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Science and Technology
REPUBLIC OF SOUTH AFRICA

European Union

# Extending access and connectivity across rural communities in South Africa

## POLICY DIALOGUE HOSTED BY THE DEPARTMENT OF SCIENCE AND TECHNOLOGY AND THE EUROPEAN UNION

## Workshop Report

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**CSIR Conference Centre: Amethyst Room**

HSRC
Human Sciences Research Council

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# ACRONYMS / ABBREVIATIONS

| | |
|---|---|
| ACP | African, Caribbean and Pacific Group of States (ACP) |
| BOP | Bottom of the Pyramid |
| CRDP | Comprehensive Rural development Programme |
| DoC | Department of Communications |
| DST | Department of Science and Technology |
| EU | European Union |
| FP | Framework Programme |
| GDP | Gross Domestic Product |
| ICT | Information and Communications Technologies |
| ICT4D | ICT for Development |
| IDP | Integrated Development Planning |
| Mbps | Megabits per second |
| NDP | National Development Plan |
| PICC | Presidential Infrastructure Coordinating Council |
| R&D | Research and Development |
| S&T | Science and Technology |
| SBS | Sector Budget Support |
| SIP | Strategic Integrated Projects |
| SKA | Square Kilometre Array |
| thedti | Department of Trade and Industry |
| USB | Universal Serial Bus (standard for devices) |
| WMN | Wireless Mesh Networks |

# EXECUTIVE SUMMARY

This policy dialogue, the 2nd in a series of three dialogues, was held in Pretoria on 12 February 2013, with the focus on extending access and connectivity to rural communities in South Africa. The policy dialogues form part of the *Innovation for Poverty Alleviation* programme which is funded by the EU Sector Budget Support programme and has been managed by the Department of Science and Technology (DST) since 2009. This Sector Policy Programme has the overall objective of contributing to DST's policy and strategy of using science and technology to reduce poverty through job creation, SME development, economic growth and the improvement of quality of life

The workshop consisted of presentations by the Minister of Science and Technology Mr Derek Hanekom, the Department of Science and Technology, the Department of Communications, an international expert on ICTs for rural development, and a number of speakers from the CSIR Meraka Institute in South Africa. Overviews were presented on government initiatives in ICTs for rural development, as well as the three demonstrator projects currently running in rural parts of South Africa, viz:

- Broadband for all: the Wireless Mesh Demonstrator Project
- Local ownership models - Infopreneurs/Village Operators in ICT-enabled change agendas in rural innovation initiatives
- The Cofimvaba Rural Education Intervention.

Several key factors emerged from the implementation of these demonstrator projects:

1. **The need for integrative approaches:** Rural development is not sector specific and cannot be implemented by one agency only. Integration is needed at the policy level between all government departments involved in rural development; between the various tiers of government; and also between players in communities, the private and the public sectors.
2. **The bottom of the pyramid needs more attention: T**he BOP requires a more concerted effort from a wide range of players, including communities, to determine the high-level '*for what*?' question. Until this is clear for all those involved, a streamlined outcome is unlikely.
3. **Ongoing support is required for the future sustainability of rural development projects:** This could be provided through existing government budgets, through the allocation of budgets to support local entrepreneurs and service providers, or through linkages to commercial enterprises.
4. **Cybersecurity is a major issue in rural connectivity:** When dealing with children and communities, it is critical that awareness is raised about cybersecurity issues and the risks associated with internet access.
5. **The empowerment of the individual cannot take precedence over that of the community:** The Ubuntu way of thinking is integral to working in rural development. Communities need to be supported and awareness created of possible options. However, ultimately communities have to make their own decisions.

The workshop created an opportunity for the 45 participants to share perspectives on future actions required to move the demonstrator projects from research to full-scale implementation. This included policy recommendations that need to be addressed. These can be summarised as follows:

- The lessons learned about integrative processes and the involvement of local government, districts, provincial and national government should be captured in recommendations that can assist in developing coordinated national policy with bottom-up local inputs.
- Efforts need to focus equally on policy, R&D and strategy development. R&D should be ongoing, encourage the development of models and include technology aspects
- Business models should include public-private partnerships as an option in both rural-based interventions and those at the high-end of the economic scale. Government models where different departments or fora have come together for a specific purpose in terms of either programmes or policy interventions through government clusters, are also an option.
- Rural development is a cross-cutting issue and as such, needs to be addressed through a rural development policy in each of the national departments, and possibly even the provincial departments. This in turn will allow planning in each of the departments that could feed into the National Development Plan.
- The Government's Strategic Integrated Projects (SIPs) have adopted a more integrative approach towards infrastructure development where the SIPs need to reinforce and complement each other.
- The lack of continuation in government has been a major challenge for building longer-term relationships. As new players are brought into government, the tendency is to start from scratch with different partners. This was resulted in numerous failures as government structures change. The adoption of the National Development Plan should resolve this issue as no single individual can override the direction laid down by government.
- There are different cultural dynamics in different regions and what works in one area will not necessarily work in another. ICTs in rural development also need to take cognisance of the Ubuntu principle and using relationships as currency.
- The absorptive capacity of communities is a critical issue to consider – if the community is empowered to grow, then its capacity to absorb and adapt becomes greater.
- ICT for its own sake is not sufficient and the key question to be asked is: 'ICT for what?'
- Regional differences need to be taken into consideration in the broadband policy, as does the need to drive down the cost of bandwidth, otherwise this will never benefit rural communities.
- Ongoing maintenance and ensuring that there is budget available is a key issue. Skills development should be aligned to any maintenance plan, so that as infrastructure is built, the skills to maintain it are supported in parallel.
- The possibility of considering communication as a basic human right, in the same category as clean water, could be considered - this would fundamentally change views on access.

# INTRODUCTION

## INNOVATION FOR POVERTY ALLEVIATION PROGRAMME

The *Innovation for Poverty Alleviation* programme is funded by the EU Sector Budget Support programme and managed by the Department of Science and Technology (DST), and has been running since 2009. This Sector Policy Programme has the overall objective of contributing to DST's policy and strategy of using science and technology to reduce poverty through job creation, SME development, economic growth and the improvement of quality of life. It is aimed at the implementation of not only the National Research and Development Strategy, but also the 10-Year Innovation Plan; formulated to help drive South Africa's transformation towards a knowledge-based economy in which the production and dissemination of knowledge leads to economic benefits and enriches all fields of human endeavour.

Within the overall objective, DST identified the following focus areas:

- Enhancing the development of sustainable livelihoods and sustainable economic development;
- Improving human settlements, focussing on access to basic and social services;
- Developing, establishing and improving science, technology and innovation infrastructure, including ICT services and applications;
- Developing human capital, including the promotion of youth participation in science and technology;
- Improving South Africa's response to global environmental challenges; and
- Improving institutional capacity and regional collaboration.

## SECTOR BUDGET SUPPORT DIALOGUES

The Sector Budget Support (SBS) Dialogues have the express purpose of facilitating an organised reflection on the research results from the SBS-funded research to clarify and strengthen the knowledge base of policy makers and inform the policy-making process. The dialogues bring together senior policy makers and their advisors to discuss the research results and the implications the research has for policy development and implementation in a neutral environment. In addition to policy makers and their advisors the events will also be attended by researchers and practitioners, both local and international.

The objectives of the dialogues are to:

- Engage with actors across sectors
- Make recommendations for implementation
- Exchange good practice
- Analyse impact of new technologies
- Explore inter-sectoral strategies and opportunities
- Promote learning, dissemination and knowledge transfer
- Raise awareness of critical policy issues
- Enrich policy discussion
- Explore policy options and tools

## ICTS FOR DEVELOPMENT

The world is experiencing an accelerated pace in digitisation, where there is mass adoption of smart and connected ICT by consumers, businesses, and government. In South Africa, there is still a divide in access and use of information and communication technologies between the rural and urban areas. Information and Communication Technology for Development (ICT4D) projects are seen as a way of improving the prospects for economic development in rural communities, in part by providing the tools, or platforms, for innovation in an environment marked by scarcity. These projects link the rural, mostly agrarian, economy with the knowledge economy and a key factor for their success is reliable and fast connectivity and specifically broadband in rural communities.

This policy dialogue explored various ICT projects developed for rural areas, including the wireless mesh network (WMN) technology demonstrator project, implemented by the CSIR Meraka Institute. This SBS-funded technology demonstrator project has successfully implemented the wireless mesh network technology in over 200 government facilities, which mostly consist of public schools in the District Municipalities of Nkangala (Mpumalanga) and Sekhukhune (Limpopo). The project is now in the process of further connecting a select number of public schools in the District Municipality of JT Gaetsewe, Northern Cape.

The primary objectives of the WMN technology demonstrator project are to:

- To build a large scale demonstrator of the WMN technology in support of rural economic development; and
- To establish a model for rural community centred network infrastructure, owned and operated by small, local businesses also known as Village Operators.

Further to the primary objectives, a number of key supporting objectives are being pursued, such as establishing a basis for the replication of the WMN model in other parts of South Africa; providing sound evidence for informing policy development and decision making; and showing how science and technology can directly and effectively contribute to socio-economic development.

The dialogue provided a forum for those departments who may consider taking on the responsibility for a broader roll-out of wireless access – the Departments of Basic Education, Rural Development and Land Reform, and Health – to discuss the various models and their possible application for this purpose. In addition, there were inputs from a wide range of stakeholders and players with an interest in driving forward the WMN demonstrator the pilot to the implementation stage. The dialogue also examined some of the sustainability challenges for rural ICT4D projects and considered models which aim to empower the communities they operate in with the knowledge and skills required to sustain them.

### GOAL

The goal of the dialogue was two-fold:

- To provide an opportunity to discuss policy implications across departments with varied needs; and

- To facilitate the development of a framework for the roll-out of access and connectivity to rural areas and support initiatives aimed at building and sustaining rural economic growth outside of the agricultural sector. This includes the identification of key technologies and infrastructure required to sustain rural development.

# WORKSHOP PROCEEDINGS

## Session 1 : Context and Background

**WELCOME AND INTRODUCTION**
**Chair: Mr Imraan Patel**
**Deputy Director-General: Socio-Economic Partnerships**
**Department of Science and Technology (DST)**

Mr Patel introduced the session and mentioned that both the Socio-Economic Partnerships and Sector Budget Support programmes fell under his responsibility and both were looking at the application of Science and Technology for poverty alleviation. The Minister of Science and Technology, Mr Derek Hanekom, was introduced together with Mr Richard Young from the EU, who would provide information on the ICT agenda in the European context.

This policy dialogue on ICTs is the 2nd in a series of SBS policy dialogues which focuses on key priority areas in the SBS programme - the first addressed water delivery systems, while the 3rd will deal with energy. These policy dialogues form part of a value chain of activities and initiatives that the DST has been implementing to advance a 2002 commitment in R&D strategy. It examines how technology can be put to work to address three quality of life challenges, including poverty alleviation. The intention with the policy dialogues is to create a forum where people can reflect on the workshops and look at ways of integrating learning into delivery systems

The Department has been investing in large-scale projects to test scale and the possibilities, challenges and opportunities presented by using technology to address service delivery. The Department cannot however implement at scale and discussions are needed at deeper levels on how best these can be taken forward to implementation. Many other players in the system are needed, whether it is the Department of Communications (DoC), the Department of Trade and Industry (thedti), or the private sector in some instances.

There are many interventions happening on the ground that produce knowledge that transforms. The Department sees itself as developing decision support systems and knowledge products such as case studies and policy briefs, thus becoming the knowledge partners in delivering to scale.

**ICT-RELATED POLICIES IN THE EU**
**Mr Richard Young**
**Head of Development Cooperation at the EU Delegation**

Mr Richard Young opened the session by explaining that in the UK, where he resides, the situation is quite different in that rural communities are the most affluent whereas most problems are experienced in the urban environs.

When looking at Europe and the promotion of ICT, the questions have focused on how a better life can be created for all; how to spread the fruits of growth; how to accumulate capital; how to make more from less; and how to use resources more wisely. All of these can essentially be achieved through innovation, and ICTs in turn are increasingly playing an important role. The statistics of the 80s do not reveal the presence of ICT – they were visible around us but only in the 90s and 2000s did the effects of ICTs start to appear in European data. Up to 40% of increases in labour productivity could be attributed to ICT. ICTs can now be seen as a general purpose technology that can promote further innovations, lower costs, and be used strategically.

In the EU economy, the ICT sector makes up about 5.3% of total employment, and just under 6% of the EU's GDP (about € 670 billion, or twice South Africa's GDP). Given the EU's difficulties it has put together a programme to address smart, sustainable and inclusive growth. Flagship programmes within this larger programme relate to youth, addressing poverty, skills and jobs training, resource efficiency and innovation. ICTs have received particular attention through the creation of the *Digital Agenda for Europe,* which sets out the EU's intended strategy. The Digital Agenda consists of seven focus areas (pillars) and 101 specific actions.

- A digital single market;
- Interoperability and harmonization of standards;
- Internet trust and security;
- Faster and ultrafast internet access, with the objective of providing 30 Mbps to all by 2020;
- Investment in research and innovation, and spurring investment from the private sector;
- Enhancing digital literacy, skills and inclusion; and
- ICT–enabled benefits which addresses the EU's societal challenges such as energy efficiency, and efficient government.

Regular use of the Internet should increase, given that one-third of the population in the EU has never used the internet. The intention is to reduce this to 15% by 2015.

Mr Young then questioned to what extent these focus areas also apply in Africa and made reference to the three successive S&T programmes with ACP countries; and the support provided for the space technology programmes with GALILEO, and DMES in global positioning navigation in Africa.

The EU has allocated financial resources to the AfricaConnect programme that brings African researchers together via the internet; it is also looking at the ACP's S&T and communications. The EU Africa Infrastructure Trust Fund is being used to finance ICT and technology activities. All are designed to promote ICTs within Africa. Further examples include the Framework Programmes (FPs), Horizon 2020, the Wireless Mesh Network project, dialogues with the Department of Communications on the broadband digital rollout, the Africa-EU strategy partnership on S&T, and Living Labs where communities can contribute to the adaptation and use of ICT

In his closing remarks, Mr Young emphasised three points in particular. Firstly, ICT is not an end in itself, and has to be used effectively if it is to make an impact. Secondly, one should be modest in promoting ICTs. It needs to be unpicked – he referred to the example of teaching people to fish, e.g. do people want fish, do they know how to fish? He also warned against the use of the term 'best practice'. Finally, ICT was mentioned as the dominant factor in improving labour productivity and that this was so critical that it is being treated separately from innovation.

C: Mr Imraan Patel spoke about good practice and possible lessons that could be learnt from such examples. He mentioned that ICT sits within an ecosystem where aspects such as cost effectiveness, maintenance and systems need to be addressed. These impact on marginalised communities but

also create opportunities, so it is important to ensure their long-term maintenance. In terms of enabling frameworks, the EU's Digital Agenda has lessons for South Africa.

**REMARKS**
**Mr Derek Hanekom, MP**
**Minister of Science and Technology**

The Minister welcomed the audience and was encouraged by the level of seniority of the audience, as this indicated that the policy dialogues were being taken seriously. He commented that policy dialogues were stimulating and 'nice things to do', but that reflection is needed as to where these could take us and how these would guide and allow improvements in doing things better. A plan is needed to take the policy dialogues forward.

The Minister mentioned that ICTs are not the answer to all problems but that ways to extend access need to be explored and people need to know what is possible. In addressing poverty alleviation, many issues have to be addressed, e.g. insufficient food, clean water and access to energy. Children who are hungry and who have no transport will not gain from the benefits of ICTs unless their other issues are also addressed. There is however value in introducing people to possibilities and allowing communities to make their own choices, based on informed policy.

South Africa has good policies, but needs implementation. There is some truth in stating that if policy does not take into account the ability to implement, then can the policy really be considered good? Is the policy working? Are there a host of other factors to take into account? There is need for a reflective approach.

The Minister used the visual of the donkey cart as an analogy in dealing with policy challenges – '*die donkie is 'n wonderlike ding'* [the donkey is a wonderful thing]. The donkey takes people somewhere. In the same way policy can, for example, make provision for well-stocked and well-managed clinics, but if communities cannot get to the clinics, or fetch their pensions due to heavy rains, then the policy has failed. In the same way ICTs can play a role, but transport is as essential a component of poverty alleviation. More appropriately, policy should ask questions such as, what form of transport offers the appropriate transport? What works better than the donkey cart? This needs to be supported by research and asking the right research questions. For example, can animal-drawn transport provide the solution? Should this be promoted in certain situations? Is the donkey the best animal, is the cart the best design, can the donkey user be provided with an improved technology solution to make the cart work better? Can it be used elsewhere? What is the business model? What is the sustainable solution and would entrepreneurship provide a more sustainable model? Testing sites therefore become very important and should ask the same policy questions. Good policy without an implementation plan is not a good policy.

The Minister quoted the example of setting up small transport businesses for rural schools which could provide 5000 new businesses. A policy dialogue could tease out these types of options, but it would need to be tested and thought about creatively.

The Chair thanked the Minister and requested that the participants think about his questions over lunch.

Q: [Rod Grewan, Northern Cape Provincial Department, Department of Development and Tourism] Mr Grewan requested clarity on the analogy with transport and communications, especially in terms of understanding the types of policy frameworks, access and connectivity required. He asked the

Minister to expand on how to translate the transport analogy and its policy development into the connectivity issues faced across the country.

C: [Ms Juanette John, NRE, CSIR] Provided a comment that the people on the donkey cart need to provide not only what their needs are but also what they have to offer in the whole process, perhaps 'indigenous knowledge', although the term is often used incorrectly.

C: [Rensie van Rensburg, CSIR Meraka Institute]. The National Development Plan (NDP) needs not only an implementation plan but also a maintenance plan.
A: Everyone supports the NDP and the implementation of the plan lies in the 2030 vision. The responsibility lies in all of us. The maintenance of, for example, infrastructure, transport and schools, is a weakness in the plan as it is not provided for. It is necessary to explore appropriate solutions in given situations. For example, in Wireless Mesh Networks, what lessons are there elsewhere? What lessons do we have in South Africa? Do we want to do it on a greater scale? What is the situation regarding broadband and connectivity? Are the answers different in the various provinces? What have we learnt? We do not want to get stuck on small pilots. The Department is not an implementation department but provides informed policy advice. Can we take our learning experiences to a different level? If wireless mesh is just a quaint idea then say it, stop doing it and stop wasting time on quaint ideas. If it is a good idea why does it remain just a small pilot? These are some of the policy questions that should be interrogated and engaged on.

## Session 2: International Perspective

**Chair: M Isaac Maredi**
Chief Director: Sector Innovation and Global Change
Department of Science and Technology

The Chair welcomed everyone and mentioned that the Department works with various partners to look at how they can influence policies through S&T, and how to provide advice to their implementing partners, including the private sector and other agencies. All the initiatives under discussion are in rural settings, international and local, and therefore in different contexts. The issue is about sustainability and the capacity to use. How do the lessons and the models that emanate from these interventions help our Government or whoever will take these forward? How do they help in terms of upscaling of the initiatives?

**EXPERIENCE OF PROVIDING WIRELESS ACCESS TO RURAL COMMUNITIES**
**Mr Gertjan van Stam**
**Zimbabwe**
[*written paper provided in Appendix 5*]

Mr van Stam started his work in telecommunications in 1987, moving to South Africa in the mid-90s and spending the past 12 years in the bush in Zambia and more recently in Zimbabwe. The realities in rural areas are extremely complex and problems are amplified as compared to the situation in urban environments. A recent quote states that *"In ICT for development 10% of your time and money should be spent on technology and 90% of the time in people and in process and in politics."*

Van Stam raised the question why communications are needed in rural areas. He quoted the example of his wife, an HIV/AIDs doctor, who has seen 100 children die out of a total of 700 treated. The average turnaround time from clinic to the laboratory for diagnostic tests took a total of 46

days; far too many given that HIV/AIDS spreads faster in children. There is a need for speed, ICTs are needed and should be prioritised.

In their village, they created the largest rural network in Africa, with the required $9000 collected from the community to set up the wireless mesh network. 54% of the network's messages are local and 71% of users access the networks for online learning. Some have even obtained degrees. He mentioned some of the hurdles when their ICT experts were provided with housing, and how this created jealousies and resulting havoc within the community. Likewise, there were challenges when electricity was provided to the ICT team; this also resulted in jealousies within the village.

An ICT rural training centre was established where 585 people were trained in digital literacy and 12 A+ engineers graduated. However, these experts are sitting idle due to restrictive policies created centrally which prevent them from working in rural government positions. There have also been many technical challenges, for example, the reliability of older technology versus newer technology, hardware which blows up and cannot be replaced, and the increasing cost of connectivity and website hosting. Overall, digital exclusion is widening.

Van Stam presented four specific social dimensions which differ in rural environments:

*1. Orality.* Rural communities communicate through oral discourse and their preferred method for learning is storytelling. The real sustainability is in using local languages. Guides and manuals are not effective means for communication in rural communities.

*2. Ubuntu.* The individual is seen as a derivative of the community. In practice, people emphasise interpersonal relationships, group harmony and consensus over individual achievement. How can this dimension be placed in systems? In ICT, engineering systems are developed with a Western mindset which benefits the individual over others. This wreaks havoc in indigenous cultural systems that exist and sustain the social fabric and cultural heritage in rural areas. If it benefits an individual, the individual is placed in danger. However, if Ubuntu thinking was included in our systems and policies, ICT would support traditional African values. This can be supported through community radio.

*3. Relatio.* The amount of relationship is the amount of currency that you have in your relationships. The Western view on money is not really understood in rural communities, and the relation economy is based on the economy of giving. The Western definition of entrepreneurship, which raises the standards of only certain individuals, is problematic.

*4. Dogma.* This refers to how we frame the world, and where both sides of cultural divides may be guilty of pre-conceived ideas. African leadership is decentralised and seeks balances. In Van Stam's experience local leadership is allowed to emerge, through the youth, and a model has been developed. Rigid policies do not cope well with African behaviour.

There is a challenge in aligning paradoxes between Western and African cultures. Complexities in rural areas cannot easily be compressed into cause and effect. Currently the Western system rewards individuality and a 'winner takes it all' approach, which contrasts with the African system of fellowship and spirit of compassion. As the system stands, rural talent cannot contribute to the development of the country. There is a need to focus on social innovation where you work together. This is an appropriate way to develop the means of access to ICT in rural areas.

In conclusion, the speaker recommends that sustainable progress can only be achieved if the emphasis is not only on physical capital, ICT equipment and funding, but also on the values and

culture in rural areas. Programmes should invest on the relationship level and not merely on the financial and technology levels. This should be conducted in a modernised, traditional African way.

Q: [Mr Themba Masilela, HSRC]. Requested the speaker to expand on importance of leadership and mentioned that faith leadership had not been mentioned.
A: There is little literature on traditional leadership. The leaders of tomorrow are today's youth. In practice there are two forms of leadership:- 1) the traditional chief structure, which confirms decisions made at a lower scale, and which provides more spiritual than executive leadership; and 2) leadership by democracy. Young people need to be taught to modernise traditional African leadership. In the case of Macha, this has been achieved through the use of community radio. The main issue in leadership today is the constant battle between traditional leadership and the Western implementation of leadership styles.

C: [Mr Isaac Maredi, DST] re-emphasised the importance of the 90:10 rule and taking cognisance of social dimensions.

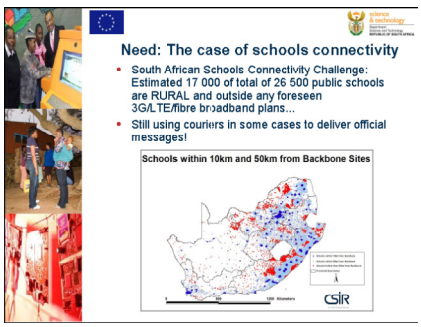
**CANCELLED: INNOVATIVE APPLICATION OF COMMUNITY WIRELESS NETWORKS TO BRING SOCIOECONOMIC PROGRESSES IN RURAL NEPAL**
**Dr Mahabir Pun**
**Nepal Wireless Networking Project**

## Session 3: Rural Technology Interventions

**BROADBAND FOR ALL: THE WIRELESS MESH NETWORK PROJECT**
**Mr Kobus Roux**
**Manager: Strategic Initiatives**
**CSIR Meraka Institute**

[*video material provided*]
A video was presented on the *Broadband for All* project offered by the CSIR Meraka Institute and its partners. The project aims to provide affordable broadband connectivity to under-serviced rural communities, and particularly remote or rural villages with limited or no access to digital communication facilities. The initiative is sponsored by the South African Department of Science and Technology. The video highlights the positive difference that ICTs have made in the lives of village operators in terms of job creation through entrepreneurial opportunities, education and job seeking. The project has been running for about four years.

The video was followed by a presentation on the Wireless Mesh Network project. Its forerunner, The Digital Doorway project, has been running for the past 10 years and has focussed on providing robust computer-based terminals into underserved areas at a time when smartphones and tablets did not exist. This was seen as a way of introducing ICTs and digital literacy into communities. The cost of connectivity was however a major problem.




The Wireless Mesh project was therefore initiated as a large-scale demonstrator which could provide low-cost infrastructure in areas with no connectivity. The focus is on schools, on the premise that if it works there it will also work for clinics and police stations. The project has focused on the

areas of Sekhukhune and the Northern Cape. Major challenges have included the lack of skills and funding, high unemployment, difficult access and remoteness, all of which have contributed to the high cost of logistics support. The WMN has focused on Backhaul and Gateway mesh networks but these still need to link to the backbone. The core principle of the WMN is that it is run by community networks, through the village operators (VOs). These VOs are playing a crucial role in determining what is possible, what is needed and what support is required.

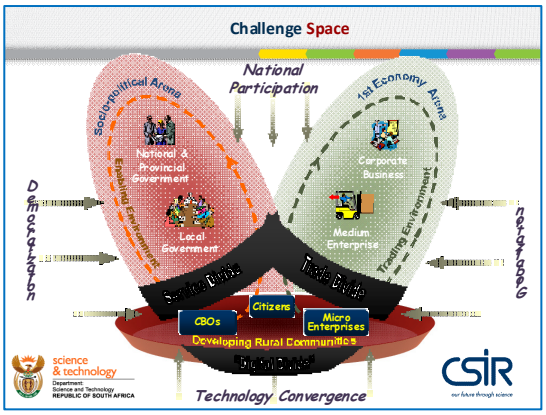
Several key lessons have been learnt:

1. The need for ongoing support from anchor users as money is needed for the maintenance of infrastructure. This could be achieved through provincial government support and through the schools, clinics and other government departments. It is unlikely that there will be enough critical mass from end-user payments. The Northern Cape, for example, has expressed willingness to commit.
2. More applications and products are needed as infrastructure on its own is not very useful. For example, real business is coming from sideline businesses such as e-filing, registering of online grants and FICA registrations.
3. Timelines are a problem. Community-driven activities take more time but will achieve more in the longer term.
4. The operational aspects of project implementation have to be considered from the outset, particularly how daily operations will be maintained once the project is running.

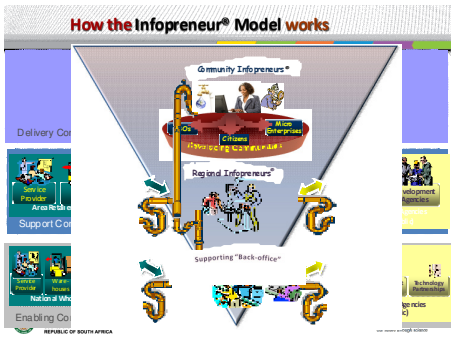
The lack of coordination across government departments and between different spheres of government continues to be a challenge. There is also a need to address institutionalisation of the project as it moves from research to implementation. In closing, the important point was made that usage is driven by the readiness of communities to adopt ICTs.

**LOCAL OWNERSHIP – INFOPRENEURS® AND VILLAGE OPERATORS: INNOVATIVE AND SYSTEMIC ICT-ENABLED CHANGE AGENDA IN RURAL INNOVATION INITIATIVES**
**Mr Rensie van Rensburg**
**CSIR Meraka Institute**
**ICTs for Rural Enterprise and Economic Development**

The presentation started with a description of The Challenge Space, and particularly the Bottom of the Pyramid (BoP) which is excluded from globalisation, democratization and national participation. How can we provide opportunities for young people in this space when densification in peri-urban areas is intensifying and people are running away from rural spaces? Are there alternatives to agrarian activities? The challenge has been to set up shop in the knowledge economy and to create service businesses which can provide sustainable livelihoods. So what does the solution look like and what does it



do? Instead of putting technology into the gap, people are placed there with some technology.
With this in mind, a system of Community Agents has been established. These are technology-enabled micro-business owners who have never received a salary. They are however operating in a high-risk environment as more than 86% of micro-businesses fail within the first three to six months. The solution is to address the whole channel - 'The network is it!' - this is the enterprise, not just the community agent.




An overview was provided of how the model works. The regional office infopreneurs can be seen as the bridge builders, with links to the private and the public sector. They link the entrepreneurs to municipalities; the entrepreneurs in turn collect data for the municipalities and extend small business development services into the areas where it is needed. Support is provided from the back office. The intention is that the channels should be bi-directional, with services provided to and from the BoP, rather than only sucking money out of it. The most important factor is that it is driven and owned by humans, and its success depends on humans.

There are differences between the roles of the Village Operators (mentioned by the previous speaker) and Community Infopreneurs, where the former provide ICT services and the latter provide services based on this ICT infrastructure. A major gap is that skills development services are not reaching the communities. It is timely to reconsider the use of ICTs for training in other skills, including technical training. There is more readiness for this type of training now than there was in the 90s.

The infopreneurs offer a range of bundled services. In Vhembe municipality they capture data about the economy, as generally municipalities do not know what is happening in the 1st, 2nd and 3rd economies. For example, in Pampierstad in the Northern Cape, only 20% of enterprises are indigenously owned. E-financial services have not worked well, due to the high transactional costs demanded by Vodacom. There is also a real need for local government to do sustainable livelihood asset surveys. Infopreneurs could assist in facilitating inbound and outbound logistics to rural retail as well as supply and demand linkages within rural spaces. Other possibilities exist in commercial services, for example what can be done for businesses: can we help them to procure collaboratively? How can you do it in such a manner that it is not seen as a threat? How do you help them to manage inventory?

The team has done an extensive survey on community-owned tourism in the Motale municipality, where Exxaro is stopping their mining activities in the coming year. The whole municipality depends on mining so the challenge is how to replace that economy in a year's time with the available resources in the community. How could community-based tourism be supported? Other possible opportunities could be found in nursing where the infopreneurs could assist with dispensing in rural areas. In the Eastern Cape, schoolchildren could become involved as agricultural extension 'nurses' in rural areas. The project has also developed and expanded its InTouch Africa application platforms to include Awarenet, an offline collaborative facebook-like application, and the inclusion of accounting services.

The project is collaborating with the learning project at Cofimvaba (Merryl Ford's presentation), in which the school grounds are used, together with the provision of knowledge services, to incubate farmers who can then take their knowledge outside of the schools to provide an agricultural extension 'nursing' service. In all of this it must be kept in mind that more than technology (wires

and boxes) is required and that interventions need to be in the service of larger economic development.

In closing, one of the project team members mentioned that there are four categories of skills that need to be developed:

1. Training skills – using youth as trainers
2. Business skills
3. ICT skills
4. Ability to act as change agents.

Continuous learning and development are also very important, as is the 'extended family network' which exists within the model. As a closing comment, the presenter pointed out that there are good signs that the project is working but believes that South Africa is not serious about developing the BoP. Unlike Kenya, it can survive without the BoP. He believes there will be an uphill battle unless we are serious about adopting an integrative approach, across line departments and supported by DST, and are serious about taking initiatives into under-serviced areas.

**GOVERNMENT PERSPECTIVE**
**Mr Alfred Mashishi**
**Department of Communications**
**Chief Director: Special Projects**

The presentation opened by pointing out the similarities between the previous presentations in needing clarity about the roles of the different agencies, and who takes responsibility for policy implementation. These roles need to feed into one another.

South Africa faces several challenges:
1. Voice has been the dominant technology in mobile communications and infrastructure development has focused on mobile technology;
2. The enablers that will allow implementation need to be identified; and
3. Legislation has been vague and can easily be exploited. The ICT sector has been driven by the private sector, with a focus on urban environments. Rural communities have been ignored and there is a need to focus on basic ICT services and infrastructure, not only LTE/4G technologies. Furthermore, there has been a bias towards agriculture and farming in rural areas.

The slides used in this presentation provide a comprehensive overview of the numerous Government policies, strategies and implementation mechanisms in place. These include the following, each of which was discussed in more depth in the presentation:

- National Development Plan Vision 2030
- Broadband Policy 2020
- National Growth Path
- Presidential Infrastructure Coordinating Council (PICC)
- Comprehensive Rural Development Programme (CRDP)
- ICT Rural Connectivity Strategy

Government, through its Medium Term Strategic Framework (MTSF) 2009-2014 has had to play a balancing act between the five priority areas (jobs, health, security, rural development and education) and 12 outcomes. Access is a cross-cutting multiplier as is rural development, which

forms the spring board for achieving all the other priorities. There is a drive within government to place ICTs in the centre-fold, particularly for rural communities, but ICTs are not seen as a primary need in the same category as other basic needs. This has created challenges. The government has however committed that people have a right to access and connectivity irrespective of time and space.

The Presidential Infrastructure Coordinating Council (PICC) has identified 18 Strategic Integrative Projects (SIP) of which SIP 15, Expanding Access to Information Technology, has particular relevance to the topic of this policy dialogue. The focus of SIP 15 is to provide for:

1. Broadband coverage to all households by 2020;
2. Migration of television broadcasting services from analogue to digital technology; and
3. Connectivity to schools.

The Department of Communications is responsible for the execution of SIP 15, which included the following activities:

- Desktop study review on ICT in rural areas in nine provinces (31 district municipalities);
- Review of the areas in the IDP to identify the needs and requirements on basic services and ICTs;
- Assessment of current needs and requirements for ICT, broadband, broadcasting and postal services facilities and services; and
- Development of a business model and framework, including an implementation and partnering framework, with required funding estimates.

The focus of the SIP is on job creation and already 144 project jobs and 24 300 direct jobs have been created.

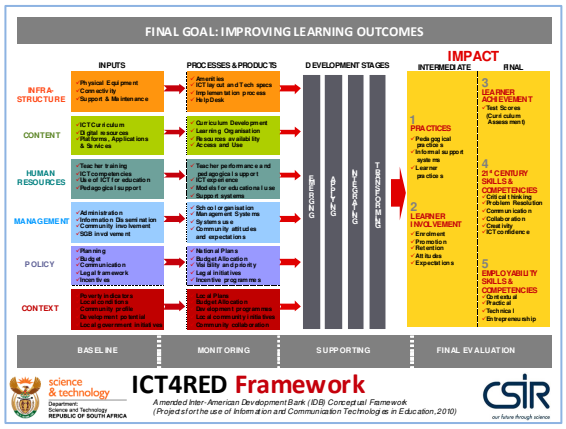
The presentation closed with the conclusion that, where there is political will, as in Rwanda and Kenya, things will move forward. The National Development Plan (NDP) has been adopted as the plan to move forward in South Africa, and this transcends all political authorities. The presenter emphasised the need for the integration of entities and that all legislation needs to be analysed to assess how ICTs can play a role.

**BUILDING LOCAL CAPACITY – SCHOOL-BASED INITIATIVES**
**Ms Merryl Ford**
**CSIR Meraka Institute**

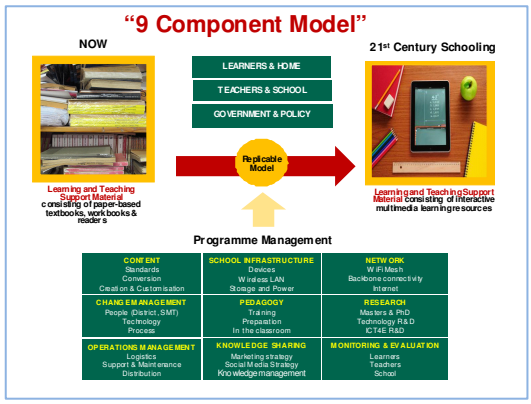
[*video material provided*]
The presentation focused on one specific project, namely the Cofimvaba Rural Education Intervention (Eastern Cape). The intention is to create a platform for participation and collaboration across various sectors to demonstrate how technology can support education in the wider sense. The focus is therefore not only on ICT, but also health and nutrition, transport and logistics, building technologies, water and sanitation, and renewable energy. A Science and Technology Centre is to be established and the ICT for Rural Education Development (ICT4RED), which is the focus of this presentation.

The ICT4RED conceptual framework, amended from one developed by the Inter-American Development Bank (IDB), was presented and the various developmental stages discussed. Additional

skills such as problem solving, critical thinking, communications, creativity and confidence with ICTs were added to the framework. Intermediate impacts are being examined, for example, how teachers are teaching, how learners are learning, and to what extent learners are involved in the process. The broader question is whether ICTs can be used to widen learners' horizons. The final impact studies hope to assess whether test and matric results will improve.




The Cofimvaba eTextbook project, operating in 26 schools in Nciba and involving 6 500 learners, will take place over the next three to five years. The aim is to support access to digital content through the use of ICTs in schools. Various models are being tested in terms of content, infrastructure, connectivity, costs, logistics and sustainability. The latter includes adoption of the technology as well as financial sustainability. The project strives to develop local capacity and there is a strong emphasis on support and maintenance, operations, teacher training and change management. The intention is to develop a replicable model, through the demonstrator, that will assist government at the district and national levels to make smarter decisions, particularly in developing 21st century skills. A nine-component model has been built that will hopefully work in all schools, not just rural schools.




The 'Learn to Earn' model has been introduced to train teachers in how to use the tablets in the school environment. The model is being implemented in a single school and already preliminary results are emerging:

- Teachers are taking ownership of the technology and starting to use it in innovative ways e.g. applications of the jigsaw methodology, taking photos and videos to share learning with others, and the lending of tablets to learners to allow them to undertake research;
- The levels of commitment are high with regular attendance, low levels of absenteeism, and classes running longer on request from the teachers;
- The incentivisation approach has worked well - teachers are rewarded for completing assignments by giving them new technology such as USB speakers, earphones and airtime.

The presenter concluded by stating that the 'Learn to Earn' model will be replicated in other schools. It has worked well and will therefore continue.

The session concluded with a brief overview by Tina James of some of the key issues to be discussed in the afternoon session: - technology and infrastructure, integration and cooperation, service delivery, job creation, sustainability, consideration for the context in which implementation takes place, upscaling and replicability, and finally partnerships.

# Session 4: Model for Implementation

## PANEL DISCUSSION

**Kobus Roux, Rensie van Rensburg & Merryl Ford**
CSIR Meraka Institute
**&**
**Alfred Mashishi**
Department of Communications

**Facilitator: Tina James, icteum consulting**

The afternoon session commenced with a panel discussion based on questions from the workshop participants. Questions centred on a number of recurring themes:

**KEY THEMES EMERGING FROM THE DISCUSSIONS**

6. **THE NEED FOR INTEGRATIVE APPROACHES**
   Rural development is not sector specific and cannot be implemented by only one agency:
   - At the policy level, there needs to be integration between the various government departments with a responsibility for addressing rural development. The present piecemeal approach in policy development will result in fragmented implementation which is likely to fail.
   - Between the various levels of government – national, provincial and local – in terms of implementation.
   - Between key players – the private sector, CSIR, government, communities – so that a holistic, integrated approach can be adopted for policy development and implementation.

7. **THE BOTTOM OF THE PYRAMID NEEDS TO BE GIVEN MORE PRIORITY**
   The BOP requires a more concerted effort from a wide range of players, including communities, to determine the high-level '*for what*?' question. Until this is clear for all those involved, a streamlined outcome is unlikely.

8. **ONGOING SUPPORT REQUIRED FOR THE FUTURE SUSTAINABILITY OF RURAL DEVELOPMENT PROJECTS**
   This could be provided through existing government budgets, through the allocation of budgets to support local entrepreneurs and service providers, or through linkages to commercial enterprises.

9. **CYBERSECURITY IS A MAJOR ISSUE IN RURAL CONNECTIVITY**
   When dealing with children and communities, t is critical that awareness is raised about cybersecurity issues and the risks associated with internet access.

10. **THE EMPOWERMENT OF THE INDIVIDUAL CANNOT BE GIVEN PRECEDENCE OVER THAT OF THE COMMUNITY**
    The Ubuntu way of thinking is integral to working in rural development. Communities need to be supported and awareness created of options, but ultimately communities have to make the decisions.

A summary of the key questions which were discussed is presented below:

**Q: What is meant by a 'rural area'?** [Mr Gertjan van Stam, Zimbabwe]

A: [Mr Alfred Mashishi]: From an ICT perspective we talk about underserviced areas, most of which are located in rural areas. It's not really about the definition of 'rural', but rather about the lack of connectivity and ICT services. The Department of Rural Development and Land Affairs has criteria that are used. Areas have been defined in terms of how deprived they are.
A: [Mr Imraan Patel]: The Department of Rural Development and Land Reform is the custodian of the comprehensive rural development programme which defines economically viable units, in this case districts. 23 districts of the 49 districts are currently defined as districts in distress and they

form the focus of one of the SIPs, and the CRDP. There is therefore a reasonably clear institutional definition of what constitutes a rural area.

**Q: How much integrative work have the panellists done themselves, because their work seems to dovetail at some point?** [Mr Rod Grewan, Northern Cape]

A: [Mr Kobus Roux] Integration within an institute is easy; the challenge is integration across institutions and we cannot claim success in this even though we are working on it.
A: [Mr Rensie van Rensburg]. There are two levels of integration, vertical and horizontal. Vertical integration looks at things in a layered fashion, e.g. connectivity, a computing layer, an application layer, and so on. The lack of horizontal integration is very worrying, because in rural spaces you cannot implement a single sector intervention. The cost is too high for upscaling and replication. Integrative interventions are required in the rural spaces, but the drivers are lacking. Unless integrative policies are developed, there will be no integrative action. The provinces are the best places to achieve integration, because they have the ability to take from a number of national departments and integrate at the provincial level. Nationally it becomes very difficult. The question to ask is what is being done currently, and secondly, what is the ideal way if you do have integrative policies.
A: [Mr Alfred Mashishi]: The issue of integration is a no-brainer. Policy leads to infrastructure, which leads to access and affordability, and finally to uptake and usage. If there is no uptake and usage, then there is no need for that policy to be developed and if there is no policy, there is no need to check if the infrastructure works or not. For integration there needs to be competency at the national, provincial and local levels. At this stage there is no provincial competency and no MEC with designated responsibility for ICTs. This means that MECs in other portfolios believe they do have the competency to deal with ICTs. There needs to be integrative policy, integration at the infrastructure level, but also at the political level.
A: [Ms Merryl Ford]: The CSIR has put in place a cross-cutting integration layer within the organisation and this is working across various domains such as education, rural innovation and health. This is also happening in the DST on the Cofimvaba project, where various silos are being pulled together to show real impact by integrating offerings. It is really hard work to integrate across various dimensions where many players have to be involved - traditional leadership, municipalities, district offices and the provincial Department of Education, the private sector. It becomes a hugely complex environment, but in Cofimvaba there is an opportunity to show how it can be done.

**Q: What applications can be developed to bring about socio-economic growth within the bottom of the pyramid, using ICTs?** [Mr Thabo Valla, Northern Cape]

A: [Mr Rensie van Rensburg]: We are starting to get things right on the economic development side, but the challenge is to find someone to pay for it. It adds high value to micro enterprises in the rural context, but they cannot pay enough to sustain the channel. One area that needs to be addressed is that financial (access to finance) and non-financial services (mentoring, training) for small emerging businesses should be delivered through a single access point. It should be driven at the provincial and local municipal levels.

**Q: How do you upscale the training and implementation in rural communities, particularly with regard to information security issues**? **How do you deal with cybersecurity issues**?

A: [Mr Kobus Roux]: There is a policy vacuum regarding information security dealing with children and child online protection on the one hand. On the other hand, to address this appropriately, it needs to be community-wide, not sector- or person-specific. We do not have the answers, but let's take action and then determine the best way to deal with the issue. At this stage the focus is on

providing controlled connectivity to schools. It's not open access or free for all, so censorship is being managed because we are dealing with minors in terms of what websites they can access. At the same time we are working with the parents, the teachers and the principals, and with the village operators to provide awareness training. When it goes beyond the schools, it will be a very different issue for which we have no answers yet.

C: There are concerns regarding children's safety and working with children from a young age. The education department has taken large steps with regard to teaching and development in service and pre-service training to address these needs for digital safety and creating awareness around the use of new technologies.

A: [Ms Merryl Ford] Regarding mobile safety, schools are not been given internet connectivity but have a content server loaded with educational content that can be accessed. There is control over what is accessed. The tablets are only Wifi enabled. Before any rollout in a school, the issue of mobile safety is discussed. For example, what are the child's rights; can someone take a photo of you without your permission? The reality is that children have already been exposed via their cell phones to various inappropriate materials and using their cell phones inappropriately. So it's a matter of educating them. There are other physical safety issues such as not letting young children walk home with tablets. These are kept safely in a school environment where they are managed and controlled by the school. The schools themselves need to be empowered to manage the risks and the opportunities; they need to make the decisions.

A: [Mr Alfred Mashishi] Cybersecurity policy has had to deal with the contentious issue of where the responsibility lies for enforcement. Cabinet has now adopted a cybersecurity programme, which intends to look at issues of children and cybertheft, including the role and ethics of social media. There needs to be an awareness drive in communities on what needs to be done, and the roles parents and children need to play.

A: [Mr van Rensburg] Computer viruses are a major issue in school computer labs and this existed long before connectivity was introduced.

**Q: What are the vehicles that will bring about socioeconomic development, for example, for the farmer to get access to markets and for the markets to access to the farmers? What is affordable and if government can give X amount of free water and X amount of free electricity a month, why can't they give X amount of free bandwidth?**

No answer provided.

**Q: Sustainability:**

**1) Who owns the solutions?**

**2) What is the support model (technically and financially)?**

**3) Who will pay once the project is completed?**

**4) Is there a partnership with service providers, e.g.** is **there discounted usage**?

**5) Is there an exit strategy?**

A: [Mr Kobus Roux]" The current sustainability model is membership-based with a fixed monthly fee. This pays for the maintenance and the cost of the village operators, given that there are enough schools being serviced by a particular village operator. There is a ratio of between 1 to 10 or 1 to 20 number of members to 1 village operator. 50% of the income is needed to operate and pay for accommodation, his/her livelihood, etc and the other 50% for upstream services. This is where service providers are involved, e.g. telecoms operators, billing operators. The system at this stage is not trying to deliver services to end-users; the focus is on delivering to members and, for example, an Internet Cafe would be a suitable member.

A: [Ms Merryl Ford] Our focus is on schools (from Grade R to Matric). Tablets are being tested with preloaded content – what kind of content is required is being assessed but has to be related to the

curriculum. There will be a Wifi mesh giving access to a local content server at the school. From age 12 to Matric, each learner will have their own tablet. Studies have shown how technology such as e-reader and tablets will benefit households. There are no answers studies are needed to assess how these are being used at home. Regarding affordability the aim is to use existing budgets within the Department of Education. Rather than putting in a computer lab in a particular school, which may not need a computer lab, alternative models can be considered using existing budgets. Over the next three to five years, we need to determine whether there is sufficient budget. Studies have shown that providing content in digital format dramatically cuts the logistics costs of delivering school textbooks. This is not yet understood, but the financial modelling is part of the process. We would welcome partnerships with network operators and telecomms providers, as normal rates are currently being paid. Some form of sponsorship or financial support would be appreciated.
A: [Mr Rensie van Rensburg] Initially it is more likely that the model will bring cost savings rather than generating income. Gertjan van Stam has done a few things to generate new revenue streams into the community. Selling your arts and crafts online, for example, has not worked and is not worth pursuing.
A: [Mr Alfred Mashishi] ICTs cannot cure all social ills and economic deprivation, but they do provide options to deal with these issues smarter and faster. ICT costs need to be brought down. In service provision and access, sustainability needs to be achieved through entrepreneurship, to generate economic viability for either the youth to use a particular service or to create some sort of employment. In terms of the bigger picture, the NDP is calling for a manufacturing-driven economy with a focus on labour-intensive practices and job creation.

**Q: What is needed in the ICT policy to support more decentralised / community / local ownership solutions? From a DoC level, what are you looking to do in future to support more community ownership of the process?** [Mr Paul Plantinga]
No answer provided.

**Q: There have been so many interventions since the mid-90s. Are we just continuing more of the same or has there been some synthesis, analysis, case studies, academic research that qualifies the lessons learnt and allows movement forward?**

C: Some interventions can cause other vulnerabilities. A systemic approach needs to be incorporated into the policy.
A: [Mr Rensie van Rensburg] The knowledge economy is absent in the NDP and requires inputs from a younger generation. Further, there is no integrative 'for what?' in the rural context which will result in fragmented and dispersed policy. Work back from the 'for what?' perspective and then integrate the policies from that environment.
A: [Mr Mashishi] Many initiatives have taken place over the years, some successful, some not. Various players have undertaken initiatives (the private sector, local government), all leading to a common goal, but there is muddiness in the middle. Legislation is outdated and convergence needs to be addressed. The government has started with a policy review, and the intention is to have consultation processes. The intention is to have a white paper that will take the country forward to 2030. The SIPs are also looking at knowledge-based factors e.g. in SIP 4 on building schools, all have to be ICT-compliant.

**Q: What has changed and what is new in what the CSIR is presenting?**
[Mr Rod Grewan]

A: [Mr Kobus Roux] Previously solutions were dreamt up in labs. The approach is now more inclusive, e.g. the Digital Doorway project involved communities deciding for themselves what they wanted. We now understand that projects need to go beyond deployment and installation, and that

operational issues need to be considered. Much has changed around infrastructure. Generally the failures tend to be remembered e.g. Underserviced Areas Licences (USALs) and cooperatives, but not the successes.
A: [Ms Merryl Ford] It is not just the CSIR doing the interventions. Of the nine components in the Cofimvaba project, CSIR is responsible for only two. It's about partnerships with institutions who are experts and who have previous experience such as SchoolNet. For example, there will be a request for proposals for a training provider. Other partners include Edunova, Cosacares with the Department of Basic Education as well as the Eastern Cape Department of Education. The beneficiaries are also part of the process, and the CSIR has become more inclusive.
A: [Ms Adele van der Merwe] Today 75% of the beneficiaries are BOP users, who have access to mobile technology. We are using a bottom-up approach whereas previously the approach was top-down.
C: [Mr van Stam] The changes do not apply to only one entity. For example, the private sector has not been given guidance by government as to their service obligations, e.g. MTN's obligations in terms of numbers of schools to be connected. This is changing and a model is being built that speaks to government priorities and the obligations expected of the private sector.
C: [Dr Ruxwana] The environment has changed, but the technology solutions in the present are also different. The blame cannot be put solely on the service providers or private sector. The government is starting to understand the present needs for ICT interventions better but in the past most of these interventions were not addressing needs and they failed because at the government / political level they were not planned for at that time. It is encouraging to hear the government has a plan in place.
A: [Ms Merryl Ford] The Cofimvaba project is the first project that has taken such a systemic approach. This is not easy as there are many dependencies in the system but this is the approach that needs to be adopted.
C: There does not appear to be an exit strategy once all the interventions have been put in place.
A: [Mr van Rensburg] Meraka established the first living lab in the country and is serious about co-invention and user-driven innovation. When you depart on a research path with a community, there is no talk of extraction from a project since they are involved in the research and walk the path with you.

**Q: The policy discussions still seem to propagate a Westernised world view, and are not addressing the destabilisation of communities through the upliftment of individuals**

A: [Mr Alfred Mashishi] On the issue of an African versus a Western world view, the speaker has made a very profound statement by stating that relationship is currency in rural areas. This type of thinking was not in place previously - there is the assumption that people with nothing and who live in rural areas, would want what you have. These days any kind of engagement has to be preceded by serious interaction. The politicians and the Cabinet have put heavy weight on checking what spade work has been done, what support there is for the proposed initiative, whether there has been uptake and how this has been determined.
C: There is the danger of being patronising and making decisions on behalf of communities. What needs to happen in parallel is to create the support and awareness, to do what is possible, but not to determine how it should be done. In the case of infopreneurs/village operators, these individuals were selected from within the community and were seen to have relationships in the community that have value to that community.
C: [Ms Merryl Ford]: It is important that partners [in project] are those who are actually responsible for making these things happen, for example, the district office, the provincial and national Departments of Education. The CSIR's role is to support and ensure that the partners can continue with the project after completion. If not, an agency needs to be identified who can manage the process.

C: Regarding jealousy in the community, it has to be understood that 'knowledge is king/queen' and that communities know who the knowledgeable people are within their communities. By becoming knowledgeable, selected individuals are being empowered. However, the schools and district offices were selected, in this case, by the Eastern Cape Department of Education and the district office.
C: Interesting issues have emerged during the projects, e.g. witchcraft which were in existence long before the project was initiated. The system in that environment needs to solve such problems; all the project can provide is support and advice and assist in providing a more empowering environment.

## BUILDING A MODEL

Following the Q&A session, the facilitator directed the discussions towards how the lessons learned could be taken forward to ensure sustainability, upscaling and replication of the work carried out thus far. The summary below presents a consolidated view of the discussion points that can be taken forward from this policy dialogue:

- The DST has adopted a policy learning approach which has been useful in its role as a coordinating department. It has provided evidenced-based advice through the research it has supported. The lessons learned about integrative processes and the involvement of local government, districts, provincial and national government should be captured in recommendations that can assist in developing coordinated national policy with bottom-up local inputs.

- Efforts need to focus equally on policy, R&D and strategy development. R&D should be ongoing, encourage the development of models and include technology aspects. Information security issues within the South African context need to be addressed. South Africa needs to look at 'best approaches' rather than 'international best practice'.

- There is the notion that government should take the lead in areas where the market has failed, as in large ICT infrastructure rollout. However, an exploration of business models should include public-private partnerships as an option in both rural-based interventions and those at the high-end of the economic scale. There are also government models where different departments or fora have come together for a specific purpose in terms of either programmes or policy interventions through government clusters, for example. The learning from R&D could be embedded in those discussions, therefore enabling up-scaling. In addition, if there are failures, these lessons should be taken into account in future deployment.

- Rural development is a cross-cutting issue and as such, needs to be addressed through a rural development policy in each of the national departments, and possibly even the provincial departments. This in turn will allow planning in each of the departments that could feed into the National Development Plan. In addition, development in rural and urban areas needs to be synchronised.

- Government has adopted a more integrative approach towards infrastructure development through the SIPs, which reinforce and complement each other. For example, SIP 15 has dependencies with other SIPs, as does SIP 16 (the SKA project) but at the same time there is accountability assigned for each of the SIPs through the assigning of lead departments who are expected to coordinate the activities. Political leadership needs to push and promote ICTs to make them more visible.

- One of the key barriers to developing partnerships (donors, private sector) has been the lack of continuation in government. This has made it difficult to continue with relationships over a longer time period. As new players are brought into government, the tendency is to start from scratch with different partners. This was resulted in numerous failures as government structures change. The adoption of the National Development Plan should resolve this issue as no single individual can override the direction laid down by government. However, this still needs to be proved.

- Generally speaking, projects are being approached in a more consultative, participative manner and have more likelihood of succeeding. However, there are different cultural dynamics in different regions and what works in one area will not necessarily work in another. In terms of ICTs in rural communities, people need to see how ICTs can change their lives in a real sense. ICTs in rural development also need to take cognisance of the Ubuntu principle and using relationships as currency. The absorptive capacity of communities is a critical issue to consider – if the community is empowered to grow, then its capacity to absorb and adapt becomes greater. The development space does not require exposure to technologies, but rather an emphasis on preparing people to explore that space themselves, much as is being done in the Living Labs methodology. More skills development is needed to unleash existing potential in the BOP.

- ICTs cannot cure social ills but can provide options and solutions. ICT for its own sake is not sufficient and the key question to be asked is: 'ICT for what?' There is a need to define generic requirements across different areas and sectors, and to determine how they synergise and support each other.

- Digital convergence policy is already ten years too late and policy is likely to continue lagging as the environment becomes increasingly complex. Regional differences need to be taken into consideration in the broadband policy, as does the need to drive down the cost of bandwidth, otherwise this will never benefit rural communities.

- Ongoing maintenance and ensuring that there is budget available is a key issue. Skills development should be aligned to any maintenance plan, so that as infrastructure is built, the skills to maintain it are supported in parallel.

- In Finland, communication is regarded as a basic human right in the same category as clean water. This has fundamentally changed views on access. This may be an example to explore further in South Africa.

The facilitator closed the session by providing an overview of the key points emerging during the workshop before handing over the session Mr Isaac Maredi for closing of the workshop.

# WAY FORWARD AND CLOSURE

**Mr Isaac Maredi**
**Department of Science and Technology**

The discussions and learning generated during this policy dialogue provide valuable inputs for the DST to take forward into a number of government fora, for example, SIP 15, the cybersecurity policy framework and the building of competencies and capabilities around information security.

The organisers, participants, speaker and facilitator were thanked for their contribution and the point was re-iterated that further dialogues are envisaged with more opportunity for engagement. The workshop outcomes will be documented and circulated to participants for further inputs.

# APPENDIX 1:

# PROGRAMME
## EXTENDING ACCESS AND CONNECTIVITY ACROSS RURAL COMMUNITIES IN SOUTH AFRICA

**Policy dialogue hosted by the Department of Science and Technology and the European Union**

**Rapporteur: Ms Tina James, Icteum Consulting**

| | |
|---|---|
| 08:00 | Registration, tea and coffee |

| | |
|---|---|
| 08:30 | Session 1: Context and background |

**Chair:** **Mr Imraan Patel, Deputy Director-General: Socio-Economic Partnerships, Department of Science and Technology (DST)**

08:30 Welcome and introduction (Chair)

ICT-related policies in the EU (Richard Young, Head of Development Cooperation at the EU Delegation)

09:15 Remarks (Minister of Science and Technology, Mr Derek Hanekom, MP)

| | |
|---|---|
| 09:30 | Session 2: International perspective |

**Chair:** **Isaac Maredi, Chief Director: Sector Innovation and Global Change, DST**

09:30 Experience of providing wireless access to rural communities
(Mr Gertjan van Stam –Zimbabwe)
The provisioning of wireless access to rural communities is constrained in both "the World of Things" and "the World of Humans". Access to Information and Communications Technologies in rural communities

- challenges institutions, regimes of knowledge and social practices that influence choice:
- constrains meaning: and
- influences identities and communities.

This presentation positions itself from a rural African perspective, a position often restrained or 'out of reach'. From 12-years' experience and ethnographic study of engineering activities in rural Zambia and rural Zimbabwe, the author introduces some general constraints for the introduction of ICT. These constraints are determined by:

- environmental challenges specific to rural areas, such as unreliable electricity or supply chain logistics. Rural inhabitants have little control over these challenges;

- skills constraints caused by the lack of availability of trained ICT practitioners, as well as the process of training and equipping these practitioners in ICT; and
- social constraints.

  Four specific social dimensions that influence the experience of wireless access to rural communities that are introduced are:
- **Culture,** which is based on the high-context Ubuntu culture in African communities. The culture is relational, collectivist, intuitive, and contemplative. Therefore, in practice, people emphasise interpersonal relationships, group harmony and consensus over individual achievement.
- **Orality**, meaning rural communities base interactions on oral discourse and regard verbal interaction as instant. Among others, orality offers the unique ability to assess comprehension and effect instantly. Orality facilitates the social cohesion of the rural African civilization. Orality influences everything, and thus the community regards issues as substantial only when they have been discussed in person.
- **Relatio**, 'the economy of sharing', as in reality, two parallel economic systems exist, each addressing the basic questions of choice and resource management. One is a traditional rational Western system, the other a relational African system. The rural community allocates resource in macro-economic terms by satisfying relationship equivalents of banking, markets, and regulation. The majority of micro-economic actions undertaken by those of the Relatio mindset are working towards long-term stability.
- **Dogma**, involving the processes of dealing with the fall-out of colonial teaching, instilled by the current geopolitical positioning and perceived power-distance of stakeholders.

Experience seems to suggest that there is much room for social innovation of conceptual frameworks to provide ICT access in rural communities, applicable to the rural context and culture to be in equilibrium with local culture and heritage, taking into account locally important aspirations and paradigms.

09:50 Innovative application of community wireless networks to bring socioeconomic progresses in rural Nepal (Dr Mahabir Pun, Nepal Wireless Networking Project)

Information and Communication Technology (ICT) has become a vital instrument for delivering a number of services such as education, healthcare and public services both in developed and developing countries. Community wireless networks in Nepal are community-centric telecommunication infrastructure developed to provide affordable communication for those who live in remote areas. In the presentation I will discuss about the role of Nepal Wireless in achieving socio economic development of rural communities by facilitating affordable Internet access. I will explain about the challenges Nepal Wireless faced and the approaches it took to address those challenges such as lack of technical skills, appropriate technology and funding, difficult geographical terrains, unstable political situation, and expensive devices. In addition, I will address the success and failure factors of the community-based ICT4D approach in order to guide similar endeavours. I will conclude the presentation by some suggestions for policy makers, community developers, and academicians.

10:10 Questions and answers

| | |
|---|---|
| 10:25 | TEA |

| | |
|---|---|
| 10:40 | Session 3: Rural technology interventions |

10:40 The Wireless Mesh Network Project (Mr Kobus Roux, CSIR Meraka Institute)

South Africa has approximately 26 500 schools (primary and secondary), of which at least 17 000 are in remote rural villages. None of these rural schools have any form of Internet connectivity. The same rural villages may have one health facility for every 20 schools and very few other public or community-service centres. This talk will present a model that is being developed and tested in South Africa to establish rural connectivity by way of village operators as rural micro-enterprises that build, operate and support localised network infrastructure using wireless mesh network technology. The design of the intervention focuses on sustainability and resilience in providing the connectivity service, keeping in mind the adverse conditions, limited resources, and cultural and political contexts in which these networks have to survive. In the space where the market does not normally operate, the creation of a new ecosystem with an associated business model is being explored. The findings and learning from the first phase, in which 200 schools were connected and 15 village operators established, will be presented.

11:10 Local ownership – Infopreneurs® and village operators (Mr Rensie van Rensburg, CSIR Meraka Institute)

The authors wish to continue sharing a "view from the practice" in the continued creation and growth of an "ecosystem" of social (information-focused) entrepreneurs - Infopreneurs® - in rural South African contexts. The presentation will cover the past two years of ongoing research in a Living Lab fashion, aimed at understanding and addressing the critical challenges of *scalability* and *sustainability* in the utilisation of technology (primarily ICT) as enablers of a service extension (including agricultural extension services) network in under-serviced rural environments. The talk will provide an insight into the practical experience gained from work done in *institutionalising support* and *mentoring mechanisms* for community (village) level change and service agents, i.e. Infopreneurs®. It will provide some lessons learned on the *enhanced sustainability* of the Infopreneurs® network through the *"deepening" of the service offering* of the network, i.e. *scope enhancement* leading to a more extensive value-proposition. The objective is to present the results to date as a basis for both the private and public sectors to use *alternative social enterprise mechanisms* to deliver on social capital and services needed by communities at the so-called bottom of the pyramid. The presentation covers mainly *social change aspects of our ICT for development work*. We will report on our efforts to use a range of *social development approaches* to ensure the "uptake" and viability of the utilisation of ICTs to enhance economic and enterprise development.

11:30 Government perspective (Mr Alfred Mashishi, Department of Communications)

11:50 Building local capacity – school-based initiatives (Ms Meryl Ford, CSIR Meraka Institute)

The education system is a particularly complex and sensitive one, affected by many seemingly unrelated factors. Any intervention should be as all-encompassing as possible, taking into account the multi-dimensional nature of the environment that it seeks to

| | |
|---|---|
| | influence. There are many examples of failed ICT in education initiatives which collapse as soon as the project ends. This is often the result of too much focus on the technology, whereas success and failure is often determined by softer issues, such as training, making provision for cultural factors, the appropriate engagement processes within rural communities and, in particular, building local capacity. This presentation discusses the initial results of a "learn to earn" approach in educator development in a large-scale tablet implementation at schools in the Cofimvaba educational district of the Eastern Cape. The training aims to ensure that educators are empowered to design learning experiences that improve learning and are able to maximise the potential of the technology to enhance teaching. In this scenario, ICTs are tools in the learning process, which are used in pedagogically-appropriate ways, by confident educators, in a school environment where they have been successfully integrated. |
| 12:10 | Questions and answers |
| 12:30 | LUNCH |
| 13:30 | Session 4: Model for implementation |
| 13:30 | Discussion (Ms Tina James) |
| 14:30 | Summary (Ms Tina James) |
| 14:45 | Discussion and building a model *(*Ms Tina James) |
| 15:30 | **Way forward and closure (**Mr Isaac Maredi) |
| 15:35 | Departure |

# APPENDIX 2:
# SPEAKERS' AND FACILITATOR'S BIOGRAPHIES

**MS MERRYL FORD**

*Ms Merryl Ford* is the manager of Education and Mobile Learning at the CSIR Meraka Institute. The major objective of the Meraka Institute is to facilitate national economic and social development through human resource development and needs-based research leading to innovative products and services based on ICT.

Merryl has more than 20 years of experience in the ICT domain, particularly in a developing world context. After joining the CSIR to pursue her passion for innovation, she now focuses on how the digital knowledge economy can be harnessed to benefit all sectors of society. Her interests include the use of mobile devices, technologies and services to support education and learning.

**MR DEREK ANDRE HANEKOM**

*Mr Derek Andre Hanekom* is the current Minister of Science and Technology and is a member of the National Executive Committee (NEC) of the African National Congress (ANC) since 1994. He completed his schooling in Cape Town and matriculated from Jan van Riebeeck Secondary School in 1970. After completing his compulsory conscription, he worked abroad for various organisations, including working on farms, factories and building sites. He returned to South Africa in his early twenties and continued farming for six years.

After serving a three-year period in prison, Derek worked with the trade union movement in Johannesburg, until his wife's release from prison in 1987, and subsequent deportation to Zimbabwe. He spent three years in exile in Zimbabwe. During this period Derek served as the co-ordinator of the Popular History Trust in Harare. Mr Hanekom provided the ANC with information about the apartheid defence force's attempts to overthrow the Mozambican government through the rebel movement, Renamo. This led to their arrest in 1983, initially charged with high treason, but subsequently reduced to lesser charges as a result of the international sensitivity of the case.

He returned to South Africa after the unbanning of political organisations in 1990 to work at the headquarters of the ANC where he was responsible for policy formulation on land and agricultural matters during the period of negotiations prior to the first democratic elections in 1994. Prior to his appointment as Minster of Science and Technology, Mr Hanekom served as Deputy Minister of Science and Technology from 29 April to 3 October 2012; as Minister of Agriculture and Land Affairs of the Republic of South Africa from 1994 to 1999 and also as a member of Parliament from 1999 until 2004.

He serves as Deputy Chair of the Board of the Ahmed Kathrada Foundation.

**MS TINA JAMES**

*Ms Tina James* has more than 30 years' experience in various aspects of ICTs in developing countries, particularly Africa. Work undertaken to date has drawn on her wide range of expertise in the management of multidisciplinary projects, strategic planning, programme design, and facilitation of participative processes, all of which are based on an in-depth understanding of ICT-related activities in the region.

She established icteum consulting in 1997 and has carried out extensive consulting assignments on ICT policy and strategy development, research and monitoring and evaluation. For the past five years, she has developed a particular interest in supporting entrepreneurship for women in ICT- and technology-enabled businesses. The FEMTECH programme is currently being deployed in Tanzania. She is an associate lecturer of the University of the Witwatersrand's LINK Centre in Johannesburg, South Africa on Gender and ICTs, and has also served as an evaluator for the EU's FP on ICTs.

Previously she was the Senior Advisor for the Canadian International Development Research Centre (Acacia programme supporting ICT for Development in Southern Africa) and served in various management positions at the CSIR in the fields of ICT and Environmental Information Management.

In 2009 she established a new business, Dancing Divas, which brings together her passion for dance, empowerment of women and developing her entrepreneurial skills. The business was awarded the 2011 702-Pastel Softline Small Business Award and has since featured in several leading South African magazines, DSTV's Summit TV business channel and the MTNterprise Business magazine.

**MR ISAAC MAREDI**

*Mr Isaac Maredi* is the Chief Director, Sector Innovation and Global Change at the Department of Science and Technology. He holds a Master's in Information Technology. He is responsible for a portfolio that provides strategy and policy direction for R&D and innovation in the areas of global change, including environmental services and technologies, information and communication technology (ICT), innovation programmes in a variety of key economic sectors such as agriculture, maritime industries and mining, as well as guiding and supporting regional innovation programmes and activities at provincial and local levels.

Previously he was Director, ICT in the same department and provided leadership in development of the recently-completed Ten Year ICT research, development and innovation roadmap, in conjunction with the Meraka Institute of the CSIR. He also served as a senior specialist in ICT R&D and Innovation at the State Information Technology Agency (SITA). Before that Mr Maredi was an IT Project Manager, User Support at the University of Pretoria. Before that he served as a senior consultant in Software Applications Development at Gijima & Business Connexion, and a high-school teacher.

**MR ALFRED MASHISHI**

*Mr Alfred Mashishi* is the Chief Director responsible for Operations and Special Projects in the Department of Communications (DoC). Some of the DoC special projects include IPv6 (Internet

Protocol version 6 initiative), Community Broadcasting, Rural Connectivity Initiative, e-Skills Institute and Child Online Protection.

Alfred has worked as a civil servant for many years in various capacities and at different institutions, such as the Defence Force, Parliament, and Foreign Affairs. He has a Master's degree from the University of California and did his undergraduate studies at Stellenbosch University.

He is a public policy and strategy manager with a focus on innovation, sustainability, social and economic development, and public management and governance.

**MR IMRAAN PATEL**

Employed since 2006 at the South African Department of Science and Technology, Mr Patel currently holds the position of Deputy Director-General, Socio-Economic Partnerships, and represents the department on the social and economic clusters of government, the advisory committee for the Green Fund, the steering committee of the Employment Creation Fund.

At the DST, he is responsible for strategically driving a portfolio of investments and policies that support social and economic development through science and technology.

Areas of focus include Information and Communications Technologies, Sector Development, Climate Change and Biodiversity, Environmental Goods and Services, Advanced Manufacturing, Mining and minerals beneficiation, and Innovation for Poverty Alleviation.

**MR KOBUS ROUX**

*Mr Kobus Roux* is an electronics engineer with more than 15 years' experience in the conceptualisation, research and development of wireless systems, network architectures and protocols, and information systems. His current interest are in applying technology through innovative business models - especially involving wireless broadband. Extensive experience and understanding of development work in rural South Africa. Specialties include creative processes and new concept development, Futures/foresight techniques.

**MR JOHANN (RENSIE) VAN RENSBURG**

*Mr Johann (Rensie) van Rensburg* is the Manager, Meraka Institute's Information and Communication Technologies (ICTs) for Rural Enterprise and Economic Development initiative at the CSIR and has been active in the ICT for development arena for 18 the past years.

Mr van Rensburg has extensive experience in working with government, science councils and industry in the implementation of sustainability models and technical solutions for the advancement of rural communities in South Africa and the SADC region. One notable example is the inTouch Africa® software system, a total 'bandwidth-friendly' support system for community-based centres and networks rendering business development and broad-based community development services. The Infopreneurs® deployment model is another of his successful projects, which provides a

"franchiselike" approach to the commercialisation of ICT (information and communications technology) intensive service businesses in rural communities.

**MR GERTJAN VAN STAM**

*Mr Gertjan van Stam* was born in the Netherlands. For the last 10 years he and his family have lived in the rural village of Macha, in the southern province of Zambia. Before that he stayed for two years in rural Murambinda, Zimbabwe. He has been involved with strategic developments in ICT in Africa since 1987.

His goal is to identify and inspire local talent and introduce appropriate technologies to build the necessary capacity for community-led activities to yield sustainable human development outcomes. His quest is for a logical framework for understanding dynamics of change in African communities and engendering leadership capable of inspiring, initiating, implementing, operating, and scaling up sustainable progress and the use of technology in the local community.

Since 2011, Gertjan has volunteered in strategy-making at the IEEE, the largest professional institute in the world. He is part of IEEEs Ad-Hoc Committee for Humanitarian Activities, working on Social Innovation and leading 'thought leadership and advocacy'.

His activities in Zambia were featured in IEEE The Institute, and his career was documented in an award-winning IEEE video at TryEngineering. The activities in Zambia were documented worldwide though BBC Clicks. Gertjan authored the book Placemark, and has published over 20 articles on findings and lessons learned in rural Africa.

**MR RICHARD YOUNG**

*Mr Richard Young*, an economist by training, heads up the Development Cooperation at the European Union Delegation to the Republic of South Africa since 2010. He previously worked for the UK Government as an Economic Adviser, focusing mainly on air traffic forecasting, regulation, and privatisation in the transport sector. He has also worked for the Ministry of Transport, Mozambique, where he worked on restructuring the transport sector.

Mr Young joined the European Commission in 1993, and has served as an Economic Adviser in Ethiopia, Senegal, and Brussels. During his time in Brussels he was influential in developing the European Union's policies in the areas of Budget Support and Public Financial Management. He also worked on projects and programmes in a number of countries – South Africa, Lesotho, Swaziland, Syria, and North Korea, as well as being responsible for Asian regional projects, promoting in particular collaboration under the Asia Europe Meeting (ASEM), with a focus on development cooperation, education exchange, and science and technology.

# APPENDIX 3:
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| Mr | Richard | Young | Head of Development Cooperation, EU Delegation | |

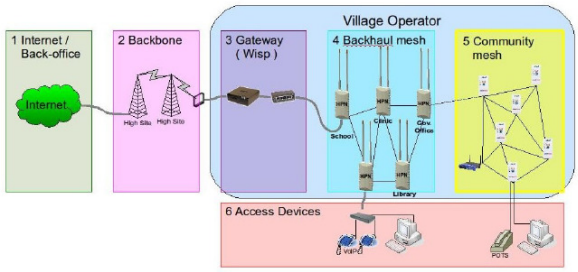
# APPENDIX 4:
# PRESENTATIONS

## The approach - DIY

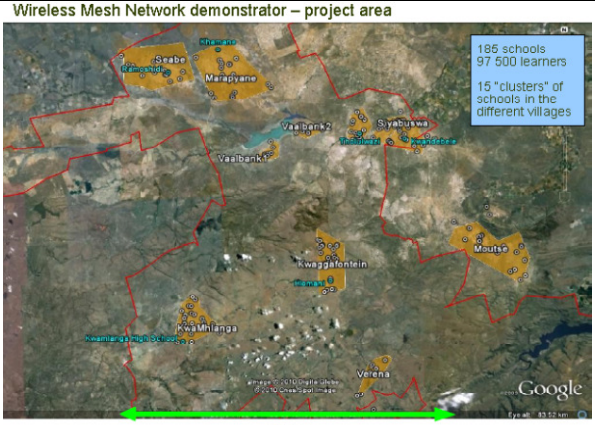
**Community based networks**
- Aggregate local demand
- Keep costs local
- Develop local skills and local ownership

**Wireless Mesh Networks**
- No expensive 'high sites'
- Low cost equipment
- Autonomic, auto-configuring, and self-healing

## Technical and business architecture: Broadband for All – Wireless Mesh Networks through local entrepreneurs - Village Operators (VOs)




## Wireless Mesh Network demonstrator – project area




## Mesh network across a whole province...

## Achievements and outcomes

## Achievements and outcomes

- Local technology development and transfer
- Rural infrastructure
- Technical and business skills and capacity
- Organisational infrastructure
- People, jobs
- Service delivery
- Impact
- Sustainability

## From ICT R&D into local technology into local production lines

Developed a **wireless mesh radio (HPN)**

Developed a wireless network management system that is used by the local technical support (or VO) to manage and evaluate the mesh network

Developed ability to update the software of the devices in the network over the air.

Developed secure desks for storage of the Village Operator equipment.

Software for filtering web access

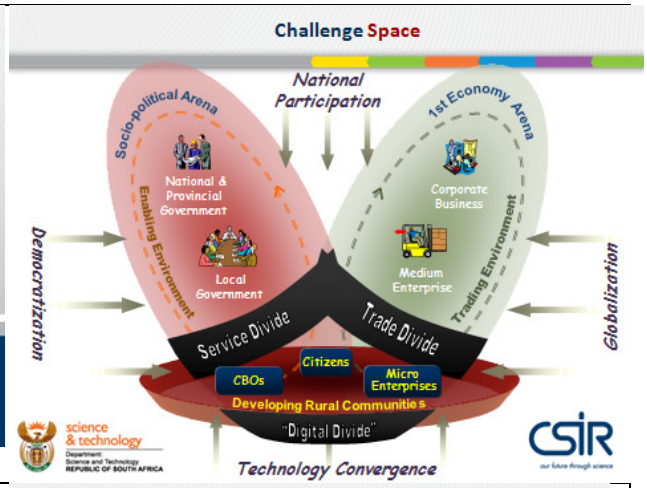
Partnerships with local software industry for monitoring and operations

## Established a working broadband infrastructure

Village Operators
A social innovation living laboratory
Skills towards getting jobs towards creating jobs
Schools: General internet access towards power users
Access to government (forms, procedures, reference)
"Business club" to facilitate utility of broadband and ICTs
Community access (e.g. "e-mail agency")
Peer learning
Towards sustainability
Commitment and support from anchor user(s)
Developing (evolving) appropriate applications, products, services
Requires time and space to develop...
csir

WELCOME
WELKOM
SIYAKWAMUKELA
FAX
0866998241
YOU MAY
TAKE A SEAT
THANK YOU!!!
TIRED OF LONG QUES AT SARS?
FILE ON-LINE FOR ONLY
R80.00
SAME DAY FILING
INTERNET A ALL
Product/Service Information
BB4ALL
csir

Infopreneurs® and Village Operators: Innovative and Systemic ICT-enabled Change Agents in Rural Innovation Initiatives
February 2013 Futures Overview
Presented by: Johann (Rensie) van Rensburg
Date: 12 February 2013
science & technology
Department: Science and Technology
REPUBLIC OF SOUTH AFRICA
CSIR
our future through science


Challenge Space
National Participation
Socio-political Arena
1st Economy Arena
Enabling Environment
Trading Environment
National & Provincial Government
Local Government
Corporate Business
Medium Enterprise
Democratization
Globalization
Service Divide
Trade Divide
Citizens
CBOs
Micro Enterprises
Developing Rural Communities
"Digital Divide"
Technology Convergence

Solution Challenges
Changing the nature of rural enterprise and economic development in a way that can ...
Prevent young talent leaving...
...and change cattle traffic-control...
...to a new place beyond!
science & technology
CSIR
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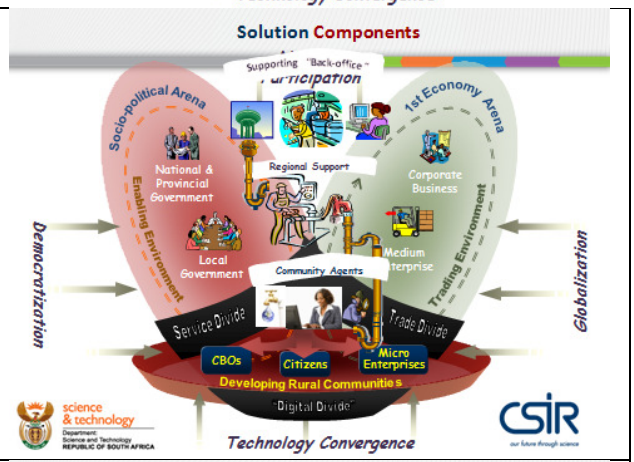
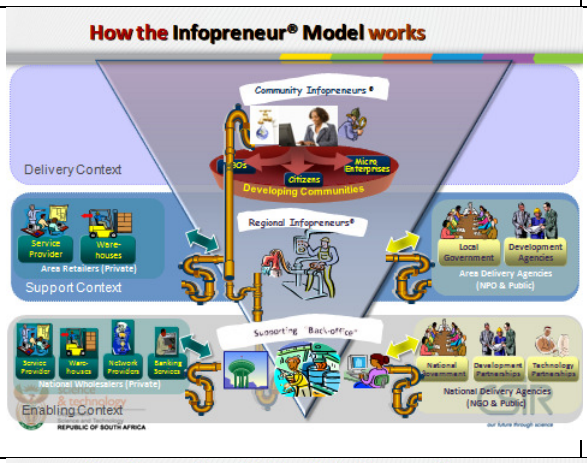
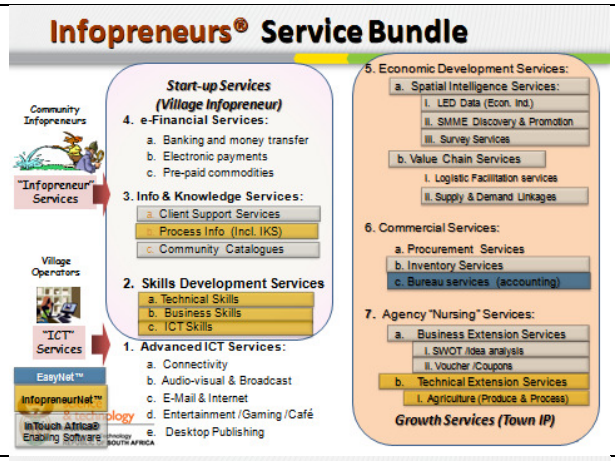
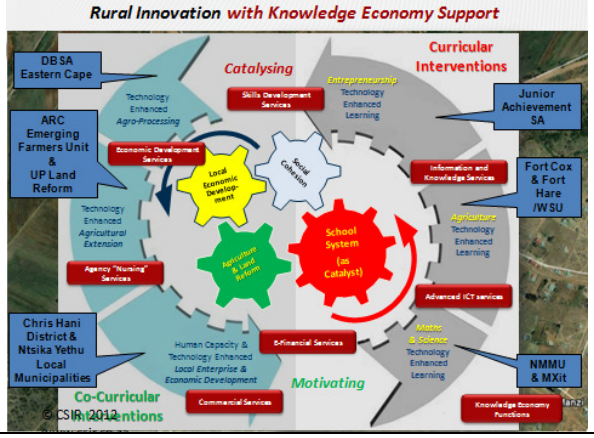

Solution Components
Supporting "Back-office"
Regional Support
Community Agents
Socio-political Arena
1st Economy Arena
Enabling Environment
Trading Environment
National & Provincial Government
Local Government
Corporate Business
Medium Enterprise
Democratization
Globalization
Service Divide
Trade Divide
CBOs
Citizens
Micro Enterprises
Developing Rural Communities
"Digital Divide"
Technology Convergence


How the Infopreneur® Model works
Community Infopreneurs®
Delivery Context
Citizens
Micro Enterprises
Developing Communities
Regional Infopreneurs®
Service Provider
Ware-houses
Area Retailers (Private)
Support Context
Local Government
Development Agencies
Area Delivery Agencies (NPO & Public)
Supporting "Back-office"
National Wholesalers (Private)
National Delivery Agencies (NGO & Public)
Enabling Context


Infopreneurs® Service Bundle
Start-up Services (Village Infopreneur)
Community Infopreneurs
"Infopreneur" Services
4. e-Financial Services:
a. Banking and money transfer
b. Electronic payments
c. Pre-paid commodities
3. Info & Knowledge Services:
a. Client Support Services
b. Process Info (Incl. IKS)
c. Community Catalogues
Village Operators
"ICT" Services
2. Skills Development Services
a. Technical Skills
b. Business Skills
c. ICT Skills
1. Advanced ICT Services:
a. Connectivity
b. Audio-visual & Broadcast
c. E-Mail & Internet
d. Entertainment /Gaming /Café
e. Desktop Publishing
EasyNet™
InfopreneurNet™
InTouch Africa® Enabling Software
5. Economic Development Services:
a. Spatial Intelligence Services:
I. LED Data (Econ. Ind.)
II. SMME Discovery & Promotion
III. Survey Services
b. Value Chain Services
I. Logistic Facilitation services
II. Supply & Demand Linkages
6. Commercial Services:
a. Procurement Services
b. Inventory Services
c. Bureau services (accounting)
7. Agency "Nursing" Services:
a. Business Extension Services
I. SWOT /Idea analysis
II. Voucher /Coupons
b. Technical Extension Services
I. Agriculture (Produce & Process)
Growth Services (Town IP)


Rural Innovation with Knowledge Economy Support
DBSA Eastern Cape
Catalysing
Curricular Interventions
Junior Achievement SA
ARC Emerging Farmers Unit & UP Land Reform
Fort Cox & Fort Hare /WSU
School System (as Catalyst)
Chris Hani District & Ntsika Yethu Local Municipalities
NMMU & MXit
Motivating
Co-Curricular Interventions
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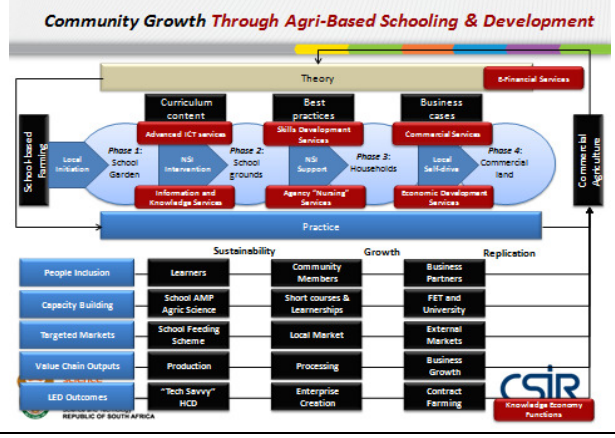
Community Growth Through Agri-Based Schooling & Development
Theory
Practice
Curriculum content
Best practices
Business cases
Phase 1: School Garden
Phase 2: School grounds
Phase 3: Households
Phase 4: Commercial land
Sustainability
Growth
Replication
People Inclusion
Capacity Building
Targeted Markets
Value Chain Outputs
LED Outcomes
Learners
Community Members
Business Partners
School AMP Agric Science
Short courses & Learnerships
FET and University
School Feeding Scheme
Local Market
External Markets
Production
Processing
Business Growth
"Tech Savvy" HCD
Enterprise Creation
Contract Farming

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# Presentation on "Extending Access and Connectivity across rural communities in South Africa"- Government Perspective

## Introduction

- Government Balancing act through 5 priorities for MTSF 2009-2014 (jobs, health, security, rural development and education)-12 outcomes
- Access through connectivity cuts across in all the priorities as a force multiplier.
- Rural Development priority is the spring board to achieving all other 4 priorities (Rapid Urbanization study conducted proving contrary)
- Major issue is that "Government has committed that all the people in the country should be able to have access and connectivity all the time irrespective of time and space"
- Difficulty with ICT not hailed as the primary need centers in its salient nature as opposed to other human basic needs.
- There is now a huge drive to put ICTs on the centre-fold – Rural communities receiving attention



## Government Policies and Initiatives re: Connectivity

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- National Development Plan Vision 2030
- Broadband Policy 2020
- National Growth Path
- Presidential Infrastructure Coordinating Council (PICC)
- Comprehensive Rural development Programme (CRDP)
- ICT Rural Connectivity Strategy



## National Development Plan Vision 2030

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- The main underlying challenge is " Poverty and Inequality"
- Propelled by the following challenges facing SA *(Divided Communities, Too Few Jobs, Crumbling Infrastructure, Resources Intensive Economy, Spatial Divides, Poor Education, High Disease burden, Public Poor service, Corruption )*

Focusing in Manufacturing as a drive for Economic growth (labour intensive manufacturing, mid-skill service)

- ICTs will underpin the development of a dynamic and connected information society and a vibrant knowledge economy
- Seamless info infrastructure will be universally available and accessible
- Infrastructure will provide access to the creation and consumption of converged services



## National Development Plan Vision 2030 (cont)

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- Priorities
  - 100% Broadband Penetration by 2020
  - All government institutions and individual citizens should have access to affordable access to info services and voice communications
  - SA's performance against other countries must be benchmarked to ensure that it is positioned in the top quartile of the ITU's Development Index ranking of middle-income countries
  - Strategic investment and regulatory guidance must result in relatively low access costs to the internet



## National Development Plan Vision 2030 (cont)

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- Government to be making extensive use of ICTs to engage with citizens
- All South Africans to have access to affordable ICT services
- e-Strategy collaborations between the State, Industry and Academia to stimulate research and innovation



## Broadband Policy 2020

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- View Broadband as an ecosystem
- Build on a spirit of good public-private partnership
- Ensure the nationwide availability of broadband services
- Calls for expansion of demand for broadband services through e-government applications, e-commerce and digital literacy education programmes
- Biased towards rural communities
- Objective of BB
  - To ensure universal services and access to reliable, affordable and secure broadband services by all prioritizing rural and underserviced areas
  - BB to be made available universally to all parts of the country like water, roads, electricity, etc
  - Targets investment in rural and underserviced areas to minimize the digital divide (Schools, Health facilities, gov institutions



## PICC

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- The SA government adopted a National Infrastructure Plan in 2012 that intends to transform the economic landscape that will create sustainable jobs
- Cabinet decided to establish a body that will integrate and coordinate the long term infrastructure build (PICC) with its supporting management structures.
- PICC will use the spatial mapping of infrastructure gaps which analyse projected economic growth and areas which are not served with basic needs.
- 18 Strategic Integrated Projects (SIPs) have been created to support economic development and address service delivery in the poorest provinces
- Each SIP comprises a large number of specific infrastructure components and programmes





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HSRC
Human Sciences
Research Council

## Purpose and Goals of PICC

- Coordinate, integrate and accelerate implementation
- Develop a single common National Infrastructure Plan that will be monitored and centrally driven
- Indentify who is responsible and hold them to account
- Develop a 20 year planning framework beyond one administration to avoid a stop-start pattern to the infrastructure roll-out

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## Terms of Reference of PICC mandate

- Identify 5 year priorities
- Develop a 20 year project pipeline
- Achieve a development objectives: skills, industrialization, empowerment, research and development, etc
- Expand maintenance of new and existing infrastructure
- Improve infrastructure links in rural areas and provinces
- Scale-up investment in infrastructure
- Address impact of prices
- Address capacity constraints and improve coordination and integration
- Support African development and integration

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## SIP 15: Expanding Access to Information Technology

- The focus of SIP 15 is to provide for:

1. Broadband coverage to all households by 2020;
2. Migration of television broadcasting services from analogue to digital technology; and
3. Connectivity to schools.

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## Impact Assessment of SIP 15

- Job Creation (144 project jobs and 24 300 direct DTT)
- Promoting rural development
- Addressing Spatial Imbalances
- Industrial Development and Localization (link to NDP) STB
- Economic Performance of poorest provinces
- Regional integration

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## DOC Collaboration with PICC on SIP 15 re-Rural Connectivity Project

- The Department of Communication is responsible for execution of SIP 15 (Expanding access to communications technology)
- Doc Has developed ICT Rural Connectivity Strategy with ff objectives
  - To accelerate the deployment of relevant ICTs infrastructure for effective development in rural communities.
  - To build ICTs skills capacity in rural communities, thus increasing uptake and usage.
  - To enhance Rural ICT Enterprise Development in order to foster local economic development and improving rural livelihoods.
  - To broaden the ICTs market access scope for rural based small enterprises.
  - To increase the access levels of Television and Radio broadcasting services.
  - To enhance and promote the development of local content markets and content adaptability to rural conditions
  - To ensure easy access to primary and secondary health care services by rural communities through the use of ICTs.
  - To accelerate service delivery in rural communities through implementing e-Government programmes

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## DOC Collaboration with PICC on SIP 15 re-Rural Connectivity Project (cont)

- Study to facilitate ICT Rural Connectivity Implementation Plan was concluded through intensive collaboration with Provinces and Local government.
- It is concluded and will be integrated in the implementation plans of SIP 15.

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## PROJECT SCOPING & DELIVERABLES

In line with that the DoC has to implement rural ICT strategy as contribution to Outcome 7 by doing the following:

- Conducted Desktop Study Review on ICT in Rural Areas in nine provinces
- Conducted a review of the areas IDP to identified the needs and requirements on basic services and ICT perspective
- Collected existing ICT , Broadband , broadcasting, postal services facilities and services in the areas - with the current need & requirements
- Compiled of the Business Modelling and Framework - detailed below
- Compiled the Implementation & Partnering Frame work
- Propose business case with required funding estimates

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## AREAS IDENTIFIED & COVERED IN THE STUDY

- Study covered : 31 District Municipality in all the provinces which also specify wards that or may be prioritized
- Due to interlay and geographical landscape of districts and local municipality vs wards, it is ideal to focus on creation of "ICT Smart Districts"
- Population and households covered in the study is highlighted in the summary of findings
- Agreed ICT needs and requirements with Provincial Task Teams as per province are indicated as part of the proposals

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## Type of Data Collected

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- Mobile connectivity;
- Broadband connectivity;
- Schools connectivity;
- Health connectivity;
- Fixed infrastructure;
- Backhaul and POPs;
- Government Services;
- Postal and Banking Services;

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## Technological Components to provide end to end solutions

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- Network Design
- Data Centers/POPs
- Healthcare Facilities
- Educational Facilities
- Community Libraries Facilities
- Community ICT Centers
- Content Hub linked to Tertiary Intuitions

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## Conclusion

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- There is a huge political will to have ICTs as the centre piece of SA's development
- The NDP is adopted by the country authorities as the guiding framework
- Integration of entities addressing ICTs is needed
- All policies realize that there is a clear need to bring all citizens within the information and knowledge age with speed and agility
- Connectivity and Access is emphasized on the need for provisioning of basic ICT services.
- Perusing relevant pieces of legislation to locate what they are saying regarding ICTs

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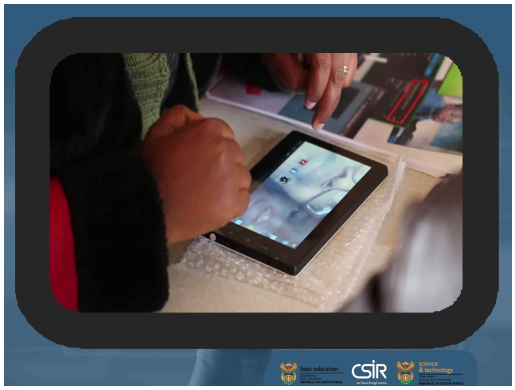
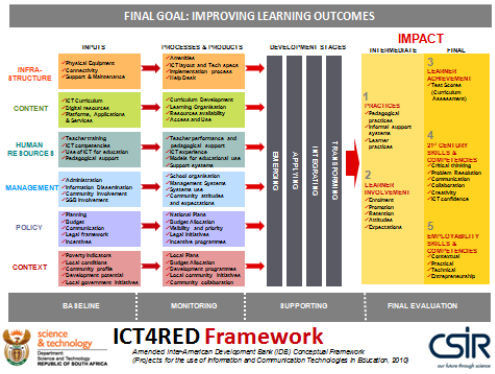
## Cofimvaba Rural Education Intervention
## Key objective

To create a platform to enable widespread participation and collaboration between multiple stakeholders (private, public, academic, civil society, community) to implement a large **Technology for Education Demonstrator in the Cofimvaba rural school district** that has the **buy-in of key stakeholders** and has **demonstrable impact** on education and quality of life in the region

## Cofimvaba Rural Education Intervention
## Focus Areas

- Health and Nutrition
- Transport and Logistics
- Building technologies
- Water & Sanitation
- Renewable energy
- Science and Technology Centre
- **ICT for Rural Education Development (ICT4RED)**






**ICT4RED Framework**

*Amended Inter-American Development Bank (IDB) Conceptual Framework (Projects for the use of Information and Communication Technologies in Education, 2010)*

## ICT4RED
## eTextbook Project Scope (3 – 5 years)

- Focus on 26 Nciba schools, 6 500 learners
- Test various models, in terms of
  - ✓ Devices (tablets)
  - ✓ Content
  - ✓ Infrastructure
  - ✓ Connectivity
  - ✓ Integration into the school
  - ✓ Costs (TCOs)
  - ✓ Sustainability
  - ✓ Logistics
  - ✓ Support & Maintenance
  - ✓ Operations
  - ✓ Change Management
  - ✓ Teacher training
- In parallel with existing paper-based textbooks

Specific focus on local capacity development!

## "9 Component Model"

NOW

Learning and Teaching Support Material consisting of paper-based textbooks, workbooks & readers

LEARNERS & HOME
TEACHERS & SCHOOL
GOVERNMENT & POLICY

Replicable Model

21st Century Schooling

Learning and Teaching Support Material consisting of interactive multimedia learning resources

**Programme Management**

| | | |
|---|---|---|
| CONTENT<br>Standards<br>Conversion<br>Creation & Customisation | SCHOOL INFRASTRUCTURE<br>Devices<br>Wireless LAN<br>Storage and Power | NETWORK<br>WiFi Mesh<br>Backbone connectivity<br>Internet |
| CHANGE MANAGEMENT<br>People (District, SMT)<br>Technology<br>Process | PEDAGOGY<br>Training<br>Preparation<br>In the classroom | RESEARCH<br>Masters & PhD<br>Technology R&D<br>ICT4E R&D |
| OPERATIONS MANAGEMENT<br>Logistics<br>Support & Maintenance<br>Distribution | KNOWLEDGE SHARING<br>Marketing strategy<br>Social Media Strategy<br>Knowledge management | MONITORING & EVALUATION<br>Learners<br>Teachers<br>School |

## Cofimvaba eTextbook Priority Focus

AIM: 21st Century Schooling
SUPPORT FOR ACCESS TO DIGITAL CONTENT

Support for a 21st Century School Environment

ICT to support teaching and Learning

Support for informed and "smart" ICT decision-making

LEARNERS AND HOME

TEACHERS AND SCHOOL

GOVERNMENT AND POLICY

Improved EDUCATIONAL OUTCOME

Learner Achievement | 21st Century Skills & Competencies | Employability Skills & Competencies

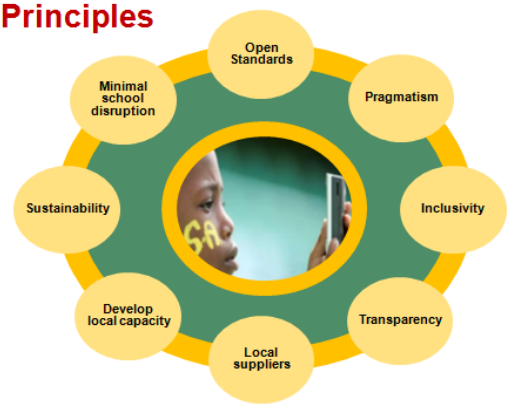
"Basic Enablers" - Creating the required pre-conditions for learning

FUNCTIONAL SCHOOL ENVIRONMENT
Competent Management & Leadership
Competent Educators
Informed parents

ADEQUATE INFRASTRUCTURE
Buildings
Sanitation
Electricity
Water
Access to ICTs

HOME ENVIRONMENT
Health
Nutrition
Transportation
Socio-economic circumstances

## Principles




## ICT4RED
## Local Capacity Development

- Change Management in Schools
  - Partnering with change management experts
  - Management perspective on "How to integrate ICTs into schools"
  - Principal, Vice-Principal, designated ICT champion
- Change Management in the District
  - How to support schools wrt "How to integrate ICTs into schools"
- Operational Management / Support & Maintenance
  - First line technical support and management from young entrepreneurs/technicians from the area (similar to Village Operator model)
  - Partnering with a company already active in Cofimvaba re training of first line technical support
- Teacher Training
  - How to TEACH with the technology

## ICT4RED
## Teacher Training - "Learn to Earn" model

- Tested with teachers at Arthur Mfebe Senior Secondary School
- How to TEACH with tablets – unique opportunity to model advanced pedagogy by the way the training takes place
- Focus on EMPOWERING the teachers
- Small, focused 3 hour sessions, 2pm – 5pm, every 3 weeks
- Attendance compulsory
- Homework after every lesson – reflection before every lesson
- If homework is completed, you get a small incentive (earphones, SD card, screen protector, tablet cover, keyboard, airtime, USB speakers, etc, etc)

## ICT4RED
## "Learn to Earn" model – preliminary results

- Teachers actively using tablets at school (although mostly as phones and cameras)
- Most teachers bought attractive covers for their tablets
- Teachers using advanced pedagogy to help put together a strategy for tablets at their school (used Jigsaw method that was used to teach them during one of the training sessions)
- Teachers using tablets to video CAPS courses to share with those who couldn't attend
- Examples of teachers lending tablets to learners so that learners can do research
- Very little absenteeism
- Courses start early and end late (on request from teachers

## Rollout for Phase 1 (2013)

**STEP 1: Meeting with principals and deputies, and allocated ICT champion and District Officials**
- ✓ Hand out tablets
- ✓ Preparatory course – change management and how to manage technology in a school
- ✓ Homework to be completed before STEP 2

**STEP 2: Teacher training**
- ✓ Tablet per teacher
- ✓ Model as per Arthur Mfebe – "Learn to Earn"
- ✓ Homework to be completed over 4 courses (until the researchers are sure that they are ready), then STEP 3

**STEP 3: MobiKits to Schools**
- ✓ According to size of school
- ✓ Shared tablets in the classroom
- ✓ MobiHub installed (local wifi in the classroom, local content)
- ✓ Monitoring & evaluation as to usage and management of these devices
- ✓ Continuing training of the teachers (who continue to do their "homework")
- ✓ Once happy that the school is ready, STEP 4

**STEP 4: Tablets to learners**
- ✓ Continuing training of the teachers (who continue to do their "homework")
- ✓ Wifi installed in school plus linked to other schools in cluster
- ✓ Tech support person appointed
- ✓ Pedagogy support person appointed

**STEP 5: Handover to management entity**
- ✓ Ongoing ops management and support

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