecole Polytechnique Fédérale de Lausanne (EPFL). He earned his PhD in civil engineering from Brigham Young University, where he worked on eccentrically braced frame seismic systems. Prior to joining the EPFL Dr. Prinz worked for a brief period as a blast engineering consultant at Applied Research Associates, Inc., where he helped design United States embassies and Federal Buildings.

Abstract: This paper presents the findings from an international workshop that brought together various NGOs, rebuilding coordinators, private sector leaders, engineers, and academics to discuss methods and issues related to fast reconstruction in developing regions affected by natural

disasters. Natural disasters in developing regions often destroy homes and, together with economic conditions, force people to live in temporary shelters such as tents. Experience shows that rebuilding is often a long process because of issues related to land rights, evacuation of debris, standing building safety, coordination between local authorities, government organizations and NGO's, etc. In order to debate on the matter, the following themes were selected for the workshop:

- Stimulating local economies, involving the local unskilled workforce
- **Meeting basic needs**, fast and safe rebuilding with appropriate materials; particularly considering the use of steel as a building material.
- Adaptable construction, ways between affordable transitional shelters and sustainable longterm housing.

Discussions on these three themes led to consider the particular problematic of rebuilding in urban settings. Fast rebuilding technologies suitable for high density urban environments are needed, as well as strategies for implementing such technologies in environments where construction methods are tied to habit. In this context, the idea of promoting a multi-story, multifamily, locally fabricated shelter concept for fast rebuilding in urban environments is explained.

Keywords: Fast rebuilding, local fabrication, urban environments, natural disasters

15:40-16:00 [100] Indigenous Resource Management Technologies from Northern Nigeria: New Frontiers for Research in Poverty Reduction and Sustainable Rural Development

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Biography of presenting author: Dr. Michael W. Musa is an Agricultural Sociologist who at present is a Senior Research Fellow under the Department of Agricultural Economics and Rural Sociology at the Institute for Agricultural Research in the Ahmadu Bello University, Zaria, Kaduna State, Nigeria. With strong focus towards development and social transformation, his interests spans across areas of indigenous knowledge systems, community, national and international development. Responsibilities engaged with include consultancy, research, administration, lecturing and supervision of undergraduate and postgraduate students in development studies.

Abstract: For many years, rural people in Nigeria's diverse agroecological settings have contributed not only to national food production, but have survived under conditions of environmental risk and uncertainty based on a wide variety of indigenous resource management technologies developed by them. However, there is insufficiency of research and empirical data on the role that their indigenous resource management technologies can play in complementing efforts towards poverty reduction and sustainable rural development, especially in northern Nigeria. The fact that the complexity and diversity of rural livelihoods depend on indigenous technical knowledge and sustainable resource use, suggests the need to comprehend certain essential features that would help discern useful practices for selection so as to introduce technologies that are socioculturally appropriate, environmentally sound and sustainable. This paper presents the results of an empirical analysis carried out in selected rural communities in northern Nigeria which examined the relevance of indigenous dimensions to poverty reduction and sustainable rural development. The study documents information about rural people's perception of poverty and how this influences their decision-making processes in the classification and management of resources in evolving coping strategies. Data were collected by the complementary use of conventional survey techniques along with participatory methods of social inquiry under the approach 'Participatory Community Environment Analysis (PCEA). The rural people studied were found to have self-descriptive criteria in terms of their perceptions about poverty, and the multifaceted ways in which resources are identified and technologies employed to cope. The concept of poverty among the rural people is value-laden with some tangible and others intangible. The interactive flow of insights drawn from understanding the cognitive realities and resource management technologies of the rural communities can reinforce efforts towards successful program implementation designed for poverty reduction and changes in site-specific rural environments. This has potential implications for value linkages and strong collaborations between development practitioners and professionals in the pursuit of future poverty reduction and sustainable rural development strategies in Nigeria.

Keywords: Indigenous technologies, poverty reduction, resource management, sustainable development, northern Nigeria

Day 3 - Thursday 31 May 2012 - Morning Session

TECHNOLOGY TRANSFER OR CO-CREATION? KNOWLEDGE SHARING AND EMPOWERMENT

Education and Cooperation - 31 May 2012 - [Room SAS Polydôme] - 10:30-12:00

10:30- 10:50	François Golay	СН	Ecole Polytechnique Fédérale de Lausanne	355	Academic Cooperation to Foster Research and Advocacy Competences in the Occupied Palestinian Territory (West Bank)
10:50- 11:10	Yedida Wolfe	IL	Tel Aviv University	151	Innovating Together: Improving Bilateral Research Collaboration for Development
11:10- 11:30	Gabriela Tejada	MX	Ecole Polytechnique Fédérale de Lausanne	337	Scientific Diasporas, Knowledge Circulation, Development: Insights from the Study of Skilled Moldovans Abroad

ICT, Re	ICT, Resource Mgmt. & Sustainability - 31 May 2012 - [Room Polydôme] - 10:30-12:00						
10:30- 10:50	Christoph Hess	СН	Biovision Foundation	303	Implementing an ICT User Response System (URS) for Sustainable Agriculture in Africa		
10:50- 11:10	Mahendra Singh Pal	IN	G B Pant University of Agriculture & Technology	159	E-Agriculture: A Modern Transfer Technology Tool for Food Security and Poverty Alleviation in India		
11:10- 11:30	Charles Martin- Shields	US	George Mason University	50	Dynamic Web-based Learning: Co-Creating Development Solutions Across Geographies		

	Technology and Innovation - 31 May 2012 - [Room CO2] - 10:30-12:00						
10:30- 10:50	Fernanda Rojas Marchini	CL	FogQuest: Sustainable Water Solutions	232	Fog Collection Technology Transfer and Co- Creation projects in Falda Verde, Chile and Tojquia, Guatemala		
10:50- 11:10	Ann De Keersmaecker	BE	Artesis University College	353	Towards Scaling Up Grassroots Innovations in India: A Preliminary Framework		
11:10- 11:30	Anna Crole-Rees	СН	Crole-Rees Consultants	X24	Engendering the Innovation Process in Rural Areas: Closing the Gap between Supply and Demand		

	Human Settlement - 31 May 2012 - [Room Polyvalente] - 10:30-12:00					
10:30- 10:50	Satprem Maïni	FR	Auroville Earth Institute	94	Earth Architecture to Empower the People	
10:50- 11:10	Daniel Wyss	СН	SKAT Foundation/SKAT Consulting	X26	South-South Transfer of Clean Brick-Making Technologies in Asia and Africa	
11:10- 11:30	Arunava Dasgupta	IN	School of Planning and Architecture, New Delhi	374	Himalayan Vernacular Technologies - Sustenance and Continuity: Collaborative Engagements and Future Directions	

DAY 3 - THURSDAY 31 MAY 2012 SESSION 3: Technology Transfer or Co-Creation? Knowledge Sharing and Empowerment

MORNING

10:30-12:00 Education and Cooperation

Room SAS Polydôme

10:30-10:50 [355] Academic Cooperation to Foster Research and Advocacy Competences in the Occupied Palestinian Territory (West Bank)

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Biography of presenting author: Francois Golay is a professor for Geographic Information Systems [GIS] with the Ecole Polytechnique Federale, Lausanne [EPFL], Switzerland. He graduated as a surveying engineer. He got a PhD in Geomatics and led several years the application analysis department of SIT-Conseil, a private consulting company in the field of GIS. He joined EPFL again after spending one year at the University of Washington in Seattle. His research interests deal with GIS analysis and design methodologies, spatial decision support, and Human-Computer interaction.

Abstract: Palestinians living in the West Bank, a territory occupied by the State of Israel according to International Law, face a deprived access to land and a limited ability to move freely which pertains to the presence of Israeli settlements and other infrastructure (closures, restricted or forbidden roads, etc.). This confinement has significant impacts on their economic and social livelihoods, and it is even worsening with the on-going construction of a 709 km long Barrier which mainly runs inside the West Bank.

With the regard to this situation, there is a clear need to strengthen the capacity of the civil society and its representatives to apply sound research processes as a basis for improved advocacy for the Palestinian's human rights. Monitoring processes and tools are needed to assess the impacts of the Palestinian's confinement, particularly in relation to the Barrier's construction. Reliable data has also to be collected, managed, and above all, shared.

These challenges have been addressed within the Academic Cooperation Project in Palestine [ACPP] that was established by the Barrier Monitoring Unit [BMU] of the United Nations Relief and Works Agency for Palestine Refugees in the Near East [UNRWA]. ACPP brings together academic partners from Palestine and Switzerland, as well as Palestinian governmental agencies.

The project has started in early 2011 and is funded by the Swiss Agency for Development and Cooperation [SDC] and EPFL. It is designed as a large cooperation networking platform involving researchers, students, public servants and experts from Palestine. A large set of actions have already been developed during the first year of the project, including courses, training, and research actions.

First relevant results and impacts of the different actions are presented in this paper. Taken as a whole, the project produces valuable results for all partners: useful advocacy material for the Palestinian partners, and a unique "real-scale laboratory" where investigations are jointly conducted to develop novel confinement and change indicators.

Keywords: Palestine, Barrier, cooperation, capacity building, advocacy, geographic information systems [GIS], accessibility, landscape metrics, land management

10:50-11:10 [151] Innovating Together: Improving Bilateral Research Collaboration for Development

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Biography of presenting author: Adv. Yedida Wolfe is a policy analyst and strategic consultant working at the Harold Hartog School of Government and Policy at Tel Aviv University in Israel. As one of the nation's leading policy think tanks, the Hartog School encourages multidisciplinary research into governance-related issues and helps bridge between the academic and policy communities. In addition to her work on cross-border industrial R&D collaboration, Adv. Wolfe has engaged in policy work in fields ranging from environmental protection to women's rights.

Abstract: Cross-border collaboration is an important tool for the development of innovative technologies. Yet, while there are a plethora of North-North programs promoting industrial R&D collaboration, few effective North-South models have been put into practice. Where bilateral research collaboration programs do exist between OECD and developing countries, these programs generally only involve earlier stage academic research, rather than industrial research geared toward development of commercial products.

At present, there are very few government-funded North-South industrial R&D programs. Despite this, there are reasons to believe that such programs could be beneficial to advancing development goals. The question of feasibility and expedience of this approach requires a consideration of two central questions: (1) What are the primary strengths of bilateral industrial R&D frameworks? (2) Can these strengths be realized in the North-South context?

At their essence, industrial R&D collaboration programs are particularly successful where a certain asymmetry exists between companies – that is, when each company brings a unique value proposition to the table. This seems to hold true in the case of North-South collaboration as well. Southern companies bring with them a deep understanding of local needs, conditions and cultures, greater capacity for frugal innovation, as well as, reduced labor costs and easier access to suppliers and other market actors. Northern companies, for their part, bring to the table technological expertise that may not be available in partner countries. Thus, upon initial review, it would appear that bilateral industrial R&D programs may be a productive vehicle to complement other private sector development (PSD) activities. That said, proper consideration of this question requires a more careful analysis of strengths, weaknesses and practicability.

This paper will provide an overview of existing multilateral and bilateral models for industrial cooperation. After highlighting the basic strengths and weaknesses of these models, the authors will then consider the potential use of these models to promote North-South collaboration, considering questions of feasibility and incentivization.

Keywords: Collaboration, North-South, Innovation, R&D, Technology

11:10-11:30 [337] Scientific Diasporas, Knowledge Circulation, Development: Insights from the Study of Skilled Moldovans Abroad

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Biography of presenting author: Gabriela Tejada is scientist at the Cooperation & Development Center (CODEV) of EPFL, where she is Project Leader of Research into Scientific Diasporas, currently heading two projects involving Moldova and India. She is also responsible for encouraging collaborations with international organizations. She was Coordinator of the UNESCO Chair in Technologies for Development (2008-2010). She obtained her primary degree in International Relations from Universidad Iberoamericana, Mexico and she holds a PhD in Political Science from the Autonomous University of Barcelona, Spain.

Abstract: The world knowledge divide has led to demands for alternative ways of improving international cooperation in order to contribute to a reduction in the scientific disparity and inequalities in the availability of human capital between the North and the South. The human aspect has an essential role to play in determining ways of optimizing knowledge circulation within the current context in which the increased international mobility of skilled people offers new dimensions for scientific cooperation as a result of major global transformations. While science is ever more dependent on relationships and international exchanges, scientific collaboration has become an indispensable mechanism for the advancement of developing and transition countries. The efficient production and equitable use of knowledge requires international collective action, and this confirms the need for novel participatory approaches and a broadening of the beneficiaries and the empowerment of new relevant actors. Within this framework, today original ideas recognize the importance of scientific diasporas and promote their interventions as key players. The technological progress that has transformed the methods of production and the transmission of information enables scientists abroad to have an impact from a distance, without having to consider their definitive return as the only reasonable option. This situation also influences international cooperation as diasporas can function as bridges for the circulation of world knowledge and the transfer of technology. Highlighting their position as knowledge communities, this paper seeks to encourage scientific diasporas as agents of development and international cooperation by offering an innovative perspective of the exchange of knowledge that can optimize North-South cooperation. Focusing on an evidence-based analysis of research on the Moldovan scientific diaspora implemented by the Cooperation & Development Center (CODEV) at EPFL and the Academy of Sciences of Moldova (ASM) in a knowledge coproduction effort, the paper argues that the recognition of knowledge as a global public good, the encouragement of decentralized collective organization and actions and the provision of enabling settings and opportunity structures, are key conditions for facilitating the initiatives and interventions of diasporas.

Keywords: Scientific Diasporas, skilled mobility, international cooperation, knowledge circulation, development, Moldova

10:30-12:00	ICT, Resou	rce Management	t & Sustainability	Room Polydôn	ne
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10:30-10:50 [303] Implementing an ICT User Response System (URS) for Sustainable Agriculture in Africa

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Biography of presenting author: MA in Sociology, Economics and Political Science from the University of Zurich and professional background in the IT industry. Working as a strategy consultant with focus on social media and ICT4D in Africa. Currently preparing a PhD project in the same field.

Abstract: The URS platform focuses on the communication activities with SMS and applications for mobile phones. It aims to capture end user feed-back on the use of agricultural information. Its success depends on an enabling environment which includes: receptiveness of the end-users for the technology, such as their need, awareness and demand for the technology, as well as its cultural suitability; a policy framework with public-private partnerships; mentoring opportunities either through formal scientific education, or informal support from successful role models; and access to other support services, such as networks, and facilities. The smart phones have two applications installed: Field Insight that has an Android OS menu based application that allows the end users to browse and navigate a light version of the Infonet-Biovision (www.infonetbiovision.org) content database and Survey for creation, management, publishing, and collection of survey data using electronic surveys. The URS will strengthen the Biovision Farmer Communication Programme's principles of systemic approach (emphasizing multi-disciplinary, multi-sectoral, multiple partners, and operating at different levels from local to national), promoting technological innovations that are socially and environmentally sustainable, making significant livelihood impact, embracing demand-driven approach, and creating synergies with other partners to scale up program activities.

Keywords: Kenya, agriculture, health, sustainability, IAASTD

10:50-11:10 [159] E-Agriculture: A Modern Transfer Technology Tool for Food Security and Poverty Alleviation

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Biography of presenting author: I am working as a Professor Agronomy at G B Pant University of Agriculture & Technology, Pantnagar (India). I graduated from Pantnagar and completed post doctorate from China in 2000. I have specialization in maize and sunflower agronomy, irrigation and nutrient management. I have guided 4 Ph d and 10 M Sc Ag students and published 2 books and 70 research papers in different national and international journals of repute. I have also published 80 popular articles on different aspects for different stakeholders including farming communities. I also presented research papers in international conferences held in China, Pakistan, Thailand, Nepal and France. I was also awarded with different awards like 'Merit Scholarship, 'Chinese Fellowship', 'INSA Visiting Fellowship', and 'Best Teacher Award'. I am a life membership of 6 professional Societies including 'Indian Society of Agronomy', Indian Society of Agricultural Sciences. Presently I was elected as a 'Joint Secretary' of Indian Society of Agronomy.

Abstract: Poor countries like India, is facing a rising demand for food grains that may not be fully met by the supply side. The food grain production has been in range of 215 to 220 mt for last few years as against the expected demand of 235 mt in 2025 and this gap is fulfilled by only imports. The increasing input cost, decreasing arable land, shrinking irrigation water and climate change have made production scenario very grim in most of the agricultural dominated countries. The government policies of waiving off huge amount of taxes and electricity bills have been criticized because this vast money may be utilized in rural development needs such as soil regeneration, irrigation, land reform and diversifying livelihoods are crying out for investment. The Department of Agriculture in centre and state, agricultural universities, NOGs, etc are the primary institutions for agriculture extension activities in India. Recently, India Govt. has initiated new scheme called 'Agriculture Technological Information Centre (ATIC) which has been implemented in every state and agricultural universities and KVKs and acts as a single window system'. The National Agriculture Policy emphasizes upon the use of Information and Communication Technology (ICT) for achieving a more rapid development of agriculture in India. The Department of Agriculture and Cooperation, therefore, is in the process of preparing a National e-Governance Plan in Agriculture (NeGP-A) for a more focused implementation of e-governance activities in the agriculture sector.

The Department has also developed four portals and 40 websites covering both headquarters and its sub-formations under the component "Development of Agricultural Informatics and Communications". Some important portals which has till now been developed are (a) AGMARKNET Portal (http://agmarknet.nic.in), (b) DACNET Portal (http://dacnet.nic.in), (c) DAC Portal (http://agricoop.nic.in), (d) INTRADAC Portal, (http://intradac.nic.in), (e) SEEDNET Portal (http://seednet.gov.in), (f) Agricultural Census Portal (http://agcensus.nic.in). Besides, number of digital programs related to e-agriculture like Expert Systems, Gyandoot, An agriculture-based portal, www.indian-farmers.org, Agricultural Expert Advice Dissemination System etc. have also been developed and are available for effective e-agriculture service in India. Therefore, e-agriculture is now a new effective and cheaper extension tool for fast extension and communication of agricultural technologies among farming communities for food security and poverty alleviation in India and other developing nations.

Keywords: Agri-portals, AGRISNET, E-Agriculture, expert systems, food security, ICT, MNREGA

11:10-11:30 [50] Dynamic Web-based Learning: Co-Creating Development Solutions Across Geographies

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Biography of presenting author: Charles Martin-Shields is a doctoral student at the School for Conflict Analysis and Resolution at George Mason University. His research focuses on the evolving role that technology plays in peacebuilding and development, and currently works as a project director with TechChange, a Washington, D.C.-based consulting group. Prior to TechChange, Charles earned his M.A. in International Peace and Conflict Resolution from American University's School of International Service, and holds a B.A. in German Language and Studies.

Abstract: The field of distance learning has existed for decades, and with the growth of the internet, new models of web-based distance learning can enable professionals across geographies to learn from one another and increase north-south and south-south idea exchange. Currently, web-based distance learning still requires further methodological theorization, both in terms of pedagogy and evaluation; in practice through, there are very few examples of high-quality online learning platforms that leverage the full social capacity of the internet for training international development professionals to use as case studies. This paper will use TechChange's online learning platform as a case study of interactive, social online learning targeted at the tech for development professional community. TechChange, a Washington, D.C.-based technology and development consulting group, designed a social, interactive online platform to provide training about relevant emerging technologies for professionals working in development, disaster response and governance. Drawing on theories of social learning and social network

development, TechChange focused on making the training platform socially oriented and interactive, assuming that students would learn as much from each other as from the facilitators. To monitor and evaluate this assumption, the team took a two-fold approach; they created an internal system for assessing participation, called "Techpoints" to monitor ongoing participation, and provided students with a post-class qualitative survey to better understand whether the social model of learning was perceived as useful among participants. This paper will analyze the methodology and results of their monitoring and evaluation procedures to better understand the pros and cons of social online learning. We will explore three of their assumptions. The first is that online learning is a viable alternative to face-to-face training at a systemic level, which we will analyze using a basic cost comparison analysis of doing a comparable training in a classroom given TechChange's participants' geographic distribution. The second assumption is that through social exchange, North-South and South-South idea-exchange occurred; we will do this by correlating Techpoints and the actual content participants contributed on the learning platform. The third assumption, that social learning is perceived by participants as valuable for exchanging ideas and learning, will be evaluated qualitatively by reviewing 30 randomized student evaluations of the courses. At each stage, we will provide critique of the monitoring and evaluation methods employed by TechChange, with the aim of exploring where they can improve their tools to enhance positive data-collection. Through a critical analysis of cost relative to geographic reach, the user-generated content within the TechChange's courses, and the evaluations of those courses, this paper aims to support the development of pedagogically sound, methodologically rigorous web-based training, which could have a significant impact on transgeographic knowledge sharing in pursuit of reducing poverty and supporting development.

Keywords: Distance learning, social networks, sustainability, local knowledge, training

10:30-12:00 Technology and Innovation

Room CO2

10:30-10:50 [232] Fog Collection Technology Transfer and Co-Creation projects in Falda Verde, Chile and Tojquia, Guatemala

Fernanda Rojas Marchini¹, Virginia Carter² and Melissa Rosato³

- ¹ Core Volunteer, FogQuest: sustainable water solutions. Geographer, Universidad Adolfo Ibáñez
- ² Field Project Coordinator, FogQuest: sustainable water solutions.
- ³ Associate Executive Director, FogQuest: sustainable water solutions.

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Biography of presenting author: Fernanda Rojas is a Geographer and currently works as researcher at the Territorial Intelligence Centre at the Adolfo Ibáñez University in Chile. Since 2008 she has been a core FogQuest volunteer and has assisted and directed the construction of fog collectors in Tojquia, Guatemala and also coordinated the logistics and oversaw a build in Boutmezguida, Morocco. With local builders she has employed a highly participative training approach. She is also a member of the British Council's Climate Generation 2011 in Chile.

Abstract: Fog Collection technology is innovative, appropriate and simple. The Large Fog Collector (LFC) is composed of a vertical panel of mesh with an under hanging gutter erected using posts. It collects water from fog and rain on its surface making it a viable water supply for rural communities, especially in arid regions with few options. Projects around the world face the challenges of integrating geographic suitability and local organizational capacity. There are different ways a project can be initiated and pursued, and diverse project goals influence technology learning, empowerment, community motivation and management. This paper analyses two successful fog collection projects designed and implemented by the Canadian NGO FogQuest in Falda Verde, Chile and Tojquia, Guatemala. By using case-study methodology to compare the different project approaches and contextualizing on-the-ground challenges, conclusions regarding best practices are elaborated. For both cases, three project stages were considered: 1) how the technology viability was assessed and implemented, 2) how the technology was adopted by the users focusing on sustainable operation and maintenance; and 3) how the prior processes have influenced the future goals.

The Falda Verde project, with 400m2 of collection surface produces an average of 600L of water per day and is helping sustain a fisherman's association in growing 1000 Aloe Vera plants in the driest place on earth: the Atacama Desert. The Tojquia project, in Guatemala uses a decentralized household-level framework which includes 35 LFCs and 1400m2 of collection surface. It is currently the largest community-built and run fog collection project in the world producing an average of 6000 L of clean water per day and helping over 150 individuals. Given the project goals of empowerment, some of the beneficiaries are now capable of building LFCs without external supervision and are effectively managing the project via existing community structures. The cases suggest that technology transfer and knowledge co-creation are inherently linked and are dependent on context. The empowerment of a community or group can lead to motivation and co-creation of knowledge. When the origins of a project are through technology transfer, it must evolve into a co-creation participatory process for ongoing success.

Keywords: Fog collection technology, transfer and co-creation, community management, empowerment.

10:50-11:10 [353] Towards Scaling Up Grassroots Innovations in India: a Preliminary Framework

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Biography of presenting author: Ann De Keersmaecker is a PhD student with a background in product development and industrial engineering. She is affiliated with the Artesis University College Antwerp in Belgium, and Technical University of Delft, the Netherlands, the University of Antwerp in Belgium. Her research interest lays in innovations in developing countries and sustainable design. Moreover, she coaches Bachelor and Master students in both design and research assignments and is involved in other research projects in design.

Abstract: Grassroots innovations (GI) include need-based products or services that are created by individuals or groups within local communities. These products and services have potential to contribute to the quality of an individual's life, and on a larger scale contribute to the development of a community by creating new business activities. The grassroots innovations are often created in a resource constrained environment; with limited access to formal knowledge, infrastructure and materials, and limited buying power. Although GIs have potential to be a commercial success, scaling up and commercialization of grassroots innovations is often inhibited because of a lack of formal education among innovators, absence of entrepreneurial culture and supporting infrastructure in the given context.

This paper elaborates the significance of GIs for people in developing countries. Grassroots innovations can be a subject of business development and be significant to empower local communities. In order to live up to its potential, it is important to understand the mechanisms on how to scale up a grassroots innovation and overcome inhibiting factors.

Until now, only a limited number of grassroots innovations have been scaled up or have been commercially launched in the developing countries. In India for instance, some governmental organizations are supporting grassroots innovations which have potential to be successful in the market. To get insights in the up scaling process, we propose to learn by examining existing scaling up cases. Based on these insights, solutions can perhaps be suggested to optimize the scaling up process.

A preliminary framework is proposed to identify design drivers articulated by grassroots innovators and up-scalers towards successful scaling up. Thereby the framework suggests design drivers retrieved from literature could be crucial for scaling up grassroots innovations successfully. It is essential to understand how these design drivers are reached. Conclusions are drawn to facilitate the construction of the framework.

Keywords: Grassroots innovations, scaling up process, product development, sustainable business, developing countries

11:10-11:30 [X24] Engendering the Innovation Process in Rural Areas: Closing the Gap between Supply and Demand

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Biography of presenting author: Anna Crole-Rees is leading a research program, in which innovation is a priority topic, at Agroscope, Wädenswil. She lectures at the Swiss Federal Institute of Technology, Zurich. She has been working on several projects with a gender approach, mainly energy services provision, commodity supply chains and program evaluation in Africa and Central Asia. She holds an MSc from the University of Reading and a PhD from the Swiss Federal Institute of Technology, Zurich.

Abstract: Already in the 1980s, the CGIAR system acknowledged that women make essential contributions to agriculture in emerging countries and that they have less access than men to productive resources, innovations, and income opportunities. Closing the gap would generate a significant increase in production, income, and livelihood in rural areas. Hence, the need to "engender" agriculture through research and innovation processes has long been recognized.

A few decades later, the evidence-based documentation of this gap has greatly increased. Methods and tools that include the gender variable have been developed. However, one is forced to admit that this gender gap still exists. Women still make the greatest contribution to food production and processing, and they still suffer from social, legal and economic inequalities. Several international institutions are nowadays repeating the message and reinforcing their efforts.

The Gender in Agriculture Partnership (GAP), an initiative developed through the mechanism of the Global Forum on Agricultural Research among partners, including FAO, the CGIAR and regional Fora, aims to contribute to closing the gap by making innovation better serve the needs of women farmers (GAP 2011). A medium-term road map is taking shape. It makes use of different kinds of activities and, most important, of innovative partnerships among the various stakeholders at both the international and local level.

Taking Niger as an initial case study, the GAP developed a novel and direct participatory assessment of innovation priorities of farm-households' members to determine genderdisaggregated innovation needs and priorities, recognize different perspectives, and determine the potential for change in women's priorities when more relevant innovation options are made directly accessible through open radio communication. The assessment tool takes various approaches into consideration: gender, participation, livelihood and is demand-driven. It was first used in 8 villages in three different regions in Niger, in partnership with local development and research agents.

The results of this case study clearly demonstrate that rural preoccupations are much broader than agricultural technologies and concern all aspects of daily life. Potential innovations to address most of these needs already exist in the country, but are not available to the specific villages' populations, and, hence, are not supplied locally. There are clear discrepancies between women's and men's demands. The study highlighted several entry points for reducing inequalities at both individual and collective levels. The study method itself also allowed assessment of the readiness (openness) of rural communities to discuss such topics, the influence of external communication links in achieving greater access to innovation for women, and the level of awareness of gender inequalities among the local population and the various actors. The program will need further time to actively address the gender competences of all the stakeholders.

The case study concludes that several recommendations made in the 1980s, such as including socio-economic aspects and making use of gender-sensitive methods, are still valid. It advises using a broader and holistic approach to innovation, not only for income-generating activities, including agriculture, but for all activities contributing to livelihood. Such work has to be done in partnership with the local population and the local authorities and development organizations. Making innovation work better for women requires long term institutional change and reorientation of innovation processes so that gender implications are considered from the outset of research prioritization, and it also necessitates targeting agricultural knowledge and making it more directly relevant and available to women farmers and household's heads.

Keywords: innovation process, agriculture, gender, supply, demand, needs assessment

10:30-10:50 [94] Earth Architecture to Empower the People

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Biography of presenting author: Satprem Maïni is a French architect, born in 1959. He has a Post Master in Earth Architecture from the School of Architecture of Grenoble, France. He lives in Auroville since 1989, where he is the director of the Auroville Earth Institute that he founded. Satprem is the representative for Asia of the UNESCO Chair "Earthen Architecture, Constructive Cultures and Sustainable Development". The Auroville Earth Institute is also partner of the network BASIN South Asia and various others world networks.

Abstract: Building with earth is a means to build affordable houses and to empower people by giving them the opportunity to build their habitat themselves through a community process. Examples of earthen buildings all over the world prove that this material is economical, long lasting and can promote an endogenous and sustainable development.

The Auroville Earth Institute, near Pondicherry, researches, develops, promotes and transfers energy and cost effective earth based technologies. These technologies are disseminated through training courses, seminars, workshops, publications and consultancies in and outside India. Since 1990, more than 7850 people from 73 countries have been trained. One of the goals of the Auroville Earth Institute is to give everyone the knowledge and therefore the possibility to build their habitat themselves using earth techniques.

Compressed Stabilized Earth Blocks (CSEB) have many environmental and social advantages. As firewood is not needed for their production, choosing CSEB over fired bricks limits deforestation. If planned in advance, quarries resulting from sourcing soil on site can be converted into rainwater harvesting tanks, wastewater treatment systems, reservoirs, basement floors or landscaping features. The embodied energy of a m³ of CSEB wall is about 10 times less than a m³ of country fired bricks in India (Puducherry area). This outstanding energy efficiency is a result of the very little quantity of stabilizer needed to produce CSEB.

The production of CSEB is an easily transferable technology that can be learned in a few weeks. The Auroville Earth Institute organizes one week training courses that guarantee a complete technology transfer. This technology allows unskilled and unemployed people to learn a new skill and find a job. Building with earth and particularly with CSEB, which is a labor-intensive technology; it helps reducing unemployment and allows builders to lower their dependence on imported materials which decreases the overall price of buildings. Earth is a sustainable construction material that has beneficial social and economical impact on the community.

Keywords: Earth architecture, compressed stabilized earth blocks, technology transfer, endogenous development

10:50-11:10 [X26] South - South Transfer of Clean Brick-Making Technologies in Asia and Africa

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Biography of presenting author: Master of Architecture at the University of Geneva (IAUG). Postgraduate studies on sustainable development at the University of Geneva (IUED) and the EPF Lausanne. Management of the HEKS Switzerland Country Programmes for Serbia and Bosnia. Construction and settlement planning delegate for Caritas Switzerland in Indonesia. Sustainable Building and Settlement Specialist at Skat Consulting Ltd /Skat Foundation, working in Pakistan, Nepal, Serbia, South Africa, Haiti, Rwanda, Burundi, Afghanistan and Sudan, mainly on urban development issues and transfers of building material production technologies.

Abstract: The international community has been supporting the promotion of energy-efficient and socially acceptable brick-making technologies for decades and has learnt many lessons on appropriate and inappropriate approaches for Technology Transfer (TT) and the local anchoring of improved production techniques. Skat Consulting Ltd has been facilitating the transfer of energyefficient brick kiln technologies in developing countries for many years. Founded in 1978, SKAT (<u>S</u>wiss Resource-Centre [Kontaktstelle] for <u>Appropriate Technologies</u>) is a pioneer within the socalled Appropriate Technology movement. Furthermore, it hosts and moderates international communities of practice, and facilitates South-South Technology Transfer projects in Asia, Africa and Latin America. The presentation gives an overview of different TT methods applied in the field of building material production. Success stories and failures in the building material sector show the evolution of Appropriate Technologies (AT) promotion methods from Experts Driven North-South TT to present Private Sector Driven South-South Technology Transfer. Good and bad practices from China, Nepal, Pakistan, South Africa, and Rwanda illustrate the potential and the challenge of technology transfer methods over the past 30 years.

Multi-disciplinary local TT-facilitation teams are established and trained for the transfer of energyefficient brick making technologies from China to South Asia and Africa. By combining local knowhow of innovative entrepreneurs, engineers, suppliers of raw material and equipment as well as policy-makers, promoting appropriate technologies is being substantiated.

Energy-efficient brick kiln technology is currently disseminated from entrepreneur to entrepreneur, facilitated by local TT teams all over South Asia and in South Africa. Where these kilns have been established, the neighboring population and brick labor is less exposed to toxic gases, the amount of child labor is reduced and less energy is wasted through inefficient kiln-firing. Success or failure of a technology transfer depends as much on the selected transfer method and the involved stakeholders' will to succeed, as on technology design and its local appropriateness. New concepts such as Open Source technology systems offer new perspectives for international technology transfer.

Keywords: Tech. transfer, methods and approaches, brick industry, environment, child labor

11:10-11:30 [374] Himalayan Vernacular Technologies - Sustenance and Continuity: Collaborative Engagements and Future Directions

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Biography of presenting author: Arunava Dasgupta is an urban designer and architect, currently engaged as Associate Professor in the Department of Urban Design, School of Planning and Architecture, New Delhi. Over the last twenty years, through applied research projects in rural and urban Himalayan settlements, he has been pursuing the larger question of the role of architects and designers beyond the city, while advising state and central government departments towards formulation of sustainable development guidelines for settlements under transformation.

Abstract: This paper will discuss salient issues related to the erosion of vernacular construction technologies under pressure from endogenous and exogenous conditions afflicting rural habitats in transition while offering a suggestive direction for an integrated program of applied research and capacity strengthening among a varied range of stakeholders and policy makers. Over time, the collective wisdom of the rural vernacular has steadily given way to the ever-enticing building systems and connected technologies of the urban. Such transformations of time-tested sustainable methodologies towards energy-intensive, universalized building products have contributed to increasing degradation of environmental resource apart from irreversible loss of local identity and association. Against this backdrop, the purpose of this paper is to focus on the trajectories of change that are responsible for the shift in prevailing sustainable practices of vernacular building traditions as recorded across a defined time period and potential directions of future collaborative possibilities towards addressing such trends.

Our experimental endeavor is set in ecologically fragile, culturally unique, tribal settlements of the remote Himalayan regions within the state of Himachal Pradesh in India. Spanning across more than a decade of empirical observations on transformations of the vernacular, this applied research initiative captures the essence of the above narrative of change and moves forward to suggest a community-driven engagement program for capacity strengthening and co-creation of alternative technologies for sustainable construction practices. From a macro-perspective of settlement-level planning guidelines harnessing existing potentials while confronting future challenges, to micro-level demonstration pilots, the experiment engulfs a wide range of scales and user groups and helps generate a multi-dimensional platform for collective knowledge sharing and mutual exchange.

Using three tribal villages in the above-mentioned eco-zone as cases, the paper will establish the connection between rigorous, long term, field-based documentation/research of sustainable vernacular technologies, to a multi-pronged, collaborative platform of alternative design and construction practices encompassing the complex range of issues and possibilities surrounding such areas of concern.

Keywords: Vernacular construction technology, rural transformation, collaborative engagement, capacity strengthening

Day 3 - Thursday 31 May 2012 - Afternoon Session

SESSION 3: TECHNOLOGY TRANSFER OR CO-CREATION? KNOWLEDGE SHARING AND EMPOWERMENT

Ed	Education and Cooperation - 31 May 2012 - [Room SAS Polydôme] - 14:00-16:00						
14:00- 14:20	Shaijumon C.S.	IN	Indian Institute of Space Science and Technology	195	Role of Village Resource Centers in Technology Diffusion and Development		
14:20- 14:40	Michael Canares	PH	HNU Center for Research and Local Governance	129	Difficulty to Connect: Impediments to Fostering Collaboration for Knowledge Creation among Developing Country Scholars		
14:40- 15:00	Prosanto Pal	IN	The Energy and Resources Institute	339	Building capacity through Research, Development, Demonstration and Deployment (RDD&D) collaboration: Evidence from the Transfer of Low Carbon Energy Technologies in India		
15:00- 15:20	Shauna Jin	US	Technical University Delft	372	Partnerships for Sustainable Design in Vietnam: Leveraging Culture and Design		

ICT, R	ICT, Resource Mgmt. & Sustainability - 31 May 2012 - [Room Polydôme] - 14:00-16:00						
14:00- 14:20	Natalie Ceperley	US	Ecole Polytechnique Fédérale de Lausanne	205	Technology's Role in Documenting Indirect Ecosystem Services, the example of a wireless network of meteorological stations and an agroforestry tree in a West African Parkland		
14:20- 14:40	Gizaw Desta Gessesse	ET	Amhara Regional Agricultural Research Institute	174	Application of Local Erosion Indicators and Joint Learning Approaches for Improving Soil Conservation in the Uplands of Lake Tana Basin, Ethiopia		
14:40- 15:00	Vanessa Maria Brito de Jesus	BR	State University of Campinas	333	Social Technology and Agroecological Methods: Interactions among different Types of Knowledge for Social Inclusion in Northeast Brazil		

	Technology and Innovation - 31 May 2012 - [Room CO 2] - 14:00-16:00						
14:00- 14:20	Pierre Rossel	СН	Ecole Polytechnique Fédérale de Lausanne	X13	Technology: A Bootstrapping Lever for Development		
14:20- 14:40	Viviana Munoz Tellez	СН	Ecole Polytechnique Fédérale de Lausanne	317	Transfer of Technology to Least Developed Countries: From Promise to Realization		
14:40- 15:00	Deepak Ashwani	IN	Aalborg University	308	Alleviating Energy Poverty through Social Business		

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14:00-16:00 Education and Cooperation

Room SAS Polydôme

14:00-14:20 [195] Role of Village Resource Centers in Technology Diffusion and Development

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Biography of the presenting author: Dr. Shaijumon C S is currently working as Reader in Economics in the Department of Humanities, in Asia's first Space University named, Indian Institute of Space Science and Technology (IIST) under Department of Space, Government of India. He is a Fulbright Scholar and is having eleven years of teaching and research experience in India and abroad. He received his master's and doctoral degree in the field of economics from University of Kerala, India. He is the recipient of several awards and honors which includes, National Youth Award, Fulbright Award and Freeman Fellowship. His current research is mainly focuses on the area of technology and economic development.

Abstract: Space technology and Information communication technologies are state of the art technologies of modern civilization. Indian Space Research Organization (ISRO), with the intention of disseminating knowledge of any kind to rural masses using advances of information communication technologies in space research, has envisaged the Village Resource Centre (VRC) concept in the year 2004. ISRO's VRC conduct interactive programs on a regular basis in the areas of, agriculture, water resources, tele-health care, awareness programs, skill development / vocational training for livelihood support etc., are connected to knowledge producing institutions like Universities, development institutes, hospitals and other institutions in association with NGOs/Trusts and state/central agencies. The purpose of this study is to empirically analyze the impact of VRCs in the area of agriculture by capturing the agriculture productivity, level of knowledge and innovation performances of the farmer community. The specific objectives of the study are: to analyze the productivity and knowledge level of VRC attending and non attending people and its role in regional economic development; to analyze the innovation performance of VRC attending agriculturists in two regions. The study has conducted in Meppadi Panchayath (11°33'38.24"N, 76° 8'31.32"E) in Kerala State. Findings of the study show that the impact of new developmental intervention through Village Resource Centers are significant in the level of knowledge diffusion, innovativeness, and productivity of farming communities, and are quantitatively measured. There is a significant reduction of information inequality among the people and noticed the emergence of a new socio-economic relationship. It is understood from the study that the farmers are keenly interested in increasing their knowledge day by day and as a result of trying to increase their income from farming. The Village Resource Centers have done a great deal in helping the farmers in this regard. VRC's plays a vital role in improving the quality of life in villages by providing new knowledge to the farmer community. The VRCs are connecting the knowledge between the experts and the village community. The services are reaching the doorsteps of common man, in local language.

Keywords: Village resource center, diffusion, innovation, productivity, technology

14:20-14:40 [129] Difficulty to Connect: Impediments to Fostering Collaboration for Knowledge Creation among Developing Country Scholars

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Biography of presenting author: Michael P. Canares is a Ford Foundation International Fellow. He is a graduate of law and accountancy from Holy Name University-Philippines and development studies from the London School of Economics. As recognition of his teaching, research, and community development work, the Central Bank of the Philippines and Citibank awarded him the Most Outstanding Finance Educator of the Philippines award in 2009. He is recently published in the International Journal for Small Business and Entrepreneurship.

Abstract: Developments in information technology over the last ten years have revolutionized the manner by which scholars and activists have created, established, or strengthened, platforms and avenues for creating and sharing knowledge products that impacted positively on the condition of the world. However, there seems to be uneven development in this regard, as less and less south to south collaborations have actually taken place and have produced results that are more meaningful than what are created in collaborations initiated by scholars from the north, with the participation of scholars from the south. The reasons why this so are investigated in the context of network of scholars and activists in developing Asia who were recipients of the scholarship grant from the Ford Foundation International Fellowships Program.

The study showed that there are at least three thematic impediments in fostering south-south collaboration. First, there are technology gaps that hindered efficient access. In archipelagic countries as the Philippines and Indonesia, certain areas have weak or intermittent internet connection. Accessing the web and establishing or engaging in conversations with fellow scholars, for at least 57% of the total participants is difficult. Secondly, there is a lack of thematic fit. Though the scholars and activists are asking the same questions, responding to similar challenges, and engaging in the same arena in development work, a common platform is missing. Finally, considered most significant is the issue of resource constraints to scholars as individuals, and to the scholars as a network. The scholars and activists in this study are first and foremost constrained in financial resources to pursue collaborative work as well as knowledge resources to ground their work on the current debates with the rest of the world.

The research recommends facilitated collaboration that would address the key challenges indicated above. It would entail the participation of human, financial, and technical resources that would create an enabling environment for scholars in the south to pursue collaborative work.

Keywords: South-south partnerships, collaboration, knowledge creation

14:40-15:00 [339] Building capacity through Research, Development, Demonstration and Deployment (RDD&D) Collaboration: Evidence from the Transfer of Low Carbon Energy Technologies in India

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Biography of presenting author: Prosanto Pal is a Senior Fellow in the Industrial Energy Efficiency Division at TERI (The Energy and Resources Institute) in New Delhi. The division undertakes research projects on energy efficiency improvement and cleaner technologies promotion among industries. Mr. Pal has been involved in cleaner production studies; RDD&D (Research, Development, Demonstration and Diffusion) of energy efficient technologies among SMEs and studies on issues related to technology transfer from developed to developing countries. He leads several multidisciplinary research projects in these fields and has published numerous articles in international and national journals. He has authored a book on cleaner technologies in the foundry industry. Mr. Pal has been educated in India and the UK: a Bachelor of Technology from Indian Institute of Technology (Delhi) in Chemical Engineering; a Master's of Science from University of Warwick (Coventry) in Manufacturing Systems Engineering and a Master's Degree from University of Strathclyde (Glasgow) in Process Engineering.

Abstract: There is a growing consensus that effectively addressing climate change requires a global concerted effort towards low carbon pathways. Many suggest that the diffusion of affordable low carbon technologies in developing countries represents one important channel to assist their transitions to low carbon development pathways, and yet the goal of achieving effective technology transfer remains elusive. Some indicate that effective technology transfer can be achieved by building up technological capabilities – or the abilities of actors to contend with technological change. Collaboration between parties at various stages of the innovation process, through research, development, demonstration and deployment (RDD&D) mechanisms is viewed as being pivotal to building technological capabilities along with more effective international technology transfer.

Nevertheless, debates exist regarding the role of RDD&D in stimulating capacity building and in encouraging successful low carbon technology transfer. For instance, there is disagreement

regarding the key drivers for RDD&D collaboration; which policy levers can encourage effective RDD&D collaboration; and which types of RDD&D mechanisms are most successful.

Drawing on empirical insights based on research in India, this paper argues the following points. To begin with, the role of intergovernmental processes in driving low carbon RDD&D collaboration has – in certain instances – been minimal. Rather, market access has been the key driver instigating and fostering action in the area of low carbon technology transfer. In addition, while debates continue regarding whether the key driver of technology transfer and capacity building should be the public or private sector, evidence suggests that *both* the private and public sectors along with intermediaries play an important role in encouraging collaboration. Thirdly, more effective RDD&D strategies involving international knowledge and expertise have resulted in more successful and rapid technology transfer, but – perhaps unsurprisingly as they generally have more resources at their disposal – this type of collaboration is more frequent amongst larger firms. Furthermore, more successful collaboration can be traced to needs driven initiatives which engage local actors. Finally, partnerships which targeted building local technological capacities elicit more success.

Keywords: Low carbon technology transfer, India, research development, demonstration and deployment (RDD&D), technological capabilities

15:00-15:20 [372] Partnerships for Sustainable Design in Vietnam: Leveraging Culture and Design

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Biography of presenting author: Shauna Jin is a PhD candidate at the TU Delft. Her research focuses on cross-cultural collaboration to address design for sustainability topics in emerging economies. She is working within the EU funded, Sustainable Product Innovation [SPIN] Project which promotes links between the EU and South East Asia.

Abstract: This paper discusses need and relevance of new local-global collaborations for sustainable design. Future Living Studio is a case study that explores how to enable cross-cultural collaboration in Vietnam towards addressing sustainable design and production issues. This paper presents the first empirical results of a diary study supplemented by observations to examine the strengths and opportunities relative design and cultural positionalities bring to cross-cultural teams. A facilitated approach focused on supporting positive team dynamics is proposed as a way to improve knowledge exchange by explicitly building in mechanisms to promote equality, mutual learning, respect, inclusivity and reflexivity so that process and result can be negotiated, inclusive and emergent.

Keywords: Co-creation, sustainability, case-study, Vietnam

14:00-16:00 ICT, Resource Management & Sustainability

Room Polydôme

14:00-14:20 [205] Technology's Role in Documenting Indirect Ecosystem Services, the Example of a Wireless Network of Meteorological Stations and an Agroforestry Tree in a West African Parkland

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Biography of presenting author: Natalie Ceperley has been a PhD student at EPFL since 2008, splitting her time between Burkina Faso and Switzerland. She is interested in the importance of vegetation and land cover in the hydrologic cycle of West Africa from both local and scientific perspectives. She received a Master of Environmental Science with a certificate in African Studies from Yale School of Forestry and Environmental Studies and a Bachelor's degree in Biology with a concentration in Global Development Studies from Grinnell College.

Abstract: The Gourmantche people of South Eastern Burkina recognize *Sclerocarya birrea* as a locally important agroforestry tree because of its cultural, agricultural, and nutritional value. Although it is understood to provide hydrologic benefits to surrounding crops by local farmers, the larger scientific community had not yet documented its benefits. Using an easily deployable network of wireless meteorological stations, we observe the effect of these agroforestry trees on the local water balance. *Sclerocarya birrea* trees are found to promote deep infiltration of the surface precipitation into the deep ground water, promoting recharge. On a patch scale, the highly vegetated surface is shown to conserve soil moisture after the rainy season and thus allows for longer crop cycles. In addition to the hydrologic services, the increased quantity of vegetation allows for marketable ecosystem services such as carbon sequestration or food production diversity.

The scientific study was bracketed by a participatory mapping workshop that launched the project and guided research directions and a set of interviews that assessed the importance of *Sclerocarya birrea* to the local community, local perception of climate change, local history and reasoning of land use, traditional knowledge of farming and rain practices, local technological needs, and local perception on current development, specifically over the time period of the project. The goal of these interviews was to understand the local community's perspective on the scientific questions, basis, and propositions of our research project. By framing the project within two different organized dialogues with the village, we are able to make conclusions of the social importance and potential impact of this research.

In this paper, we compare the results of the scientific measurement effort with the local perception of this tree, and propose how innovative technology can be used for on going monitoring of the ecosystem services. Such a monitoring effort could be beneficial to set up additional incentive schemes to encourage farmers to maintain agroforestry trees, thus promoting a more diverse subsistence base, increasing carbon storage, and creating a more resilient social-agricultural system.

Keywords: Ecosystem services, meteorological stations, agroforestry, water balance, Burkina Faso

14:20-14:40 [174] Application of Local Erosion Indicators and Joint Learning Approaches for Improving Soil Conservation in the Uplands of Lake Tana Basin, Ethiopia

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Biography of presenting autor: Gizaw Desta is an Ethiopian-born and researcher with expertise in soil conservation, hydrology, and watershed management. Over the past one and half decades, he has worked in different research capacities in a public research institute. He earned his B.Sc. in 1994 and his M.Sc. in 2003 specialized in Soil and Water Engineering from Alemaya University, Ethiopia. He obtained his PhD from BOKU in 2009. Gizaw has published and co-authored for more than 15 research articles in proceedings and journals.

Abstract: Many land-users in the highlands of Ethiopia, though well aware of the negative effects of erosion and other forms of land degradation, do not make soil erosion a top priority problem until it reaches the stage of gully formation on their farmlands. Most soil conservation planning and implementation approaches therefore rely on empirical assessment methods by experts and give little consideration to sharing and enhancing farmers' local erosion knowledge. Therefore, supporting and facilitating the adoption and transfer of improved erosion control technologies and innovative land management practices through building and sharing farmers' local knowledge along with genuine participatory approaches is essential. The purpose of the study was to improve the efficiency of existing soil conservation practices implemented in the past and facilitate the knowledge transfer and adoption of improved measures through farmer-expert joint learning approach (JLA) and application of local erosion indicators (ALEI) as a tool.

This paper offers information on processes and methods of farmers' participation and use of their local knowledge to improving soil conservation on the basis of the results of ESAPP/CDE supported research project. Farmers' knowledge about erosion indicators was explored by frequent field visits and farmer-expert dialogue. It is found that farmers often do not notice and give priority for short-term erosion indicators such as in the form of rill erosion, tillage erosion, ditch erosion, etc. and their long term consequences. On the contrary, those indicators such as gullies, land sliding, yield reduction due to soil depletion, flooding, sedimentation, etc., were easily identified and their impacts are realized by farmers. At the end of the JLA, farmers able to describe and understand both seasonal and long term erosion indicators in qualitative and quantitative ways. They also identified and described weaknesses of existing soil conservation practices and practiced innovative improvement measures.

The methodology described here has provided positive impacts on the local knowledge and attitude of farmers such that it is widely explored and demonstrated by self actions and change practice. It has also brought an impact in generating innovative practices, minimizing sense of dependency, and understanding the importance and consequences of seasonal effects of tillage, sheet and rill erosion for long term land degradation. In addition, the farmers have been empowered through the ownership of the erosion assessment, planning of conservation measures and practicing soil conservation improvements. Thus, the methodology enables the farmers to prevent and do efficient erosion control measures and orient them towards long term and sustainable erosion protection strategies by integrating farmer and expert knowledge, and using the erosion indicators as a tool for assessing and prioritizing severity of erosion.

Keywords: erosion indicators, local knowledge, participatory approaches, empowerment

14:40-15:00 [333] Social Technology and Agroecological Methods: Interactions among Different Types of Knowledge for Social Inclusion in Northeast Brazil

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Biography of presenting author: Doctoral student of the Science and Technology Policy Department of Campinas State University in Brazil, with the thesis on social technology and values within agro-ecological agriculture. Member of the Research Group in Policy Analysis and Innovation. Master in Production Engineering from Federal University of São Carlos, with a dissertation on "Monitoring and Evaluation of the Social Technology Network: a collective construction." Associate to Kooperi - Collective Self-organized Group for the Promotion of Solidarity Practices.

Abstract: This article presents analysis and results obtained from the observation of a farming experience on small properties in the state of Paraíba, Brazilian Northeast. The field research suggests that the relationship between farmer and technicians, mediated by the transfer of technologies of irrigation and soil management, in which different kinds of knowledge are brought into interaction, leads the family, society and the world itself to become understood in a new way – making possible the development of knowledge that encompasses other and new social values, moving towards a new technological rationality.

Two aspects allow us to comprehend this phenomenon. The first refers to the technology. In the experience analyzed, the set of agroecological technologies found in the properties is designated as Social Technology, a type of technology that realizes the critical of the conventional technology, driven by a more sustainable perspective and less harmful to the environment and to humans. Leads to another technoscientific rationality, carried by social values such as solidarity, cooperation and autonomy. The process of technology transfer, in this perspective, is supposed to be done in a participative way, respecting cultural aspects of rural communities.

The second element is the interaction between knowledge. Farmers and technicians interact through dialogue, in which traditional and technical knowledge are brought together allowing the re-significance of practices and concepts. When observed knowledge interactions about soil management and irrigation technologies, the initial results suggests that the act of getting to know this social technology seems to work as a vector of transformation in the lives of families, since it has made possible for them to establish new relationships with the soil, with food, and with their neighborhood. It also serves to generate beliefs and discourse about the positive effects of agroecological practices, influencing other farmers of the state, with conventional plantations, to change and innovate in a sustainable way.

Keywords: Traditional knowledge, interaction, social technology, social change, Latin America

14:00-16:00 Technology and Innovation

Room CO 2

14:00-14:20 [X13] Technology: A Bootstrapping Lever for Development

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Biography of the presenting author: Pierre Rossel is currently a senior scientific fellow at the Ecole Polytechnique Fédérale of Lausanne, College of management. For more than 25 years, he has been active in the technology assessment and technology intelligence field, teaching, researching and publishing in such domains as the impact of information and communication technology, innovation dynamics or knowledge pathways for development.

Abstract: Based upon some 25 years of research, action research and advisory mandate experience, our paper claims that technology is a powerful tool for development and within that perspective for poverty reduction, but provided that it is envisaged in a systemic framework, both as a target and an evaluating toolbox. The implication of that claim is that any serious shortcut or too direct and simplistic expectations from technology implementation to poverty reduction is likely to end up in the opposite, namely re-enforcing divides and problems in the short as well as in the medium term. Identifying and turning around typical paradoxes to be coped with when it comes to using technology as tool for development, the paper advocates the integration of key clues or guidelines to turn any local or sectoral experiment in a systemically relevant deployment.

Keywords: Technology, innovation, assessment, sustainable indicators, public policy, systemic integration

14:20-14:40 [317] Transfer of Technology to Least Developed Countries: From Promise to Realization

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Biography of presenting author: Viviana Munoz Tellez is a PHD student on economics of innovation, with particular focus on developing countries. Viviana is also Manager of the Innovation and Access to Knowledge Programme of the South Centre, an intergovernmental organization of developing countries based in Geneva. She holds a Master's degree in Development Management from the London School of Economics.

Abstract: The international community has long recognized that Least Developed Countries (LDCs) require assistance to build a viable technological base. Appropriate technology is needed to address developmental challenges including poverty, disease, malnutrition and climate change, as well as to upgrade LDCs productive capacities and infrastructure to tackle economic stagnation and commodity dependence.

A number of international agreements in the areas of trade, intellectual property and environment include provisions aimed at promoting technology transfer to LDCs. These provisions create generally obligations on developed countries to implement measures domestically to encourage and facilitate technology transfer to LDCs and provide for financing. Despite efforts made by developed country governments towards compliance, several studies have found that the provisions on technology transfer to LDCs remain largely inoperative, particularly Article 66.2 of the Agreement of Trade Related Aspects of Intellectual Property Rights (TRIPS).

In this paper we use a case study to explore the reasons why this model of technology transfer has not worked, and reflects on what may be done in both the providing and recipient country context to effectively drive technology transfer and exchange of knowledge. The case study involves an entrepreneur in an LDC country who is seeking appropriate technology to process woodchips as a renewable energy fuel source to power a local business.

The case study indicates that there are a number of barriers that may inhibit the transfer of technology in this context. These include lack of information, coordination and financing to match technological capabilities in developed countries with technological needs and entrepreneurship in LDCs. Moreover, even when a match is successful, these barriers may still inhibit the transfer of technology. The paper advances ideas for support mechanisms.

Keywords: Technology transfer, least developed countries

14:40-15:00 [308] Alleviating Energy Poverty through Social Business

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Biography of presenting author: Deepak is a researcher of Environmental Management from Aalborg University, Denmark and StartingBloc Social Innovation Fellow of Los Angeles 2012. He aspire to begin a social entrepreneurship to serve the people suffering from indoor air pollution due to open fire cooking. He had worked for social development in academic and professional projects (specifically in Rwanda and Zambia) related to cooking fuel pellets, gasifying cook-stoves and biochar produced from stoves which is used as soil amendment.

Abstract: Use of wood and charcoal for cooking is a major cause of increasing deforestation and associated environmental problems worldwide. Apart from low fuel efficiency, the traditional stove designs, cooking culture and architectural custom also contribute to indoor air pollution, which is considered as one of the leading health problem in developing countries for women and young children and a contributing factor to global warming. However, modern alternatives like LPG/Kerosene are riddled with other problems such as cost, safety and lack of infrastructure in remote areas. Therefore, it is essential to introduce sustainable fuel supply made from local resources along with improved biomass stoves, with high fuel use efficiency and as competitive emissions as of LPG. The gasifier stoves built on the principle of biomass gasification, meet these requirements and also produce biochar, which can provide income as well as an excellent soil amendment for the users. However, the use of these stoves with sustainable fuel supply is very limited at present and field studies are required to develop profitable business models of gasifier stoves and cooking fuel to identify potential problems and solutions for encouraging wider acceptance of these stoves. Most of the stove programs promote the use of efficient cook stoves but there is a need of sustainable and profitable business model to couple the availability of cooking fuel along with gasifier stoves.

In this research paper, the approach of Inyenyeri business model sustainability in Rwanda to reach its customers are discussed along with the use of fuel pellets as a cooking energy. Inyenyeri business model is first of its kind to use crowdsourcing for pellets generation and gasifier stove with the biochar generation in the field of stove programs. The focus of the research is on the social innovation done by Inyenyeri with the aim of energy poverty alleviation, which is claimed to be much more than just providing clean cooking energy by the company.

Keywords: Gasifier stoves, pellets, Rwanda, social business, poverty alleviation

14:00-16:00 Human Settlement

Room Polyvalente

14:00-14:20 [354] Spelling Space: Exploring Ideal Types for Concept Formation in International Architecture Projects

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Biography of presenting author: Isabella Pasqualini is an architect, researcher and urbanist. Beyond authoring prize awarded competition projects and visions her works were selected for the Swiss Art Awards 2008 and 2010. Currently a PhD student at the École Polytechnique Fédérale de Lausanne in collaboration with the Laboratory of Cognitive Neuroscience she investigates the perception of architectonic space while also engaging in projects ranging from multisensory art installations to a design summer school at the Tsinghua University in Beijing.

Abstract: The cultural dimension is known to be crucial for the introduction of architectonic and urbanistic standards into countries with emerging economies. Particularly, the recent presence of digital media and tools has incremented the easy assimilation of Western standards. From the architect's point of view this represents a problematic trend, not only leading to conflictual situations during the development and construction process, but also to conceptual failures caused by insufficient consideration of local values and know-how. In this paper, we propose novel ways to conceive solutions for international development projects by involving on the one hand recurrent criteria, but on the other also by exploring and fostering local values and manufacture skills.

We ground our approach onto existing models of theory building by implementing typologies or ideal types as elements of concept formation in the architectonic design process. Using a recent case study in China we will illustrate the application of such an ideal type. In the case study we describe how within a Sino-Swiss academic environment we have co-authored a project-specific architectonic language through the use of a commonly generated ontology by considering environmental and cultural issues. Great emphasis has been laid on a mutual learning effect and the involvement of a development process related to crafting prototypes. This approach has allowed us to address issues of environmental sustainability at a very early and high-level conceptual stage by involving and developing conceptual skills borne from local needs and potentials. Together with our partner we have tried to balance arguments stemming from the original contextual background and a striving for innovation. The aim of our activities is to transfer to our partner institution a frame for architecture centered on cross-disciplinary autodidactic academic learning.

Two of the prototypes issued from this ontology have been constructed and exhibited at the Beijing Design Week and Beijing Triennale 2011. In both of them, the slightly distinct approach reflects not only some of the actually existing cultural differences, but also the endeavor of creating together. This article concludes the start-up phase of an on-going project.

Keywords: Architecture, design, conceptualization, ideal type, typology, ontology

14:20-14:40 [173] The Process of Urban Planning in Detail: Where to Find Leverage?

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Biography of presenting author: Dr. Jérôme Chenal, b. 1973, is architect and urban planner. He studied architecture at the The Swiss Federal Institute of Technology (Ecole Polytechnique Federale of Lausanne). He made his PhD in the Laboratory of Urban Sociology (Lasur-EPFL). He is currently researcher at University College London (Development Planning Unit). His researches concern the link between spatial transformations and social mutations, at the crossroad of architecture and lifestyles, urban planning and street-level practices. His empirical investigations take place in Switzerland and in French metropolis of Africa and in India, where he develops news methodological instruments for urban research using especially photography.

Abstract: In the field of urban development, each lender and development project has its own methods, issues and cities of study. While the Millennium Development Goals (MDGs) extol the virtues of sustainable development (Bolay, 2010), the Cities Alliance has developed City Development Strategies (CDSs), which is an action-plan for equitable growth in cities, developed and sustained through participation, to improve the quality of life for all citizens (ECON Analysis, 2005). The World Bank for its part continues its Urban Development Projects (UDPs), simultaneously supporting the Cities Alliance.

The different approaches used by international organizations, however, generally propose the same planning tools, and thus ultimately the same master plans; the fact that in the past several years we have moved from a "classic" vision of planning to a more "strategic" one has, in fact, changed nothing. Planning in Africa remains a total failure, as the continent is unable to organize its regions and merely assents to *a posteriori* decisions made outside the legal framework.

We believe that, in order to propose ways of overcoming these obstacles, only keen knowledge of the processes behind planning and development projects will allow us to understand the issues we must address; we must start by understanding the contexts in which plans are developed and determine at which point obstacles and challenges present themselves, or, on a more positive note, at which point it is possible to infuse change and innovation; the main challenge is knowing which parameters to change in order to get different results. And yet, lenders and international organizations continue to propose superficial ways of working that do not allow us to change this paradigm.

The goal of this paper is therefore two fold. The first is to provide a quick historical overview of urban planning in Africa by highlighting some of its milestones and show that the planning tools being used today are, regardless of what we call them, the same as those that have been used for decades. We will also look at some of the obstacles that thinking on these tools encounters; they leave little room for innovation, lack pragmatism and are developed by the same structures everywhere (namely private offices). Worse still, whatever the methods used in the processes for developing these plans, they consistently fail to take into account the democratic/official/social contexts of cities as well as their geographical location.

Our second goal is to show the process used to develop a planning document for the city of N'Djamena that actually takes into account certain critiques and, if accepted, will make it possible to overcome the current hurdles in urban planning. This way of working offers flexibility, allowing us to plug in new data obtained from scientific research during the plan development process and to give it an institutional basis and widespread acceptance during its development. We will also look at a housing project developed on behalf of the Ministère de l'Aménagement du Territoire, de l'Urbanisme et de l'Habitat (MATUH) in the Republic of Chad in 2008.

Keywords: Urban planning, urban planning tools, process of urban planning

14:40-15:00 [62] New Dynamics in Integrated Sustainable Urban Environmental Management - An Educational Approach

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Biography of presenting author: working on environmental management case studies in India. Presented paper at international conferences and published articles in referred journal on the same theme. At present he is working on climate change disclosure practices of Indian companies project funded by Gitam University.

Abstract: One of the main programs of Agenda 21 is concerned with the strengthening of institutional capacities in order to have the localities develop their own environmental action plans. UNCED has put urban environmental problems on the front stage and it has identified the local authorities as a major partner of national governments and international agencies in developing and implementing sustainable urban environmental action plans.

Developing countries should, with appropriate international assistance, consider focusing on training and developing a cadre of urban managers, technicians, administrators and other relevant stakeholders who can successfully manage environmentally sound urban development and growth and are equipped with the skills necessary to analyze and adapt the innovative experiences of other cities.

First, in the context of a strong local self-government; second, in a national network involving all state levels government, the private sector, non-governmental organizations and international agencies; third, in the context of evolving international-institutional co-operation. This research paper further has explained the need for preparation of action plan that should be done in accordance with a few main principles: public participation, co-operation with citizens initiatives and the private sector, consistent application of environmental policy by local authorities, fostering of preventive actions and of the "polluter pays" principle. Accordingly, a model is designed for institutional approach for urban environmental management. Further this study considered specific tasks: implementation of strategies, new innovative planning practices, designing of organizational and technical solutions, new forms of co-operation, continuous education and awareness development programs, institutional building for which this study has identified techniques and methods for institutional approach.

This paper has also developed a model structure for institutional approach for Urban Environmental Management on the basis of Co-ordination of the functions of environmental protection with responsibility to the highest body of local government; organization of environmental protection tasks on a cross-sectoral basis. This paper further reviewed the existing curricula of higher education in the filed of environmental science and management.

Research has highlighted the essential links with urban environmental planning by drawing special topics from existing professional and scientific curricula that includes environmental law, environmental ethics, environmental economics, environmental management etc. further the paper has also discussed the place for a new curricula in the urban environmental management by developing a model in academic world.

The concept of sustainable urban environmental management is a new approach in India in particular and developing economies in general. Results from the study may be referred as guidelines for academicians and administrative authorities in Asian region.

Keywords: Integrated sustainable management, educational institutions curricula, partnership, approach, practical implications, developing countries

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« Appropriate Technology? » Needs and Participation

1. [283] Preparing for Cyclones in a Changing Climate: Lessons and Experience from Bangladesh

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Biography of presenting author: Khaled Masud Ahmed, since 2002, has developed a long and strong experience in disaster management field through working in community based DRR actions and programs. He undertook DRM strategy 2010-2014 and Contingency Plan for floods and cyclones in Bangladesh and conducted VCA for Maldivian Red Crescent Society. He was awarded a scholarship course on Disaster Risk Reduction from Ecole Polytechnique Federale de Lausanne' and completed IFRC 'Field School' training. He is a focal point for formation of Sphere Bangladesh Community.

Abstract: Bangladesh has a history of extreme weather events with catastrophic consequences on development achievement and aspiration. The average annual frequency of tropical disturbances in the Bay of Bengal ranges between twelve and thirteen, of which five attain cyclonic strength (with wind speeds of more than 64 kph). Although they contribute only 5% to 6% of the global total, they are deadliest in the world accounting for about 75% of the global losses in terms of lives and property. Global warming consequences will most likely also have significant implications for the predictability, frequency and intensity of extreme weather events such as frequent cyclones, prolong drought and devastating flood (IPCC, 2007 and IPCC SREX, 2011).

This poster illustrates Cyclone Preparedness Programme (CPP)' (www.cpp.gov.bd) an example of technology and people's participation. Recognizing the sad reality of 1970 super cyclone (which killed over 500,000 people) in response to request from the United Nations General Assembly CPP was developed in 1972. And with support from the IFRC and Swedish Red Cross, CPP evolved in 1973 as a joint venture program of BDRCS (Bangladesh Red Crescent Society) and the Government of Bangladesh. The CPP is an organic component of the nation's institutional early warning system and which has been a role model in community based early warning services. CPP functions with a network of 47,270 trained volunteers in coastal Bangladesh, disseminates early warning collected from Bangladesh Meteorological Department (BMD) through a wide network of 130 HF/VHF radios. The early warning is transmitted through CPP setup at 6 zonal and 32 upazila (sub-district) offices. The unit team sets out in villages and issues cyclone warnings.

CPP is a mechanism which relies on technical skills and volunteers' commitment for ensuring that all potential victims of an approaching cyclone are given sufficient warning to 30 million coastal people so as to enable them to move to safe- sites.

Keywords: Development, community based early warning, extreme weather events, global warming

2. [388] Bio-control of the Asian corn borer in the Democratic People's Republic of Korea

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Biography of presenting author: 10 years experience as a CABI advisor in international agriculture at the interface of capacity building and agro-ecology. University studies in ecology after post secondary school training in pedagogy, didactics and psychology have facilitated effective work in the field of participatory technology transfer including knowledge transfer and capacity building in integrated crop management. Relevant work experience includes the demand driven development, implementation and dissemination of tools for sustainable agriculture through innovation systems approaches and the facilitation of multi-stakeholder approaches.

Abstract: Agriculture is of high importance in DPR Korea with approximately 50% of the available work force employed in a cooperative farming approach. However, it is becoming increasingly difficult for work teams to reach their production targets due to declining soil fertility, increasing insect pest incidence and limited access to agro-chemicals. In order to increase national food production and improve food security, work in DPRK has focused on sustainably enhancing maize

production using an Integrated Pest Management (IPM) approach. IPM combines cultural, chemical and biological control methods to provide long-term prevention and reduction in pesticide use. Biological control of the Asian corn borer, which causes extensive maize damage and yield losses, was a key part of the IPM strategy and involved mass production of a parasitic wasp, *Trichogramma* spp.

Initial testing of the IPM approach in DPRK demonstrated a promising 28 percent increase in maize yield. A total of 24 facilities to mass produce the parasitic wasp were therefore subsequently established in a number of different counties. The facilities have the capacity to supply wasps to up to 100 cooperative farms and potentially increase total maize production by 10'000 tons per year.

Capacity building of the personnel involved in wide-scale IPM implementation was crucial to the success of the project. MoA staff was trained to manufacture and maintain local mass production facilities. The joint development of a knowledge transfer concept, together with the introduction of new training methodologies, formed the basis for successful hands-on training of production and on-farm application staff. Capacity building at institutions indirectly linked to IPM implementation (e.g. Universities) strengthened overall national competence in IPM. Policy workshops were held to develop national IPM guidelines, which in turn have led to maize IPM being set as a high priority area by the government. Understanding driving forces in the special set of circumstances in the DPRK culture and institutional framework were of a high interest and crucial for finally successfully implementing IPM.

Keywords: Integrated pest management, institutional capacity building, biological control, Asian corn borer, innovation systems,

3. [345] Use of Moringa Oleifera Seeds for Drinking Water Treatment in Chad-Cameroon

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Biography of presenting author: Graduated in Civil Environmental Engineering at the University of Brescia in 1997. PhD in Sanitary-Environmental Engineering with a research concerning "Non conventional process in water potabilisation systems". She is carrying on her research activity since 1996 at the Department of Civil Engineering, Architecture, Land and Environment (University of Brescia), working on the following themes: drinking water treatment, solid waste recycling, special solid waste reuse in construction and appropriate technologies for developing countries.

Abstract: A European cooperation project was started in collaboration with ACRA, an Italian NGO, with focus in the Valley of Logon River (Chad and Cameroun).

The project was aimed at valorizing local natural resources to improve living conditions of the population. Improvement of drinking water quality is a target that has to be achieved.

A survey was carried out in order to investigate the practices of local population about water management and socio-economic, sanitary and environmental aspects. 37 villages were analyzed and 278 questionnaires were submitted. It resulted that 94% and 78% of the families interviewed in Chad and in Cameroon, respectively, used unimproved sources (unprotected wells and surface waters) and only 19% of water was sporadically treated with hypochlorite dosage in some villages in Cameroun.

Further to this investigation, 12 villages were selected for a water quality monitoring program.

Considering the results of the survey and literature data, *Moringa Oleifera* seeds were identified as a local resource to be exploited for water treatment. In fact, powder from *Moringa Oleifera*, added to water, has the capability of reducing turbidity and microbiological contamination (Pritchard et al., 2010). Also other local seeds, *Azadirachta indica* and *Balanites aegyptiaca*, were tested.

Different coagulation/flocculation tests were performed on river water samples using the ASTM-D-2035-08 method. This experimental activity was carried out at lab-scale in Italy in order to analyze the removal yields of turbidity and bacteriological contamination.

The first results show that *Moringa* seeds reduced the turbidity from 40 NTU to 5 NTU, with an optimal pH value of 10 and an optimal dose of 75 mg/L. Otherwise, the dosage of powder from the other seeds did not show any coagulation properties. The research is still ongoing and an infield experimentation is being developed in order to evaluate the real applicability of this solution.

Keywords: Water treatment, natural coagulant, Moringa Oleifera

4. [224] The Appropriation of Traditional Building Technology by Modern Architecture in Extreme Situations

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Biography of presenting author: Degree in Architecture (2007) from the School of Architecture at Granada University, Spain. Fellowship in the Teacher Education Program University (2009-2012) in Cartagena. Doctorate program: Architecture, Urbanism and Environment. Member of the Research Group "Contemporary Migrations, Residential and Public space: Architecture and Territory in the Mediterranean Area". Publications in the area of vernacular architecture. Some international conferences: EFLA Regional Congress, Tallin, Estonia; Internacional Congress 7VCT, Lisbon, Portugal; Congreso Internacional de Innovación Docente, Cartagena, Spain.

Abstract: Modern architecture was created in Western industrialized countries after industrial revolution. A new building process started meant for an industrial process based on 'in situ' prefabrication, standardization of components, normalization and modular coordination and new materials. Spreading globally such new architecture became a problem. Not until 40's and 50's did modern architecture start to make an impact on less developed countries. The problems related to foreign technology importation combined with those of social theory imposition alien to them, particularly in the housing domain. Before this situation, the following question arises: How was it possible to carry out the modern architecture project in regions where it was absolutely non-viable from a technological perspective?

Three examples will show the different ways in which modern architecture could fit in such distant and different countries as India, Egypt and the Arctic.

- Chandigarh city in India, work of Le Corbusier, Pierre Jeanneret, Maxwell Fry and Jane Drew.
 We will illustrate how Indian vernacular building solutions, and traditional materials and techniques were used in the construction of the 500,000-inhabitant capital of Punjab.
- New Gourna city in Egypt, work of Hassan Fathy. He drew the conclusion that the sets of houses with reinforced concrete structure which had been built by the government for the 1950's were more expensive in terms of money, transport and salary expense than the local methods of self-building, and which did not agree with non-Western lifestyles.
- Svapavaara city in Lapland, work of Ralph Erskine. This city evidences the success of the application of the vernacular Arctic technology.

The lesson given by the three cases in such different situations, evidences that it was possible to carry out such enterprise by deploying the technology available in each place, and redirecting human processes towards renewable sources and minimum material consumption, being both solutions inherent in traditional values and vernacular architecture.

Keywords: traditional building technology, building technology advanced, modern architecture, vernacular architecture, XX century.

[261] A Novel Approach for a Coupled System AOPs-Biologic for Valorization of Byproducts from the Sugar Cane Industry as a Source of Biofuels in the Developing Countries: The Colombian Case

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Biography of presenting author: Chemical engineer from the National University in Colombia. Presently he is finishing its PhD in the Bioenergy and Energy Planning Research Group at the EPFL. He has been involved in the conception and management of the project "Sustainable Biofuels in North Andean Countries" (SUBA) funded by the SDC-EPFL fund. His research activities include life cycle assessment and techno-economic analysis of biorefinery systems. **Abstract:** The Colombian government through the creation of the law 693 of 2001 has encouraged the search for new renewable and sustainable energy sources in order to solve the critical situation derived from the use of hydrocarbons as automotive fuels.

Evidence suggests that AOP's (Advanced Oxidation Processes) are able to transform complex and toxic molecules present in agricultural crop wastes and wastewaters, in order to improve biofuel production yields. Local technology, such as traditional anaerobic digester and electrocoagulation are being developed in order to dispose and valorize this kind of wastes. However, without previous pretretreatment stage, yields are low and large-scale implementation seems significantly limited. The behavior of a coupled system AOPs–Biologic aimed at the valorization of LC residues (sugarcane bagasse) and vinasse from the bioethanol industry in Colombia was evaluated. The ozonation and photofenton oxidation processes were assessed as pretreatment strategies in order to increase downstream biogas production yields.

In the case of bagasse, AOP's performance was compared to that of steam explosion pretreatment which is commonly used in the pulp and paper industry. For the raw vinasse, biogas production increased due to pretreatments from 49.5% to 65.87% for the ozonation and photofenton pretreatments, respectively. In addition, toxicity essays showed that the pretreatments enhanced the biodegradability of vinasse. A 72% and 88% of anaerobic biodegradability was observed for raw and ozonized vinasses respectively, proving an enhancement in organic matter degradation attributable to ozonation. Regarding photofenton oxidation, the anaerobic process showed a biodegradability of 72% and 83% for raw and pretreated vinasse. The bagasse ozonation was seen to increase biogas production in 80.2% against the pretreatment with steam explosion which was 17.1% compared to the biomethanization of raw bagasse.

Results suggest that the use of AOPs as pretreatment improved biogas production yields from both vinasses and bagasse feedstocks. A coupled system AOPs-Biologic treatment represents a promising alternative to valorize residues from the sugar cane industry in Colombia.

Keywords: vinasse, methane, lignocellulosic, ozone, photofenton.

Towards Sustainable Integrated Development? Partnerships and Systems

6. [X29] Multi-stakeholder Led Processes and Multidisciplinary Research in Low Carbon Planning in Developing Countries: Considering the Role of Technological Capacity and National Development Priorities in Selecting Appropriate Mitigation Actions

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Biography of presenting author: Anya is part of the Energy Environment & Climate Change team at the Energy Research Centre, University of Cape Town, South Africa. She holds an MSc in Energy & Development Studies and a Masters in Structural Engineering with Architecture. Anya is a researcher focusing on technology and Nationally Appropriate Mitigation Actions (NAMA's) under the UNFCCC. Prior to joining the ERC she worked in the fields of energy, water and waste efficiency; and the application of technologies to improve the livelihoods of poor communities.

Abstract: Low carbon development relies on the planning and implementation of climate change actions in the context of national development priorities, technological capacity and poverty alleviation goals. These actions could be policies, financial instruments or purely technology-based interventions. However at the core of their success, is the technological capacity to identify, design, implement and manage them. Technologies and technological capacity may already exist domestically or require external support. Understanding the implications of technology choices on national development priorities - such as job creation and poverty alleviation, requires extensive stakeholder processes across multiple disciplines – from policy makers and academics to technology specialists and community development practitioners.

This poster outlines some of the lessons and challenges from current research work at the Energy Research Centre (ERC) that focuses on low carbon development supported by innovative technology mitigation actions in the context of poverty alleviation. This includes the MAPS

program, a collaboration amongst developing countries using government mandated in-country process that combines stakeholder interaction with research, process and knowledge sharing. The MAPS program builds on the Long Term Mitigation Scenario process, which combined multi-stakeholder processes and research to identify appropriate technologies for reducing emissions in South Africa. Findings are also presented from the ERC's research with private sector wind developers, NGO's and community members in ensuring local socio-economic benefits from the South African renewable energy procurement program.

Climate change, economic planning, technology, and poverty alleviation span across many disciplines and are traditionally dealt with by different institutions at international, national and local levels. Cross-disciplinary approaches require, for example, the integration of national planning processes with existing institutional infrastructure and the alignment between engineering procurement processes with community development. Technology and technological capacity is crucial in ensuring long term low carbon development. How this is integrated into planning and implementation processes is a challenge. This poster shares experiences from multidisciplinary research approaches to integrating technological capacity and poverty alleviation goals in low carbon development.

Keywords: Multidisciplinary research integrating technological capacity, poverty alleviation, low carbon planning

Technology Transfer or Co-creation? Knowledge Sharing and Empowerment

7. [263] Scientific Mobility and Reverse Knowledge Transfers: The Case of India

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Biography of presenting author: Metka Hercog is a scientific researcher at the Cooperation & Development Center at the Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland. She is a political scientist, with an emphasis on migration and international development processes. She is completing her PhD in Public Policy from Maastricht University, The Netherlands. Ms. Hercog obtained an MSc degree in International Development Studies from Utrecht University and a University Degree in Political Science from the University of Ljubljana.

Abstract: Possibilities for scientific mobility have expanded through academic partnerships, exchange programs and joint research projects. Despite the upsurge of international cooperation and associated scientific mobility there is little evidence as to how this has affected the sharing of knowledge between receiving and sending countries. The imbalances in evaluations range from concerns over the enduring loss of scientists to the celebration of highly-skilled migrants as a driving force for regional development, growth and innovation. The effects of scientific mobility, however, depend on a number of factors such as the skill levels of those involved and duration of such movements. We present a qualitative analysis aimed at understanding under what circumstances scientific mobility leads to knowledge transfers, with drawing examples from the case study on India. Drawing on a number of interviews with principal informants and Indian researchers, who are either currently based in Europe or have returned back to India, we in the first place shed light on the mechanisms for channeling human capital and secondly, on factors that are relevant for creation of positive knowledge spillovers. We show that knowledge spillovers back to the country of origin hinge on successful creation of efficient mechanisms for the exploitation of scientific knowledge. Even though Indian scientists consider regional and national development of their home country as very important, they often do not know in what way they could personally contribute or they have a lack of trust in the necessary structures in India. Even when they have access to up-to-date knowledge and research practices, it is not until research collaborations and informal relationships embed researchers into scientific communities that backward knowledge transfers are possible. It turns out that with low numbers of Indians in Europe as compared to the traditional immigrant counties, it is relatively more difficult to get involved in community groups, associations and networks, which are central to the success of long-distance collaboration.

Keywords: scientific mobility, knowledge transfer, scientific communities, countries of origin, India

8. [X7] From the Laboratory to the Target User – a Challenging Task

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Biography of presenting author: Dr. Doris Herrmann is responsible for the program management of the Indo-Swiss Collaboration in Biotechnology. In the year 2000 she obtained her master degree as Engineer of Agriculture of the ETH Zurich, Switzerland. After completing her PhD degree at the University of Zurich, Switzerland in the year 2006, she worked as a postdoctoral fellow at different institutes in Switzerland and France. Dr. Herrmann is author of more than ten peer-reviewed articles as well as several popular articles and publications.

Abstract: The identification of appropriate technologies and their development in laboratories of research institutes are only the first steps in the entire value chain of product development. Public and/or private partners for the production/development of the technology have to be identified and partnerships established. As the last chain link, channels for distribution of the product to the target user such as smallholder farmers have to be developed.

Indo-Swiss Collaboration in Biotechnology (ISCB) is a longstanding (1974) bilateral research and development program, jointly funded and steered by SDC (Swiss Agency for Development and Cooperation, Government of Switzerland) and DBT (Department of Biotechnology, Government of India). Since 1999, the program focuses on innovative (bio)technologies in agricultural and environmental research which have an impact on poverty reduction, food security and adaptation to climate change. Networks of Swiss and Indian partners are supported in the areas of pulses, wheat, biofertilizers, biopesticide, bioremediation and biosensors (http://iscb.epfl.ch/).

After more than a decade of working on specific subjects and often with project partners on a consistent basis, technologies were developed which are now ready to be transferred to private or public partners for further product development and commercialization. In order to facilitate this process, the ISCB has established the Technology Advancement Unit (TAU). TAU supports the project partners to identify opportunities and technologies for product development, to clarify administrative purposes like technology protection, to identify appropriate partners and to negotiate agreements with partners as well as to monitor the product development process. Several successful examples will be presented in the poster.

Bringing a technology from the laboratory to the target user is a time consuming and challenging task. Scientists and their institutes in developing countries often do not have the necessary capacity and knowledge for this process. A specialized support of management units of research programs is therefore highly valuable and can contribute in a decisive way to the process of expeditious product development.

Keywords: Product development for poverty reduction, agricultural and environmental biotechnology, bilateral research and development program, Indo-Swiss collaboration

9. [X30] EDUCITY

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Biography of presenting author: Laura Maccioni (Cagliari 1982) graduated in "Construction-Engineering - Architecture" at University of Cagliari, Italy. In 2009 she obtained the Master in Advanced Studies "Urban Design in Developing Territories" at ETH Eidgenössische Technische Hochschule, Zurich, with the supervision of Prof. M. Angélil and Prof. K.Christiaanse. During her career she collaborated in international urban projects with de Architekten Cie.Amsterdam, Holland and KCAP Zurich, Switzerland. Since 2009 she collaborates with Sardarch Architettura, a research laboratory of urban phenomena in Sardinia, Italy.

Abstract: Education in one of the fundamental factors of development. No country can achieve sustainable economic development without substantial investment in human capital. Education enriches people's understanding of themselves and the world, improves the quality of their lives, and leads to broad social benefits for individual s and society.

Currently 50 percent of the population of Ethiopia does not have access to the education system, a challenge compounded by the growing population rate. This is mainly reflected in the lack of the practical knowledge, tools, and methods necessary to support the development of the country.

Education is the key to an urban transformation. By combining education with development in energy, ecology, and the economy further progress can be achieved.

The initial phase of the development of the city starts with the establishment of a vocational technical school, representing a foundation in technology, creating a sound growth for the settlement. These vocational schools constitute the main centers of the settlement, promoting further expansion of the neighborhoods around them.

The presence of the school will influence the surrounding neighborhoods, creating community learning centers. The city and school will interact through various activities that take place outside of the school compound.

Libraries, dormitories, auditoriums, public sanitation points, street markets, and water supply centers constitute a programmatic interface between the education center and city. Therefore, the school will not only be used by students, but will be a social space for the community, involving the city's residents in the learning process.

Educity focuses on the development of Mendida, an existing village of 4,000 people in Oromya close to the border of the Amhara region.

Following the analysis of our research, four areas are determined to be suitable locations for the envisioned vocational schools. The first vocational school is the school of agriculture, devoted to crop and livestock production. The second vocational school is the forestry school, inhabitants will get acquainted with best practices for forest planting and conservation. The third school, established for construction, in an area which is covered with basalt outcrops, an aggregate material for construction. Students will learn how to quarry and use modern tools and methods to build the city with local materials. Finally the fourth vocational school is dedicated to agro-industry. Knowledge of mechanical engineering and the processing of agricultural products is transmitted in order to create technical skills that assist the agricultural production and trade for export.

Keywords: Education, knowledge, schools

10. [X31] Dynamic Mobile Training for Community-based Animal Health Workers

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Biography of presenting author: Leah graduated from the University of Toronto in 1990 with a degree in Biomedical Communications; an interdisciplinary graduate program in the design and evaluation of visual media in medicine and science. Following graduation Leah developed her skills as a medical illustrator and animator for a medical publishing company. Leah joined LifeLearn in 1994 and has held positions in production, and marketing and sales. She currently holds the position as Chief Creative Officer and is responsible for the design and delivery of LifeLearn's elearning programs.

Abstract: The future of animal health in the developing world depends more on access to existing knowledge than on resource-intensive research or development. Livestock production is essential to the livelihoods of millions of vulnerable people around the globe. Poor animal health and productivity is a primary driver of poverty. Providing extension services through the training and monitoring of community animal health workers (CAHWs) is a well-recognized and validated approach to addressing livestock morbidity and mortality amongst rural communities in low-resource environments where veterinary infrastructure and resources are deficient. However, access to relevant and timely information is a major challenge for CAHWs and organizations working with them to improve livestock health and productivity outcomes.

The intent of this project is to develop a dynamic smart-phoned based knowledge mobilization and exchange system that can adapt to capacity development needs for improving food security through livestock health and production. The research objectives will provide a critical analysis on the role and suitability of mobile-based knowledge mobilization exchange tools for communitybased animal health workers.

For food to be secure (available, accessible and useable), knowledge to protect food supplies needs to also be secure (available, accessible and useable). This project will determine whether a smart-phone based tool will allow for knowledge security in rural Laos so that information can later be disseminated via this tool to promote food security through improved and sustainable food animal production. Measurement outcomes of knowledge security will focus on applicability

(how well the technology works in the field?); usage (how do the field workers use the data?), and perceptions of utility (are CAHWs and project facilitators engaged in using such technology?). Should this pilot study establish that this modality of knowledge mobilization is effective, we can then build on this by developing a full-scale learning platform that would assist in more widespread access and dissemination of information that will directly impact animal health and therefore protect food security.

Keywords: smart-phone application, training, community-based health workers, food security

11. [X32] The International Platform on Sport and Development (www.sportanddev.org): a case study in ICT4D

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Biography of presenting author: Usha Selvaraju has been involved in the field of Sport & Development from 2006 and holds Bachelors and Masters degrees in International Development from the School of Oriental and African Studies (SOAS) in London. She is specialized in the area of Sport & Development communications and has published widely online and in print. Usha Selvaraju conducted Sport & Development research and Monitoring & Evaluation exercises in Sport & Development. She grew up in Geneva and is originally from Singapore.

Abstract: The International Platform on Sport and Development (www.sportanddev.org) is an information portal and online community dedicated entirely to the use of sport and physical activity as a means to reach development and humanitarian objectives. This poster examines the role www.sportanddev.org has played in not only reflecting but also in shaping discourse in the 'Sport & Development' sector.

How can we better exchange North-South and South-South knowledge?

www.sportanddev.org was initially conceptualized as a database to gain an overview of which actors were using this approach and as a means to collaborate and avoid duplication. The latest version of sportanddev.org has decentralized the process of sharing information, giving more autonomy to the user to contribute views and perspectives. The authority of the sportanddev.org team lies mostly in quality control and less in content censorship. Priority is given to 'voices from the South' of the Sport & Development sector. This positive discrimination is deliberate in order to maintain sportanddev.org's integrity as a platform for alternative, non-mainstream, bottom-up approaches to development through sport.

How can local knowledge be valorized in scientific research?

Various research and monitoring & evaluation efforts driven by local scholars and researchers are profiled on sportanddev.org, with a view to being published in scientific publications. As one of the few platforms that provides space for 'grey' research, sportanddev.org has provided a 'stepping stone' for researchers to publish their works via this medium.

What can be done to exchange good practices?

The sportanddev.org website and collaborative tools it provides has attempted to serve the pressing need in the Sport & Development sector for exchange of good practices. The provision of tools and resources contributed by members of the sportanddev.org network, allows for the members of this network to gain valuable knowledge and access information on 'tried and tested' approaches to using sport as a tool for development.

Keywords: information, communication, development, ICT4D, sustainable
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