

## *Spreading the news: The use of ICT to raise rural living standards*

Twenty-first century technologies are rapidly spreading into rural Africa, Asia and Latin America. What prospects for broad-based socioeconomic and human development do these innovations open up in rural communities with poor socioeconomic prospects? **Kgabo Ramoroka** and **Peter Jacobs** look at how local communities benefit from the spread of state-of-the-art information and communication technologies (ICT).

Local municipalities in South Africa are helping many rural communities to access broadband wireless networks for social communication, learning and business activities. For example, the Peebles Valley community in Mpumalanga close to the Kruger National Park now enjoys the benefits of a community internet link.

The local clinic, which is also a major HIV/AIDS care training and support clinic, forms the hub of this internet user network. The clinic uses 60% of the available wireless bandwidth per month, but it also serves as the link through which surrounding schools, homes, farms and other clinics have internet connectivity free of charge. In this case, reliable access to a broadband wireless network translates into many benefits for local communities, serving as a catalyst to deliver better rural healthcare services with positive spillovers cascading across the delivery of other social services.

However, cost, adequate infrastructure and local skills are crucial determinants of what social gains this venture could yield for rural communities in the long run. These barriers could undermine the sustainability and developmental impacts of innovation.

The International Development Research Centre (IDRC) funded the start-up installation and operational costs of the network, but there is a need for additional sources for future investments. Adequate infrastructure is vital for its continued existence and effective operation. Moreover, from the outset this initiative exclusively relied on bringing in highly-skilled personnel from outside this rural locality. Yet

technological innovations are capital, and skills intensive, and to maximise long-term benefits requires transferring technological capabilities and building adequate local skills.



**Reliable access to broadband wireless networks can be a catalyst for better rural healthcare services with positive spillovers cascading across the delivery of other social services.**

### **How do innovations spread in rural areas?**

Technological innovations might be made available in a rural area, but their spread among the intended local users is not automatic. Understanding the dynamics of innovation diffusion and adoption might be a helpful first step to exploiting technological innovations for sustainable rural development.

The ways in which role-players in an innovation system communicate, share and disseminate new knowledge is known as diffusion. This process depends on, among other determinants, appropriate communication channels and social systems. Mass media (TV, radio, newspapers etc.) and interpersonal communication are examples of communication channels. Without a channel for the flow of scientific and technological information between actors in the innovation system, diffusion is blocked. The social structure incorporates the relationships, networks and institutions that govern the behaviour of individuals or groups in a community. The contextual environment influences both the types of knowledge transfers (including indigenous knowledge) as well as the informal ways of distributing innovation.

Adoption takes place when actors decide to make full use of an innovation because they see it as a solution to a problem. However, the speed at which users adopt innovations varies greatly, and adoption is neither a linear nor a smooth process. The experiences of 'early adopters', for instance, often affect how potential users react to an innovation and their adoption decision. An innovation that is perceived to be difficult stands a high chance

of rejection. The easier it is for would-be users to see the benefits of an innovation, the more likely they are to adopt and apply it.

### Transfer of innovation to underdeveloped areas

Real-life examples from elsewhere in Africa compellingly illustrate how multiple factors help or hinder the diffusion and adoption of innovation among rural communities in underdeveloped localities.

In Macha, a rural area in Zambia's Southern Province, there is a community broadband wireless network similar to the service operating in rural Mpumalanga. This village, located 75km from the nearest town of Choma, was never seen as a viable business area by telecommunication operators. Today this community, dependent on subsistence farming and migrant labour, has access to computers and a functional wireless internet network.

Farmers use the internet to research information on production, and job seekers use it to search for employment opportunities. A young sunflower farmer credits this network with his discovery of new ideas about farming. Locally

trained ICT experts support recording patient information, maintain ICT hardware and software on a daily basis, and train other community members in effective ICT usage.

### How do households in SA access ICT?

The 2011 General Household Survey (GHS) of Statistics South Africa included a module on household-level access to functional landline telephones, cellular phones and internet connections. This information provided a sense of household-level access to the basic ICT devices across rural South Africa.

Table 1 summarises self-reported access to functioning cellphones, landline telephones and internet connections within rural households across South Africa's nine provinces. The findings showed that, on average, more than 90% of rural households in South Africa had access to working cellphones – almost totally eclipsing landline telephone access even in remote and underdeveloped villages in the former homelands.

By contrast, landline phone access was relatively higher in the formal rural locations of all provinces, concentrated below 15% of

households per province except the formal rural areas of Eastern Cape, where 27% of households reported access to a working landline telephone. Connection to the internet was virtually non-existent within rural households across ex-homeland localities, but internet connectedness is beginning to diffuse into the formal rural areas.

### Conclusion

Through cellphones, rural households are linked into the modern information and communications revolution. Solar panels and wind turbines give rural households access to more environmentally friendly energy sources. Sustainable use of these technological innovations opens new possibilities to lift people trapped at the bottom of the rural social pyramid out of poverty and underdevelopment.

*Also read the article, Terms of endearment.*

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*This article summarises a concept paper of a new DST-funded project designed to develop and pilot-test a Rural Innovation Assessment Tool (RIAT).*

## More than 90% of rural households in South Africa had access to working cellphones in 2011.

**Table 1: Self-reported access to functional ICT services within rural households by province (GHS 2011)**

Province	Households (N)	Cellphone		Landline telephone		Internet access	
		Rural Locality Type					
	Share of all households (%)	Ex-homeland	Formal	Ex-homeland	Formal	Ex-homeland	Formal
Eastern Cape	(N)	3,038,070	103,491	26,654	36,264	17,346	29,382
	(%)	87.78	77.02	0.77	27.13	0.5	21.75
KwaZulu-Natal	(N)	4,444,576	458,880	68,608	31,414	34,213	26,328
	(%)	93.1	96.64	1.44	6.71	0.72	5.66
North West	(N)	1,501,156	291,495	15,163	10,571	21,180	27,382
	(%)	92.75	90.22	0.94	3.3	1.31	8.47
Mpumalanga	(N)	1,772,365	336,871	15,915	9,636	32,279	19,108
	(%)	96.28	91.93	0.86	2.61	1.73	5.19
Limpopo	(N)	4,030,373	133,379	43,618	18,184	30,550	12,594
	(%)	94.48	89.93	1.02	12.33	0.72	8.39
Northern Cape	(N)	162,918	98,271	3,740	16,408	0	7,285
	(%)	91.39	63.79	2.1	10.64	0	4.73
Free State	(N)	265,453	192,781	1,568	31,302	4,805	23,720
	(%)	92.17	84.94	0.54	13.6	1.64	10.45
Gauteng	(N)	156,908	266,696	1,028	43,473	0	35,888
	(%)	95.49	93.24	0.61	14.96	0	12.55
Western Cape	(N)	n/a	231,596	n/a	38,534	n/a	18,777
	(%)	n/a	72.08	n/a	12.15	n/a	5.84

Source: Statistics South Africa, 2012. General Household Survey 2011

## *Terms of endearment: sustainable ICT development*

Introducing information and communications technology (ICT) in deep rural areas brought the glaring contrasts between Western and African thinking sharply into focus, says ICT engineer **Gertjan van Stam**. He shared some observations at a workshop jointly hosted by the Department of Science and Technology, the European Union and the HSRC. In this article he elaborates on his research, concluding that ICT outcomes benefit from interactions aligned with the oral culture.

**D**evelopment must be conducted on the terms of those being developed. This is the philosophy behind a research project attempting to implement ICT in deep rural areas, which involved making an effort in finding solutions that would ensure the long-term acceptance and use of technology where many other projects have failed.

The goal of the research included identifying and inspiring local talent, and introducing ICT through participatory oral research methodology. It included building capacity through community-led activities that could achieve sustainable progress – not only in economic terms but also in terms of intellectual growth, culture and social wellbeing.

### **Methods**

The research consisted of observations, interactions, assessments, interventions and feedback within the context of the local rural community, while thoroughly immersed in the local culture, utilising oral culture, action and participatory research. The research strived to unearth relevant ways of interaction while simultaneously introducing ICT.

### **Findings**

#### **Data gathering**

The collected data was stored in an 'oral manner', that is, residing in the minds of people. The data not only contained the record of evanescent sound, but also contained all non-verbal communication such as the

season, place, sun position, mental state of the people present, the seating arrangement, and somatic information such as gestures and facial expressions.

Interaction with a specific stakeholder was instantly followed up with interaction with all stakeholders, assuring quick dissemination of information and a level playing field for all involved. Only at a later stage, when the research and interventions were established, interactions become more individual.

The memories of people in the oral tradition are formidable. The manner in which data is stored can be designated as 'remembrance of the meeting as it transpired'. The existence of data was regularly tested by interviewing the people to retrieve and re-assess the information.

#### **On writing**

Due to the existence of barriers to data collection in rural settings, the use of writing and paper was avoided. Community members observed that writing instilled uncertainty and was unclear; texts allowed for word play, whereas verbal communications were regarded as particularly clear. Especially valuable was the idea that whoever was present would know the information 'as is communicated'. It was felt that writing was difficult to control and thus posed significant cultural challenges.

I found that carrying written texts, or even paper, into a meeting would completely

change the atmosphere of the encounter. Even writings on the contents of the meetings posed difficulties, with apprehension about acknowledging that a written text was a representation of that meeting; or that it was being used to shame people, for example pointing out mistakes, grammatical or otherwise, in the texts. Writings thus appeared to be seen as a potent means of exercising control.

#### **Data processing**

Processing the orally-stored information was done in an oral equivalent of social networks. Networks of community members and stakeholders validated the orally stored data and processed it through meetings and discussions. That way aggregation and abstraction of information was recognisable, and output was evident in various modes of communications.

Tangible outcomes occur when large numbers of people affirming their support of the change within existing cultural realities, and individual community members displaying explicit comprehension of change and its benefits, each testify about having a hand in the change. This happens through various formats like stories, songs and human interactions. The social networks change with membership and existence. They are inclusive and in constant flux, assuring relevance and efficiency, and they lead to outcomes that empower individuals with the necessary authority to embed the change.



**Oral culture heavily restricts experimentation or adding new information without communities' consent, and the whole process of processing new information by itself is a tool for community acceptance**

During the data processing stage, which takes place during in-person conversations with leaders, groups of people or other social networks, the community discusses the designation or effect of the matter at hand. Oral culture heavily restricts experimentation or adding new information without communities' consent, and the whole process of processing new information by itself is a tool for community acceptance.

Conceptualisation of the information emerges naturally through the process of verbalisation, often incorporating aspects of the immediate, familiar environment. As such, the new world is assimilated into the old world.

All high-technology interventions, like the introduction of ICT or an airplane, are described in a context of events involving people, like a medical doctor sourcing a car on the internet, a local farmer finding information on a potential new cash crop, and key stakeholders flying on the first airplane ride. This correlates with the fact that oral culture does not use counting, statistics or linear facts, but rather keeps track of activities in which humans are involved.

**Assessments**

The people involved are intelligent, knowledge-

*These articles appeared in the HSRC Review of June 2013.*

able and keen masters of mental processes. The use of all verbal communications as per oral cultures is a valuable and valid means of research. Local culture primarily validates evidence through oral processing, not through written representation. In practice, oral information can be verified. Validation of written communications is deemed impossible as their contents are not registered, nor are the writings secured.

The assessment of the data incorporated aspects of 'being together' and while assessing the data, it was always asked, 'who was present?' and 'what was the disposition of the inter-actors?'

While storing and assessing data in oral cultural formats, assessments of causation include all aspects of the data, including intangibles like character and authority.

Ironically, what was a simple deduction for the oral person was often a complex assessment for the researcher. I often found myself overlooking a relevant aspect as soon as I turned to documenting my findings and theories. Further, the process was recognised as highly hermeneutic, searching for meaning and inter-relational messages in the data, and

incorporating systems and methodologies involving traditional experience, knowledge and wisdom from history.

The environment does not necessitate work with formal deductive procedures, nor in purely logical forms, but with a more practical thought pattern. It depends on 'who talks' to see what is true, not only for the data processing stage, but also during acceptance phases. It is witnessed that even the most experienced people – those who work with ICT on a daily basis – describe technology in terms of its operations, and assess its benefits mainly in the operational context.

Lastly, interventions or activities were never readily accepted. Much time is needed for new occurrences to mature and to be incorporated in the community and culture. When an intervention occurs more or less unexpectedly, the community default is to 'wait and see which way the cat jumps' or go back to 'the default'.

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*This is an extract from a paper, The Journal of Community Informatics. Read the full paper at <http://ci-journal.net/index.php/ciej/article/view/871/979>*

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