

ICT4D 2.0 and Mountain Communities

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Information and communication technologies (ICTs) have been making their way into mountain regions for many years. This process is now moving into a second stage: we can call it 'ICT4D 2.0' for mountain communities. This paper explores the priorities for this next phase which will include new technologies, new approaches to innovation and implementation, and a new perspective of mountain communities.

The first phase of ICTs-for-development – ICT4D 1.0 – dates back to the 1990s: it began when the Internet and other digital technologies began connecting with the Millennium Development Goals which needed suitable tools. Under pressure for quick deliverables, practitioners adopted a model used in remote communities of North America and Northern Europe: the telecentre (meaning one or more Internet-connected PCs housed in a communal setting). Telecentres were established but many ran into difficulties; often proving to be neither sustainable nor scalable (Etta 2002).

New technology priorities

On the threshold of ICT4D's second phase, mountain communities stand at a technical fork in the road. Do they lobby for Internet access along the telecentre path or ask for good e-content requiring hardware

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innovations: low-cost, low-specification 'netbook'-type devices; low-cost telecommunication approaches such as WiMAX; and better ways to store, carry and transmit electricity? Or do they switch to the mobile phone? If they switch to mobile phones, should we still keep thinking about the Internet as the key technology or should we examine how to carry out mountain development through current mobile functionalities?

Most likely, progress will occur simultaneously along all hardware routes, but the spaces in between that open up when technologies are combined are important. Already remote communities are benefiting from hub-and-spoke models: community radio stations that receive questions by cell phone and broadcast answers sourced from the Internet; or telecentre databases that farmers in the field can interrogate via text messaging.

Hardware alone is an empty shell. Sustainable mountain development will only be achieved if we fill that shell with useful applications. Information will be the foundation. ICT connectivity is of limited value unless farmers can find information of specific relevance to mountain agriculture (Heeks and Kanashiro 2009). Beyond content, communities need reliable, affordable, and applicable services. ICT4D 2.0 will likely be based around an 'm-services' model: for example, using mobiles to deliver health service reminders or information for applications to schools and colleges. Particularly promising, as demonstrated in Kenya, is m-finance because the majority of mountain citizens are currently 'unbanked' (Jack and Suri 2010). [Additional cases are described in some of the other papers in this periodical.]

ICTs seem well understood as tools for delivering information and services to mountain rural communities; little understood is how communities can use these tools to create new incomes and jobs. This productive facility is partly encompassed when mountain residents act as authors of data as seen in community radio and participatory video projects which deliver relevant content and empower those involved as participative creators.

The sense of empowerment and inclusion that comes from content creation and/or application is valuable. But the priority for mountain communities is income generation and employment creation, and we are just waking up to the possibilities. With mobiles, incomes are being created both around the technology – selling accessories and pre-paid cards, and via the technology – selling or taking calls. The early innovators, the Gramin Phone people in Bangladesh, took mobile phones to the farms and fields to connect rural women with their migrant husbands in the Gulf States. More novel ICT-enabled microenterprises are now commencing. In Kenya, Txteagle (www.txteagle.com) is bringing the crowd sourcing model to remote rural areas: outsourcing micro-tasks to mobile phone owners for very small payments (translating from English to Swahili or transcribing short audio clips). A priority for ICT4D 2.0 will be conceiving innovative business models using the growing ICT base – of mobiles, telecentres, and so forth – to create employment in mountain regions.

Innovative models

We can identify three different models of innovation.

'Laboratory' (pro-poor) innovation is the first to take place outside mountain communities but on behalf of those communities. Telecentres began this way, and the One-Laptop-Per-Child project was similar; developing new technologies in North America and then trying to extend them to the global South. The danger is a 'design – reality gap': a mismatch between the assumptions and requirements built into the design and the on-the-ground realities of highland regions (Heeks 2002).

'Collaborative' (para-poor) innovation takes place working alongside mountain communities. For example, new software applications under the Bridging the Global Digital Divide project (www.bgdd.org) were developed by academic teams who lived and worked in villages to get local people participating in the design and testing process. This approach will be central to ICT4D 2.0, but it needs to learn lessons from development studies about who participates in this type of co-innovation and how and why they participate: sustainability and benefit-sharing need to be maintained.

'Grass roots' (per-poor) innovation in the context of the Hindu Kush Himalayan (HKH) region is a process of learning by people within mountain communities. In the 1990s, it was hardly a possibility because there were not enough ICTs. More recently, as mobiles, wireless connected PCs, and the web start to arrive in remotest rural areas, these communities are fostering innovations and experiencing benefits. This process does not occur in the traditional laboratory-based knowledge transfer sense but in the sense of adapting and applying the technology to new pathways. At present, we have only anecdotes about this – communities using airtime as currency; communities creating their own mobile-based systems for emergency response – but soon we will hear about communities using ICT to learn how to improve agricultural productivity and access distant markets. As the weight of such anecdotes grows, there will be pressure within ICT4D 2.0 for more systematic means to capture, evaluate, and scale up the innovations materialising within mountain communities.

Good practices for ICT4D 2.0 implementation (based on SDC 2007)



Implementing good practices

If all the above possibilities are to be achieved, then lessons must be learned from the mistakes of ICT4D's first phase. These centre around three issues (see figure).

- Project governance – particularly finding a way to draw stakeholders together into productive partnerships
- Project design – finding ways to manage those design-reality gaps: ensuring local realities are acknowledged and mapped; and ensuring 'hybrid' professionals are present who combine an understanding of technology, systems, and development.
- Project management – shifting from a blueprint approach that manages via a one-off, top-down plan to a process approach that sees ICT4D projects as a journey that will only be sustainable if it is flexible enough to meet the changing financial, social, and political capacities and demands of mountain populations over time.

A combined profile will be required for those leading ICT programmes in mountain regions in future. We might call these ICT4D 2.0 champions 'tribrids' rather than hybrids because, they must combine expertise from three different domains: computer science, information systems, and

Conclusions

There is no sharp dividing line to say, "ICT4D 1.0 stopped here; ICT4D 2.0 began here". In mountain villages and towns, there is a sense of evolution, not discontinuity. And yet a messy, fuzzy but new paradigm is emerging. Where ICT4D 1.0 was about getting the foundations in place and proof of concept, ICT4D 2.0 can turn part of its attention elsewhere. It can stop thinking solely about pilots and instead think about sustainability, scalability, and impact. It can stop thinking from a monodisciplinary perspective and instead think from a tri-disciplinary perspective that combines computer science, information systems, and development studies. And it can stop thinking solely about 'needs' – often defined from outside mountain communities in rather paternalistic terms. Instead, it can think about 'wants' – what is it that the mountain residents themselves actually demand?

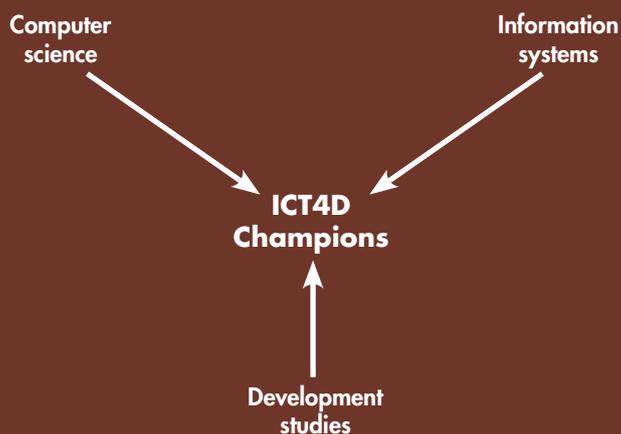
In conclusion we can see that ICT4D 2.0 is about reframing our view of those living in mountain communities using a paradigm which is emerging. Where ICT4D 1.0 marginalised them, ICT4D 2.0 centralises them, creating a demand-driven, rather than a supply-driven, focus. Where ICT4D 1.0 characterised them as passive consumers, ICT4D 2.0 sees them as active producers and innovators.

Three questions emerge. How can those who live in mountain communities be producers of digital content and services and create new incomes and jobs through ICTs? And how can we recognise and scale the ICT-based innovations they produce? We hope that with the work ICIMOD is pursuing in the HKH region, we can generate innovative learning pathways and good practices in the use of ICT4D.

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Creating ICT4D 2.0 champions



development studies. These champions can provide a balanced approach to ICT4D strategy; an innovative approach that pulls its plan of action from an amalgam of the key questions each domain can answer:

- What is possible with digital technology? (from computer science)
- What is feasible with digital technology? (from information systems)
- What is desirable with digital technology? (from development studies)