

# INNOVATION AND THE DEVELOPMENT NEXUS: PROSPECTS FROM RURAL ENTERPRISES IN SOUTH AFRICA

**Tim Hart**

Human Sciences Research Council and Stellenbosch University  
thart@hsrc.ac.za

**Peter Jacobs**

Human Sciences Research Council

**Kgabo Ramoroka**

Human Sciences Research Council

**Alexandra Mhula**

Human Sciences Research Council

**Brigid Letty**

Institute of Natural Resources

## ABSTRACT

The purpose of South Africa's White Paper on Science and Technology was to set South Africa on a path away from its historically exclusive and relatively dysfunctional National System of Innovation to one more inclusive in its representation and dealings with civil society, the private sector and the marginalised – particularly the poor. Despite the links of subsequent science, technology and innovation policies and strategies to development outcomes, the

focus on the poor was notably overlooked. In the decade since the White Paper was released, the gradual and minimal 'trickle-down benefits' of innovation failed to address increasing inequality, unemployment and subsequent poverty across South Africa. Evidence from our study of four rural district municipalities, using a purposively designed snowball sampling approach, indicates that current innovation activities in these areas appear prominent in the service or tertiary economic sector. This evidence reinforces prevailing ideas that the service sector is an important area for innovation and development, while the primary sector, including agricultural activities, remains important but perhaps less than previously emphasised. The high number of public, private and non-profit enterprises innovating in the service sector delineates this sector as a crucial entry point for innovation linked development. However, several prevailing trends with regard to innovation networks and the diffusion of innovations exist as challenges across all three sectors. These obstacles need to be overcome if the innovation and development nexus is to be strengthened and lead to broader local socioeconomic development and economic growth.

**Keywords:** innovation policy; rural development; rural district municipalities; economic growth

## INTRODUCTION

Innovation is often considered the panacea for rectifying the relatively slow growth and seeming ineffectiveness of many planned social and economic outcomes of programmed development in middle- to low-income developing countries (Marcelle 2012). This perceived relevance of innovation to development is most easily discernible in the growth of interest, diversity and number of the scholars in the discipline of innovation studies and its multidisciplinary nature over the past four decades, having shifted dramatically from the seminal singular writings on innovation in economics by Joseph Schumpeter in the 1940s and 1950s. More recently the presumed necessary linkages between innovation (in the form of science, technology and engineering) and development is clearly emphasised in the African Union strategy document, *On the Wings of Innovation* (AUC 2014, 10), which 'places science, technology and innovation at the epicentre of Africa's socio-economic development and growth'. African leaders deem innovation important to the achievement of development in Africa. South African policy makers are part of this innovation for development cadre.

South Africa's White Paper on Science and Technology (DACST 1996) was considered a vital framework to enable South Africa to avoid many of the pitfalls experienced by other developing countries in their attempts to formulate and apply innovation strategies for economic growth and development. Albeit largely influenced by the OECD members and Canada in particular, the 1996 White Paper included lessons learned from developing countries in Asia and Latin America.

Ideally, the document was to set South Africa on a path away from its historically exclusive and relatively dysfunctional National System of Innovation (NSI) to one more inclusive in its representation and dealings with civil society, the private sector and the marginalised – particularly the poor. Despite the links of subsequent science, technology and innovation (STI) policies and strategies to development outcomes (DST 2007), the focus on the poor was notably overlooked (DST 2012; Hart, Jacobs and Mhula 2013).

The 2007 OECD (Organisation for Economic Cooperation and Development) review of South Africa's NSI documented some of its evident and persistent structural and coordination challenges. In the decade since the White Paper was released, the gradual and minimal (in quality and quantity) 'trickle-down benefits' of innovation failed to address increasing inequality, unemployment and subsequent poverty across South Africa. The OECD surmised that the technologies and innovations required for reducing poverty were not clearly understood throughout the NSI and thereby undermined the ability of government to act effectively by coordinating appropriate strategies and resources within (and outside of) the NSI to ensure a greater poverty reducing impact on the causes and effects of poverty. However, this can also be attributed to failure of the state to diffuse broader ideas of innovation practices and types to provincial and local government, as well as many of those engaged in innovation activities, particularly to rural areas (Hart, Jacobs and Mhula 2013). In fact, knowledge economy policies tend more towards deracialising the scientific cadre of the NSI than extending knowledge throughout the diverse regional and local systems of innovation (DST 2007).

South Africa's rural areas, notably the former homeland areas and also those provinces with low population density, are acknowledged as areas that historically received very little investment (including STI) and development. This was notwithstanding the fact that these areas were and are still home to a large number of poor and vulnerable communities, many of whom obtained their livelihoods from engagement in the mining and agricultural sectors of the economy. Given the historical and current circumstances, what are the prospects for innovation-linked development in rural South Africa?

Recent research undertaken by the authors illustrates that despite the macro-level challenges and delays, there is acknowledgement within rural district municipalities that not only does innovation occur in these areas but that innovation, including that which focuses on the poor, is necessary to augment local rural development. Additionally, there is a growing awareness that innovation in the service sector has potential for local development with a pro-poor focus. We draw on evidence from a purposefully designed study conducted during 2012 and 2013 to understand the purpose of rural innovation actors, their innovations, and the prospects these hold for rural development. Spaces where there is strong potential for effective innovation and development linkages are noted and we examine some prevailing challenges.

## RURAL INNOVATION OUTLOOKS AND ACTIVITIES

### Rural innovation as agricultural innovation?

Scholarly literature strongly equates innovation in rural areas with agriculture, and in the global development climate, studies largely focus on smallholder agriculture in developing countries. The focus is generally on the introduction of new crop and livestock breeds, as well as the use of new technologies to improve and increase the output of produced commodities and the marketing thereof (Mugwagwa et al. 2010; Spielman et al. 2009). Other studies in this sector have considered the parallel activities of poorer smallholder farmers who attempt livelihood improvement through own innovation activities of invention, diffusion, adoption and adaption of technologies. Much of this is undertaken through farmer experimentation and farmer-to-farmer exchange of knowledge (Gupta 2012; Reij and Waters-Bayer 2001). Essentially, agriculture is the sector of focus of much of the rural innovation literature. When other types of innovations such as storage, information and communication, energy, water and transportation technologies are studied, it is their contribution to the agricultural sector or agrarian households that warrants most attention.

Recognising depeasantisation and other transformations in rural areas of developing countries, Rigg (2006) notes an increasing shift away from agriculture as the primary or only backbone of economic growth and development in rural areas. In South Africa, commercial agriculture is shedding its workforce and is declining as a major employer (Aliber, Baiphethi and Jacobs 2009), often as a result of adopting labour reducing innovations. Internationally, the trend in rural employment is shifting towards increased and stable skilled and semi-skilled employment in the growing public sector services of health, education and local government (NESTA 2007; Virkkala 2007). In South Africa, observations indicate that small-scale manufacturing, service and retail enterprises are becoming commonplace. The recently completed Knowledge and Innovation for Rural Development (KIRD) pilot project, a component of the Cooperation Framework on Innovation Systems between Finland and South Africa, reports that rural innovation systems in the Eastern Cape Province include community services, tourism and natural resource rehabilitation and management (COFISA 2010). As rural areas transform and more income flows in, so the opportunities for innovation in sectors outside of agriculture increase (NESTA 2007).

### Who are the rural innovation actors?

The research methodology involved initial scoping visits in four South African Rural District Municipalities (RDMs), drawn from 26 of the most destitute RDMs in the country. Each RDM was located in a different province. Scoping allowed for the identification of a variety of innovating enterprises, innovation activities and

types (products, processes, marketing strategies and social arrangements) in each of the districts. A snowball sampling approach was used to get peers to identify other innovators in different economic sectors. All innovators were screened and a total sample of 482 informal and formal enterprises that innovated during 2011 or 2012 was interviewed. Interviewers used a questionnaire eliciting qualitative and quantitative responses. In some cases secondary interviews were conducted to obtain deeper qualitative information regarding innovation activities and perceptions. Of the 482 innovating enterprises sampled, 98 (20%) are public enterprises, 202 (42%) are private enterprises and 182 (38%) are non-profit enterprises.

Although not drawn from a sample that permits broad inference, data from the current study supports the view that there is an increasing movement in rural areas towards innovation in sectors other than agriculture. More than half the sample (54%) of innovating enterprises came from the tertiary sector, providing services and products related to health, education, community services, finance, and information and communication. The primary sector, including agriculture and mining, remains significant at around 30 per cent of the sample. Manufacturing and energy supplying enterprises made up 16 per cent. At present, more than 70 per cent of the public sector enterprises sampled are located and innovate in the tertiary sector. Interestingly, only slightly less than 50 per cent of the private sector and non-profit sector enterprises are also engaged in the service sector. There is a lot of innovation taking place in the service sector of the local economy in these RDMs and while the service sector is vital for all residents in rural areas, it serves as a crucial entry point for development interventions that focus on providing basic services, skills, education, job creation and welfare facilities for the poor.

## What are the common innovation activities undertaken?

Most respondents adhere to a traditional understanding of innovation. A widespread opinion was that innovation must be something new and should involve the use of new inventions and technology to improve the revenue of the user (individual or enterprise). ICTs were considered to play an important role in innovation. Only 7 per cent of all enterprises in the sample actually invent innovations and only 56 per cent innovate exclusively for commercial purposes. Refreshingly, there is an eagerness to gain a more robust understanding of innovation and some enterprises are engaged in a variety of innovation practices. During 2012, the most common activity that all sampled rural enterprises were engaged in is adoption (53%). Less than a third (29%) adapted existing innovations and less than a quarter (24%) diffused own innovations or the innovations of others.

Of the total sample, 42 per cent of enterprises reported that they innovate in order to improve existing social conditions. There appears to be a significant awareness that innovation can be linked to socioeconomic development. While private enterprises generally emphasise adoption and adaption to improve their revenue and market

share, the public and non-profit enterprises tend towards adopting innovations for diffusion to poorer settlements and villages in the districts. Qualitative interviews noted that within poor communities, innovating individuals were engaged in job creation, basic service provision and caring activities for less fortunate residents. However, this inspirational outlook on innovation and development linkages in rural areas is restrained by a number of prevailing challenges. Here we consider those of existing innovation networks and the diffusion of innovations.

## CHALLENGES TO LOCAL INNOVATION FOR DEVELOPMENT

### Local innovation networks

Innovation networks exist and are considered valuable, with 75 per cent of respondents belonging to some form of innovation network. Membership of such networks was said to enhance their ability to innovate, permitting them to share resources such as knowledge and information (and occasionally funding) and to use skills for combined benefit. During discussions on the formality and informality of the innovation networks, most enterprises (86%) indicated that they are part of formal networks. These involve structured relationships and a form of written agreement as to how knowledge, skills and other resources are shared. In some cases different actors conduct distinctive roles and functions.

The 14 per cent of enterprises who state that their networks are informal, do so because interactions are usually ad hoc and unregulated by any sort of agreement or formal relationship, and members are not obliged to share opportunities or information, helping one another when they can. Specific roles and functions are seldom distinguished. Examples from different sectors include: farmers sharing technologies and practices they invented, adopted or adapted to neighbours and to farmers in other communities; construction workers sharing information on new technologies; as well as people sharing ideas, practices and opportunities on caring and supporting vulnerable community members to other communities.

Despite the formal or informal nature of the innovation networks, qualitative responses show that these networks often face similar challenges. If the network largely involves local actors and the enterprises are almost exclusively locally based, some had no idea where to get needed information, skills or resources. Enterprises in networks extending beyond the district, and especially those involved in provincial and national networks, such as the larger private and non-profit organisations and the public sector enterprises, did not report this challenge to the same extent. However, some municipal officials report that despite being part of provincial and national networks, innovation activities remained challenging because networks could not always identify the resources and skills required to enhance innovative practices. Similarly, the fact that a network is considered formal does mean that it is able

to provide the support required when it comes to improving and increasing local innovation activities and may not be able to support the adoption of new innovations. The challenge most innovators encounter is the scope of the innovation network and, most importantly, its ability to identify vital resources, notably knowledge and materials that are not locally available. Innovation networks also play a crucial role in the diffusion of innovations.

## Diffusion of innovation practices

We noted above that slightly more than half (53%) of the sampled enterprises engaged in adoption of innovations during 2012 and that less than a quarter engaged in diffusion of innovations. Herein probably lies the great challenge to innovation-linked local development – it is more about adopting and even adapting suitable innovations than inventing. There is a need to increase the diffusion of innovations into RDMS as well as to improve the rate of uptake (adoption) if innovation is going to link positively to development and stimulate socioeconomic development and growth of local economies. This suggests that diffusion from outside these rural areas into them, as well as diffusion within them is crucial. Adaption to local conditions can follow from this as and when required.

Qualitative exploration of diffusion and adoption activities presented some thought-provoking findings. Firstly, the trend appears to be the flow of innovation and innovative ideas into these rural areas from other areas, including main provincial towns and metropolitan areas in South Africa. Often the appropriateness and local usefulness (and even demand) of these innovations is not a decision making factor when it comes to diffusion, although it is when adoption is considered. This was particularly the case with innovations introduced by some state agencies. Thusong service centres are a good example. While the principles behind them are healthy, they are constrained by a lack of cooperation among service providers, insufficient demand or even desire for many of the services that are provided, and the inability to maintain some of the technologies used.

Secondly, the perception of some respondents is that local development agents often preferred expensive, complex and difficult to maintain innovations – products and practices – developed in other areas and were often unaware of or failed to acknowledge similar local innovations. Development agents are often involved in more formal and wider-in-scope innovation networks than those they serve. They also fail to recognise these groups and individuals as innovators. Consequently, they tend to rely too much on the ‘wisdom’ of the formal networks to which they belong. This overreliance on externally developed innovations has two interesting consequences: Important local innovative products and processes are ignored and are often not actively diffused on a wide scale, if at all, within the areas in which they are developed and where they can have great impact. Rather, there is a tendency

to replace them with innovations that require various degrees of local adaption. Furthermore, the only locally invented or adapted innovations that are diffused outside of these areas appear to be those that have the following criteria: First, the innovator should be linked to a formal innovation system that expands several tiers such as local, district, provincial, national and even international. This enables the innovator to formalise (regulation) the innovation and to get assistance with its diffusion (marketing and distribution). Second, only innovations with immediately visible commercial value appear to be strategically diffused outwards. In our observations, much of this seemed to be confined to the historically well-established and very formal commercial agricultural sector.

## CONCLUSION

Evidence from our study of four rural district municipalities indicates that current innovation activities in these areas seem to be prominent in the service or tertiary economic sector. This evidence reinforces prevailing ideas that the service sector is an important area for innovation and development, while the primary sector, including agricultural activities, remains important but perhaps less so than expected. The high number of public, private and non-profit enterprises innovating in the service sector delineates this sector as a crucial entry point for innovation linked development. However, several prevailing trends with regard to innovation networks and the diffusion of innovations exist as challenges across all three sectors in all four of the RDMS. These hindrances need to be overcome if the innovation and development nexus is to be strengthened and lead to broader local socioeconomic development and economic growth.

## ACKNOWLEDGEMENTS

This Research Note draws from evidence obtained during the Rural Innovation Assessment Toolbox (RIAT) Pilot study undertaken by Economic Performance and Development (EPD) researchers of the HSRC during 2012 and 2013. The authors acknowledge the financial support of the Department of Science and Technology. The views expressed are those of the authors and do not necessarily reflect those of any other party.

## REFERENCES

- AUC (African Union Commission) 2014. *On the Wings of Innovation: Science, Technology and Innovation Strategy for 2024*. Addis Ababa: African Union Commission.
- Aliber, M., M. Baiphethi and P. Jacobs. 2009. Agricultural employment scenarios. In *Another Countryside: Policy Options for Land and Agrarian Reform in South Africa*, ed. R. Hall, 133–163. Bellville: Institute for Poverty, Land and Agrarian Studies.



- COFISA (Cooperation Framework on Innovation Systems between Finland and South Africa) 2010. *Enhancing innovation in South Africa: The COFISA experience*. Pretoria: Department of Science and Technology.
- DACST (Department of Arts, Culture, Science and Technology). 1996. *White Paper on Science & Technology: Preparing for the 21st Century, 4 September 1996*. Pretoria: Department of Arts, Culture, Science and Technology.
- DST (Department of Science and Technology). 2007. *Innovation Towards a Knowledge-Based Economy: Ten-Year Plan for South Africa (2008–2018)*. Pretoria: Department of Science and Technology.
- DST (Department of Science and Technology). 2012. *Department of Science and Technology Ministerial Review Committee on the Science, Technology and Innovation Landscape in South Africa: Final Report March 2012*. Pretoria: Department of Science and Technology.
- Gupta A. 2012 Innovations for the poor by the poor. *International Journal of Technological Learning, Innovation and Development*, 5(1/2): 28–39.
- Hart, T. P. Jacobs and H. Mangqalaza. 2012. *Key concepts in innovation studies – Towards working definitions*. RIAT Concept Paper Series – Concept Paper 2. Pretoria: HSRC.
- Hart, T. P. Jacobs. And A. Mhula. 2013. *Review of South African Innovation Policy and Strategy 1994–2012: Innovation for Rural Development*. RIAT Concept Paper Series – Concept Paper 3. Pretoria: HSRC.
- Marcelle, G. 2012. Editorial. *International Journal of Technological Learning, Innovation and Development*. 5(1/2): 1–11.
- Mugwagwa, J.T., W. Wamae and S.M. Outram. 2010. Agricultural innovation and food security in sub-Saharan Africa: Tracing connections and missing links. *Journal of International Development* 22: 283–288.
- NESTA (National Endowment for Science Technology and the Arts). 2007. *Innovation in response to social challenges*. NESTA Policy Briefing March 2007. London: NESTA.
- OECD (Organisation for Economic Cooperation and Development). 2007. *OECD Reviews of Innovation Policy: South Africa*. Brussels: OECD.
- Reij, C. and A. Waters-Bayer. eds. 2001. *Farmer Innovation in Africa: A source of inspiration for agricultural development*. London: Earthscan.
- Rigg, J. 2006. Land, farming, livelihoods, and poverty: Rethinking the links in the rural South. *World Development* 34(1): 180–202
- Spielman, D.J., J. Ekboir and K. Davis. 2009. The art and science of innovation systems inquiry: Applications to sub-Saharan African agriculture. *Technology in Society* 31: 399–405
- Virkkala, S. 2007. Innovation and networking in peripheral areas – A case study of emergence and change in rural manufacturing. *European Planning Studies* 15(4): 511–529.