The aim of this report is to provide an understanding of the processes of informal settlement in KwaZulu-Natal, to refine a typology of settlements and to introduce principles that would inform policy on their reconstruction. Discussion is focused on informal settlements outside the Durban and Pietermaritzburg metropolitan areas; in other words, the predominantly rural settlements of the region. Emphasis is placed on the quantitative dimensions of current access to employment and service provision.

The study is based on data from the former Natal Provincial Administration (NPA), a survey by Woods et al in 1994, and an NPA survey of the South Coast and East Griqualand in 1992. Information on informal settlements remains inadequate and urgently required.

Table 1 presents the provincial summary of informal settlements and their population outside KwaZulu-Natal's two metropolitan conglomerations. The distribution data derived from Table 1 shows escalating degrees of spatial marginalisation in non-metropolitan areas. It indicates that for every two settlements in a major industrial complex there are, for example, six in or adjacent to a town, nine within 15 kilometres (off a major road) of an urban centre, and 12 which are more than 15 kilometres from an urban centre off a major road.
Table 1 Distribution of Informal Settlements: KwaZulu-Natal excluding Pietermaritzburg and Durban Metropolitan Areas

<table>
<thead>
<tr>
<th>Access class</th>
<th>No</th>
<th>%</th>
<th>No</th>
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<tr>
<td>Major Industrial complex</td>
<td>9</td>
<td>6.4</td>
<td>47166</td>
<td>9.2</td>
</tr>
<tr>
<td>Town</td>
<td>26</td>
<td>18.4</td>
<td>44706</td>
<td>8.7</td>
</tr>
<tr>
<td>15km and less</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On major road</td>
<td>14</td>
<td>9.9</td>
<td>114216</td>
<td>22.4</td>
</tr>
<tr>
<td>Off major road</td>
<td>39</td>
<td>27.7</td>
<td>125077</td>
<td>24.5</td>
</tr>
<tr>
<td>More than 15km</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On major road</td>
<td>4</td>
<td>2.8</td>
<td>5090</td>
<td>1.0</td>
</tr>
<tr>
<td>Off major road</td>
<td>49</td>
<td>34.8</td>
<td>174760</td>
<td>34.2</td>
</tr>
<tr>
<td>Total</td>
<td>141</td>
<td>100</td>
<td>811014</td>
<td>100</td>
</tr>
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</table>

A quarter of the settlements surveyed occur in urban centres, accommodating 92,000 people. Of the 53 most marginalised settlements - those more than 15 kilometres from an urban centre - only four occur on a major road. Settlements of lower levels of inaccessibility, which were a third of all settlements surveyed, are almost entirely the most marginalised.

A more detailed breakdown of settlements and population numbers shows, interestingly, that in the more marginal sub-regions of KwaZulu-Natal there is a greater tendency for settlements to be located in more inaccessible areas within the sub-region.

In the coastal core area, 27% of settlements occur in or adjacent to towns and on major routes near the urban centres while only 25% of settlements are in the most inaccessible class. More than half of the population of this sub-region live in settlements up to 15 kilometres from an urban centre on a major route.

In contrast, the profile of the inland core is far more extreme, with most settlements and 81% of people occurring within major industrial complexes. Settlement distribution in the region’s intermediate area shifts from the urban centres and peaks in a class of intermediate accessibility of up to 15 kilometres from an urban centre, where 47% of the settlements occur off major routes. In population terms the shift is more pronounced, with 55% of people living in the least accessible class of settlement.

In the southern agricultural area a further shift towards the least accessible class occurs: this is where 60% of the population and settlements are found. This trend is perpetuated into the northern primary area, although interrupted by the location of 10 settlements adjacent to towns.

## Provision of Services

The generation of line and point services, and access to these, would be influenced by settlements' position in the hierarchy of accessibility. Other factors such as density and concentrations of population would influence service threshold. This discussion focuses on the provision of piped water and electricity.

A classification for the provision of water was formulated. It was found that seven of the 104 settlements surveyed had no water supply, that 43 relied on natural water sources (Level 0), and 27 accessed water from enhanced natural sources such as reservoirs, tanks, wells, boreholes and protected springs (Level 1). Only 10 settlements had communal standpipes or water tanker services (Level 2), and 17 settlements had services ranging from multiple standpipes to full reticulation (Level 3).

Of the 17 settlements with the highest water provision, 13 were in urban centres or on a major route within 15 kilometres of these (Table 2). Of the remaining four settlements off the major routes, three have populations of 17,000 people or more.

Table 2 Selected Levels of Water Provision in Informal Settlements: KwaZulu-Natal Excluding South Coast, Pietermaritzburg and Durban

<table>
<thead>
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<th>Level 3</th>
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<tr>
<td>Major Industrial complex</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Town</td>
<td>8</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>15km and less</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On major road</td>
<td>3</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Off major road</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>More than 15km</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On major road</td>
<td>-</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Off major road</td>
<td>2</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>10</td>
<td>7</td>
</tr>
</tbody>
</table>
Settlements with a communal standpipe or water tanker service are characteristically urban or on major routes, or occur off major routes but have populations of 12 000 or above. The worst degrees of deprivation occur in and around urban centres in small settlements, six of which have populations of 368 or less. It is possible that issues of affordability will be paramount considerations in upgrading these settlements.

Electricity and Other Services

Electricity occurred in only 10 of the surveyed settlements to various degrees. Partial or full electrification of street lighting or structures was found in different combinations. Eight of these settlements also had high levels of water provision, and were predominantly urban, while one had Level 2 water-supply and one had Level 1 supply.

Among the 54 settlements with some form of improved water supply, gravel roads are the second most common internal service, occurring in 35 settlements. The remaining settlements have dirt roads or footpaths and there were tarred roads in only two urban settlements.

There were 11 settlements with improved sanitation and an equal number with an improved refuse disposal system. In six cases these two services occurred in combination. Improved sanitation also tends to occur with improvements in water supply, and in six cases with Level 3 water supply. Improved refuse disposal systems all occurred in conjunction with Level 3 water supply.

This ‘concentration’ of services in some settlements provides some insight into service delivery where it occurs in informal settlements. Of the 17 settlements with Level 3 water supply, four had a complete package of all four services. These settlements are in or near urban centres, with the exception of one settlement, which has a large population. Another three settlements had a combination of Level 3 water and two other services, and seven settlements had Level 3 water and one service.

Settlements where there was Level 3 water and one other service may well indicate weak coordination of delivery by the authorities. It is unlikely that they can be ascribed to a flexible policy of delivery where individual households may opt for a particular package.

While the levels of investment in service infrastructure in the 104 settlements is not insubstantial, overall provision is very low with, for example, about half of the settlements having to rely on natural water resources.

The supply of line services can be explained in terms of the logic underlying settlement typology: viable service provision is influenced by accessibility and related threshold considerations such as population concentration. The typology may well be useful in assessing sustainable provision in as yet unserviced settlements.

Social Facilities

High order facilities such as schools and clinics require considerable threshold support for viable operation. For example, a threshold population of 500 families for a primary school and 1 500 families for a high school were suggested by service providers as rules of thumb for rural service provision. Therefore the size factor is initially considered, followed by an examination of the influence of accessibility.

Threshold values for social services were calculated from the data in the regional survey by Woods et al for settlements which had known levels of service. The following very low threshold sizes were determined: 1 400 for a primary school, 1 900 for a clinic, 2 000 for a permanent clinic and 2 200 for a high school.

The sample found that fixed clinics occurred in settlements ranging in size from 200 to 80 000 people, while mobile clinics occurred in a size range of 300 to 32 000 people. Both primary and secondary schools occurred in a size range from 300 to 80 000 people. Five of 13 settlements have more than 10 000 people but no clinic provision, and similar absences of high schools were recorded. By comparison, the smallest settlements of below 500 people recorded three primary schools, two mobile clinics, one high school and a fixed clinic.

These considerations of size lead to the following conclusions. Firstly, the number of small settlements with high order facilities implies that either thresholds are inadequate for their sustainability or that they rely on a wider population for threshold support. In the latter respect, informal settlements function as villages or towns in an integrated system of service provision involving the entire settlement system.

Secondly, low median threshold sizes are attributed to lack of facilities in certain settlements as well as under provision. The former is partly
due to threshold capture of settlements in urban areas. For example, seven of the nine settlements in major complexes and 17 of the 23 settlements in or adjacent to towns have no schools or clinics. Where a number of settlements cluster, pressures on social services are acute.

Table 3 records those settlements in the regional survey in which social facilities are present. Comparison with the distribution of water provision shows that while piped water provision and other services favour higher levels of accessibility, the opposite is true for social facilities.

Although point services (apart from mobile clinics) rely on line services such as water and electricity for efficient operation, it is found that line services are predominantly urban oriented while point services are concentrated in rural areas of low accessibility. Clinics in rural areas off major roads are largely dependent on their own water supply for successful operation.

**SPATIAL PATTERNS**

Although data from the two surveys provided valuable information on oscillating migration and commuting, interpretation is sometimes necessary to distinguish the two processes. Patterns of access are discussed according to the spatial classes below, covering the whole of KwaZulu-Natal.

The coastal core area is characterised by web patterns of linkage, implying employment in more than one urban centre. These patterns are a result of the intense urban development of the coastal core. Short distance commuting circles of 15 kilometres around towns overlap, resulting in a highly integrated urban system. A high degree of choice is available to work seekers in this area.

On the north coast, clusters of settlements occur in close proximity to industrial complexes and around towns. The striking feature of the south coast is the dominant linkage with Durban. It is not unrealistic to project the metropolitan development of the eastern seaboard from Margate to Empangeni in the medium to long term.

In the inland core the degree of spatial integration is less pronounced, with more limited spatial choice. In the northern part short distance commuting from settlements clustered around industrial complexes predominate, while the southern part experiences more long distance commuting and oscillating migration.

Settlements in the intermediate area show mixed patterns of access, with settlement clusters involved in farming and forestry, employment in local towns and in distant, larger centres. Oscillating migration could be fairly substantial in the Greytown, Ixopo and Harding areas.

Settlements in the southern agricultural area show mixed linkages as well as agricultural orientation. In the southern Drakensberg oscillating migration to urban employment is likely to occur, while in East Griqualand limited employment opportunities encourage migration: the two settlements have declining populations.

The northern primary area shows a number of rural settlements with no access to urban employment. There are three clusters of settlements around towns and two in the St Lucia area. A number of large settlements occur in northern Natal, and in these oscillating migration to distant industrial complexes - often for gold sector jobs - is the dominant process.

**POLICY IMPLICATIONS**

The concept of informal settlement requires reformulation. These settlements are not isolated concentrations of population with a discreet set of social and economic relationships that can be considered entirely as a unique focus of reconstruction policy. Rather, informal settlements should be considered as components of the entire settlement pattern in which they play an important part.
Despite the relative neglect and under provision of services, substantial investments in infrastructure occur in informal settlements in the region. These settlements function in a variety of ways, ranging from mining and agricultural villages, education and health centres to retirement and religious centres in addition to that of dislocated residential dormitories. In this sense the functions of informal settlements are not dissimilar to formal towns and villages that have benefited from higher levels of service provision and urban management.

The functional roles of settlements change with time. Informal settlements, like formal settlements, satisfy certain needs to various degrees and as perceptions of settlement performance change, settlements may change in function or decline. Declining settlements may cease to exist.

This study found that the possibility of decline occurs in settlements with populations of less than 1,000. In rural areas this phenomenon was noted in settlements off the major road routes in districts of overall population decline.

This is not merely a caution on the widespread phenomenon of rural settlement decline. On the one hand, settlement function may be reinforced and built upon as, for example, in well located areas with threshold support and existing concentrations of services. On the other hand, functional change may be sensitively and creatively facilitated.

However, it is recognised that not all places have the same ability to generate and support the same functions - accessibility is important. For example, agricultural development schemes are most likely to succeed in areas accessible to expanding metropolitan markets or where major flows of regional population occur as market outlets.

In inaccessible rural areas raising rural incomes and healing the land through public works projects are preconditions to development of the agricultural sector. Rural settlements in these areas may embrace new functions related to public works projects such as material caches and plant nurseries for restoration projects.

In general, attempts at manipulating the space economy may not result in long term benefits, as shown by the former Regional Industrial Development Programme. This means that opportunities for directing internationally competitive economic sectors into peripheral areas is extremely limited, with the major exception being resource based tourism. The development of this sector could considerably benefit informal settlements in less accessible areas. However, current approaches in which tourism is a capital intensive industry will need revision.

Regarding rural service provision, this study found that a spatial disjuncture occurs between provision of line services and point services such as clinics and schools in less accessible areas. Although further study is required to determine the role of smaller, less accessible settlements in serving surrounding rural populations, it is considered that this spatial disjuncture epitomises the basic dilemma of servicing marginalised areas with services that need to be sustained by high levels of accessibility.

Rural services need not be embedded in rural areas of low accessibility nor in the settlements themselves. Intermediate positions in the hierarchy of accessibility should be examined, for example on the major routes. As Dewar has pointed out, the exact location of different facilities on such routes may vary with the specific requirements of the services with, for example, educational, health or economic nodes at different locations.

A further point involves facilitating processes of access of which three possibilities are suggested. Firstly, given the overwhelming metropolitan orientation of the regional workforce, the role of Durban is stressed. Secondary city policy may be appropriate here. In addition, the implications of a vast metropolitan area along the eastern seaboard focusing on Durban requires further consideration.

Secondly, there is a strong case for a coherent public transport policy that supports a hierarchy of accessibility compatible with the generation of and access to employment, services and other opportunities. The eastern seaboard is a case in point. In this area the linear-nodal development of the coastal belt with improved commuter transportation focused on Durban provides points of departure for rural service routes through former KwaZulu districts to the midlands route parallel with the coast.

Small towns such as Ixopo are logical focuses for agricultural development on this midlands route, and the entire system could be supported by the multi-functional use of river systems. Furthermore, rail infrastructure could be revitalised.

Thirdly, patterns of movement can and do change. Conscious use of new roads to support rural settlements is necessary. In certain instances road provision provides significant opportunities that could support latent patterns of movement.
The proposed Pietermaritzburg bypass may be such a possibility, due to the need for improved road quality in the Vulindlela area, the orientation of Transkei commuter traffic, the population concentrations in the Impendle/Hlanganani area and the possibility of an N3-Himeville link that avoids the Mkomazi valley route. A potential public works project involving a proposed dam near Impendle also features here.

CONCLUSION

This study has shown that spatial organisation has considerable influence on access to a range of benefits used by informal settlements in the province. It is also considered that spatial considerations embodied in the typology of settlements can meaningfully inform the formation of informal settlement policy.

In the two surveys involving about half a million inhabitants of informal settlements, it was seen that about 20% reside in urban centres and a third in the least accessible rural areas. The remaining half of the population lives in locations of intermediate accessibility, equally distributed on and off major road routes. Clearly the priorities of these different residents and possibilities for reconstruction will vary widely.

REFERENCES


Bradford, Conning and Partners (1991) 'Minitramp Programme - Matrix Data'.


