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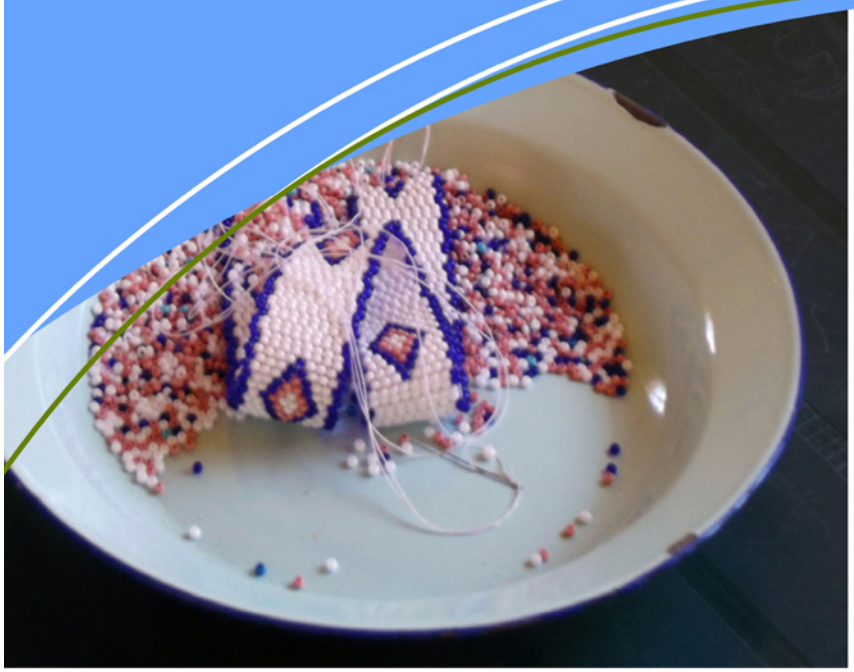
Mapping Innovation for Rural Development in Mopani District Municipality



Economic Performance and Development

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MAPPING INNOVATION ACTIVITIES FOR RURAL DEVELOPMENT IN MOPANI DISTRICT MUNICIPALITY: PILOT STUDY PRELIMINARY FINDINGS

RURAL INNOVATION ASSESSMENT TOOLBOX (RIAT) PHASE TWO

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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 innovators. This is the first in a series of four district municipality reports and provides the findings for the District of Mopani in Limpopo Province. The early conceptual inputs from members of the RIAT Project Steering Committee and other regular, but part-time, RIAT Project Team members, who are not authors of this specific paper, are acknowledged. Also acknowledged are the contributions of the various fieldworkers involved in this pilot study, namely: Aubrey Mphateng, Matsekola Mokori, Brandon Bodenstein, Cornelius Holtzhausen and Jabulani Mathebula. We also acknowledge the assistance of those people in the Mopani District who participated in the research. Alison Ziki and Annemarie Booyens are thanked for editing and layout of the final document. The views expressed are those of the authors and do not necessarily reflect those of any other party.

EXECUTIVE SUMMARY

This report provides preliminary findings on using the Rural Innovation Assessment Toolbox to map innovation activities among a purpose-built sample of 122 enterprises in Mopani District Municipality. To contextualise our findings and motivate some local development possibilities that investment in innovation might be able to increase, the report starts with a brief overview of the research methodology used, the sampling frame, an explanation of working definitions and the pertinent demographic and socio-economic information for Mopani District. The latter is used to explore the potential of innovation activities as a catalyst for human wellbeing enhancing local development. It then discusses the findings of the quantitative and qualitative aspects generated from the application of the RIAT innovation mapping instrument.

Roughly 20% of the Limpopo 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 for 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 highlighted 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 introducing 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 of improving 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 grassroots 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 District 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 if considered when making decisions about development interventions in the future. 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 tapped into discoveries of tertiary and scientific agencies as platforms for invention.

Adoption 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 District. 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 rank 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 adaption 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 has 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 District 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.

1 INTRODUCTION

This report focuses on Mopani District in Limpopo Province and provides some of the findings, and analysis thereof, from the pilot use of the Rural Innovation Toolbox (RIAT) rapid mapping tool (Version 1). This part of the RIAT pilot study took place between the 18 February and the 26 March 2013.

The next two sections of the report provide some background to the RIAT study, the core concepts invoked and the research methodology used in the Mopani District. The remainder of the report presents a short socio-economic review of the district, drawn largely from the district municipalities' (DMs) latest Integrated Development Plan (IDP) and recent data obtained from Global Insight Regional Explorer, followed by the presentation and discussion of the findings derived from the pilot RIAT rapid mapping instrument. Experiences gained during the implementation of this part of the RIAT pilot study are described in the final report for the Department of Science and Technology (DST) and are not described here. The experiences gained in Mopani District Municipality, along with those gleaned from the pilot exercise in Chris Hani District Municipality, were used to refine the instrument for implementation in the Dr. Ruth Segomotsi Mompati and uMzinyathi district municipalities. That instrument is RIAT rapid mapping tool Version 2.

Little is known about innovation in Mopani District, whilst an exhaustive and coherent picture of localised innovation actors and activities in this rural district does not exist. This study is an initial attempt at filling this knowledge gap, and the authors are mindful of the fact that the documented evidence of innovation in this report makes up a tiny fraction of what might be occurring in reality. Nevertheless, it is a repository of policy-relevant information which did not exist prior to this study and can serve as a useful guide to policy interventions aimed at boosting local innovative performance, which ought to begin with knowledge capabilities and what enterprises within the district actually know (or do not know) about innovation.

2 BACKGROUND TO RIAT

The Rural Innovation Assessment Toolbox (RIAT) starts from the basic understanding that innovation is a multifaceted process of knowledge generation, adaption, 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.

The primary objective of the RIAT project is firstly to develop a tool that can map out innovation actors, activities and systems in spatially marginalised contexts. The second key objective is to

develop a complementary set of instruments (a toolbox) that could assist actors to improve their self-learning about their innovation potential and activities. The third objective is to design the instruments in such a way that they could assist with the future monitoring and evaluation of innovation activities in the RDMs. Cutting across these three objectives is the need to apply 'systems thinking' to broad-based rural innovation so as to understand the actors and factors influencing new knowledge generation, diffusion, and use (adoption and adaption) for rural development in South Africa (Hart et al, 2012).

In order to achieve these objectives, the research team made three major investments. Firstly, they invested in grounding the various 'innovation assessment tools' in cutting-edge conceptual and policy thinking on science, technology and innovation, both internationally and in South Africa. This grounding process required understanding current innovation conceptual and policy thinking. It resulted in the production of several concept papers and the formal and informal engagement with South African and international innovation scholars, thereby ensuring that subsequently developed tools would derive from state of the art thinking. The second investment was to develop new scholars on rural innovation systems by incorporating interns and junior researchers into the RIAT team, enabling their rapid development in this field, and assistance with the theoretical and practical applications of rural innovations systems research. The third investment was the crafting of appropriate methodologies to map rural innovation activities, understand how these form a 'systems perspective', to test self-reflective learning potential of rural actors and to determine monitoring and evaluation potential of the various instruments over the medium-term. The critical engagement with theoretical and practical approaches to innovation systems thinking in South Africa and internationally were vital to understanding the meanings of rural innovation and informing the methodology for information collection and analysis.

3 CORE CONCEPTS AND WORKING DEFINITIONS

The RIAT research team spent several months reviewing existing local and international definitions in order to arrive at practical working definitions for the implementation of the pilot project (this work is showcased in the various concept papers compiled by the team and available on the EPD page of the HSRC website: www.hsrc.ac.za). The development of working definitions was undertaken to facilitate the interaction with the enterprises, organisation and individuals within the RDMS as well as to clarify the definitions that were adopted for the purpose of the study. The most crucial definition in this study is that of innovation, so time is spent clarifying the concept and various characteristics of innovation. The working definition of social innovation that was used for the purposes of this study is then presented, emphasising what was considered to be important in distinguishing the typical or generic use of innovation from that of 'social' innovation.

Innovation refers to both a process and the output of that process. The innovation process typically involves four activities: adoption (the incorporation or use of an innovation into an enterprise or individual's way of doing things which improves on what was previously done); adaption (the changes made by the user to an innovation in order to make it more useful to the user); diffusion (the transfer or sharing of an innovation with others to use for their own purposes – it does not necessarily always include the sharing of all of the knowledge required to use the innovation); invention (the creation of a virtually new or much changed and improved innovation – this can be incremental such as the move from portable phones to cellular phones to smart-phones; a process aided by the increased improvement in computer technology and network platforms). Not all of these activities need to be present for an innovation process to have occurred. Quite simply, adoption of something new that improves what one is doing is an innovation, i.e. a single activity means that an innovation process has taken place. While adoption may lead to adaption or even diffusion, invention does not have to occur in the present for something to be considered an innovation. Essentially, one would anticipate that invention should be followed by adoption, adaption and then diffusion. However, invention could be equally followed by diffusion without the inventing enterprise or individual actually adopting the innovation for their use. More importantly, if we consider the example of a smart-phone we realise that it is based on the integration of a number of technologies and systems that have been developed since the late 19th Century and improved during the course of the 20th Century to result in the smart-phone used in the 21st Century. In such instances it would be incorrect to say that the smart-phone was invented in the 21st Century by a specific company or person. It has emerged incrementally overtime and we would not expect to identify the specific time and place when the smart-phone was invented. In this example we would not see a process involving invention but rather one involving adaption, diffusion, adoption and perhaps further adaption and diffusion. In other words, the process of innovation is not a linear one and need not start with invention. In fact, within a specific spatially bounded area the innovation process might begin with adoption.

The study has interpreted the innovation process as one akin to the value chain and named it the Innovation Value Chain (IVC). Various factors and actors along the value chain determine how far an innovation travels and what happens to it as it travels. Some innovations may have long journeys (such as the telephone) involving the repetition of various innovation activities. Others may have much shorter journeys and only involve one or two innovation activities. We discuss this IVC process in more detail in the presentations of the findings below and look at how it is manifested in this district.

Innovation or innovations (plural) are the output of the innovation process (or activities), which is generally accepted to occur as part of the core function of enterprises, organisations or individuals, and where the purpose of innovations is to improve or increase the core function directly or indirectly. In this regard four innovation types are identified: products (these include goods and

services); processes (these include the means to provide/deliver improved products); marketing strategies (ways to increase the quality, scale and access to existing or new markets); and organisational arrangements (to use new organisational methods, including new or changed business practices, internally in an organisation or to create changes and improvements in external relations with other organisations).

Knowledge is also crucial to the innovation process and outputs. The development of the Rural Innovation Assessment Toolbox (RIAT) has started from the basic understanding that innovation is a multifaceted process of knowledge generation, adaption, spread and use, for the delivery of broad-based[1] societal benefits (economic, technological, institutional and social). Knowledge appears to have two important roles in innovation. In the first instance some level of knowledge is required to generate new knowledge. In this sense there has to be a building on existing knowledge to bring about new knowledge that is considered by the user to be an improvement. Some level of knowledge is required for innovation to occur and improved or new knowledge can be the output of the innovation process. In the second instance knowledge may be required to be part and parcel of a product (service or good), process, organisational arrangement or marketing strategy so that these can be used effectively by both the provider and the consumer in their respective roles. Innovation is both a process as well as output of this process and involves the use of knowledge in the innovation process and/or the development of improved or new knowledge through this process. Sometime this knowledge is required to make use of other outputs of the innovation process. There are three further characteristics that determine whether or not a product, process, strategy or arrangement is considered to be an innovation.

It is possible to draw out three minimum core requirements for something to be considered an innovation. The first is the idea of novelty. To be considered an innovation, an idea, practice, process, product, etc., must be new to the organisation or at least be a significantly improved version. This requirement of novelty or newness holds for the producing or adopting enterprise or individual. The second requirement is that of value. To be considered as an innovation, the product, process, marketing strategy or organisational arrangement must have value. However, value need not necessarily be exclusively confined to notions of financial or commercial value - social value, welfare, satisfaction, perceived improvement in one's life are all important. The adoption of an innovation indicates its usefulness and potential for further innovation in the form of adaption or even incremental change. In light of this some scholars suggest that a further or third requirement for something to be an innovation is that it can be diffused beyond the producing individual or enterprise – broader adoption requires diffusion. Such diffusion or sharing can take place through market and non-market channels. However, some scholars argue that R&D is not innovation until the outputs thereof connect to a market (Gault, 2010). It is the authors' opinion that such a market need

[1] Of course there could be accumulation by individuals but our understanding of the DST interest and focus is that of broad-based societal benefits, rather than individual and trickle-down benefits of innovation.

not be commercially oriented and is more likely to be determined by the need or desire for an innovation. If no diffusion occurs beyond the developing enterprise or individual then there might not be any probable broader economic or social impact.

Social innovation differs from the more generic concept of innovation in the sense that the outputs of the social innovation process should have an identifiable social impact rather than simply an economic or other (e.g. adding to the state of knowledge or science) impact. There is much debate about what is or is not reasonably classified as a social innovation. Analysis of the literature on the subject illustrates that there are three primary understandings of the concept of social innovation, as well as variations of these. The first understanding considers the organisation or the management of people and things within enterprises or social settings. Furthermore, these can be both informal and formal organisations and arrangements. Examples include trade unions, bargaining councils, stokvels, working parties, job-sharing schemes and distribution methods.

A second understanding proposes that social innovations are those that have social outputs or benefits. They make welfare, wellbeing or social improvement contributions, which enable poorer people to access and participate more actively in socio-economic opportunities and affairs of the state (governance/service delivery). Examples include improved health, sanitation, water, electrification, education and security. Such innovations can be products or processes. However, they must involve social value and possibly inter-generational value and improvement. Medium-term ideas around sustainable environmental development, reduction of the carbon footprint and promoting the green economy are examples of innovations that have inter-generational value. Loan strategies that are directed to and accessible to the poor, as well as national radio and television broadcasters, are also considered to be social innovations in this category, as the affordability of such products and services is maximised through various means, including state funding. However, some scholars argue that a social innovation must be a social and public good (Harris and Albury, quoted in YF/SIX 2010: 16) and they would not consider the private sector development of a necessary vaccine as a social innovation, unless it was subsidised, freely available and accessible. Other scholars see Google as a social innovation, despite its origins in the private sector (like the vaccine example above), because its value to society outweighs the profits to the private sector.

The third understanding is a rather narrow combination of the above two. Social innovations are those innovations (new products, services, models and practices) that concurrently meet social requirements and produce new social collaborations outside of the enterprise environment. This notion excludes innovations occurring in enterprises. Social innovations must have social means (driven by users) and ends (benefits to users). Users should influence social innovation rather than it being exclusively top-down; therefore it must achieve systemic change (YF/SIX 2010).

There is also an increasing awareness of the social dynamics of innovation processes and outputs. Here the roles of history, politics, social relationships, etc. in influencing the innovation process and outputs, particularly focusing on access to resources, are examined. The study's interest was more on the existence of social innovations although it is clear that social dynamics have an important role in influencing innovation activities of all types within the RDMs; especially with regard to what is available and who gets access to innovations.

The study adopted a middle of the road approach with regards to social innovation, whereby it must emphasise improvement in social wellbeing or welfare improvement for society as a whole; or for a specific marginal or vulnerable group in society, such as infants, orphans or the poor. It should do this through products, processes and/or formal and informal social and organisational arrangements. As a result the study did not focus deeply on social innovations linked to marketing strategies and in fact did not pick up any such innovations in its sample. While the authors accepted that there can be economic spin-offs from social innovation, they are of the opinion that the social contribution must be greater and it should involve community participation and empowerment in the social wellbeing enhancing innovations.

4. METHODOLOGY

Given the relative 'newness' of this type of innovation measurement and mapping exercise, exploratory methods proved to be most suitable for pilot-testing Component 1 of the RIAT, the survey instrument to conduct rapid mapping of the rural innovation system and value chain. A scoping visit was undertaken in Mopani District Municipality in November 2012. The purpose of the scoping visit to the district was to establish how best to link the innovation concepts derived from the literature and engagement with the experts, with the experiences and prevailing circumstances in the district. The scoping visit was also used to establish the most suitable sampling approach and build on the survey instrument design by illustrating thematic and crucial areas for the questionnaire structure. Furthermore, the scoping visit had the purpose of identifying key stakeholders, initiating contacts and possible interviewees, and getting 'a feel' for innovation activities and types within the district.

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 (enterprises, organisations and individuals) engaged in the innovation value chain in rural settings were 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 was considered most suitable for overcoming many of the initial obstacles

encountered in identifying the rural innovation actors, but it also brought with it some internal constraints. Consequently, the sampling approach is now discussed in some detail.

As the population of innovators or innovation actors in rural areas are often hidden and therefore unknown, it is difficult to identify the best sample size. Therefore, it was decided that the sample drawn not be random because the lack of a discernible and finite population would make probability sampling redundant. The team adopted a purposive built survey design in which non-probability sampling was based on convenience. Following from this, snowball sampling was the best approach to selecting individual respondents. Potential respondents were firstly identified through a referral process (often peer referral or service provider referral) and then were screened to determine if they were suitable respondents (i.e. those to whom the survey instrument can be administered because they were engaged in innovation activities during 2011 and 2012). In the case of RIAT rapid mapping instrument and primarily for subsequent monitoring and evaluation purposes it was decided that respondents should have engaged in at least one innovation activity during the previous two years (2011 or 2012). Of course this meant that this pilot study unfortunately excludes earlier innovation activities that exist in the district and which contribute to ensuring economic and social development. A further restriction that this approach places on the data collected is that, because it is not a random probability sample from a discernible and finite population, the evidence cannot be used to make any inferences beyond the sample generated during the study. **Given this situation and the fact that this is a pilot study this study cannot and does not attempt to make broad inferences for out-of-sample enterprises based on the collected data.**

A range of relevant contact people were identified during the scoping visit in November 2012. Following discussions with these contact people, in which the project and specific purpose of the questionnaire were explained, they were asked to refer the fieldworkers to potential innovation actors from various sectors, i.e. those engaged in one or more innovation activities of invention, adoption, diffusion and adaption. In the pilot phase all the actors on the lists generated during the scoping visit were screened and if appropriate, interviewed using the rapid mapping survey instrument (Component 1 of the toolbox). They were then asked by fieldworkers to refer them to another two to three potential innovator respondents and the screening and interview process was repeated. In this manner, the snowball sampling approach identified appropriate respondents that were interviewed as part of the survey.

A more or less generic approach to sampling and interviewing was used in Mopani District Municipality during the pilot phase. The district was divided into three zones or hubs, where the main economic activities in the RDM are concentrated. These hubs were Tzaneen (Zone A), Giyani (Zone B) and Phalaborwa (Zone C). The fieldworkers comprised of three teams of two people; each fieldworker underwent three days of intensive fieldwork training in Pretoria. In the district they were coordinated by an HSRC intern who assisted with administration, fieldwork and research activities. A

senior researcher, who managed the district team, visited the Mopani District twice, going to all three zones, to ensure that the fieldwork was on track, to resolve possible obstacles and to ensure that questionnaires were being accurately completed. The referral process started with the scoping visit contacts and thereafter expanded through the identification of new participants mainly, but not exclusively, from participating respondents.

Within the Mopani District three teams identified and interviewed a total of 122 innovation actors (individuals/organisations/enterprises), which translates to 41 actors in Zone A, 39 actors in Zone B and 42 actors in Zone C. The upper limit for the district was intended to be approximately 120 respondents from different organisations/enterprises or departments within these organisations/ enterprises and the lower limit was 100. The targeted sample (N = 100 - 120 organisations/ enterprises) was 50% in the primary sector, 20% in the secondary sector and 30% in the tertiary or services sector (the total sample size is based on the upper boundary limit of 120 units). The targeted sample was unevenly spread across the sampling zones. The reality, as emphasised by the scoping visits, is that each zone has a different composition of sectors and industries. For example, in reality, primary sector activities may represent well below 50% of all enterprises in Zone C, while the share of the services sector in Zone C on the other hand is about 50%. If we compare this scenario with the targeted sample in Zone B, we see that the primary sector activities are greater than 50%. Because of the presence of informal actors in the innovation systems in these areas, the fieldworkers were advised to ensure that the final sample includes a good and 'representative' mix of informal enterprises/activities[2]. The willingness and availability of respondents to participate is an important factor in understanding the results, as not all identified innovators were willing to be interviewed and others were unavailable. Consequently, the fieldwork teams had to identify other actors who were engaged in at least one of the four innovation activities in order to achieve the upper and lower limits set by the research managers.

It is envisaged that the rapid mapping survey technique evolves with the others tools in the RIAT to form an integrated package of instruments for final use at the end of the third phase of the study. There was significant fine-tuning of the rapid mapping instrument on the basis of a richly nuanced picture of grassroots innovation activities pieced together from investigations over the last ten months. The research experience and use of the tool in the Mopani and Chris Hani Districts also guided the refinement of the rapid mapping tool used in Dr Ruth Segomtosi Mompati and uMzinyathi Districts. This experience will help inform sampling methodologies for more frequent and less resource intensive measurement, monitoring and evaluation beyond Phase 3.

[2] More information on sampling in terms of sectors and industries per RDM can be accessed by downloading the relevant methodology RIAT Concept Paper, available on the EPD page of the HSRC website: www.hsrc.ac.za.

5 SOCIO-ECONOMIC INFORMATION FOR THE DISTRICT

Mopani District Municipality (MDM) is located in the Limpopo Province (see Figure 5.1 below) with an estimated population of 1.1 million people, which is approximately 20% of the Limpopo population, estimated at 5.5 million. Based on available information about the spatial location of the population, it is estimated that 86.5% of the residents in MDM live in rural areas compared to the 13.5 % that live in urban areas (Global Insight 2013).

Figure 5.1: Limpopo Province 2013 (*Source: LGH Limpopo 2013***)**

Mopani is located in the south-eastern part of Limpopo Province and borders on the Kruger National Park. The district municipality covers an area of about 20 011 km² (MDM, 2011). The district comprises of five local municipalities, namely: Ba-Phalaborwa, Greater Tzaneen, Greater Giyani, Maruleng, and Greater Letaba (see Figure 5.2). The Capricorn and Mopani districts are the main economic centres of the Limpopo Province. The Mopani District has four major towns namely Phalaborwa, Ga-Modjadji, Tzaneen and Giyani; the latter is the administrative seat of Mopani District Municipality.

Figure 5.2: Mopani District Municipality map (*Source: LGH Limpopo 2013***)**

5.1 SOCIAL PROFILE

5.1.1 Population

The total population in Mopani District is estimated at 1 120 287 (Global Insight 2013). More than half of the population are females (53.9%), estimated at around 603 413. The slightly smaller male population (46.1%) is estimated at 516 874. Table 5.1 below indicates the total population for 2011 for MDM. According to the table, the largest single share of the population are the youth and young adults at almost 40%, while the minority share are the elderly. Children and adults each make up slightly more than 20% of the population.

Table 5.1: Total population in 2011 by age group classification

Classification	Age	Number	Share %
Infants	**0-4**	141 988	13
Children	**5-13**	239 677	21
Youth and young adults	**14-34**	413 632	37
Mature adults	**35-65**	262 457	23
Elderly	**70+**	62 652	6
Total		1 120 287	100%

Source: Global Insight (2013)

5.1.2 Poverty and health

The Mopani District Municipality is characterised by a high level of poverty (44.3% of people living in poverty in 2011), as is the Limpopo Province as a whole, in that it has 43% of people living in poverty. The Human Development Index[3] (HDI) is 0.61, which indicates a medium to high level of human development in the district. The Gini Coefficient[4] is 0.63, which indicates a high level of income inequality within the district.

The provision of health services in the province generally, and the Mopani District in particular, is an enormous challenge. In Mopani District there are at least seven hospitals, nine health care centres and eighty-seven clinics. The most prevalent diseases are diarrhoea, pneumonia, tuberculosis, HIV/AIDS, malaria, cholera and sexually transmitted infections (MDM 2009: 68). The proportion of people in the district who are HIV positive is estimated at 6.5% (73 257), and the AIDS mortality rate per annum is estimated at 0.3% (3 523) (Global Insight 2013).

[3] Human Development Index is an indicator of development. It measures life expectancy, literacy and the standard of living (Income).

[4] Gini coefficient is a summary statistic of income inequality, which varies from 0 to 1. If the Gini Coefficient is equal to zero it means that incomes are distributed in a perfectly equal manner, indicating a low variance between high and low income earners in the population. If the Gini coefficient is equal to one, income is completely inequitable, with one individual in the population earning income, whilst everyone else earns nothing.

5.1.3 Education

There is a high shortage of schools in the district, which only has a total of 457 primary schools and 255 secondary schools to serve the school-going population. The total number of primary school pupils is approximately 194 000, who are accommodated in 4 273 classrooms; this indicates that the pupil-classroom ratio is 45:1 in primary schools. There are 255 secondary schools in the district with approximately 100 000 who are accommodated in 2 476 classrooms. The pupil-classroom ratio is 40:1 in secondary schools (MDM 2009: 66).

The challenge of educating learners is exacerbated by this overcrowding in classrooms and the lack of resources, facilities and basic services such as electricity, water and sanitation (MDM 2009: 66). There is also a serious backlog of schools and facilities for learners with special needs and schools for the disabled. The current educational facility backlog is estimated at 75.56% (ibid: 68). There are eighteen municipal libraries in the district that provide access to literature for school children and adults.

The functional literacy rate in MDM for the age group 20 years and older who completed Grade 7 is 59.2% for 2011, while the provincial functional literacy rate is slightly higher at 64.7% for the same year (Global Insight 2013).

The district literacy rates indicate a steady improvement over the period 1996-2011, but still remain lower than the national and provincial rates. The provincial functional literacy rates improved from 51.7% in 1996 to 64.7% in 2011, whereas the district literacy rates improved from 47.6% in 1996 to 59.2% in 2011. Table 5.2 indicates the highest levels of formal education attained in the district for 2011. Education is broken down into nine categories.

Table 5.2: Highest level of education: age 15years+ (2011)

Level of Education	Number of People	Share%
No schooling	119 041	16.2%
Grade 0-2	12 226	1.7%
Grade 3-6	70 022	9.5%
Grade 7-9	174 996	23.6%
Grade 10-11	172 486	23.4%
Certificate / diploma without Matric	6 221	0.9%
Matric only	122 127	16.5%
Matric & certificate / diploma	45 133	6.1%
Matric & Bachelor's degree	13 025	1.8%
Matric & Postgraduate degree	3 346	0.5%
TOTAL	738 622	100%

Source: Global Insight (2013)

5.1.4 Number of households by type of dwelling

According to the IDP, the backlog for basic needs - of which housing is a part - was estimated at 40 469 (15.3%) in 2008 within the district. For each of the local municipalities it was recorded as follows: Greater Tzaneen 14 145; Greater Giyani 12 951; Greater Letaba 5 123; Ba Phalaborwa 3 248; and Maruleng 5002. The total amount of indigent households was estimated at 265 289 (MDM 2009: 38). The number of households living in traditional houses is 14 863. The majority of households live in formal housing and they are estimated at 226 160. Table 5.3 indicates the number of households by type of dwelling.

Table 5.3: Number of Households by Type of Dwelling (2008)

Type of dwelling	Number of households
Very formal	23 617
Formal	226 160
Informal	7 214
Traditional	14 863
Other dwelling type	1 399
Total	273 254

Source: Global Insight (2013)

The backlog for sanitation in the Mopani District is approximately 209 403 households, which is the number of households without hygienic toilets, indicating that such households have no formal toilet or that they make use of either a pit toilet or the bucket system. The lack of sanitation services has created massive environmental and health problems in the rural and urbanised areas of this district (MDM 2009: 41). Nearly all the villages in the district do not have RDP level sanitation. This constitutes a major risk for ground water pollution and human health. Water borne sewerage is mainly found in the towns, while septic tanks are mainly situated on privately owned large properties, such as farms, hotels and guesthouses.

5.1.5 Water and electricity

The water backlog for the households below the RDP minimum service standard is 124 366. Households above the RDP standard are not considered to be part of the water supply backlog. Above RDP level includes all households that have access to piped water within their dwelling, within their yard or within 200 metres of their dwelling (Global Insight 2013). Below RDP level can include households in dwellings that are considered to be formal but have no immediate or direct access to water.

The Mopani District is characterised by low rainfall, especially in the Greater Giyani and Ba-Phalaborwa local municipal areas. This situation results in severe water shortages and regular drought conditions. Consequently, there are competing demands for scarce water between

economic sectors (agriculture, mining and forestry) and domestic users. The main sources of water are the Letaba River catchment area and boreholes (MDM 2009: 39).

The number of households without electricity connections is 31 245 (Global Insight 2013). In Mopani, electricity is generated and distributed by ESKOM. In the urban areas the local municipalities also play a brokerage role in distribution. Most of the people in the rural areas and low income groups continue to use a range of energy sources such as wood for cooking, irrespective of whether their houses are electrified or not (MDM 2009: 41).

5.2 ECONOMIC PROFILE

5.2.1 Employment

The level of unemployment in Mopani District is fairly high. The male population has an official unemployment rate of 17.4 %, and the female official unemployment rate is 21.2%. Table 5.4 below indicates the formal sector employment for the province and the district. For the province, mining employed 14.9%, agriculture 14.7%, community services 7.9%, households 8.5% and the electricity sector 7.4%. These sectors employ the majority of the people. For the district a similar pattern is illustrated in Table 5.4, although the percentages are lower in most cases; mining and agriculture each at 4.1% and the electricity and community services sectors each at 1.9%, with households at 1.7%.

Table 5.4: Employment shares in formal economic sectors: Limpopo and Mopani (2011)

Formal Sector	Employment share of national total (%)	
	Limpopo	Mopani
Agriculture	14.7%	4.1%
Mining	14.9%	4.1%
Manufacturing	1.5%	0.3%
Electricity	7.4%	1.9%
Construction	3.8%	0.8%
Trade	4.7%	0.4%
Transport	2.9%	0.5%
Finance	1.9%	0.4%
Community services	7.9%	1.9%
Households	8.5%	1.7%
Total	6.2%	1.4%

Source: Global Insight (2013)

The provincial economic development study of 2000 identified tourism, agriculture, mining, trade and manufacturing as sectors of potential growth in the Mopani District (see MDM 2009 for more

information). There are also a number of diverse under-exploited tourism assets, such as the northern portion of the Kruger National Park. This national park, private nature reserves and game farms cover almost half of the district, which is also identified as one of the five best conserved ecosystems in the world. This situation provides good opportunities for eco-tourism and associated Small, Medium and Micro Enterprise (SMME) development (MDM 2009: 32).

The dominant economic sector in the district is a variety of mineral mining activities. This type of mining has been the dominant sector since 1996. The other important sectors are community services, trade and finance. The Mopani mining activities are concentrated in Ba-Phalaborwa, and this area has been through eight years of rapid expansion. Ba-Phalaborwa mining operations were formerly a state-owned mining cluster; however, recently they have become jointly owned by Rio Tinto (58%), Anglo American (17%) and Phalaborwa Mining Company (25%) (ibid: 33). However, sectors such as manufacturing, construction and transport have not experienced any significant growth during the same period.

5.2.2 Gross Value Added

It is standard practice to summarise the economic performance of a region or country in terms of three broad sectors: primary, secondary and tertiary sectors. The primary sector consists of the agricultural and mining activities. The secondary sector consists of the manufacturing, electricity/energy, construction and trade activities. The tertiary sector consists of the transport, financial and community services. We see from Table 5.5 below the provincial and the district's sectors contribution to economic growth. For the province, the tertiary sector contributed 55.1%, primary sector 36%, and the secondary sector only 8.9%. The tertiary and secondary sectors contributed a significant amount to the local economy. For the district the tertiary sector contributed 48.2%, the primary sector 45.1%, and the secondary sector 6.7%.

Table 5.5: Sector's contribution to economic growth in 2011

Economic Sector	Limpopo Province	Mopani District
Primary sector	36.0%	45.1%
Secondary sector	8.9%	6.7%
Tertiary sector	55.1%	48.2%
Total	100.0%	100.0%

Source: Global Insight (2013)

Table 5.6 illustrates the various economic sectors' Gross Value Added[5] (GVA) contribution to the economy of Limpopo Province and Mopani District. In the column for the sector's share of the regional total for the province, mining is at 32.9%, community services at 22.2%, and finance at

[5] Gross Value Added is a measure of output (total production) which measures the total output of a region by considering the value that was created within that region. One can think of GVA - R as the difference between the inputs obtained from outside the region and the outputs of the region – that is, the region's total 'value added'.

15.3%. For the district mining (42%) had the highest contribution, along with community services recording 18.7% while trade at 13.8% and finance at 11.6% contributed lower rates but were significantly higher than construction (2.2%) and manufacturing (1.3%). Agriculture had a low contribution across both the province and the district (3.1%).

Table 5.6: Gross Value Added per sector

Sector	Sector's share of regional GVA (%)	
	Limpopo	Mopani
Agriculture	3.1%	3.1%
Mining	32.9%	42.0%
Manufacturing	2.7%	1.3%
Electricity	3.4%	3.2%
Construction	2.8%	2.2%
Trade	12.0%	13.8%
Transport	5.7%	4.1%
Finance	15.3%	11.6%
Community services	22.2%	18.7%
Total Industries	100.0%	100.0%

Source: Global Insight (2013)

Table 5.7 below indicates the contribution to economic growth. The provincial contribution is as follows: the primary sector's contribution to economic growth declined to -0.8%, secondary sector contributed 0.2% and the tertiary sector 1.1%. For the district, the primary sector's contribution to economic growth also declined to -0.6%, secondary sector 0.1% and the tertiary sector 2.1%. Overall, the district contributed more at 1.6% while the province contributed only 0.5%.

Table 5.7: Contribution to total economic growth (% point, constant 2005 prices)

Economic Sector	Limpopo Province	Mopani District
Primary sector	-0.8%	-0.6%
Secondary sector	0.2%	0.1%
Tertiary sector	1.1%	2.1%
Total	0.5%	1.6%

Source: Global Insight (2013)

Table 5.8 below indicates the activities that have been identified through the most recent IDP for further economic development in the local towns within the district. These are mainly in the areas of mining, agriculture and tourism.

Table 5.8: Mopani District Municipality – local towns and activities identified for further economic development

Town	Sectors for economic development
Greater Letaba	agriculture and tourism, transport and communication
Greater Giyani	agriculture, communication, transport and retail development
Ba-Phalaborwa	mining and tourism
Maruleng	tourism
Greater Tzaneen	farming and tourism

Source: MDM 2009

The mining sector in Mopani has a huge potential for growth given recent increases in the international copper price. Despite the development of several initiatives, such as the Phalaborwa Spatial Development Initiative (SDI) to increase the potential of the mining industry in the district, there are infrastructural constraints that prevent the growth of mining. The most significant constraint is the lack of suitable transport facilities. The two main rail freight routes (Richard's Bay and Maputo) are highly unreliable and in poor condition (MDM, 2009).

5.2.3 Constraints in the district

According to the Limpopo Spatial Rationale of 2007, approximately 55% of the 348 settlements in the Mopani District area are small and scattered mainly in the central, south western, northern and north-eastern areas of the district. This settlement pattern constraints the provision of basic and social services and affects long-term sustainable development in these settlements (MDM, 2009: 35). Innovative thinking is required to determine the best ways to provide community services and infrastructure, while creating employment and improving livelihoods to ensure that services become sustainable, as must employment.

5.3 CONCLUSION

The Mopani District Municipality is characterised by relatively high levels of unemployment (although lower than those of the other three districts included in the pilot), poverty and educational challenges, including the shortage of schools and classrooms. These challenges combine to constrain the local economy and adversely affect economic and social development. The majority of the population is very young, which holds a lot of potential for the local economy if the challenge of education and skills development is overcome.

There are sectors with a comparative advantage - such as mining, agriculture and electricity - which are a source of employment and they boost the local economy. The primary sector plays a significant role in the local economy; however, other sectors should be explored that could have potential to

create jobs and grow the local economy. Diversified economies tend to weather economic recessions better.

6 RURAL INNOVATION IN MOPANI DISTRICT MUNICIPALITY

6.1 INTRODUCTION

The rapid mapping survey instrument can be simply divided in to five core sections, each composed of several questions that together provide evidence about the five main areas of interest. These areas are discussed in turn and the study concludes by discussing what the results of the survey are able to inform us about rural innovation. The reader is again reminded that the discussion refers only to the sample obtained during the pilot study, so no further inferences can be made outside of the sample. Similarly the study was a pilot study so the reliability and validity of the questions, the practical usefulness of the instrument and the sampling frame and methodology were in a process of development when the information was gathered.

A sample of 122 enterprises were visited and interviewed. However, several more enterprises were visited but not interviewed because no innovation activities were identified that took place during the years 2011 and/or 2012.

6.2 ENTERPRISE PROFILES

The first section of the survey instrument aimed at developing profiles of the enterprises, organisations and individuals that were interviewed during the Rural Innovation Assessment Toolbox pilot rapid mapping survey in Mopani District Municipality. Of the total sampled enterprises, 11 were public enterprises, 58 were private enterprises and 53 were non-profit organisations (this is indicated in the first row of Table 6.1 below). The referral and innovating enterprise identification method used in the sampling process seemed to generate a high number of private and non-profit enterprises in contrast to public enterprises. This distribution was to be expected given the high number of private enterprise in the economy generally. The high number of non-profit organisations is perhaps slightly higher than anticipated but again these enterprises include volunteer groups, spiritual and religious groups, various social clubs, development NGOs and CBOs, etc. The high number indicates that they have an important role to play in the district, cannot be overlooked and must be included into the national system of innovation, especially as most concentrate on social development and welfare.

Table 6.1 also summarises the three types of enterprises in terms of statutory registration as a legal entity, registration for income tax purposes, economic sectors within which the enterprises operate and the dominant subsector within each economic sector, participation in a larger group or company (including franchises) and the main territory of output distribution of the enterprises (in terms of outputs sold and freely distributed at a local or regional level).

If we look at statutory registration we note that all the public enterprises in the sample (100%) were registered with government departments. A large proportion of the private enterprises (81%) were formally registered as legal companies (CC or PTY Ltd.). Of the remaining private enterprises 7% were registered as sole proprietors, but 9% were not registered at all. The 4% of private enterprises registered as NPOs or with government departments cannot be explained accurately and is probably due to respondent or researcher error during the interview. Of the sampled non-profit organisations (NPOs), 83% are registered as either a NPO with the Department of Social Development (DSD) or as a Section 21 company with the Department of Trade and Industry (DTI). Another 8% were registered with another undisclosed government department, and 8% were not registered. Only 7% of all the enterprises included in the sample were not registered as some type of legal entity.

Virtually all the enterprises sampled were registered for Income Tax purposes (84%), with 12% of the sampled private enterprises and 25% of the non-profit organisations not being registered with SARS.

More than half of the sample comes from the tertiary sector. The subsectors within the primary, secondary and tertiary sectors listed in the table only demonstrate the most dominant subsectors in each of the three sectors. We see that the larger share of enterprises in the primary sector are engaged in agricultural activities, irrespective of whether they are public, private or non-profit enterprises. All the public enterprises (100%) that are found in the primary economic sector are enterprises engaged in agricultural activities. In the secondary economic sector, the larger share of enterprises is engaged in manufacturing activities. As we would expect, there are no public enterprises engaged in this subsector. Lastly, in the tertiary economic sector the largest share of enterprises are engaged in community social services. As expected, a large share (80%) of public enterprises operating in the tertiary economic sector are engaged in community social services. The small share of private enterprises is also expected. Only slightly more than two-thirds of the non-profit enterprises are engaged in community services. Perhaps most significant is that from the sample it can be noted that 64 of the 122 (53%) sampled enterprises are engaged in the tertiary sector. This suggests that there is significant innovation taking place in this sector and that it deserves increasing attention.

Not all enterprises are part of a larger group or organisation, with only 37% of the sample acknowledging being part of a larger organisation. Almost two-thirds (63%) were not part of a larger corporation or company. It is perhaps surprising that only 91% of the government organisations indicated that they were part of a larger group. This is probably due to an interviewee error.

Table 6.1 reveals that more public enterprises (91%) distributed output free of charge to local consumers and most private enterprises (67%) participated in sales to local consumer markets. 66% of the sampled NPOs were engaged in sale of output within local/regional markets and almost 68% of them engaged in free distribution of outputs within local/regional boundaries. The high share of sales of goods and services by NPOs probably has to do with their need for generating income

beyond that received in the form of grant income from funders. Similarly, while Section 21 companies might not distribute dividends, they are engaged in income generating activities that provide the company with a profit, especially consultancy services.

Table 6.1: Share (%) of enterprises/organisations in terms of statutory registration, taxation, economic sector, group membership & output distribution by enterprise type

	Valid observations	Public enterprises (n = 11)	Private enterprises (n = 58)	Non-profit organisations (n = 53)
Statutory registration				
Business CC/PTY (LTD)	48	0	81	2
Registered with government department	16	100	2	8
NPO/ Section 21/Cooperative	45	0	2	83
Sole proprietor	4	0	7	0
Not registered	9	0	9	8
Income tax				
SARS registration	102	100	88	75
Not registered	20	0	12	25
Economic sector				
Primary sector	37	9	29	36
(Agriculture and forestry)	*(31)*	*(100)*	*(71)*	*(84)*
Secondary sector	21	0	22	15
(Manufacturing)	*(20)*	*(0)*	*(100)*	*(88)*
Tertiary sector	64	91	48	49
(Community Social Services)	*(18)*	*(80)*	*(4)*	*(35)*
Part of larger enterprise or group				
Part of larger group	45	91	26	38
Main territory of output distribution				
Sales output - Local/regional	77	18	69	66
Free distribution-local/regional	70	91	41	68

Note: Valid observations refer to the number of non-missing values; n = the total number of observations/enterprises (individuals or companies)

6.3 Local Understandings of Innovation and Social Innovation

Following the enterprise profiling section, the questionnaire focused on paying particular attention to local understandings of innovation and social innovation in the Mopani District and attempting to understand the purpose of innovation among the sampled enterprises. From the analysis of the qualitative data it became clear that most of the respondents in the survey had an understanding

about innovation. Many of the responses had to do with 'bringing about change within an organisation' and 'doing things differently'. Other responses were more specific and related to technology: 'bringing in new technology' and 'using old technology in new ways'. There were also comments relating to 'creating something new' or creating something that hasn't existed before'. A small share of the respondents acknowledged having no idea of the term innovation, but the screening process indicated that despite this they were engaged in some form of innovation activity such as invention, adoption, adaption or diffusion. However, very few of the sampled enterprises were actually aware of the concept of 'social innovation'. In Table 6.2 we see that most of the sampled enterprises (84%) were unaware of this concept. Across the different enterprise types the table shows that only 27% of public enterprises, 12% of private enterprises and 17% of NPOs are aware of the term 'social innovation'. This is cause for concern as many government and NPOs are undertaking social innovation activities. Furthermore the term is used in policy documents but does not seem to be understood by diffusers and users in the enterprises sampled in Mopani District. However, despite not being aware of the term, a fair share of enterprises across the sample was engaged in 'social innovation'.

The innovation of products (goods and services), processes, marketing strategies or organisational arrangements in various enterprises is driven by different reasons or motivations. In the pilot survey the main purpose for undertaking innovation was categorised into two types. Firstly, innovation for direct economic benefit and secondly, innovation to improve social well-being and welfare - an idea in line with the meaning of 'social innovation'. Survey results reported in the second part of Table 6.2 show that most private enterprises (86%) are engaged in innovation activities for the purposes of increasing production and profits. A much smaller share (14%) of these enterprises innovates with the express purpose of benefiting society or specific groups of vulnerable members of society. As expected, most public enterprises (82%) are engaged in innovation activities to benefit the community at large. The NPOs appear to be roughly split down the middle in terms of the main purposes of innovating.

Table 6.2: Share (%) of enterprises aware of social innovation and main purpose of innovation by enterprise type

	Valid observations	Public enterprises (n = 11)	Private enterprises (n = 58)	Non-profit organisations (n = 53)
Awareness of social innovation				
Aware of social innovation	19	27	12	17
Not aware	103	73	88	83
Main purpose of innovation activity				
Direct economic benefit	76	18	86	46
Social wellbeing & welfare	45	82	14	54

Note: Valid observations refer to the number of non-missing values; n = the total number of observations/enterprises

Despite the term 'social innovation' not being recognised or understood by many respondents, there seems to be quite a lot of activity around social innovation. Consequently, we examine some of the examples of local social innovations supplied by the respondents.

What are believed by the respondents to be social innovations are not always social innovations; however, the examples shed some light on the variety of innovations, which are locally provided as indications of social innovations (even in the restrictive sense) that are occurring in the Mopani District. Those respondents who indicated they had heard of the term were urged to explain social innovation by providing their own definition or examples of the term. One example provided is that of Mandla One Stop. This registered non-governmental organisation (NGO) built a structure consisting of an office, store room, and an area for children to eat during lunch and dinner times. In this example, an increased volume of space was provided to address the local community's problem of the shortage of space for vulnerable (homeless and orphaned) children to gather and to eat meals. A facility that offered these services did not exist until such a space was created by Mandla One Stop. It is considered to be an innovation by the respondents but not necessarily a social innovation. This innovation is understood by respondents to be beneficial to the community but isn't defined as a social innovation. This example from the community services sector is an innovation in the core function of the enterprise, i.e. social upliftment or welfare activities.

The Youth Development Centre described in the example in Section 7 below is another example of a social innovation within the community services sector. Here we see several innovation activities that aim to improve various literacy and numeracy problems across a broad spectrum of rural residents residing in five villages.

However, a social innovation should not be solely understood as purely sector based, i.e. not exclusively confined to the community services sector. A variety of enterprises in Mopani District in other sectors are engaged in social upliftment and development activities. For some this may be their core function, but for others it might be part of employee benefits or part of Corporate Social Investment (CSI) activities.

In one instance a registered non-profit enterprise assisted new farmers in the local area. This enterprise, 'Growth for Emerging Stock Farming' understood the experiences of many of the farmers it worked with and enabled them to access new technology and implements for farming activities, through its relationship with a local mining company. It managed to organise for the mining company to sponsor tractors for local cooperatives to assist farmers to cultivate, plough and harvest crops. Respondents identified this sponsorship or donation as a social innovation as it assisted local farmers free of charge. This indicates the grey area of social innovation, as identified in Mopani District by various actors. The real concern is not whether or not this is a social innovation but rather that the recipients of this service do not pay for the use of the sponsored equipment. Therefore, it seems that

no maintenance is carried out and that no provision is made to replace the tractors should they breakdown. Some further innovation is now required to move away from further dependence on grants in this type of case, otherwise the introduced innovations are not sustainable.

In Mopani District social innovation was understood to focus on certain groups of individuals, such as the vulnerable, poor, orphaned, elderly, and youth. But there was also an understanding of social innovation as also being one that benefits the community more widely, beyond just certain groups and the use of certain products. As the Phalaborwa Workers Initiative pointed out, people must change their values and ideas to ensure that their activities are beneficial, rather than harmful, to the broader community – such change in ideas and responsibilities is seen as innovation. In the Mopani District social innovation was also regarded by some respondents as a process of targeting socio-economic problem areas and introducing new innovations such as products (goods and services) that have social benefits. These types of ideas about social innovation are not prevalent in this district and take on a secondary focus in many of the enterprises that were interviewed. For many organisations it was more important to provide products and services for profit, although such products could improve the wellbeing of the community in a secondary manner, e.g. more efficient energy consumption products, or improved food quality or food production.

The lack of general understanding and awareness of the concept 'social innovation' in Mopani District does not translate into the lack of respondents being able to identify innovations with social and welfare contribution. Respondents are able to grasp the concept and offer insight into possible innovations that have immediate direct social implications for the local communities or indirect long-term benefits. Most of the examples of social innovations mentioned originated elsewhere but were adopted by the local enterprises.

When social innovations are defined as such, they are generally confined to the community services sector. However, it is incorrect to assume that this is the only sector contributing to social upliftment and thus that the only key actors undertaking social innovation come exclusively from this sector. When social innovation takes place, the innovation type was limited to adoption of new products and services that offered social benefits. However, this does not mean that other innovation activities do not occur (see Case 1 in Section 7 below), but rather that the difficulty in understanding the concept made self-identification of the innovation activities difficult. In most instances private enterprises are not engaged in social well-being or welfare driven innovations but that some innovations come with spill-over benefits, often regarded as trickle down effects that have some indirect welfare benefit.

6.4 Innovation Value Chains and Innovation Types

This section provides evidence about innovation activities and the value chains among enterprises sampled in Mopani District Municipality. It starts by presenting some of the innovation activities

taking place within the three different types of enterprises, and further presents the share of enterprise types involved in each innovation activity during the years 2011 and 2012. It then goes on to exploring the innovation value chains (IVC) most evident from the sampled enterprises in the Mopani District. This is done by using the two case studies of innovating enterprises in Section 7.

Table 6.3 presents a summary of innovation activities in 2011 and 2012 by enterprise type. The column of valid observations indicates the overall participation of sampled enterprises in innovation activities during both years. In both years the rate of adoption was the highest followed by adaption. Adaption was followed by diffusion. Invention is the least common innovation activity undertaken by enterprises in the sample. However, the rate of invention was higher than the rate of diffusion in 2011, but lower in 2012.

Most public enterprises (82%) and private enterprises (95%) were not engaged in the invention of innovations. These figures remained the same for both enterprise types during 2011 and 2012. A drop in the share of enterprises engaged in invention is revealed in the case of NPOs. The share of NPOs engaged in invention dropped from 10% in 2011 to 8% in 2012. There are no evident reasons for this change.

These findings, with adoption being the most common innovation activity, indicate that there is a relatively high dependence on externally (outside of the district and even the province) developed innovations among the enterprises sampled in Mopani District Municipality, i.e. at least within the sample local enterprises depend on enterprises outside the district for the availability of innovations. We note a greater share of public enterprises is engaged in the adoption of innovations, as compared to the share of these enterprises that engaged in invention. In 2011, 55% of public enterprises adopted innovations; however, this share dropped drastically in 2012 to 18%. In contrast to this public enterprise trend, the private and non-profit enterprises tended to increase their adoption of innovations during 2012. The share of private enterprises engaged in adoption of innovations rose from 42% to 61%, while that of NPOs rose from 40% to 66%. We have no strong reasons for the fluctuation in adoption, except that perhaps if an enterprise has recently adopted an innovation there is no need to do this again in the following year. Similarly, if an enterprise has not recently adopted, it may need to do so in consecutive years.

In 2011, a greater share of private enterprises (29%) was engaged in adaption or improvement of innovations, in contrast to public (0%) and non-profit enterprises (13%). However, in 2012 we see a change in that at least 10% of public enterprises were engaged in the process of adapting or improving innovations. Another increase is observed in the non-profit enterprises, whereby the share of these enterprises engaged in adaption rose from 13% to 15%. Perhaps, surprisingly, there was no change in the share of private enterprises adapting innovations in 2011 and 2012. There were low levels of innovation transfer in Mopani District among the three enterprise types. Only 8 of the 122

enterprises sampled reported engaging in the diffusion of innovations of any type during 2011. This increased to 21 observations in 2012. A greater share of public enterprises seems to be involved in the process of transferring knowledge to other users. In all the three enterprise types, the share of enterprises engaged in diffusion of innovations increased in 2012.

Table 6.3: Share (%) of enterprises engaged in innovation activities by enterprise type, 2011 & 2012

Activity		Valid observations		Share (%) of Public enterprises (n = 11)		Share (%) of private enterprises (n = 58)		Share (%) of Non-profit organisations (n = 58)	
		2011	2012	2011	2012	2011	2012	2011	2012
Invent	Yes	10	9	18	18	5	5	10	8
	No	108	113	82	82	95	95	90	92
Adopt	Yes	50	72	55	18	42	61	40	66
	No	68	49	45	82	42	39	60	34
Adapt	Yes	23	26	0	10	29	29	13	15
	No	95	95	100	90	71	71	87	85
Diffuse	Yes	8	21	10	18	9	16	4	19
	No	109	100	90	82	91	84	96	81

Note: Valid observations refer to the number of non-missing values; n = the total number of observations/enterprises

As pointed in Section 3 above, the innovation process is interpreted as one akin to the value chain and named the Innovation Value Chain (IVC). Various factors and actors along the value chain determine how far an innovation travels and what happens to it as it travels. Some innovations may have long journeys involving the repetition of the various innovation activities of adoption, adaption, invention or diffusion. Others may have much shorter journeys and only involve one or two innovation activities, or even only a single innovation activity. The study now discusses this IVC process as it is manifested in this district. The best way to do this is to provide some examples and then two slightly more detailed examples in Section 7 to illustrate some of the nuances, differences and similarities involved.

Out of all four innovation activities, it can be noted that invention was the least evident in the Mopani District sample (see Table 5.3). It was followed by diffusion - the second least evident innovation activity. When diffusion takes place it is usually preceded by adoption and/or adaption. With diffusion, it almost seems as if a pre-condition is adoption and/or adaption. It does not appear to occur in Mopani District without being preceded by one or the other. In the large-scale commercial agricultural sector diffusion takes place only if the adoption, adaption or invention has proven successful in the local setting, i.e. innovations need to be tested locally and proved to be successful locally before any form of sustained diffusion takes place within the network of innovators. Of course this is not always the case in other sectors and even in more informal

agricultural activities. Testing, if it takes place in such instances may be informal and not necessarily aimed for the use of others in the sector. It was observed that service providers (especially government and non-government) would introduce some products or services without them having being locally tested; although in many cases they had been tested elsewhere. Invention on the other hand is rarely followed by diffusion of the invention. This is particularly so in private profit-seeking enterprises, as the example below illustrates.

Relish International is a food processing and manufacturing enterprise mainly producing bottled relish preserves. The company was established in 1995 and in the current year they sell their produce to a large supermarket chain in South Africa as well as to international retailers. The company adapted the traditional Atchar product that they were manufacturing to gain access to a new market. This product is an improvement of the traditional South African Atchar - a preserved mango and spice relish. The adaption is simple but novel. The company saw an opportunity in the market for a pip-less and finely chopped mango relish and found a niche market at the international level which increased their sales. The idea has not been actively diffused by the company to other producers/ manufacturers, as this might reduce their leading place in the niche market. In fact, the opposite has occurred and the product has been trademarked as specific to the company's identity. Therefore, adaption may not always be followed by diffusion in the IVC. There is a process of distribution of the product but not diffusion of the product and the production process.

When it occurs, diffusion takes place after other innovation activities. The preceding step in the IVC is most commonly adoption or adaption. Diffusion is scarce in the Mopani District, when looking at the private sector, but fairly typical in the public sector that adopts innovations from elsewhere and then diffuses them to clients/consumers. An example of the sequential adoption, adaption and diffusion in the IVC is The Oaks Co-op. Their IVC started with the adoption of an improved broiler chicken farming technique in 2011, i.e. the adoption of a process. This new process ensured better production of chickens by the enterprise. Once the adopted process proved lucrative, The Oaks Co-op assisted in the development of another enterprise to use the same process. The adoption and diffusion of the boiler chicken farming technique shows that adoptions can be diffused successfully. Diffusion often only takes place when there is a successful outcome of the original adoption or adaption.

In this example another important innovation process was unpacked. The initial adoption acted as a catalyst for other innovations which involved the adaption of a new manufacturing process as a result of the increased by-products generated by adopting the improved technique. The increase in the amount of chickens on the farm resulted in the need for adaption of the waste removal process. This adaption was the removal of waste from the chickens and processing it to be used as fertilizer on the surrounding farms. The enterprise converted their increased waste matter into a commodity that could be sold as a result of the high volume of broiler chickens produced by adopting the new

broiler production technique. The Oaks Co-op then diffused this process to the enterprise which had received the initial diffusion of the broiler chicken production process.

This example highlights how one innovation activity can lead to engagement in other innovation activities within the enterprise; in this instance an unanticipated increase in a production by-product gave rise to the need for further innovation, which increased scope and income. This second innovation was also diffused to the second enterprise to assist them in making use of the extra by-product. The adaption of waste removal consisted of taking the now increased chicken manure and transforming it into fertilizer for the neighbouring farms. The adoption was of the initial process followed by an adaption to the waste removal processes on the farm, due to the increased waste that resulted from the increased chicken production. After the success of the waste conversion process and its application in the local context, this process was also diffused. If the testing within a local context goes well it is more likely to be diffused. By understanding the context of the adaption or adoption one can understand the success or lack of diffusion of innovations between organisations. This example Illustrates that the adoption can result in changes and the need for further adaption elsewhere in the production process, as the increased waste needed to be removed effectively. Here it was done profitably. It is a good example of the need for further and unanticipated adaption and reinforces the often unreported fact that many innovations occur as a result of earlier innovations but are not necessarily an improvement on the initial innovation type. Also important here is that the increased manure was processed into fertiliser and could be sold, increasing income and thereby off-setting the production costs of broiler chicken farming. We now look at the two illustrative examples to get a deeper understanding of the process of innovation in Mopani District.

7 TWO ILLUSTRATIVE EXAMPLES OF INNOVATION IN MOPANI

7.1 INTRODUCTION

This section presents the innovation value chains that occurred in two selected enterprise examples when they engaged with a specific type of innovation. The section concludes with a comparison of the two examples, highlighting the similarities and differences. In the process of selecting examples of enterprises for this section, the enterprises had to be from different economic sectors. These illustrative examples highlight a variety of innovation activities and innovative patterns within enterprises. In so doing, they illustrate the overall innovative performance of these enterprises, the nature of the innovation activities carried out, the different knowledge bases underlying the innovation processes, and the different patterns of interaction through which enterprises generate, interact and diffuse innovations.

7.1 EXAMPLE 1: YOUTH DEVELOPMENT CENTRE

The Youth Development Centre (YDC) is an organisation that innovated during 2011 and 2012. This example depicts three innovation activities in the innovation value chain and shows that the innovation value chain is non-linear. The YDC adopted an existing literacy and numeracy programme for rural school children from a non-governmental organisation based in Johannesburg. The programme was diffused locally to a network of youth volunteers working with educators and learners in five surrounding villages. The innovation chain didn't end there. The YDC further adapted the programme based on inputs from the youth volunteers, educators and the learners and their own experience in using and diffusing the existing programme. The adapted content was to be diffused to all villages during 2013, but had not been diffused at the time of the interview. In this example, the innovation activities or value chain involve the adoption of an external product, its diffusion to surrounding communities and subsequent adaption to ensure its relevance at the local level. This latter adapted product is to be diffused.

7.2.1 Description of the enterprise and innovation activities

The YDC is a non-profit organisation (NPO) that was founded in 2008. The primary sector that this enterprise operates in is the community social services sector, and education sub-sector in particular. It is involved in helping children and youth in improving their literacy and numeracy capabilities and provides rural youth with a platform to showcase and carry out their academic and artistic talents. Its core function is to address some of the social problems facing children and youth in rural communities.

Volunteers, in most cases post-matric youth, who have not yet been admitted into tertiary institutions, are facilitators of the centre's activities in the five rural villages. The centre has a youth volunteer training and development programme to help them identify and train young people who run the satellite centres in the local villages and are responsible for implementing a number of after-school enrichment activities for the children; in many cases assisting them with literacy challenges and helping them improve their academic results. The majority of learners who attend the centres are between eight and fifteen years old. The YDC relies heavily on donations and grants, as it is a non-profit organisation.

7.2.2 Reason for innovation

The YDC identified a gap in literacy and numeracy among young children in primary schools and among the school leavers in the surrounding villages. This gap was first identified for children between Grade 7 and 9. The centre works closely with schools (primary and secondary schools) in the villages. They realised that there are children and youth in the communities who are entering high school but cannot read and write adequately and there are also children and youth who do not understand basic mathematics. There was a clear need to bring about social change for the

community by addressing some of the gaps in the existing education system as manifested in the villages. They initiated social change by starting after-school literacy and numeracy classes and forming reading and homework clubs. This programme went on to include school leavers and adults in the villages who were also struggling with literacy and numeracy. As the programme was implemented, it was realised by the volunteers of the YDC that the teaching material adopted from the Johannesburg-based NGO, Open Schools Worldwide, was not adequate for the experiences of the children and youth in the villages. The YDC saw a need for improving their services by incorporating this literacy programme, further adapting it to the needs of its clients and expanding services and outreach to older members in the five villages who were experiencing similar problems.

7.2.3 Innovation value chain

In this example we observe the innovation value chain as starting with the adoption of an externally developed product, the literacy and numeracy programme (external to the district and the province), then the diffusion of this product to the satellite centres and staff and then the subsequent adaptation of the teaching materials of the programme, which were to be diffused during 2013.

Adoption process: In 2011, the YDC adopted the numeracy and literacy programme from Open Schools Worldwide.

Diffusion process: In the same year, 2011, the literacy and numeracy programme was diffused to five local YDC satellite centres. Children attended the classes in the afternoon and on weekends. The centre identified low levels of literacy amongst post-school youth and adults. It then started a library and literacy programme for school leavers and adults, along with reading groups to overcome the low literacy and numeracy levels evident in all five villages.

Adaptation process: The original course content was not always appropriate or meaningful to the local experience of the participants. Therefore, the centre realised it needed to adapt the material to make it more appropriate and suitable for local circumstances and experiences. In 2012 the centre started adapting the material. This involved the adaption of the various teaching guides used and the teaching materials for both the facilitators and the users. Diffusion of the adapted material was to take place during 2013.

7.3 Example 2: The Biogas Enterprise

The Biogas Enterprise (BE) is one that seeks to reduce the impacts of rural poverty through offering rural households biogas for cooking activities at a subsidised rate. The example shows that people from outside one's locality can bring in new knowledge and innovation for use by local people. A Nethelands based foundation sourced information and brought it into the operations of this enterprise.

7.3.1 Description of the enterprise and innovation activities

BE is a locally based non-governmental and non-profit organisation that constructs and operates bio-digesters. It was founded in 2007 and started as a pilot project. Its aim is to improve the standards of living in households in rural areas by introducing and making available the use of biogas to rural communities. These bio-digesters enable households to cook using the bio-gas instead of fuel wood. The main economic subsector that this enterprise operates in is the energy sector.

The bio-digester is an underground system consisting of chambers made of bricks and concrete and a connection of pipes. Cow dung is used to create the gas by adding water to ensure the bio-digestive process. A pipe separates the developed biogas from the cow dung bio-digester and another system of pipes transports it to the connected stoves located in households. The biogas cannot be stored for future use. The digesters are the organisation's property and not that of the households whose stoves are linked to the system. In the village the majority of households own cattle and as a result there is dung available for biogas production. Cow dung is also collected from surrounding villages, as households own cattle and keep them in kraals during the night, which makes cow dung available for collection in the morning. The digesters are filled with cow dung and water on a daily basis, to enable the digester process. One of the challenges to cow dung availability is that many households still use cow dung for the decoration of floors and walls inside and outside of their houses and other buildings.

7.3.2 Reason for innovation

The pilot phase of the bio-digester project was considered successful and there was a potential to expand and commercialise the biogas production and use. The innovation was the adoption of the business model and roll out to households after the pilot testing proved the idea to be practical. The households in the village were consulted through a survey and their willingness to use and purchase the biogas was assessed. The reasons for this change from wood fuel to biogas was mentioned by the BE manager, as biogas can remove the dangers of wood smoke to health; and in addition the women and children will have to spend less time on collecting firewood. Biogas used for cooking by rural households will also reduce deforestation caused by rural households regularly collecting firewood. One of the reasons for commercialising the biogas and not the bio-digesters is that households who do not own cattle may not be able to access sufficient cow dung for collection and thus may not be able to make use of their own bio-digester for biogas production. Similarly, the bio-digester is relatively expensive to build and might be outside the means of some households. A central bio-digester is used and maintained by the BE and it serves the various households wanting to make use of gas for cooking purposes.

7.3.3 Innovation value chain

Two innovation activities are identified in this case study. The biogas enterprise adopted a business model of commercialising biogas locally, following from a pilot study of the viability of implementing the product (bio-digester and biogas service). They also started training local people on how to construct the bio-digesters, how it works and can be connected to stoves for cooking purposes. They continue diffusing the knowledge about the bio-digesters by demonstrating its functioning and capabilities to school learners and others who visit the site. They also show these visitors how the biogas is produced from the combination of cow dung and water. So here the innovation activities are adoption and diffusion and further diffusion of information about the product, but not the product itself, although the generated gas is provided as an energy service.

Adoption process: The bio-digester was initially piloted in the area from 2007 and once this proved successful they adopted a business model of commercialising the biogas for sale to local households in 2012 (Notably about 5 years of local research and testing went into the product before it was made broadly available). The innovation to adopt a business model was part of advice from a network of Netherlands based enterprises and networks. The BE constructed digesters to produce biogas for cooking and the produced biogas is then sold to households near to the digester. The family pays a fixed price for this gas, which they can use daily for cooking. Households sign a contract with the Biogas Enterprise. The contract explains that households pay a fixed amount of money every month for the period agreed in the contract and in return the organisation assures that the households have sufficient gas for cooking at all times. The constructed digesters remain the property of the BE. The household survey was conducted to find out if the households were willing to use biogas for cooking and to sign an agreement with the NGO. The results indicated that the majority of the households would be willing to buy biogas and sign a contract. One of the reasons the BE conducted a household survey was to find out how much the households are willing to pay and the amount they can afford, since the project purpose was to improve the quality of their lives and did not intend to exploit them.

Diffusion process: Households that were contracted, as well as those that did not enter into an agreement to purchase the bio-gas, received training on how to construct biogas digesters. The households were trained so that they are able to construct their own bio-digesters in the future and produce biogas for cooking. This training is provided free. The experimental site where the first bio-digester was built for the pilot study is being used as a demonstration site for science learners from local schools and other people from outside the village. Youth are also encouraged to work closely with the manager to learn how the project and the system operate. The manager also noted that the aim is to have the local people running with the idea of biogas production for cooking and other purposes over the long-term.

7.4 COMPARISON OF THE ILLUSTRATIVE EXAMPLES

Do rural people benefit from innovations? Although the enterprises in both examples came from different sectors and economic subsectors, we find a strong theme of social innovation in both.

In the first example of the YDC three innovation activities occurred, and rural residents appear to have benefitted from these activities. More in depth research may illustrate differences in how and in what ways people benefitted. The YDC adopted a literacy and numeracy programme to help improve literacy and numeracy capabilities of children and school leavers in five rural villages in which it was operating. This was based on their pre-2011 interaction with members of these villages. The community benefited since there were no costs charged for children to attend after-school classes at the centre and the support by local educators can be assumed to indicate the value of the programme. Furthermore, the teaching material was adapted during 2012 to make it more appropriate for lived experiences of the children and adults in the local communities. The innovations are socially driven to benefit the community residents in need of improved literacy and numeracy skills.

In the second example, two innovation activities occurred. The biogas enterprise adopted a business model based on initial pilot research and consultation with the villagers over a period of five years. Despite the fact that a survey was conducted to find out how many of the households were willing to pay for the biogas, payment for the service means that those households that cannot pay are excluded from the service. To overcome this, the organisation trained, at no charge, local and surrounding villagers to construct biogas digesters, while learners from local schools and other visitors are able to visit the original experimental site at no cost and to learn about the bio-digester process and products.

The difference between the first and the second examples is that in terms of social benefits, in Example 1 most people who so desire can benefit from the services of the YDC should they wish to use these, irrespective of age, gender and class - as the services are basically free of charge. As the service was diffused to another four villages in the area they too benefit from these activities and also do not pay for the services. In the second example the adoption of a business model means that the service benefits only those households that can afford the service, particularly those that signed a contract to purchase the biogas. However, the shift to biogas might mean less deforestation or perhaps more wood fuel available for those who cannot yet afford to shift to biogas.

Why innovation? In the first example, the YCD's main objective or core function is to address some of the social problems facing the youth in rural communities. The introduction of the literacy and numeracy programme was aimed at addressing the problems of children and youth who cannot read and write adequately and those children who are facing difficulties with basic mathematical literacy. This example represents a social innovation in the narrow sense since it is a product (good or service)

that directly benefits the community at large. However, in the second example the focus is on providing services for which there is full cost recovery. The reason for the innovation was to recover costs and run a business, while simultaneously adding value to the wellbeing of some residents who are able to pay for the service. The primary purpose was to provide an improved energy service that if used would generate an income, improve the environment and improve local wellbeing by providing a cleaner source of energy for cooking and reduce time spent on gathering fuel wood. The consultation with the community was in a sense a marketing survey to identify whether or not there was a market for this source of energy in the area. Of course the technology of the bio-digester construction has been diffused but we have no evidence if this was adopted, by whom and what, if any, economic model has been used.

Innovation actor relationships: system versus network? The Youth Development Centre serves two functions for the local network of innovation actors. It sources external knowledge and diffuses it within the local system to the organisation's satellite youth development centres in the five villages. In other words, it has a brokerage role to some extent. This youth centre adopted a literacy and numeracy programme from an NGO based in Gauteng and thus outside of its immediate network. Then it diffused this product (material and service) locally to the surrounding villages, acting as an innovation source and means of diffusion. It also provided for the adaption of the service when local users identified this as necessary. We further observe the YCD's capability of absorbing new knowledge, improving on it and a willingness to share the knowledge with others, virtually free of charge, to ensure the direct improvement of their wellbeing. In the second example we observe the benefits of knowledge spill-overs to community members who are in a position to make use of such spill-overs. The establishment of the biogas digester was partially intended as a means of obtaining income and partially as a means of improving the quality of life in rural areas. This was achieved by getting local residents to switch from using firewood for cooking fuel to using stoves powered by biogas produced from local cow manure. However, community members and others also benefited from receiving the knowledge of constructing biogas digesters and understanding the workings thereof.

In the Mopani District sample, enterprises are mainly adopting innovations, followed by adaption. Inventions are not common. When invention does occur it is hardly ever followed by diffusion of the inventions; most likely due to the desire to retain the benefits of intellectual property for the commercial enterprises involved in the invention activity. IVCs will differ in each district, and also within each enterprise example and innovation types, although similarities will and do exist. Weaknesses and strengths of being able to innovate can only be understood when exploring the micro-environment (internal conditions) and the macro-environment (external conditions). The differences within the IVC become clearer when one unpacks the degrees of micro-level encouragement and macro-level support available, or the lack thereof in many instances.

8 MICRO OR INTERNAL ENVIRONMENT OF THE ENTERPRISE

This section provides a glimpse of the internal organisational environment of public, private and non-profit enterprises sampled in the Mopani District Municipality. Internal factors, such as the access to basic services, including water and electricity as well as access to resources such as infrastructure, scientific knowledge, educational facilities and skilled personnel are deemed likely to influence and enable the ability of enterprises to engage in innovation activities. Some enterprises, particularly those situated near the major towns, are likely to have access to a range of facilities even though they might not have ownership of these facilities, i.e. enterprises and organisations close to towns are able to access libraries and through libraries or the local post office they might access fax machines, copiers, computers and the internet. In other more remote areas Thusong Service Centres might be the source of accessing the Internet and online knowledge databases. The study was also interested in where enterprises most often carried out their innovation activities.

8.1 INNOVATION ENABLING ENVIRONMENT

The sampled enterprises in Mopani District Municipality vary in their core function and subsector of operation. As a result, they engage in a wide variety of innovation activities. The innovations are usually sector-specific and as a result, seldom crossover from one sector to another (in other areas this may well be the case e.g. low dose radiation X-ray machines used on mines are now used in the medical and health sector). While innovation in the district might largely be sector-specific, this does not suggest that the required resources are sector-specific. In fact, they are in many instances required by most sectors. Numerous resources are required and many of these cut across the various sectors and economic sub-sectors. For example skilled and unskilled labour is needed for both the mining and the agricultural sector (the skills are often of different types). These sectors also rely heavily on water and energy for their production although they often use these for different purposes and processes.

From Table 8.1, it is evident that most innovation activities of the sampled enterprises are conducted in business premises (31%) or in the community/at home (30%). Smaller proportions are conducted on farmland/fields (20%) and in manufacturing plants/workshops (14%). The greater share of public and private enterprise innovation activities take place in business premises. The larger share of NPO innovation activities occur in the community/local settlements (40%), as do a large share of public enterprise innovation activities (36%). The private enterprises dominate innovation activities conducted in business premises (38%) and in factories/manufacturing plants/workshops (22%).

In terms of access to basic services, Table 8.1 illustrates that around 80% of all enterprise types have access to electricity and running water. While more than 80% of the public and private enterprises have access to flush toilets, almost 40% of the NPOs do not enjoy such access. Perhaps more pertinent to innovation questions about accessing knowledge is the fact that most surveyed public

enterprises had access to a library facility, while less than a third of the private and NPO enterprises had such access. Out of the three enterprise types, public enterprises (17%) and NPOs (13%) had access to scientific laboratories. Public enterprises sampled had no such access. Although 90% of the public sector enterprises had access to computers, about three-quarters of private enterprises and slightly more than half the NPOs had such access. Virtually all enterprises (>90%) had access to cellular phones, while the public enterprises had the largest share (at 73%) of access to landline telephones. A similar pattern was evident for Internet access, with more than 80% of public enterprises having Internet access. On the other hand, only 64% and 38% of private and NPO enterprises, respectively, had access to the Internet.

Most public (81%), private (92%) and NPO enterprises (88%) indicated that costs involved in innovation activities are often a constraint in selecting and using innovations or applying new knowledge and processes. This can be seen in Table 8.1, with only 14 enterprises reporting that cost is not a factor in selecting and using innovations.

Table 8.1: Share (%) of enterprises with access to resources and facilities for innovation by enterprise type (N=122)

	Valid observations	Public enterprises (n = 11)	Private enterprises (n = 58)	Non-profit organisations (n = 53)
Main place of carrying out innovations				
Farmland or field	24	0	16	28
Business premises/park	38	45	38	21
Community/settlement/home	36	36	19	40
Factory/manufacturing/workshop	17	0	22	8
Other main place	7	18	5	4
Direct access to resources				
Plumbed running water	97	91	79	77
Flush toilets	92	91	84	62
Electricity	111	100	93	87
Library facility	44	91	33	28
Science laboratory	17	0	17	13
Computer	81	91	74	53
Landline	47	73	41	28
Cell phone	116	91	98	92
Internet	66	82	64	38
Cost a factor in selecting innovations				
Yes	107	81	92	88
No	14	0	17	8

Note: Valid observations refer to the number of non-missing values; n = the total number of observations/enterprises

In the analysis of the qualitative data, enterprises in Mopani District highlighted that one of the largest problems with the public sector services is a lack of provision of 'proper infrastructure' to maintain the innovations that have been introduced. This lack of 'infrastructure' is explained as a lack of access to basic services, such as water, roads and public transport, electricity, education and health facilities. The inadequacy of existing resources is viewed by local actors in the sample as hindrances to the innovation processes in the district. Another local resource that is considered inadequate is the local provision of information about innovation occurring at local, national and international levels, which may be of use to local actors. The majority of enterprises seem to rely on the Internet or their various networks to get the information needed to ensure that innovations are successful and can function in the local context. One of the biggest requests is for the financial support of innovation activities; this is usually explained as assistance from government to support a broader spectrum of innovation activities, types, actors and needs, i.e. innovation that is not sector, class or race bound, or which takes a narrow invention-only view of innovation.

According to some of the enterprises interviewed, many of the materials required for innovation activities are usually sourced from outside the district. On the other hand, access to knowledge is more readily facilitated by the access to relevant organisations and information obtained through the Internet. There appears to be a continuous need to import parts, accessories, machinery and materials into the district for innovation activities as well as to maintain innovations. This is said to slow down the innovation process and reduce the benefits thereof.

Despite the fairly high figures indicating access to basic service access in Table 8.1, there is a general dissatisfaction with government services by the sampled enterprises in the Mopani District. This dissatisfaction ranges from unequal access to resources and information and a general lack of disregard on the part of municipalities to deliver basic services to all; services which are deemed invaluable by the surveyed enterprises in the district. The lack of access to adequate infrastructure in the district is said to increase costs, contributing to the expenses involved in innovating. A lack of infrastructure is usually attributed to the local authorities at district and local levels, as well as authorities at the national levels.

While enterprises generally agree that the state does offer support to some aspects of their innovation activities, it appears as if the majority of the organisations lack the resources to innovate successfully and believe that government is responsible for this paucity, as many constraints are in the area of basic services and infrastructure, i.e. ICT, roads, electricity, education and facilities, etc. Surveyed enterprises in Mopani reported that they do not have sufficient access to transport systems, information or awareness of support for innovation activities. They believe that these three inadequacies hinder their innovative capabilities and reduce the scope of their innovative activities. The general perception is that when access to information and support is available it is sector specific

(agriculture, energy, ICTs), and increasingly the more commercial enterprises are favoured to receive innovation support.

8.2 Training and Skills Development

Human resources are deemed important to innovation activities. The survey instrument attempted to obtain quantitative data about skills believed to be important for innovation in the different enterprise types. Some qualitative information was also sought in attempts to make sense of the quantitative data. In Table 8.2 we see that less than one third of the enterprises employed unskilled labour. While no unskilled personnel were reported in the public sector, we see that 38% of NPOs employed unskilled labour. The larger share of enterprises (34%) employed personnel from the skilled category, with the public enterprise workforce having the largest share (55%) of such personnel. The public enterprises employed the greater share of highly-skilled employees (36%); while only the private enterprises (3%) and the NPOs (4%) employed professionals.

Table 8.2: Share (%) of enterprises reporting critical skills for innovation by enterprise type (N=122)

	Valid observations	Public enterprises (n = 11)	Private enterprises (n = 58)	Non-profit organisations (n = 53)
Critical skills for innovation activities				
Unskilled	35	0	26	38
Semi-skilled	27	9	19	28
Skilled	42	55	38	26
Highly skilled	9	36	5	8
Professionals	4	0	3	4

Note: Valid observations refer to the number of non-missing values; n = the total number of observations/enterprises Unskilled workers [zero- incomplete schooling]; Semi-skilled [Grade 12 + incomplete technical training- including short-term on the job training]; Skilled workers [completed technical diploma; relevant B-degree]; highly skilled [completed Honours Degree/ Post-Grad Diploma]; Professionals [Masters + Research Staff]

The qualitative data indicates that those skills considered important by enterprise representatives for the innovation process are not linked to the educational levels of the innovator and other actors in the enterprise but rather to the work that people carry out on a daily basis as the core functions of the enterprise. Skilled workers are considered to have both the 'know how, savvy and initiative' to offer insight and pragmatic understanding of the possible applications of innovations. The unskilled labour is understood to have some possible ideas, but that the actual innovation activities are left to people who can implement the ideas. In some of the formal enterprises it was indicated that innovation is derived top-down as well as bottom-up. This is perhaps the ideal but it is uncertain how this works out in practice. Employers who promoted this view were of the opinion that innovation can be achieved by two-way communication between the employee and the employer and that all employees, irrespective of their levels within the organisation/enterprise can contribute to innovation ideas.

Unskilled workers make up the second largest portion of the work force in the surveyed enterprises. In a few instances unskilled workers are indicated as having a role in the innovation processes. In such cases the unskilled labour force is seen as a source of insight that would not be accessible if they were not involved in the enterprises' most basic tasks. An example provided was that farmworkers, those working in the fields/farmlands on a daily basis, experience the working environment and its processes in a different manner to those people working in the offices and management. The workers are usually able to offer insight into ways of improving processes at the levels of the production system that they are familiar with. The respondent noted that the final decision was ultimately made at the management level of the organisation.

Skilled workers make up the largest share of workers in the sample. The influence of skilled workers on the innovation process is described as them being the individuals who offer 'fresh/new' ideas. Their insights into the innovation process appear to be more readily accepted by management, due to the assumption that the more knowledge or skills an individual has, the more innovative they will be and the more willing the enterprise (or its owners) will be to accept any new ideas this cohort might propose. According to the respondents, the most important group of people in the enterprise's innovative activities are the skilled individuals. This being said, the skill levels of workers within various enterprises are not an indicator of innovative activity or future potential to innovate. Observations in the field indicate that innovation takes place in many of the enterprises, whether or not the workers are skilled or unskilled. Innovation cannot be attributed to a single category of skill.

This is no to say that the skill levels are not to be considered valuable and make a contribution when understanding innovation in the sampled enterprises. More specifically, the formal skills level seems to affect the extent to which the enterprise can engage with other institutions and to strengthen relationships outside of the enterprise. For example, some companies with a number of skilled employees at the senior level can be more engaged with other organisations located outside of the local environment and the district. The example of Phantom Juices Inc. illustrates how this might happen. The respondent explained that Phantom Juices have had the opportunity to attend national events, from which they get many of their ideas for innovation activities. This has resulted from the ability of skilled employees to develop networks outside of the enterprise, both inside and outside of the economic sub-sector and across industries. The enterprise is also more inclined to send skilled workers to these events outside of the district because these workers are considered to have 'a long term interest in the company's success and are motivated to create new innovations'. While they are also the nodes within the network (and would need to be the point of contact) this strange rationalisation means that any networks that less-skilled personnel are involved in are considered unimportant for the enterprise.

Both the formal and informal enterprises surveyed expressed an interest to get access to various types of training that would enable them to be more innovative in the future, as this type of tanning

was believed to contribute to future growth in the profits and overall success in the enterprise's development.

9 MACRO CONTEXT - BROADER INSTITUTIONAL AND REGULATORY ENVIRONMENT

9.1 INTRODUCTION

The extent to which enterprises engage in innovation activities is also influenced by external factors. Institutional support from the state and other enterprises, including polices geared at supporting innovation in local areas and national and sector specific regulations, play a crucial role in influencing innovation activity. Furthermore, innovation networks also contribute significantly to the engagement of enterprises in innovation activities. This section presents quantitative and qualitative evidence of the macro context and the role of other institutions in facilitating the innovation process and environment.

9.2 INSTITUTIONAL AWARENESS AND INFLUENCES

The surveyed enterprises were asked whether or not they considered the support of other organisations (state and private) along with the national and sectoral regulatory framework necessary for their innovation activities. In Table 9.1 we see that most of the enterprises considered institutional support an important contributor to innovation activities. Interestingly, the private enterprises were less positive in this regard in comparison to the public and NPO enterprises.

The regulatory and policy environment in South Africa plays a crucial role in facilitating the operation of enterprises both at the local and national level. However, Table 9.1 indicates that only 18% of all enterprises (or 55% of public enterprises, 14% of private enterprises and 15% of NPOs) are actually aware of the national policies relating to Science, Technology and Innovation (STI). This is a concern given that all enterprises in the survey were involved in some type of innovation activity. Despite this low awareness of STI policies a much higher share (50%) of all enterprises are aware of state support for innovations: 73% of public enterprises; 38% of private enterprises; and 57% of NPOs. However, it is possible that the respondents confused normal state grant activities as part of the innovation support process, even if the grants are not directly linked to innovation activities. The trends regarding the application for state support are similar to the patterns of awareness of state support. Application for state support does not indicate if the applicants were successful in receiving state support, only that they had attempted this.

Table 9.1: Share (%) of enterprises needing institutional support and familiar with STI state policies by enterprise type (N=122)

	Valid observations	Public enterprises (n = 11)	Private enterprises (n = 58)	Non-profit organisations (n = 53)
Institutional support necessary				
Yes	103	100	72	94
No	19	0	28	6
Aware of SA STI policies				
Yes	22	55	14	15
No	100	45	86	85
Aware of state support for innovation				
Yes	60	73	38	57
No	60	27	62	40
Applied for state support for innovation				
Yes	56	55	29	62
No	64	36	69	38

Note: Valid observations refer to the number of non-missing values; n = the total number of observations/enterprises

Besides regulatory and policy support, institutional support also involves formal state support or state enterprises that assist private and NPO enterprises with innovation activities by providing information, training and skills, funding, research services or other support activities. These enterprises can be located at the local, provincial or national level. Respondents in the Mopani sample indicated that government departments and government development agencies played a role in supporting innovation activities. An example of a development agency operating in Mopani District is that of the Small Enterprise Development Agency (SEDA). Other enterprises that support local innovators are NPOs or non-governmental organisations (NGOs). Limpopo Business Support Agency (LIBSA), for instance, has been supporting a number of the smaller enterprises in the district. These agencies are considered important in the diffusion and adoption of new ideas regarding products, processes, arrangements, and marketing strategies - especially in the initial stages of innovation activities. They are also able to link the enterprises they support to other enterprises that can assist them, such as those involved in quality control, sector specific skills and also research agencies that assist with the development of products.

Table 9.2 on external organisational environment presents a summary of external factors that influenced the engagement of enterprises in innovation activities within the public enterprises, private enterprises and NPOs in Mopani District Municipality. There were a number of channels through which innovation knowledge flows between enterprises. These channels included interactions among enterprises; universities and public research laboratories; diffusion of knowledge and technology to firms; and movement of personnel from outside the district or province into the

local area. Most public enterprises (36%) used formal networks to source innovation knowledge. A smaller share of public enterprises used internal specialist departments, government service providers and tertiary and scientific knowledge organisations to source innovation knowledge. While no public enterprise reported using informal networks, 23% of private enterprises relied on informal networks to source knowledge in contrast to only 18% of such enterprises using formal networks. Among the three enterprise types, the private enterprises used Internet search engines to source knowledge while none of the public sector (and only 8% of NPOs) used this facility for innovation purposes.

Table 9.2: Share (%) of enterprises aware of and with access to innovations (N=122)

	Valid observations	Public enterprises (n = 11)	Private enterprises (n = 58)	Non-profit organisations (n = 53)
Innovation knowledge sources				
Formal networks	21	36	18	13
Informal networks	26	0	23	25
Internal specialist department	14	18	9	13
Self-experimentation	25	9	18	26
Internet search engine	16	0	21	8
Government service provider	7	18	5	4
Tertiary & scientific knowledge	4	18	0	4
Other know sources	8	0	7	8
New innovations mostly introduced into enterprise				
Yes	85	64	69	72
No	36	36	29	28
Offered variety of innovations				
Yes	92	91	74	74
No	28	9	24	25
Able to select innovations to use in enterprise				
Yes	99	73	90	74
No	19	9	21	16

Note: Valid observations refer to the number of non-missing values; n = the total number of observations/enterprises

Most of the sampled enterprises (85 or about 70%) introduced new ideas and knowledge from the previous sources into their innovation activities. About 72% of NPOs did so, followed by 69% of private enterprises, and lastly 64% of the public enterprises that participated in the survey. Almost all the public enterprises, about 92% of the public enterprises that participated in the survey, indicated that they are presented with a variety of innovations to choose from. Approximately 74% of private enterprises and 74% of NPOs reported that they are also presented with a variety of innovations to

choose from. A higher share of private enterprises (90%) was able to select innovations from the variety of innovations that were presented to them.

As the lessons from the illustrative examples in Section 7 suggest, innovation networks in local areas have an important influence on knowledge flows among small, medium and large enterprises. In addition, innovation progress largely depends on a complex set of relationships among enterprises producing, distributing, diffusing and applying various kinds of knowledge about innovations. The innovative performance of enterprises in Mopani District proved to depend on how enterprises relate to each other as elements of a rural network of knowledge diffusion, creation and use, as well as the technologies they use. Table 9.3 presents evidence of interactions among enterprises in a rural network. A high number of enterprises that participated in the survey formed part of an innovation network. Some enterprises were part of informal innovation networks; However, a very low share of private enterprises reported to be in an innovation network that is considered part of the national system of innovation. In the same table we see that most public enterprises (91%) were part of formal innovation networks. Only 22% of private enterprises were participating in formal innovation networks. Private enterprises and non-profit organisations participated more in locally based innovation networks than public enterprises did.

Table 9.3: Share (%) of enterprises participating in innovation networks and system by enterprise type (N=122)

	Valid observations	Public enterprises (n = 11)	Private enterprises (n = 58)	Non-profit organisations (n = 53)
Part of innovation network				
Yes	75	91	34	85
No	47	9	66	15
Type of innovation network				
Formal	58	91	22	66
Informal	17	0	12	19
Innovation network part of NSI				
Yes	34	91	10	34
No	41	0	24	51

Note: Valid observations refer to the number of non-missing values; n = the total number of observations/enterprises

The local support networks that have proved important in the innovation process are the collaborations between private enterprises within the same economic subsector; often occurring across provincial and district boundaries. An example of this is Phantom Juices Inc. The representative explained that the innovation process is determined by the collaboration with private enterprises in the same industry and that collaboration is crucial for innovation. Phantom Juices Inc. is a juice manufacturing and bottling enterprise that buys local fruits, makes juice from the pulp,

bottles the juices and then distributes the product at a national level. This enterprise's innovation involved the adoption of a product from the original plastic bottle by moving away from the typical 500ml hard-plastic bottle to a sack-like container/sachet that could hold 500ml of liquid. This was more durable and could be reused if needed. The container was cheaper than the 500ml bottle used by other bottling companies. This adoption was only possible due to the input (insight and equipment) from a nationally based enterprise within the bottling manufacturing sector. This collaboration between enterprises across provincial boundaries is a common (and probably necessary) occurrence in the innovation process among enterprises in the Mopani District sample.

Other bodies at the national and international levels are involved in the innovation activities in the district. Some examples are the collaborations between universities, from outside of the district and the province, and enterprises, industry specific associations (e.g. Citrus-Fruit Growers Association) that have national scope, sector-specific and innovation-specific research organisations (e.g. Du Roi Laboratories and the Citrus Research Institute that assist local farmers in Greater Tzaneen and elsewhere) and international funding agencies (e.g. Cannon Collins who have an educational trust for South African enterprises).

The innovation environment does not always involve external institutional support. In some instances innovation has taken place without the assistance from any of the organisations mentioned above. In these instances the innovation process has been influenced by the enterprise's desire to improve their processes, marketing strategies and products in and for the local context. When this occurs it is not an indication that an enterprise is functioning entirely on its own but rather that its innovation activity at that moment did not involve the assistance from other institutions but took place without collaborating with them during the specific innovation activities.

9.3 RURAL INNOVATION SYSTEMS

Based on the evidence generated from the sampled enterprises, the rural innovation system in Mopani District Municipality seems to be characterised by a number of interesting features. The evidence highlighted the importance of enterprise contacts and interactions among innovating enterprises, either informally or formally. However, in Mopani District Municipality reliance on informal networks by public enterprises for sourcing innovation and other innovation resources and support can be noted. More than half of the sampled enterprises (61%) are part of an innovation network, yet a relatively small share considers themselves to be a part of the national innovation system - a mere 25%. Private enterprises and non-profit organisations participated more in local based innovation networks than in national innovation networks. Among most enterprises, external networks outside the local area are considered of primary importance. The evidence also pointed to the importance of local peer-to-peer learning in all the three hubs sampled by fieldworkers during the pilot testing survey. Enterprise owners would visit another enterprise to learn about best

practices used in that particular enterprise. For example, in one area local farmers visited another farm to receive training from that farmer on how to use certain agricultural practices, e.g. manufacturing fertiliser out of available resources at virtually no cost.

Adoption and adaption are crucial innovations activities in Mopani District Municipality. Most enterprises source ready-made innovations and adopt them into the business; and more often improve on these adopted innovations to suit their needs, activities and their environment. This is evident from Example 1, presented in Section 7 of this report. Invention and diffusion of innovation activities are fairly limited among enterprises in the district. It was also noted that while adoption was often based on innovations developed outside of the area, the movement of locally developed or improved innovations from sites within Mopani District to other parts of the country or even globally was more likely to occur if the organisations were commercially oriented, formal and part of formal networks. Innovations developed or improved within the informal sector did not seem to move outwards as easily, despite their value. This state of affairs is perhaps due to the often simple nature of such innovations or the fact that they are largely unacknowledged because they occur in the informal sector.

Poor infrastructure and poor access to services are some of the limiting factors of engagement in innovation activities and contribute significantly to innovation costs. Over 80% of enterprises in all enterprise types reported that costs involved in innovation are often a constraint to innovation. Another contributing factor to innovation costs is that most associated materials come from outside the district and often the province. Public enterprises had much better access to some resources compared to private enterprises and NPOs. About 73 % of public enterprises had access to landline telephones. A similar pattern was evident for Internet access, with more than 80% of public enterprises having internet access. On the other hand, only 64% and 38% of private and NPO enterprises, respectively, had access to the Internet. Many enterprises may have the potential to innovate in rural areas but be limited by the availability of the various resources to develop and sustain innovations. The rural innovation system in Mopani District, in terms of those enterprises sampled, seems also to be characterised by a lack of general understanding and awareness of national innovation policies, regulation framework and institutions that make up the National System of Innovation in South Africa.

10 CONCLUSION AND LESSONS

This report provides preliminary findings on using the Rural Innovation Assessment Toolbox to map innovation activities among a purpose-built sample of 122 enterprises in Mopani District Municipality. To contextualise our findings and motivate some local development possibilities that investment in innovation might be able to increase, this report started with a brief overview of pertinent demographic and socio-economic information for Mopani. 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 (poverty rates, inequality measures and the Human Development Index) of the district generally fall below the provincial averages, suggesting relatively lower quality of life and living standards than the average person living in Limpopo. Looking at the sectoral composition of the district's economy, it is worth noting that tertiary services, followed by primary extractive activities (particularly mineral mining), dominate gross value added and economic growth. It is against this backdrop that this report has begun to explore the potential of innovation activities as a catalyst for human wellbeing enhancing local development.

Several high-level insights flow from the assembled evidence and deserve to be highlighted 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. This does not mean that the kinds of economic transactions these enterprises undertake always involves strictly formal contractual arrangements; for it is well-known that officially and outwardly formal organisations are active in multiple informal economic relationships and vice-versa. Another striking feature of these enterprises is that they are predominantly involved in tertiary services and primary sector economic activities (particularly agriculture, instead of mining). This pattern remarkably matches the sectoral distribution of gross value added and thus strengthens confidence in our findings despite the limitations in our empirical methodology explained at the beginning of the report.

Little is known about innovation in Mopani District, as an exhaustive and coherent picture of localised innovation actors and activities in this rural district does not exist. This study is an initial attempt at filling this knowledge gap and we are mindful of the fact that the documented evidence of innovation in this report makes up a tiny fraction of what might be occurring in reality. Nevertheless, it is a repository of policy-relevant information which did not exist prior to this study and can serve as a useful guide to policy interventions aimed at boosting local innovative performance, which ought to begin with knowledge capabilities and what enterprises within the district actually know (or do not know) about innovation.

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 and respondents were able to identify innovations within their enterprises. Interestingly, 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'. Given Mopani's relatively low levels of social and human development highlighted above, such evidence suggests that there might be merit in greater government investment in 'social innovation' because it opens the prospects for new ideas and practices to directly uplift the living standards of large numbers of people.

Alongside what enterprise representatives knew about innovation, a more pressing concern has to do with poor localised awareness of national innovation policies and government assistance to promote innovation at grassroots level. Approximately one out five enterprises self-reported an awareness of national Science, Technology and Innovation (STI) 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 - in every seven enterprises interviewed, six of held this viewpoint. 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. Why private enterprises would be averse to institutional support for innovation is difficult to answer and would probably begin with an in-depth case by case investigation of their opinions.

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 the authors 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 - hovering between 9% and 7% for the years 2011 and 2012. The virtual absence of invention is not surprising because the critical drivers of original knowledge and artefact creation are generally missing - as shown by the low-levels of self-reported access to scientific labs and libraries for innovative activities. Sampled enterprises rarely 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 was far more prevalent among enterprises and this stands in sharp contrast to invention. Despite tracking adoptions over what is considered a very restricted timespan of two recent years, 2011 and 2012 in this case, the evidence points towards more vigorous uptake of new ideas, practices and artefacts originally developed by other enterprises outside Mopani District. The two illustrative examples show that the two enterprises adopted innovations from outside their localities.

Overall, whereas two out five enterprises adopted innovations in 2011, this improved to three out of five in 2012, with the most active adopters being among non-profit and private enterprises.

As argued above, although the lack of appropriate infrastructure as well as other explicit and transaction costs might be typical barriers to adoption, the findings show that knowledge sharing and networking facilitate the adoption and use of innovations. In fact, 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. 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 - with no less than 70% of non-profits reporting this activity.

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. Like adoption, the sites of adaption are adequately resourced business premises, farms and manufacturing plants. 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 adaption but perhaps less so for leading-edge inventions. Institutional rules and regulations within the network rarely appeared to be prohibitive barriers to adaption, but cost is indeed a major impediment to this innovative activity, as is the availability of resources and infrastructure to sustain innovative activity.

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. In theory, at least, access to and use of critical resources – like reliable and user-friendly ICT services - boost diffusion activity. Notwithstanding the limited information on ICT access and usage, it is surprising to find that whereas two out of five enterprises have landline phone access, three out of five enterprises have access to functioning computers and Internet services which allow for visual innovation sharing methods. Moreover, one would expect dynamic interactions between diffusion and adoption (or adaption), but systematically mapping these connections would probably best be done through nuanced case studies.

To sum up, findings of this pilot study in Mopani District 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. Even though the cost of scaling up innovative activity is a major concern, the non-profit and private commercial enterprises that actively adopt and adapt rarely applied for government support for the dominant innovation activities. Reasons for this ought to be further investigated and must begin with aggregating the total value of government investment in innovation activities across this district. Strengthening learning capabilities of actors in the local innovation space, especially know-how of STI 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 District.

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APPENDIX ONE: RURAL INNOVATION ASSESSMENT TOOLBOX (RIAT) FEEDBACK SESSION TO MOPANI DISTRICT

GREATER TZANEEN MUNICIPALITY, TZANEEN

31 JULY 2013

7:30AM – 1:30PM

Workshop Agenda

7:30-8:00 Registration

8:00-8:20 Opening and Introductions

8:20-9:00 Rural Innovation Assessment Toolbox [RIAT]- Overview of Concepts & Methods

- What is RIAT?

9:00-10:30 Engaging with RIAT Evidence - Presentation & Open Debate

- What has the RIAT evidence revealed about innovation activities in Mopani?

10:30-11:00 Tea Break

11:00-12:00 Self-reflection & Horizon Exploration

- How to harness innovation for development in Mopani?
- Out-of-box thinking about localized innovation activities

12:00-13:00 Enhancing Rural Innovation Networks/Systems

- Learning from the evidence to fine-tune our 'rural innovation' vision
- Where do we go from this point forward?

13:00-14:00 Lunch

OVERVIEW

This was the first session of the process of reporting back on the pilot studies done as part of the RIAT project in four rural district municipalities. The aim was three-fold:

- Inform participants about the usefulness of RIAT, and give participants feedback about the findings.
- Encourage participants to reflect on the findings.
- Based on the 'pilot findings', facilitate an exploration of how to harness innovation for development (beginning with the identification of catalytic socio-economic activities).

The workshop was attended by 18 local participants from the district of Mopani. These participants represented private sector, government enterprises, government departments and the district and local municipality. Five members of the RIAT team attended and facilitated the workshop. Mr Thabo Radebe represented the Department of Science and Technology. The workshop was coordinated and hosted by the Greater Tzaneen Municipality. Due to some transportation delays the workshop started at 8:45am. Dr. Peter Jacobs chaired the workshop.

1. Welcome and introduction

Dr. Jacobs welcomed everybody and explained the purpose and process of the workshop, which followed the programme detailed above. Participants completed two attendance registers: one copy for the Greater Tzaneen Municipality and one for the RIAT team.

2. Presentation by Dr. Peter Jacobs: Rural Innovation Assessment Toolbox [RIAT] - Overview of Concepts & Methods

Dr. Jacobs highlighted the purpose of the RIAT pilot study in the four districts and reviewed some of the key concepts and the methodology and sampling frame used with regard to administering the mapping instrument in Mopani and the other three districts. He emphasised that the mapping instrument (survey) was only one of the tools and that two other tools were being developed as part of the RIAT collection. This self-reflection participatory interaction is part of the action component of the toolbox. These tools are to be further explored and developed in the next phase of RIAT. He pointed out that some of the activities taking place during this interactive session would assist the research team in developing the various tools. Subsequently, participant interaction is vital.

3. Q and A session for clarity purposes

One question about the scope and extent of the research in Mopani was raised but the answer was deferred to the next session. In addition to this, there was a comment by the LED officer - reflecting on their initial interactions with the RIAT team - that it took time for them to understand this 'new' way of looking at innovation. The commentator said that the presentation helped to clarify key concepts and the big picture behind this study.

4. Presentation by Mr Kgabo Ramoroka

Mr Ramoroka presented some of the findings from the mapping survey that had taken place in the district during February and March 2013. He highlighted the profiles of enterprises interviewed, the

innovation activities they were involved in and the types of innovations most common to the enterprises in the district. In particular, the adoption of products (goods and services) was most common. He also noted that few of the respondents had any prior awareness of the term 'social innovation' but that despite this there were a number of enterprises (individuals as well as companies) engaged in social innovations; particularly the public sector enterprises and non-profits.

5. Q and A session for clarity purposes

After the presentation there was opportunity for questions and the following queries/comments were raised by workshop participants:

- Were there any specific enterprises identified with constraints that needed attention? Agriculture and manufacturing have study groups that look at strengthening the sectors. It was suggested that the study groups might have examples of innovation to share.
- Concern was raised that 16% of enterprises were not registered with SARS and it was asked whether this was a representative sample as that would be a concern. Attention was also drawn to the fact that 16% of enterprises said they did not require institutional support for innovation and if there are possible reasons for this.
- The method of sampling was challenged in terms of whether it was representative of innovation in the district.
- A question was raised about whether there are existing institutions that support innovation activities given that the cost thereof was raised as a constraining factor.
- The concept of social innovation was discussed. It was suggested that there is a lack of awareness of the concept and of how it relates to sustainable livelihoods and that measures need to be put in place to ensure dissemination of this knowledge.
- The possibility of learning more about innovation cases from other districts was raised.
- The point was raised that normally people think of scientific innovation when talking of innovation and the RIAT initiative has highlighted that it can be much wider than this – even including an initiative such as the village bank that is being piloted.

The limitations and the purpose of the methodology was emphasised to ensure that participants were aware of why this particular methodology and sampling frame were used (snowball sampling via referral). Participants were cautioned that given the unknown number of innovators and innovating enterprises (formal and informal) in the district it was meaningless to use a random sample and thus inferences at the scale of the entire district municipality were not possible. In this kind of study, random sampling requires an exhaustive enterprise register with geographic stratification. It was stressed that the enterprises interviewed were only those that were identified as innovators after referral and subsequent screening by the research team. The percentages highlighted in Mr Ramoroka's presentation were to illustrate possible trends rather than definite shares of activities and innovation types.

An explanation of social innovation was provided to the participants and examples from the research were provided to illustrate how social innovation could link to livelihoods. However, it was noted that social innovations were mostly used to improve people's welfare and that the various types

evident in the district involved the use of products, processes and organisational arrangements. The example of the Thusong Centre network in Greater Tzaneen Municipality was discussed and the fact that the lack of integrated service delivery resulted in these centres being unable to provide the core services anticipated by rural residents. Even their secondary functions of ITC facilities were being underutilised. It was noted that introduction of innovations needed to be based on local requirements and also had to involve commitment from the different service providers. In the Thusong Service Centre example two service providers had never appeared at these centres and their offices had been vacant for several years.

6. Interactive session by Ms Brigid Letty

This session was facilitated by Ms Letty, with input from the RIAT team, especially during the break-away groups. In the initial plenary session, the workshop participants identified, from the range of sectors that could contribute to LED, those sectors most important and relevant to the group present.

To provide a basis for the session, Ms Letty asked participants to indicate their understandings of rural development/the purposes thereof. Responses were as follows:

- Alleviation of poverty (food security)
- Entrepreneurial development
- Job creation
- Sustainable living conditions.

It was agreed that these were important outcomes of rural development.

The two sectors finally selected were agriculture and forestry (focal area: emerging farmers) and conservation and natural resource management (focal area: being heritage tourism). These were also closely aligned with the vision of the municipality.

The participants then self-selected which group they wanted to attend to work through the set questions to explore how and where innovation would be most effective in these two sectors.
The two groups then worked collectively to respond to the following questions:

- How to harness innovation for development in Mopani District?
    - What are the challenges of the sector?
    - What opportunities for rural innovation to strengthen this sector?
    - Who is involved in the sector?
    - What examples do we have of existing innovation activities?

Once the activities were completed, the participants selected a representative from each group to present their findings.

7. Report back by participants on group work

Agriculture and Forestry

How to harness innovation for emerging farmers (land reform and others)?

- Finance (available but often provided before other compliances met)
- Water (licenses - everybody needs them to irrigate but few have them or are aware of this requirement).

What opportunities for Rural Innovation to strengthen this sector (actors and their activities)?

- Finance (NYDA and Land Bank) funding models - improvement
- Entrepreneurial development models – improvement
- To appoint service providers to show compliance (indicate what must be done to meet compliance requirements in agricultural sector).

Partnership model that allows people to access land through Rural Development (Land Reform) or through lease.

Who is involved in the sector?

- Commodity Associations (organisations)
- Financial Institutions
- DRDLR, Department of Agriculture, SEDA, GTEDA.

Tourism, including conservation and natural resource management

Heritage sites identified by group as main focus requiring innovation.

- Challenges?
  - Lack of marketing – promotion
  - Too many stakeholders focusing on one [institutional arrangement]
  - Underdeveloped – poor infrastructure and resources.
- Opportunities for rural innovation to strengthen the sector?
  - Development of websites – marketing
  - Clarity/integration of stakeholder involvement
  - Funding opportunities for infrastructure – signage, roads, electricity and water.
- Who is involved?
  - Communities, local municipalities and marketing agencies.

Examples (where innovative intervention is required)

- Baleni Heritage Site
- Modjadji
- Kruger [Masorini]
  - Website and Marketing Boards – created by the community
  - Diffusion through school competitions – Partnership with KZN Tourism NGO. ABSA sponsor
  - Open Africa Route – brochures
  - Story Telling and Narration training – DVDs.

8. Interactive session by Mr Tim Hart – most prevalent innovation activities and types in the Mopani District

Once the two groups had provided feedback on their discussions, Tim Hart wrapped up the session by asking two questions as part of the self-reflection process.

Firstly, participants were asked which of the main innovation activities (adoption, adaption, invention and diffusion) were most prevalent in the district. One respondent indicated that adoption was most common followed by diffusion, adaption and invention. The other participants agreed to this statement.

Participants were then asked to identify which is the most common innovation type (products – goods and services, processes, organisational arrangements and marketing strategies) encountered in the district. One respondent indicated that it is the adoption of products. Other respondents agreed to this. However, there was some confusion about adopting products for innovation versus processing agricultural products in the district that could be sold to improve income and thereby support local economic development.

9. Closure by Dr. Peter Jacobs

Dr. Jacobs summarised the morning's activities and outcomes, highlighting that it had allowed a preliminary investigation of how innovation could address challenges facing key sectors. He added that the RIAT team was now leaving the district municipality to consider how to implement some of the recommendations (i.e. taking innovations from the drawing board into reality). Although RIAT does not have resources to take the process forward, the session provided a strong basis for doing so. In terms of RIAT this would involve the use of various tools to undertake in depth case studies of the focal points identified in the meeting (financial models to support emerging farmers, village banking and community-based heritage tourism).

Dr. Jacobs added that for the DMs that were not part of the pilot, the next phase will be the development of these case studies for selected sectors/subsectors. He offered to make the RIAT team available if the DM could secure the necessary resources. This offer was positively accepted by the DM officials at the workshop.

Two final inputs were received from the participants in terms of lessons learnt. Firstly, that the respondents answering questionnaires sometimes do not express a need for support because they are unaware of their need for it.

Dr. Jacobs closed by saying that people had internalised the concepts shared during the workshop, which had allowed them to apply them to discussions about addressing development through rural innovation.