A critical evaluation of the operational application of various settlement typologies in South Africa

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Abstract

This article critically evaluates the definition and operational application of various settlement typologies across selected government departments for the purposes of the planning, implementation and monitoring of development programmes. Both quantitative and qualitative research methods are applied and informant and group interviews are conducted with 21 different government departments or entities. Nine different typologies are identified and compared on the basis of the requirements highlighted during the group interviews and international best practice. Discussions with the various interest groups highlight the need for a functional typology that consists of a number of categories or classes that can be combined as needed and not be restricted to a simple urban-rural dichotomy. A more dynamic and accessible linkage between the spatial units of analysis of the various typologies is also required. It is found that the South African City Network/ Council for Scientific and Industrial Research (CSIR) settlement typology meets most of the criteria set by the literature as well as the groups interviewed. In view of the widespread use of the Statistics South Africa (Stats SA) data and typologies, it is recommended that the South African City Network/CSIR typologies should dovetail as much as possible with the 2011-census data and classification system.

'N KRITIESE EVALUERING VAN DIE OPERASIONELE TOEPASSING VAN VERSKILLENDE NEDERSETTINGSTIPOLOGIEË IN SUID-AFRIKA

Hierdie artikel evalueer die definisie en toepassings van verskeie nedersettingstipologieë wat deur verskillende regeringsdepartemente en ander openbare instellings gebruik word vir die doeleindes van beplanning, implementering, en monitering van ontwikkelingsprogramme. Beide kwantitatiewe en kwalitatiewe navorsingsmetodes word gebruik en groeps-onderhoude word onderneem met 21 verskillende regeringsdepartemente en entiteite. Nege verskillende klassifikasiesisteme word vergelyk, gebaseer op die vereistes soos geïdentifiseer tydens die groepsonderhoude en die oorsig van internasionale beste praktyk. Die behoefte aan 'n funksionele tipologie wat voorsiening maak vir 'n aantal klasse wat saamgevoeg kan word soos nodig en nie net beperk is tot 'n landelik-stedelike onderskeid nie word beklemtoon gedurende die groepsonderhoude. Die resultate van die navorsing toon ook 'n duidelike behoefte aan 'n meer dinamiese en toeganklike skakel tussen die ruimtelike eenhede van analise in die verskillende klassifikasiesisteme. Die navorsing bevind dat die tipologie soos ontwikkel deur die Suid-Afrikaanse Stadnetwerk en die Wetenskaplike en Nywerheids Navorsingsraad (WNNR) aan meeste van die kriteria wat uit die literatuur oorsig en die groepsonderhoude geïdentifiseer is, voldoen. In lig van die wye gebruik van die Statistiek Suid-Afrika-data en -klassifikasie is dit noodsaaklik dat die WNNR-klassifikasie en die 2011-Sensusdata en tipologie optimaal geintegreer word.

CHEBISISO E TEBILENG EA MALULO A FAPANAENG KA HARA NAHA EA AFRIKA BORWA

Serapa sena se shebisisa polelo le tshebediso ea malulo a fapaneng hara mafapha a fapaneng a mmuso ka mabaka a ho rera, ho etsa le ho shebella hoa manane a tswelopele. Mekhoa e mebedi ea ho phethahatsa patlisiso e leng oa ho batla taba tsa dinomoro (quantitative) le ho batla taba tsa maikutlo (qualitative) e sebedisotsoe serapeng sena. Tlhatlhobo ea sehlopha sa difapha tse 21 tsa mmuso di ile tsa phethahala. Mekhoa e robong e ile ea fumanoa ea ba ea bapisoa le ditlhoko tse ileng tsa buoa mahareng a tlhatlhobo tsa dihlopha. Dipuo le dihlopha tse amahanang le ditaba tsena di bontshitse ho hlokahala e se ke ea ba le ho felloa ke sebaka sa hore di chenchoe. Kamahano ea dibaka le mefuta ea bolulo e hloka ho ba teng le eona. Ho fumanehile hore South African City Network kapa Council for Scientific and Industrial Research e leng (CSIR), ke eona e shebehallang e le eona e khonang ho etsa tsena tsohle tse sehlopha se hlahlobiloeng se buileng ka tsona. Ka baka la sena, ho bonahala hore palo ea sechaba ea 2011 e kenyelletsoe e be e sebelletsane le CSIR ho phethahatsa mosebetsi oa ho akaralletsa dibaka.

1. INTRODUCTION

A wide range of strategies and policies influence the way in which urban and rural development interventions are being conceived, funded, operationalised and measured in South Africa. The National Development Plan (NDP) 2030 includes strategic focus areas related to both rural (dealing with an integrated and inclusive rural economy) and urban (human settlements) dimensions, both requiring a common understanding of settlement typologies and definitions (NPC, 2012). Moreover, three of the Medium Term Strategic Framework 2009-2014 outcomes focus specifically on results that would benefit from a clearer understanding of how the concepts 'urban' and 'rural' are defined (The Presidency, 2009). Outcome Seven calls for the development of vibrant, equitable, sustainable rural communities that make a contribution towards food security for all South Africans. Outcome Eight focuses on sustainable human settlements and improved quality of household life. Outcome Nine aims to achieve responsive, accountable, effective and efficient local government systems. The importance of these outcomes was underscored by the establishment of the new Department of Rural Development and Land Reform (DRDLR) in 2009 to act as an initiator, facilitator, coordinator and catalyst for rural development interventions in South Africa.

The various agencies involved in development and service delivery activities in rural and urban areas have, however, mainly developed their own operational settlement typologies and analytical definitions of the concepts 'urban' and 'rural', resulting in a large degree of variation across individual departments and across the three spheres of government. This lack of standardisation also influences the effectiveness of monitoring and impact evaluation as well as statistical reporting. Surprisingly, little effort has been made to align and integrate the various typologies in use. The increased focus on rural development, as part of the government's poverty alleviation and developmental agenda, as well as the need for monitoring and evaluation

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of development and service delivery outcomes across all government departments necessitates some form of standardisation across various sectors. The aim of this research is to critically evaluate the use of different settlement typologies across selected government departments. It commences with a concise literature review of settlement typologies in theory and practice, followed by the identification of existing settlement typologies used by various government departments. It concludes with a critical evaluation of these typologies to identify common threads that can contribute towards improved synergy and integration.

2. A REVIEW OF SETTLEMENT TYPOLOGIES IN THEORY AND PRACTICE

The definition of functional settlement typologies not only influences the way in which plans are conceptualised and resources allocated, but it also impacts on where and how development interventions are implemented. Any ambiguity in defining the rural-urban context can lead to misclassification and misguided policy formulation (Brown & Cromartie, 2004: 283) and may result in erroneous interpretations of rural trends and opportunities (Isserman, 2005: 465) as well as urbanisation processes (Hugo & Champion, 2004: 384).

Four general settlement typology groupings can be distinguished based on the primary variables used for classification: administratively, morphologically, demographically and functionally defined. In many regions, classification depends, to a large extent, on administrative decisions rather than the meaning and functions of these areas (e.g. for Brazil, Pinto da Cunha, 2004: 198). Administrative boundaries are commonly used for classification purposes, often resulting in entire administrative subunits such as districts defined as 'rural' or 'urban', thereby simplifying the work of public sector planners and officials who have to deal with categorisations. The main disadvantage of these classification criteria is that they do not take cognisance of cross-border flows and often tend to be large and heterogeneous. Morphological definitions are primarily based on urban form, such as the presence of a formal urban layout and structure. The advantage of this classification system is that it offers continuity and comparability over time. The main shortcoming is that it does not take living conditions or economic growth potential into consideration. The most widely used approach is demographically defined typologies, based on settlement size and density (UN, 2008: 105-109). Despite its widespread use, there are some challenges inherent to this method that may result in some misclassification. This can mainly be ascribed to time lapse between censuses (Hugo & Champion, 2004) and problems with international comparisons, as similar degrees of urbanisation do not mean that countries are at the same stage of economic development (Garca, 2004: 167). One of the main points of criticism against the use of density is the problem of idiosyncratic land areas characterised by mixed uses as opposed to homogeneous residential uses (Coombes, 2004: 309). The fourth group is functionally defined typologies, based on how space is conceived and used. These typologies are usually based on a number of different variables, resulting in a range of classes and can be developed for both general and specific purposes (e.g. as shown by Olatunde, Leduc & Berkowitz, 2007 for health services in Canada using the General Practise Rurality Index).

One of the main arguments for the development and use of more nuanced typologies is the transformation of urban systems. Dynamic patterns of urban development require innovative and alternative systems of classification that go beyond the traditional approaches. The increased mobility of people, goods, services, capital and ideas blurs the distinction between urban and rural populations (Hugo & Champion, 2004: 11). The general limited availability of flow data, however, makes it difficult to fully incorporate flows into typology development. The relationships between the core and the periphery have also become increasingly complex to the point that simply regarding the concepts urban and rural as a dichotomy has become obsolete (Dahly & Adair, 2007: 1407). Views of space have shifted towards an approach where relationships and networks predominate rather than it being absolute and contained (Couclelis, 1991: 4; Coombes, 2004: 316; Bourne & Simmons, 2004: 267; Naudé, Le Maitre, De Jong, Forsyth, Mans & Hugo, 2008: 6). Advances in GIS systems now make it possible to develop geocoding systems that are more flexible, with more classes and greater variability (Brown & Cromartie, 2004: 283). However, the fact that the rural-urban dichotomy survived for so long probably indicates that typology users value simpler categorisations, and a multi-class typology should aim towards identifying a limited range of categories (Coombes, 2004: 312).

There is no globally uniform approach to defining settlement typologies, and more specifically urban-rural typologies. Urban typologies defined by selected countries in various world regions are primarily based on demographic criteria such as size and density typologies and differ from country to country (UN, 2008: 105-108). Attempts have been made in some regions to standardise definitions and approaches. For example, the nomenclature of Territorial Units for Statistics (NUTS) 3 typology has been proposed and is used, to some extent, in Europe as a way of standardising reporting on urban and rural contexts, but most countries continue to use their own typologies. The definition of the Organisation for Economic Co-operation and Development (OECD) distinguishes between three types of regions, grouped according to the share of the regional population living in rural communities (Ballas, Kalogeresis & Labrianidis, 2003: 7):

- 'Predominantly Rural' (PR), more than 50%;
- 'Significantly Rural' (SR), between 15% and 50%, and
- 'Predominantly Urbanised' (PU), below 15%.

In Scotland, six settlement types are used, namely cities, large urban, medium urban, small urban, small rural, and remote rural (Scottish Enterprise, 2008: 9). These typologies can also be aggregated into fewer classes for national planning purposes. Pinto da Cunha (2004: 200) describes a more nuanced settlement system in Brazil that consists of eight typologies forming a scale of decreasing 'urbanness'. These classes include urbanised area, non-urbanised area, isolated urban area, rural agglomerate of urban extension, isolated rural agglomerate or village, isolated rural agglomerate or nucleus, other population agglomerates, and rural area (excluding rural agglomerate). The census bureau grouped categories 1 to 3 together as urban and the remainder as rural. Category 4 could be regarded as transitional between

urban and rural, but has not been used as such by the census bureau. This classification system is based on the form of space, distance and social infrastructure for rural subclasses. An additional system developed in Brazil for use in urban agglomerations distinguished between five criteria: degree of centrality/area of influence (integration); existence of decision-making centres and international relations; scale of urbanisation (includes density, size, pace of demographic growth); complexity/diversification of the urban economy, and diversification of the tertiary sector (Pinto da Cunha, 2004: 203).

A wide range of rural-urban definitions and applications are in use at federal level in the United States and include, among others, those of the National Centre for Disease Control (NCHS, 2012) and the US Department of Agriculture (USDA, 2013). In the case of the USDA, there are 9 rural-urban continuum codes – three for metropolitan areas and 6 for non-metropolitan areas. Metropolitan counties are classified by population size, whereas non-metropolitan counties are classified by the extent to which they are urbanised as well as their proximity to metropolitan areas. Another typology often used is the Rural-Urban Commuting Areas (RUCA), based on census tracts and consisting of 33 categories classified according to settlements and town sizes and the functional relationship between places, as measured by tract-level work commuting data (Hart, Larson & Lishner, 2005: 1152).

Ogdul (2010: 1519) uses three classifications, based on the NUTS classification, to determine urban-rural distributions in Turkey: dominantly urban, dominantly rural, and transitional. The six multi-indicator factors used for the purposes of classification include agricultural production, non-agricultural production, employment, demography, education, and flows of money and goods. Urban definitions in Africa have primarily been based on census definitions. Bocquier (2004: 150) advocates the use of a morphological approach, based on aerial photography and urban boundaries related to actual form instead of administrative boundaries in this region.

3. PREVIOUS RESEARCH ON SETTLEMENT TYPOLOGIES IN A SOUTH AFRICAN CONTEXT

Various authors have argued for the use of multidimensional measurements in the development of regional typologies to define the spatial landscape of South Africa (e.g. Fair 1970: 124; Fair, 1976: 40; Geyer, Steyn, Uys & Van Der Walt, 1988: 286; Harmse, 2007: 83; Van Huysteen, Bierman, Naudé & Le Roux, 2009a: 175). There is, however, significant divergence in terms of approach and definition used in scientific publications when it comes to settlement typologies. Rural areas in South Africa have generally had poorer access to services and have also experienced lower rates of improvement over time when compared to urban municipal areas (COGTA, 2011b: 5). Harmse (2010: 429) evaluated the nodes of the ISRDP in terms of poverty levels and found that many nodes included municipalities with relatively high levels of development, and that some municipalities with very low levels of development were not included.

These inconsistencies in the definition and use of settlement typologies resulted in a number of practical problems. Nleya (2008: 269) argues that ambiguous definitions of urban and rural lead to the misclassification of urban informal settlements and obscure the extent of urban poverty, especially within the context of access to basic water services. Hall & Cliffe (2009: 2) maintain that the lack of a clear rural development and land reform vision led to a situation where investment in rural development focused primarily on transport and industrial infrastructure within spatial development nodes. These inconsistencies also influence the effectiveness of demarcating functional administrative boundaries. Geyer *et al.* (1988: 286) investigated the statistical validity of the boundaries of the official development regions of South Africa and used multivariate analysis to identify statistically derived regions that supported or served as alternatives to the officially defined development regions.

A number of social demographic characteristics also impact on the development of a consistent settlement typology in South Africa. One of the major complicating factors is the existence of significant circular migration streams and resource flows between urban and rural areas (Cross, 2006: 209; Wentzel, Viljoen & Kok, 2006: 172). Others include pockets of relative wealth with good infrastructure and highly sophisticated commercial farming activities in rural areas and the existence of pockets of dense rural settlements that are remnants of the apartheid ideology and predominantly consist of former homeland territories (Naudé *et al*., 2008: 3; Van Huysteen *et al*., 2009a: 203). The spatial distortions caused by apartheid legislation, which controlled movement and settlement patterns, also resulted in a settlement system where there is not always a correlation between settlement size and economic activities/size. Van Huysteen, Oranje & Meiklejohn (2010: 4) thus argued for a move away from considering rural as a homogeneous space and proposed a discourse on rural diversity. Such a discourse would ultimately manifest itself in a more nuanced typology as well as more appropriate interventions aimed at addressing the rural development challenges faced by the country.

4. A COMPARATIVE OVERVIEW AND EVALUATION OF SETTLEMENT TYPOLOGY USE IN SOUTH AFRICA

The analysis of settlement typologies used in South Africa involved both primary and secondary data collection. Secondary data collection included information and datasets of the typologies currently being used by the selected Government departments and information on the legal and strategic framework influencing the definition and application of the concepts urban and rural. Primary data collection involved semi-structured interviews with key informants and groups from the various departments and spheres of government providing services in areas where the rural-urban typologies are relevant (see Table 1). The focus group discussions were participatory in nature and allowed the flow of the discussion to influence the content. All interviews took place between August and December 2011.

Key informants in each department were identified on the basis of current Statistics South Africa stakeholders, making use of census and sample survey data, advice from the Built Environment group at the CSIR, and the Presidency. At least one group discussion was held in each of the national departments selected for the study at national level and one provincial discussion for each department (see Table 1). Provincial selection included provinces with a large traditional/tribal component, such as KwaZulu-Natal, as well as provinces with a large commercial farming component in combination with traditional/tribal areas, such as

Mpumalanga. Participants of the focus group were targeting those with a primary interest or some expertise on the subject matter of discussion, and group sizes were as far as possible limited to a maximum of five individuals to increase the effectiveness of the discussions.

The inclusion of settlement typologies in the analysis process was based on the primary point of departure that they are actively used – either for resource allocation purposes or for planning, analysis and/or strategy development. The summary of typologies in Table 2 and the subsequent analysis thus only focuses on those cases where a clear typology has been defined and is actively used. For example, at the time of this research, the South African Police Service was in the process of revising their typology for the purposes of defining access norms and standards whilst the Department of Human Settlements only used an implied typology and was thus not included in this analysis. The research did not include typologies developed and used outside of government and public-sector institutions. The focus is primarily comparative and aspects such as evolution of typologies over time and a detailed exposition of the reasons for their development are not included.

The information outlined in Table 2 confirms the current divergence in typology development and use across government departments and spheres in South Africa. These typologies vary in terms of scope, scale, application and

Table 1: Groups and individuals interviewed as part of the qualitative research

Institution	Methodology	Number of groups/individuals	Designations/functions
Council for Scientific and Industrial Research (CSIR)	Group interview	3	Urban and regional planners, built environment specialists
Department of Cooperative Governance and Traditional Affairs (COGTA)	Group interview	1 group (4)	Researchers, policy analysts, subject matter specialists
Consultant	Key informant	1	Demographer
Department of Agriculture, Forestry & Fisheries (DAFF)	Key informant	1	Food security, Monitoring and Evaluation (M&E) specialist
Department of Basic Education	Group interviews	1 group (8)	M&E, Geographic Information System (GIS) and subject matter specialists
Department of Human Settlement	Key informant	3	Policy analyst, GIS specialists
	Group interviews	1 group (6)	Geographers, GIS specialists, subject matter specialists, policy analysts
Department of Health	Key informant	1	Policy analyst
	External key informants	3	Academics and health professionals
Department of Transport	Key informant	1	Engineer
Department of Rural Development and Land Reform (DRDLR)	Key informant	2	Policy analyst, geographer
	Group interviews	1 group (3)	Policy analyst, geographer
Department of Water Affairs (DWA)	Key informant	1	Engineer
	Group interviews	1 group (3)	Engineers and GIS specialist
Eastern Cape Provincial Government and Buffalo city officials	Group interviews	1 group (6)	Geographers, planners, DRDLR officials
Economic Development Department	Key informant	1	Geographer
Eskom	Group interviews	1 group (3)	Engineer, GIS specialist and planner
Free State DRDLR and Department of Agriculture	Group interviews	1 group (3)	Geographers, planners, DRDLR and DAFF officials
Human Sciences Research Council (HSRC)	Group interviews	1 group (5)	GIS specialist, geographer, rural development specialist, economic performance and development specialists
KwaZulu-Natal Provincial Government and eThekwini metro planning officials	Group interviews	1 group (6)	Geographers, planners, DRDLR officials
Mpumalanga DRDLR officials	Key informant	1	DRDLR official
National Planning Commission (NPC)	Key informant	2	Geographer and planner
Presidency	Group interviews	2 groups (8+4)	Statistician, geographers, GIS specialists, M&E specialists, subject matter specialists
South African Police Services (SAPS)	Key informant	2	M&E and GIS specialist
Treasury	Group interviews	1 group (8)	Economists, subject matter specialists

the types of variables that informed the development of the typology. Over the years, the CSIR has contributed significantly to the conceptualisation of settlement typologies within South Africa, as described in Spocter, Green, Van Huyssteen & Maritz (2011: 17, 20), and developed various settlement typologies (e.g. Naudé *et al*., 2008; Naude, Zietsman & Mans, 2009; Van Huysteen *et al*., 2009a; Van Huysteen, Oranje, Robinson & Makoni, 2009b). These include, among others, the functional urban rural typology as well as the Cities network/CSIR settlement typology. The typologies developed by the Departments of Health, Education, and Social Development were explicitly developed for the purposes of paying an additional allowance to employees who work in rural and hard-to-staff areas and facilities. Local and metropolitan municipalities, on the other hand, generally use their urban development boundary to distinguish between 'urban' and 'rural' areas. These different approaches and scales result in a situation where an individual settlement can be classified as 'rural' at a national level, while at a local level the town may have defined its own 'urban' boundary with a 'rural' hinterland beyond this boundary.

This lack of synergy and inconsistent settlement typologies has its roots in limited central guidance post-1994 and the fact that the perspectives and needs of the different spheres of government and the different departments within the same sphere are very different. The declaration of ISRDP rural nodes (areas with clear administrative boundaries for special rural development interventions), for example, provided an opportunity for clear central guidance. However, an evaluation of the ISRDP nodes (Harmse, 2010: 429) found that many of these nodes included municipalities with relatively high levels of development, while some municipalities with very low levels of development were excluded. The identification of the 22 priority districts according to the 2011-cabinet decision suffers from the same limitations in that it covers large administrative units with both affluence and severe service delivery backlogs, whereas smaller pockets of poverty and service delivery deprivation have not been included. A further disadvantage of an approach that classifies entire administrative units as 'rural' or 'urban' is that certain larger towns and cities that cannot be regarded as rural from a functional perspective are classified as rural. This not only distorts analysis aimed at policy and strategy formulation, but also monitoring and evaluation of impact and the reduction of spatial inequalities. It also illustrates a tension between urban planning-oriented approaches with a definite spatial structural, rather than functional bias, on the one hand, and the need for comprehensive and integrated development, on the other, which requires more functional definitions. In the case of the Department of Cooperative Governance and Traditional Affairs, one of the focus areas is to provide improved support to local municipalities. In this instance, the widely acknowledged differential nature of municipalities is a central tenet that has to be considered and that requires a differentiated approach, based on a spatial categorisation of municipalities, using characteristics that are unlikely to change dramatically over time. This framework focuses on a differentiated approach which is primarily based on municipal capacity, taking into consideration factors such as historical legacy, socio-economic vulnerability, capacity shortages, and an inability by a municipal area to take command over its physical location (COGTA, 2011a: 16). Another divergent factor is the wide range of settlement boundaries used by the various role players. For example, Stats SA uses urban boundaries as proclaimed by the Surveyor General, whereas the CSIR considers functionality and urban form to determine their boundaries. The Department of Water Affairs again uses their own unique geo-spatial referencing system to establish settlement and agglomeration boundaries.

The comparative overview of the various typologies clearly points to the need for a common typology at national level to improve the efficiency of planning and reporting. Reconciling the needs and perspectives of the different spheres of government in respect of a settlement typology will represent a significant challenge. The main reason is that the practical applications of typologies are affected by the scale at which they are used. What may appear to be a useful categorisation from a national prespective may be inappropriate at a local municipal level. However, if the objective is to find integration and synergy from a national perspective, and in doing so to find the greatest interface with planning processes at local level, a typology that is based on the same principles and spatial and developmental considerations inherent to the municipal Integrated Development Planning process is likely to capture most of what is implemented when measuring progress and impact. Not all the typologies were found to be suitable for inclusion into the more-in-depth analysis phase of the study. This was either because they were based on a continuum, or not being actively used or insufficient information was available about them. Table 3 provides a comparative evaluation of the various settlement typologies that were selected for further study. It first compares the various typologies in terms of type, use and scale. Each typology is then evaluated against a number of criteria, based on international best practice, as identified during the literature review, and a set of user-defined criteria identified during the interviews with the participants as well as general contextual considerations for functional typologies in South Africa.

Each of the typologies considered in detail in this study was found to have a number of strengths and weakness, as depicted in Table 3. For example, the CSIR typologies make provision for spatial distortion by basing their typologies on equal size areas. However, simultaneously, the 50 km^2 mesozones are too large as a unit of analysis to reflect the great diversity and complexity of larger urban settlements and regions. The settlement typology also does not provide a sufficiently nuanced classification of settlements in the ex-Bantustan states. The Stats SA typology is primarily based on the geographical classification used for the census and can be directly related to readily available data sources such as census and household survey data. The size of the enumerator areas is mainly determined by the number of households that can be visited by a census enumerator. As a consequence, the sizes of these areas vary considerably, with small EAs in densely populated areas and large EAs in sparsely populated areas. Although geographically distorted, it does represent areas of approximately equal population size.

Table 2: Nature and uses of typologies of selected departments included in the study

Department	Policies/definitions	Use/application	Typology classes	Reason for developing typology	Variables used to develop typology
CSIR	Functional urban-rural typology.	Used as the basis for spatial trend analysis, NUDF in partnership with NPC and Presidency. Also formed the basis of the DSD and work with, for example, eThekwini.	1 – Functional urban nodes 2 – Functional linked urban areas 3 – Commuter areas 4 – Rural nodes and clusters 5 – Dispersed rural settlement areas 6 – Sparse rural production areas 7 – Economically marginal and protected areas 8 – Mountainous areas	For strategic planning purposes in partnership with Presidency, National Planning Commission and Department of Trade and Industry.	Variables used for classification included land use, settlement, population density and economic activity.
	Settlement typologies.	Across government. Presidency, NUDF, SA Cities Network.	1 – City regions 2 – Cities 3 – Regional service centres 4 – Service towns 5 – Local and niche settlements 6 – Clustered and dispersed settlements	Initially as an urban classification system for the 2009 draft NUDF. In partnership with SALGA and SA Cities network.	Used Functional Urban and Rural typology of the GAP2 mesoframe1[1] to demarcate 'new' settlement boundaries. Accessibility to services and livelihoods, settlement size and density, urban functional index, economic activity, as well as accessibility were the main factors used for classification.
ESKOM	Uses 14 rural nodes that formed part of ISRDP.	To define rural and urban for purposes of strategic planning. The rural-urban concept not to be used to determine tariffs or for any other purposes.		To target rural development programmes and expenditure.	
Department of Health (2004)	Draft rural health concept paper. Possibly not to be pursued further. Prior to this, identified facilities classified as rural for payment of rural allowances.	Rural allowances for staff working at facilities classified as rural.	0 – Urban 1 – Rural	To determine which staff members wil qualify for a rural allowance.	Situated in ISRD node. Located in hard-to-staff areas. Nominated by provinces.
Department of Rural Development and Land Reform (2011)	ISRDP nodes, war on poverty. Treasury's municipal classes based on population density. currently using ISRDP definition.	CRDP 57 municipalities; 64 vulnerable municipalities; 22 rural districts in 6 provinces identified by Cabinet.	ISRDP nodes. Twenty-two districts.	Targeting of rural development interventions and expenditure.	Districts with the largest service delivery backlogs.
Department of Social Development (2008)	Index of places where social workers would qualify for rural allowance; 2008.	Payment of rural allowances or, as rephrased in the project, an incentive scheme to attract and retain staff in areas that are difficult to staff.	Continuous scale, based on an incentive index which takes a combination of living and working conditions into consideration.	To determine which staff members wil qualify for a rural allowance.	Two broad categories: living environment (personal perceptions and living conditions) and work environment (management support, workplace/office, other institutional support and physical working conditions). Distance from settlements included in composite accessibility index (proxy for living conditions). Road conditions proxy for accessibility to urban functions. Percentage households below the minimum monthly income needed to sustain a household (MML) (proxies for physical working conditions). For the incentive index, the working conditions index was weighted three times that of the living conditions index.

1 A demarcation of South Africa into more than 25,000 "mesozones," each approximately 50 km². These mesozones have been defined in such a way that they are nested within municipalities (administrative boundaries) and other significant geo-economic and historical area demarcations and that the zone boundaries correspond with major travel barriers (such as rivers) and breaklines (Van Huysteen *et al*, 2009a: 199).

Department	Policies/definitions	Use/application	Typology classes	Reason for developing typology	Variables used to develop typology
Department of Transport (2000)	Rural transport strategy for South Africa; based on typology developed by CSIR 2000.	Rural transport strategy. Not implemented beyond research phase. PDG/MIIF classification used for the rural transport systems and infrastructure grant dispersed directly to LMs by National Treasury.	0 – Metro urban core (Urban) 1 – Urban periphery (Rural) 2 – Traditional subsistence (Rural) 3 – Mining complexes (Rural) 4 – Game and nature reserves (Rural) 5 – Displaced urban settlements (Rural) 6 – Commercial farming high and medium intensity (Rural) 7 – Arid and low-intensity commercial farming (Rural) C2 PDG/MIIF classification that is discussed under National Treasury and COGTA.	To provide a basis for transport strategy and policy formulation.	Classification of magisterial districts in terms of a central place hierarchy and multi-criteria indices: weighted rural road infrastructure need index, a composite social and service needs index and a multi-criteria sustainability analysis which included six residential and six economic factors.
Department of Water Affairs (2000)	Eleven main categories, developed in early 2000. Refined in 2007/2008.	DWA WSNIS; geo-referenced database linked to WSDP of local authorities. Initially planning and implementation; currently mainly for analytical purposes and as requested by users.	A1 – Metropolitan area (urban) A2 – Urban formal town (urban) A3 – Former township (urban) A4 – Working towns – mines (urban) B1 – Urban fringe – informal settlements B2 – Urban fringe – ex-homeland towns (formal towns) C – Rural – dense village > 5000 (rural) D – Rural – small village < 5000 (rural) E – Rural scattered (rural) F – Farming (other) O – Service centres (mines, prisons, etc.) (other)	Originally developed to fast-track water and sanitation service delivery in rural areas.	Density, size, history (homeland and township), informal, economic activities.
National Treasury/ COGTA	MIIF typologies based on 7 classes, 1 for metros, 4 for local municipalities, and 2 for district municipalities.	Not used for resource allocation, but used to influence policy and strategic planning. Used by MDB, SALGA, COGTA. Strategy and policy formulation.	A – Large urban complexes with populations over 1 million and accounting for more than 50% of all municipal expenditure in the country (Urban) B1 – Local municipalities with large budgets and containing secondary cities (Urban) B2 – Local municipalities with a large town as a core (Urban) B3 – Local municipalities with small towns, with relatively small population and significant proportion of urban population, but with no large town as a core (Rural) B4 – Local municipalities which are mainly rural with communal tenure and with, at most, one or two small towns in their area (Rural)	To classify municipalities into groups that would facilitate policy and strategy formulation.	Population. Land use for B4.
Stats SA (Stats SA 2003)	EA classification Census 2011.	Across government. Widely used in research community.	1 – Rural formal (rural) 2 – Tribal area (rural) 3 – Urban formal (urban) 4 – Urban informal (urban)	Used for official statistical reporting on urban and rural in the country. Also widely used in research community.	Land classification according to Surveyor General for categories 1 to 3. Category 4 based on field assessment.

Sources: Own construction based on COGTA 2009, COGTA 2011a, COGTA 2011b, COGTA 2011c, CSIR 2011, DBE 2011, DHS 2011a, DHS 2011b, DOH 2011, DOT 2011, DRDLR 2011a, DRDLR 2001b, DWA 2011a, DWA 2011b, ESKOM 2011, HSRC 2011, National Treasury 2011, NPC 2011, NPC 2012, Presidency 2011a, Presidency 2011b, Van Huysteen *et al*. 2009a.

Table 3: Comparative evaluation of typologies

Typology	DRDLR	DSD	Health	DWA	Transport	Treasury/ COGTA	CSIR Functional Urban-Rural	CSIR Settlement	Stats SA 2001
Principal classification type	Administrative	Functional	Functional	Functional	Functional	Administrative	Functional	Functional	Morpho-logical
Agencies currently using typology2[2]	DRDLR 22 districts across government	DSD	Health	DWA	None	Treasury, COGTA, Presidency, Rural transport grant	Depart-ment of Trade and Industry (DTI), basis of later typology work, e.g. for Ethekwini, CSIR settlement typology, etc.	Cities Network, Presidency, human settlements, economic develop-ment, NPC	Widely used for different purposes
Scale	District Municipality (DM)	Mesozone	Health facility	Individual settlement	Geo-referenced	LM and DM	Mesozone	Mesozone	Enumera-tion area
Literature:									
Combination of more than two variables	Partial	Yes	No	Yes	Yes	Yes	Yes	Yes	No
2. Flexible continuum/ more than two classes; recognition of heterogeneity	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Partial
3. Contiguity taken into consideration	Partial	Yes	Partial	Partial	No	No	Yes	Yes	No
4. Flows taken into consideration	No	Yes	No	No	No	No	Yes	Yes	No
Criteria proposed by groups participating in the study:3[3]									
1. Flexible	No	Yes	No	Yes	Partial	Partial	Yes	Yes	Partial
2. More than two classes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3. Developed at LM level or lower	No	Yes (meso-frame)	Yes	Yes	Yes	Yes	Yes (meso-frame)	Yes (meso-frame)	Yes
4. Multivariate classification, including poverty and access to services	Yes	Yes	No	Partial	Partial	Partial	Yes	Yes	No
Alignment with national policy and strategy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Functionality in terms of development imperatives	Partial	Yes	Partial	Yes	Partial	Partial	Yes	Yes	Partial
Spatial distortions corrected – spatial comparability	No	Yes	No	No	No	No	Yes	Yes	No

2 Sources: Based on COGTA 2009, COGTA 2011a, COGTA 2011b, COGTA 2011c, CSIR 2011, DBE 2011, DHS 2011a, DHS 2011b, DOH 2011, DOT 2011, DRDLR 2011a, DRDLR 2001b, DWA 2011a, DWA 2011b, EDD 2011, ESKOM 2011, HSRC 2011, KZN 2011, National Treasury 2011, NPC 2011, NPC 2012, Presidency 2011a, Presidency 2011b.

3 Sources: Based on Buffalo City 2011, COGTA 2009, COGTA 2011a, COGTA 2011b, COGTA 2011c, CSIR 2011, DBE 2011, DHS 2011a, DHS 2011b, DOH 2011, DOT 2011, DRDLR 2011a, DRDLR 2001b, DWA 2011a, DWA 2011b, EDD 2011, ESKOM 2011, FS 2011, HSRC 2011, KZN 2011, MP 2011, National Treasury 2011, NPC 2011, NPC 2012, Presidency 2011a, Presidency 2011b, SAPS 2011.

Typology	DRDLR	DSD	Health	DWA	Transport	Treasury/ COGTA	CSIR Functional Urban-Rural	CSIR Settlement	Stats SA 2001
Easy linkages with Stats SA socio-economic data sources	Yes	No	No	No	Yes	Yes	Indirectly via socio-economic data in Geospatial Analyses Platform.	Indirectly via socio-economic data in Geospatial Analyses Platform.	Yes
Ease of use at provincial and local municipal level	Yes	No	Yes	Partial	Yes	Yes	No	Yes	Yes
Conceptual linkages with IDP planning processes and rural-urban typology use at local level	Partial	No	No	Partial	Partial	Partial	No	Yes	Partial
Comparability over time	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes
International comparability	No	No	Partial	No	No	No	No	No	No

The classification used by National Treasury (MIIF/PDG classification) is easy and simple to use at local government level, as they classify municipalities into one of five classes, based on a number of characteristics. Since the classification is based on municipal boundaries, the application of census and other statistical data to the framework is relatively straightforward. However, this approach does not take into account the potential wide range of different settlements varying in size, development needs, resources and potential within individual municipalities. Like the MIIF/PDG classification, the approach of targeting specific districts with service delivery backlogs (22 districts) also eases the administrative application of the typology. The spatial basis of this classification is, however, geographically too wide to adequately account for the heterogeneous nature of districts.

Based on this evaluation, it would appear that the CSIR typology (if some of its inherent shortcomings can be addressed) is most likely to seamlessly fit into most planning processes and frameworks conducted at the local level. The DWA typology also proved to be a very good source for a more nuanced classification of rural and, more particularly, ex-Bantustan settlements.

5. CONCLUSION

The overall aim of the study was to critically evaluate the way in which settlement typologies are defined and used across selected government departments for the purposes of the planning, implementation and monitoring of development programmes. Discussions with the various interest groups highlighted the importance of a typology that consists of a number of categories and not only an urban-rural dichotomy. A flexible system that can be re-grouped into four or five categories, which, in turn, can be grouped into a final urban and rural classification, seems to be the consensus. The discussants also highlighted the blurring of the service delivery, poverty and urban-rural development agenda. Limited strategic guidelines from The Presidency about the definition of, in particular, the concept 'rural' during recent years have resulted in some confusion and conflict in this respect.

Although the CSIR typology was found to best fit into most planning processes and frameworks of the various spheres of government, most official datasets such as censuses and household surveys are based on the census frame and associated EA and geography typologies. Most of the official datasets in the country are, therefore, likely to be analysed using the Stats SA typologies. Despite the sound empirical footing of the mesoframe and associated settlement typology, its use and application (although growing) is still

relatively limited in the broader spatial planning and development arena. One of the potential challenges is the ease with which the spatial units of the mesoframe can be updated and aggregated or disaggregated for application at various scales. It is thus important that the classification system used for the CSIR settlement typology should dovetail with the 2011-census typology. Such an alignment would result in greater synchronisation between development and monitoring activities implemented through the IDP and related processes. This integrated classification system can then determine a joint cut-off point for urban and rural settlements to be used by organisations where dichotomous measures are needed. The CSIR typology could also benefit from carefully considering how the nuanced classification of rural settlements by DWA can enrich and expand their current settlement typology.

Further research is needed to create more dynamic and accessible linkages between the mesoframe and the EA demarcation. This will not only make the mesoframe more accessible and widely used by a larger audience, but will also increase the extent to which spatial considerations are included in data analysis, based on census and household surveys across the country. Such a more dynamic settlement typology will contribute to what the draft NUDF (COGTA, 2009: 2) refers to as "urban and rural being viewed as parts of a continuous regional, national, and international system interrelated through a web of economic, social, political and environmental linkages". Such a consistent and dynamic settlement

typology will provide a sound point of departure for future spatial modelling and development planning processes.

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