

in two areas of extreme poverty in the Eastern Cape were mapped, including informal actors. Conventional innovation systems approaches would result in many actors being overlooked. To react appropriately to the health system of an area, some attempt must be made to define what it means to be 'healthy' in that context. A wide range of health practitioners deal with a range of phenomena, from the physical to the spiritual, including highly qualified medical doctors alongside traditional healers.

In the formal system, there is a critical lack of technologies and skills in these rural areas. There is little horizontal interaction in the informal medical area, but interaction is stronger in the formal system. Across the two systems, here is some knowledge sharing between traditional healers and nurses, and between NGOs and formal actors. However, many modern health professionals in the formal system struggle to adapt to rural contexts. In an attempt to address this gap, an NGO selected local young people to attend university to train as health professionals, with the intention that they will become 'agents of change' in the community on their return.

The emerging trends support alternative ways of thinking about health and innovation, but universities may tend to push these to the margin. Higher education and research organisations should listen to the local intermediaries who drive change. There is a need for integrated systems of health care which determine what can be done in terms of practice.

Technology, social need and local value

Given the typical gaps between communities and formal science, Lesego Nkhumise and Gillian Marcelle of the University of Witwatersrand conducted an impact study of two CSIR water management projects in Limpopo and Eastern Cape. In Dresden, Limpopo, the perception was that access to water was provided in exchange for government votes, the community was not very happy with the CSIR and there was not a strong sense of ownership of the innovation as a result. In Cwebe, Eastern Cape, the CSIR was regarded as a water providing service company. Local communities insisted on interaction with the science council, as they were unhappy with the municipalities. The salutary lesson is that

the technology introduced was good, but the way it was deployed within the communities was suboptimal and lacked transparency. The technology was not delivered in terms of social need, or local value, usefulness or relevance. For example, there was no follow-up to see how effective the water installation was, and whether the communities' needs were being met. In short, effective interaction and bi-directional knowledge exchange is necessary, but achieving this remains a challenge.

PRELIMINARY INSIGHTS FOR LINKING KNOWLEDGE PRODUCERS AND MARGINALISED COMMUNITIES

The commitment to equity and social development is enshrined in government economic, innovation and higher education policy, but the challenge is to encourage, implement and extend it, so that effort and resources do not remain focused on 'big science', global competition and economic development defined in terms of Gross National Product.

Policy-makers should not be mesmerized by standard metrics of innovation. They do not always measure the right things and can be used to pressure governments into inappropriate policies. Rather, it is necessary to measure, map and try to understand local innovation in its own terms, with a focus on value in terms of its usefulness to the local beneficiaries, rather than solely on novelty.

In working with universities and science councils and utilising their knowledge and skills, their distinctive role and nature should be foregrounded. The best way to involve academics and scientists is to align their disciplinary and professional inclinations with the social and economic developmental work that policy requires.

The reality of caution, even distrust at times, between researchers and government policy-makers should be recognized, and on both sides efforts should be made to overcome this in the interests of the common goal.

Policy-makers and knowledge producers concerned with the development of marginalized communities, rural or urban, should attempt to understand how innovation takes place at local level, and identify how to augment, rather

than displace, this practice. This is linked to the need for an appreciation of how innovation and development are embedded in the 'culture' of communities. Damaging mistakes can be made if there is not a subtle and sympathetic understanding of local conditions and practices. The role of local intermediaries is critical.

Policy-makers should take small firms or 'enterprises' in the informal sector seriously. They are building-blocks of a vigorous local society, and what happens in them is directly concerned with human development.

Finally, the idea of 'transfer' of knowledge or technology to communities or informal sector enterprises is problematic. It assumes that people are passive recipients, rather than agents actively learning and building local capabilities, however imperfectly, and however challenging the process of engagement.

References

- Diyamett, B.D. 2008. Scientific community, relationships between science and technology and the African predicament: who is to blame and what can be done? Presented at the 6th Globelics conference, Mexico City, Mexico, September 22-24, 2008.
- Kruss, G., Visser, M., Aphane, M. & Haupt, G. 2012. *Academic interaction with social partners: investigating the contribution of universities to economic and social development*. Cape Town: HSRC Press.
- Jamison, A. 2009. The cultural aspects of innovation, including grassroots innovations. Retrieved from http://www.slidefinder.net/c/cultural_aspects_innovation_including_grass/10221866
- National Advisory Council on Innovation (NACI). 2009. Broad-based innovations to address socio-economic challenges faced by South Africa. Summary of proceedings of National workshop. CSIR conference centre, Pretoria. February 27, 2009.
- OECD. 2012. *Innovation and Inclusive Development: Discussion Report*. Paris: OECD

Acknowledgments

The author acknowledges Prof. Vasu Reddy's editorial inputs.

AUTHOR

Dr Glenda Kruss
Research Director,
Education and Skills Development
Human Sciences Research Council.
Enquires to gkruss@hsrc.ac.za

Linking knowledge producers and marginalised communities

This policy brief draws on a workshop on **Linking knowledge producers and marginalised communities** that was held at the Tsogo Sun Hotel, on 15 November 2013, sponsored and organised by the Department of Science and Technology (DST), the Human Sciences Research Council (HSRC) and the Cape Peninsula University of Technology (CPUT).

Since 1994, the Department of Science and Technology (DST) has promoted the role of universities in innovation and competitiveness through a focus on industry interaction. The emphasis is particularly on firms in high-technology formal sectors, to grow new niche concentrations in biotechnology, nanotechnology or space science, for example. In contrast, higher-education policymakers have tended to promote the role of universities in community engagement, equity and social development. A wide range of projects have long existed in which universities cooperate to promote local development in fields such as water, conservation of indigenous species, and regional development.

Recently, there is growing potential for convergence and alignment between these two policy tracks. DST policy has recognised the need to be more inclusive of people and activities in the informal economy, the need to take into account other forms of knowledge, and the need to understand the complex social and cultural dynamics that influence the adoption and diffusion of innovation. At the same time, across the higher education system, there has been a shift towards institutionalisation of a broad concept of engagement and social responsiveness as integral to academic scholarship. Engagement should be grounded in the core missions of teaching and research, and linked to economic and social development, depending on disciplines and institutional types.

A range of strategic initiatives, funding programmes, development projects and networking interventions have been rolled out over

the past five years by DST-related agencies. One example is the pilot Community University Partnership Programme, initiated at the universities of Fort Hare, Limpopo, Venda and Zululand. In 2012, DST partnered with the Organisation for Economic Cooperation and Development (OECD 2012), to define the emergent concepts of grassroots innovation, bottom of the pyramid innovation, inclusive innovation, and to promote the notion of innovation for inclusive development. All of these policies and plans assign universities and science councils key roles as knowledge producers, to partner with communities.

Formal policy has the potential to overcome the disjuncture between the innovation and higher education spheres, but in practice there remains contestation, misunderstanding, and resistance to change. Many academics continue to interpret engagement narrowly, as being responsive to the academic community. Many community engagement practitioners tend to focus on philanthropic community service projects, or on student service learning in community settings, with little awareness of the potential for knowledge intensification and innovation that can lead to inclusive development.

Some would argue that there is an incompatibility between the drivers of science systems and the drivers of local technology demand at a lower level within marginalised communities (Diyamett 2008). Hence universities should rather focus on innovation and expanding the 'knowledge frontiers', appropriate to local conditions. In contrast to such a position, others argue for a more holistic approach, in which universities are involved in the full spectrum of

knowledge and technology capability building (NACI 2009, Jamison 2009). The knowledge generated in universities should be diffused and transferred to wider social and public benefit, particularly to marginalised communities, rather than primarily to the benefit of the private sector. Even where there may be agreement on inclusive developmental goals, there are few proven strategies on how to achieve the university's ideal roles. There is a lack of models that can support interaction between academics and marginalised communities to generate new knowledge, and to apply, diffuse and transfer existing technology and research. The challenges of such interaction are many, including power imbalances between academics and community members, differing knowledge bases, the need to build trust, and the reality that local power relations and shifting political conditions often undermine hard-won gains.

In this context, a recent DST / HSRC science seminar drew together researchers and policy makers in the higher education and innovation spaces, to debate the role of knowledge producers in different types of universities and science councils. Researchers presented new work, and participants grappled with the policy implications of the emerging evidence: how to foster interaction between universities, science councils and marginalised communities in ways

that will promote innovation towards inclusive development?

VALUE SHOULD BE EMPHASISED MORE THAN NOVELTY

The first challenge raised at the workshop is to clarify the notion of innovation from the perspective of a country like South Africa.

Gillian Marcelle of the University of Witwatersrand posed a challenge to participants, to reject the prevailing conventional biases in science, technology and innovation studies, and reimagine "innovation". Why reimagine innovation? In prevailing definitions of innovation and the analyses of science systems based on them, there is a widespread bias towards *newness*, rather than *usefulness*. The emphasis on novelty is embodied in the powerful myth of the 'lone hero' approach to innovation, merging with the bias towards technocentric solutions and analysis: the image of the 'geek in the garage'.

The most powerful bias of all is the insistence on standard metrics of innovation, notably the *Oslo Manual* of innovation indicators. This is a trap that imprisons South Africa and many other developing countries. There are alternative measures of innovation that tell a more accurate and more developmental story. It is necessary to begin to explore and develop definitions of innovation that put more emphasis on innovation as an intentional process, and that define it in terms of acquiring and using knowledge, with more focus on learning and building of capabilities. In short, we need to include within the definition not only new or improved products and processes, but the prospect of transforming life for the better. Value should thus be emphasised more than novelty.

We need a historical approach that tries to reveal carefully how innovation actually takes place in particular developing country contexts. The fact is, we know very little about innovation in informal settings. Typically, research in the field focuses on how large corporations can move into new markets. The question remains: how do developing world actors - how do spaza shops, for instance - actually do their innovation? The nature of micro-level innovation has not really been explained, and this is a very important gap and a real barrier to understanding and to social development. It is where the entire policy of a country like South Africa should be reoriented.

UNIVERSITIES AND SCIENCE COUNCILS EXTENDING ACADEMIC SCHOLARSHIP TO WIDER SOCIAL BENEFIT

The second challenge raised is to consider the distinctive nature of universities and science councils.

Glenda Kruss of the Human Sciences Research Council challenged participants to question the way innovation studies tends to treat universities and science councils as 'black boxes' contributing to firm innovation, without understanding how they work. In the current global context, academics and scientists have to respond to new, multiple, imperatives. The distinctive feature of universities is their substantive role as knowledge generators, with academics driven by disciplinary reputations and ambitions. The call to universities to engage with communities and be involved in innovation is more likely to succeed if it is directly informed by such an understanding. Hence, the challenge to academics is to extend their scholarship directly to the benefit of multiple social partners - communities, informal enterprises, as well as firms and government - in ways that are consistent with their departmental, or university missions, and with regional and national developmental goals.

A comparative perspective from Latin America

Valeria Arza of CENIT/UNTREF based in Buenos Aires, Argentina contributed a comparative perspective on research organizations - universities and public research institutions - in Latin American countries, which face similar development challenges. In relation to one of their potential roles - modeling policy debate and policy agendas - research organizations can extend their scholarship to critique policies, disseminate research findings and encourage wider understanding. There are obstacles: the acceptability of research findings to the electoral base and receptiveness of politicians in distinct political cycles; urgent policy needs may not articulate with the scientific culture of the time; there are often difficulties in achieving trust and improving communication with policy-makers; and there are epistemic problems, since social research is complex, and not easy to relate. The basic question is: how to improve the social relevance of research organisations. Clear identification of social needs is required, as well as better definition of organisational values and strategies in terms of social relevance. Above all, research must be produced that responds effectively,

whilst maintaining academic excellence - or we may add, that extends scholarship to the benefit of policy makers.

Interaction in South Africa

We do not have a great deal of evidence on the current interactive practices of South African research organisations. *Glenda Kruss* provided emerging evidence from research which suggests that there is high awareness amongst academics that they should be interacting with external social partners, particularly communities, but how that is interpreted in practice differs widely between disciplines and different types of university. Many academics in research universities, for example, interact only on a very isolated scale, often with a single external partner, typically another academic. Or another example, is that for many academics in law faculties, interaction takes the form of involvement in legal aid clinics. Some academics are involved in community outreach, such as groups of university employees painting schools or collecting food and clothes for impoverished communities, but these philanthropic activities are not grounded in academic scholarship, and do not involve learning or building capabilities.

Most commonly, interaction tends to benefit university teaching and student learning. Across the higher education system, there are not many academics who interact *directly* with marginalised communities or informal enterprises to support their innovation or learning processes. There are however, many academics in universities and in science councils who use their research create new products or processes - such as water filters, or solar lighting, or low cost medical devices or treatment protocols - that potentially can transform the quality of life for the better. The question then is one of how those technologies are successfully diffused and adopted by those who can potentially benefit.

The workshop provided emerging evidence for each of these two broad trends, presented here in turn.

MECHANISMS THROUGH WHICH UNIVERSITIES CAN ENHANCE THE LIVELIHOODS OF MARGINALISED COMMUNITIES

Individual and institutional enablers

Recent research under the rubric of the *Universities Network on Innovation for Inclusive Development in Africa* (UNIID-Africa) draws on a conceptual framework that proposes the study

of innovation in informal settings. The aim is to understand how to transform marginal innovative activities into sustainable innovations that have wider impacts and stronger links with the formal sector (IDRC 2011, Cozzens and Sutz 2012, Kraemer-Mbula & Wamae 2010). The evidence suggests that in South Africa, these cases make up a very small minority of the forms of interaction typically found in universities and science councils.

Michael Gastrow of the HSRC presented preliminary evidence from case studies, which informs our understanding of the mechanisms and strategies that facilitate and constrain such direct interactions between universities, informal enterprises (whether cooperatives, social enterprises, subsistence farmers or fisherfolk) and marginalised communities. Academics were motivated primarily by their disciplinary reputations and traditions, and the interactions were strongly driven by socially committed individual academic champions. Communities were primarily motivated by proactive development strategies. The initiation and maintenance of interaction relied on community leaders to act as intermediaries between academics and community members. External intermediaries also played a role - all the cases were initiated out of a confluence of interests of the university and the community, facilitated by intermediary partners such as NGOs or local government agencies. University policies and structures had a minimal impact on these interactions, which were not driven in response to policy imperatives promoting community engagement or social innovation in universities, and were weakly articulated with internal organisational structures. The exception was a DST-funded external interface structure located at a university of technology. However, in all cases the university mandate and strategic direction influenced the form of interaction. At the research university the interaction was oriented to research with traditional knowledge relations. At the University of Technology the interaction took the form of technology transfer to SMME partners. The comprehensive university focused on participatory action research. The rural university initiated a network with local communities, extension officers from the department of agriculture, national funding agencies and agriculture students.

Overall, the evidence suggests that institutional policies and structures can play a role in enabling such interactions, but that in practice at present, the primary enablers lie in the mo-

tivations of committed academics, community leaders, and intermediary actors.

Mutual benefit and sustainable practices

Jacqui Scheepers of the Cape Peninsula University of Technology provided in-depth evidence of two specific mechanisms, by analysing successful service-learning projects and technology station activities. These combine multiple resources to improve the livelihoods of communities in a sustainable and responsible way, for example aquaponic growing systems, or fish processing. What accounts for success of such projects? First, institutional policy insists that interaction should be linked to an academic discipline, students should receive credit for what they are doing, and there must be evaluation of what is achieved. Second, to avoid incoherence, an overarching theoretical model is needed to coordinate the various efforts across disciplines and over time. This will address the need to break out of a cycle of 'hit and run' projects which start well, and then collapse. Third, and very significantly, is the contribution and inputs from the communities themselves, with society 'speaking back' to initiatives from universities. Primarily, these experiences suggest the importance of building networks leading to communities of practice, to systems of influence, with mutually beneficial relationships.

Rural innovation, local knowledge and networks

Rural universities are distinctive in their histories and their roles in relation to their isolated spatial location and direct proximity to the most marginalised communities. A project led by *Peter Jacobs and Tim Hart of the HSRC* analyses local innovation within four rural district municipalities in Limpopo, Eastern Cape and KwaZulu-Natal provinces. A large proportion of the population of all these areas is below the poverty line, and in all of them, the average poverty rate is above that for the provinces as a whole.

The plan was to map the process of innovation and the patterns of invention, adaptation, adoption and diffusion, of enterprises in these rural districts. The aim was to learn from people on the ground, and link the findings to what other public actors were attempting to do. It is generally difficult to find innovation actors in rural areas, as many are informal, and their activities fit into a very broad understanding of innovation. A survey of rural enterprises was conducted, and results shared through a dialogue with the people of each district,

giving local organizations a body of evidence from which to work.

The survey focused on the sharing of information and knowledge as sources for innovation, learning and capability building. Analysis showed that 75% of enterprises self-reported sharing knowledge for innovation. But lots of questions remain inadequately or incompletely answered: for example, the extent of interaction with government departments. Three types of enterprise were identified: private, public and non-profit, and each reflected different rates of knowledge-sharing. While there was sharing of locally-generated knowledge, bringing ideas in from outside the area was of considerable importance. The study showed that innovation can enhance living standards through cooperation between 'innovators', with non-profit organisations being active collaborators and sharers of knowledge. Networking is strongly related to pursuing innovation. Networking is most significant among formal networks, but the question remains about its significance in informal ones.

The idea of innovation has been monopolized for a century by those not dedicated to equality. The project is a significant attempt to incorporate a perspective from below, to track and map what is being done in terms of innovation in rural areas.

KNOWLEDGE PRODUCERS AND THE PROMOTION OF INNOVATION FOR PUBLIC BENEFIT

A second set of research contributions focused on university and science councils' indirect interaction to the benefit of marginalised social groups. The focus was research and innovation in the potential interests and benefit of the public, and in terms of social interactions to support diffusion and adoption of technology.

Rural health systems and local intermediaries

Erika Kraemer-Mbula and Lindile Ndabeni of the Institute for Economic Research and Innovation at Tshwane University of Technology focused on rural health systems, which have the potential for local innovation and social inclusion. Health is a basic need, and if it is not effective, all sorts of other activities are not possible. Social exclusion is different from poverty, and involves access to equal rights. What is innovation in this context?

The key actors in the rural health care systems