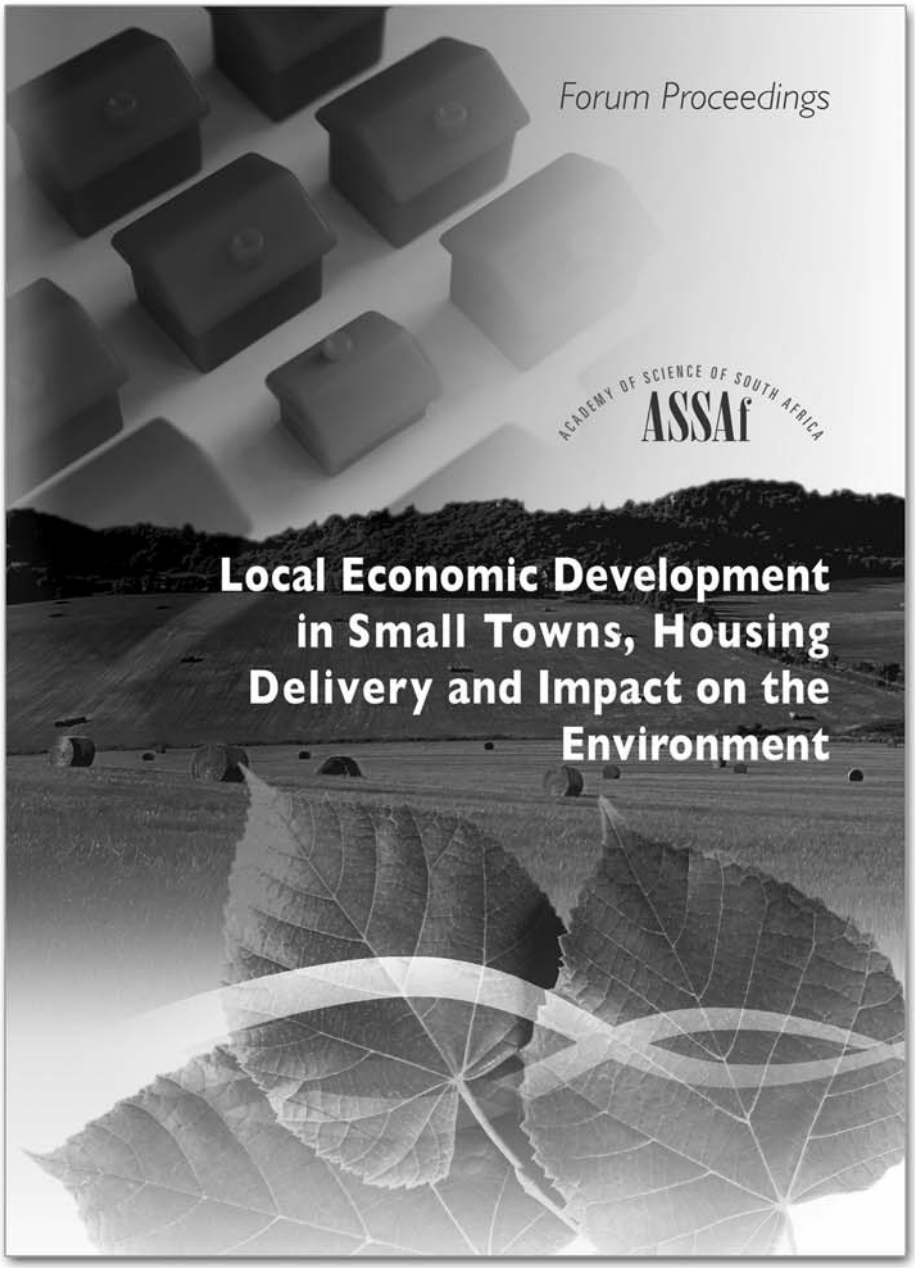

Forum steering Committee on Science for Poverty Alleviation
Academy of Science of South Africa

ACADEMY OF SCIENCE OF SOUTH AFRICA
ASSAf

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The Academy of Science of South Africa (ASSAf) was inaugurated in May 1996 in the presence of then President Nelson Mandela, the Patron of the launch of the Academy. It was formed in response to the need for an Academy of Science consonant with the dawn of democracy in South Africa: activist in its mission of using science for the benefit of society, with a mandate encompassing all fields of scientific enquiry in a seamless way, and including in its ranks the full diversity of South Africa's distinguished scientists.

The Parliament of South Africa passed the Academy of Science of South Africa Act,
Act 67 of 2001, *and the Act came into operation on 15 May 2002.*

This has made ASSAf the official Academy of Science of South Africa, recognised by Government and representing South Africa in the international community of science academies.

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Acronyms

AIDS	Acquired Immune Deficiency Syndrome
ASADI	African Science Academy Development Initiative
ASSAf	Academy of Science of South Africa
CDE	Centre for Development and Enterprise
CLARA	Communal Land Rights Act
CSfPA	Committee on Science for Poverty Alleviation
CSIR	Council for Scientific and Industrial Research
DPLG	Department of Provincial and Local Government
DST	Department of Science and Technology
DWAF	Department of Water Affairs and Forestry
EU	The European Union
GDP	Gross Domestic Product
GVA	Gross Value Added
HIV	Human Immunodeficiency Virus
IAC	InterAcademy Council
IAP	InterAcademy Panel
ICSU	International Council on Science
IDPs	Integrated Development Plans
ISRDS	Integrated Rural Development Strategies
KIDS	KwaZulu-Natal Income Dynamics Study
LEADER	A French acronym for 'Links between Actions for the Development of the Rural Economy'
MLL	Minimum Living Level
NASAC	Network of African Science Academies
NEPAD	New Partnership for Africa's Development
NSDP	National Spatial Development Perspective
NSI	National System of Innovation
NWGA	National Wool Growers' Association
PGDS	Provincial Growth and Development Strategies
PSLSD	Project for Statistics on Living Standards and Development
RDP	Reconstruction and Development Programme
RWH	Rooftop Rainwater Harvesting
SADC	Southern African Development Community
SALDRU	Southern Africa Labour and Development Research Unit
SEDA	Small Enterprise Development Agency
SMMEs	Small and Medium Enterprises
SOEs	State-Owned Enterprises
TWAS	Academy of Sciences of the Developing World
UNDP	United Nations Development Programme
USNAS	United States National Academies
WEALTH	Water, Energy, Agriculture, Land, Technology and Health

About ASSAf

The Academy of Science of South Africa Act (2001): A statutory body placed strategically in the national System of Innovation

The Academy of Science of South Africa (ASSAf) was inaugurated in May 1996 in the presence of **then President Nelson Mandela, the patron of the launch of the Academy.** It was formed in response to the need for an academy of science consonant with the dawn of democracy in South Africa: activist in its mission of using science for the benefit of society, with a mandate encompassing all fields of scientific enquiry in a seamless way, and including in its ranks the full diversity of South Africa's distinguished scientists.

The Parliament of South Africa subsequently passed the **Academy of Science of South Africa Act, *Act 67 of 2001*,** which came into operation on 15 May 2002.

ASSAf is thus the official national Academy of Science of South Africa, recognised by Government and representing South Africa in the international community of science academies.

Internationally recognised science academies are similar in that they are:

- **self-perpetuating,** with a merit-based membership that creates an upward aspiration for quality and excellence in scientific endeavours;
- **multi-disciplinary,** striving to represent science as a consilient continuum of knowledge, insight and practical solutions;
- **independent of government,** but can be funded by government for performing certain tasks;
- a **credible voice of science** to be heard on topics of national concern, independent of institutional or commercial linkages, obligations and agendas; and
- linked together in an **independent global community** that can mobilise scientific thinking, skills and knowledge across the world.

ASSAf places a particular emphasis on **excellence in the application of scientific thinking to the problems and challenges facing South African society.** It draws its membership from all population groups and from all scientific disciplines.

OBJECTIVES

Scientific thinking for the good of society

According to the Act the **objectives of the Academy** are:

- to promote common ground in scientific thinking across all disciplines, for example the physical, mathematical, life, human, social and economic sciences;
- to encourage and promote innovative and independent scientific thinking;
- to promote the optimum development of the intellectual capacity of all people;
- to provide effective advice and facilitate appropriate action in relation to the collective needs, opportunities and challenges of all South Africans; and
- to link South Africa with scientific communities at the highest levels, in particular within Africa, and further afield.

VISION

An engine of excellence in scholarship and intellectual cooperation

ASSAf aspires to be the apex organisation for science and scholarship in South Africa, internationally respected and connected, its membership simultaneously the aspiration of the country's most active scholars in all fields of scientific enquiry, and the collective resource making possible the professionally managed generation of evidence-based solutions to national problems.

MISSION STATEMENT

Clarifying the niche of the Academy

Like democratic South Africa in general, ASSAf aspires to play both a national and an international role, particularly with respect to the African continent. We see the Academy as usefully at arm's length from government and other organised sections of the state, comprising an assembly of excellent scholars from many disciplines who are well-networked both nationally and internationally, and have shown their interest in and capacity for promoting the development of a prosperous and a fully enabled society. Membership of the Academy (by election) is both an honour and an obligation to work individually and collectively (as the Academy) to ensure that decision-making requiring scholarly scrutiny and analysis is based on the best and most integrated understandings and insights available to the country. The Academicians thus represent an organised, independent but responsive scholarly voice to help guide the development of the country and its people.

The mission of ASSAf is thus to

- become increasingly associated in the mind of the nation with the highest levels of scholarly achievement and excellence in the application of scientific thinking for the benefit of society;
- consolidate its infrastructure and capacity, and to expand and mobilise the membership to ensure that scholars from a full disciplinary spectrum are available for its work, and that these are indeed both thinkers and doers, willing to put significant effort into the Academy's activities;
- embark on a programme of systematic studies of evidence-based issues of national importance, some proposed by government or other sectors, and some identified by the Academy itself;
- develop a sound and robust methodology for constituting consensus study panels, organising their work, including conferences and workshops, and producing authoritative reports that are well-disseminated and have significant impact;
- alternatively, constitute committees to oversee the Academy's work in broad areas of focus, usually expressed by the holding of national forums on particular key issues, leading to forum reports that have a significant impact on policy and practise;
- publish science-focused periodicals, especially a multidisciplinary journal of high quality (the *South African Journal of Science*) and a science magazine that will showcase the best of South African research to a wide national (and international) audience (*Quest - Science for South Africa*); and to promote the development in South Africa of an indigenous system of research journals of internationally recognised quality and usefulness;

- develop productive partnerships with other organisations, especially (but not only) the National Departments of Science and Technology, Education, Health and Agriculture; the National Advisory Council on Innovation; science councils; higher education institutions, etc., with a view to the building of capacity in science and its applications within the National System of Innovation (NSI);
- create new and diversified sources of funding for the sustainable functioning of an independent Academy;
- communicate effectively with the general and specific publics, as well as with partners and sponsors;
- develop a plan for the expansion of the activities of ASSAf in partnership with the national science academies of other countries, including contracted partnership with the US National Academies; and
- play a significant role in the international science system, particularly in Africa, through organisations such as the InterAcademy Panel (IAP) and the InterAcademy Council (IAC), the Academy of Sciences of the Developing World (TWAS), the International Council on Science (ICSU), as well as the Network of African Science Academies (NASAC), all in the context of the New Partnership for Africa's Development (NEPAD).

MEMBERS

Core asset of the Academy (each styled "MASSAf")

After nomination by four existing Members (at least two of whom do so from personal knowledge of the candidate), new Members of the Academy are elected in a secret ballot. The normal criterion for election is significant achievement in the advancement or application of science, and, in addition, Members should be persons who can be expected significantly to assist the Academy in achieving its objectives. By October 2006, ASSAf had over 250 Members drawn by self-categorisation from the earth, economic, life, mathematical, physical, social, technological, education, and agricultural sciences as well as the humanities.

COUNCIL

Steering Academy activities and taking responsibility

The affairs of the Academy are governed by a Council comprising 12 members, each of whom holds office for four years. This Council is elected by the Members every two years. For the sake of continuity, six members continue to serve a further term, while six new members are elected once they have been nominated according to the constitutional mechanism. To provide a better balance of race, gender or disciplinary area, the Council can co-opt additional members from persons who were nominated for election to the Council.

The office-bearers are, respectively, the President, two Vice-Presidents, a General Secretary and a Treasurer. Committees can be formed in order to carry out specific functions but each must be chaired by a Member of the Academy or, preferably, of its Council. Reports drawn up by its committees or ad hoc task group are approved by the Council before entering the public domain.

INTERNATIONAL CONNECTIONS

Crucial catalyst for Academy-type activities

ASSAf is an active member of the IAP, a growing organisation that embraces the national science academies of over 90 countries. The Academy of Sciences for the Developing World now has an office in Africa based in Nairobi, and the Network of African Science Academies, of which the President of ASSAf is a Vice-President, is also located in that city.

ASSAf became an "intense partner" of the US National Academies (together with the Nigerian and Ugandan Academies of Science) as part of the African Science Academy Development Initiative (ASADI), receiving a substantial 5-year grant to build its capacity for generating evidence-based advice for the government and the nation in general.

STRATEGIC PLAN AND POLICY DEVELOPMENT

The way to go

ASSAf has developed a comprehensive strategic plan following a thorough process for identification of its strengths, weaknesses, opportunities and threats. Through its governing Council, the Academy has developed policies and guidelines for its activities. The initiation of the ASADI partnership with the US National Academies prompted the generation, proposal and adoption of the following items:

- Guidelines for proposals of science-based topics in terms of the ASSAf Act
- Guidelines for proposals of science-based topics (project proposals)
- Guidelines for the appointment of consensus study panels and forum steering committees
- Policy on conferences
- Formation of a forum steering Committee on Science for Poverty Alleviation (first example of an ASSAf "Board")
- Panel for the Consensus Study on Nutritional Influences on Human Immunity, with special reference to clinical tuberculosis and HIV infection (first ASSAf consensus study).

ASSAf's strategic plan and the Academy's policies and guidelines are publicly featured on the ASSAf website at http://www.assaf.org.za.

RESEARCH PUBLISHING

The core of the quality assurance system for the dissemination of research findings

The Academy of Science of South Africa signed a contract in 2001 with the Department of Science and Technology (DST) for various activities in connection with the "strategic management" of research journals published in South Africa. The first component was a comprehensive study of the present and best-possible future role of research journals published in South Africa, now completed through the release of a full report in March 2006, with evidence-based recommendations, and a range of follow-up project integration and implementation strategies.

SAJS

Publishing the *South African Journal of Science*

The *South African Journal of Science* is the leading multidisciplinary research journal in Africa, and features a great diversity of original work by researchers throughout the country and abroad, concentrating on articles that have an appeal that is wider than that of single disciplines. Among the highlights of the volume published in 2005 were articles featuring the research at historically black universities supported by the Royal Society-NRF bilateral programme. The journal appears six times a year, and is accessible online as one of the e-publications managed by SABINET.

QUEST

Publishing *Quest*: A quarterly magazine of high quality, presenting science for South Africa

The Academy publishes the national science magazine *Quest: Science for South Africa* that was launched in 2004. *Quest* serves as a platform for communication about scientific research done in South Africa. It strives to showcase South African science in action, and is aimed at the broad scientific community, decision-makers, the public, students, and especially the senior grades at secondary schools.

Foreword

R M Crewe
April 2009

The Forum on Local and Economic Development in Small Towns, Housing Delivery and Impact on the Environment is the second to be convened by the Committee. The Forum was a one-day workshop, held on 27 June 2008; with Prof Cloete as the convener.

The committee is certain that the workshop will lead to further beneficial developments for South Africa. This Forum report is aimed to be used as a guide that would provide the methodology of future committee-led projects.

During 2005 the DST leadership proposed that ASSAf undertake a "Forum-type" study of science-and technology-based approaches to the alleviation of poverty in South Africa (one of the five new "missions" of the National R&D Strategy adopted by Cabinet in 2002). The ASSAf Council accepted the suggestion, and approved the establishment of a "Committee on Science for Poverty Alleviation". The Committee was formed by inviting all ASSAf Members to consider whether they would be willing to serve on the new Committee for an initial three-year term. Responses were received from a total of eight ASSAf Members who volunteered to serve on this Committee.

The DST leadership has proposed that ASSAf undertakes a "Forum-type" study of science- and technology-based approaches to the alleviation of poverty in South Africa. This is not a task that our present structures can easily perform; a spread of expertise and experience is needed to define the most promising sub-topics of the study; the most productive and feasible approaches to the study of such sub-topics, and the people in and outside the country who can play specific roles in the studies concerned. The situation highlights the shortcomings of our present internal arrangements.

The ASSAf Council has approved the establishment of its first internal structure as a pilot of further developments along the same lines. The structure is the "Committee on Science for Poverty Alleviation" (the broad topic of one of the five new R&D missions of the government), which is to be multi-disciplinary in its composition and functioning. This Committee will be formed by inviting all ASSAf Members to consider whether they would be willing to serve on the new Committee of approximately eight persons for a three-year term; if more than eight volunteer their services, a simple election will be held, the Academy as a whole voting on the basis of short citations for each candidate. Once elected, the new "Committee" will be asked to address the ways by which the request from the DST might be met on the part of the Academy (see the approved "Guidelines for Requested Studies by ASSAf"). The further processes will then proceed under the general supervision of the Committee, reporting to the Council itself.

The establishment of the Committee on Science for Poverty Alleviation (CSfPA) was based on the successful practice of the US National Academies of creating long-lived "Boards" to oversee their activities in focus areas such as "Global Health" or "Microbial Threats". Although ASSAf "borrows" models in this way from the US National Academies as its mentor within the ASADI project, adjustments to meet our needs are adopted when necessary, in order to support crucial functions of the Academy endeavouring to become a new and potentially important element in the country's science system. In this case, the CSfPA has the potential to be a successful "Board", but may use the Consensus Panel methodology to address particular issues, apart from the more typical-convened workshop approach.

This Forum on Local Economic Development in Small Towns, Housing Delivery and Impact on the Environment is the second in a series that are being convened by the ASSAf Forum Committee on Science for Poverty Alleviation.

Noting that poverty is a major issue of concern in South Africa; it is a very broad topic that can be addressed as a combination of selected elements. Local economic development in small towns, several cases on this important topic has been tried. The purpose of this workshop was therefore to bring all these cases together and critically address them as a whole. The plenary decided to structure the workshop to consider the following issues that would *guide the national strategy*: The population in small towns; Creating entrepreneurship culture amongst the youth; Infrastructure and resource development, e.g. railway lines, artisan schools, etc; and look at economic versus physical model approach. The outcome of the workshop is therefore not necessarily a strategy but rather a methodology of how 'local economic development in small towns' can be achieved.

Acknowledgement

The Committee on Science for Poverty Alleviation of the Academy of Science of South Africa (ASSAf) wishes to express its warmest appreciation to the presenters as well as all the individuals who gave their valuable time to provide information and advice to the Forum through their participation in the Forum. The workshop programme indicating names of all presenters is included as an Appendix.

The valuable leadership and guidance provided by Professor Eugene Cloete, Chair of the Committee, is gratefully acknowledged.

Prof Roseanne Diab for her leadership and support, Dr Chrisna du Plessis who made inputs in organising the workshop.

Mr Richard Clark (editor) and Kraft Information Design are warmly acknowledged for producing this publication.

The Academy staff Mr Thabo Radebe, Projects Officer and Study Director for this Forum, Dr Nthabiseng Taole, Projects Manager is thanked for their much valued contributions during the course of the Forum process and the production of this proceedings.

The support offered by all ASSAf staff and others who contributed to the success of this Forum is also greatly appreciated.

Finally, the Committee acknowledges the financial support provided by the United States National Academies through the African Academies Development Initiative (ASADI) Programme, as well as that provided by the South African national Department of Science and Technology (DST).

Introduction, T.E. Cloete

Committee Chair:
MASSAf and University of Pretoria

The Academy of Science of South Africa's Committee on Science for Poverty Alleviation is an independent nongovernmental body that supports one of the five new missions of the Department of Science and Technology (DST), namely science and technology for the alleviation of poverty. The Committee serves as an important interface between the research and policymakers.

The Committee organises interdisciplinary fora and seminars that bring together researchers from a variety of disciplines to:

(a) promote interdisciplinary dialogue and assist policymakers in making evidence-based decisions
(b) highlight areas of science that can have a direct and immediate application to the alleviation of poverty;
(c) identify opportunities for investing in research areas that have the best scientific prospects
(d) help identify research gaps and guide key research questions that remain unanswered.

Thus the Committee serves as an important conduit for transmission of new scientific information to the DST, as well as other Government Departments, and inform policy.

Currently there are millions of people with unsustainable livelihoods, living in poverty in South Africa. ***"A sustainable livelihood comprises the capability, assets (including both material and social) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining a resource base"*** (Carney, 1998).

There are a number of fundamental aspects that assist in creating a sustainable livelihood. These include: **W**ater, **E**nergy, **A**griculture, **L**and, **T**echnology and **H**ealth (**WEALTH**). WEALTH is dependent on water availability and provision, and is the first step towards creating a sustainable livelihood. The lack of access to safe water has immediate and negative consequences, creating a plethora of health and other socio-economic problems. Thus, water provision is fundamental for a sustainable livelihood.

Early migration patterns (during the last 120 years, following the discovery of gold in South Africa) were towards the mining industry in Gauteng that has since become the economic hub of South Africa. This has lead to a perpetuation of this migration pattern.

Rapid unplanned urbanisation has resulted from migration to metropolitan areas, and the informal settlements have mushroomed during the past 20 years, creating high levels of poverty and a lack of infrastructure. The largest numbers of people living without any sustainable livelihood are concentrated in six metropolitan areas. These are secondary and port cities, and large towns on the major national road grid. The estimated numbers for 2004 are: KwaZulu-Natal (5.3 million), Eastern Cape (4.8 million) Mpumalanga (2.9 million) and Gauteng (2.8 million) (e.g. *The City of Johannesburg has as many people living under the minimum living level as the whole of the Free State.)*

The question is whether uncontrolled migration to water-deficient regions with high economic activity is sustainable? The next challenging question is: what does the macro spatial development plan for South Africa look like, and what are the main drivers? Another question is whether it would be easier to create a sustainable livelihood around large metropolitan areas, or whether the focus should be on rural development, or a combination of both? Unfortunately these questions do not have simple answers. However, I believe that understanding and facing the problem is part of finding a solution.

The aim of this workshop has been to focus on the current macro-indicators with regards to the distribution of poverty in South Africa, and to try and understand the impact that local economic development in small towns could have on sustainable livelihood provision.

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Role of Agriculture in Poverty Alleviation, J. Kirsten

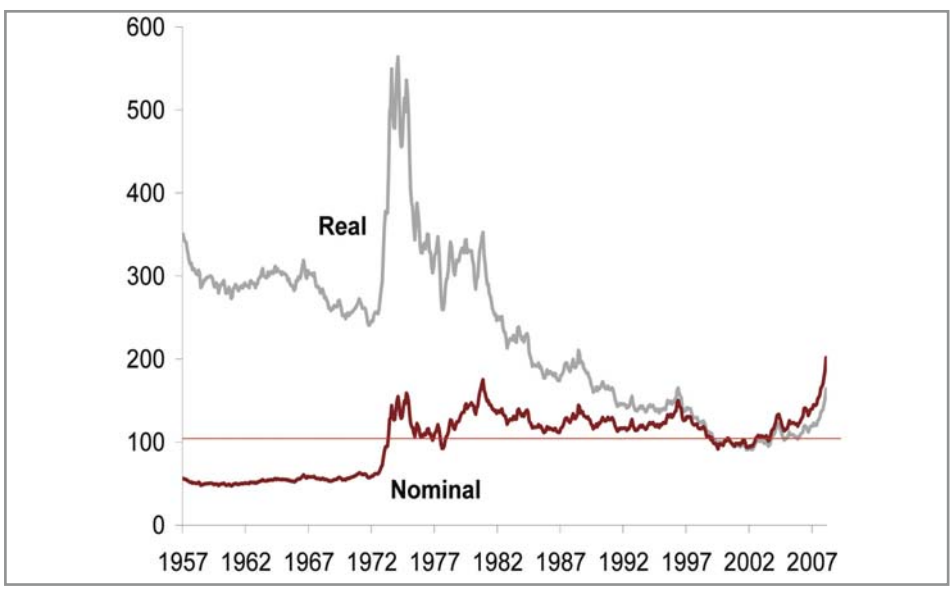
Department of Agricultural Economics, Extension and Rural Development
University of Pretoria

Introduction

World market prices for major food commodities such as grains, vegetable oils and dairy products are at an historic high, more than 60% above the levels two years ago. One cannot ignore the dramatic impact these rising trends in food prices will have on the poorest of the poor. Under these circumstances, it is increasingly asked what role agriculture plays in alleviating poverty.

As societies have urbanised and as politicians and academics increasingly focus on urban matters, there is less of an appreciation of the role of agriculture in the economy, and society, and its importance for the future of mankind. Urban biases, and the luxury of having food available, and having access to relatively cheap food for the last 30 years, (See Figure 1 showing the real decline in commodity prices) in a way has provided the basis for an intellectual and policy arrogance on agricultural and rural matters. As a result there has been little appreciation of agriculture's fundamental role, and its true development and poverty impact. This short report places the role of agriculture in historical perspective and then summarises the empirical evidence of agriculture's contribution to poverty alleviation.

Figure 1: Nominal and actual commodity prices: 1957 – 2007



Source: IMF

The debate over the role of agriculture in the process of economic development can be traced back to the physiocrats in the 18th century. Of the earliest proponents of agriculture, the physiocrats, argued that of all economic activities, only agriculture yields a surplus and that it is the "*sole productive activity*". The role of agriculture was further argued by Thomas Jefferson, who viewed '*the farmer [as] the sole foundation for an American democracy*' and "*agriculture as a nation's wisest pursuit*".

The advent of industrialisation and urbanisation in the 19th century changed this place of honour for agriculture. Analysis by historians and institutionalists formed the basis for the view that agriculture has become a declining sector, a "*black box*" that contributes labour, food and perhaps capital to the essential modernisation in industry. According to these theorists, agriculture needed no modernisation policies, as it was a naturally declining sector. Thus arose what has been referred to in many circles as the general neglect of the agricultural sector in many parts of the world. One can easily argue that the world is now paying the price for this reality, through experiencing a food price crisis.

Economic transformation and the declining share of agriculture

The natural decline of agriculture is not a paradox, but can be linked to its decline in relative importance in the face of growing, transformed and more diverse economies. Agriculture's percentage of GDP in South Africa has consistently declined from 20% to 2.8%. The first reason for this natural decline is income elasticity of demand. These measures the responsiveness of the quantity demanded of a product to the change in the income of the consumers demanding that product. With an income elasticity of between 0 and 1, expenditure on essential food products may increase with an increase in income, but not as rapidly as the income component, so the proportion of expenditure on these goods falls as income rises. A further reason for agriculture's decline is the impact of technology on agro-food products. Improved technologies have led to improved yields that have put downward pressure on commodity prices. Lower prices usually translate into lower income, which also explains a slower growth in the total value-added component of the agricultural sector.

Despite this decline in agriculture's relative share of GDP, there remains a strong link between agricultural growth and economic growth. Firstly, an increase in agricultural production leads to a decline in the price of agro-food products, which in turn has a deflationary impact. The sector is also an important contributor to a country's foreign exchange earnings, and allows for resource transfers with productivity increases. In rural areas, agriculture increases rural incomes, stimulating demand for other goods in the economy.

Apart from these broad economic impacts, agriculture plays a particularly important role in the economy of rural areas. More specifically, agriculture leads to a reduction in poverty by raising household incomes. It also leads to an increase in food production, which in turn enhances household food security. Agricultural activities in rural areas, furthermore, promote productive resource use and play an important role in promoting environmentally sustainable practices. It also stimulates income diversification and provides for social viability.

The agricultural growth-poverty relationship

A systematic investigation of the agricultural growth-poverty relationship requires identification of the main channels through which agricultural growth impacts upon poverty and an understanding of the conditions under which these channels operate effectively. The main channels through which agricultural growth can potentially contribute to poverty reduction are (Bresciani and Valdes, 2007):

(i) a general equilibrium effect through the increase of unskilled labour wage rate and employment
(ii) an increase in smallholders' income
(iii) higher agricultural output leading to lower food prices
(iv) forward/backward linkage effects which stimulate non-farm income growth and investment in agro-industries and other downstream activities.

Empirical evidence on agriculture's pro-poor role

The role of agriculture in South African livelihoods has been the subject of debate, recorded in the two-volume collection edited by Lipton *et al* (1996). While some argue that agriculture offers some prospect of reducing unemployment, others are concerned that the promotion of small-scale agriculture may become unsustainable if pursued too vigorously. Although this debate remains unresolved, studies conducted in South Africa provide a starting point from which to examine movements into and out of agriculture, as well as a way of assessing the changing poverty status of those involved in such movement.

In 1998, a consortium of South African and international researchers revisited some 1100 households, first surveyed in the KwaZulu-Natal province as a part of the well-known Project for Statistics on Living Standards and Development (PSLSD), undertaken by SALDRU in 1993. The KwaZulu-Natal Income Dynamics Study (KIDS) is a panel study that has offered unique insight through the collection of survey data over a five-year period spanning South Africa's transition, the introduction of many policies intended to reduce poverty, as well as the beginning of rapid HIV/AIDS infection. Triangulating different methodologies, a sub-sample of households were revisited in 2001 using qualitative methodologies for research (See May, 2000 and Kirsten *et al*., 2007).

The results of these studies found that KwaZulu-Natal households involved in agriculture are less likely to be in the poorest categories, and that those that had never been involved in agriculture were concentrated in the 'structurally poor' and 'structurally downward' groups. Significantly, 37% of households who had participated in agriculture fell into the 'never poor' group. The data indicate further that those permanently involved in agriculture are less likely to be 'structurally downward'.

A further study by Hendriks and Lyne (2003) has found that an increase in farm income has the potential to stimulate economic growth in the communal areas of KZN, but a considerably lower-than-expected growth arises from the small-scale agricultural sector. Kirsten *et al*. (2007) state that with an increase in export earnings in the Western-Cape,

rural household income increased relatively more than that of urban households. Finally, Kirsten *et al.* (1998) found that improving agricultural productivity in less-developed areas of South Africa improved household and child nutritional status.

Apart from the South African evidence to this effect, the World Development Report (2008) concludes that agriculture has special powers in reducing poverty. Drawing on evidence from China, India, Latin America and Ghana, it found that growth in agriculture reduces poverty twice as effectively as growth in other sectors. It cautions however, that there is one important requirement, namely, that productivity, profitability and sustainability of agriculture need to be improved. This can be achieved by improving incentives for public investment, the functioning of markets and access to financial services and inputs. Innovation through science and technology needs to be promoted, and the performance of producer organisations needs to be enhanced.

Conclusion

It should be emphasised that the major anti-poverty role of agriculture lies in its role in stemming a rise in food prices. This remains a strong argument for investment in agricultural research, agricultural support systems and rural infrastructure, specifically roads.

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The National Spatial Development Perspective (NSDP) and assumptions on small town economic investment by government, M. Oranje, E. van Huyssteen and C. Meiklejohn

Background

The Academy of Science of South Africa, as part of its commitment to supporting government's drive to alleviate poverty, organised a workshop entitled "*Local economic development in small towns merged with housing delivery and (its) impact on the environment*"[1].

We were invited to make a presentation at the workshop, setting out ASSAf's view of the position of the National Spatial Development Perspective (NSDP; the Perspective) on investment in small towns to grow their economies, create jobs and alleviate poverty.

The core argument

We have suggested that the NSDP does not in any way rule out investment in small towns, per se. According to them, what matters from the perspective of the NSDP is whether an area has the potential to grow economically in a sustainable way, create jobs and alleviate poverty. If a small town has such potential, there is nothing that precludes such investment. However, the NSDP was not adequately developed to determine where to invest what, when and for whom. It was more able to assist politicians in making hard investment choices within a world of growing resource-scarcity. It *could very well be that small towns would not be on the top of the prioritisation list when choices have to be made, as there are larger towns and cities with more development potential, and greater numbers of people living in poverty.* Concluding, it would be wrong to argue that there is, or could be something like the stand-point of the NSDP on small towns. What can be said, given that the NSDP seeks to ensure the "greatest bang for government's limited public buck", is that it would be in conflict with the Perspective if government was to neglect large places with their large populations and large economies, and instead make large investments in small towns, with their small numbers of people, and small economies. *Small investments in small places would clearly be more in sympathy with the NSDP-logic, unless of course a particular small town actually had huge development potential that was of national significance, and would warrant large investment.*

The more detailed argument

One: Notwithstanding the many advances made by government in the last 15 years of democracy, poverty remains a major challenge in South Africa. Poverty-alleviation and eradication is not a theoretical exercise in target-setting, but is crucial for improving the quality of life of all South Africans, and securing the long-term future of the country. It is

[1] Hosted on 27 June 2008 at the Department of Science and Technology, Pretoria.

generally accepted that shared, inclusive and sustainable economic and human growth and development will contribute towards alleviating poverty. As government has limited resources, it needs to invest these wisely and with maximum impact to alleviate poverty as objective.

Two: The NSDP was prepared by the Presidency, and adopted by Cabinet in January 2003. An updated 2006 version was released in May 2007. The NSDP assists government in *confronting three fundamental planning questions*, given its stated objective of addressing poverty, growing the economy, creating jobs and promoting social cohesion:

- Where should government direct its investment and development initiatives to ensure sustainable and maximum impact?
- What kinds of spatial forms and arrangements are more conducive to the achievement of our objectives of democratic nation-building and social and economic inclusion?
- How can government as a whole:
  - Capitalise on complementarities and facilitate consistent decision-making?
  - Move beyond a mere focus on integration and coordination procedures to establishing processes and mechanisms that would bring about strategic coordination, interaction and alignment to engaging and moving onto real, substantive aspects?

Three: The NSDP argues that spatial inequality is not a uniquely South African phenomenon. According to the Perspective, perusal of international literature shows that spatial inequality is a product of growth, and the dynamic qualities of areas are developed historically and culturally over a long period of time. Most countries have extreme spatial inequalities. So for example, 50% of the Gross Domestic Product (GDP) of the USA is produced on 2% of its space and 82% of the GDP of the EU is produced on 36% of its land area. The desire to obtain convergence between developed and undeveloped, or so-called "lagging regions", is therefore also not a uniquely South African phenomenon. International practice illustrates that convergence between developed and undeveloped regions takes a long time. It took the southern states of the USA 100 years to reach a similar level of economic development as those in the north, with the average rate of conversion between regions and countries with unequal spatial economies stated to be at about 2% a year, or less. The major difference in the case of South Africa is that draconian apartheid measures were used to keep the majority of the population away from the areas that offered the most economic opportunities, primarily urban South Africa.

Four: South Africa needs to ensure shared, inclusive and sustainable economic development and growth in order to eradicate the apartheid inequalities between people. However, as the NSDP argues that to pursue this goal without a plan would not have a desired outcome. As indicated by the Perspective, international case studies and regional development theory clearly demonstrate that unfocused infrastructural spending and human resource development does not improve GDP growth[2]. *Regions that already have some economic success are more likely to grow than other regions*. This is not merely because of agglomeration advantages, but also as individuals, firms, industries and regions generate mutually beneficial learning and learning opportunities and conditions. Success in terms of significant impact on increased, sustainable and shared growth is thus achieved through focused and plan-led investment.

[2] In line with international practice the NSDP uses GDP as an indicator for economic development and physical access to areas where GDP is generated as an indicator of at least an increased accessibility to income generating and livelihood creating opportunities.

Five: The NSDP makes five assumptions regarding shared and sustainable economic growth:

- Location is critical for the poor to take advantage of opportunities for growth, i.e. poor people located in economic centres have a greater opportunity to gain from economic growth than those located further away.
- Areas with demonstrable economic potential provide greater protection to the poor than those without, due to greater diversity of income sources.
- Areas with demonstrable economic potential are most favourable for overcoming poverty than areas without.
- Poor people make rational choices about relocating to areas of opportunity.
- Government needs to ensure that poor people are able to benefit fully from growth and employment in these areas.

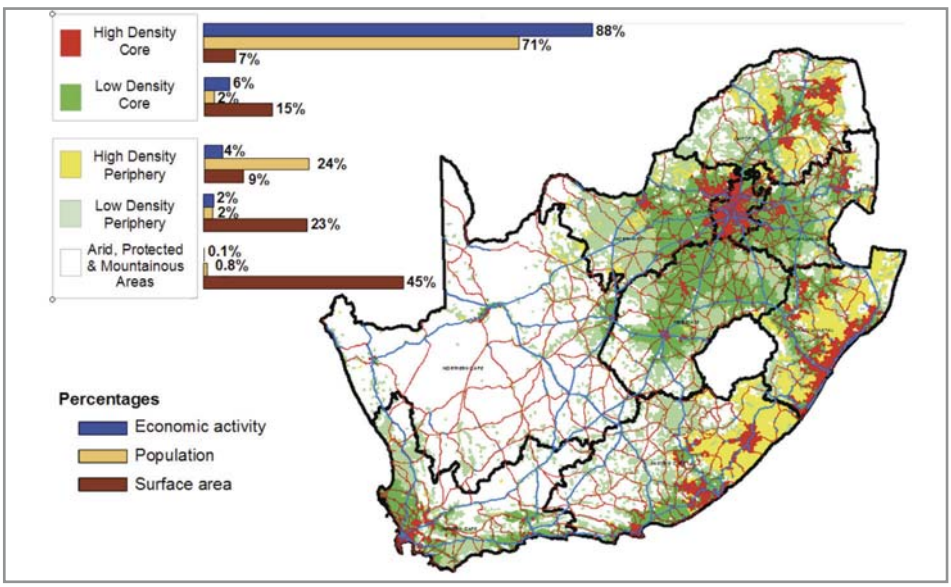
Six: The NSDP puts forward a set of five normative principles to be considered when making decisions on infrastructure investment and development spending, in and between all three spheres of government:

- *Principle 1:* Rapid economic growth that is sustained and inclusive is a pre-requisite for the achievement of other policy objectives, amongst which poverty alleviation is paramount.
- *Principle 2:* Government has a constitutional obligation to provide basic services to all citizens (e.g. water, energy, health and educational facilities) wherever they may reside.
- *Principle 3:* Beyond the constitutional obligation identified in Principle 2 above, government spending on fixed investment should be focused on localities of economic growth and/or economic potential in order to gear up private sector investment, stimulate sustainable economic activities and create long-term employment opportunities.
- *Principle 4:* Efforts to address past and current social inequalities should focus on people, not places. This could include fixed capital investment to exploit the potential of those localities where there are both high levels of poverty and demonstrated economic potential. In localities with low demonstrated economic potential, government should, beyond the provision of essential services, concentrate primarily on human capital development by providing social transfers such as grants, education and training and poverty-relief programmes, and reducing migration costs by providing labour market intelligence so as to give people better information, opportunities and capabilities to enable people to relocate, if they chose to, to localities that are more likely to provide sustainable employment and economic opportunities. In addition, sound rural development planning, aggressive land and agrarian reform and expansion of agricultural extension services are crucial.
- *Principle 5:* Future settlement and economic development opportunities should be channelled into activity corridors and nodes that are adjacent to, or link the main growth centres in order to overcome the spatial distortions arising from apartheid. Infrastructure investment should primarily support localities that will become major growth nodes in South Africa and the SADC region, to create regional gateways to the global economy.

Seven: The NSDP provides a perspective of the national space economy (given current and available data) at a national level. In doing so, *nationally significant* areas of economic development potential and need are thereby identified. Since the publication of the NSDP, this national perspective has been supplemented with further spatial economic analyses for other policy initiatives, albeit with the NSDP principles as a frame of reference.

What follows are data sets from the NSDP, and from further analyses.

Map 1: The South African space economy analysed in terms of population concentration and accessibility (Source: CSIR, GAP2 2006)

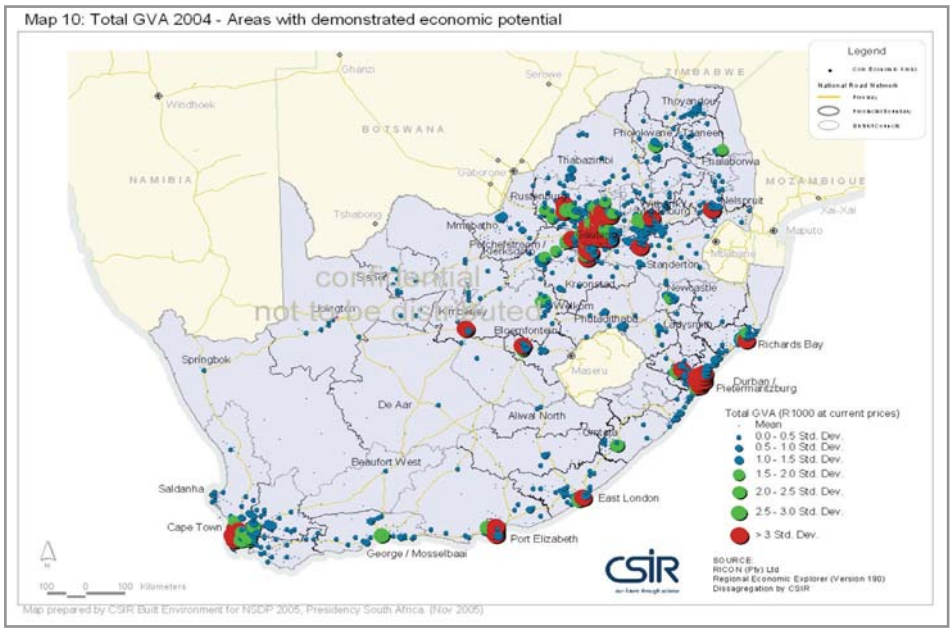


Source: CSIR 2006a Geospatial Analysis Platform, Department of Science and Technology, 2008

Map 1 indicates the distribution and location of people living in poverty, calculated by using the number of people living under the so-called Minimum Living Level (MLL) as an indicator, and economic activity, using Gross Value Added (GVA) as an indicator. The red indicates the densely populated and developed areas, with the green indicating lower but still relatively densely developed. Both the red and the green indicate areas are highly accessible to large numbers of the population. The yellow indicates areas that are also relatively densely populated, but much less accessible. The difference in population numbers and especially economic activity within these respective areas clearly illustrates where proven economic potential, as well as large numbers of people living in poverty and need are located, as well as those areas that have better accessibility to both economic and service opportunities. It clearly illustrates the concentrated nature of the South African space economy.

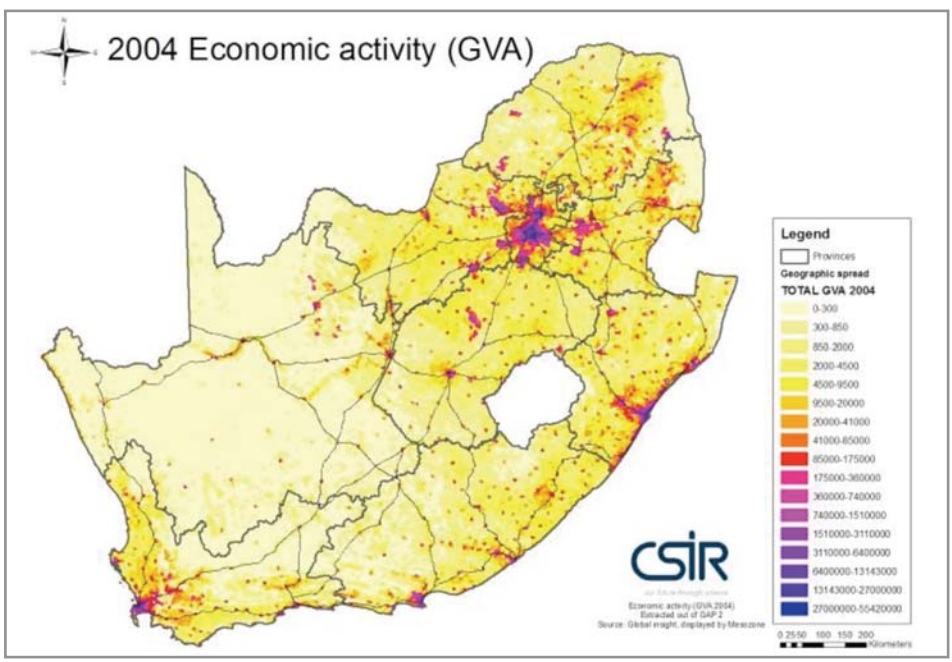
Illustrating very similar patterns, **Map 2A** provides an indication of the relative distribution of economic activity and potential (using standard deviation of GVA as an indicator of relative distribution of economic activity and potential). **Map 2B** illustrates the geographical distribution of economic activity.

Map 2A: Areas with demonstrated economic potential: Relative concentrations



Source: CSIR, Built Environment 2006b (map prepared as part of the update of the NSDP, 2006)

Map 2B: Areas with demonstrated economic potential: Geographical distribution



Source: CSIR 2006a Geospatial Analysis Platform

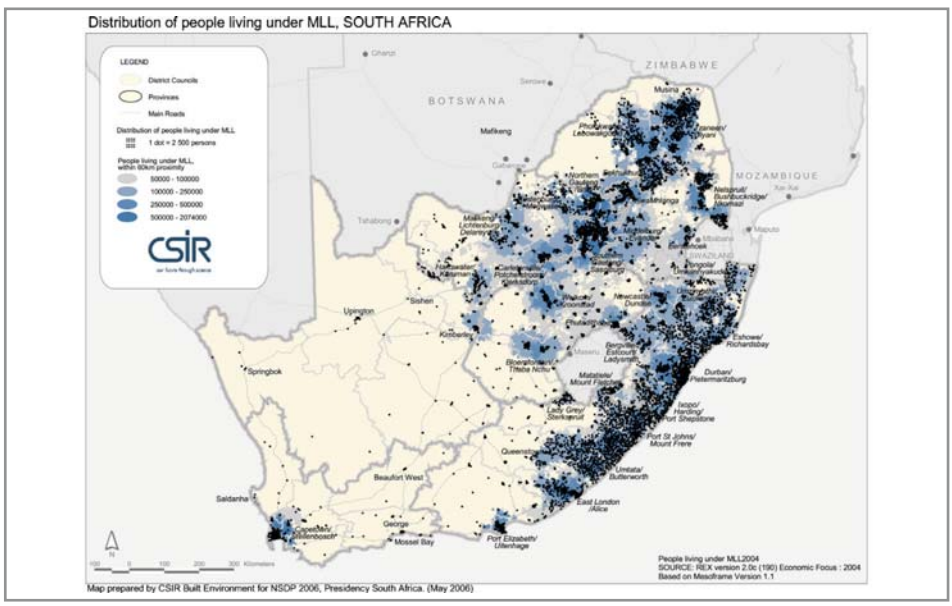
The impact and potential in the areas with concentrations of nationally significant development opportunities is highlighted with the fact that they are also the same places that:

- House the largest number of people and especially large concentrations of the poor, namely people living under the MLL (See **Map 3**);

- Have significantly high levels of both formal and informal employment (See **Map 4**);
- Provide access to economic and livelihood creating opportunities (See **Map 5** for an indication of access to economic activity and income as a key indicator of livelihood opportunities);
- Largely correspond to the location of functional city-regions, cities, major towns (See **Map 6**) and also resource-rich areas in the country.

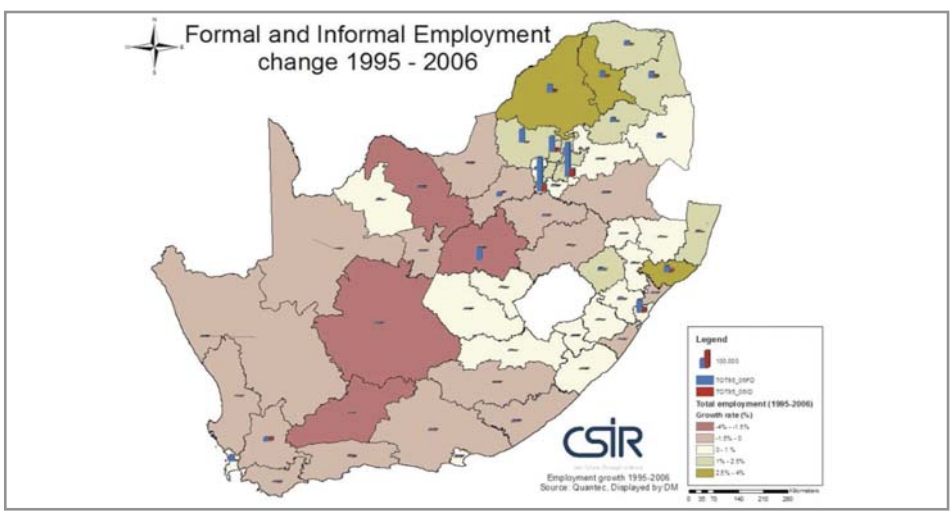
The magnitude of differences between these areas of concentration and the vast areas of the country with only locally significant economic opportunities, are starkly evident.

Map 3: Geographical distribution of poverty



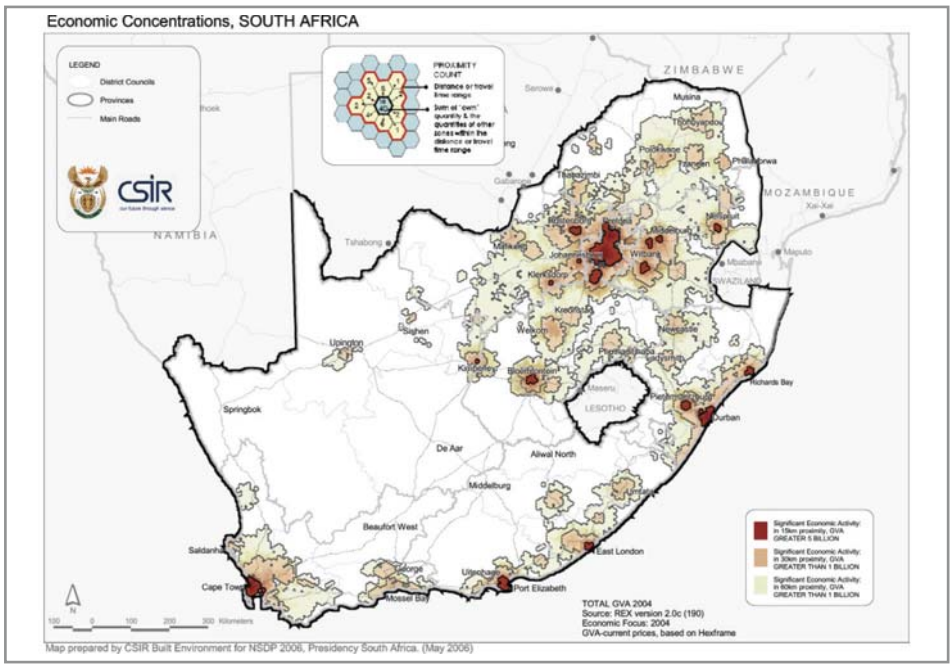
Source: CSIR, Built Environment 2006b (map prepared as part of the update of the NSDP, 2006)

Map 4: Formal and informal employment trends (1995-2006)



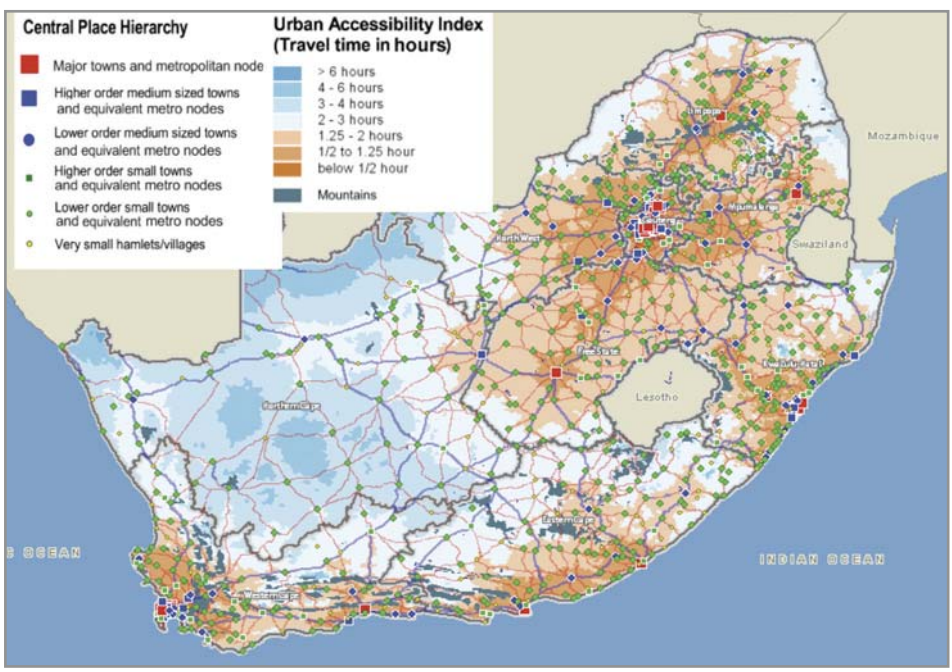
Source: Department of Science and Technology, 2008

Map 5: Access to economic opportunities and concentrations



Source: The Presidency, 2006

Map 6: Accessibility in relation to the hierarchy of towns

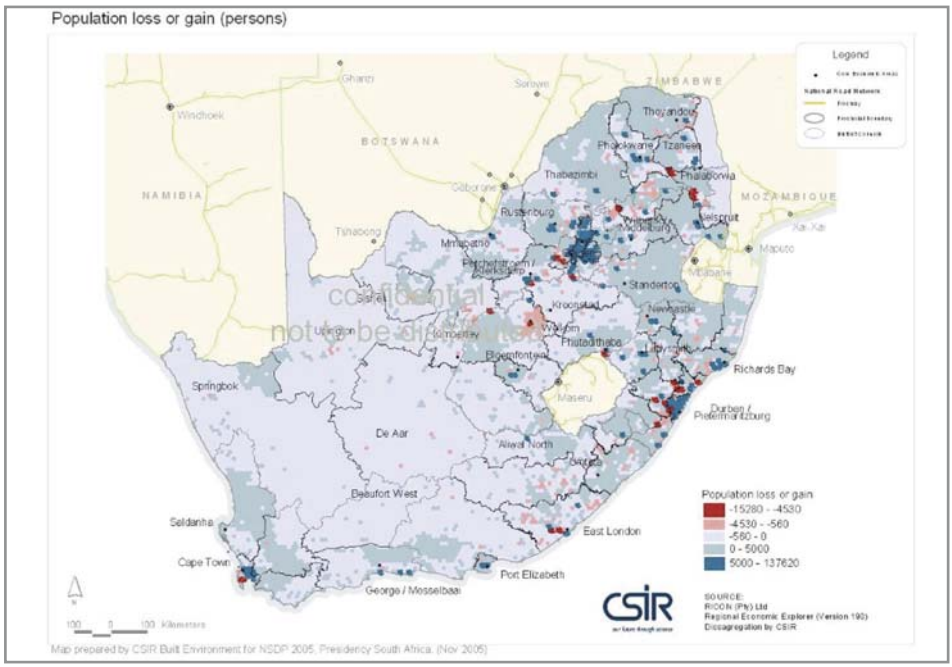


Source: CSIR 2006a Geospatial Analysis Platform

Eight: Not only the current state of development, but also key trends and temporal changes within the space economy have cardinal importance. The NSDP indicates that estimates of more than three million South Africans (almost 1 in 15) moved between districts between 2001 and 2006 (34 district municipality areas experienced a net emigration in this period). Larger towns and cities experienced a general net gain of people, while rural areas had a loss (See **Maps 7a** and **7b**). The key migration trends can be described as:

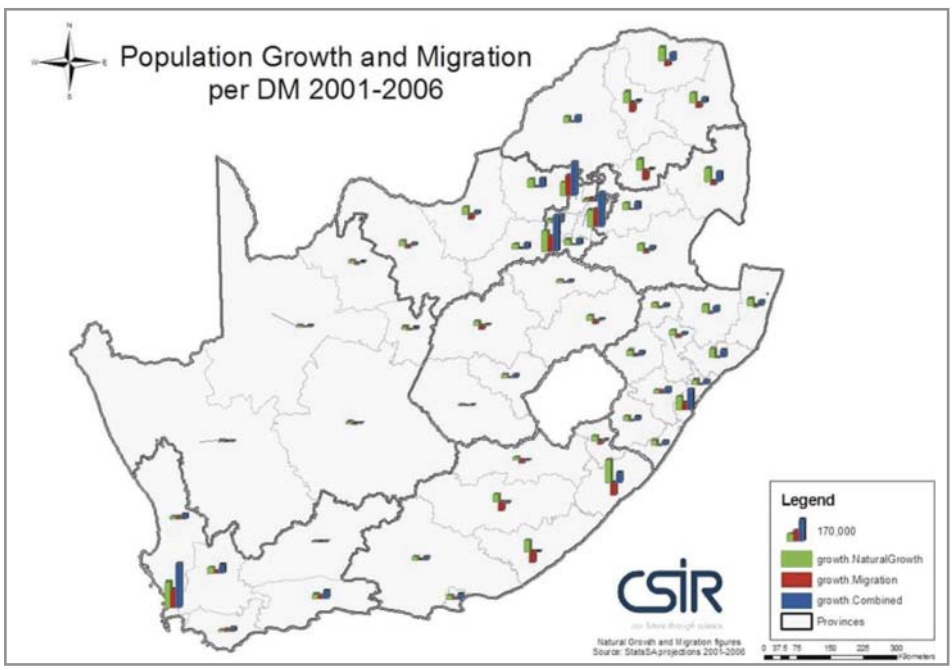
- A "*hollowing out*" of the interior, including the drier parts of the Eastern and Western Cape, nearly the whole of the Northern Cape, the south-western part of the North-West and large sections of the Free State.
- A "*migration from traditionally densely populated 'rural' areas*". This trend is especially marked in the provinces of the Eastern Cape and parts of KwaZulu-Natal. A significant change seems to be taking place in the profile of districts/regions with historically high numbers of people, poverty and dependency ratios in terms of youth, economically inactive population and grants. These areas (mostly former Bantustan areas with limited economic activity) are characterised by outward migration and a decline in young population, where in many districts there are huge sections of the 19 to 39-years highly productive age group that are found absent from these areas. A visible decline is found in the 0-14 years age group. Also evident is that the economies of some of these towns and areas are largely dependent on government services. In such towns and areas, often located in former Bantustan areas and with high population numbers, as well as in city-region areas, the relative importance of household income in creating economic and livelihood opportunities is evident.
- A "*coastal drift and city and town-ward shift*", with large numbers of particularly young people from rural areas, either in search of job opportunities, basic/housing services, a new lifestyle, education, or displaced from farms, making their way to towns and cities and to land alongside roads leading to such settlements (even if only temporarily). Functional city-region areas undergo continued net growth (including the city-region areas of Gauteng and the port cities of Cape Town, eThekwini and Nelson Mandela), cities (such as Pietermaritzburg, Nelspruit, Bloemfontein and East London), major regional centres (such as Rustenburg, Middelburg and Mthata) and particularly the towns on major access routes and movement corridors. The analysis suggests that city-region areas are attracting and housing increasing numbers of the youth, the largest and most highly skilled portion of the formal and informal labour market, as well as the largest number of those that are unskilled, economically inactive and in search of the most basic of livelihood opportunities. Also evident is an increased concentration of poverty and increasing dependency ratios in the city-region areas and cities. Even though the cities, city-region areas and those towns that fulfil typical regional services roles are the areas where the biggest inroads into service delivery has been made over the last decade, it also becomes clear that backlogs and pressures for service delivery are increasing in these same areas.

Map 7a: Net population loss or gain



Source: CSIR, 2005 (Map prepared by the CSIR in the process of updating the NSDP 2006)

Map 7b: Migration, natural growth and total population growth or decline

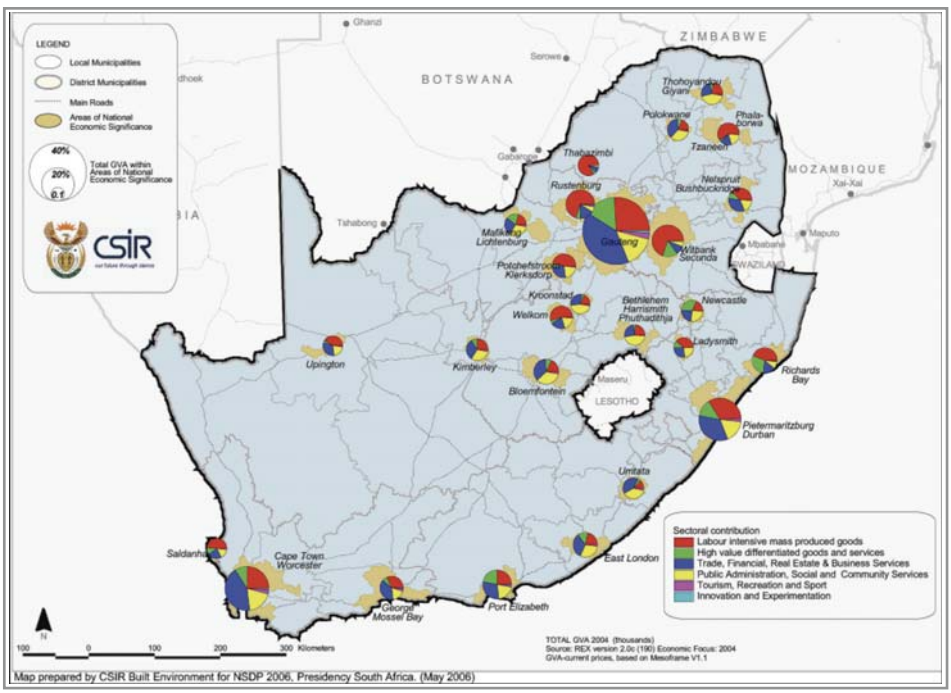


Source: Department of Science and Technology, 2008

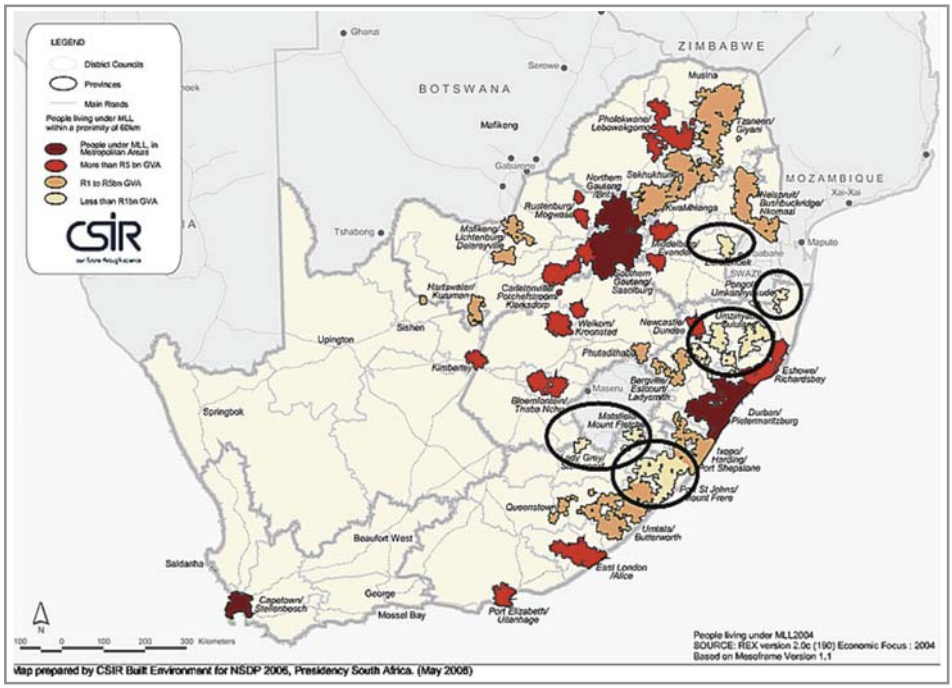
Nine: The NSDP clearly reflects the realities and challenges faced by attractor-areas, namely, areas with high potential for economic development and job creation, and areas that house the highest concentrations of those living in poverty and facing increasing challenges in dealing with that poverty. It identifies these areas as the places where poverty alleviation and shared sustainable development can converge and have the best chances of success, and are thus priority areas for economic investment. These are identified within the NSDP as 26 areas of nationally significant economic, population and poverty concentration (See **Map 8**).

Together with this, the NSDP also highlights the importance of investment in people and a development focus on those places with high concentrations of people living in poverty, and without significant access to economic and livelihood opportunities (See **Map 9**).

Map 8: National concentrations of areas of national economic significance

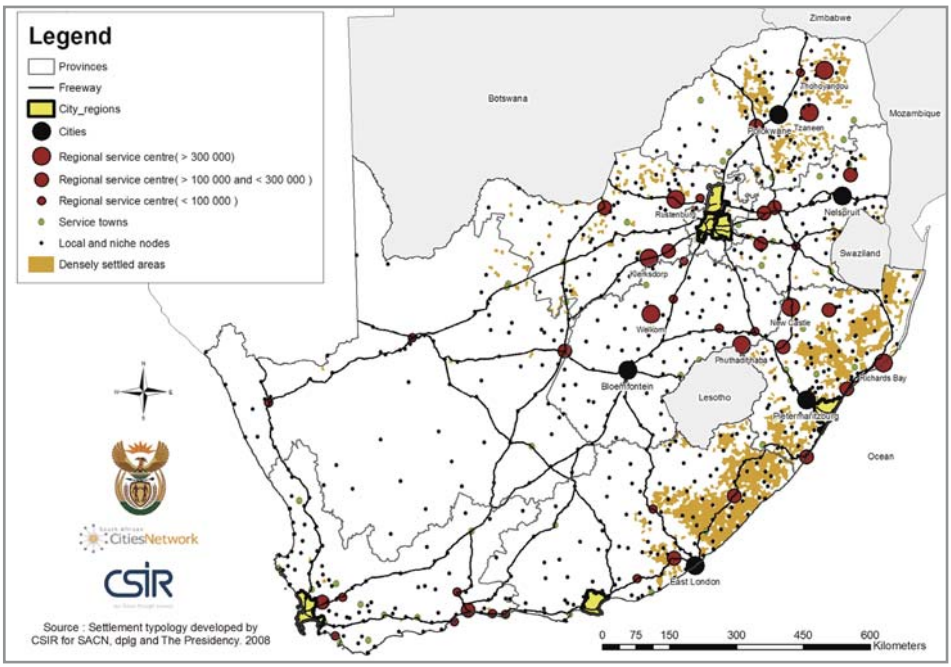


Map 9: National concentrations of areas of need/poverty



Ten: A recent study (2008) conducted by the CSIR for the South African Cities Network, Department of Provincial and Local Government (DPLG) and The Presidency once again underscores these findings. Clearly emerging from this analysis, which was more detailed than that done for the NSDP, was that the places that hold the biggest potential for significant impact on poverty alleviation, job creation and shared and sustained growth are the metropolitan city-region areas, the large cities and a number of medium and larger towns that fulfil a particular regional service role within their respective hinterlands (See **Map 10**).

Map 10: South African settlement characteristics



Source: (SACN, DPLG and The Presidency, 2008)

In slightly more detail, metropolitan city-region areas and cities (nine areas in total) are home to more than 58% of South Africans and 30% of people living under the minimum living level. The engines of the South African economy and fiscus, has generated 69% of all economic activity (2004) and in many respects, have been the generators of growth, jobs and livelihood opportunities and the gateways to the rest of the world. The study also identified 41 large towns as places that fulfil a particular regional services role (See **Map 10**), and which house an estimated 14% of South Africans, 14% of people living under the MLL, and generate 15% of all economic activity.

In addition, the study also highlights the urgent plight of the densely settled clusters and dispersed settlements in the former Bantustans, which are home to 21% of the South African population and 32% of people living under MLL and generate 2% of national economic activity. Significant characteristics of these clustered and dispersed settlements (See **Map 10**) are the limited accessibility and limited number of towns that provide a regional services role in these areas.

Finally the study also identifies a wide range of smaller towns, termed either as service centres (44 in total), or local and niche towns (600 in total), that serve particular and important local and regional functions (See **Map 10**). These 644 towns house 13% of the national population, 17% of the population living under the MLL and generate 8% of the economy. While some of these towns have shown relatively high growth rates (like the Karoo town of Prince Albert), this growth has been from a very small base, and is only of

local and sub-regional significance, meaning it cannot impact significantly on job creation and poverty alleviation. Many of these towns are, however, located in regions characterised by serious economic decline and emigration, especially of the youth.

Conclusion

The NSDP provides a particular perspective of the South African space economy, based on the attributes of economic development potential and need/poverty. As such, the perspective is neither urban, nor rural-biased. It also does not include any specific statements on investing in either set of spaces.

In assessing the question of investment in small towns, the issue arises as to which level the question is being directed. If it is asked at a national forum, the focus would be as to what the overall national gain would be achieved in doing so, *vis-à-vis* investing in another location in the country. If the question is raised at a provincial forum, other competitors for scarce investment within the provincial boundary will become involved. At local level, the question arises as to where to invest in a municipality to ensure maximum local gain?

Rather than getting involved in debates about the benefits (perceived or otherwise) of small towns that do not provide any useful developmental outcomes, is the question of where and in what the best investment would be, if we are persuing shared, inclusive and sustainable national economic growth. Once a decision is taken, implementation thereof is then possible in a focused and targeted manner.

The case for local economic development in small towns, D. Atkinson

Centre for Development Support (CDS), University of the Free State

The economic significance of small and medium-sized towns is a controversial matter. This issue has enjoyed several trends in economic thought, ranging from a positive developmental image in the 1960s, to complete disinterest in the 1970s, and to a resurgence of interest in the 1980s (Pedersen, 1990).

Small towns are now seen as a necessary and important link to the development of rural regions, and the role of small towns as service centres, within a hierarchy of settlements, is emphasised. However, whereas the focus in the 1960s was on large-scale infrastructural projects, the new approach is to focus on developing local initiatives and resources for local development (Pederson, 1990).

Promoting economic development in small towns faces a major dilemma. Whereas most metropolitan areas can be regarded as economic growth hubs, small and medium-sized towns vary greatly, both in terms of their economic base and their economic prospects. In the case of metros, their sheer demographic size and infrastructural resources facilitate a sustained economic momentum. In contrast, small and medium-sized towns are extremely diverse, with widely different types of economic base (e.g. tourism, agriculture or mining) and with very different economic fortunes that range between improved, static or deteriorating.

Consequently, the scope for a second economy in different towns varies greatly. There are no "one size fits all" solutions for small towns. "It is difficult to design policies that are sufficiently refined and discriminating to be effective" (CDE, 2004). Some towns have better markets, others have better non-agricultural growth opportunities (e.g. mining, tourism), and others have better natural resources. We should not attempt to "lift" successful policies or policy instruments from one country to another without careful consideration of market and institutional capacity, and livelihood structures (Dorward, 2006).

Four arguments arise:

1. *The need for productive government spending on small and medium-sized towns:* The future of small and medium-sized towns should be understood in relation to the spatial strategies of national and provincial governments (i.e. NSDP and PGDS). It will be argued that these towns require some level of *productive* government spending, that is expenditure that will raise local production and multipliers. For example, such spending could be on local orphanages, old-age homes, recreation centres, prisons, technical colleges or tourist facilities. All these facilities would lead to direct or indirect employment or pur

chasing power. Significantly, such expenditure should be in addition to the normal "consumption" types of infrastructure, such as water, sanitation and housing expenditure.

2. *Attracting investment:* The prospects of small and medium-sized towns are poor without private capital. Such investments need not necessarily be in manufacturing. It could be in retail or services. This will bring additional jobs and opportunities for partnerships with local SMMEs.

3. *Smart capital to find comparative advantages:* The comparative advantages of such towns need to be analysed (e.g. agriculture, tourism, agri-processing, social services, commerce) to find the means to stimulate local economies, and to bring additional private sector capital into these towns. In many cases, these towns are located *outside* the apparent "areas with economic potential", as defined in the NSDP. Much more effort needs to be done to investigate and promote the real economic drivers of a town and its hinterland.

4. *Understanding regional dynamics:* To understand the comparative advantage of these towns, there is no "one size fits all" solution to small and medium-sized towns. This means that many towns should be understood in their *regional context*. Significantly, such regions would probably *not* share common borders with municipal or even provincial borders. Even district boundaries may be too small to analyse and promote the comparative advantage of a *certain type of town* (e.g. Karoo towns, homeland towns).

"Small towns" is an umbrella term that includes towns ranging from 5 000 to 100 000 people. The diversity can be illustrated as follows (data are not verified):

Table 1: Various sized towns per province

Province	Towns 0-25 000 people	Towns 25-50 000 people	Towns 50-75 000 people	Towns 75-100 000 people
Eastern Cape	Aberdeen	Aliwal North	Alice	Grahamstown
	Bathurst	Graaff-Reinet	Butterworth	Zwelitsha
	Cala	Stutterheim		
Free State	Bethulie	Frankfort	Bothaville	Bethlehem
	Philippolis	Vrede	Ficksburg	Harrismith
	Petrus Steyn	Winburg		Parys
Gauteng		Bronkhorstspruit		Heidelberg
		Cullinan		
KZN	Bergville	Dundee	Ballito	
	Colenso	Empangeni	Howick	
	Pongola	Port Shepstone	Richmond	

Mpumalanga	Belfast	Kriel	Balfour	Bethal
	Groblersdal	Ogies	Delmas	Ermelo
	Marble Hall	White River	Piet Retief	Leandra
Northern Cape	Calvinia	De Aar	Jan Kempdorp	
	Colesberg	Postmasburg	Upington	
	Nieuwoudtville	Warrenton		
Limpopo	Thabazimbi	Musina	Warmbaths	Tzaneen
	Naboomspruit			
	Nylstroom			
North-West	Koster	Bloemhof	Vryburg	
	Ventersdorp	Fochville		
	Reivilo	Ottosdal		
Western Cape	Ashton	Beaufort West	Mossel Bay	Worcester
	Calitzdorp	Knysna	Oudtshoorn	
	Hermanus	Robertson	Stellenbosch	

Despite the elegance of the previous table, classifying small towns is not an easy task. Categorising towns according to population is insufficient: "It might not characterise a town's personality by breaking these into subjective or arbitrary classes" (Verma, 2006). Towns have a long historical background, creating a distinctive economic profile and climate. This usually focuses on non-agricultural activities, including administrative, industrial, commercial, and cultural. It is rare that a town is a mono-activity centre. For example, Howard Nelson (1955) created a further classification. His categories are manufacturing, retail and trade, professional service, transportation and communication, public administration, wholesale trade, finance, insurance and real estate, and mining.

Towns in South Africa can be classified in at least three ways: by function, by economic performance, and by historic and economic legacy. The latter term refers to situations in the erstwhile homelands of South Africa, characterised by traditional land tenure and predominantly subsistence agriculture, or by privately-owned land tenure and predominantly commercial agriculture. This is shown in Table 1 below. The asterisks (*) mark the towns that are located in traditional/subsistence areas:

Table 2: Small and medium-sized towns, per economic status

	Improving economy	Static economy	Deteriorating economy, with an increasing dependence on social grants
Medium-sized towns			
Agriculture	Bothaville (FS)	Tsomo* (EC)	
Tourism base	Hermanus (WC)		
Commercial base	Klerksdorp		
Mining base			Welkom, Odendaalsrus
Forestry base			
Fishing base			
Transport base	Beaufort West		
	(WC)		
Administrative base			
Mixed base (diversified)			
Small towns			
Agriculture			Rouxville (FS) Venterstad (EC)
Tourism base	Dullstroom (Mpumalanga) Clarens (FS) Still Bay (WC)		
Commercial base	Kroonstad (FS) Bethlehem (FS)	Aberdeen (NC)	
Mining base	Kathu (NC)	Koffiefontein (FS)	
Forestry base	Ugie/Maclear (EC)		
Fishing base			
Transport base	Beaufort West (WC)	Victoria West (NC)	Noupoort (NC)
Administrative base	Trompsburg (FS) Carnarvon (NC)		
Mixed base	Somerset East	Graaff-Reinet	De Aar
(diversified)	(EC)	(EC)	(NC)

Table 2 is not complete, because full data are not available. However, it would be a useful exercise for provincial or district officials to complete this table for their own jurisdictions.

A brief glance at the table tends to suggest lines of inquiry for the future. For example, the larger commercial towns seem to have a built-in growth dynamic, based on a sufficient level of diversification. These towns seem to be "sucking in" economic energy from the surrounding small towns. Secondly, tourism towns seem to be doing well, because they bring in new capital and spending power. Thirdly, mining towns are either booming or significantly declining. Fourthly, many agricultural towns are either declining, or they have become diversified and are therefore becoming more robust. Fifth, towns within a distinct region may improve or deteriorate, because of the *regional* comparative advantage. For example, the prospects of the Karoo may be improving, while those of deep rural towns in the old homelands may be declining. But these perspectives need a great deal more investigation. The crucial question is whether we have to begin asking questions about *comparative advantage* of different *types* (and *sizes*) of towns.

In addition, the economies of small and medium-sized towns are greatly influenced by the *type* of product or service that predominates. For example, some agricultural commodities (such as mutton and wool) have been in a long-term decline. Milk production has been hampered for many years by the low prices paid to producers, agricultural towns benefiting from bio-fuel programmes will show growth, the rise in the cost of energy and the consequent profitability of uranium will benefit towns such as Beaufort West, towns based on rail transport have been undermined by government transport policies, and some towns benefit greatly from changes in government spending priorities, such as the forestry industry in the Ugie/Maclear area.

To complicate matters, the recent move to a global economy has been painful for many towns because of the loss of manufacturing jobs, the vulnerability of export agriculture, and the increased competition in the energy and mining sectors. "The challenge is for small towns to determine their own destiny when they are subject to powerful external economic influences" (Daniels, 1989).

Given this diversity, there is no "one size fits all" solution to the second economy in small and medium-sized towns. In one town, the growth of formal sector employment (often by large corporates or large public works programmes) creates effective avenues of advancement. These possibilities are closed off in other towns, and people have to rely on the second economy to make a living, whether as spazas, hawkers, commonage farmers or shebeen owners, and in yet other towns there is significant immigration of middle-class urbanites with capital and innovative ideas.

Given this diversity, there are disagreements between those who believe that local efforts can generate sustainable growth, and those who feel that outside forces determine whether or not a small town will grow. Daniels (1989) states that there is a lack of a transferable formula for economic success; "Each community has to tailor a development strategy and program to meet its own needs and goals". He argues that, both approaches are very often needed – the "kick-start" investment from outside, combined judiciously with assistance to local people, to lift themselves by their own bootstraps.

The most useful concept in the international literature on small towns is to describe these localities as "service centres", serving the local market. The status of different service centres vary. Towns are based both on a horizontal specialisation among local enterprises interacting with the same local market (e.g. a grocery store, butchery and garage serving the same local population), and on a vertical specialisation and interaction with enterprises at higher levels of the urban hierarchy (e.g. a local doctor referring patients to more specialised physicians in the city) (Pedersen, 1990). The small town receives inputs from the larger higher-order centres. This system of service centres builds up into a hierarchy of settlements.

The role of small towns *vis-à-vis* larger centres may change, depending on extraneous variables. For example, very low rural incomes will reduce the local market, and discourage local entrepreneurs. Efficient long-distance transportation may reduce the local market, because local consumers may prefer to travel to larger centres where there are more sophisticated services and shops.

The literature on town or locality-based growth and development is fraught with theoretical dispute. Daniels (1989) has usefully outlined eight theories of local government, to which Pedersen (1990) has added a ninth:

(1) The *neoclassical model* focuses on trade as the engine of growth (Daniels, 1989). Towns should determine their "comparative advantage", and specialise in those goods and services that they can do best. The price mechanism and markets remain unfettered by government regulation, being the most efficient ways to allocate goods and services. Ideally, capital will move to capital-shortage areas, and labour will move to where labour is in short supply. Individual communities will compete with one another to keep and attract firms, capital and labour.

(2) *Export base theory* is a variant of neoclassical theory. It emphasises the growth of businesses that export goods and services as the key to local economic growth. Their market is regional, national, or even international in scope. The usefulness of exports is that it brings new money into the locality, stimulating local multipliers. Typical "exports" are agricultural commodities, processed agricultural products, mining resources, and tourism.

(3) *Central place theory:* This describes communities according to the size of trade area and the economic functions of the community. Lower order central places have small businesses that offer day-to-day convenience goods and services, but the trade areas are rather limited. Higher order central places offer a wider range of goods and services. The key variable here is the nature and density of interactions between a town and its rural hinterland, or between a town and its smaller urban satellites.

(4) *Role of local government:* Unlike the neoclassical model, this approach focuses on the role of government in providing tax breaks, loans and subsidies to attract wealthy individuals and companies. Economic growth is still based on endogenous growth, but it has to be orchestrated by a public body.

(5) *The growth machine hypothesis:* Central places can stimulate their own growth, but this depends heavily on the growth of the population in the immediate vicinity. The economic fortunes of towns depend on the ability to attract investment, and thereby to attract population. Small towns in developed countries may have limited growth capacity as self-induced growth machines, especially as retail centres (Daniels, 1989). In South Africa, in contrast, population growth is taking place in almost all small towns, but investment is often lacking. The difficulty in the South African case is the purchasing power of these small-town populations, which dampens any incentive to invest.

(6) *The internal combustion theory:* This approach holds that local entrepreneurs, through their own ingenuity and willingness to accept risk, can form businesses and fill a niche, either as export industries or as local secondary base companies. The theory emphasises the importance of retaining and expanding existing firms and fostering the creation of new local businesses. Government has a role in maintaining local services (e.g. water, roads, schools) that will help develop new businesses. This approach is a hybrid of the neoclassical export base theory and central place theory.

(7) *Outside determinants of local economic growth (exogenous determinants):* Government spending, interest rate policy, national supply and demand, and decisions of nationally based firms affect the economic basis of small towns. For example with the manufacturing cycle of a new product, , branch plants may be built in small towns as production matures, this arising from lower land and labour costs (Daniels, 1989).

(8) *Political economy:* Distribution of wealth and political power within a community, and between the community and outside forces will determine a locality's economic prospects. Types of dependency include: direct dependency, when key sectors of the local economy are controlled by outside owners; trade dependency, when locally produced goods and services are sold in distant markets over which the local inhabitants have little control; financial dependency, the need to import capital to stimulate economic development; and lastly, technical dependency, the need to import trained personnel and technology (Daniels, 1989). Theories of political economy and dependency are important in small town settings, because they address the issue of *equity*, that being who gains and who loses in the process of economic development, and what is a fair distribution of income, wealth and power. Unlike the previous theory, which emphasises dependence on external variables, this approach attributes causal significance to local as well as exogenous variables. For example, class relations within a town may lead to shopping patterns that undermine local businesses.

(9) In terms of new "network theories" (Pedersen, 1990), the interaction between enterprises is determined by factors such as ownership, size, technology, market and financial relations. The small enterprises can function as complementary to the large firms, and the productivity of the large firms could be enhanced by a network of small service and production enterprises.

This diversity of theories shows that small and medium-sized towns are very complex, with multiple internal and external dynamics. All these theories point to factors that are potentially relevant to specific localities. It does not help to artificially choose between these theories at this stage. *Much more rigorous research is needed on various South African towns to determine the causal variables that are most powerful in different situations.*

In the meantime, we flag the importance of a whole range of factors: The nature of towns' economic comparative advantage; the types of local and foreign-owned investment; the dynamism of the local business community; the networks between local firms and between them and outsiders; the initiative of central and local government; and the economic interactions between towns and their hinterlands.

A collection of case studies from the United States have shown that successful economic development involves: capitalising on existing resources; a strong planning component; leadership; training and education; aggressive pursuit of state and federal grants; low-interest loans; industrial recruitment; historical preservation (Daniels, 1989). These diverse ideas can all play a role in boosting the local economy of small towns. The additional challenge, in the case of South Africa, is to make such interventions meaningful to second-economy entrepreneurs.

For all these theories, a necessary condition for the creation of livelihoods in a non-metropolitan region is the existence of a *sufficient economic surplus* in the region (Pedersen, 1990). Such a surplus may be derived from local agricultural production, from wages to public servants, pensions to local citizens, tourists, development aid, government grants, investment from outsiders, construction projects or military establishments. Some money must be available locally to circulate, to create the purchasing power which can be spent on second-economy firms.

In terms of this argument, it is critical that government departments examine the impact of their expenditures on small towns. In many cases, government departments decide unilaterally to establish (or, more frequently, to close) key institutions in small towns. Examples are hospitals, schools and training colleges. Such decisions have major unintended consequences on the economic viability of such towns (Atkinson and Marais, 2006).

The structure of the urban system depends on the size of its economic base. Such an economic base can be created in several ways: (Pedersen, 1990):

1. Local distribution of local products (products made locally and sold to the local community).
2. Collection and processing of local products (typically, but not necessarily agricultural products) for export out of the region.
3. Distribution of products produced outside the region (typically consumer goods, and inputs for local production).
4. Local processing of non-local inputs for a non-local market (enclave industries).
5. Providing services to non-local people (e.g. tourism, old-age homes).

These functions may be carried out by formal, large-scale, multi-location organisations or by small (formal or informal) single-location enterprises. Different types of economic bases lend themselves to different kinds of entrepreneurs. Collecting and processing of local export products will usually be carried out by large enterprises and organisations, because they require large capital resources, and are often based on technologies with large-scale economies. The small enterprises will primarily supply products and services that are both produced and distributed locally, while goods imported into the region may be distributed by both small and large enterprises. Enclave industries may be both small and large enterprises, but will usually be linked to larger external enterprises (Pedersen, 1990). Local services could be undertaken by small or large companies (e.g. small B&Bs or large tourism resorts), or even by NGOs. Once again, research on South African towns should be undertaken to highlight these types of dynamics.

A wide variety of strategies can be employed to boost the local economy (Daniels, 1989), and to grow the local surplus:

- Promoting diversification, e.g. industrial recruitment often linked to the Export Base theory. Some towns may focus on attracting high-technology industries, or on tourism.
- Downtown revitalisation (linked to the internal combustion theory, combined with some outside government assistance), such as the US Main Street Programme that focuses on downtown revitalisation in small communities. It is also a Central Place strategy, an attempt to strengthen the retail base of the community.
- Boosting service industries may benefit local towns. This could include old-age homes, orphanages, boarding schools, training colleges, and tourism.
- Local government strategies would include taxing the local business community to invest in infrastructure, local business and job training. Local governments can also design their taxing systems in order to attract investment.
- The elderly is an important source of internal and external economic activity in small towns. "Retirement counties" in the US and Canada show strong population growth, and transfer payments (such as pensions) make up over one half of all income in these counties. Many small towns in South Africa have a large retired population, which brings private and government pensions into the local economy.
- Towns can focus on assisting new entrepreneurs, for example by means of business incubators.
- Changing transport patterns can have a major significance. The deregulation of routes and rates can create a disadvantage for shippers from smaller communities using rail services. But this may lead to the improvement in road transport services, to the benefit of different routes. The rapid rise in the road fuel price in South Africa may change transport systems in future, and make rail transport more profitable, which will benefit railway towns. Consequently, transport policy should be designed in conjunction with the impact on small towns.

Significantly, these strategies depend strongly on effective local change agents, whether it be the local business class, the municipality, NGOs or investment coalitions. This requirement creates a major disjunction between those towns which have a fairly vibrant middle class, running shops and providing services, and those towns which have become a virtual

rural proletariat or an unemployed wasteland that is dependent on social grants. It is unlikely that any of these latter towns would have the organisational capacity and economic vision to undertake any of these strategies.

Even if such strategies are attempted, there is no guarantee of success. There is no inherent reason for small towns to be economically successful. In fact, the decline and even disappearance of small towns is a common phenomenon in almost all countries in the world.

But it does suggest that a great deal more can be done, with more innovation and imagination, to stimulate small town economies. In fact, this poses a challenge to the underlying philosophy of the National Spatial Development Perspective (NSDP), which focuses primarily on "areas with economic advantage". The NSDP tends to promote economic activity where this is already taking place. A contrary approach would be a counter-cyclical policy, to distribute economic stimulation precisely to more backward areas. This is the approach taken by the European Union, through its LEADER programme.

Analysts in third world countries have also argued the case for evening out spatial and socio-economic disparities: "Strenuous attempts have to be made for achieving a more equitable distribution, over the whole national space, of productive forces and units and of means of production, employment, consumption and investments, as well as of services such as schools, hospitals, and vocational training" (Mukherji, 2006).

In the case of South Africa, DPLG's new LED Framework dated 2006 urges the need to identify and exploit the competitive advantage of the 52 municipal regions in South Africa. This provides a very sound basis on which to build.

A major challenge for small towns is to deal with local poverty. The sheer extent of poverty in small towns in South Africa should not be underestimated. A seminal paper by Archer (1990), about the Karoo town of Hanover, illustrates the depth of poverty amongst the unemployed underclass. Archer estimated that business activities in Hanover provided 24 jobs, not all regular or full-time. The Hanover urban middle class was estimated at between 90-100 households, perhaps employing domestic workers. So non-farm employment was estimated at 130-150 jobs in an estimated population of around 5 000. Viable alternatives for the labour force were conspicuously lacking in Hanover. There was little scope for self-employment, for petty trade or the supply of services, and domestic production of food for consumption within the household (vegetables, eggs and chickens) was all but non-existent. Monetisation of consumption, particularly of food, was an aspect of proletarianisation, clearly in evidence in Hanover. The levels of schooling years completed were well below the national average (Archer, 1990).

Today, 18 years after Archer's paper, some changes have taken place in small towns. The most significant are: the growth of a black middle class, usually linked to government services; the emigration of white youth, and the immigration of elderly affluent whites, at least to the more attractive towns; the globalisation of agriculture, which has led to farm con-

solidation and a decline in the number of white farmers and black or coloured farm workers; consequently a rapid immigration of very poor, and poorly skilled, unemployed farm workers; and the rapid expansion of government services to the poor, which acts as a magnet that causes poor people to stay on in local towns.

Throughout Africa, urban population growth rates in many small towns are high (Pedersen, 1990). The same trend is found in South Africa:

Table 3: Small towns in the Free State (Marais, 2004)

	Cities	Regional towns	Middle-order towns	Small towns
1991	1 028 841	124 042	257 515	245 168
2001	1 097 182	158 617	355 661	435 607
% change per annum, 1991 – 2001	0.9	3.1	3.5	8.9

Small and medium-sized towns have experienced a minor demographic revolution. As noted above, this is due to rapid immigration of farm workers (due to economic and labour dynamics in the commercial farming sector). But it is also due to widespread migration of people away from the erstwhile homelands towards small towns.

The migration of people away from the erstwhile homelands (e.g. Transkei and Ciskei) to the erstwhile "white South African towns" is an interesting phenomenon. It is likely that such people still have land available in the rural areas. However, their need for social services (access to social grants, and better quality schools and health care), as well as their desire for a formal sector job, encourages them to leave the rural areas (possibly keeping some family members there as a fall-back). There appears to have been a major growth in the black population in the eastern Karoo.

In the towns with a static or shrinking formal sector, this immigration leads to a growing number of unemployed people. A proportion of these individuals and families may attempt some kind of informal economic activity.

The social grants system, together with the system of public expenditure, has contributed to this trend. Many farm workers have migrated voluntarily to the towns. Some of them have preferred to become unemployed urban residents, so that they can access social services (grants, schools and clinics) in the towns, in a context where public transport between farm and town is virtually non-existent, and where many services to farms have virtually disappeared (such as farm schools and mobile clinics).

A further complication in small and medium-sized towns is the likelihood of emigration of middle-class people. It is primarily people with a background in the formal sector, possibly with the role of middle management in public or private organisations, that are likely to establish formal small businesses (CDE, 2004). This is an extremely valuable sector of

the population in small towns, because these small businesses can create employment, as well as outsourcing to other businesses. It has a major stifling effect on the local economy in towns where this stratum of population tends to leave with the perception of better prospects in the cities.

Conversely, there are towns which attract a new class of middle-class people (a phenomenon often termed "reverse migration"), whereby city-based skills, capital and networks are brought to the small towns. Many of these people are retirees, who do not contribute directly to the local economy. However, some of them venture into new enterprises, as part of a mid-life career change.

The rest of this paper outlines some strategies for revitalising small town economies:

1. Kick-starting public and private investment in small towns

This is not a return to the 1960s policies of generating local growth in peripheral regions by implanting one or a few larger enterprises in a region (Pedersen, 1990). These investments created enclave economies. Instead, the market enhancement approach can be promoted by several types of public interventions:

(1) Using public infrastructure to attract and boost sectors such as tourism or agro-processing, preferably as public-private partnerships, and based on latent local economic potential.
(2) Providing major public services (e.g. new training colleges, prisons, orphanages, old age homes, agricultural research stations, observatories), which draw on local advantages (such as affordable land or vacant buildings).

The most immediate impact of these changes will be on *employment*, and not on the second economy. Initially, and on an ongoing basis, this refers to the need to create employment, and municipal actions targeted at creating employment represent important options for poverty alleviation (Nel and Goldman, 2006). However, employment has a major stimulating effect on local economic multipliers. More small traders and producers can make a living with more money in circulation. This approach has the significant benefit of increasing the money supply, and hence the local purchasing power, markets and economic multipliers in a specific locality, on which survivalist enterprises can draw.

Furthermore, successful small enterprises are often born of work experience in the formal sector (CDE, 2004). The formal sector is thus an important ingredient in the local economy. Focusing purely on survivalists is a poor recipe for business growth. The high level of structural unemployment in small towns often means that young school-leavers do not get work experience. They are therefore almost fatally disadvantaged when it comes to establishing their own enterprise. They often lack the most basic office knowledge (such as how to write a letter or send a fax, or how to draw up a budget). The chance of such micro-entrepreneurs graduating into formal businesses is extremely remote. This suggests that investment to stimulate *formal* business growth will be an important component in

a strategy to stimulate the second economy. Also, CDE warns that it is important to help unemployed youths to become *employable* before trying to turn them into employers (CDE, 2004: 21).[3]

Larger-scale public and private investments are therefore needed in the small and medium-sized towns. These investments should not be scattered randomly in peripheral regions. They should be based on an acute analysis of local assets, advantages, under-utilised resources, and latent economic potential. They should also be accompanied by supplementary measures to grow the local resource base, particularly by means of technical skills training and measures to assist the second economy (survivalist enterprises) to "hook into" these new opportunities by providing niche products or services (such as growing vegetables for prisons and old age homes, or providing cleaning services). What we have learnt from the unsuccessful decentralisation processes of the 1960s in Africa is that "no amount of external subsidy is likely to have any lasting effect on local development if there are no actors in the area who are able and willing to exploit the subsidy for the benefit of the region" (Pedersen, 1990).

2. Boosting production by local residents

A crucial intervention is to enhance the local market and grow the "local surplus". The local "surplus" can be increased by promoting the survivalist informal economy, including local agriculture (crops and livestock), street-trading and home-based enterprises (Nel and Goldman, 2006). In particular, the strongest productive sector of the second economy is agriculture, whether as piggeries on small-holdings, sheep-farmers on municipal commonage, maize producers on traditional lots, milk producers in small-scale dairies, or vegetable producers on backyard plots.

But the focus should not only be on production, but also on markets. The availability of local and regional markets for small-scale agricultural production should be investigated, on a town-by-town basis. The remarkable success of the National Wool Growers' Association to boost emergent sheep farmers in the Eastern Cape is a good example of a strategic intervention. There are potential opportunities in many small towns to sell vegetables (e.g. in the local grocery stores or spazas) or to sell meat to butcheries. But the first economy is often suspicious of the quality of local produce, or the regularity of delivery. These relationships should be promoted, for example, by agricultural co-operatives or by SEDAs.

As local production increases, market density increases. Periodic and permanent markets will develop. In time, as the local purchasing power increases, full-time jobs and business opportunities will develop. This creates space for new traders, whether hawkers, spazas or formal shops. This becomes the basis for the development and growth of urban places (Pedersen, 1990), creating opportunities for small firms to formalise and to expand. This

[3] This raises the vexed question of rigid labour market regulation (such as minimum wages, hiring-and-firing and affirmative action). Flexible employment contracts should be developed, particularly for the youth (say under-25s), with remuneration arrangements and working conditions that are well adapted to the needs of dynamic enterprises (CDE 2004: 32).

growing diversification of the local economy will benefit the local middle-income households that have sufficient money to use the new services, and still have a demand which is sufficiently simple to be satisfied locally. But it would also benefit the small enterprises.

3. Towns and their rural hinterlands

The link in South Africa between farmers and non-farm livelihoods has not yet become important for policymakers in rural municipalities. In commercial as well as traditional farming areas in South Africa, there is a dichotomy perceived between town and country. In a survey of 19 municipalities containing small towns, not one mentioned agriculture as either their lead sector, or their second most important sector, or even their third most important sector (Nel and Goldman, 2006).

The relationship between towns and their rural agricultural hinterlands is an important factor in small-town growth and entrepreneurial prospects. But it is very complex.

Farms in the traditional farming areas tend to be small-scale family operations. These areas have been hard hit by urban unemployment, reverse migration and HIV/AIDS, which has undermined the capital base and the labour availability for farming operations. In many cases, the erstwhile "homelands" of South Africa are more similar to farming conditions found elsewhere in Africa, rather than the commercial farmland of South Africa. Consequently, some of the literature drawn from Africa may be relevant.

In this context, a key argument is that the small towns can play an important role in diversifying rural incomes. Literature points to the importance of the "rural non-farm economy" (RNFE) (Barrett *et al,* 2001, Rigg, 2005, Reardon *et al,* 2001), and the linkages between farming and non-farming enterprises in small towns (Leinbach, 1991). Some terminological clarification is called for. "Non-farm" refers to activities that can be located on the farm, but are not specifically agricultural; while "off-farm" refers to activities that are spatially located in towns. The main advantages of such activities is that they are a form of economic diversification, thereby reducing farmers' risks, and also creating sources of capital which can be re-invested in agriculture. Some of the motives for diversification are related to "push factors" (responding to risk, diminishing returns to specific economic activities) while others are related to "pull factors" (finding new urban economic opportunities).

In sub-Saharan Africa, non-farm activities are important for immediate food security through providing money to buy food, to buy farm inputs, and to provide outlets for production (Machethe, Reardon and Mead, 1997). As Reardon *et al,* 2001 claim, "The term 'rural' [is] increasingly not synonymous with 'agricultural'. Consequently, [policies] must be designed to include activities aimed at the rural environment as a whole, including the countryside and the small and medium-sized urban nuclei".

Significantly, these urban diversification opportunities may be in non-agricultural sectors, whether the private sector (e.g. the taxi industry), or they may be in the public sector

(e.g. school teachers). In Philippolis, for example, a small-scale farmer on local commonage land subsequently branched out into the taxi industry, and he has recently opened a guest house.

As far as RNFE is concerned, the same trend is echoed in the commercial farming areas, where many commercial farmers who run family farms increasingly take on town-based employment on a part-time basis.

Yet international research has found a positive relationship between non-farm income and household welfare, and between non-farm income and rural development. Additional research is needed, in specific localities, on how such linkages between agricultural activities and non-farm activities work in practice, and how local accumulation strategies work.

Rigg (2005) states emphatically that access to land is *not* the most important causal factor for rural livelihoods any more. Hence smallholder agriculture support, while necessary, is not the only policy required for rural livelihoods any more. Urban business support is equally important, particularly as the best form of livelihood support may be to enable rural people to escape from farming. This would also help to free up land for the more successful farmers to expand their land holdings. And even more importantly, the *linkages* between agriculture and urban activities (such as small-scale processing and retailing) should be promoted.

This raises several policy issues regarding diversification. Small towns should be developed as "growth poles", which provide a critical mass of interacting industries and services. New rural activities should be selected as "keystone sectors" that build bridges with other sectors (e.g. tourism). This means that key small town issues need to be addressed, such as technical support for marketing, storage and processing facilities, transport (roads and vehicles), the provision of water and electricity, promoting literacy and education, access to capital at affordable interest rates, effective postal systems and telecommunications.

The relationship between agriculture and non-farm livelihoods is not always easy to accommodate institutionally. ,The rural non-farm economy in many countries tends to fall into an institutional "no-man's land", between departments of agriculture, industry, tourism and labour (Reardon *et al*, 2001). Until institutions such as SEDAs (and their outlying offices) manage to cross these sectoral chasms, there would be no promotion of effective rural-urban economic linkages, and much of the potential of small towns will remain dormant.

4. Rediscovering the importance of the "peri-urban"

In the same spirit as RNFE, peri-urban areas offer many opportunities for synergies between agricultural and non-farm livelihoods. Many rural towns are surrounded by municipal commonages, which are increasingly used by black and coloured emergent farmers. There have been calls for commonage to be regarded as a key part of land reform. Anderson and Pienaar (2003) argue that: "Commonage provides a relatively inexpensive and

potentially very effective option for land reform. The municipal government system means that the necessary regulatory framework for rights administration and land management is already in place. Municipal legislation both empowers local authorities to act as agents of development and ensures that management is devolved to the lowest possible level. The municipality as the land holding entity is not a top-down, absentee landlord, but a key agent of local economic development."

There are several arguments for commonage making a useful contribution to urban livelihoods (Atkinson and Buscher, 2006). Firstly, commonage land is often the only natural resource available for poor urban communities, particularly in land-locked areas without access to fisheries. Commonage is readily accessible to the poor, because it is located close to residential areas, and does not require much capital to develop. It should therefore be a first-line strategy for supporting household food production.

Secondly, municipalities already own commonage land. It does not have to be purchased at great expense. This suggests that commonage development has *prima facie* importance as a component of land reform.

Thirdly, commonage development has, in theory, great potential for spin-off economic development such as local markets, local capital accumulation, local skills training, and linkages between farms and non-farm activities. As argued above, non-farm activities are potentially very important for the welfare of farm households.

Fourthly, it offers a valuable opportunity for experience and learning in collaborative or co-operative social institutions, such as commonage committees, farmers' associations, banks and co-operatives. These institutions are typically located in the small towns. Commonage is therefore a valuable "school for economic citizenship" for people who have been marginalised and disempowered for almost all their lives. It can also help in creating a new generation of young farmers, and thereby restore the image of agriculture as an attractive career option.

Commonage farmers are very diverse, and some show signs of becoming viable small farmers, and even emerging commercial farmers. The following categories of commonage farmers have been identified (Atkinson and Buscher, 2006):

- *Survivalists:* Households with few alternative sources of income (perhaps other than social grants or pensions), and who are likely to continue using livestock to fulfil basic food security needs.
- *Micro-farmers:* They have other livelihoods, and want to keep only a limited number of livestock as an income supplement, or as a hobby, or for cultural reasons.
- *Emergent small-scale farmers:* They show signs of commercialisation: for example, they may have bank accounts, they would like access to loans, they may want to farm on their own (i.e. not in a group), and they would like to farm on a larger scale, to make some profit. These farmers may be good candidates for ownership of small-holdings, where they could either undertake small-scale agriculture, or combine this with other income-generating activities.

- *Proto-capitalist farmers:* People who may have other livelihoods, but would like to go into commercial farming on a full-time or large-scale basis. For them, livestock and capital accumulation is important. Acquiring property may also be important. These farmers would be ideal candidates for a "step-up" land reform strategy, i.e. opting out of commonage use and finding their own farm.

Municipalities increasingly recognise the importance of urban agriculture or small-scale farming in peri-urban areas (Nel and Goldman 2006). But there is still no coherent strategy in this regard. This very fertile issue-area is a victim of the institutional chasm between government departments (economic affairs, agriculture, industry and tourism). Are peri-urban areas agricultural or urban? At present, these sectoral departments rely on municipalities to produce inter-sectoral linkages through their Integrated Development Plans (IDPs). But no effective guidance has been provided to municipalities about peri-urban development, and so the potential of this very strategic opportunity remains unexplored.

5. Rural diversification: The example of biofuels and wool

Improving agricultural production can have major benefits for farmers, as well as the small towns where they sell their products and obtain inputs. Such initiatives will help to promote rural production, investment and marketing

One of the success stories of agricultural extension services, run as a partnership between government and private producer organisations, is the support to Eastern Cape wool farmers. There are about 200 000 black wool farmers in southern Africa, mainly in the Eastern Cape, Free State and Lesotho, who own about 20 million sheep. Efforts to improve the market access of these poor farmers began in the late 1990s when the National Wool Growers' Association (NWGA) encouraged farmers to form farming associations. This meant that farmers would shear wool, grade it, pack it, and transport it as an association. With the support of the NWGA, this project increased the technical skills and bargaining power of farmers, and they began to access new outlets (CDE, 2006). The NWGA provided large shearing sheds where they could work together, they managed to by-pass local monopolistic wool traders by sharing marketing.

The same kind of systemic agro-processing intervention can be made with regards to biofuels in areas with traditional farmers. This will benefit the agricultural enterprises as well as the local small towns. Today, oil prices are rising to record highs, and there is a new urgency to climate change targets for reducing fossil fuel emissions. The coal industry has a limited life in South Africa, and has major air pollution consequences. Some biofuels are based on processes of fermenting the sugars and cellulose of plant material. The UN estimates that ethanol may constitute a 10% additive to petrol used by 2026 and 30% by 2050.[4]

[4] S Hofstatter, "Biofuel lessons from Brazil", FW 20 January 2006.

Biodiesel can currently be made profitably from soya (in the mild climate of the eastern part of South Africa).[5] Maize and sugar can make bioethanol profitably. The sugar industry has 48 000 small-scale farmers.[6] Subsistence farmers can be employed as contractors to manufacture biofuels, producing for central silos.[7]

Furthermore, biodiesel can be utilised for energy generation in remote areas.[8] This can lead to the establishment of profitable secondary industries. It has been calculated, for example, that energy provision to the traditional farming areas in Mpumalanga can launch 100 farmers in producing chicken and aquaculture, each with 300 ha of land, employing an additional 200 workers. Small towns will benefit from the local financial surplus generated, because it will stimulate urban multipliers.

6. Promoting regional synergies

New market opportunities must be created in these towns in order to stimulate capital investment in them, whether by local residents or outside investors. In many cases, small town opportunities are too limited, but when combined with similar towns in a regional neighbourhood, a critical mass of economic opportunity may become evident. Such regional possibilities may have to be initiated by government or non-state facilitation, together with strategic capital investments.

The South African experience of regionalism is a chequered one. Regional industrial decentralisation policies under *apartheid* were ineffective, and have been discredited. After 1994, the emphasis shifted to local and district municipalities, based on formal demarcation of municipal boundaries. Thus far, many municipalities have failed to do justice to the economic potential within their boundaries, and extremely few have managed to establish economic synergies with their counterparts across local, district and provincial borders. At present, municipal and provincial boundaries operate as rigid boundaries that prevent co-operation, even when common interests are glaringly obvious. This rigidity is an intentional by-product of the IDP and PGDS processes. There are no "political brownie points" to be scored from collaborating across borders.

There is much more to be done to promote regional collaboration between small and medium-sized towns, as long as there is a real economic basis for such collaboration. Such an economic basis could be built on ecological issues (for example, a similar climate which enables similar products to be produced), or a tourism niche market, transport conduit or watershed. One example is the potential economic benefit (with associated intense bureaucratic obstacles) facing the Lake Gariep project, which is intended to involve the Free State, Eastern Cape and Northern Cape. Branding and "products of origin" would be important aspects of such a strategy. Another example is the new desert tourism route along the west coast, linking the Western Cape and Northern Cape to Namibia.

[5] "Biofuels set for blastoff", FW 28 April 2006.

[6] Nico van Burick, "Biobrandstof: SA boere kan voorsien", LBW, 19 May 2006.

[7] A Groenewald, "Biobrandstof kan krisis versag", LBW 14 Oct 2005.

[8] A Groenewald, "Biobrandstof kan krisis versag", LBW 14 Oct 2005.

Multi-jurisdictional networks are needed for rural development (Bradshaw, 1993). Councils of government have been established in the USA, but with very limited powers. A multi-jurisdictional approach will require large enough scope to attract new economic activities to an area. Multi-jurisdictional approaches assist sharing of expertise, economies of scale of functions and programs (e.g. bulk purchasing), specialisation (providing sufficient expertise and equipment), and leveraging (the potential increases to multiply the effort of a project to link it to other projects). There is an urgent need for appropriate, flexible, and innovative regional institutions to be created. They need not be created by government; they could be private sector driven, but with strong and mutually supportive links to municipalities and government departments. "Smart money" may be required from government, to create regional networks and possibly assist the creation of regional institutions that promote investment in these localities.

Conclusion

This paper provides an overview of the economic diversity of small and medium-sized towns, and argues that support and interventions need to be closely tailored to local economic realities.

It remains a priority to attract public or private formal investments to these towns. Much more imaginative and assertive methods can be adopted to secure such investments. By promoting formal sector employment, potential entrepreneurs gain valuable work experience. Furthermore, formal institutions can be encouraged to enter into partnerships with survivalists.

Government policies have thus far recognised many of the priorities faced by small towns: the key role of local government, a strong focus on economic development, the integration of sectoral programmes, the need to promote local economic multipliers, the diversification of the local economy, and the need for partnerships between public and private spending. In particular, the ISRDS and the latest LED Strategy of DPLG provide valuable pointers to economic development of small towns.

However, government spending needs to operate on a more strategic spatial basis, to create productive investments in small and medium-sized towns. Such expenditure will help to create the local surpluses which are required for second-economy operators to connect with the formal economy. In addition, the right kind of business support services in small towns remains need to be provided, with a particular emphasis on creating effective linkages between emergent entrepreneurs and formal businesses and investments.

A much more strategic regional approach should be considered, based on regional similarities and potential advantages. Public funding may be necessary to investigate such economic potential, and to facilitate the creation of regional public and private networks to attract investment to small and medium-sized towns.

Other methods would be to promote rural non-farm livelihoods, peri-urban commonage agriculture, rural industrialisation and outsourcing of agricultural production, and regional branding and marketing to attract large-scale investments.

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Land use management, spatial planning and the land market in small towns (based on research conducted for Urban Land-Mark with Wendy Owens), F. Kitchin

Introduction

Research conducted by Urban LandMark has shown that land management in South Africa is inefficient, exclusionary and unsustainable, with negative impacts on the poor and the state. All spheres of government need to better understand the fiscal implications of the costs associated with land development for the poor. Research also demonstrates that access to well-located state-owned land benefits the city and the poor. It may not be necessary to invest large amounts to reap substantial benefits in terms of integration of the poor into the city. Economic interventions are often more successful at lower costs. However, integration is complex and does not always lead to social inclusion. It is necessary for local government to act to reduce the vulnerability of the poor when they seek access to urban areas.

Several towns and their municipalities have been examined to assess the extent to which land use policies and practices enable municipalities to provide the poor with access to well-located land in a sustainable manner to integrate them effectively into the daily workings of the town. This considered planning and urban land management and the way the market works in several smaller urban centres, namely Pietermaritzburg/Msunduzi, Rustenburg, Sasolburg/Metsimaholo, Lusikisiki/Ingquza Hill, Ulundi and Dullstroom/Emakhazeni. Since the re-demarcation of municipal boundaries in 2000, the administrative area of municipalities has been extended so that it is important to consider both the town and its hinterland when discussing land use management in municipalities.

A. Overview of Land Use Management and Planning

Effective land use management[9] is needed to increase access of the poor to land (for economic and residential purposes) for social justice, poverty alleviation, urban efficiency and sustainability. Land use management affects the availability and monetary value of land as well as physical and financial access to land. It also affects the financial viability of the municipality as it determines land value and the rates thus payable. The link between land use management and the finance department determines whether rates are collected

[9] Land use management regulates the use of land taking into account the effects of different land uses with regard to social, political, economic and environmental issues.

efficiently. Land use management is linked to rates policy which influences access to land and municipal revenue. Thus rates policy can be seen as a land-use management tool. Most town planning schemes have been developed with a racial agenda to preserve high property values in particular areas, excluding the poor. Other regulations linked to land use management (zoning, building, and safety) also affect access to land. There is a need to ensure that strategic planning documents like Integrated Development Plans (IDPs) have links to technical mechanisms and processes associated with land use management.

Key Findings

All towns under examination are battling to overcome the spatial legacy of apartheid. Compared to larger cities, they have lower levels of capacity, are more easily dominated by other interests (mining companies, traditional authorities or corrupt and powerful individuals) and are less able to control their spatial development. All these towns are experiencing rapid growth. There are some instances of densification and the provision of land for the poor close to the centre of town, but in others, the development continues to contribute to urban sprawl. There are variations in terms of industrial growth, the extent of land invasions and the regulatory framework within which planners operate.

Several key issues emerged from the research:

1. **Socio-economic context**

   Poverty levels are high in most of the municipalities that have been studied. However, there are significant differences in the nature of the economies of the case-study areas, which is reflected in the nature of the poverty. In some municipalities the population is almost uniformly poor and black, specifically Ulundi and Ingquza Hill. With the least diverse economy (Sasolburg and Rustenburg) these municipalities are dominated by powerful companies whose activities are capital-intensive.

2. **Lack of municipal control over land and performance of municipal functions**

   In all case studies the municipality does not have full control over the land it is responsible for managing. These challenges to municipal control take several forms:

   i. **Traditional authority**

   A substantial portion of land in many municipalities and towns is under traditional authority control. Thus the municipality does not have full regulatory control over land management in its area of jurisdiction. In some cases, land under traditional authority areas is brought into the normal planning process through negotiation and co-operation between the municipality and the traditional authority, in others the traditional authority has set up a parallel planning and land management process, while yet in others the traditional authority undermines the strategic planning and land use management processes that results in uncoordinated, fragmented and often environmentally destructive development. Issues re-

lating to rates collection and payment are unclear, which may impact on financial sustainability and service delivery.

ii. Mining and manufacturing companies

Mining or manufacturing companies dominate economically in some municipalities, and in terms of their spatial and social development. These companies often perform many municipal functions, dominate the strategic direction of the municipal areas and do not always consider the impact of their actions on the municipality.

iii. Land owned by State-Owned Enterprises (SOEs) and other government departments

Despite the integrated development planning process, municipalities do not have control over the management and use of land owned by SOEs or other government departments. This has serious long term implications for the spatial logic, efficiency and financial sustainability of municipalities, and often precludes the use of well-located land to provide residential and other opportunities for the poor.

iv. Private developments

Private developments in some municipalities (usually upper income residential) perform many municipal functions. Approval for these developments is often granted at provincial level, through the Development Facilitation Act (DFA), so the municipality has little control or input. This will impact the financial and environmental sustainability of the municipality.

v. Corruption

Corruption can have a major role in the daily functioning of a municipality and its strategic plan. This has economic impacts and is sometimes visible through current land use patterns. The impact of corruption may be related to the size of the town in terms of its physical visibility, and propensity to cripple the municipality, with smaller towns being most vulnerable.

vi. Power of the province

The role of the province in land management and spatial development at local level can undermine the spatial strategic planning process of municipalities e.g. Development Facilitation Act (DFA) development approvals, delays in releasing land for development, slow payment of rates, the introduction of the rural housing programme, and Environmental Impact Assessment (EIAs).

3. Municipal capacity and strategic understanding

There is a lack of consistency in planning capacity within and between municipalities. In most cases overall strategic spatial planning seems to be done, but the capacity for actual implementation is often insufficient. Many municipalities have a range of planning regulations that are applicable within their boundaries, often operating from more than one town planning scheme, etc. Several issues in particular are worth highlighting:

i. **Need to understand local economy and social needs, in overall regional context**

There seems to be a need to improve municipal understanding of "what makes the town and municipality tick" in terms of the overall regional context. The smaller towns (Lusikisiki, Flagstaff and Ulundi) are experiencing explosive growth related to their role as regional service centres, mainly from a trade point of view but also linked to social services. It is extremely important that there is a greater understanding of the role of a service centre, how it operates, and what land use strategies need to be adopted to support these centres. Several municipalities are dominated by one firm (e.g. Sasolburg), or one sector (e.g. Rustenburg) with significant impacts on the municipality's land use management and planning, and on their ability to raise revenue. A greater understanding of how the economy works in each case is needed.

ii. **Law enforcement**

Most municipalities do not have sufficient capacity to monitor and act on land use and building code infringements.

iii. **Legal capacity**

Insufficient legal capacity in terms of fighting cases against developers, particularly those introduced via the Development Facilitation Act (DFA). This has been raised by several municipalities.

4. Changing housing needs: middle income and social housing

Demand for middle-class housing is extremely high. This could be linked to a shortage of good rental stock and a lack of social housing opportunities. It is likely that the housing that civil servants can afford to buy will increase in price over time due to normal market forces, possibly to levels beyond their reach. This should increase the demand for social housing where municipalities will need to factor into the long term strategic planning and land use management and planning policies and practices. Clearly thought out and well-managed social housing could therefore play a valuable role in the overall land market. One problem is that this does not allow for wealth creation for individual households over the long term.

5. Location of housing developments and sustainability of municipality

Concern has been raised over the sustainability of some municipalities, given recent housing developments such as upper income housing in Emakhazeni, and rural housing in Ulundi and Lusikisiki.

i. In some upper income residential developments, holiday homes and golf estates, the developer is bearing some or all costs of service installation. This is done on an ad hoc basis, with no clear policy to ensure that the cost of such developments do not impact negatively on the rest of the municipality, currently, or in the future.

ii. Several municipalities have extensive and dispersed residential settlements. Primary housing stock development continues to occur in traditional authority areas away from the town centres, with obvious long term implications for service delivery.
iii. The implementation of the rural housing programme is underway or planned in some areas. It is not clear to what extent services will be provided to these houses, or who will be responsible for this, but it will be expensive to install and maintain over the long term. Thus the implementation of programmes by provincial government can undermine municipal sustainability.
iv. Linked to this, the municipality can play a role in managing its land, to encourage efficient location of commercial and economic opportunities that will boost its town centre and provide access to such opportunities for the poor (as in the case of Sasolburg Square) or it can allow small retail centres in exclusive developments (as in Dullstroom) that limit the access of the poor to shopping and employment opportunities, and undermine the economic viability of the town centre.

6. Operation of the land market

Where an informal land market did operate, it was found to operate differently for various types of housing. Officials and councillors are generally unaware of whether and how an informal land market operates, although in some cases mechanisms have been put in place by the municipality to try to prevent informal land transactions.

In some cases home owners are using their homes as collateral to obtain loans from loan sharks, and this is of great concern. In others, however, home owners are using their homes as collateral to rise up the property ladder.

A key issue raised is the need to educate home owners and potential home owners on how the market operates, what their rights and responsibilities in this regard are, and what processes and procedures are involved in acquiring land and a house.

The local economy is dominated in several case studies by a particular sector (e.g. Sasol in Sasolburg, and the mines and Bafokeng in Rustenburg) and the property market is likely to be skewed by this.

Of importance is the proportion of homes that are regarded as formal, compared to those that are informal. Only formal houses are able to be transacted in the formal market, whereas those that are informal are forced to be traded in an informal manner. These include shacks, backyard shacks, houses in traditional areas and RDP houses. The percentage of households that are informal can range from 20% in Cape Town to over 67% in Ingquza Hill, excluding RDP houses and formal houses in traditional areas, both of which are traded informally. This raises a potential loss of rates income to municipalities, and of the overall costs and benefits to the state associated with property transactions, with the operation of an informal market alongside a formal one. It is crucial to develop a greater understanding of how land transactions take place in the informal market.

7. Residential property and income generation

Poor households use their property to generate additional income in a number of ways, including backyard shacks and second dwellings, urban agriculture and home-based enterprises. In all cases it is important that the significance of this is understood, with appropriate policies and by-laws developed and implemented in a manner that ensures that the income-generating ability of the poor is balanced against the long-term interests of the municipality.

8. Timing and innovation

Several instances where the poor have gained access to relatively well-located land seem to have been linked to the timing of the development in both larger cities and smaller ones. In these cases, generally between 1992 and about 1998, it seems to have been the opportunities and energy generated by the specific political climate that provided the space for proactive and decisive decision-making and commitment, creating long-term benefits for the poor.

Conclusion and Recommendations

Many small towns are experiencing explosive growth that is not being managed appropriately in planning or implementation. There is evidence of fragmented, unsustainable, inefficient and sprawling, land-extensive development that results in the poor being located far from town. In many cases the size of the municipality relative to other institutions such as traditional authorities, mining or manufacturing companies and private developers means that they do not have effective control over their own spatial development and land management. Lack of control over land, to a certain extent, is also true of metropolitan municipalities. Related to this is the fact that municipalities, particularly those with small towns, lack capacity and are often under-resourced.

Several recommendations can be made:

1. **Local consequences of provincial and national policies and practices**
   Municipalities are severely compromised in their ability to manage their land and resources and providing the services for which they are responsible. This is linked to a lack of resources (human and financial) and weak capacity. In addition, municipalities often have national and provincial policies imposed upon them. Much decision-making that has direct local consequences becomes divorced from the local level consequently contributing to fragmented and unsustainable policies and practices, with impacts on land and the market.

   Steps should be taken to improve national understanding of local conditions. This could be done by deploying key national decision-makers to local municipalities to work alongside municipal officials for a period of time, developing more effective mechanisms to enable national officials to meet local residents, councillors and officials, hear their concerns, and develop means to address them.

2. **Need for innovation, negotiation and bargaining**
   Successful projects in terms of providing land in an equitable and sustainable manner have been linked to bold decisions, municipal commitment, and project champions. It is important that this is promoted and such projects are given priority and support by the relevant government authorities.

3. **Provision of land, land values and profit that is related to public land**
   The impact of state actions, the value of land and the land market is generally not understood. Measures are needed to ensure that state-owned land is provided at low cost for low-income housing and economic opportunities. However, the impact of this on the market needs to be considered. One of the problems is that the current legal framework does not allow for public land to be sold at lower than market-related prices, and this impacts negatively on the provision of land for low income housing.

4. **Need for differential/asymmetrical approaches**
   Most national policies that impact on local government do so in a blanket manner without taking into account local specificities. A more nuanced approach is needed, where municipalities are able to negotiate on a basis of their particular circumstances.

5. **Need to educate both policymakers and consumers**
   Consumers sometimes transact land through informal means as a result of lack of knowledge of the procedures required in the formal market. Consumer education needs to be addressed on a more wide-spread national scale.

   In addition, local municipalities and government departments need not only to recognise the existence and operation of the informal land market but also to develop appropriate mechanisms whereby they engage proactively with it.

6. **Communal Land Rights Act (CLARA)**
   The introduction of CLARA may have important repercussions in terms of municipal control over land and municipal finance. However, the implications of CLARA for municipalities are not understood by municipalities and need to be investigated and communicated to them clearly.

7. **Strategic planning and the link between land use management and municipal sustainability**
   Municipalities need to be made aware of the importance of long-term strategic planning, and the financial and environmental impact of development decisions. They need support to understand their roles and responsibilities, and to implement and monitor their policies effectively.

8. **Conversion of agricultural land**
   An investigation into the conversion of agricultural land for non-agricultural purposes needs to be conducted, how rampant is small town development, and what impact this has on food security and the provision of services.

Water provision in rural areas and informal settlements and meeting the millennium development, T.E. Cloete and I. Pootinga

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Introduction

Water is unlike other scarce natural resources. It underpins all aspects of society, from ecology to agriculture to industry - and it has no known substitutes. Like oxygen, water is fundamental to life (UNDP, 2006). Water is also an integral part of the production systems that generate wealth and guarantees well-being.

One of the most notable features of South African water resources is the variable availability of surface and groundwater, due to climate and geography. This is associated with socially-constructed water accessibility challenges, where previous government policies ignored that the majority of the population did not have easy access to water. Many areas in the country are facing water shortages, where the demand exceeds the supply. *The authors are of the view that rooftop rainwater harvesting (RWH) can play a major role in sustainable water provision for all and improve the livelihoods of millions of people who do not have easy access to water for drinking, cooking or any other purpose.* RWH is thus considered one of the alternative water resources that may enable South Africa to meet the goals set by the government, and to ensure people's well being. It involves the small-scale collection, capture and storage of rainwater runoff for different productive purposes, including irrigation, drinking and domestic use.

The National Water Act, established in 1998, states that everyone is entitled to access to water in a sufficient amount to meet the basic human needs such as water for drinking, for food preparation and for personal hygiene. Some 3.7 million people in South Africa have no access to water supply services, and another 5.4 million people are provided with limited access that still has to be brought up to a basic level of service. Rooftop rainwater harvesting is one of the alternatives available to South Africa, to guarantee reliable access to safe water in sufficient quantity. This is not a new concept in South Africa. RWH is a major source of drinking water in the rainy season in the provinces of KwaZulu-Natal and the Eastern Cape . Rainwater harvesting is one of the broad strategies where water can be conserved for domestic use (Kahinda *et al.*, 2007). This practice is currently spread-

ing in rural areas throughout the country, especially with the financial assistance provided by government to resource poor households for the capital cost of rainwater storage tanks and related works.

The full involvement of local communities in rainwater harvesting projects is however of major importance for the sustainability and success of the project. The question is whether local communities of informal settlements and townships accept the concept of rainwater harvesting?

Benefits of rainwater harvesting

The benefits that may accrue from RWH technology has been categorised into socio-economic and environmental benefits, with direct and indirect benefits. Environmental benefits are typically indirect effects and not necessarily the main motivation for farmers adopting RWH technology. The main driver for adopting RWH has been the direct livelihood benefits that accrue to them as individual farmers and/or households. There is a direct link between the provision of clean water, adequate sanitation and improved health in households.

In general the advantages of rooftop RWH are:

- Direct management by households who are solely responsible for maintenance and management. Owners are more likely to conserve water and maintain the system carefully to ensure that they retain an effective long-term water supply.
- No communal or commercial management is required, because the user is the owner of the system.
- Rooftop RWH provides water at or near the point of use, saving on time, effort and cost, otherwise incurred by tedious alternatives of manual transportation.
- Rooftop RWH can be a water supply back-up in times of emergency or breakdown of regular supply systems.
- It can used in conjunction with other water sources, relieving these other sources of some of the demand-load.
- The rainwater quality is usually acceptable for many purposes, with little or no treatment necessary. Rainwater poses minimal chemical or biological hazard.

Unfortunately politicians do not yet recognise RWH as an alternative water source. Rooftop RWH is not included in water policies, leading to a lack of finances, support and appropriate building codes for new houses.

Risks associated with rooftop RWH can arise from a lack of relevant knowledge. There is a risk of spreading a number of water-related diseases. Involvement of the communities is essential to avoid water contamination through ignorant and careless management of these systems.

Social acceptability of rooftop RWH

Several in-depth interviews were held in the Gauteng region of South Africa with key persons of townships and informal settlements, addressing the current water situation and the acceptability of rooftop RWH. There was an overall positive attitude towards rooftop RWH. Close point-of-use was seen as a major advantage for improving the standard of living in the communities. Respondents suggested that the storage tank could be used for different purposes, to optimise their water use. For example, the water tank can be used as a storage tank for municipal water during the dry season, thereby creating more efficiency and reliability to water availability. Another purpose put forward for using the storage tank was capturing rainwater to prevent flooding. Respondents suggested that they could save money by collecting rainwater instead of buying municipal water. All respondents considered the disadvantages to be very small in comparison with the advantages gained from rooftop RWH. Nevertheless, important for the success of the project is the willingness to participate. A good community structure with an efficient and devoted leader, with committees assigned for rainwater harvesting, encouraged inventive ideas, involvement and enthusiasm for rooftop RWH. A good community structure is required to minimise the problems of crime, violence and mismanagement.

In a similar survey in Zimbabwe, about 75.8% of the RW harvesters indicated that they depend on farming as their main source of income. RWH has enhanced their agricultural sustainability and food security and in most cases enabled a family to start production of agricultural products. RWH has in many cases improved the overall livelihood of the family.

The case for RWH in South Africa

The tables below indicate the current water supply situation in South Africa (DWAF, 2009).

Table 1: The current estimated population with no access to any form of formal water infrastructure. This estimate is based on Census 2001 and updated with project progress and project implementation from October 2001 to March 2008.

Province	Oct 2001 No Infra Population	No Infra Population - April 2008	% Backlog
Eastern Cape	2 226 744	720 895	29
Free State	94 841	7 224	0
Gauteng	218 340	55 386	2
KwaZulu-Natal	2 379 668	1 069 255	43
Limpopo	813 579	282 515	11
Mpumalanga	354 859	136 248	5
North-West	213 963	162 084	7
Northern Cape	42 716	24 565	1
Western Cape	67 823	21 225	1
National	**6 412 533**	**2 479 397**	**100**

The areas with the greatest need for an immediate intervention are Eastern Cape and KwaZulu-Natal, each with more than 2 million people without any access to water infrastructure (Table 1) and well below the RDP service levels (Table 3). It is therefore no surprise that cholera is most prevalent in these two provinces. These two provinces also represent the areas with the highest number of households with no access to formal water infrastructure (Table 2). There are probably many reasons for this, but most likely is the fact that the population in both of these provinces is dispersed over a large area, living in small villages scattered over the countryside, and in the case of KwaZulu-Natal, often in mountainous terrain, making it very costly to invest in infrastructure. Rooftop RWH would therefore be an ideal intervention strategy as it is a stand-alone, point-of-use facility.

Table 2: The current estimated number of households with no access to any form of formal water infrastructure. This estimate is based on Census 2001 and updated with project progress and project implementation from October 2001 to March 2008.

Province	Oct 2001 No Infra HH	No Infra HH - April 2008	% Backlog
Eastern Cape	504 807	162 249	29
Free State	26 914	2 065	0
Gauteng	68 146	17 368	3
KwaZulu-Natal	489 567	219 827	40
Limpopo	185 417	65 129	12
Mpumalanga	83 164	30 921	6
North-West	59 063	40 781	7
Northern Cape	10 684	6 134	1
Western Cape	18 422	5 625	1
National	**1 446 184**	**550 099**	**100**

Table 3: Total population with access to a water supply below RDP service levels as per Census 2001 and updated with project progress between October 2004 and March 2008.

Province	Total Water Backlog - April 1994	Total Water Backlog - Oct 2001	Total Water Backlog - April 2007	Total Water Backlog - April 2008	% Backlog
Eastern Cape	3 689 468	3 117 596	1 338 766	1 097 727	19
Free State	624 811	404 905	130 568	39 266	1
Gauteng	1 235 463	898 189	538 559	352 815	6
KwaZulu-Natal	3 863 572	4 047 872	2 304 923	2 128 791	37
Limpopo	2 405 632	2 172 269	1 272 838	1 081 218	19
Mpumalanga	1 221 170	1 016 630	607 479	474 398	8
North-West	1 030 826	909 779	502 159	381 395	7
Northern Cape	392 729	170 811	97 505	78 755	1
Western Cape	1 426 578	364 519	175 960	125 506	2
National	**15 890 249**	**13 102 570**	**6 968 757**	**5 759 871**	**100**

Table 4: An estimated current number of households, based on Census 2001 households and grown annually with STATS SA households growth formula.

Province	Oct 2001 Households	April 2008 Households	Current Annual HH Growth %	HH Density
Eastern Cape	1 553 635	1 601 199	0.56	3.60
Free State	769 922	795 900	0.64	3.03
Gauteng	2 881 878	3 388 988	0.59	2.75
KwaZulu-Natal	2 222 231	2 454 606	0.38	4.11
Limpopo	1 172 653	1 259 743	0.59	3.72
Mpumalanga	821 534	904 383	0.58	3.55
North West	852 075	925 893	0.48	3.27
Northern Cape	259 039	265 365	0.63	3.53
Western Cape	1 231 954	1 432 136	0.60	3.18
National Total	**11 764 921**	**13 028 213**	**0.48**	**3.80**

Table 5: Total population earning less that R800 per month per household served with Free Basic Water of 6kl per capita per month as at end of previous month.

Province	Population January 2009	Population Served January 2009	Poor Population January 2009	Poor Population Served January 2009
Eastern Cape	6 469 453	4 758 315	3 581 084	2 184 774
Free State	2 799 310	2 600 827	1 529 892	1 519 018
Gauteng	10 818 350	9 540 168	3 815 226	2 837 944
KwaZulu-Natal	10 584 146	8 565 259	5 863 875	4 088 013
Limpopo	5 363 093	4 318 309	3 243 164	2 650 491
Mpumalanga	3 687 565	3 337 802	2 096 883	1 262 588
North-West	3 444 980	2 821 904	1 640 844	1 145 485
Northern Cape	1 023 812	942 551	374 947	345 764
Western Cape	5 257 044	5 007 178	796 316	777 722
National	**49 447 753**	**41 892 313**	**22 942 231**	**16 811 799**

The message that comes through is that there are still too many people that are "water poor". The term "water poor" can best be described, according to Ashton and Haasbroek (2001), Black and Hall (2003), Frans and Soussan (2003) as:

- Those people who are persistently threatened by severe drought, flood or soil erosion, degradation or land confiscation.
- Those people that depend on cultivation of food and gathering of natural products and that do not have a dependable water source.
- Women and children who spend hours each day collecting and carrying water, thereby putting their security, education, productivity and nutritional status at risk.
- Those people spending a high percentage of household income on purchased water, and have to pay in excess of acceptable market rates.

- Those people that do not have access to potable water, due to chemical and/or biological contamination of available water sources.

The concept of water security is thus based on the creation of mechanisms that ensure that the poor have secure and sustainable access to water resources. This fulfils the rights and entitlements of people, especially the poor. Strong links to participatory and governance conditions ensure enablement and dictate this access. (IUCN, 2002; Soussan and Arriëns, 2003. The South African government has an appreciation thereof and has excelled in service delivery in the water sector. Notwithstanding, millions of people still do not have water security, and service delivery is experiencing a significant backlog. Rainwater harvesting could relieve the pressure in this regard, especially in hard-to-reach areas, or where water scarcity is acute, and/or in informal settlements are faced with no formal intention to develop infrastructure.

Conclusions

- Water provision is the most basic intervention and requirement for addressing poverty.
- Millions of people in South Africa are still "water poor", over and above the fact that they also have no sustainable livelihood.
- Rooftop rainwater harvesting is an intervention that can change the quality of life of millions of people in a short period of time.
- The success of RWH, as a strategy, will solely depend on the political will of the government.

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Sustainable low-technology businesses: the key to large-scale job creation in South Africa, D.F. Toerien

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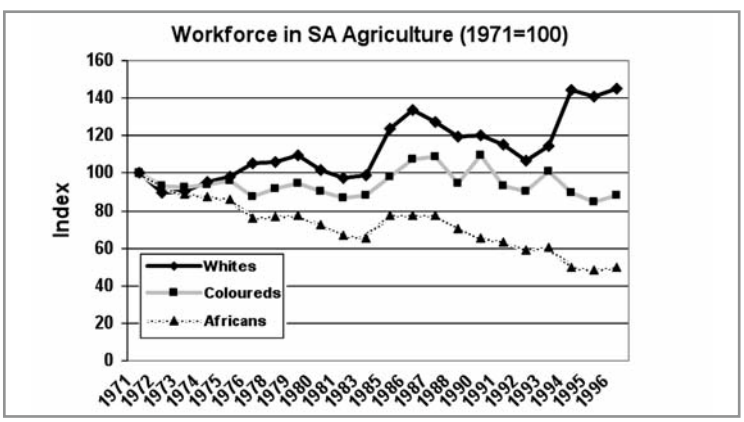
Introduction

Widespread poverty is one of the most pressing problems of South Africa. The inability over decades of the South African economy to create sufficient job opportunities has contributed to a persistently high unemployment rate. Poverty and unemployment are tightly linked.

Why does unemployment remain persistently high whilst the South African economy has been growing at a rate exceeding 3% per annum during the last decade? The nature of South Africa's minerals-energy based economy (Fine and Rustomjee, 1996) (being mainly based on commodities) explains at least part of the phenomenon. To remain competitive the global economic race requires ever-higher productivity from commodity producers. In this process, machines replace humans and the growth in jobs is lower than economic growth. In addition, more knowledge workers are needed to man and support the machines. This phenomenon is illustrated for the South African agricultural sector in Figure 1. In the period 1971 to 1995 the number of largely unskilled black workers has declined by about 50% whilst the number of largely skilled white workers has increased by about 40%. This was a time when South African agriculture was under enormous price pressures. A continuous rise in the productivity of the agriculture sector of this period helped agriculture to survive and is indicative of a trend to greater mechanisation and automation.

Figure 1: Trends in the agricultural workforce in South Africa.



The big challenge

The challenge for South Africa is to create sustainable jobs on a large scale for a generally poorly-trained and unskilled workforce. This is difficult, if not impossible, in a commodity-based economy. We have to explore other options.

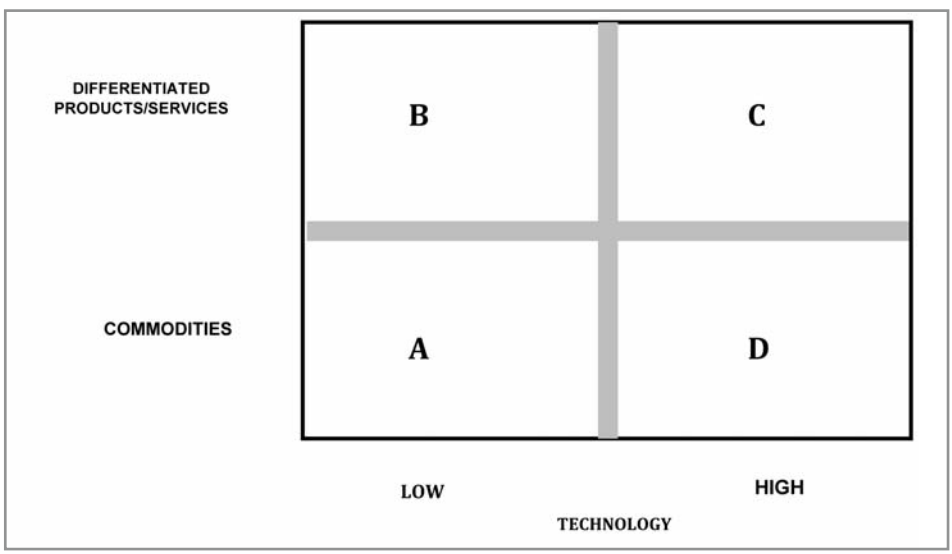
The wine paradox

South African wine exports rose from US$6.5 million in 1975 to US$69.4 million in 1995, and then to US$633 million in 2005, the same period when the rest of the agricultural industry was under severe pressure. How did one sector of South African agriculture manage to blossom, whilst most other sectors languished? The answer is found in the key success factors for industries and businesses that are focused on low-tech differentiated products/services.

Research

After a career as researcher, academic, member of the CSIR's executive management team and businessman, the author has focused on the strategies available to South Africa to deal with its job creation/unemployment problems. This research has culminated in a book (Toerien, 2005). I propose that it is necessary to examine South Africa's problems using a two-by-two matrix, defined by a low-technology – high-technology axis, and a differentiated products/services – commodity products/services axis (the Quad Tool, Figure 2).

Figure 2: The Quad Tool.



Under price pressure, enterprises in Quad A use technology/machines (mechanisation, automation, etc.) to move to Quad D. They shed workers in the process. Starting more enterprises in Quad A merely postpones the job creation challenge for a period, because after a while, these enterprises are also subject to the same forces (moving towards Quad D). With a relatively unskilled and poorly educated workforce, the only sustainable long-term solution is to focus on enterprises in the differentiated products/services domain (Quad B).

Examples of industries and enterprises based in Quad B

A large number of industries in the world are based in Quad B. This Quad includes the cinema, publishing, music, professional sport, the visual and performing arts, perfume, wine and distilled liquor industries. It also includes industries manufacturing soft drinks, dairy products, processed foods and the like. Warren Buffett and all the other top-class financial wizards belong here. The largest industry in the world, tourism, also belongs here.

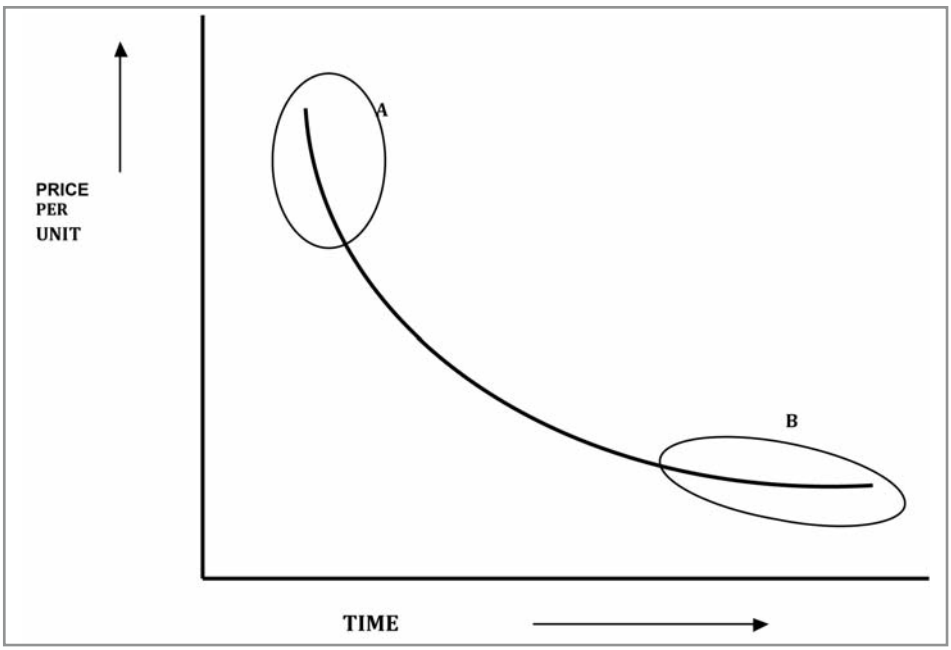
Enterprises of these industries are found in the most unexpected places. A South African example, Ardmore, a producer of ceramic art, was started in the Natal Midlands by the artist, Fée Halsted-Berning, who settled there after marrying a local farmer. She started a studio, and in time, some of the local artists became world-famous. Fée Halsted-Berning nurtured world-class talents amongst the ordinary local poorly-schooled peasants, who joined her studio. Today, Ardmore's art is sold by auction through Christie's of London, and is stocked by top shops in cities such as Paris and London.

Ilse Appelgryn, a teacher who was retrenched, started Kapula Candles in Bredasdorp. This enterprise produces hand-decorated candles, employs some 250 people, and exports a large part of its products to the discerning markets of Germany and France. Carrol Boyes was a teacher for a decade, before she started producing her functional art in Limpopo Province, where she has a factory at Letsitele, employing some 350 people. Today she is widely known, and her work sells in many countries. These three examples are only a few from South Africa.

The learning curve

Some of the opponents of globalisation cite the "race to the bottom" as the reason why countries should shy away from open global markets (Rivoli, 2005). This race is illustrated by the so-called "learning curve" (Figure 3). A new product/service (A) attracts a high price per unit, but over time, competition drives the price down until the product/service becomes a commodity (B). The only competitive advantage in commodity trading is based on cost leadership (Porter, 1985) namely, the ability to do something cheaper than anyone else. This obviously puts pressure on wages as a means of saving on costs, and often hastens the introduction of automation into production processes.

Figure 3: The learning curve (A = unique product/service; B = commodity product/service).



The low-tech paradox

A significant paradox arises from the learning curve. If all products and services are always subject to the learning curve, no low-tech product/service would avoid becoming a commodity. However, there are many products/services/brands (and the enterprises which produce or deliver them) that are very old and have not become commodities. Coca-Cola, for example, is more than 100 years old, Warren Buffett has been a financial wizard for decades, a family restaurant in India has kept the recipe of a special sauce secret for more than 400 years, and Jerusalem has been a tourist destination for more than 1000 years. Some products/services avoid becoming commodities. The question is how?

Toerien (2005) states that the competitive edge of sustainable low-tech industries and enterprises can be traced to one or a combination of three factors: (i) outstanding human talent (being able to do something that is significant and cannot easily be done by a machine), (ii) know-how (confidential/protected knowledge that forms the basis of such enterprise), (iii) man-made or natural attractions. These are the primary factors, alone or in combination, that form the basis of all sustainable low-tech businesses that produce differentiated products. These factors provide the main leverage to differentiate these businesses from their competitors, and *differentiation* is the key to escape the downward force of the learning curve.

Differentiation in low-tech environments

There are different levels of factors that contribute to successful differentiation of low-tech products or services. These are summarised in Table 1.

Table 1: Key Success Factors for Low-tech Product/Service Differentiation.

Primary Factors	Secondary Factors	Tertiary Factors
Human talent	Brands	Packaging
Know-how	Quality	Locality
Attractions	Marketing	Co-utilisation
Combinations of the above	Logistics	Traceability
	Product or service innovation	Ease of use, etc.

The secondary factors must be handled at world-class levels. If one of these activities is not pursued at the highest level, the chances of failure increase significantly. Not one of the above factors is beyond the capabilities of ordinary South Africans.

How are South African towns doing?

The business structures of 50 South African towns have been studied using the methods and principles employed in examining assemblages of organisms in aquatic ecosystems (Toerien and Seaman, unpublished data). This has allowed Toerien and Seaman to address the question as to how South African towns are faring in terms of certain entrepreneurial stakes.

The study showed that the normalised business structures of the towns clustered into five main groups:

1. **Balanced towns** with three sub-groups: ***Former Homeland:*** Thohoyandou, Phuthaditjhaba, Botshabelo, ***Mining:*** Welkom, Phalaborwa, Thabazimbi, ***Balanced agricultural:*** Riversdal, Bredasdorp, Caledon, Vredendal.
2. **Evolving church towns:** Porterville, Winburg, Ladismith, Willowmore, Robertson, Koffiefontein, Lutzville, Ashton.
3. **Lagging church towns:** Trompsburg, Heidelberg, Riviersonderend, Murraysburg, Bothaville, Bultfontein, Viljoenskroon.
   Agri and tourism towns: Graaff-Reinet, Oudtshoorn, Montagu, Swellendam, Uniondale, Tulbagh, Bonnievale.
4. **Coastal towns:** Kleinmond, Stilbaai, Gansbaai, Struisbaai, Great Brak River, Napier, Albertinia.
5. **Artist towns:** Wakkerstroom, Calitzdorp, Prince Albert, Barrydale, Dullstroom, Clarens, Greyton, Nieu-Bethesda, Philippolis, Yzerfontein.

Three of the 19 business sectors studied have a potential to build sustainable low-technology businesses, i.e. (i) the processing sector (adding value to locally produced raw materials), (ii) the factory sector (adding value to raw materials imported from elsewhere), and (iii) the tourism and hospitality sector.

Processing sector

Success varied in this sector in the 50 towns, and did not depend on geography or size of business sectors. Small towns often had more processing enterprises than large towns. Special entrepreneurship seems to be required (see later) and this is not evenly spread. Success in this sector has been more prevalent in the wine production areas than other agricultural areas, but "artist towns" and "near coastal towns" have also fared well. This is a neglected business sector in most South African towns.

Factory sector

Few South African towns in the studied group were using their opportunities to add value to primary or other products from elsewhere. It is surprising that the "former homeland" and "coastal" towns were most successful in this sector. Most entrepreneurs in Botshabelo, a former homeland town, are Chinese. This foreign influence on entrepreneurship is a striking illustration of South Africa's general inability to perceive opportunities that are associated with adding value to the raw materials from elsewhere.

The tourism and hospitality sector

The selected towns have differed markedly in the extent to which they were exploiting the power of tourism and hospitality. In fact, this sector has been one of the important discriminators between towns. On the one extreme are the "former homeland" and "mining" towns with very little development in this sector. They might miss great opportunities. On the other extreme are the "artist" towns, some of which have appeared to be perhaps overly dependent on tourism and hospitality. Between these are the "church" towns, achieving a variable degree of success.

Entrepreneurship in South African towns

Toerien and Seaman (unpublished data) propose that as South African towns grow, their "entrepreneurial space" appears to expand along a continuum bounded by low-risk, 'run-of-the mill" entrepreneurship on the one side, and high-risk, special entrepreneurship on the other side. The latter is needed for the expansion of the processing and factory sectors, a pre-condition for growth of sustainable employment in rural areas.

Conclusions and recommendations

There are many reasons to advocate that a focus on industries and enterprises that utilise outstanding human talents and/or know-how and/or attractions as the basis of their competitiveness can contribute substantially to the growth of sustainable employment in South Africa, and foster poverty reduction. To move forward, the author recommends that the following actions should be taken:

- A programme to identify successful low-tech businesses/industries in South Africa, that captures the lessons from their success (e.g. the wine industry and art-based enterprises such as Ardmore, Carrol Boyes and Kapula Candles).
- A focus on business development of low-tech opportunities that offer potential to build world-class businesses. The focus should be on low-tech value-addition to local or "imported" materials (Ardmore, Kapula Candles and Carrol Boyes are already achieving this).

- Lessons from countries such as Italy have shown the value of building clusters of similar enterprises. South Africa should pursue low-tech differentiated products/services with cluster opportunities.
- Development of the special entrepreneurship needed to unlock these opportunities should be accelerated in South Africa.
- Special training programmes to equip potential entrepreneurs with an understanding of the successful business models for this domain should be developed and implemented.
- Government departments and semi-government organisations should focus part of their activities in this area. Government policies, research programmes, entrepreneurial development, market intelligence and marketing support should all contribute to the strengthening of these sectors.

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Appendix 1: Committee member, Speaker and Staff biographies

COMMITTEE MEMBERS

Professor Solomon Benatar, MASSAf is Professor of Medicine and Founding Director of the University of Cape Town's (UCT) Bioethics Centre, and was Chairman of UCT`s Department of Medicine and Chief Physician at Groote Schuur Hospital. He is Visiting Professor in Public Health Sciences and Medicine at the University of Toronto, and Director of a NIH (Fogarty International Center) funded program for capacity building in International Research Ethics in southern Africa. His academic interests have included respiratory medicine, academic freedom, medical ethics and the humanities in medicine, human rights, health care systems, health economics and global health. Honours include election as: Foreign Associate Member of the U.S. National Academy of Sciences' Institute of Medicine; Honorary Foreign Member of the American Academy of Arts and Sciences; Fellow of the Royal Society of South Africa; Life Fellow of the University of Cape Town; Honorary Fellow of the South African Thoracic Society; Honorary Fellow College of Physicians of South Africa; and Honorary Member of the Alpha Omega Alpha Honor Medical Society, California.

Professor Roseanne Denise Diab is the major-time Executive Officer of the Academy of Science of South Africa (ASSAf) and a senior professor in the School of Environmental Sciences, University of KwaZulu-Natal. She is a Member of ASSAf and is recognised for her research contributions in the field of Atmospheric Sciences, particularly Air Quality, and more generally Environmental Management. She is a Fellow of the University of Natal and of the South African Geographical Society. Professor Diab has been a Fulbright senior research scholar, is a member of a number of international bodies such as the International Ozone Commission (IOC) and the Commission on Atmospheric Chemistry and Global Pollution (CACGP), and serves on the editorial board of Atmospheric Environment.

SPEAKERS/AUTHORS

Professor Eugene Cloete (Committee Chair) holds a MSc degree from the University of the Free State and a DSc from the University of Pretoria. He is currently the Dean of the Faculty of Science at the University of Stellenbosch. He has served as the Head of the Microbiology Department at the UP and Chairperson of the School of Biological Sciences. He also serves as a member of the Coca-Cola World Water expert panel.

His field of specialisation is water quality, water resource management, nanotechnology in water applications, public health, food microbiology and the purification of effluent and

waste products from the environment. In addition, he is director of UP's highly regarded Water Institute, as well as that university's Edward de Bono Institute of Creativity. Prof Cloete is the inventor of eight patents of which four are international. In 2005 he received a THRIP Excellence award for one of these patents pertaining to Biofilm monitoring as a technology benefiting a SMME during 2004 and has been rated as a B1 scientist by the National Research Foundation (NRF). He has already published about 120 scientific articles, and is the author or editor of four books with themes such as environmental microbiology and biotechnology, water purification and the politics of water resource management. He serves on the editorial boards of six international academic journals.

Professor Johan Kirsten is Head of the Department of Agricultural Economics, Extension and Rural Development and specialises in aspects related to agricultural policy, land reform and agricultural and food systems. He acquired his BSc Agric and BSc Agric Hons in Agricultural economics at the University of Stellenbosch and completed a Masters degree (1989) and PhD in Agricultural Economics (1994) at the University of Pretoria. He joined the University of Pretoria in 1992 after five years in the Department of Agriculture as an agricultural economist. He is a member of the International Agricultural Economics Association, member and past president of the Agricultural Economics, Association of South Africa. He has served as chairperson of the Food Price Monitoring Committee appointed by the Minister of Agriculture and also serves as a part time member of the National Agricultural Marketing Council.

Professor Doreen Atkinson is the Research Manager of the Heartland and Karoo Research Institute and a Research Associate at the Centre for Development Support, University of the Free State. She has lived in the Karoo for 12 years. She has conducted research on local government and rural development for 20 years. Previously, she was a Research Associate of McIntosh Xaba and Associates, and thereafter established the Bloemfontein branch of the Human Sciences Research Council. She has co-edited three books: The Small Miracle: South Africa's negotiated transition, with Steven Friedman (Ravan Press, 1994); From a Tier to a Sphere: Local Government in the new South African Order, with Maxine Reitzes (EISA, 2000); and A Pathway to Sustainability: Local Agenda 21 in South Africa, with Penny Urquhart (Department of Environmental Affairs, 2000). Her most recent book is Going for Broke: The fate of farm workers in post-apartheid South Africa, HSRC Publishers, 2007. She obtained a BSc Honours from the University of Natal- Durban, a Masters and PhD in Geography at the Ohio State University.

Professor Mark Oranje is the Head of the Department of Town and Regional Planning at the University of Pretoria. Over the last fifteen years Mark has acted as a consultant to a number of national and provincial government departments, national and provincial planning commissions, the CSIR, the HSRC, the Presidency, the National Youth Commission and the Municipal Demarcation Board on issues relating to IDPs, local and regional economic development, municipal, provincial, national and supranational planning, land use management, intergovernmental relations and the integration of land use and transport planning.

Dr Felicity Kitchin is consulting research has focused mainly on urban development issues. This includes issues facing local government such as administrative restructuring and alternative service delivery e.g. through the establishment of partnerships with other public organisations (public-public partnerships), analysis of integrated development plans, the preparation of business plans for local government, assessing the developmental impact of projects, evaluations of projects and programmes, examining the role of community participation in development, tourism development, studies of displaced urbanisation, and land availability studies. She also has some experience in initiating rural development projects, and regional issues.

Dr Daan F Toerien is a trained microbiologist from the University of Pretoria (B. Sc. Agric., M. Sc. Agric. and D. Sc. Agric. in the 1960s). A Post-Doctoral Fellowship at the University of California, Berkeley (1969 to 1971) and the Senior Executive Program of the Sloan Business School of the Massachusetts Institute of Technology in the USA followed. He was a professor in the Department of Microbiology at the University of the Orange Free State. He has also served as the director of the Institute of Environmental Sciences, a research institute in the university, and managed a number of research programmes and acted as study leader or co-study leader for 15 masters and doctoral students. He acted as an examiner for 17 masters or doctoral candidates from universities including those of the Free State, Pretoria, Cape Town, Natal, Zimbabwe and Tasmania.

He was a Lecturer in Microbiology at the University of Pretoria, and has worked at the National Institute of Water Research (NIWR) of the Council for Scientific and Industrial Research (CSIR). He is the author or co-author of more than 100 research papers and chapters in books, produced numerous technical reports and made more than 60 presentations at scientific conferences. He is the author of a book: Taming Janus: Technology, Business Strategy and Local Economic Development in 2005.

Ms Elsona van Huyssteen is associated with the Built Environment Unit, CSIR. Her research, technical support and capacity building interests currently centre around (1) the role of collaborative, transdisciplinary and strategic planning to contribute towards inter-regional and multi-agency planning, territorial cohesion and sustainable development; (2) metropolitan and district planning and governance; (3) the role and support of agents in contributing towards sustainable development. Recent projects include assistance to the South African Cities Network, Department of Provincial and Local Government (DPLG) and the Presidency in the National Spatial Trends Overview (2008) and the update of the National Spatial Development Perspective (2006) for the Presidency.

Ms Cathy Meiklejohn is an urban geographer with a teaching background and over twelve years of experience in consulting work. Currently working at CSIR in Planning Support Systems where she has done analytical, research, and writing work on many aspects of inter-governmental planning. Her interests and expertise are in the areas of spatial planning, instruments of planning at different scales of governance (IDP, PGDS and NSDP) and the broader governance context of planning in South Africa. She has recently done work for the Presidency as part of the 'IDP-PGDS-NSDP Harmonisation and

Alignment' project on assessing, and preparing a national progress report on the Provincial Growth and Development Strategies in South Africa.

Ms Irene Pootinga is a visiting student from the Netherlands conducting the study on Rooftop Rainwater Harvesting at the Water Institute, University of Pretoria.

STAFF

Dr Nthabiseng Taole is a Project Manager at the Academy of Science of South Africa (ASSAf). Her primary responsibility is to lead and manage the implementation of the Academy's approved projects. She is also a study director for 'A Strategic Approach to Scholarly Publishing in Books and Book Chapters in South Africa consensus study. Nthabiseng serves in the ASSAf task team on 'A Possible Scholarly Publishing Platform.' She also serves the ASSAf peer-review panel on Agriculture and Related Basic Life Sciences. Before joining the Academy, she worked as systems manager at the National University of Lesotho Library, and ICT Advocacy Manager at the Southern African NGO Network (SANGONeT). Nthabiseng holds a BSc degree from the National University of Lesotho, a Masters in Library and Information Science from the University of Cape Town and PhD in Information Science from the University of Pretoria.

Thabo Radebe is a Projects Officer at the Academy of Science of South Africa (ASSAf). He is also a study director for ASSAf forum-type study on Science for poverty alleviation. Since joining the Academy, Thabo has been actively involved in setting up and providing secretariat services to the National Scholarly Editors' Forum of South Africa. Before joining the Academy in August 2006, he was a programme officer at the Africa Institute of South Africa. Thabo is currently enrolled for an MA Development Communication degree with the University of Pretoria with a focus on Corporate Social Responsibility and the basic communication strategies applied by selected companies towards the achievement of the Millennium Development Goals.

Appendix 2: Workshop Programme

ASSAf Committee on:
Science-based approaches to the alleviation of poverty

Local economic development in small towns merged with housing delivery and impact on the environment

Date: 27 June 2008
08:30am - 13:00pm
Venue: Xhoba Boardroom, First Floor, Dept of Science & Technology
South Gate, CSIR Campus Brummeria, Pretoria/Tshwane

Opening: Prof Eugene Cloete

Speaker 1: The role of agricultural development and land reforming in poverty alleviation.
Prof J Kirsten, University of Pretoria

Speaker 2: The National Spatial Development Perspective and assumptions on small town economic investment by government.
Prof M Oranje, University of Pretoria, Cathy Meiklejohn & Elsona Van Huyssteen, CSIR

Speaker 3: The case for local economic development in small towns.
Prof Doreen Atkinson, Heartland and Karoo Institute & Visiting Professor: CDS, University of the Free State

Speaker 4: Land use management, spatial planning and the land market in small towns.
Dr Felicity Kitchin

Speaker 5: Water provision in rural areas and informal settlements and meeting the millennium development goals.
Prof T. Eugene Cloete and I Pootinga, Water Institute, University of Pretoria

Speaker 6: Sustainable low-technology businesses: the key to large-scale job creation in South Africa.
Dr Daan Toerien, Daan Toerien Consultants cc

Appendix 3: List of Figures and Tables

Role of Agriculture in Poverty Alleviation

Figure 1: Nominal and actual commodity prices: 1957 - 2007

The National Spatial Development Perspective (NSDP) and assumptions on small town economic investment by Government

Map 1: The South African space economy analysed in terms of population concentration and accessibility (Source: CSIR, GAP2 2006)

Map 2A: Areas with demonstrated economic potential: Relative concentrations

Map 2B: Areas with demonstrated economic potential: Geographical distribution

Map 3: Geographical distribution of poverty

Map 4: Formal and informal employment trends (1995-2006)

Map 5: Access to economic opportunities and concentrations

Map 6: Accessibility in relation to the hierarchy of towns

Map 7a: Net population loss or gain

Map 7b: Migration, natural growth and total population growth or decline

Map 8: National concentrations of areas of national economic significance

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Map 10: South African settlement characteristics

The case for local economic development in small towns

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Table 2: Small- and medium-sized towns, per economic status

Table 3: Small towns in the Free State (Marais 2004)

Water provision in rural areas and informal settlements and meeting the millennium development

Table 1: The current estimated population with no access to any form of formal water infrastructure. This estimate is based on Census 2001 and updated with project progress and project implementation from October 2001 to March 2008

Table 2: The current estimated number of households with no access to any form of formal water infrastructure. This estimate is based on Census 2001 and updated with project progress and project implementation from October 2001 to March 2008

Table 3: Total population with access to a water supply below RDP service levels as per Census 2001 and updated with project progress between October 2004 and March 2008

Table 4: An estimated current number of households, based on Census 2001 households and grown annually with STATS SA households growth formula

Table 5: Total population earning less that R800 per month per household served with Free Basic Water of 6kl per capita per month as at end of previous month

Sustainable low-technology businesses: the key to large-scale job creation in South Africa

Figure 1: Trends in the agricultural workforce in South Africa
Figure 2: The Quad Tool
Figure 3: The learning curve (A = unique product/service; B = commodity product/service)
Table 1: Key Success Factors for Low-tech Product/Service Differentiation