

RURAL INNOVATION ASSESSMENT TOOLBOX (RIAT)

Final Report of Phases One and Two REFLECTIONS ON AND LESSONS FROM THE PILOT STUDY

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ACKNOWLEDGEMENTS

The Department of Science and Technology (DST) contracted the Human Sciences Research Council (HSRC) to develop and pilot the Rural Innovation Assessment Toolbox (RIAT) in four rural district municipalities. The RIAT aims to enhance the contribution of science and technology interventions to rural development, deepen understanding of the social and institutional dynamics of rural innovations and inform the work of the multi-stakeholder Rural Innovation Partnership. Based on the outcomes of this project, the team must also explore ways to institutionalise RIAT as a self-discovery diagnostic tool for actors in the local innovation space. This Second Narrative Report has a dual purpose: firstly, to reflect on the experience and evidence mapping of innovation activities across 4 Rural District Municipalities, and secondly, summarise learning from the initial self-reflection and horizon exploration [SHE] sessions conducted from late-August to early-September in these districts. It is a self-contained status report which includes conceptual debates as well as practical information on project implementation, preceded by a summary of the First Narrative Report. The views expressed in this document are those of the authors and do not necessarily reflect those of any other party.

EXECUTIVE SUMMARY

The Rural Innovation Assessment Toolbox (RIAT) starts from the basic understanding that innovation is a multifaceted process of knowledge generation, adaptation, spread and use for the delivery of broad-based societal benefits (technological, institutional and social). Based on this open-ended notion of innovation, RIAT has prepared the ground for longer-term mapping of innovation value chains in spatially marginalised contexts; in this instance the 24 deprived Rural District Municipalities (RDMs) in South Africa serve as examples of spatially marginalised contexts. This document highlights the processes and dynamics inherent in the development of the RIAT during Phases 1 and 2, what we have learned thus far and how such learning shaped the existing RIAT survey instrument, as well as guided the formulation of the other tools in the RIAT toolkit.

RIAT has three primary objectives:

1. Develop a tool that can map out innovation actors, activities and systems in spatially marginalised contexts.
2. Develop an instrument or instruments that could assist actors to improve their reflective self-learning about their innovation potential and activities.
3. Design the instruments in such a way that they could assist with the future monitoring and evaluation of innovation activities in the RDMs.

The study started with a thorough engagement with the current literature and a number of innovation expert. From this process the key concepts of innovation value chains, sub-national-space-bounded innovation systems and the social dynamics of innovation (and innovation systems) were adopted as guiding concepts for the development of instruments and methodologies to form part of the RIAT toolbox. Following the adoption of these guiding concepts, the scoping visits in each of the four pilot RDMs (Mopani, Chris Hani, Dr Ruth Segomotsi Mompati and Umzinyathi) assisted the research team to construct an instrument as well as to consider other potential tools that could form valuable components of RIAT to ensure a complementary set of tools to provide the requirements indicated by the Department of Science and Technology. Three components or complementary tools for RIAT have been currently identified.

Component 1 involves a structured questionnaire for the purpose of rapid mapping and measurement of innovation activities in rural district municipalities. Component 2 considers the selection of several case studies and its exploration of innovation value chains is more qualitative in orientation, giving the desired attention to *depth* and nuance. This component is still under development. Component 3 is a *reflective self-learning* tool, modelled on participatory and interactive learning research methods. Reflective self-learning was attempted with limited success in the survey questionnaire instrument during the pilot-phase. To this end it is proposed that

participatory interactive workshops would be a complementary means of ensuring broader understanding, evaluation and integration of innovation knowledge and activities.

The scoping visits also assisted in the design of the sampling methodology for the survey and identification of local innovation actors. Because of the often hidden population of innovation system actors it was accepted that a convenience snowball sampling procedure would be best for the pilot phase. Such an approach also seems likely to be appropriate for identifying innovation actors in the medium to long-term.

The staggered piloting in two RDMs at a time provided further evidence for the need to include complementary tools, indicated and enabled the changes necessary to the survey instrument and also confirmed the relevance of the five thematic areas that make up the rapid mapping and measurement instrument. These thematic areas are as follows:

1. Profiling of the actors and their roles in the innovation system and sharing and understanding meanings of innovation
2. Innovation value chain activities and types of innovation
3. Internal organisational/enterprise environment
4. Macro-context
5. Reflective self-learning component (cross cutting)

Based on the fieldwork experiences and progress to date it is anticipated that during Phase 3 the usefulness of the tools described above as RIAT Components 2 and 3 will be validated and enable further reduction in the length of Component 1. This step will ensure that the survey instrument can be repeated rapidly in the RDMs to provide regular data for monitoring and evaluation purposes and also be used to map innovation activities in other spatially-bounded sub-national innovation systems.

In conclusion, the research methodology (convenience snowball technique) and the rapid mapping and measurement survey instrument have proved appropriate for Phase 2 of the RIAT study. As indicated, some minor changes may make the tool quicker to administer and also perhaps less robust, but would enable regular mapping and measurement of innovation activities. Importantly, the methodological process to date has not only guided and strengthened the survey instrument but has also enabled the identification of the complementary tools and methods to ensure robust data collection, analysis, self-learning, reflection and understanding by the local innovation actors.

INTRODUCTION

The Rural Innovation Assessment Toolbox (RIAT) has been designed and piloted for an action-oriented approach to mapping rural innovation activities with an eye on enhancing localised innovative performance with visible positive impacts on social upliftment and rural peoples' quality of life. More specifically, the Department of Science and Technology (DST) commissioned the Human Sciences Research Council (HSRC) in April 2012 to develop the RIAT to realise three primary objectives:

1. Develop a tool that can map out innovation actors, activities and systems in spatially marginalised contexts.
2. Develop an instrument or instruments that could assist actors to improve their reflective self-learning about their innovation potential and activities.
3. Design the instruments in such a way that they could assist with the future monitoring and evaluation of innovation activities in the RDMs.

Broadly speaking, this second RIAT Narrative report has a dual purpose. Firstly, it summarises this project's key conceptual and methodological accomplishments which were explained in greater detail in the first Narrative Report and numerous other documents. Secondly, it synthesizes learning from pilot testing the RIAT in 4 Rural District Municipalities to realise the abovementioned objectives.

Numerous lessons were learned from the conceptual and methodological design, the series of complementary data collection activities and participatory self-reflection and horizon exploration across the designated pilot sites between mid-May 2012 and early-September 2013. As work in progress it makes sense to capture some of the key lessons and to reflect on these, as this will be useful for others undertaking pilot studies in the future, even if not involved in the field of innovation studies. One of our initial challenges was learning from the experiences of others who are involved in innovation studies and particularly developing instruments to capture innovation activities in South Africa. These experiences were not recorded by the various scholars and those interviewed as part of the Conceptual and Networking activities of Phase One of the RIAT pilot study were unable to recall exactly what had transpired over several years to result in the current assumptions and experiences upon which their instruments are now heavily based. Perhaps more importantly, the reflective intention of this document is to enable us identify the best ways to proceed with Phase Three of the pilot study and consider what needs to be improved to result in a coherent set of complementary tools for the toolbox; based on our experiences, empirical observations and the evidence generated by the application of draft instruments during Phases One and Two.

The remainder of this document is composed of three primary sections:

- Preparatory Steps – overview of the process of initiating RIAT, developing the methodology, approach and tools, and steps undertaken to establish a Rural Development Innovation Network.
- Toolbox Development and Use – some insightful evidence from piloting the tools, including lessons about local understandings of innovation and practical application of the tools in their current forms.
- Future Toolbox Development and Use – shortening the mapping instrument, finalising and testing the framework for High Impact Local Innovation Case Studies (HILICs) and refining the Participatory Evaluation, Reflection and Learning Sessions (PERLS).

We conclude the document with some general observations and a brief summary of the key lessons, especially those relating to Rural Innovation Systems and the future institutionalisation of the RIAT.

PREPARATORY STEPS

Two documents, namely the *'Phase One Narrative Report'* and the *'Practical Methods'* paper, examine in great detail the gradual and systematic way in which the Rural Innovation Assessment Toolbox [RIAT] evolved over its beginning period. A significant amount of time was spent from May to December 2012 in developing concept papers to define the concepts being used and to ground them in the prominent literature. This critical engagement with 'theory' served a practical, rather than purely academic purpose. Four concept papers were planned as part of a series for the project and itemised as deliverables during discussions with the DST and the RIAT Project Steering Committee (SC). These concept papers cover a broad range of topics related to innovation, rural development and methodology but basically set out to answer the following pertinent questions:

(1) What are the existing conceptions of rural innovation and how useful are these concepts to capture rural realities? (2) Where does 'rural innovation' fit into South Africa's post-1996 science, technology and innovation (ST&I) policy landscape? (3) What are the strengths and weaknesses of existing methods to measure the extent and impacts of innovation activities in rural areas?

It identified three crucial concepts (innovation value chains – innovation activities and types, sub-national space-bounded innovation systems and the social dynamics of innovation) for understanding innovation in rural areas¹. These concepts were further enriched through subsequent 'bottom-up' explorations of knowledge flows in four of the targeted rural district municipalities during initial scoping research and reflection in November and December of 2012.

¹ We refer readers to the critical conceptual review of these innovation concepts in Hart et al (2012) - the second concept paper in the RIAT Series.

Parallel to the development of the Concept Papers a process of engagement with other international and local innovation specialists took place, some facilitated by the Department of Science and Technology (DST)². This process had two main purposes. Firstly, to elicit information and support for RIAT from the various actors involved in innovation instrument design and rural innovation to ensure that the team had access to cutting edge local instruments, projects and practices. The second purpose was to use the contacts developed and move from simply being a RIAT team towards setting up a network of scholars, all of whom are locally involved in rural innovation systems research.

In June 2012 a meeting was held at the Built Environment facility of the Council for Scientific and Industrial Research (CSIR). This was hosted by Dr Maria Coetzee and was also attended by representatives from the Meraka Institute, e.g. Dr Rensie van Rensburg. This meeting had the primary purpose of linking RIAT to the STEP SA project (see Figure 1 below) and in obtaining the Rural District Municipal infrastructural profiles compiled by the CSIR Built Environment facility. The combining of the rural infrastructural profiles and the innovation mapping profiles was considered necessary to ensure that the data could be linked and stored meaningfully within STEP SA. The RDM infrastructural profile information has, however, not yet been made available to the RIAT team and they have had to rely on socio-economic profiles developed through Global Insight Regional Explorer.

Two RIAT team members met with Professor Roy Marcus of the Da Vinci Institute in Johannesburg. This private university, along with the DST, developed and now coordinates the Technology Top 100 (TT 100) annual survey and assessment of innovative business enterprises and academic organisations (many of which have enterprise units) within South Africa. The TT 100 adopts a firm-specific approach to the generation, adoption and diffusion of innovations. Firms that operate at the technological frontier or cutting edge are not only outstanding leaders in terms of R&D, but are also able to protect their intellectual property rights. Even though the TT 100 is concerned exclusively with the capabilities of a specific organisation, it is based on a framework of building awareness and consciousness within a surveyed business organisation about its own technological and innovation capabilities, of outward movements in the innovation frontier and of how the organisation would be able to catch up to this frontier. Innovation in the TT 100 survey covers innovation within products (goods and services), processes, marketing strategies and organisational arrangements' development/improvements. It was agreed that lessons from this survey instrument, especially structure, focus and administration requirements, must be considered in the content, development and design of the proposed tools within the RIAT.

² These discussions were formal and informal, including representatives of the Institute for Economic Research on Innovation (IERI) at Tshwane University of Technology, developers of the Technology Top 100 instrument at the Da Vinci Institute, representatives at the University of the Witwatersrand, Nelson Mandela Metropolitan University and the Department of Science and Technology.

Throughout this period, there were two RIAT Project Steering Committee (SC) meetings. At the first meeting, held on 14 August 2012, the lead researchers were introduced to the various SC members and presented some of the progress and formulations that had transpired over the previous three months. The second RIAT Project Steering Committee (SC) meeting took place on 18 April 2013. This meeting followed the first pilot of the mapping instrument in Mopani and Chris Hani Districts and served as a means of providing some preliminary findings and recommendations by the RIAT research team. Following an extensive conversation about strengthening and fine tuning the existing tools and deepening the analysis of evidence, the SC recommended that DST should arrange evidence sharing workshops with researchers working on related projects commissioned by the DST. Furthermore, the RIAT team was instructed to immediately implement the self-reflection and horizon exploration (SHE/PERL) sessions -originally proposed for the next phase of RIAT- thus effectively increasing the duration of phase 2 by three months³.

Overall, the team found the support and willingness of some individuals and institutions to share ideas, experiences and knowledge extremely helpful during the various engagements with other scholars in the field. However, two concerns that are noted are firstly that some institutions that are undertaking innovation work on behalf of the DST were unwilling to share information despite making overtones about their willingness to collaborate. The team found this extremely frustrating in the sense that assistance and information was offered but then never provided and emails and telephone calls went unanswered. A second concern was the fact that the many of the RIAT Steering Committee members did not attend the actual meetings, and some of those who did attend invariably did not update themselves with the latest reports and work undertaken by the RIAT team. As a result meetings involved answering a lot of unnecessary questions, the answers for which were already in the detailed outputs distributed before the meetings. Also some of these committee members made promises to share information at the meetings but invariably did not do so afterwards.

TOOLBOX DEVELOPMENT AND USE – INSIGHTFUL EVIDENCE FROM THE MAPPING COMPONENT

During the month of October 2012, following many of the interactive engagements outlined above, the RIAT team consolidated much of the previous work on the concept papers and set up the process

³ Each session enabled local stakeholders- anchored around the District Municipalities- to critically engage with the evidence, learning about innovation activities in the RDM and using the RIAT approach to identify catalytic local innovations for further development. Reports of the four SHE/PERL sessions are attached as appendices to this report.

of ensuring scoping visits in four of the RDMs. These were initiated on 11 November 2012 and were conducted over a period of two weeks by two separate teams, each visiting two districts.

This section explains the process leading up to the development of the instrument, the fieldworker identification, training and implementation of Versions 1 and 2 of the mapping instrument. It also includes summaries of some of the key findings and insights from the implementation of two versions of the instrument in the four RDMs.

1. SCOPING VISITS IN THE FOUR RURAL DISTRICT MUNICIPALITIES

Given the relative 'newness' of RIAT innovation measurement and mapping exercise, exploratory methods proved to be most suitable for pilot-testing the mapping instrument of the 'rural innovation assessment tool'. Following the extensive engagement with the current literature and innovation experts it was decided to undertake scoping visits to the four RDMs where the proposed pilot-study would be implemented. These RDMs are as follows:

- Dr Ruth S Mompoti (North West Province)
- Mopani (Limpopo Province)
- Chris Hani (Eastern Cape Province)
- Umzinyathi (KwaZulu-Natal Province)

The purpose of the scoping visits was to establish how best to link the innovation concepts derived from the literature and engagement with other scholars, with the experiences and prevailing circumstances in the RDMs. A secondary purpose was to explain the RIAT study to some local actors and to establish support for the pilot-fieldwork process. Approximately 30 enterprises/individuals were interviewed in each district during the scoping visit. Also a list of approximately another 30 contacts and innovators was generated for each district. In the case of RIAT a range of relevant contact people were identified during the scoping visits. In the weeks leading up to the fieldwork these people were contacted telephonically, the research purpose was explained, and they were asked to refer the fieldworkers to potential innovation actors. Once these actors had been screened and if appropriate interviewed, they were then asked to refer the fieldworkers to another two to three potential innovator respondents. In this manner the snowball sampling approach identified appropriate respondents to be interviewed as part of the survey.

Unlike most national and international STI surveys, which primarily focus on registered and fairly easily identifiable firms as the unit of analysis, RIAT does not have this luxury because many of the actors (organisations and individuals) engaged in the innovation value chain in rural settings are often not easily identifiable. Some are unregistered organisations and others include unregistered individually owned micro-enterprises. To take care of these '*hidden elements of the rural innovation value chain*' the pilot phase combined purposive survey design and snowball sampling. This sampling

overcame many of the initial obstacles encountered in identifying the rural innovation actors, but also brought with it some internal constraints.

The current situation, whereby the population of innovators or innovation actors in rural areas is largely hidden and therefore unknown, makes it difficult to identify the best sample size. Any sample drawn could not be random because the lack of population size would make probability sampling redundant. The team decided to adopt a purposive built survey design in which non-probability sampling was based on convenience. Following from this it was decided that snowball sampling was the best approach to selecting responding enterprises/organisations. Potential respondents are firstly identified by a referral process (often peer referral or service provider referral) and then are screened to determine if they are suitable respondents - those to whom the survey instrument can be administered. In the case of RIAT (primarily for monitoring and later evaluation purposes) such respondents must have engaged in at least one innovation activity during the previous two years (2011 or 2012). This of course constrains the sample of innovators to a very specific time period and has the effect of excluding those innovators who may have been more prolific during earlier periods. Another effect is that many adaptations to indigenous or local knowledge that occurred before this time frame are overlooked in the RIAT study⁴. The imposition of a time frame is not considered too serious because of the existing evidence of many rural innovators in the agricultural sector and due to the fact that the RIAT study was mandated to develop a tool that could be used for future monitoring and evaluation, thereby necessitating a specific time frame as a baseline.

Before moving onto the development of the mapping instrument and a summary of the evidence it generated it is important to note that the scoping visits to each of the four RDMs was crucial to selecting the best methodology in terms of the research parameters identified during the scoping visits. The scoping visits also enabled the team to consolidate many of the concepts and theory with the circumstances encountered in the pilot sites. These experiences were to form the foundation of the mapping instrument and the other two tools.

2. INNOVATION MAPPING INSTRUMENT

Following the scoping visit to all of the four RDMs the RIAT research team met in Cape Town on the 11 and 12 December 2012 to recap on the overall project status and to review each teams' lessons from the scoping visits, start drafting the mapping instrument, discuss the possible methodology and plan for the fieldwork in February 2013. While much of the scoping study experiences have been described in the sub-section above it is important to that a key contribution to the mapping

⁴ However, other studies, particularly in the agricultural sector, remind us that rural areas are rife with informal and innovative adaptations to indigenous and other knowledge systems (Hart and Vorster 2006; Hart and Vorster 2007; Hart, Roodt, Jacobs et al 2010; Norman, Snyman and Cohen 1996). See further evidence on a diversity of rural innovation activities on the South Africa Country Page at www.prolinnova.net

instrument was to move away from the focus on 'firms' to a more pragmatic and holistic concept of enterprises. Use of the term enterprises enabled the research team and the instrument to not only focus on formal private and public sector organisations but to also to focus on individually operated commercial businesses and more importantly informal organisations/groupings and individuals who are involved in innovation activities for various purposes and not necessarily commercial. It also enabled us to generate information about innovative activities being done at schools and churches and similar enterprises not typically capture in surveys focusing on 'firms'. This was seen as a necessary shift in order to get some information on informal actors in the rural innovation system.

There is a glaring absence of good quality and coherent data on innovation activities in rural areas. This paucity is compounded by the lack of ready-made methodologies to comprehensively map such knowledge flows, document how it gets used by different local actors and the positive (or negative) spill-over effects on local socio-economic development and improved living standards. Traditional large-scale Research and Development (R&D) surveys generate indicators (innovation metrics) that are limited to firm-level and therefore relatively easily identifiable investments in proprietary technologies, quantifying the monetary value of these investments and estimating the share (and contribution) of 'investment in ST&I' in GDP and macro-economic growth. Such an approach is true for both sector specific (Ramoroka and Hart, forthcoming; Mhula, Jacobs and Hart 2013) and national innovation surveys.

These mainstream surveys, including national surveys based on the OSLO and Bogota Manuals permitting country comparisons and ranking at a global level, are rarely spatially disaggregated, usually ignoring informal innovation (Archibugi and Coco 2005; Freeman and Soete 2009) and varied interactive effects along the innovation value chains by the often 'hidden' actors. Mhula, Jacobs and Hart (2013) underscore this methodological gap in the innovation frameworks developing countries have adopted from the standard OECD indicators. Moreover, any new measurement tool that maps knowledge flows, identifies the roles of diverse actors and the developmental spillover-effects must still at least meaningfully incorporate and measure new ideas about 'social innovations', if not fully understanding the social dynamics of rural innovation. Bridging this methodological gap is crucial for building sound evidence on innovation activities in rural areas. Better tools are needed to dissect the 'what and how of rural innovation'; it requires measurement and evaluation instruments with complementary parts that neatly fit together.

The core component of RIAT is a survey questionnaire made up of a balanced mix of closed (quantitative) and open-ended (qualitative) questions on innovation activities. The purpose of this questionnaire is to rapidly map the innovation value chain in sub-nationally space-bounded innovation systems. It also has the ability to assist with identifying potential examples to include into the case studies. A preliminary attempt was made to consider the suitability and contributory potential of including a reflective self-learning component in the survey questionnaire. The outcomes of this 'experiment' indicate the necessity for a dedicated reflective self-learning workshops at ward

or RDM level. What follows is an overview of the mapping instrument, a summary of some of the data generated and suggestions for the finalisation of the mapping instrument.

The development of the survey questionnaire was an intensive process and while undergoing numerous revisions (at least 15 drafts). Two versions were piloted. The major changes were made after the administration of the first version in the two pilot-RDMs of Chris Hani and Mopani. These major changes were attempts to reduce the time required for the interviews, improve the screening process, remove detailed but largely irrelevant data, and to ensure the questions are more focused on the mapping, measurement and future monitoring and evaluation potential of the instrument.

The questionnaire piloted during the second round of Phase Two in the RDMs of Dr Ruth Segomotse Mompoti and uMmzinyathi still collects information on the five dominant themes from the first version. However, it is more consolidated and focused. This was done by using five modules; one for each thematic area. These are now described in the sequence they appear within version two of the mapping instrument.

Firstly, there is a need to profile the actors (organisations and enterprises) in the RDMs. We need to know who the actors are in the 'rural innovation system' and how they fit into the 'rural innovation system'. This process also enables the identification of the formal or informal nature of some of these organisations and enterprises. While developing a profile, the module screens the potential respondent in order to understand the core functions of the organisation or enterprise and to establish possible innovation activities during 2011 and 2012.

Secondly, it is important to understand local meanings of innovation and how these compare/contrast with some of the key concepts in order to ensure that both interviewers and respondent actors have a shared understanding (Scoones and Adwera 2009). It is a practical first-step to understand local and informal ideas of innovation generally, as well as specific purposes of innovation such as socially or commercially orientation. Without this preliminary understanding, the subsequent conversation with the respondents becomes largely meaningless (Scheuermeier, Katz and Heiland 2004). Following this discussion, the value chain of innovation activities and the types of innovations are identified and explored in some detail. Questions posed here identify what is the new knowledge, product, process, marketing strategy or social arrangement that is identified as an innovation in terms of the core focus of the organisation/enterprise and how is the respondent or the organisation she/he represents involved in the invention, adoption and application, adaption or diffusion of such innovation. It goes on to further explore the nature of these activities and their contribution to social or economic development.

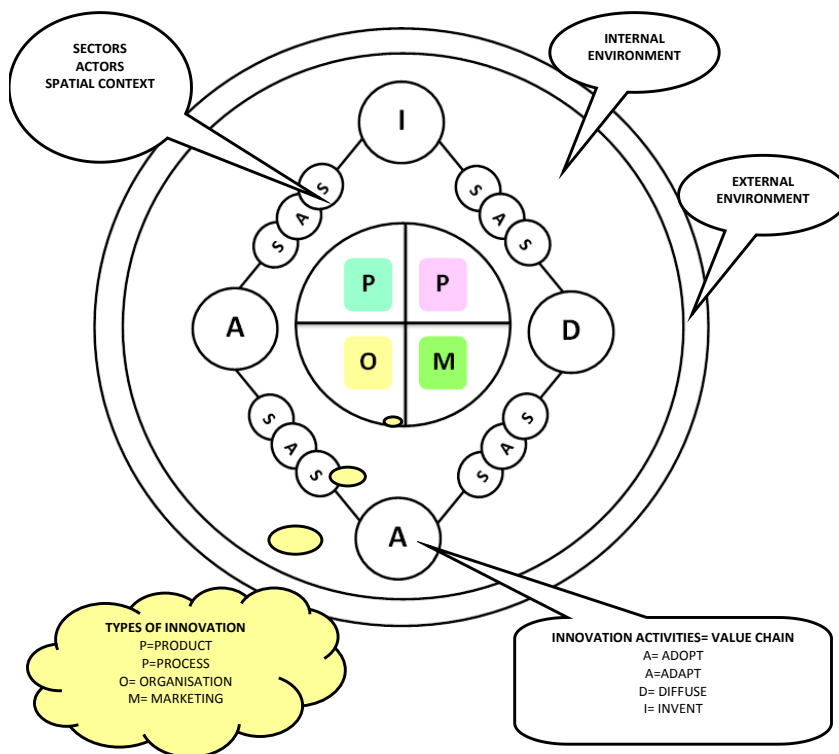
Thirdly, the instrument examines the internal organisational environment. In this module the access to resources that aid innovation within or close to the organisation/enterprise is probed. This examines areas such as facilities, sources of innovation and innovative ideas, skills training and

purpose, size of workforce and access to services such as electricity, information and communication technologies (ICTs) and transportation.

In the fourth module, the instrument then examines the macro-context in which the unit is embedded along with the broader institutional or regulatory environment specific to that industry as well as to its innovation activities. The primary purpose here is two-fold. To identify the contextual barriers and catalysts to (rural) innovation activities as well as considering possible social benefits in the form of spill-over effects that rural people might gain from innovation activities.

In line with the reflective self-learning theme that cuts across various parts of the instrument the final part of the structured questionnaire encourages respondents to reflect on their answers to the questions and asks if the questions have helped them to view 'rural innovation' through a wider lens. This is the only series of questions in the mapping instrument that are spread across the instrument rather than confined to a specific module. We are mindful of the limitations to this type of measurement approach, as it captures individual self-learning of the concepts discussed in the mapping instrument and does not provide enough time for self-reflection and further discovery (Scheuermeier, Katz and Heiland 2004). Nor does it aid the respondent with awareness and understanding of the diversity and similarity of innovations happening within their immediate area of operation or even in neighbouring areas within the district. Nevertheless, it was the first step towards a more robust and intensive participatory self-evaluation and horizon exploration (SHE) sessions with representatives of sampled enterprises. A general analysis of the responses and a critical review of these assisted with the conceptualisation of a more interactive platform and instrument. Phases 3A and 3B will ensure adequate pilot-testing and the construction of a replicable framework for SHE sessions. Figure 1 provides a simplified schematic representation of the focus areas of the RIAT mapping instrument and other tools.

Figure 1: Rural Innovation Assessment Toolbox (RIAT) Focus Areas



The RIAT team has assembled a complementary set of tools for mapping sub-national spatially-bounded innovation value chains and fill key data gaps in this area. To date, the research team has successfully completed two elements of this evolving toolbox – the measurement approach and the information collection instrument (or Component 1). It must be pointed out that the piloting experience over the past six months has indicated that at least three methodologically distinguishable components of the toolkit are required to measure, map, explore innovation systems and innovation value chains, and encourage self-reflective learning.

3. FIELDWORK PLANNING AND IMPLEMENTATION

Fieldwork planning started in January 2013. This activity was shared amongst the RIAT team members. The two senior researchers were to manage the two fieldwork teams while the junior researchers had the role of coordinating the fieldworkers in the field and working with the project administrators to arrange the logistics, such as adequate transport for rural conditions and accommodation in the main towns in the districts. During December 2012 and January 2013 expressions of interest for fieldworkers were communicated to colleagues within the HSRC as well as associates at universities and other research organisations. By early February 2013 ten fieldworkers had been identified, interviewed and hired on short-term contracts. Crucial to the selection process was the ability to speak local languages as well as being comfortable with local customs. The fieldworkers were a mixed group, some being postgraduates in economics, sociology, development

studies and social anthropology, while others had no tertiary qualifications but had years of prior fieldwork experience and came recommended. The second round of RIAT fieldwork used many of the same fieldworkers again given that they had the necessary field experience and significant resources had been invested in their training. Five replacements were made prior to the second round of fieldwork.

The first round of fieldwork lasted six and a half weeks with a weekend break in the middle. It started with a three day intensive training session at the HSRC in Pretoria on the 12 February and ended on the 26 March 2013. The second round of fieldwork lasted six weeks, also with a weekend break in the middle. It commenced with training over three days at the HSRC in Pretoria starting on the 15 April 2013. Fieldwork ended on the 24 May 2013.

During both training sessions the fieldworkers spent the first day learning about the key innovation concepts, the purposes of the study, sampling approaches and respondent selection. The second day was used to go through the mapping instrument and for recapping on some of the concepts. The third day dealt with logistical arrangements and some brief interviewer/interviewee role-playing was conducted. Various documents were provided to the fieldworkers during the training sessions, including the relevant draft of the mapping instrument, an accompanying Fieldworker Guide to assist the fieldworkers in using the mapping instrument, RIAT Concept Paper 2 on working definitions and lists of the various contact people obtained during the scoping visits. Many of these had been contacted the week before the fieldwork and appointments had been set up for interviews.

The fieldworkers in each District, comprised of three teams of two people, coordinated by an HSRC intern and supported by a senior researcher during the fieldwork. Each district was divided into three zones (main centres/towns) and the fieldworkers were based in one zone and then moved to the second and third as they completed the set interviews in each zone. They used the contacts established during the scoping visit to identify the first round of potential respondents (representatives from identified organisations and enterprises). At these interviews they would then identify other potential innovators. Initially the teams concentrated on innovation actors located around the primary town in each economic hub or zone and then they moved outwards to the approximate boundary of each hub/zone, identifying and interviewing suitable respondents in the process. In many instances the research found that this was a useful way of identifying innovators. It also had the further effect of respondents being acknowledged for their innovation activities by the research team and also by peers who had provided their names to the research team. Respondents noted that often their innovation activities went unacknowledged and this process afforded them some recognition of their achievements by others. One drawback, to this process was that in some cases the respondents, often those in government departments and municipalities, referred the fieldwork team to 'model' innovators, i.e. those who were part of official diffusion/transfer programmes. This may have resulted in the more informal innovators being overlooked.

During the second round of fieldwork each fieldwork team in a district was given one or two local municipal areas in which they were to conduct the interviews. During the first phase it was noticed that some fieldwork teams were setting up interviews with the same people. Allocation of local municipal areas to each team prevented this. Where relevant the teams shared potential respondents with other teams in the district; especially when these fell outside of their local municipal area. This approach should have ensured that fieldworkers did not overlook relevant actors located in more remote and marginalised sites on the periphery of each hub/zone. After about two weeks the three teams in each district then moved on to the next hub/zone and repeated the process. This process was repeated until sufficient interviews (not more than 40 per hub) were conducted in each zone in each district.

As discussed in the RIAT *Practical Methods* paper, within each RDM the three teams were expected to identify and interview a total of approximately 120 innovation actors (individuals/organisations/enterprises), which translates to about 40 actors per zone. The upper limit for each RDM was approximately 120 respondents from different organisations/enterprises or departments within these organisations/enterprises and the lower limit was 100. The teams actually completed over 120 mapping instruments for each District. This was more than what the research managers had anticipated given the complexity of the sampling approach. While the deviation of the targeted or theoretical sample from the final realized sample is normal for all surveys, in purposive designs rigorous control forms are extremely valuable instruments for building a database about the features of observed units. It is a crucial step to improve knowledge of response rates among local enterprises and for the transition from exploratory sampling approaches to random probability samples.

The prior awareness of informal actors in the innovation systems in these areas resulted in the research managers encouraging the fieldworkers to ensure that the final sample included a good and 'representative' mix of informal enterprises/activities. Unfortunately this was not always the case in every district because of the difficulty of identifying such actors during the fieldwork period. More in-depth work in many of the rural villages is required to identify the actors in this category.

At the end of each fieldwork session representatives from each of the fieldwork teams (a total of three fieldworkers from each district) met together with the fieldwork coordinators and the senior researchers to discuss experiences, findings and consider where changes to the instrument and the fieldwork process were required. These sessions were also used to map out the RIAT process for the subsequent months. During the first reflection session a number of changes to the instrument were recommended. These were made and version two was finalised during the period before the second round of fieldwork training.

Reflections on learning across both phases of pilot testing the semi-structured core questionnaire revealed that that the descriptive case studies and the PERL/SHE workshops would need to be separate tools on their own. The case studies generated from the mapping instrument were

considered inadequate and specific time would be required to collect data for this activity outside of the administration of the innovation mapping instrument. This activity was to take place during Phase 3 of RIAT and a selection of three to five cases from a particular district would be developed in a still to be selected sample of the remaining 20 RDMS. In the interim several illustrative examples were developed from the mapping instrument data and included in the reports shared with the four pilot RDMS. It was also decided that ideas and conceptualisations around the PERL/SHE tool could be briefly piloted as work in progress during the forthcoming feedback sessions with the four pilot RDMS in July, August and September 2013. The reflection sessions were considered extremely valuable learning activities in that all participants were able to share their ideas and experiences of the fieldwork research process and logistical arrangements. Some minor and some significant alterations were made to the project plan and the instruments as a result of these two sessions.

In summary the teams generally collected the data as required and achieved the sample limits set for each district. At least four crucial lessons were evident from the fieldwork process. Firstly, more role playing and even possibly trial interviews are needed during the training session to overcome initial barriers to using the instrument correctly and ensuring that respondents were willing to participate. Secondly, most interviewers found it difficult to generate qualitative data. This is largely due to a weakness in their university training as well as experience and exposure to this style of data collection. Thirdly, even if the fieldworkers had the necessary skills and experience to generate and record qualitative data the actual time available for interviews was too short to enable this too be done adequately. Finally, the scoping visits proved essential to ensuring support for the fieldwork, as well as for identifying initial respondents who were able to provide names of other innovators and potential respondents. The remainder of this section summarises some of the pertinent findings from each of the four RDMS that participated in the pilot-study during Phase 2. More detail about the findings can be found in the respective reports for each participating District Municipality.

4. SUMMARY FINDINGS FROM MOPANI DISTRICT MUNICIPALITY

The Rural Innovation Assessment Toolbox Mapping instrument was piloted to map innovation activities among a purpose-built sample of 122 enterprises in Mopani District Municipality. Roughly 20% of the provincial population lives in Mopani, with more than 80% of these residents located in rural areas across this district. Human wellbeing indicators for the district generally fall below the provincial averages for the same indicators suggesting relatively lower quality of life and living standards than the average person living in Limpopo. Tertiary services, followed by primary extractive activities (particularly mineral mining), dominate gross value added and economic growth.

Several high-level insights flow from the assembled evidence and deserve to be underscored as a helpful step towards thinking about appropriate policy recommendations. Based on technical criteria about registering with an enterprise authority and for income tax purposes with SARS, approximately 90% of all sampled enterprises could be classified as so-called formal sector enterprises. Another

striking feature of the sampled enterprises is that they are predominantly involved in tertiary services and primary sector economic activities (particularly agriculture instead of mining).

In the sampled enterprises, almost all respondents equated innovation with hard technologies, creativity, and bringing something new into the enterprise. The conventional idea of 'innovation' was fairly well known among participating enterprises. About one in ten private organisations engage in innovation activities with the primary objective to improve social and human wellbeing with a similar ratio self-reporting an awareness of the restricted meaning of social innovation. More surprisingly, a substantial share of sampled public and non-profit enterprises pursue innovation activities with the explicit or implicit goal to improve human and social wellbeing yet no more than one out of four of these organisations reported an awareness of the restricted definition of the concept 'social innovation'. This fact, if coupled with increased government support to 'social innovation', may well increase the prospects for new ideas and practices to directly uplift the living standards of large numbers of people.

Unfortunately, at grass roots level there is poor localised awareness of national innovation policies and government assistance to promote innovation. Approximately 25% of enterprises self-reported an awareness of national Science, Technology and Innovation (ST&I) policies - heavily skewed in favour of public enterprises. An overwhelming share of the enterprises considered institutional support (policies, laws and agencies regulating and supporting innovations) an important contributor to innovation activities. However, what reduces an appreciation of the need for institutional support is the disproportionately negative perception of institutional support prevalent among slightly more than one quarter of private enterprises in our sample.

A novel framework to comprehensively document the nature and extent of innovation activities (invention, adoption, adaption and diffusion) in Mopani underpins this report. With the aid of this approach and its related methodology we were able to uncover patterns of rural innovation that can potentially overcome rural underdevelopment and raise the living standards of rural communities. Few enterprises in this district are pioneering creators of new products, processes, organisational or marketing arrangements coupled with intensive research and development for new knowledge production. This traditional notion of innovation, or simply invention, took place within a marginal share of all sampled enterprises for the years 2011 and 2012. This evidence is not surprising because the critical drivers of original knowledge and artefact creation are generally missing. Few enterprises had or used a specialist R&D division, self-experimentation or tapping into discoveries of other tertiary and scientific agencies as platforms for invention.

Adoption activity was far more prevalent among enterprises and this stands in sharp contrast to invention. The evidence points towards more vigorous uptake of new ideas, practices and artefacts originally developed by other enterprises outside Mopani. More than 60% of sampled enterprises are actively involved in knowledge sharing networks which adopters are most likely to benefit from.

Among the enterprises participating in self-reported networking for innovation, interactions with partners are predominantly formal rather than informal although there are sectoral differences. Moreover, enterprises that adopt innovative ideas, arrangements and products from outsiders confirmed that they are offered various choices, enjoy the freedom to choose and tend to introduce the 'new knowledge' into their enterprises.

Improvements and incremental changes to innovations sourced from outside enterprises ranks a distant second after adoption in terms of the proportion of enterprises involved in this activity. On average, only one out of five enterprises actively adapts innovations, with private enterprises ahead of non-profits on this front. A plausible explanation for the capability to adapt and adopt flows from the marginal importance given to highly-skilled and professional workers - primarily scientific skills and knowledge vital for invention. In fact 85% of sampled enterprises said that they prioritise skilled, semi-skilled and unskilled workers which would probably suffice for adaptation but perhaps less so for leading edge inventions. The non-profit and private commercial enterprises that actively adopt and adapt rarely applied for government support for the dominant innovation activities.

The proportion of enterprises that transfer, share and distribute new ideas, products and practices in Mopani have more than doubled from 7% to 18% from 2011 to 2012. Diffusion of innovations among sampled enterprises clearly surpassed invention within two years thus shifting it into the third most prevalent innovation activity in this district.

To sum up, findings of this pilot study in Mopani support a basic proposition: in order for innovation to be a catalyst for rural development, with an emphasis on enhancing human wellbeing, then the costs hindering innovative performance must be cut. In practice this means easing the ability of enterprises based in Mopani District to adopt and adapt innovative products, processes, organisational and marketing arrangements. Strengthening learning capabilities of actors in the local innovation space, especially know-how of ST&I policies and the national system of innovation, combined with effective institutional coordination are urgent interventions to successfully harness innovation for broad-based quality of life enhancement in rural Mopani.

5. SUMMARY FINDINGS FROM CHRIS HANI DISTRICT MUNICIPALITY

Slightly more than 800,000 residents live in Chris Hani with about 70% of them concentrated in rural localities across the district. A quick comparison of human development indicators for the District Municipality with similar Provincial information shows that the quality of life and living standards of the people living in the Chris Hani District are relatively lower than the average person living in the Eastern Cape Province. The gross value added per sector reveals that tertiary economic activities form the mainstay of the District's economy. In fact, the community and services sector account for 49% of all employment whereas the agricultural sector provides jobs for about 12% of the

economically active workforce. Unemployment rates in the District also exceed the Provincial jobless rates, with males accounting for the largest proportion of the unemployed.

The evidence also provides insight into the main economic activities of the respective enterprise types. From the sampled enterprises, a slightly higher number was from the tertiary sector, closely followed by primary economic activities. Within the tertiary sector, the subsectors of trade and finance followed by community and social services together accounted for almost 80% of all suppliers of these services. Unsurprisingly, the private sector and non-profit organisations dominated the provision of trade and financial services, whereas the public sector and non-profits were more prominent in delivering community and social services. In the primary sector, nine out of ten enterprises were active in agriculture with marginal differences across the different types of enterprises. The District has a very small manufacturing sector operated by the non-state organisations. Non-profit and private enterprises are predominately located within Chris Hani, with 70% to 80% of their outputs destined for local markets within the boundaries of local municipalities. At least in terms of broad sectoral economic classification, the sampled enterprises are ranked in the same order as the gross value added per sector reported in the socio-economic profile for this District Municipality.

Even though only one in every five respondent enterprises reported an awareness of the concept 'social innovation' (limiting ourselves to the narrowest meaning of this concept), more than half of the full sample indicated that improving social and human wellbeing form the primary motive for their innovation activities. Respondents from the private sector and the NPOs were least aware of this term. However once the concept was explained to the respondents they were able to understand the concept and could relate it to an example from their own experience. Enterprises also had different reasons for innovating. Private enterprises were innovating for direct economic benefits (higher turnover and profits) whereas both public and non-profit enterprises prioritised the welfare of society at large. Notwithstanding this last finding, more enterprises in this rural district evidently practice a limited form of 'social innovation', yet this concept has not gained widespread traction among its practitioners.

A central purpose of this investigation was to rank and explore how intensely enterprises in Chris Hani District Municipality pursue various innovation activities- invention, adoption, adaption and diffusion. Invention is the least prevalent innovation activity in the District with one in five enterprises self-identifying as inventors in 2011, dropping to one in every six enterprises in the following year mainly due to the sharp contraction of invention among non-profits. The marginal increase in the share of private sector inventors is worth noticing. Invention is typically connected with advanced human capabilities- heavily dependent upon high-end and professional skills- but less than 9% of enterprises rated this as critical for their innovation activities- without any significant difference across enterprise types. In terms of skills profiles and typical inputs associated with original creations and discoveries, such as onsite science labs, specialist internal R&D divisions and

libraries, private inventors do not tower above their public and non-profit counterparts in their access to these crucial inputs. Although their access to tertiary and scientific know-how might be marginally better than other enterprises, private inventors did not report substantially higher access to advanced science-based knowledge for developing new products, processes and practices.

Adoption ranked as the most prevalent innovation activity across the district- marginally expanding from 39% of sampled enterprises in 2011 to about 43% in 2012. Whilst adoption virtually stagnated among public and private enterprises over the two years, more non-profits evidently adopted and used inventions from outside organisations over this period. There was no remarkable difference between where the average non-profit practiced its innovation activities and that of other enterprises- on farms, in a factory or in the community. The physical resources or amenities at the main facilities of the non-profit adopters were also similar to that the other enterprises, but they enjoyed poorer access to the internet and landlines. Furthermore, non-profit adopters are more reliant than other enterprises on the government departments as a source of innovative knowledge as exhibited by their above average awareness of government assistance for innovation as well as their higher share of applications lodged for government support.

The number of enterprises adapting and diffusing innovations have also increased from 2011 to 2012, but a larger number are diffusers than adapters. Public enterprises play a proportionately larger role in diffusion compared to private and non-profit organisations. Although the public sector retains its dominance in sharing, transferring and distributing innovations, a declining share of public enterprises have done so over the two years, whereas both the other enterprise types are slightly more prevalent in this segment of the local innovation value chain. Similar to adoption, diffusion is closely aligned to networks through which actors share innovative ideas and practices. The illustrative example of Marlow Agricultural High School outside Cradock shows a novel way to improve its agricultural curriculum through partnerships or networking with private and public organisations in the farming sector. Moreover, it demonstrates informal knowledge sharing with a school in Alice, roughly 200 kilometres away from Cradock, aimed at enhancing their agricultural curricula.

Out of seven interviewed enterprises, five of them self-reported active participation in an innovation network which they often classified as formal and rarely informal, even among non-profit organisations. These networks also act as sources of innovation know-how. The relatively better access that public enterprises enjoy in the domain of ICT resources (computers, internet and phones) might be critical enablers in this resource-constraining environment which help in sharing and transferring innovations, especially to communities, households and farmers.

Adaption ranks as the third most common innovation activity in Chris Hani District Municipality, with increasing involvement of private enterprises followed by government organisations as the chief drivers of incremental growth in this innovation activity from 2011 to 2012. The local private sector

has bypassed the non-profits in adapting, a dramatic shift arguably tied to several advantages: a workforce with higher capabilities, better resource access and greater decision-making power on using and introducing selected innovations into their enterprises. Moreover, the private sector has been adapting better produces, process and arrangements in a context where only one in four self-reporting that they have applied for state support. In sharp contrast, the contraction in adaption among non-profits seems to be positively related to or worsened by the cost barriers that impede this kind of innovative activity.

6. SUMMARY FINDINGS FROM DR RUTH SEGOMOTSI MOMPATI DISTRICT MUNICIPALITY

Roughly 13% of the provincial population lives in Dr. Ruth Mompoti, with more than 65% of these residents located in rural areas across this district. Human wellbeing indicators for the district generally fall below the provincial averages for the same indicators suggesting relatively lower quality of life and living standards than the average person living in North West. Access to services such as potable water, sanitation and electricity and roads is relatively low. The district is the largest beef cattle producing district in the country. Locals sometimes refer to it as the ‘the Texas of South Africa’. Farmers also produce maize and peanuts for the national and the export markets. Tertiary services followed by primary sector activities (particularly agricultural) dominate gross value added and economic growth.

Several high-level insights flow from the assembled evidence and deserve to be underscored as a helpful step towards thinking about appropriate policy recommendations. Based on technical criteria about registering with an enterprise authority and for income tax purposes with SARS, approximately 75% of all sampled enterprises could be classified as so-called formal sector enterprises. Another striking feature of the sampled enterprises is that they are predominantly involved in tertiary services (community and financial services) and primary sector economic activities (particularly agriculture instead of mining).

In the sampled enterprises, almost all respondents equated innovation with hard technologies, creativity, and bringing something new into the enterprise. The conventional idea of ‘innovation’ was fairly well known among participating enterprises. Almost 90% of private organisations engage in innovation activities for direct economic benefit. Not surprisingly, 75% percent self-report no awareness of the restricted meaning of social innovation. On the other hand, a substantial share of sampled public and non-profit enterprises pursue innovation activities with the explicit or implicit goal to improve human and social wellbeing yet no more than one out of four of these organisations reported an awareness of the restricted definition of the concept ‘social innovation’. This fact, if coupled with increased government support to ‘social innovation’, may well increase the prospects for new ideas and practices to directly uplift the living standards of large numbers of people.

Unfortunately, at grass roots level there is poor localised awareness of national innovation policies and government assistance to promote innovation. Approximately 30% of enterprises self-reported an awareness of national Science, Technology and Innovation (ST&I) policies - heavily skewed in favour of public enterprises. A significant share of the enterprises considered institutional support (policies, laws and agencies regulating and supporting innovations) an important contributor to innovation activities. However, what reduces an appreciation of the need for institutional support is the disproportionately negative perception of institutional support prevalent among private enterprises in our sample.

A novel framework to comprehensively document the nature and extent of innovation activities (invention, adoption, adaptation and diffusion) in Dr. Ruth Mompati underpins this report. With the aid of this approach and its related methodology we were able to uncover patterns of rural innovation that can potentially overcome rural underdevelopment and raise the living standards of rural communities. Very few enterprises in this district are pioneering creators of new products, processes, organisational or marketing arrangements coupled with intensive research and development for new knowledge production. This traditional notion of innovation, or simply invention, took place within a marginal share of all sampled enterprises for the years 2011 and 2012. This evidence is not surprising because the critical drivers of original knowledge and artefact creation are generally missing.

Adoption activity was far more prevalent among enterprises and this stands in sharp contrast to invention. The evidence points towards more vigorous uptake of new ideas, practices and artefacts originally developed by other enterprises outside Dr. Ruth Mompati. An impressive 85% of sampled enterprises are actively involved in knowledge sharing networks which adopters are most likely to benefit from. Among the enterprises participating in self-reported networking for innovation, interactions with partners are predominantly formal rather than informal although there are sectoral differences. Moreover, enterprises that adopt innovative ideas, arrangements and products from outsiders confirmed that they are offered various choices, enjoy the freedom to choose and tend to introduce the 'new knowledge' into their enterprises.

Improvements and incremental changes to innovations sourced from outside enterprises ranks a distant second after adoption in terms of the proportion of enterprises involved in this activity. On average, only one out of four enterprises actively adapts innovations, with private enterprises ahead of non-profits on this front. The private commercial enterprises that actively adopt and adapt rarely applied for government support for the dominant innovation activities, contrary to some NPOs (56%) that do apply.

The proportion of enterprises that transfer, share and distribute new ideas, products and practices in Dr. Ruth Mompati have increase from 7% to 13% from 2011 to 2012. Diffusion of innovations among sampled enterprises clearly surpassed invention within two years thus shifting it into the third most prevalent innovation activity in this district.

Although there are some evidence of innovation activity in the district, improved government support could large improve the environment for innovation. One of the reasons identified by the sampled enterprises is the lack of coherent support for innovation in the rural district by the government. Also, highly bureaucratic funding process is discouraging for most enterprises. At the firm level, lack of capacity is another reason for low level of innovation. This factor could also be improved through government support.

To sum up, findings of this pilot study in Dr. Ruth Mompoti support a basic proposition: in order for innovation to be a catalyst for rural development, with an emphasis on enhancing human wellbeing, then the costs hindering innovative performance must be cut. In practice this means easing the ability of enterprises based in Dr. Ruth Mompoti District to adopt and adapt innovative products, processes, organisational and marketing arrangements. Strengthening learning capabilities of actors in the local innovation space, especially know-how of ST&I policies and the national system of innovation, combined with effective institutional coordination are urgent interventions to successfully harness innovation for broad-based quality of life enhancement in rural Dr. Ruth Mompoti.

7. SUMMARY FINDINGS FROM UMZINYATHI DISTRICT MUNICIPALITY

uMzinyathi District is one of the poorest and most underdeveloped rural areas of KwaZulu-Natal, with only 16.6% of the population living in urban areas. Some 60% of the municipality comprises Ingonyama Trust Land, under the control of the Traditional Authorities. Lack of education, skills and functional literacy are a challenge to socio-economic development. Furthermore infrastructure backlogs also impact negatively on economic development. The District has a high rate of unemployment (29.5%), with most jobs being in the agricultural sector and community services sector.

Given the high levels of poverty and shortages of jobs, innovation is seen as one mechanism that can contribute to socio-economic development in the area. The rapid mapping exercise provided a better understanding of the extent to which innovation is taking place in uMzinyathi, as well as a better understanding of the types of enterprises that are engaging in these activities. The purpose-built survey design coupled with the mechanism of identifying participating organisations through a referral system (viz. snowball sampling) identified a range of public and private organisations as well as non-profit organisations (NPOs) having innovation activities. Most of these organisations proved to be registered entities – including being registered with South African Revenue Services (SARS) - though a large number appeared to be engaged in informal transactions and activities. In terms of economic sectors, the innovating enterprises were mainly in the tertiary sector (especially community services) and the primary sector (especially agriculture and forestry) with fewer being in the secondary sector (mainly in manufacturing).

The study revealed that most people understood the term 'innovation' to relate to 'new ideas or new and better ways of doing things', and the concept of innovation activities including adoption, adaption and diffusion – and not just invention - was new for many respondents.

Many respondents (especially within the private sector) were not aware of policies relate to science, technology and innovation. There appeared to be a greater awareness of state support for innovation, but generally also a perceived need to improve efficacy of government support and/or regulation. Furthermore, despite a fairly high level of awareness of available support, a large number of organisations (especially private enterprises) had not actually applied for this.

The term 'social innovation' was also new to many, with 71.3% indicating that they were not aware of the concept. Despite this, when investigated further it was found that society wellbeing and welfare was frequently the reason for innovating (especially amongst public enterprises and NPOs), surpassed only by innovation for direct economic benefit, which was encountered mainly within the private enterprises. For the latter, innovation included the introduction of new products and processes in some cases and the introduction of new organisational arrangements or marketing strategies in other cases – or combinations thereof. A few enterprises were innovating for subsistence purposes.

In terms of what RIAT classified as being innovation activities (namely invention, adoption, adaption and diffusion), adoption was found to be most prevalent (especially amongst the NPOs) and yet many respondents would not have previously recognised it as an innovation activity. Adaption and diffusion of innovations were also encountered, but in fewer enterprises than was the case with adoption. Diffusion was highest amongst public organisations and lowest amongst private organisations, which is to be expected as public organisations often play a role of supporting enterprises, which could be through diffusion of new products and processes, while private organisations generally innovate to improve their economic performance and thus are less likely to share their innovations with other enterprises as they may lose their competitive advantage. Invention, which is what many people equate to innovation, was very limited (encountered in less than 5% of enterprises) and possibly reflects the lack of the required skills and facilities. The survey revealed a perceived need for basic skills improvement, as well as sector-specific skills (e.g. operation of machinery, web design skills, etc.) interpersonal skills and business management skills to ensure better innovation in the future.

Innovation was found to take place in a wide range of settings including business premises, communities, farmlands, within factories and at home – and to a lesser extent within schools, higher education institutes and research centres. This is a key finding as it highlights the need to recognise the innovation that is undertaken by non-conventional research and development actors.

The concept of innovation networks or systems was explored through the study as these are seen as mechanisms for sharing resources and knowledge. While most of the enterprises were found to

supply goods and services within the local market, most respondents saw themselves as part of an innovation network – especially public enterprise and NPOs. This was less so for private enterprises, where only 67% perceived this to be the case. The study revealed that support provided to enterprises generally came from other local enterprises; locally-based government support or national level organisations (for example, research institutes and development agencies). While there were some enterprises that indicated that they had innovated independently of other organisations – the latter was less prevalent, and while their innovation activities were independent, the operations of the enterprise did involve other actors.

Many of the respondents who saw themselves as part of a network saw these as formal innovation systems. In terms of the special nature of these networks, there was a fairly equal spread between enterprises with local networks versus those with wider linkage. Building on this concept, relatively few private enterprises (17%) and NPOs (25%) were found to be part of larger organisations, indicating that they were mainly locally based enterprises – except for the public enterprises, which generally saw themselves as part of a larger organisation (government in general or the specific department under which they fell), which in some cases provided access to in-house knowledge and skills. Overall there was a lack of understanding of the concept of a national system of innovation.

Basic resources such as toilets, running water, electricity and cell phones (many of which are presumably not used for internet access) were reasonably common among enterprise while access to libraries and science laboratories was relatively low. This means that while enterprises are able to operate – and to innovate to some extent, the exposure to new ideas and the opportunity to invent are fairly limited. Access to internet via internet cafes and public facilities was found to be very limited.

To sum up, the findings of this pilot study clearly demonstrate the existence of innovation activities amongst rural enterprises and recognition amongst many of them that such activities can improve the income generation potential of the enterprise and/or improve the livelihoods and wellbeing of rural communities. All spheres of government as well as other organisations that support people living in rural areas need to not only recognise the innovative capacity of enterprises, but also provide an enabling environment in which innovation can take place. Given that the study found very limited incidence of invention, with innovation being dominated by adoption, organisations aiming to achieve rural development need to make some key decisions about the route that they wish to follow in supporting innovation. They either need to accept that enterprises do not have access to the necessary facilities nor the necessary skills and thus focus on supporting adoption – or they need to take steps to provide an enabling environment for invention. The exact nature of the facilities required to support innovation also needs to be given attention. Alternatively, support agents can acknowledge that in general the adoption of new ideas/products/processes/arrangements is within the reach of the majority of enterprises and thus interventions should focus on creating exposure to new knowledge. This could include providing internet and library facilities or creating linkages with

actors that might have ideas (including cross-visits to other communities where relevant innovations exist). Future exploration of innovation activities should also recognise that innovation takes place in a range of settings and is not limited to research stations, research and development units in big companies or engineering firms. One key role that government must play is to improve the awareness amongst rural enterprises of the supportive policies and programmes that exist, particularly for social innovation. Another role that organisations could play is that of innovation brokering, facilitating the establishment of linkages between different actors and providing access to new ideas that enterprises can incorporate into their own operations.

Multi-stakeholder platforms are one mechanism for bringing different stakeholders together to support ongoing innovation processes or to think innovatively about possible solutions to challenges that rural communities are facing. The support of innovation processes, especially those involving multiple actors, is potentially an effective mechanism to achieve socio-economic development in rural areas such as uMzinyathi.

FUTURE TOOLBOX DEVELOPMENT AND USE

Throughout the report it has been noted that Component 2 and Component 3 are still being developed, and that their necessity as part of the complementary tools in the toolbox derived from both the experiences of the RIAT team and some feedback from participants. The technique to do case studies of the innovation value chain process has been termed High Impact Innovation Case Studies [HILICS] and the self-reflective learning tool is termed Participatory Evaluation, Reflection and Learning Process Sessions (PERLS). This section briefly outlines the purpose of these two tools and their envisaged structure which is undergoing development and which will be refined during Phase 3. The section is introduced by providing a brief summary of the Evaluation, Learning and Action (ELA) methodology that underpins the use of these two tools along with the mapping instrument.

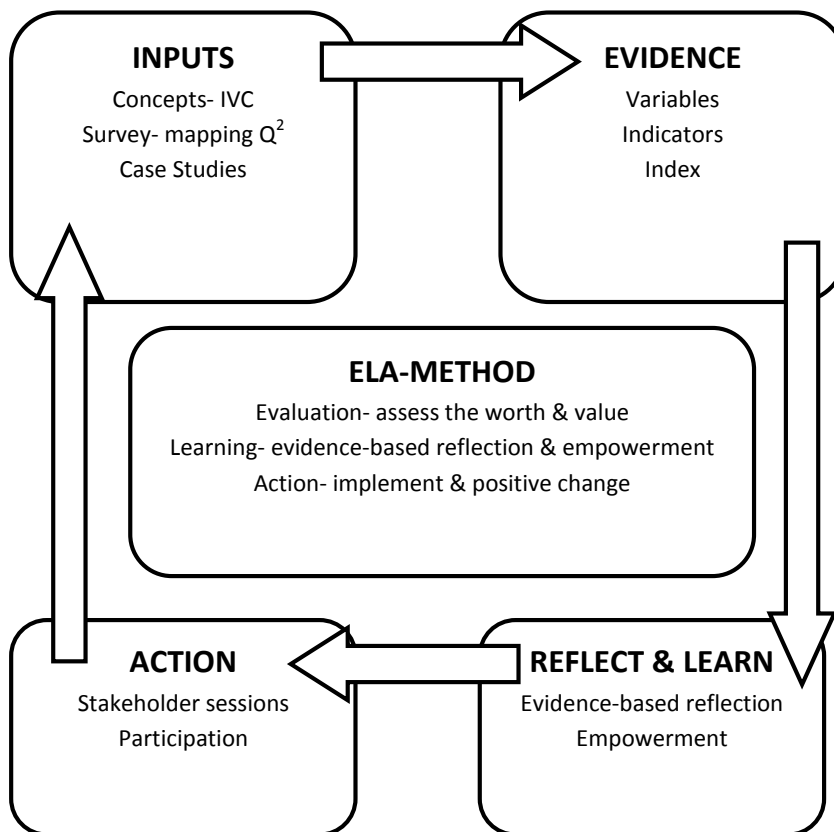
As an assessment framework, the RIAT methodology applies leading-edge thinking on participatory or empowerment evaluation (Fetterman 2004) and bottom-up methods of indicator development (Holden 2009; Reed et al 2006). Figure 1 is a schematic summary of this Evaluation, Learning and Action (ELA) methodology- which aims to assess how innovation activities improve the quality of life or human wellbeing in rural areas. It illustrates relationships among the core ingredients for any assessment toolkit oriented towards participatory action and social change: information inputs, evidence generation, reflection and learning followed by action which ideally should inform future rounds of this dynamic process.

Innovation indicators and variables, at the heart of the evidence stage in the ELA methodology, must be grounded in a sound conceptual perspective as explained in the previous section. At the most basic level, indicators and variables are interacting elements in a multifaceted indicator development process (Mhula, Jacobs and Hart 2013). Figure 2 below depicts, at a high level and in a simplified

form, that variables and indicators (including indexes or composite indicators) and intermediated steps between information inputs (conceptual frameworks and data collection instruments with meaningful quantitative and qualitative questions- the 'mapping tool') and reflection and learning sessions that empower innovation actors.

Variables and indicators are systematic ways of organising information (a mix of quantitative and qualitative data); these measures of progress derive from a combination of inputs, like an appropriate survey instrument. At a more technical level, a useful way to distinguish variables from indicators is to visualise them as elements that hierarchically interact: indicators represent a higher-order organisation of related variables. It is important to underscore that this is not a one-way ascending movement, but an iterative process between the various stages. In addition to this dynamic interaction of variables and indicators, the ways in which variables and indicators correspond to the conceptual framework implies a reflexive indicator-variable development exercise.

Figure 2: Rural Innovation Assessment Toolbox (RIAT) Methodological Framework



1. PARTICIPATORY EVALUATION, REFLECTION AND LEARNING PROCESS SESSIONS (PERLS)

The PERL sessions serve a number of purposes. The primary purpose is to enable the local actors to reflect on innovations and innovative activities within the District, thereby encouraging them to consider ways in which innovative activities could be best pursued to foster improved socioeconomic development within their district and local municipalities. The secondary purpose is to identify two to three sector specific case studies in conjunction with participants to provide opportunities for deeper exploration of the innovations, the innovation value chain activities (specifically the upstream and downstream actors, activities and relationships), and the structure of the rural innovation system as manifested by these specific cases. To do this effectively the PERL sessions need to be attended by the following representatives in each RDM: Participants: DM LED manager / strategic planning manager / IDP manager; LM LED manager / strategic planning manager / IDP manager; Provincial DoA; DAFF; DRDLR, DoEducation and DoHealth, DEDT, Private sector and NGOs .

Furthermore, using these tools the RIAT team must ensure that RIAT strengthens the capabilities of local government (Local municipalities as well as District municipalities), as the identified lead agents, in the rural innovation system. These processes should encourage the development of effective rural innovation systems as a mechanism for achieving local economic development and improved livelihoods.

The developed framework for the PERL sessions is indicated below. It was implemented during the PERL sessions in the pilot-RDMs it requires further refinement and the time frame needs to be extended from a morning session to a whole day session.

1. Presentation by RIAT team
 - Clarify concept of innovation and IVCs
 - Outcomes of the innovation mapping process - Evidence of innovative activities within DM
2. Encourage sharing by participants about other examples of innovative activities
3. Horizon exploration (group work from actors in different sectors, the outcomes of which are shared in plenary)
 - Where is the RDM now in terms of economic sectors, rural livelihoods, employment, etc?
 - How do you realistically see socioeconomic development of the RDM in 5 years' time?
 - Where should the focus be to achieve LED, food security, job creation, etc?
 - *To keep focus on innovation: What sort of innovation is required?*
 - If innovation is a mechanism to overcome challenges / seize opportunities, how can DM and other stakeholders support it?
4. Identification of two or three catalytic sectors and focal point for a (micro/meso/macro) case study within each
 - Consider sectors where innovative change is required or where cases of innovation were identified that appear to offer high impact opportunities if adequately and efficiently supported
5. End with a checklist for respondents to reflect on what they have learnt from the session (this has been developed but needs further refinement)

Once the case studies have been completed after a period of about four months, then the research team will present these findings to the participants at a second PERL session for further reflective learning by the participants. A slightly different framework for these PERL sessions will be developed.

2. HIGH IMPACT LOCAL INNOVATION CASE STUDIES [HILICS]

The participatory case study assessment process will be piloted within each of the 20 RDMs during Phase 3. The participants will select the two or three cases in each district that they deem most suitable for improved innovative performance. This will make the process more participatory and enable attention and lessons to be developed from examples that the local actors see as being important. The purpose of the DIVS is do detailed identification of the innovations, track the various innovation value chain activities (specifically the upstream and downstream actors within and outside of the RDM, their activities, roles and relationships in the IVC), identify both facilitating and obstructing factors, and clarify the structure of the rural innovation system in which these specific cases manifest themselves. Challenges and opportunities experienced, as well as those foreseen will be explored and solutions examined. It is anticipated that each case study would take about two to three months to complete. The exact framework for this process is still to be finalised, but here we provide a brief outline of what is anticipated.

1. A detailed description of the innovating enterprise (core livelihood activities and function)
2. Identification of main innovation type and innovation activities (specifically with regard to main purpose)
3. Reason for innovation and sources of innovative ideas and knowledge
4. Human resources required, skills and sources
5. Physical resources required and used in the innovation process along with availability
6. Other primary innovation actors involved (this will involve visits to these actors to understand the nature and extent of their involvement)
7. Detailed description of the innovation value chain and opportunities and challenges encountered by the innovating enterprise
8. Map out the innovation system involved – including secondary network actors, markets and regulatory bodies
9. If enabled by the selected case study then a limited evaluation of the innovation by recipients of the product, process, marketing strategy or organizational arrangement, will be conducted

The findings and lesson from the case studies will be synthesised and reported back to the local actors at a second PERL session.

GENERAL OBSERVATIONS AND CONCLUSION

Some general observations about the RIAT process to date are necessary before providing some concluding comments. These observations relate largely to administrative matters as well as to some practical issue around the future institutionalisation of RIAT. One of the immediate obstacles the research team faced was that of 'gate-keeping' activities. These took two forms. Firstly, when trying to establish contacts, develop working definitions and instruments during Phase 1, we encountered some aversion to our research agenda and role. While many of the contacts were provided by the DST these organisations were sometimes far from welcoming. While support was offered, it was actually never forthcoming despite repeated requests and attempts at further interaction. Others were of course far more welcoming and provided the team with assistance to the extent that RIAT was able to initiate a Rural Innovation Systems Network of researchers during 2013 with the support of IERI. This provided a useful platform to exchange ideas and progress with others involved in rural innovation research. Interactions of this group that were planned for 2013 have now been postponed to 2014 due to other commitments by organisations and individuals involved. It is foreseen that this network will expand to include other organisations and individuals.

The second group of gatekeepers were provincial bureaucrats and traditional authorities who requested consultation before any research could be done (including initial scoping visits). This situation was encountered particularly in the Eastern Cape and KwaZulu-Natal and delayed some of the research activities as a result. Despite letters from the DST supporting the research and requesting cooperation this problem remained, often with the permission to undertake fieldwork being granted a day or two prior to the fieldwork activity. This situation also posed contingent time and financial burdens on the RIAT team as gatekeepers expected the team to avail themselves when it was suitable to them and not always to the team. Short notice of meetings meant that fieldwork times had to be changed and that there was a level of uncertainty which impacted on logistical arrangements. Ultimately, permission was not denied by any of these gatekeepers and seemed to be more a show of authority than anything practical.

A second general observation is about the usefulness of the Steering Committee for projects such as this. This body was expected to support and assist with conceptualising, reflecting and oversight of the research process. However, few members were engaged in this activity and some never attended any of the project sessions during the first and second phases. At the actual Steering Committee meetings some members had not bothered to read the progress reports and updates and diverted the meetings away from strategic thinking and implementation planning to raising questions, the answers to which were covered in the project documentation submitted prior to each meeting. At these meetings some members also promised assistance. In some cases this was provided by certain individuals while others ignored the follow-up requests after the meeting. Essentially a Steering Committee should be made up supportive individuals whose role is to provide ethical and research support.

A third observation relates to the future institutionalisation of RIAT. As discussed above the tools are complex and require skilled users who are versed in the different techniques required. This will become more important as Components 2 and 3 are finalised. Component 1 requires some fieldwork ability but also a nuanced understanding of innovation from sociological and economic perspectives. While the fieldworker teams were skilled in survey and interview techniques, having had prior experience, they were also trained over a number of days and assisted in the field by senior researchers and managed by interns. However, this appears insufficient due to the demands placed on the RIAT team to ensure the correctness of the data and the continual need to assist some team members with the basic and more nuanced understandings of innovation. It is suggested that the minimum requirement for fieldworkers must in future be post-graduates in economics, sociology or social anthropology, development studies, etc and have some academic exposure or experience in innovation studies. Improved understanding of innovation could be attained by longer training and practical field-testing. It is also probable that the proposed reduced scale and scope of the mapping instrument may also reduce some of the confusion, interviewer fatigue and week qualitative data collection. The instrument should be shorter and easier to complete. The qualitative data will require experienced researchers with sound case study experience – most likely sociologist, social anthropologists and development economists. Given the expertise required to use the tools and manage the data collection process it seems unlikely that such a team of researchers could be based at local municipalities. A more practical option is to contract a skilled service provider to administer the instruments at set intervals over a specified period of time and across all or a selected sample of RDMs. An alternative option would be for the current RIAT team to work with a selected few District and Local Municipalities to assist them with catalysing innovation for social and economic development once Phase 3 has been completed. These lessons could then be shared across municipalities by the municipal officials themselves. A greater awareness and acknowledgement of innovation in these RDMs, as well as innovation activities to meet local people's more pressing needs are required.

A final observation relates to understanding and awareness of innovation in the RDMs and amongst the rural population more generally. Many respondents framed innovation from a technical perspective in that innovation had to do with adoption or invention of new technologies. Only during discussions did people acknowledge the role of a more social perspective, such as people organising themselves better to improve productivity, outputs and processes. Essentially the broad definitions of innovation activities and types were initially not acknowledged. This posed initial problems in the first round of fieldwork when trying to identify innovative actors. In the second round we attempted to overcome this through more detailed screening and posing the question as to what new activities had been introduced into the enterprise in order to improve its core focus. This approach overcame many of the earlier obstacles but some problems were still encountered with defining innovation broadly and identifying innovators. For example, if an individual had done something innovative that had value to others this might have been overlooked because it was not the core focus of the

individual or enterprise. Similarly, the fact that many people in rural areas engage in multiple livelihood strategies also meant that some innovative activities and innovations were overlooked as they were not part of the activity the respondent might have considered his or her core livelihood.

In line with the above there was also very little acknowledgement of the concept of social innovation, despite a good share of rural actors being involved in social innovations. When social innovation was acknowledged, in some cases respondents referred to technical arrangements such as solar heating and lighting. In other instances respondents referred to the slow diffusion of economic benefits that would ultimately benefit the recipients to some extent. An example of this would be an individual identifying opportunities whereby they could employ more people, do less work themselves, and take the greater share of the income.

A significant number of respondents had no real awareness of the national system of innovation (NSI), its regulatory role or the assistance that could be obtained from the system. The NSI is the system of bodies and policies that all enterprises undertaking innovation must adhere to. However, because it excludes/fails to recognise actors it therefore fails to support and coordinate them. In view of these knowledge gaps about definitions and the NSI it is important that steps are taken to diffuse the knowledge about innovation to people in rural areas. Such diffusion will provide those involved in socioeconomic development with much-needed knowledge, as well as encourage them to acknowledge, make use of appropriate innovations and to support even simple innovative activities. To some extent the RIAT fieldwork and the PERL sessions have provided new knowledge about innovation in general to some of the rural actors (respondents and workshop participants). This was acknowledged after interviews as well as during the PERL workshops. However, it is believed that a more focused and inclusive effort should be undertaken to diffuse knowledge and ideas about innovation to a broader group of rural innovation actors. Participants noted that there exist gaps in information sharing about local innovations and even in terms of awareness of innovation or innovation policy framework. One way in which this can be overcome is to have primary, secondary and tertiary sector-specific PERL sessions in each of the RDMs. At each sector workshop a specific case study could be identified. This would be followed by a period in which the innovation system and value chain of the cases are explored by the RIAT team. At the end of about three to four months the cases and subsequent findings could then be presented to a larger group of interested local actors. Here the actors could reflect on the various cases and subsequent evidence in the light of improving socioeconomic development in the particular RDM. It must be noted that during the later PERL sessions held in the RDMs, especially when there was a large group of participants, the participants shared their knowledge and experiences. In some cases this increased awareness of innovation activities in the local area, reasons for obstructions in the value chain as well as providing some possible solutions to these.

These four RDMs, as with the other 20, are districts in which there is a high level of impoverishment. Many residents are not only constrained by low or no incomes but also by the lack of access to other

resources, including physical, natural, human, social and financial resources. District and local municipalities are the main providers of infrastructure and basic services, with some even extending services to ICTs. Provincial departments provide services such as health, welfare and education. Impoverishment may catalyse or hinder innovation activities. In most of these areas we found that the main innovation activity was adoption, followed either by adaptation or diffusion in secondary position. Invention was rare and often only manifested in well-resourced private commercial enterprises that had good linkages both locally and outside the province, sometimes extending to the national and international domain. As adoption was generally the most common innovation activity, it could be suggested that this should become an area of government support. However, such support would need to be extremely holistic (and also innovative) in that it would need to focus on people's needs, provide choices in terms of innovation types, ensure that adopted innovations can flourish, and that further innovation activities can take place. Support would also need to be integrated. The case study exercise proposed in Phase 3 should provide clearer ideas on how to improve support. It is apparent from the results of Phase 2 that it is apparent that a broader and more integrated acknowledgement of innovators and innovations within RDMS or even at local municipal and ward level is important if innovation is to provide a catalyst for rural social and economic development. Currently, innovation is not clearly understood and many innovators are overlooked, meaning that these often informal innovators receive no acknowledgement or encouragement for the work that they do.

Based on the experiences and progress to date it is anticipated that during Phase 3 the usefulness of the tools described above as RIAT Components 2 and 3 will be validated and enable further reduction in the length of Component 1, the rapid mapping and measurement survey instrument. This step will ensure that the survey instrument can be repeated in the RDMS to provide regular data for monitoring and evaluation purposes and also be used to map innovation activities in other spatially-bounded sub-national innovation systems.

The research methodology (convenience snowball technique) and the rapid mapping and measurement survey instrument have proved appropriate for Phase 2 of the RIAT study. As indicated, some minor changes may make the tool quicker to administer and also perhaps less robust, but would enable regular mapping and measurement of innovation activities for monitoring and evaluating purposes. Importantly, the methodological process to date has not only guided and strengthened the survey instrument but has also enabled the identification of complementary tools and methods to ensure robust data collection, analysis and understanding.

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