

URBAN INFUSION AS A POLICY OPTION FOR FUTURE URBAN DEVELOPMENT IN SOUTH AFRICA: THE WITWATERSRAND METROPOLITAN AREA AS AN EXAMPLE

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POVZETEK

URBANIZACIJA NA AFRIŠKI NAČIN – RAZLIČNOSTI V URBANEM RAZVOJU METROPOLITANIH OBMOČIJ JUŽNE AFRIKE

Zasičenje mest in spremembe v tradicionalnem procesu urbanizacije, ki se kažejo predvsem v trendih, ki jim strokovnjaki pravijo "centripetalna urbanizacija" ali "vzratna urbanizacija" so v zadnjih 15. letih tema skoraj vseh razprav urbanistov in prostorskih planerjev. Po socialnih ali rasnih skupinah diferencirano izpeljane študije selitev kažejo, da potekajo ob generalnem migracijskem ciklu, vzporedno, še selitveni procesi, ki so drugačni in se od povprečja razlikujejo. Takim večzvrstnim selitvenim oblikam, ki se pojavljajo v isti deželi pravimo "diferencirana urbanizacija". Zaradi možnega razvoja v tej smeri, si je omenjena razprava zadala nalogo raziskati smeri urbanizacije v južnoafriških velemestih. Ugotovila je, da je urbanizacijski proces črnškega prebivalstva kontradiktoren in polarno nasproten istemu pri belopoltem prebivalstvu. Ta trend bo najverjetneje obveljal tudi v post-apartheidskem razdobju in ustrezno oblikoval južnoafriška velemesta.

Introduction

In the past, demographers, planners and other urbanists tended to concentrate on mainstream migration as an explanation for urban development at the national and subnational levels. Urban systems were regarded to be either in the "urbanization", "counterurbanization" or "polarization reversal" phase of development (Richardson, 1977; 1980; Vining and Pallone, 1982; Vining and Strauss, 1977). This approach poses certain difficulties for urban management purposes, because (1) these processes are not mutually exclusive but overlap, and (2) different regions in a country and even different cities within a region may be in different phases of development. This is also the case in South Africa. These factors make the urban management process so much more complicated.

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In an explorative paper it was recently suggested that South Africa need to look at 'urban infusion' as an option for urban development in the future (Geyer, 1993). As a follow-up to the previous paper this paper attempts: First, to expand on the discussion on the relevant urban development scenarios for South Africa today, and, second, to understand the macro processes which should be taken into account in the management of urban areas. To this end specific elements of the major processes that are involved in the shaping of the urban system as a whole are being looked into.

The Process of Differential Urbanization

The concept of differential urbanization (DU) was recently introduced (Geyer, 1990; Geyer & Kontuly, 1993). It contains three basic elements:

- First, it combines the concepts of urbanization, polarization reversal, and counterurbanization across the development spectrum in one multidimensional process of urban development.
- Second, it differentiates between the roles played by mainstream and substream migration in the urban development process.
- Third, it identifies productionism and environmentalism as the fundamental driving forces behind the process of urbanization, polarization reversal and counterurbanization.

The first element of differential urbanization referred to above is that large, intermediate, and small sized cities in First and Third World urban systems tend to develop in sequence with one another. The relationship between these processes is indicated at an inverted semi log scale in Figure 1, where "time" is compacted towards the left of the horizontal axis (Geyer and Kontuly, 1993). Presently, polarization reversal is generally perceived as a phenomenon only to be associated with certain advanced less developed countries (LDCs), and that the urbanization phase of urban development in certain developed countries (DCs) was superseded in the 1970s by counterurbanization (Fielding, 1989; Frey and Speare, 1988; Fuguitt, et al., 1989). Although population migration trends in the First world countries have subsequently returned to urbanization, clear indications have been found that a country such as France first went through a phase of polarization reversal before it entered the counterurbanization phase.

A second characteristic of DU is that mainstream and substream population migrations normally flow in opposite directions during different phases of urban development. Generally, both streams differ in terms of their per capita levels of income, educational levels, age structures, etc. (Figure 2). Indications of main and substream migration were found in several DCs and LDCs. In France the older people tended to deconcentrate while younger people tended to concentrate in the former FRG during

the 1970s (Koch, 1980). In the United States the higher income groups tended to de-concentrate while poorer rural African Americans and Hispanics kept on concentrating in the major metropolitan areas over the same period (Berry, 1976). In South Africa white population shares have increased towards the fringe of the Pretoria-Witwatersrand-Vaal triangle (PWV) area between 1970 and 1985 in South Africa, while those of the Africans decreased in the same areas (Geyer, 1990).

The third aspect of DU can be regarded as the driving force behind the phenomenon.

Table 1: Economically active urban population as a percentage of total economically active population in each sector, 1980-85. (South Africa, 1985, 1986)

A Metropolitan areas

	Mining		Industry		Commerce		Services		Total	
	1985	'80-85	1985	'80-85	1985	'80-85	1985	'80-85	1985	'80-85
Africans	83.94	-0.18	41.96	-3.02	31.25	-4.06	55.08	-3.56	44.10	-3.69
Asians	0.41	0.02	8.11	0.39	7.86	1.00	2.79	0.74	6.24	0.70
Coloureds	0.77	0.19	18.57	1.89	10.84	1.93	9.66	0.85	12.84	1.60
Whites	14.88	-0.03	31.36	0.74	50.05	1.13	32.47	1.97	36.82	1.39
Total	100		100		100		100		100	

B Intermediate sized cities

Africans	41.50	3.19	41.84	-6.75	33.15	-7.78	59.38	-8.05	42.29	-6.73
Asians	0.12	-0.08	1.29	-0.15	1.91	-0.01	0.41	-0.05	1.02	-0.09
Coloureds	2.47	-0.02	21.23	3.99	10.83	2.56	9.51	1.59	12.40	2.19
Whites	55.91	-3.09	35.64	2.91	54.11	5.23	30.70	6.51	44.29	4.63
Total	100		100		100		100		100	

C Small sized cities

Africans	62.73	-7.29	57.51	-6.88	47.65	-9.39	65.68	-6.15	55.45	-7.27
Asians	0.74	-0.21	2.31	0.50	3.33	0.15	0.89	0.08	2.12	0.23
Coloureds	4.55	-1.00	24.76	6.23	16.79	4.41	16.73	2.67	19.94	4.23
Whites	31.98	8.50	15.42	0.15	32.23	4.83	16.70	3.40	22.49	2.81
Total	100		100		100		100		100	

Table 2: Percentage people living in the major metropolitan areas of South Africa per population group, 1991. (South Africa, 1992)

	RSA	Total Metr.	PWV	Durban	Cape Town
	N	%	%	%	%
Africans	21 646 471	21.02	17.02	7.88	1.93
Asians	986 620	58.35	14.92	40.77	2.66
Coloureds	3 285 718	41.80	7.95	6.63	10.07
Whites	5 068 110	57.34	40.64	6.63	10.07
Total	30 986 919	34.42	19.86	8.10	6.46

Productionism Versus Environmentalism

Many explanations have been given for urban concentration and deconcentration in the First and Third World at the macro level. They include:

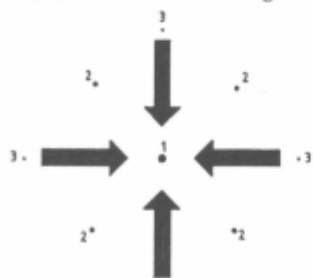
- the economic cycle
- agglomeration and deglomeration forces
- economic restructuring.
- reduced distance friction
- implicit and explicit state policy
- rural resource development
- spatial closure and protectionism
- residential preferences
- changing socio-demographics
- concentrated or dispersed educational and social services

Although all these factors could influence migration at the local, subnational and/or national levels none of them satisfy as explanations individually, because some of them could be the cause of either concentration or deconcentration, some could be their result, and others could be both cause and result, because they are all inferential or secondary. Productionism and environmentalism are regarded as the only two fundamental explanations for concentration and deconcentration respectively.

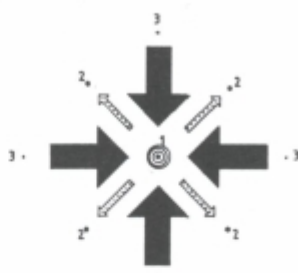
Productionism refers to the stage in people's lives when improved job opportunities, education, and income are more important than actual living conditions. In accordance with the spatial implications of the concept of mobility transition (Zelinsky, 1971) which underlies the concept of differential urbanization, this has proven to be a major driving force behind the tendency of the rural poor to migrate to larger cities in most First and Third World countries.

In environmentalism a person's need to improve his actual living and environmental conditions becomes dominant. Generally, deconcentration in the First and Third world is dominated by this force.

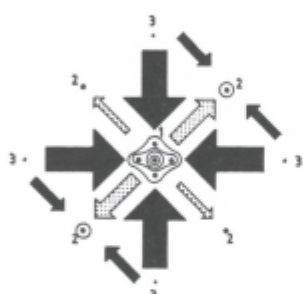
Figure 1 A graphic model of the phases of differential urbanization: mainstream and sub-stream migration flows



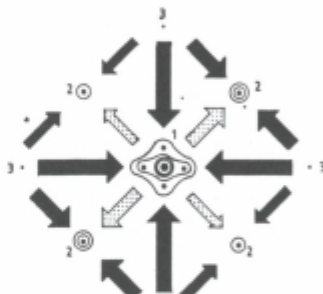
1a. Early Primate City Stage



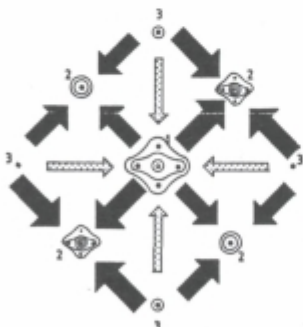
1b. Intermediate Primate City Stage



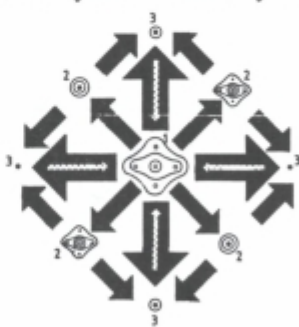
1c. Advanced Primate City Stage



1d. Early Intermediate City Stage



1e. Advanced Intermediate City Stage



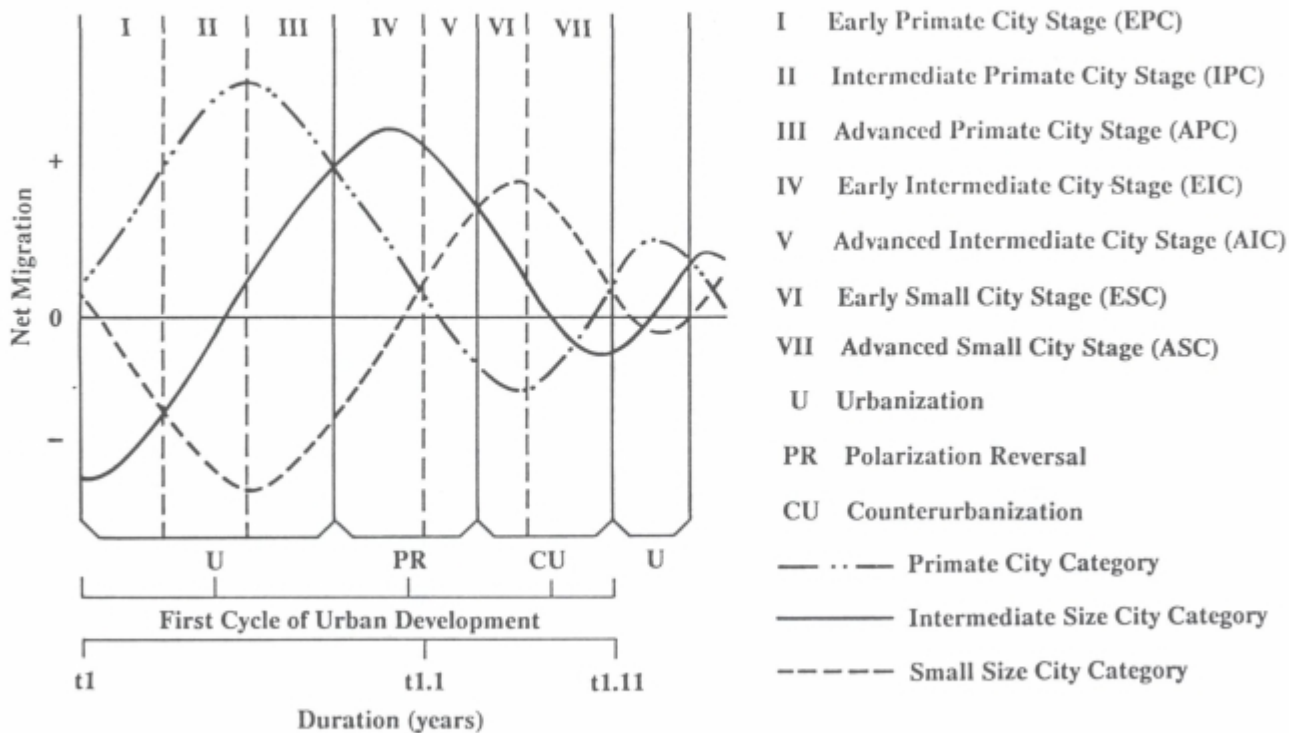
1f. Small City Stage

Downstream Movements (mainstream) →

Upstream Movements (sub-stream) ⇨

(Geyer and Kontuly 1993)

Figure 2 Generalized stages of differential urbanization



General Deductions from Fundamentalism

A few relevant deductions in terms of urban management may be made at this point:

First, there is a positive relationship between net migration rate and settlement size during urbanization. During counterurbanization the relationship is negative (Fielding, 1989; Ogden, 1983). During polarization reversal the relationship could be described as symmetrical where the medium sized cities in a country grow faster than both the small sized and primate cities.

Second, the process of urbanization is defined as the tendency of industry and population to concentrate at a limited number of locations at the macro-level, while diffusion or urban sprawl occurs at the micro level (Clark, 1967). This definition still treats population migration as an aggregated whole. In terms of differential urbanization (Figure 2) some environmentally-driven deconcentration may already occur at a substream level, while productionism-driven concentration occurs as a mainstream phenomenon.

If we disaggregate spatially, Figures 1 and 2 imply that a secondary city at a higher level of disaggregation may act as a primate city at a lower level of aggregation. This means, growth in one city could ultimately have an effect on growth in other cities at the same level of aggregation, or in cities at higher and/or lower levels of aggregation. Therefore, urban management should not only address factors with a local impact. It should also include factors relevant at the "urban system" level. For instance, a city may gain industries on aggregate, but may be losing a certain range of industries to the urban system at a higher or lower level. This factor should be included in the development scenarios for the city.

Consequences for Urban Management in South Africa

Being productionism-driven, the rural poor in South Africa have been migrating towards the larger urban areas until 1985 (Geyer, 1993, Figure 4). Since 1985 the concentration rate of this population group has increased considerably in all the zones in the PWV area (Figure 3) This is due to the abolishment of the influx control measures of the government since the late 1980s. It is expected, however, that the long term trends which are dominated by the flood of migrants to most urban areas in South Africa especially since 1990, would once again return to the trends which prevailed before 1985.

From 1980 to 1991, the Gompertz curve and the corresponding Gini coefficient for the PWV area have changed only marginally from 0.79 in 1980 to 0.82 in 1991. At the same time the Gini coefficient for South Africa as a whole have increased substantially, from 0.69 in 1980 to 0.86 in 1991. The erosion of the middle income

group as depicted by the changes in the positions of the Gompertz curves of the country for the corresponding years (Figure 4), indicates an expected continuation in the increasing proportion productionism-driven migrants to the PWV area. Generally, the difference in the change in the two indicators between 1980 and 1991 is an indication of the ability of the larger metropolitan areas to weather economic slump periods better than the country as a whole.

Because the migrants from the rural areas cannot afford to commute, they obviously want to live as close as possible to areas of employment. On the other hand, the proportions of the Whites increased towards the periphery of the PWV, the small towns on its fringe, as well as in the intermediate sized cities surrounding the metropolis until the late 1980s (Figure 3). Many of these more wealthy people in our cities, are environmentalism-driven. They can afford to commute and prefer environmentally more attractive locations. Many of these locations occur at the fringes of the metropolitan areas, hence the tendency of this group to decentralise.

Table 3: Percentage people living in informal houses in the major metropolitan areas fo South Africa per population group, 1991. (South Africa, 1992)

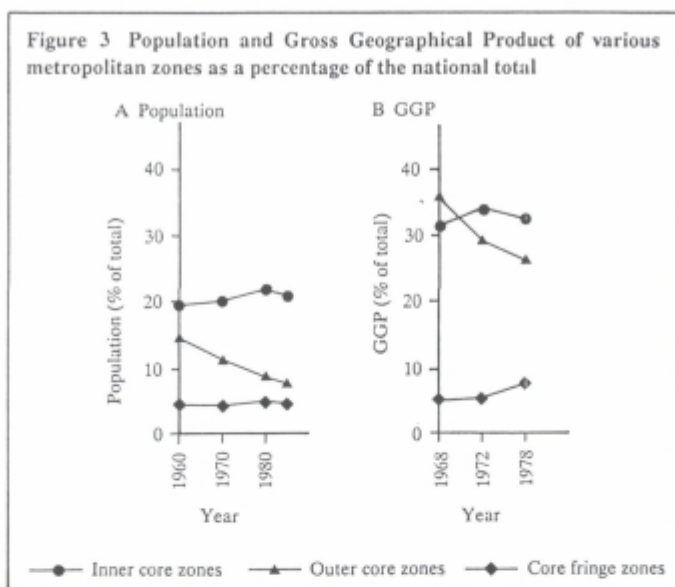
	Africans		Asians		Coloureds		Whites		Total	
	M*	I**	M	I	M	I	M	I	M	I
	No.	%	No.	%	No.	%	No.	%	No.	%
PWV	3684621	19.93	147241	0.23	261347	2.32	2059489	0.08	6152698	12.07
Durban	1706329	48.56	402201	1.09	64681	0.37	336173	0.06	2509384	33.21
Cape T.	418406	52.62	26243	0.03	1047559	1.26	510512	0.03	20027220	11.66
Total	5809356	30.70	575685	0.82	1373587	1.42	2906174	0.07	10664802	16.97

* M – Metro,

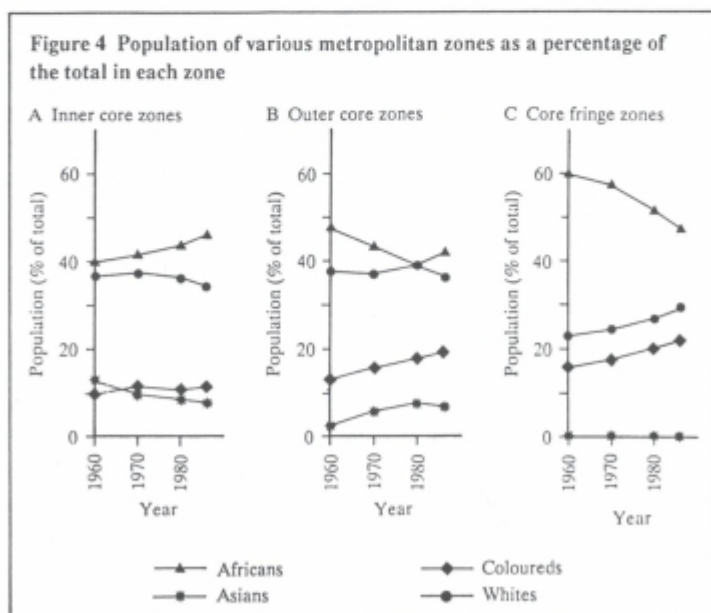
** I – Informal

Table 4: Economically active population as a percentage of each race group in metropolitan areas, 1980–85. (South Africa, 1985, 1986)

	Mining		Industry		Commerce		Services		Total
	1985	'80–85	1985	'80–85	1985	'80–85	1985	'80–85	
Asians	0.41	-0.08	45.68	-2.86	37.74	1.25	16.17	1.69	100
Blacks	11.86	-0.52	33.49	0.73	21.25	-0.51	33.4	0.30	100
Coloureds	0.38	0.02	50.90	-0.72	25.32	1.97	23.4	-1.27	100
Whites	2.52	-0.44	29.98	-0.09	40.76	0.10	26.74	0.43	100
Average	6.23	-0.80	35.19	0.38	29.99	0.54	28.59	-0.12	100



(South Africa, 1974; 1985; 1986)



(South Africa, 1986)

If the rural poor are accommodated on the urban fringes, as is happening at present (Figure 5) the morphological principle given above is reversed and the urban structure is inverted. Inevitably this will result in clashes between the diffusing higher income groups and the centralising lower income groups as has occurred between existing residents in the northwest of the Witwatersrand and squatters in the Zevenfontein area. Figures give an indication of the extent of the problem on the perimeter of the Witwatersrand. Other examples where similar clashes between the existing residents and squatters have erupted are the area west of Midrand to the north-east of Johannesburg, the Orange Farm area south of Johannesburg as well as Hout Bay in the Cape Town metropolitan area.

This is not a problem limited to South Africa, however. It has occurred previously elsewhere in the world as well:

In Europe, many French African citizens returned to France after the independence of the French African Colonies during the late 1960s and early 1970s. A large proportion of these people settled at the fringes of the Paris metropolitan area which resulted in an inversion of the urban structure; the wealthy living on the inside and the poor on the outside. This resulted in tremendous urban management problems which had to be solved by the development of New Towns and the provision of expensive mass transit facilities.

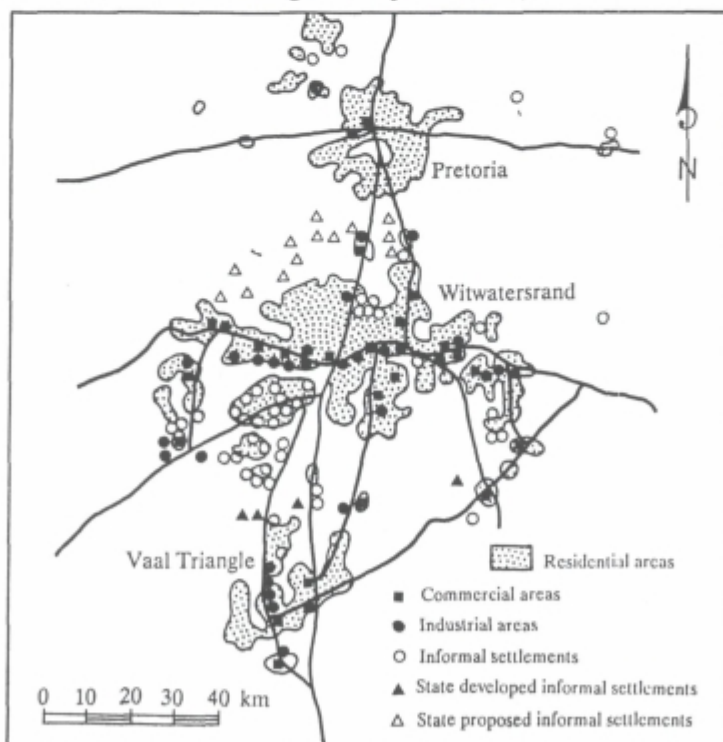
In Mexico City, due to extreme forms of financial segregation, vast so-called "lost cities" developed at the fringe of the city (to the north and east of the metropolis) at long distances from places of work (to the west) (Hall, 1984).

These mistakes should not be repeated in South Africa. The continuous areas which have been identified for informal settlement along the fringes of the PWV (Metropolitan Chamber, 1992) could ultimately lead to a repetition of this problem (Figure 5). If proper care is not taken, the sandwiching of the higher income groups between the urban poor on the inside and those on the outside is a distinct possibility. This is what could be called the "diffusion option". Alternatively, the same information on the availability of land could be used to identify zones of "urban infusion" – i.e. zones radially oriented towards the inner city instead of concentric zones along its edges (Geyer 1993). In the first paper on this theme (Geyer 1993) potential "zones of infusion" were indicated in three of the major metropolitan areas of South Africa. In this matter is pursued further with respect to the Witwatersrand Metropolitan area. Specific areas which are suitable for urban infusion as well as the development priority given to them are shown in this figure. Based on the urban infusion approach suggested in this paper both the areas and the development priority given to each differ somewhat from those identified by the Metropolitan Chamber (1992). Most of the areas indicated within the metropolitan built up area are relatively small isolated patches of derelict or open land which can easily be utilised for informal urban settlement. They are small and spatially removed from one another

which increase the possibility of their integration with the existing surrounding urban areas. The larger areas indicated on the perimeter of the city should not be allowed to be settled in their entirety because this will undermine the objective of the containment of large continuous informal cities in the country.

If an attempt is to be made to accommodate the expected future patterns of differential urbanization in the South African metropolitan areas, more than only the identification of land for informal settlements should receive attention. From an urban management point of view, the settlement of the higher income groups is as important as that of the informal settlements, because in many respects the two issues could be regarded as the two sides of the same coin. Consequently, environmental, demographic, and urban morphological factors are as important as geo-technical factors such as servicing costs, slopes, geology, etc. in the identification of land for urban settlement.

Figure 5 The location of informal settlements in the Pretoria-Witwatersrand-Vaal Triangle metropolitan area, 1991.



Relating these spatial fundamentals to industrial development, a locational distinction should be made between industries in terms of their technological sophistication and labour intensiveness. In principle, technologically more advanced/capital intensive industries relying more on highly skilled labour should be stimulated towards the peripheral areas of our main metropolitan areas, spatially tying their distribution with the differential urbanization patterns of higher income group diffusion in our major metropolitan cities. Towards the inner city, attention should be given to the development of the informal sector and to labour intensive industrial development such as commercial and service industries.

In contrast with the planning and spatial management of our urban areas by the South African government during the apartheid era, an attempt should now be made to link urban development policies and strategies with existing spatial and economic development trends. The differential urbanization trends highlighted in this paper are one of the crucial factors which should be taken into account in the formulation of urban development policy in the country. If the urbanists in South Africa could succeed in bringing urban management policy in line with the underlying urban demographic trends in the country, one will have succeeded in moving closer to the planning ideal of synchronising implicit and explicit spatial policy.

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Figure 6 The location of informal settlements in the Durban-Pinetown-Pietermaritzburg metropolitan area, 1991.



Figure 7 The location of informal settlements in the Cape Town metropolitan area, 1991.



Figure 8 The integration of formal and informal urban development in metropolitan South Africa

