

**GLOBALIZATION AND LOCAL DEVELOPMENT: THE
SEDIBENG STEEL INDUSTRY IN SOUTH AFRICA**

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1. Introduction

The initiative by the Sedibeng District Municipality (SDM) and North-West University – NWU (Vaal Triangle Campus) to investigate the potential development of secondary industrial development through the promotion of clusters in the local economy, is a response to the relatively slow growth, limited structural change and high unemployment and poverty levels, that has characterised the region since 1994 and which has been extremely severe for the huge labor reserve in the regional black townships. This is probably related to the dominance of resource-based economic activities by large capital-intensive firms such as Arcelor Mittal Steel with limited backward and forward linkages within the local economy.

However, it should be realized that clusters are generally embedded in the overall dynamics of value or commodity chains. This is specially the case of the steel, metal and other activities related to the international Arcelor Mittal Steel Company that dominates the productive capacity in the region. There is a need to identify the chain dynamics and its income generation and distribution potentials. The present research must also be seen within the framework of the Sedibeng Growth & Development Strategy (GDS). One of the focus areas of the GDS is to reinvent the local economy from an old to a new, where one of the identified projects is the mineral and steel based industry –to identify long and short-term levers for growth.

The objective of phase one of the proposed research, is to assess and determine the potential for the development of sustainable industrial clusters in the Sedibeng

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economy, related to the existing global steel value chain. The central challenge in further research will be to identify concrete business strategies, local policies and training facilities that would provide a platform for the development of SMMEs that will generate employment opportunities and economic growth, especially for the unemployed in the townships. The purpose of this presentation is to discuss the development potential of the Sedibeng steel industry within the context of the local socio-economic situation and the global steel chain dynamics. This will form a basis to identify potential further clustering for job creation and poverty alleviation. After this introduction the socio-economic context will be discussed in section 2 with a closer look at the local development strategy since 1994 and the underlying labor imbalances. Section 3 gives the ethnic differences in Sedibeng's poverty profile, while the present manufacturing specialization and dynamics are treated in section 4. The global Sedibeng steel chain and methodological approach are explained in section 5 with a first identification of some clustering opportunities. The final section 6 will be dedicated to some concluding remarks.

2. Socio-economic context

A brief overview of Sedibeng's present Growth and Development Strategy, demographics and labor profile gives the main context of poverty incidence and social aspects in the regional economy.

Sedibeng Growth and Development Strategy

The jurisdictional area of the Sedibeng region covers the entire southern part of the Gauteng Province in South Africa, extending along a 120 km axis from east to west. The total extent of the Sedibeng area of jurisdiction is 4 630 km², which consists of three local municipalities: Lesedi Local Municipality (LLM), Midvaal Local Municipality (MLM) and Emfuleni Local Municipality (ELM). The total number of households in Sedibeng is estimated at 224 307. ELM constitutes more than 80% of the Sedibeng population (SDM, 2006a: 19) and is also the dominant local economic contributor.

The Metsimaholo Municipal Area (home of the large SASOL petrochemical company) is situated in the northern part of the Free State Province. The Vaal river is the border between this area and Sedibeng. Both areas form a cohesive and

intensively integrated economic unit that cannot be separated by politically demarcated boundaries. The so-called Vaal Triangle/region is Sedibeng excluding Lesedi but including Metsimaholo. The focus of this presentation will be primarily on the Sedibeng region with specific reference to the Emfuleni area, while in some cases the information of the Vaal will be used.

A range of Sedibeng stakeholders cooperated during 2006 and 2007 around the development of a shared growth and development strategy for this region that could impact significantly on the lives of all the people. The South African government has committed itself towards accelerating shared growth to halve poverty and unemployment by 2014 and promote social inclusion. Each district and metropolitan municipality has been requested by the Department of Provincial and Local Government (DPLG) to prepare a GDS while the premier of Gauteng committed local government in the province to speedily complete GDS processes.

The GDS forms part of new efforts to give content to the description of South Africa as a developmental state. It is a tool to develop partnerships to realize national growth objectives and represents a collaborative effort by SDM and the three local municipalities (SDM, 2007:2). The Sedibeng GDS is proposing five critical focus areas, the so-called “Five Rs”, which are (SDM, 2007:45):

- **Reinventing** the economy by consolidating the existing sectors and exploring new sectors of growth.
- **Renewing** communities by provision of basic services, regeneration and property development to improve the quality of living for all.
- **Reviving** a sustainable environment by increasing the focus on improving air, water and soil quality and also moving from a producer and receiver of waste to a green city.
- **Reintegrating** the region with the rest of the Gauteng Province as well as South and Southern Africa through improving connectivity and transport links.
- **Releasing** human potential through accelerated investment in people and increased focus on the development of social capital.

The research regarding the Sedibeng steel industry must be seen within the framework of especially the first focus area of the Sedibeng GDS with extensions to the third and fifth areas. According to the SDM (2006b:2) one of the projects to reinvent the Sedibeng economy is to identify long and short term levers for growth related to the

minerals and steel industry. Sedibeng is one of the five most important centres of high value mass producing manufacturing in South Africa and the region can and need to build on current well performing economic “anchor” industries – most notably steel (SDM, 2007:47).

Demographics and Labor Force

Structural change in the economy of a region will have a great effect on the welfare of its inhabitants in terms of employment, expenditure patterns, income and poverty levels. For this reason it is of great importance to have an adequate picture of the current demographic profile of the area to determine the largest concentration of the population as well as population specific data such as race, gender and age distribution.

According to government sources such as Stats SA (census figures) and local government sources, Sedibeng has a total population of 1,13 million people (SDM, 2006a: 20). It accounts for about 12% of the total Gauteng population. It is clear from all the stats that 8 out of every 10 people in Sedibeng live in Emfuleni and the vast majority (more than 700 000 people) live in the black township areas (especially Sebokeng and Evaton). More than 80% of Sedibeng’s population is black. The following is a breakdown of where people live across the Sedibeng district: Emfuleni with 28% of land has 84% of people; Lesedi with 22% of land and 9% of people; Midvaal with 50% of land and 7% of people.

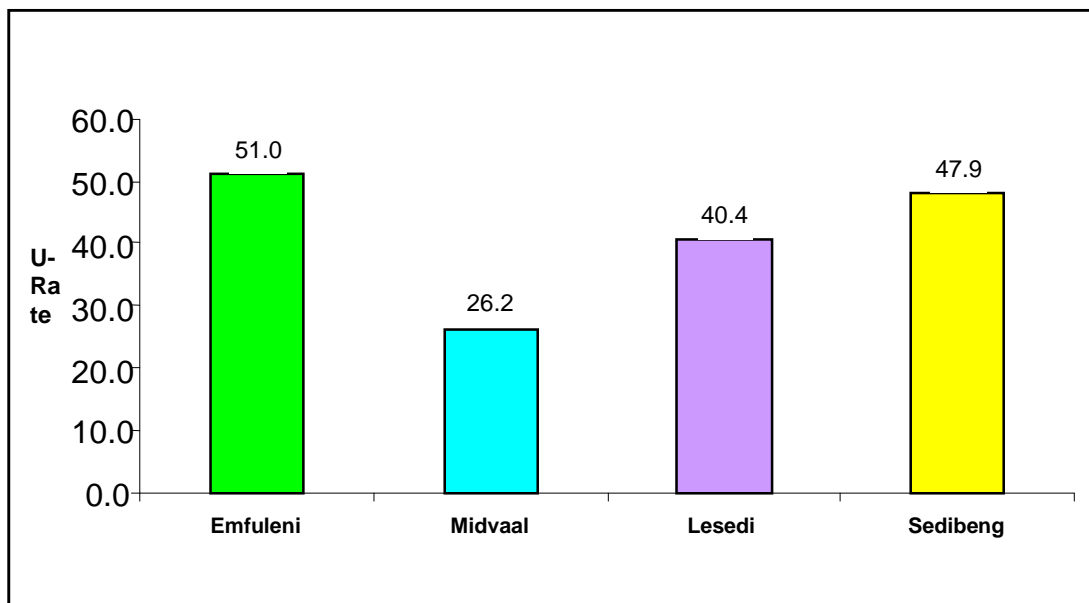
According to the 2001 (latest) census figures Sedibeng’s annual population growth rate was 2,1%. Private research institutions stated in 2004 it was 1,8% and according to the National Spatial Development Perspective (NSDP) the growth rate declined to 1,2% in 2006 (SDM, 2006a: 21 & SDM, 2007: 8). It is therefore evident that the Sedibeng population growth rate declined the last couple of years from approximately 2,5% in 1997 to just more than 1% recently. Growth in population is influenced through a triangulation of fertility, mortality and migration. The population growth decline can, amongst others, be ascribed to HIV/AIDS that have a significant influence through increased mortality.

A normal population age structure/distribution would reflect a smooth pyramid with a large number of young people declining into age. In contrast, the pyramid for

Sedibeng shows a marked absence of young people of both genders between the ages 15 and 29. This “missing youth” phenomenon may be explained by HIV/AIDS deaths and/or may reflect the lack of job opportunities in the region, resulting in people in this age group to migrate to higher opportunity areas and the reduction of immigration. It may also be that some of the young people leave the region in order to access education and training outside Sedibeng

Unemployment figures (expanded definition) for Sedibeng vary according to source, but the overriding trend up to the 2001 census has been that of increasing unemployment – from 37% in 1996 to 48% in 2001 (SDM, 2007:25). Surveys by the Vaal Research Group – VRG (2004b: 10) indicate an unemployment rate of 47,9% for the region compared with 40,4% for Gauteng. In the black township areas the unemployment rate is much higher (61%) and the number of unemployed persons per household is 1.35 (VRG, 2004a: 15 & VRG, 2004b: 13). The unemployment rate for the different areas of Sedibeng is given in Figure 1. It ranks the highest in Emfuleni with a 51% unemployment rate.

Figure 1: Unemployment rates for the Sedibeng region

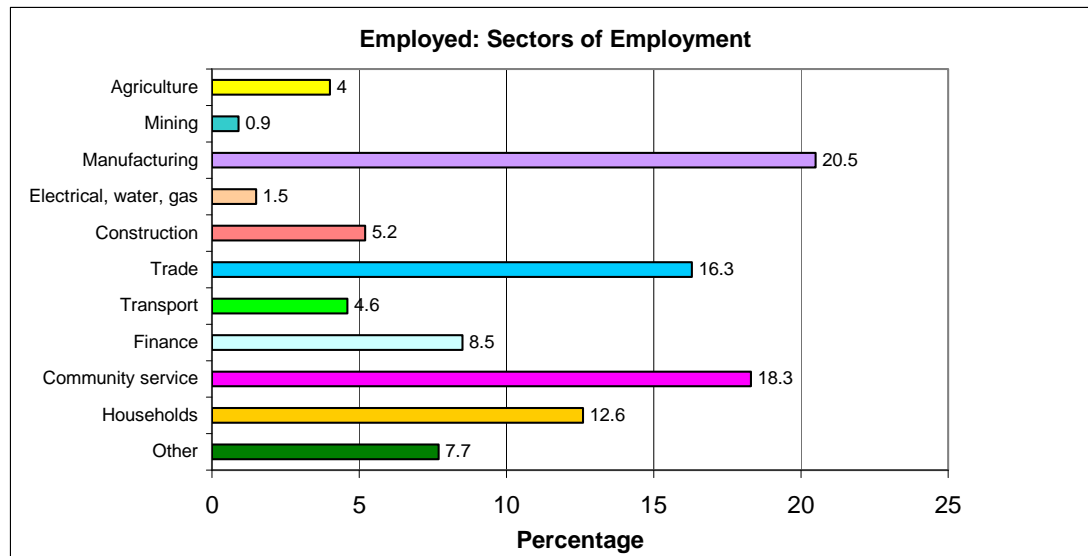


Source: VRG, 2004b – calculations from 2001 Census data

The SDM (2007:25) states that since 1996 the employment in the informal or second economy of Sedibeng has grown in response to the decline in formal employment. As a percentage of total employment, the informal economy represents approximately 13%. However, manufacturing provides almost a quarter of all jobs, remaining the

single most important employer. Despite the importance of manufacturing, more than half of all formal sector jobs are within the tertiary/service sector. Figure 2 portrays the employment (formal and informal) in the various economic sectors of Sedibeng.

Figure 2: Employment per sector in Sedibeng



Source: VRG, 2004b – calculations based on Stats SA & Demarcation Board, 2003

According to research a couple of years ago (Slabbert & Slabbert, 2002a:9), the employment profile of the Vaal/Sedibeng is characterized by specialization in certain activities.

- The manufacturing of basic metals and metal products which are responsible for almost 66% of all manufacturing employment.
- Trade and service activities: the wholesale and retail, community & personal services and other services are responsible for about 78% of all tertiary employment.

Based on 2001 census data and 2006 projections by research institutions like Urban-Econ, the emphasis of the occupational profile of Sedibeng lies in the provision of elementary occupations (25,7% – sales and services, agricultural workers and laborers in mining, construction and transport services), the craft and retail trade (13,8%) followed by plant and machine operators – 11% (SDM, 2007:26).

The level of education attained by the population is also very important when dealing with labor force statistics. Not only does it show the level of skills that individuals within an area have obtained, but also the amount and skills of school leavers that must be absorbed by the labor market in the area. Although access to education is

improving, a key concern in Sedibeng is the fact that a significant proportion of the population still has no schooling. The average number of years of education for workers in the formal sector is 10 years, in the informal sector 7,5 years and in the so-called domestic sector 6,4 years (Richardson, 2005:12&13).

A serious problem in Sedibeng is the high rate of non-attendance (29%) of school or other educational facilities. The problem is most severe in Midvaal (38%), followed by 31% in Lesedi and 27% in Emfuleni (SDM, 2006a:30). Education levels are however increasing although the level and type of skills required by the economy need to be improved upon. According to 2006 projections (based on 2001 census data), the percentage of people with a grade 12 qualification (completed secondary school) augmented from 14,4% in 1996 to 26,2% in Emfuleni, from 18,7% to 26,5% in Midvaal and 12,2% to 21,3% in Lesedi (SDM, 2007:28). The numbers of people with no schooling or only primary education is still very high.

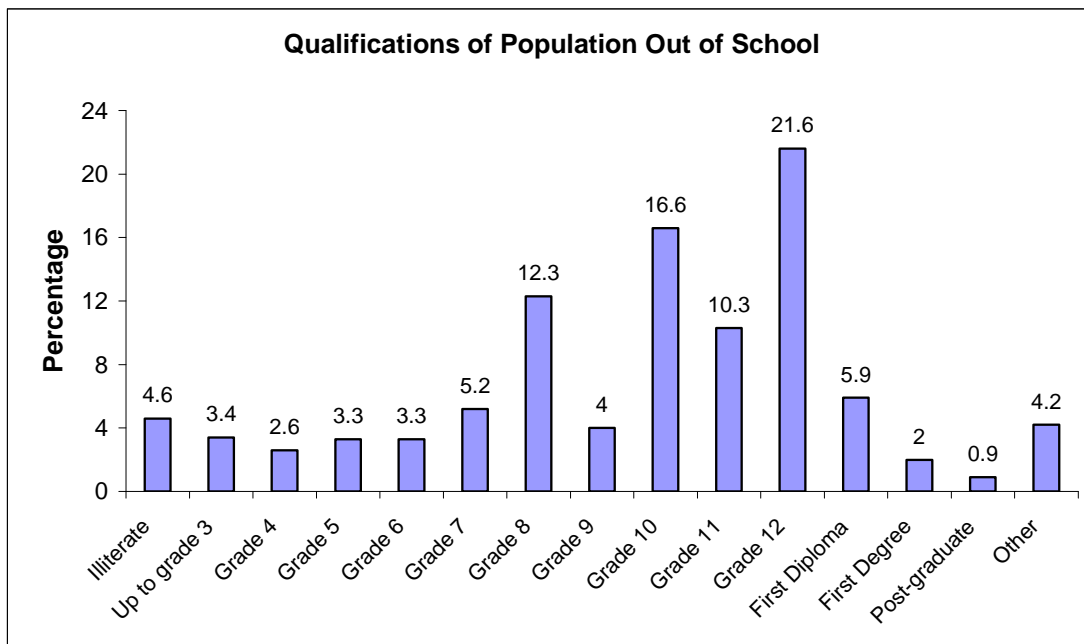
There's a link between the education level and employability in the various economic sectors. Skill shortages pose a real challenge and threat to economic growth and development of the Sedibeng region. Local industries experience a shortage of medium to higher skilled employable staff. In the metal industry for example, there is a shortage of welders, patternmakers, toolmakers, machinists, moulders, draughtsmen experienced in computer aid design, fitters, millwrights, turners, boilermakers, cutters and IT technicians (SDM, 2007:29). A study on skills of the unemployed of the Bophelong township in Emfuleni gave catering and cooking (22%), sewing (12%) and baking (9,7%) as most important available quality attributes (Slabbert, 2003: 10). These were more related to domestic work rather than industrial or professional activities. Less than 8% of the unemployed had building and construction skills. Not surprisingly, the demand for training was more or less in the same areas of catering and cooking, sewing and baking.

The skill qualification base of Sedibeng has been expanded in a manner that increases the employability of the labor force (VRG, 2004b:8). It is, however, necessary to improve the transition of scholars into the tertiary education system in order to stimulate further expansion of the qualification base. Various aspects need to be addressed, such as the alignment of the skills/qualification development programs with the requirements of industry as well as ensuring access to financial support for

the individuals who have the potential to increase their qualification levels through appropriate training. A variety of mechanisms and initiatives to address these issues are being undertaken by the National Government and include measures as the Sector Education and Training Authorities (SETA's) and the re-structuring of the tertiary institutions. These issues are beyond the scope of this paper, but it should be stressed that all these initiatives will have a positive influence on the qualification base of the Sedibeng labor force.

A more detailed profile of the qualifications of the post-school population are portrayed in Figure 3, based on a VRG survey undertaken in Emfuleni in 2003. 34.6% of this population has a grade 12 or higher education.

Figure 3: Qualifications of the Emfuleni post-school population



Source: VRG, 2004b

Looking again at the Bophelong study, we may observe that the qualifications of the labor reserve were concentrated in grades 11 and 12 (total of 42%) (Slabbert, 2003: 9). The persons that were employed in this township in 2003 were mainly domestic servants (30%), community, social training and personal services (22%), trade and catering (16%) and construction workers (13%). The demand for training was in Bophelong also concentrated for 40% in catering, cooking and sewing, while the preferred self-sustaining activities were concentrated in the same sectors plus retail trading (total of 53%); (Slabbert, 2003: 11-12). From all these figures it will become

clear that both labor capabilities and skills availability are not very appropriate to develop small secondary industry businesses in the region, especially not in the townships of Sedibeng.

3. Poverty and social aspects

It is important to look at the extent of poverty in the Sedibeng region as the proposed secondary industrial development and clustering should have a positive impact on poverty alleviation and job creation. Reliable statistics in this regard are only available up to 2003 for Sedibeng and up to 2005 for Emfuleni.

According to the Development Bank of Southern Africa (DBSA), the absolute poverty line for a minimum amount to cover basic necessities in South Africa gives a monthly household expenditure requirement of R353 per adult. However, calculations by Global Insight reflect a higher figure of R678 required for one person as indicated in Table 1 below, which shows the poverty lines in nominal rands for various household sizes and years.

Table 1: Poverty lines in nominal rands for various household sizes between 1996 and 2003 in South Africa

Household size	1996	1997	1998	1999	2000	2001	2002	2003
1	431	468	501	527	555	586	640	678
2	568	616	659	659	730	772	842	892
3	755	820	877	922	971	1 027	1 121	1 187
4	948	1 030	1 101	1 158	1 219	1 289	1 407	1 489
5	1 133	1 230	1 314	1 383	1 456	1 539	1 681	1 779
6	1 327	1 441	1 540	1 620	1 706	1 804	1 969	2 084
7	1 509	1 639	1 752	1 842	1 941	2 051	2 239	2 371
8+	1 839	1 997	2 135	2 245	2 365	2 500	2 729	2 889

Source: SDM, 2006a: 27

According to Global Insight, the poverty rate (the percentage of population living below the poverty line) is approximately 39%. In contrast, Urban-Econ's estimate is 46% while COPAC's is closer to 50%. An average poverty rate based on these figures is more or less 45%. The differences in estimates show that poverty measurements depend on the variables used. Using Global Insight's figures, to halve the poverty rate

in Sedibeng, would require more than double the people employed and a decline in the unemployment rate from its estimated 47% to about 20% (Richardson, 2005:15&16).

The VRG (2004b:20) estimated that in 2003 the percentage of households below the poverty line in Emfuleni is 51.5%. In the townships of the Vaal region this percentage is much higher, with 62%. As there is no separate information available for Emfuleni for the earlier years, but only for the Vaal as a whole, the figures for the region are indicated here in order to portray the trend. In 1991, 30% of the townships' households were below their respective poverty lines. By 1994 it was 42%, by 1999 it was 53% and in 2003 it was 62%.

Households with no income almost doubled between 1996 and 2001. The percentage of households in the three lowest income categories increased from 30,4% in 1996 to 45,6% in 2001. Moreover, the percentage of households in the next four higher income categories declines, indicating a considerable decrease in the average household income. This was also confirmed by VRG surveys. There has been some growth in income (from 1996 to 2003) but this was skewed towards high-income earners (Richardson, 2005:16). The poverty gap in Sedibeng is significant and it is estimated that at least R600 million is needed to bring people out of poverty. The SDM (2006a:26) states that the Gini coefficient for Sedibeng is 0,61. The number of people living with less than \$1 per day is 78 483 (7%) and with less than \$2 per day is 14%.

The profile of the poor in Emfuleni includes the following (VRG, 2005):

- 51,6% of all households and 53,6% of the total population live in poverty, with an average income shortfall of 46% in other words an average poor household only receives 54% of the income needed to be on the poverty line.
- The average household size for poor is 3,62 persons, compared to 3,52 persons for the non-poor.
- Poor households have a smaller percentage of fathers than mothers; single parent families are more prominent among the poor.
- It is less likely for female household heads to find employment than male household heads.
- The poor spend 86,4% of their income on survival items like food, water and electricity, housing, clothes and transport.

- The dependent population (economically non-active and children) make up 54,2% of the total population and the dependency ratio for the poor is 7,1 while it is only 3,7 for total population.
- The unemployment rate for the poor is 71,8% and for the total population is 54,1%.

The human development index (HDI) as a composite indicator of a decent standard of living is measured by life expectancy at birth, educational attainment and income (GDP per capita). The United Nations divides countries into those with high human development (HDI > 0,8); medium human development (0,5 to 0,8) and those with low human development (< 0,5).

Table 2 shows comparative HDI figures (2003) for Sedibeng against national and Gauteng provincial figures across ethnic groups. The legacy of apartheid is clearly evident with the lowest human development amongst blacks (0,52), while whites remain in the high human development category (0,82). Sedibeng falls within the medium human development category and shows higher figures than the national averages, except for whites. The higher HDIs for Gauteng may be explained by the weights of the two big cities Johannesburg and Pretoria.

Table 2: Comparative HDI figures for 2003

Population group	National	Gauteng	Sedibeng
Black	0,52	0,61	0,56
Coloured	0,61	0,72	0,68
Asian	0,74	0,78	0,76
White	0,85	0,87	0,82
Total	0,59	0,69	0,62

Source: SDM, 2007:15

It is positive to note that the HDI for Sedibeng has increased slightly by 0,02 from 1997 to 2001 (0,59 to 0,61 respectively). In 2003, this had again increased slightly to 0,62. Given that poverty in Sedibeng is increasing, the improvements in HDI figures either point to increases in life expectancy and knowledge that have not translated into increases in income or to improvements only for specific groups of people and therefore to an increase in inequality over this period (Richardson, 2005: 2). Access to a number of social services is not bad in Sedibeng, as can be seen in Richardson

(2005:23-33) and the SDM (2006a:27-39). The majority of the population in Sedibeng has access to shelter through formal (81,8%) and informal housing (18,2%) and the backlog is estimate at 52 300 units. Access to water is good as 98% of the households have access to piped water. More than 80% of households have access to a flush toilet, 2% use the bucket system and 3% of the population has no access to toilets. Approximately 14% of the households are not electrified. Three public hospitals serviced by the Gauteng province are located in Sedibeng and there are 38 clinics. HIV/AIDS has a significant impact on the poorer communities of Sedibeng. The zero-prevalence rate increased from 15% in 1996 to 29,4% in 2000. Particulate pollution in Sedibeng (mainly Emfuleni and Midvaal) exceeds international health standards by more than 200%. Approximately 70% of this is due to household coal burning and dust while the remainder is due to industrial activities (like Arcelor Mittal) and motor vehicles, posing potential public health concerns. In general the state of transportation infrastructure is good although there is empirical evidence to suggest that there is a gradual decline in the condition of road infrastructure generally. Road infrastructure in rural areas and low-income township areas like Sebokeng, Evaton, Sharpeville, Boipatong, Bophelong and Ratanda, is in a poor condition. It is estimated that 14 000 households in Sedibeng are without adequate roads.

4. Sedibeng economy and importance of manufacturing and the steel industry

Sedibeng contributes 2,3% to the national product and constitutes the 9th largest local economy in South Africa. While Gauteng plays a critical role in the South African economy with 39% of the GDP, Sedibeng forms 6% of the provincial economy (SDM, 2007: 17). Sedibeng's economic growth rate was well below the average provincial and national rates between 1997 and 2000, while the growth rate far outstripped the national figures between 2001 and 2003. This should nevertheless be viewed in the light of major contractions in the steel industry prior to recovery. Since 2003, the growth rate is more closely aligned with provincial and national existing and projected trends of 3,5% plus (Richardson, 2005:11,12). The share of the townships in gross output has declined: for Emfuleni it had halved from 0.8 to 0.4% in the 1990s (Pelupessy, 2000b: 3).

It is evident that the manufacturing sector is the single largest sector in the Sedibeng economy with a contribution of almost 40% to the gross geographical product (GGP). The manufacturing of metal, metal products and machinery (mainly iron and steel industry) dominates the manufacturing sector of especially the Emfuleni area. It is responsible for approximately 80% of all manufacturing activities in this locality. Table 3 shows the functional specialization and economic base of the Vanderbijlpark and Vereeniging urban areas of Emfuleni. It is especially the Vanderbijlpark area that is considerably dependent on the basic iron and steel industry.

Table 3: Functional specialization of Emfuleni’s urban areas

AREA	FUNCTIONAL SPECIALIZATION	ECONOMIC BASE
VANDERBIJLPARK	Basic iron and steel, heavy metal, engineering workshops, tertiary education, recreation/tourism, regional shopping.	The economic base is less diversified than Vereeniging and specializes in basic iron and steel manufacturing.
VEREENIGING	Heavy metals, ceramics, engineering workshops, water-based recreation/tourism, government services and higher order regional shopping centre.	Large, relative more diversified and specialized in manufacturing.

Source: Slabbert, 2001

Upstream industries are active in the primary activity of “extracting, processing and refining a mineral deposit” whereas downstream industries utilize metal to manufacture metal products, which can range from producing simple components to complex machines and equipment out of the raw materials extracted “upstreams”. Downstream production is important for an economy as it adds value to the final product and is more labor intensive than primary industries which tend to be highly capital intensive (SDM, 2007:20).

A breakdown of manufacturing emphasizes the dominance of metal products in the Sedibeng regional economy. As an example, the region is home to Arcelor Mittal Steel, which is the dominant primary steel producer in South Africa. According to the Metals Sector Development Strategy, “South Africa is the largest steel producer in Africa (with almost 60 percent of Africa’s total production)” of which the majority is located in Sedibeng. The first challenge in Sedibeng’s manufacturing economy is to move beyond primary manufacturing and better capturing value in upstream and downstream activities.

According to the Department of Trade and Industry (DTI, 2005), the manufacturing sector is largely dependent on the iron and steel-manufacturing sub-sector, which makes it highly vulnerable to practices as import parity pricing, which means that a company can set the price of its produce at the same level of importing it. This means that prices can be set as if “South Africa was uncompetitive, had relatively high production costs and was a net importer of basic metals – the exact opposite of the reality”. According to the DTI (2005) the produce is priced in Sedibeng at international market prices and added with international shipping and related costs, such as insurance and financing, wharfage and related port charges for off-loading, import tariffs and local transport costs.

Although South Africa has on a global scale relatively low steel production costs, this means that downstream steel industries have no locational advantage, as the steel price is as high as if it was imported. This pricing strategy has a detrimental effect on the region for downstream industries as they tend to be located elsewhere in the Southern Africa (SADC) region due to cheaper import costs of steel in other countries. Despite this, industrial development seems to be strong in Sedibeng due to the comparative advantage that Sedibeng still offers. Sedibeng has a comparative cost advantage in the provision of non-metallic mineral products, metal products, machinery, household appliances, electrical machinery and apparatus, that comprise a total of 32% of the total exports of Sedibeng. This means that the region is doing better than South Africa as a whole in producing these products (SDM, 2007:22&23).

In analyzing and assessing industrial development and clustering, sectoral linkages are very relevant and important. The degree of linkages has a direct bearing on multiplier effects and provides an indication of agglomeration advantages that point to existing and potential development opportunities or constraints. Two types of linkages can be distinguished, the backward linkage effects and the forward linkage effects.

The multiplier analysis assesses the effect on an economy of exogenous changes in the final demand categories, which are consumption of final goods and services, exports, fixed investments in the region and/or changes in inventories. This leads to an increase in production, followed by an increase in turnover, household income and employment. The higher the multiplier, the larger is the impact of a change on the

economy. The effect of such changes is measured most frequently in terms of output, income and employment gains.

The production of metal, metal products and machinery dominates 80% of the manufacturing sector in Emfuleni. Due to its size the manufacturing sector's backward linkages are significant to the economy. Of the total inputs (labor included), 49,1% comes from within the region. The development of inter-industrial linkages, especially with the above-mentioned activities, has led to agglomeration advantages and significant turnover multipliers in the economy (Slabbert and Slabbert, 2002b). There are, however, relatively weaker forward linkages in the region. Only 33,5% of the total industrial output is sold to other economic sectors within the region. Buying sectors are mostly other manufacturing industries, construction, trade and services sectors with 82,4%, 5,8%, 4,0% and 4,2% of total intermediate output respectively. There is, however, more than half of total output going outside the region.

The rather high (72,3% of the total intermediate inputs) inter-industrial deliveries of the manufacturing sector are regarded as an opportunity for further diversification in this sector. This implies that there is a potential for the development of new or upgraded industrial sectors linked to existing industries, which are important markets for suppliers of intermediate products. According to Slabbert and Slabbert (2002b) it is estimated that an increase in final demand of an industrial enterprise in the area of R1 000 000 per annum, would increase output by R396 000 per annum, households income by R 229 000, imports by R 813 000 and 5.1 employment opportunities would be created.

In Table 4 the sectoral multipliers of the region are presented. It shows the effect that a R1 change in the final demand of a specific sector has on the economy of the region. In the case of the labor multiplier, it states the effect of a R1 000 000 change in the final demand of a specific sector on the regional economy.

There were several Economic Summits and initiatives by the Sedibeng private and public sectors the last couple of years to save and revive the local economy and to focus specifically on job creation. Recommendations in this regard include the promotion of downstream manufacturing enterprises and low-technology SMMEs and the stimulation of new small businesses to the existing eight thousand or so. The small

number of SMMEs in the townships is very concentrated in one or two tertiary sectors. In the Emfuleni townships 75% of the formal turnover were generated by 380 small trading businesses and 15% came from 208 small personal services companies (Pelupessy, 2000b: 4).

Table 4: Sectoral multipliers of the Sedibeng economy

Economic sector	Turnover	Income (GGP)	Imports	Labor (per R'million)	Remuneration
Agriculture	1.217	0.240	0.861	7.925	0.111
Mining	1.157	0.268	0.831	4.817	0.108
Manufacturing	4.772	0.396	0.813	5.120	0.229
Electricity/gas/water	1,325	0.785	0.586	6.191	0.404
Construction	1.198	0.434	0.813	7.172	0.270
Trade	2.073	0.867	0.637	14.296	0.551
Transport	2.147	0.293	0.860	2.818	0.167
Financing	2.072	0.331	0.806	4.206	0.150
Service and other	2.500	0.866	0.527	20.110	0.428
Tourism and entertainment	1.202	0.942	0.645	14.033	0.640

Source: Nel, 2001

There is an urgent need for the initiation of a sustainable inward industrialization process aiming at the manufacturing of products that are produced and used in the region, where especially downstream SMMEs of final products may be important. For this purpose a research and training methodology will be developed based on the Global Commodity Chain approach and Cluster analysis for regional development.

5. The Sedibeng steel industry and research approach

The approach that will be followed in phase one of the research, will include the first mapping out of the global chain emanating from Sedibeng, the identification of existing clusters in this chain with an indication of promising production lines. The analysis of the other relevant economic aspects of the region and the definition of the next research stages based on the outcomes of this research will also be among the expected results. It should be noted that this is the first phase of a medium term integrated research and training project that aims at the development of sustainable local SMMEs and employment in the Sedibeng steel and metal products chain. Special attention will be given to the opportunities for the townships, which

underlines the importance of the specific location of economic activities and clusters within the chain.

To explain the strength of the methodology it is necessary to give a brief overview of the governance force in this chain. According to the latest annual financial statement of Arcelor Mittal (2006) a total revenue for flat steel products of R12,8 billion is shown and of R1,6 billion for long steel products for the Vanderbijlpark and Vereeniging Works respectively. This is based on the input of 42.5 millions MT of iron ore, 129.6 millions MT of coal and a lot of other energy. Looking at Emfuleni area figures of 1998, the flat steel products plant had a considerable market share of 98% and the long steel plant had 70% (Pelupessy, 2000b). This very concentrated structure is also common with the other big role players in their respective sectors of the area, such as the Eskom energy provider with 100% (monopolist), Vantim trader with 77% and the Meyerton located base metal producer Samancor (97%) and bricks, and others manufacturer Electrode S.A. (69%). The presence of so much market power enhances the scope of control on human and financial resources of Mittal steel in the chain. It gives also the possibility to create extra profits by the 177% mark-up pricing strategy for regional and local buyers, as well as the considerable discounts for large steel buyers (Transnet-Eskom, 2007). When analyzing the flat and long steel products chain, it shows that approximately 70% of the flat and 74% of the long steel production are destined for the domestic South Africa market while 26 and 30% are exported. Only a very small part (less than 10%) of the steel production for the domestic economy is located in the Sedibeng region. The region also “imports” many metal products from the rest of South Africa.

Table 5: Composition of flat steel products produced by Arcelor Mittal at the Vanderbijlpark Works

Flat steel products:	%
Hot-rolled coil	43
Galvanized	18
Cold rolled coil	14
Tinplate	10
Others	15
Total	100
Total production: 3,2 milj. MT (capacity = 4,5 milj. MT)	

Source: Arcelor Mittal, 2006

Table 5 gives a summary of the composition of flat steel products produced by Arcelor Mittal at the Vanderbijlpark plant with the respective percentages of the total production.

Of the total production of 3.2 million metric tons, 23% is used in the national building and construction sector, 18% for pipe and tube manufacturing and 11% for the automotive industry. When analyzing the Vereeniging Works long steel production, it reveals that 43% of the total is billets, ingots and profiles.

Table 6 gives a summary of the total composition of long steel product manufacturing at the Arcelor Mittal Vereeniging Works.

Table 6: Composition of long steel products produced at the Arcelor Mittal Vereeniging Works

Long steel products:	%
Billets, ingots, profiles	43
Seamless tubes	25
Windows and posts	21
Forged	11
Total	100
Total production: 0,4 milj. MT	

Source: Arcelor Mittal, 2006

Approximately 32% of the total long steel production provided to the South African market is sold to the construction sector, 16% to machines and equipments firms and 13% to mining and energy companies, while automotive companies use 7%. If the Sedibeng economy in terms of production is considered, it appears that 70.1% of the total output produced in the Sedibeng area stays in South Africa while the other 29.9% is exported internationally. When analyzing the production that is distributed nationally, it shows that only 31.7% of the 70.1% or 23% of the total output (all sectors) is used in the Sedibeng area as final or intermediate products (Grobler, 2006). This means that the output share from the steel industry used in the region is only half of the overall share (10% compared to 23%), indicating much less local forward linkages from steel production compared to the average other sectors.

Table 7 shows the destination in percentage of manufacturing output of the Sedibeng area.

**Table 7: Destination of goods produced in the Sedibeng area
(Domestic distribution)**

Destination area	Percentage
Sedibeng	31.7
Cape town	14.5
Durban	12.6
Port Elizabeth	2.2
East London	2.0
Johannesburg/Pretoria	30.0
Other	7.0
Total	100

Source: Grobler, 2006

A NWU & VRG survey that was done in 2006 amongst firms in the Sedibeng area also indicated that 3.6% of firms are in the primary sector, 51.2% in the secondary sector and 45.2% in the tertiary sector. If firms in the secondary sector for purposes of this study and chain analysis are considered, it shows that 28.7% of firms in the Sedibeng area are busy with steel related activities (engineering - heavy or light) and only 4.8% of firms are involved with activities that can be considered as downstream activities in the steel chain (steel sheet manufacturing, castings, forging, steel mesh manufacturing etc.).

All these regional and domestic productive activities are part of a global commodity chain, based on steel and metal products manufacturing. This is not only a consequence of the exports of Arcelor Mittal to the rest of Africa (6-10%), Asia (9-13%), the Americas (2-8%) and Europe (3-5%); but also because of competing imports, the use of capital, technologies and inputs from abroad. International regulations, quality criteria and designs are also affecting the Sedibeng chain activities. A global commodity chain (CGM) may be defined as a functionally integrated value creation network, consisting of a sequence of border crossing productive, trade and services activities, which goes from raw material exploitation, through different transformation and trade stages to the final consumption or use of an end product (Pelupessy, 2000a). All local, national and international processes of value creation and distribution, as well as their positive externalities are considered by the GCM approach.

It is a political economy methodology that may identify local, national and international winners and losers of globalization processes, while loosening some of

the restrictive assumptions of neoclassical economics, such as the existence of market equilibria, level playing fields and exogenous technical change (Busch, 2007). The methodology allows for the assessment of upgrading and development opportunities for SMMEs in the chain and the possibilities to create local jobs (Palpacuer and Parisotto, 1998). The structure and dynamics of the chain are determined by its input/output system of value creation, geographic location of the productive activities, the institutional framework and governance structure. The analysis of these four basic dimensions will be needed for the full identification of a chain and its dynamics. According to its governance structure, the Mittal chain is producer-driven (Gereffi, 1994: 96-100) which underlines the importance of the Sedibeng steel industry.

To effectively redress poverty, slow growth, limited structural change and high and growing levels of unemployment in the region as indicated, it is imperative that linkages and employment multipliers emanating from resource-based industries such as Arcelor Mittal Steel are strengthened. An international example is given by the largest Australian steel producer, the BHP commodity chain, which is a complex multiplier network with more than 7,000 large and small buyers in 50 countries in the building and construction, automotive and other manufacturing industries! (Newview, 2007). The development of clusters of SMMEs within the value chain is a means of generating such linkages. According to Altman (2005) an industry cluster is a regional concentration of competing, complementary and inter-dependent firms that drive economic development and growth. An industry cluster includes companies that sell inside as well as outside the region, and also supports firms that supply raw material components and business services to them.

From a theoretical perspective, clusters enhance the competitiveness of industries or regions by generating efficiencies that are external to the firm. The economic rationale for clusters is their ability to exploit cumulative external economies. Such external economies may be both supply and demand driven. The success of local upgrading efforts is affected by the way the clusters are inserted in the global chain (Humphrey and Schmitz, 2002; Giuliani et al. 2005). For these reasons cluster analysis will be used complementary and interactively within the GCC method. Most of the Sedibeng intermediate goods are sold for further transformation to the rest of South Africa. This opens the way to study the conditions to initiate regional “import” and “export”

substitution processes. Successful clustering based on dynamic externalities was, among others, found in the Italian industry with spillovers in input-output relationships originating in downstream final sectors of metal products, plastics and machinery (Forni and Paba, 2002)..

In the producer-driven Mittal chain there are interesting downstream opportunities for SMMEs clustering in the building and construction, tubes and pipes, machines and equipments sectors. The production of these final consumption and investment goods within the region is an example of product or functional upgrading processes (Hubert) with higher regional value added generation compared with the present “export” of intermediate steel materials. Also, regional “imports” could be substituted in this way. Construction and building SMMEs related to social housing programs (RDP) are especially important for job creation and demand satisfaction in the townships. A one million rand turnover could create 48 new jobs, while local contractors may generate additional household income in comparison with non-local ones (Pelupessy, 2000b).

The earlier mentioned qualified labor shortages in the townships and the actual internal pricing policy of Mittal are still in the way of realization of this strategy. Accelerated in-service training programs for townships and locally differentiated social responsibility type pricing by Arcelor Mittal, may give solutions to these problems.

The global trend is for increasingly deliberate initiatives to promote such developing clusters and the corresponding job creation within the chain, rather than their passive development through activities of the private sector (Palpacuer and Parisotto, 1998:7-8). The aim is to put in place the specific elements required to set off and support the development of virtuous productive circles. Possibilities to exploit agglomeration advantages in economic and environmental terms could improve both local firm and chain efficiencies (Albino et al. 2002; Chertow, 2007). As part of the above-mentioned analysis a more detailed chain and cluster mapping have to be done. Another opportunity that requires such a refined mapping exercise is given by the fact that about one-eighth of the goods produced in Sedibeng is exported to Durban in the Kwazulu-Natal province. Most of it is input to the automobile chain with successfully integrated SMMEs (Robbins, 2007). Further study is needed to identify specific possibilities to facilitate a shift towards OEM (own equipment manufacturing)

production in the automobile components and reparation section. Much can be learned for Sedibeng from the successful clustering and chain integration of micro-enterprises in the Durban case and the positive and negative aspects of this strategy (Hall & Robbins, 2006; Robbins, 2007). Whether this insertion in a global chain leads to upgrading of local industrial clusters, will depend on the degree of success to access technology, capital, inputs and markets; the reduction of transaction costs; and the possibility to secure competitive advantages (Hall and Robbins, 2006: 3-5). Successes of the Durban auto industry clusters included cash savings by joint negotiations and shared resource, knowledge sharing and competitive performance improvements (Barnes & Morris, 2003). The method to investigate this will be based among others on surveys and structured interviews with relevant role-players and stakeholders in the area.

6. Concluding remarks

The information in this document is a first report of the Sedibeng steel cluster research project of the North-West University (Vaal Triangle Campus) in South Africa and Tilburg University (IVO) in the Netherlands. Some basic dimensions of the Sedibeng global commodity steel chain were discussed – such as the socio-economic context of high and persisting ethnically differentiated unemployment and poverty levels in the region, in spite of the presence of considerable natural resources based growth. This is to stress the need for secondary industrial development through the promotion of steel related economic clusters of SMMEs in the region to create jobs and reduce poverty, especially in the local townships.

The nature of the Sedibeng economy and steel industry were also analysed to point out the importance and limitations of inter-industrial linkages and multipliers. A first examination of the dominant force in the Sedibeng steel and metal products chain, the international steel giant Arcelor Mittal in Vanderbijlpark and Vereeniging, indicates some potential for downstream steel and metal final products clusters of SMMEs. This may open the possibility for higher local value added generation compared to the delivery of intermediate inputs to extra regional and export markets (functional upgrading). Opportunities are identified in the building and construction, as well as the automotive components and reparation sectors. Present and future demand for these final goods and services in the townships may make them appropriate locations

for productive SMMEs. Labor qualification gaps and actual steel pricing strategies are still barriers to the realization of these opportunities. The development and upgrading of local clusters of SMMEs in global value chains, input-output spillovers and industrial symbiosis techniques are interesting methodological tools to be explored in further research.

What to do next? The general objectives of this research project are to identify and plan the upgrading and creation of local SMMEs in downstream and upstream parts of the Sedibeng steel en metal products commodity chain.

Phase 1 of the project will focus on the complete value chain and the further identification of two promising production lines. In stage 2 local chain governance, behaviour of existing chain actors and the impacts on employment and productive opportunities will be analyzed. Stakeholders' networks and local government training for capacity building will be made operational in this stage.

In stage 3 new SMMEs production opportunities with priority on townships and niche market studies will be done. Deliverables in this stage include new production and upgrading opportunity assessments (business plans). Stage 4 will be the design of employment oriented local business strategies and local/regional government policies with stakeholders and government staff participations.

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