


Resource deserts, village hierarchies and de-growth in sparsely populated areas: the case of Southern Lapland, Sweden

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 Small villages in northern Sweden have seen a continuing removal of key services, such as schools, shops and public transport, since the 1970s. Disinvestment in public services has not been strategically planned but has happened in response to population loss and increased costs on a case-by-case basis. More recently, there has been a shift in policy thinking to what might be termed a ‘de-growth’ approach where digitalisation and increased personal mobility are used to provide new ways of delivering services. The purpose of this paper is to examine the existence of ‘resource deserts’ in Southern Lapland and the emergence (or consolidation) of village hierarchies in allocating public services. We map out the distribution of neighbourhood services (grocery stores, pre-/schools and petrol pumps) among villages, and explore the lived experiences in accessing these resources in different villages. Our results show that resource deserts clearly exist in the south and east of the region, while villages in the more sparsely populated western mountain areas were generally in a better position to retain resources. We identify a lack of consistent and transparent service planning at the village level as a key shortcoming in municipal and regional service strategies. There appear to be unofficial settlement hierarchies in the differential treatment of villages that are otherwise similar in population size, population change and distance to central places. We find that political decisions on service allocations are likely influenced by several factors. These include legacy effects relating to historic settlement status, the location of villages in relation to key transport or mobility corridors, as well as ideological factors favouring villages with more ‘exotic’ features and development potential in line with the municipalities’ economic, social and political priorities. We finally argue that a shift to de-growth needs to be more strategically planned if it is to eliminate resource deserts and promote equity of service access across all villages.

Keywords: resource desert, service decline, village hierarchies, rural planning, sparsely populated areas, northern Sweden

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Introduction

The Southern Lapland region in the inland North of Sweden is a sparsely populated area (SPA) that has struggled with population and economic decline since at least the 1970s. A dominant narrative has revolved around the continuing withdrawal of key services, including closures of schools, shops, health centres and reduction in other public services, particularly outside the municipal centres (Carson *et al.* 2016). Only occasionally do we hear about new private or community sector investment in grocery stores, petrol pumps, or hospitality businesses (Habibipour *et al.* 2022). New public sector investment in physical services has been almost non-existent outside of one or two mountain resort villages.

Service disinvestment has not been strategically planned across the region as a whole, nor within individual municipalities (Syssner 2020). As an example, the 'village futures' plan in Åsele municipality only went as far as to state that the responsibility for addressing the negative impacts of disinvestment rests with the villages themselves, with the municipality only acting in an advocacy role (Åsele Byaportal 2022). This lack of planning is not unusual in SPAs like Southern Lapland and often leads to contradictory policy settings, making it difficult for village communities to take agency (Carson & Argent 2020).

The reasons for disinvestment have mostly been clearly communicated – population loss and increasing cost of service delivery. In addition, Sweden's municipal reforms between the 1950s and 1970s have played a key role in cementing the municipal centres as the main service hubs in SPAs (Wiberg & Limani 2015). Often-times even in these centres, services are fragile, and municipalities are forced to save costs at the expense of their rural villages.

Local and county governments in the region appear to pin their hopes for a better future for people living in villages on digital technologies (Löfving *et al.* 2022) and high individual mobility. This despite substantial downgrading of postal services (meaning that online shopping is rarely delivered 'to your door') and population ageing making private transport less ubiquitous. Nevertheless, the public rhetoric does reflect a recent shift from a 'decline' model of development (aiming to reduce costs as quickly as possible) to a 'de-growth' model (aiming to identify new ways of delivering accessible and equitable services to smaller populations). Our chief concern with this transition is the extent to which it may also be spatially unplanned, resulting in the emergence or persistence of 'village hierarchies' within shrinking municipalities where some benefit from the process while others do not.

The purpose of this paper is to examine the existence of 'resource deserts' (Satcher 2022) in Southern Lapland and the emergence (or consolidation) of village hierarchies in allocating public services. The first part of our research maps out the distribution of key services among villages according to size and distance to identify hierarchies of resource-rich and resource-poor villages. The second part then explores some of the lived experiences in individual villages by drawing on several cases documented during our long-term research engagement in the region. These cases include discussions of 1) the differential treatment of villages in the municipality of Arvidsjaur, 2) the example of school closures observed in several municipalities, 3) the apparent favouring of more remote and exotic mountain villages (with prominent tourism development, cross-border mobility and Sámi presence), and 4) the political process of selecting sites for the roll-out of 'virtual health rooms' (VHRs). Together, these case examples point out important inconsistencies in public service planning at the village level and illustrate how certain villages are favoured or neglected in public service allocations. Finally, we offer some thoughts on the challenges facing new ways of service delivery as part of a de-growth approach to public service planning.

Southern Lapland villages as sites of decline (and de-growth)

The region referred to as 'Southern Lapland' comprises ten inland municipalities, including two municipalities in Norrbotten county and eight in Västerbotten county, which collectively make up the 'Region Tio' economic development collaboration (Johansson *et al.* 2015). This region experienced peak population in the late 1950s and early 1960s at around 85,000 residents, with a decline of 43% to 48,000 residents in 2020. According to data from Statistics Sweden (SCB), population loss up to the year 2000 was limited to settlements outside of the (current) municipal centres, with those centres growing by 25%. However, since the year 2000, both the region (-15%) and the municipal centres (-8%) have lost

population, and 40% of residents continue to live outside the municipal centres. No municipality or municipal centre has gained population since the year 2000, while a substantial number of villages (24 out of 54) have either experienced small population growth or no population loss in that time.

The economic foundations of the region were forestry, mining, and more recently energy generation (hydropower and windpower). Forestry and energy remain important but require fewer resident workers than they once did, and deliver few direct tax benefits to the municipalities. In this century, service sectors such as health, education, local government administration and tourism have increased their share of the workforce if not their total number of resident employees (Hedlund & Lundholm 2015).

The key to service planning in the region is municipal (and to a lesser extent, county) tax revenue, along with equalisation payments from the national government (Wiberg & Limani 2015). These revenues, per capita and in real terms, have increased dramatically in all municipalities since the year 2000. The municipalities argue, however, that these increases have not kept pace with the rising costs of service delivery related to service technologies, labour force and administration, and compliance (Hall *et al.* 2016).

There has been a shift in rhetoric around Southern Lapland in recent years, with several projects sponsored by European Union (EU) agencies, the Nordic Council of Ministers, the Swedish national government, and the Västerbotten and Norrbotten county governments, broadly aimed at examining how innovation in approaches to economic and social development might address the challenges of small and sparse populations. These projects have largely focused on digital innovation (Habibipour *et al.* 2022; Löfving *et al.* 2022), but there have also been investigations of smart specialisation in the traditional industries of forestry and energy production (Jungsberg *et al.* 2020), and processes of economic diversification (Dubois & Carson 2017). In 2021, the Västerbotten section of Southern Lapland was selected as a 'model region' for Sweden's national *god och nära vård* ('good and close care') health services policy, which seeks to find new ways of service delivery beyond the removal of services (Jonsson *et al.* 2022). One of its key promises is that every person should have equivalent and sufficient access to health and care services irrespective of where they live.

Collectively, these projects can be considered as exploring 'de-growth' rather than 'decline', looking for ways to manage the process of population loss while maintaining and even improving equity and quality of life (Carson *et al.* 2020). The de-growth model suggests that investment in 'new ways of doing things' is more beneficial for residents in declining areas than a continued process of disinvestment. To illustrate this approach, we later discuss the example of the VHRs – a new way to provide health and care services in small villages – which most prominently distinguishes between decline-disinvestment and de-growth-reinvestment approaches.

Resource deserts and service distribution

One ambition of de-growth is to avoid the emergence or persistence of 'resource deserts' as areas without ready access to essential services (Renting *et al.* 2012). While one might expect resource deserts to be commonly located in rural areas, the majority of available literature is concerned with urban areas. Food deserts are the most discussed form of resource deserts, referring to neighbourhoods without adequate grocery stores or other food outlets (Amcoff 2017). There is also literature concerned with access to pharmacies, after-school care, primary care, and public transport (Sallan 2020). There is no consistent method for identifying resource deserts, but it is typically proposed that key resources should be within walking distance – which could be anything up to five kilometres. Sharkey (2009) examined food deserts in rural areas in the United States (US), using a catchment distance of one mile (1.6 km). Australia's Modified Monash Model of access to primary care uses 5 km (or sometimes 10 km) as a catchment for primary care services (Versace *et al.* 2021). In the past, Västerbotten County Council (Region Västerbotten 2018) has offered various kinds of assistance to smaller grocery stores so long as they were at least 10 km distant from the next store. These sorts of (short) distances do not seem very useful in the context of SPAs, but the idea that key services should be within ready commuting distance remains valid.

Resource deserts tend to be found in urban neighbourhoods containing the more vulnerable – the poor, ethnic and cultural minorities, and immigrants. Satcher (2022) introduces the term 'multiply-deserted areas' (MDAs), which are correlated with socio-economic and demographic characteristics of

residents, showing that about half of neighbourhoods lacking one of the three key resources (food, pharmacy and urban greenspace) typically lack at least one of the other two.

In Sweden, the national agency for economic and regional growth (Tillväxtverket 2021) mapped the distribution of services such as schools, shops, petrol pumps, pharmacies and postal services across Sweden, with the entire inland centre and north of the country identified as having low or very low service access relative to the rest of the country. The agency also noted the ongoing process of service removal and closure being focused on areas with already poor access to services. It is difficult to pinpoint this gap in service distribution to a single cause, with a mix of reasons at play. Apart from low population densities and public funding constraints, the impacts of changing user demands and self-reinforcing market functions are also critical. Residents (at least those without mobility restrictions) may choose to access schools or health services in urban locations outside their assigned catchment areas simply because they expect a better standard or diversity of services. While these issues clearly also affect service concentrations in urban areas, the socio-economic consequences are immeasurably amplified in SPAs where distance and lack of transport options mean that less mobile people have few (if any) alternatives.

Central places and rural settlement hierarchies

Calls for addressing service delivery problems in SPAs are not new in Sweden, where the traditional welfare state model has a long history of striving for equal access to social services regardless of class, occupation, and place of residence. Sweden's municipal reforms between the 1950s and 1970s were explicitly designed to create settlement hierarchies based on merging urban centres and rural catchment areas along the lines of central place theory (Christaller 1966). With the municipal centres firmly established as central service hubs, rural villages outside those centres were expected to retain basic 'neighbourhood services' (including grocery shops for daily supplies, primary schools, and petrol services) (Weissglas 1975). The larger and sparsely populated inland municipalities were granted some exceptions to this central order, allowing them to resource smaller service nodes for their dispersed populations. These formal place hierarchies have largely persisted until today, but there have been shifts within the lower-ranked layer of villages. In Västerbotten, for example, villages that have retained neighbourhood services continue to receive formal support as strategic 'service nodes', in contrast to smaller 'service points' or villages with no physical services where support is essentially limited to ill-defined 'new coordinated service solutions' (Region Västerbotten 2018).

The idea that particular settlements are 'less favoured' than others has also been discussed in other fields (Gerse & Szilágyi 2016). In archeological research, methods have been developed for imputing the relative importance of individual settlements to political and economic development. Initially, those methods were based on estimating population size (Duffy 2015), but it is now widely accepted that a focus on size alone is insufficient (Smith 2021). Size is an indicator of the level of human activity in a location, but not necessarily of how that location fits into the broader settlement landscape (Quinn & Ciugudean 2018). Paliou and Bevan (2016) raise the example of settlements in mining regions, where proximity to ore determines (large) settlement size, but (smaller) settlements located closer to transport routes and other economic infrastructures ultimately accrue more resources and political status. In this sense, the changing strategic importance of major transport infrastructure, and the resulting changes in time-space compression and accessibility, can impact on the status of individual settlements. This is perhaps best illustrated by the 'rise and fall' of historic railway towns across many SPAs, or the coming and going of regional airport hubs.

Settlement hierarchies are scalar (Palmisano 2017). As stipulated in central place theory, a set of relatively unimportant (rural) places are connected to a central place which holds political and economic power, which in turn is connected to a higher-level central place. In Sweden, the position of municipal centres as service hubs is firmly protected within this hierarchy. Beneath this formal administrative layer, however, hierarchies may be more dynamic. Quinn and colleagues (Quinn & Barrier 2014; Quinn & Ciugudean 2018) note that central places may 'rise and fall' and that there are important differences between settlements in the same layer which are either naturally occurring (such as location on trade routes), coincidental (such as location relative to a route which has not yet developed), or emergent. An emergent property may be the adoption of a new ideology (political,

economic or cultural ideals) in what had otherwise been an insignificant settlement leading to the emergence of that settlement as a central or higher-level place. For example, a new focus on tourism and 'attractive' development in many SPAs might signify a change in ideology about what industries and locations are worthy of public and private investment (Koster & Carson 2019). Other examples might include the reappraisal of once neglected locations that suddenly become important in deciding the outcomes of government elections.

Quinn and Ciugudean (2018) also emphasise the role of social institutions in differentiating settlements. Places where people meet for informal and formal interactions are critical to the roles that settlements play in society. Places where desirable outsiders come to interact can become politically powerful, even if their resident populations remain small. Quinn and Barrier (2014) further emphasise the importance of legacy in that some places may retain certain reputations, resources and power irrespective of growth or decline in population size because of functions they performed in the past. This might be because of legacy infrastructure (like a significant church building) or social ties – where people with power retain links with smaller villages that they or their families once occupied (Smith 2021).

In contrast to hierarchies, landscapes may be characterised by settlement heterarchies (Quinn & Barrier 2014; Smith 2021) in which different settlements are favoured for particular functions. Settlement heterarchies can operate across time as well as space, such that a settlement may be an important market location (with few other functions) for some time, then become more significant as a place of worship (losing the marketplace), and then return (or not) to its market role. The concept of 'hierarchy' may have lost favour against the idea of networks and heterarchies, but there remains the implication that settlements failing to attract appropriate resources become of 'lower order' (van Meeteren & Poorthuis 2018) and have fewer opportunities for economic, social and political development (and vice versa).

In examining settlement hierarchies in Hungary, Gerse and Szilágyi (2016) describe six levels of settlement, including small villages (<500 residents), and how they interact through work commuting patterns (reflecting the distribution of employment opportunities). Their conclusion is that village-to-village commuting has been increasing, indicating a lack of homogeneity within that settlement level. They also suggest that Hungary's future was likely to be increasingly polycentric (or heterarchical), and that formal planning has had limited impact on this experience.

Smékalová (2018) examined settlement hierarchies more implicitly by evaluating the distribution of EU cohesion funding among municipalities in Slovakia. Municipalities were classified into five levels according to population and employment data. Funding overwhelmingly was received by municipalities with high service employment, low unemployment, and high levels of education, and rarely received by municipalities with high unemployment and low levels of education. Smékalová argued that municipalities attracted resources because of their knowledge of 'the system' (gained through high levels of education and familiarity with services economies). These municipalities are able to organise (typically around two or three key people) to be active in seeking resources.

Humer and Granqvist (2020) specifically theorised the impact of different planning approaches on the distribution of health services in Finland. They argued that the 'free market' approach adopted by Finland in its health reforms of 2015–2019 would likely lead to an increasing concentration of resources in 'central places' which, as they demonstrate, are not geographically 'central' in SPAs. Rather, different sub-regions have different characteristics that determine the optimal location of health services. There should therefore be a stronger consideration of geography (not just population and 'ideology') in planning processes.

Koster and Carson (2019) propose something of a settlement hierarchy for SPAs from a tourism and amenity perspective. They suggest that places which are remote and 'exotic' (i.e. more attractive, striking, unusual, and out of the ordinary) become favoured for public and private sector investment, as do those closest to the larger urban centres. What remains are the 'boring bits in between' – these typically have few standout attractions, attract only small-scale investment, and struggle to gain political attention.

In summary, the literature suggests that uneven development and spatial disadvantage are coupled with the presence or absence of readily accessible key services and resources, although the extent to which this is a 'chicken-or-egg' problem remains contested (Amcoff 2012). The distribution of resources creates or reinforces settlement hierarchies, heterarchies and/or networks which determine individual access. These may depend on population size, population change, distance from central places,

proximity to connecting infrastructure (transport networks), legacy, or types and extent of local action by residents and private sector investors. Planning the distribution of key resources in SPAs is critical to ensure equity of access particularly for more vulnerable residents who are often overlooked by 'market forces'. Swedish policies like *god och nära vård* provide a framework for such planning in places like Southern Lapland, but the ability to fulfil such policy promises to move from a decline-disinvestment approach to de-growth-reinvestment is limited by a lack of knowledge of current resource distribution patterns and how they came to exist and persist.

Methods for identifying resource deserts and village hierarchies

Selecting villages

The unit of analysis for this research is 'the village' – a discrete area of settlement which included the categories of småort (50–199 residents) or tätort (200 or more residents) as defined by Statistics Sweden (SCB). In 2022, [SCB released shapefiles](#) containing resident counts for localities with more than 49 residents quinquennially between 1990 and 2020. Prior to 1990, counts were only released for localities with 200 or more residents. Across Southern Lapland and excluding the 10 municipal centres, there were 54 localities included in the 1990–2020 data. Twenty-seven of these could also be identified in locality counts dating back to 1960.

Selecting resources

This research broadly follows the approach of Satcher's (2022) 'multiply-deserted areas' (MDAs), focusing on the key 'neighbourhood services' that rural settlements should ideally offer to their residents (Weissglas 1975): grocery stores, primary schools, and petrol services. We created a database of grocery stores (as of October 2021) across the 54 villages as a proxy for food access, recognising that these stores also play a broader role by providing postal services, lottery, pharmacy and other distribution functions. In terms of schools, there was a variety of school types (covering different school years) available across different villages, but any village that has a school also has a pre-school (for ages 3–6), which we selected as a proxy for primary schools and childcare services. Petrol services, typically a self-service pump, were selected as the third key resource due to the persistent importance of private car travel to access non-local services.

Other resources, such as access to public transport, recreational facilities, religious facilities, mobile food services, and recycle stations for waste disposal, were also considered as important local resources but were not included due to lack of consistent data or irregular services.

Independent variables and analysis

The 'settlement hierarchies' literature considers population size, population change, distance to central places, legacy, community and industrial activity, and 'ideology' as determinants of settlement positioning. This research quantified the first five of these, but not industrial activity or ideology. Ideology is considered in the Discussion section. Industrial activity (meaning private sector businesses) is considered in the case examples, but it was not possible to develop a consistent measure for this that would resolve issues around differences in types of business, size of business, location of business operations or impact on local employment.

Population size and population change 2000–2020 were derived from the SCB data files. Municipal centres (all of which have all three key resources) were 'central places', and distance from village to municipal centre (for the same municipality) was calculated from the SCB shapefiles.

'Legacy' was defined as having once been the centre of a parish or municipality, thus having substantial political-administrative roles at different points in history. In 1862, what were Church of Sweden parishes became formal administrative units (kommuner). By 1930, there were 20 of these in the inland of Västerbotten. Between the 1950s and 1970s, amalgamations of municipalities occurred as part of Sweden's municipal reforms. In 1969, there were 14 municipalities in the region, with four

of these being subsumed in the early 1970s – Tärnaby and Stensele into Storuman municipality; Örträsk into Lycksele municipality; and Fredrika into Åsele municipality.

Most villages have a community group (*byaförening*) registered with their municipality. However, relatively few are 'active' on a regular basis in terms of providing services, organising events, maintaining community facilities or representing the village in political processes, making it difficult to identify levels of social capital and local action required for effective informal planning (Meijer & Syssner 2017). Ultimately, we decided to derive our own measure of 'active community group' as one which had posted to its website or social media in the month prior to the research (June 2021), and had promoted a community activity (organised by the group or someone else) in the previous six months. Clearly this is an imperfect measure as some groups may be active but not regularly communicating online, while some of the groups we identify as active may be doing very little or involve a very small number of participants. Nevertheless, we were able to derive a consistent measure in this way.

Analysis of the relationship between presence of key resources and population size, population change (2000–2020), and distance to municipal centres was done using the student's t-test. Analysis of the relationship between key resources and legacy and active community group was done using chi-square tests. In each case, there were two dependent variables, consistent with Satcher (2022): 1) the presence of any key resource and 2) the presence of all key resources. Finally, stepwise multiple regression analyses were conducted to predict presence of resources (any or all) from population size, change in population 2000–2020 and distance from municipal centres.

Qualitative data and case examples

The case examples draw on qualitative data and ethnographic observations collected by the researchers in a cumulative and unstructured fashion over a seven-year period (2014–2021) as part of a broader research program looking into the socio-economic future of village settlements in the inland north. This included regular visits to more than 20 of the 54 villages to conduct formal interviews (with residents, entrepreneurs and local community leaders), hold information sessions, participate in public workshops, analyse the content of community noticeboards, engage in informal discussions with village residents and municipal planning stakeholders, and collect other observations. Reports from the Social Boards, Education Boards, and Leisure and Culture Boards of each of the ten municipalities have been reviewed for mentions of villages and their plans for rural service provisions. Formal interviews (16 in total) were conducted in 2015–2016 with political leaders and heads of Social, Education and Leisure and Culture departments in all municipalities, and again in 2019 with six of the municipalities, focusing on what formal planning was undertaken for villages, and how decisions about resource allocation were made. Additional observations were collected by members of the research team participating in meetings related to the Virtual Health Room (VHR) project in Västerbotten, as well as meetings of new working groups established within the *god och nära vård* model region project.

It is critical to note that the results describe our observations up until mid-2021. There have been substantial changes in specific villages since then, including the investment in new grocery store models in two of the villages discussed in our case examples (Moskosel and Kristineberg). There have also been continued discussions about the viability of (pre-)schools in several locations, with the possibility that some schools will not be open by the time this article is published. The dynamic nature of development in these villages is recognised, and what is provided here are individual stories reflecting things that can happen within this village hierarchy.

Part I: Mapping the pattern of resource distribution

More than half (29 out of 54) of the villages in this study had at least one of the three key resources (preschool, grocery store, petrol pump), as summarized in Table 1. Eleven villages (38%) had all three resources, seven (24%) had two of the three, and 11 (38%) had just one. Four villages had just a preschool, four had just a grocery store, and three had just a petrol pump. Importantly, 78% of villages with a preschool also had at least one of the other two resources, as was the case with 80% of villages with a grocery store, and 85% of villages with a petrol pump.

Table 1. Number of villages with resource combinations.

Resource combination	Number of villages
All three services	11
Pre-school only	4
Pre-school and grocery store	1
Pre-school and petrol pump	2
Grocery store only	4
Grocery store and petrol pump	4
Petrol pump only	3
Pre-school (total)	18
Grocery store (total)	20
Petrol pump (total)	20

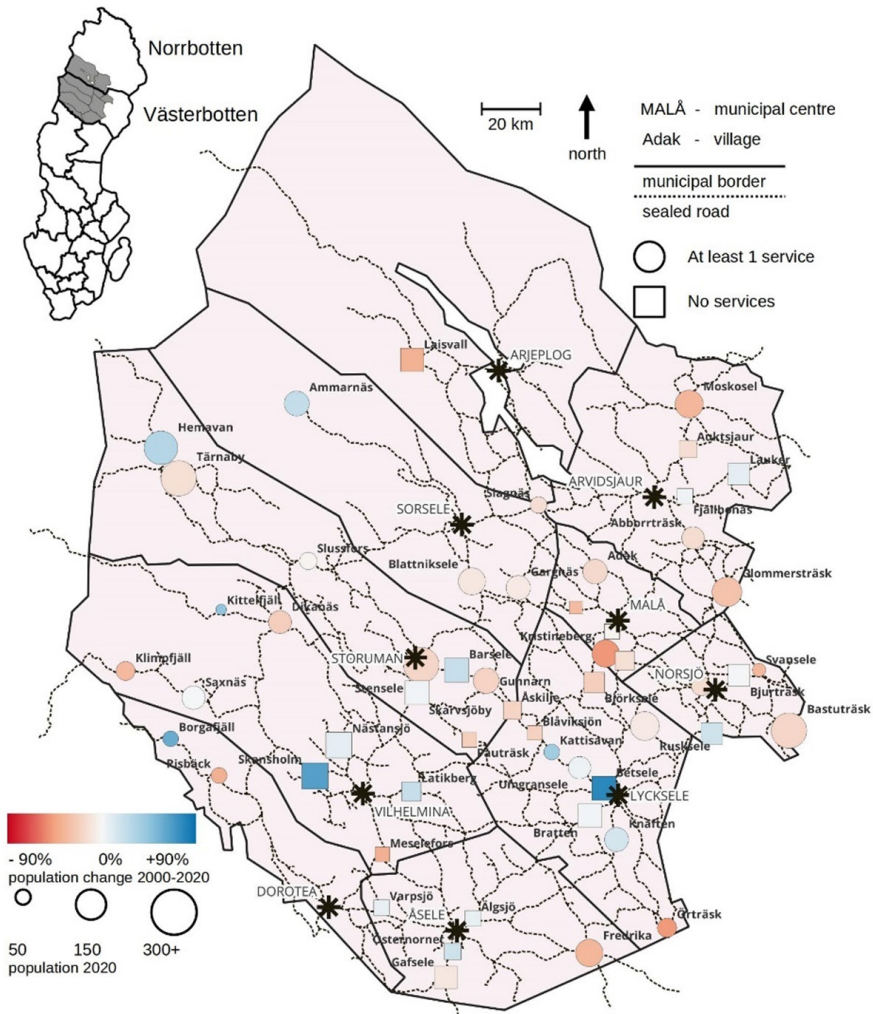


Fig 1. Distribution of villages with some (circle) and no (square) key resources.

Figure 1 summarises the pattern of resource distribution among villages. Villages represented by circles have at least one of the three key resources (29 villages), while villages represented as squares have none (25 villages). The size of the marker reflects population size, while the colour represents change in population 2000–2020 (blue indicating population growth, and red indicating population loss). Almost all mountain villages on the western fringes had resources, even the very small ones like Slussfors (population 87) and Kittelfjäll (population <50). In contrast, villages without resources were common in the eastern parts, and particularly in the south-east.

Villages with some resources were significantly larger than those without (average 167 residents compared with 84, $p > 0.05$), and significantly more distant from municipal centres (58 km compared with 25 km, $p > 0.05$). However, there was no significant difference in population change (a loss of 1% for villages with resources, compared with no change for villages without). About 40% of villages with resources were historical parish centres, compared with 16% of villages without ($p > 0.05$). Similarly, 40% of villages with resources had active community groups, while just 2 of the 25 (8%) villages without resources had an active group.

A multiple regression was conducted to predict presence of resources from population size, change in population 2000–2020, and distance from municipal centres. While the model was statistically significant ($F = 10.90$, $p > 0.05$), it accounted for only 40% of the total variance, and population change was not a significant contributor. Removing population change increased the overall strength of the regression model ($F = 15.07$) but did not increase the amount of variance explained. In other words, while size and distance were good predictors of the presence or absence of services, other (unknown) factors were also at play.

The summary statistics hide some important features of the data. The 20 largest no-resource villages were all larger than the smallest resource village (Kittelfjäll), and 10 of these had populations in excess of 100 residents. These were no more distant from municipal centres (21 km on average) than the ten closest resource villages with populations in the same range. The four parish villages without resources compared favourably in size to the four smallest parish villages with resources (about 80 residents).

Figure 2 shows the 11 villages which had all three resources as circles. The resource-richness of mountain villages is further emphasised here, with Slussfors, Dikanäs (population 139) and Saxnäs (143) notable because of their small population size compared with Hemavan (272) and Tärnaby (469). What is also stark is the absence of resourced villages (except for Glommersträsk, Fredrika and Rusksele) across a majority of municipalities (Arjeplog, Arvidsjaur, Malå, Lycksele, Norsjö, Åsele and Dorotea).

Villages with all resources were significantly larger than those with fewer or no resources (average 204 residents compared with 110, $p > 0.05$), and significantly more distant from their municipal centres (72 km compared with 35 km, $p > 0.05$). However, there was no significant difference in population change (a loss of 1% for all-resource villages, compared with no change for other villages). Nine of the 11 all-resource villages (82%) were historical parish centres, compared with 30% of other villages ($p > 0.05$). Similarly, over half of all-resource villages had active community groups, while fewer than 20% of other villages had an active group.

A multiple regression was conducted to predict presence of all resources from population size, population change, and distance from municipal centres. While the model was statistically significant ($F = 7.64$, $p > 0.05$), it accounted for only 30% of the total variance, and population change was not a significant contributor. Removing population change increased the overall strength of the regression model ($F = 11.63$) but did not increase the amount of variance explained. Again, while size and distance were good predictors of the presence or absence of services, other (unknown) factors were at play.

None of the four fastest growing villages, and only two of the 21 fastest growing villages had all resources, despite 11 of these (and two of the top four) having populations in excess of 100 people. While all had lost population, four of the ten largest villages (Stensele, Bastuträsk, Moskosel, and Kristineberg) were (at the time of this research) without all three key resources.

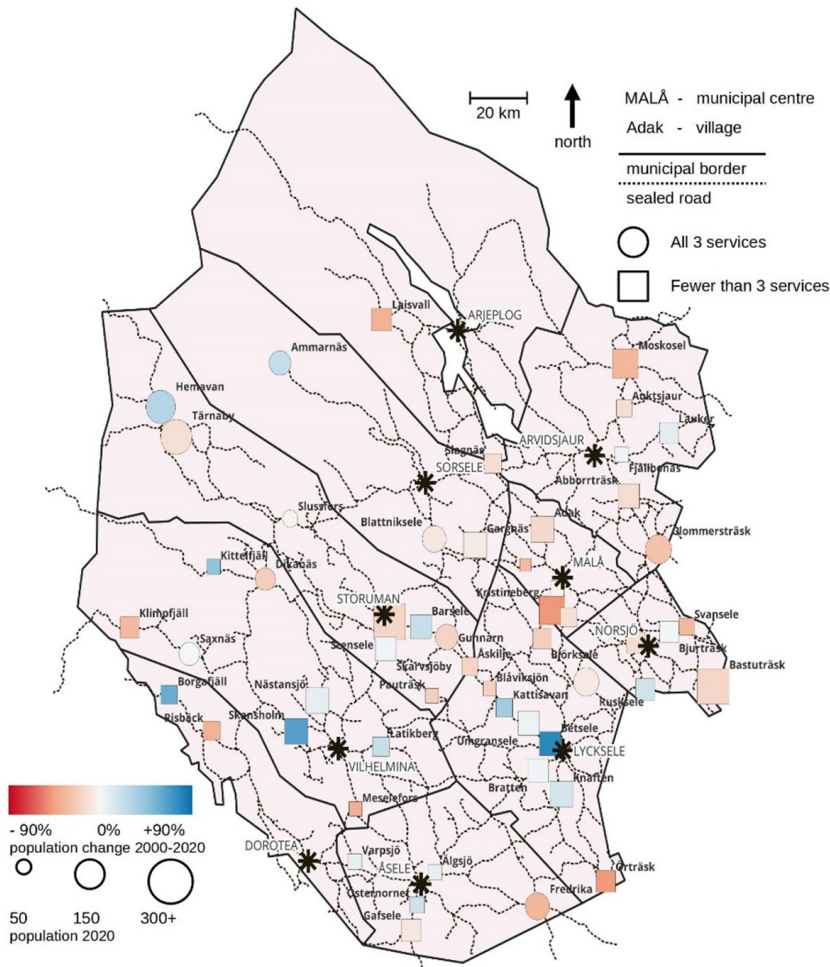


Fig 2. Distribution of villages with all key resources (circle).

Part II: Experiences of village hierarchies in public service allocations

This section discusses several case examples drawn from our extended fieldwork to illustrate apparent village hierarchies in public service allocations across the region. The first example presents the case of two competing villages in the municipality of Arvidsjaur, focusing on local perceptions of why these villages have been treated differently by the municipality. The second example problematises the inconsistencies in municipal decision-making regarding the closure or retention of village schools. The third example shows how the more remote and exotic villages in the mountains seem to have gained a higher status than other villages. The final case provides insights into the intransparent political process of selecting villages as sites for the VHR project as a foretelling of the challenges facing adoption of a de-growth approach to public service planning.

The case of Moskosele and Glommersträsk

The two largest villages in Arvidsjaur municipality are Moskosele in the north-west and Glommersträsk in the south-east. During one of our public seminars, we were told about the perceived history of these two villages and their competition to be seen as the ‘second town’ of the municipality. Both

villages had a history in forestry, but Moskosel had a state-owned forest company operating the sawmill, while Glommersträsk was at the centre of private operations. Participants suggested that this history had a continuing effect on contemporary village life, with Glommersträsk seen as more entrepreneurial and 'vibrant', and Moskosel as waiting for the government to address local decline. Also Glommersträsk's location on the road connecting Arvidsjaur with the larger industrial centre of Skellefteå on the coast was mentioned as a reason for the relative advantage of Glommersträsk over Moskosel. The Moskosel-Glomersträsk story is interesting here because:

- Both villages are similarly distant from the municipal centre (~45 km), and not within 50 km of another larger town.
- Both had experienced similar population development for the entire period, including 2010–2018 (remaining at just under 200).
- There was no notable difference in their age profiles.
- Both villages had challenges relating to abandoned houses and infrastructure dotting the main street and compromising general village appearance.
- While there had been quite visible private investment in Glommersträsk (a timber/furniture producer, a berry manufacturing business, a restaurant, and some small tourist activity providers), this had also been the case in Moskosel (a camping park, a tent manufacturing company, a cultural centre), but perhaps with less direct local employment.
- Both villages are located on or adjacent to major tourism and transit roads.
- Both villages had organised community enterprises to operate a small shop and petrol pump in recent years.

Nevertheless, at the time of our workshops, Moskosel residents felt that the two villages had been treated quite differently by the municipality. Glommersträsk had retained its elementary school, while Moskosel had not. We were told of concerns that the municipal government was going to cease snow ploughing and turn off the streetlights in Moskosel but not in Glommersträsk. It was clear from our data that size, demographic profile, and relative isolation were not distinguishing features of the two villages. Nor, it would seem, were level of private investment or community participation. The perception of the 'superiority' of Glommersträsk persisted even when quantitative data about population trajectories was made public. Instead, discussions with Moskosel residents and municipal leaders suggested some explanations: Glommersträsk's main streets are also main thoroughways for the municipality (heading to the city of Skellefteå), while Moskosel sits off the main inland road heading north to smaller centres like Jokkmokk and Gällivare, which have offered fewer industrial links and political benefits for the municipality than Skellefteå. Therefore, Glommersträsk was more visible within the municipality. In addition, Moskosel had a reputation as a village that was 'losing things', also reflected in the sign for the village on the main road (Fig. 3), while Glommersträsk had a reputation as a village that was gaining or retaining things.



Fig. 3. Road-side sign to Moskosel, January 2018 (by authors).

On the subject of schools

One argument made for retaining the school in Glommersträsk was the distance children need to commute to the next closest school. However, the same argument was insufficiently strong to preserve the school in Moskosel. The same inconsistent application of 'distance' as a factor in service allocation occurs across the region as a whole. Villages such as Gunnarn in Storuman municipality and Gargnäs in Sorsele municipality have retained schools, while Latikberg (Vilhelmina municipality) has not. The closing of the Latikberg school (2017) followed several years of debates based principally on number of enrolments, with only minor consideration given to the issue of commuting. The steady decline in student enrolments at the Latikberg school was not a result of fewer children, but more parents commuting to the municipal centre preferring to bring their children with them.

In Lycksele municipality, 'remote' schools in villages such as Umgransele and Kristineberg face regular threats of closure, despite relatively stable populations and long distances to alternative facilities. Kristineberg is particularly interesting, since it is much further distant to the next school than the other villages. Kristineberg is a border village, with the municipal centre of Malå just 30 km away, allowing families to send their children to school there. Proximity to Malå has also been cited as a factor in decisions to either remove other services from Kristineberg, or not to consider Kristineberg as a site for new services.

Favouring the exotic?

The experiences of the more isolated mountain villages in the western part of the region also deserve special attention. These villages have previously been described as the 'exotic remote' outposts within the inland North (Koster & Carson 2019). They are quite distinct in character due to their scenic landscapes, a stronger reliance on tourism, increasing second home investment, and a more prominent and visible Sámi presence. As such, they typically stand out from the long list of villages in the forested 'in-between' areas to the east, sometimes as positive growth outliers bucking the trend of rural decline (as in the case of a few ski resorts), sometimes as places of cultural significance, and sometimes as places facing politically delicate issues of socio-economic disadvantage that require special government intervention. From this perspective, exotic remote locations are often more 'visible' within local or regional government agendas and in a better position to attract new investment or support for retaining services (*ibid.*).

Our observations suggests that, in fact, the more remote villages in the municipalities of Storuman, Vilhelmina, Sorsele, and Dorotea seem to have had a competitive edge over other villages in their municipalities when it comes to retaining services. The village of Tärnaby in Storuman municipality has been an official 'second centre' since it was merged into the municipality in the 1970s, with elementary and secondary schools, including a nationally-renowned highschool specialising in skiing, and a primary healthcare service similar in scope to those in the municipal centres. The Tärnaby region has also attracted substantial local government investment in tourism infrastructure. Even here, though, investment has been increasingly re-directed to the ski resort of Hemavan (~20 km to the west), and there are regular discussions within the municipality about the extent to which continued tourism growth in Hemavan may dilute services in nearby Tärnaby. In this context, Hemavan is perceived as the booming exotic growth outlier able to attract external entrepreneurs and large-scale mobility flows (including cross-border travel from Norway, and through its own airport connecting to Stockholm). In contrast, Tärnaby (which has more permanent residents) is often described as suffering from the legacies of losing its status as a parish centre and, thus, needs to be propped up with public services (Müller 2019).

The other mountain districts also tend to have similar 'village pairs' distinguished by their tourism and service roles (Borgafjäll/Risbäck in Dorotea municipality, and Kittelfjäll/Dikanäs as well as Klimpfjäll/Saxnäs in Vilhelmina municipality). Although their tourism sectors and international visitor mobilities are still rather small-scale (compared to Hemavan at least), there is a palpable shift in hierarchy from the residential to the more tourism-oriented villages. For example, Kittelfjäll in

Vilhelmina municipality is clearly becoming the municipal priority hotspot with increasing investment in infrastructure, tourism services, modern shop facilities and new petrol pumps emerging in recent years. Meanwhile, the nearby residential village of Dikanäs has been facing ongoing threats of losing key services, most notably its elementary school.

The mountain villages tend to have more prominent Sámi presence than the forest villages in the east, arising from different processes of colonisation. While the forests were settled earlier in the 18th century, the mountain areas were less valued for their settlement potential, with much more dispersed settlements established by the state and the Swedish church to manage Sámi affairs (Norlin & Lindmark 2021). At the heart of these typically was the church building, which was the site for regular gatherings of Sámi people, not least for administrative purposes. Sámi residential schools were also usually attached to these churches. Although the church is no longer such a central actor, the legacies of being a Sámi administrative centre seem to persist. Mountain villages often attract local government funding related to their responsibilities as Sámi municipalities (Bjärstig *et al.* 2020). This might manifest in extra resources for language services, and at least some attention to Sámi culture in what education and health services do exist. Availability of such culturally-appropriate services seems to give the villages some bargaining power in arguing why local service facilities cannot simply be closed down as in other villages.

Virtual health rooms

An example of new resource allocation in recent times has been the VHR project. VHRs are public facilities which have equipment for users to take simple health-related measurements and do virtual consultations with distant health professionals. To this point, the VHRs have been targeted largely at older residents with more limited capacity to access non-local health services. After a lengthy trial in Slussfors, funding was received to establish one room in each of the inland municipalities in Västerbotten (Jonsson *et al.* 2022). An advisory committee of municipal representatives was formed to decide on their location. The decisions were not made based on any quantitative assessment, such as distance from existing healthcare facilities, population size, demographic profile (especially age structure), or catchment potential. Instead, a small number of villages selected largely on the basis of 'name recognition' were invited to present their case to the committee. The outcomes were illustrative of the relationships between villages and their municipalities:

- One municipality decided not to participate because of concerns that it would be pressured to select a village that the municipal leaders did not want in the program.
- One municipality requested a 'mobile' VHR rather than having to select a single village in preference to others (although it was subsequently encouraged to nominate a village).
- The preferred villages in two municipalities argued against having a VHR for fear that this would result in closure of their district nursing stations.
- One municipality faced the challenge of choosing between two relatively proximate and equivalently sized villages. Despite community enthusiasm appearing greater in one, it was the other which was ultimately selected.
- One municipality initially wanted to put a VHR in the municipal centre itself to ease pressure on the primary care facility. Vigorous lobbying from residents of a village contributed to changing this decision.

The VHR project revealed the lack of strategic approaches to planning for villages at both municipal and county levels. Site selection was clearly a political rather than evidence-based process. When comparing population trajectories of selected and non-selected villages, it seems that selected VHR villages are on average slightly larger than non-selected ones (about 180 residents compared to 160 residents). However, VHR villages have collectively experienced greater population loss (20% on average) than non-selected villages (which collectively grew by 5%). Perhaps VHRs were awarded as compensation for decline (and loss or threatened loss of services such as district nursing stations) rather than as facilities to manage increasing demand or existing challenges of access.

Discussion

While only 11 (out of 54) villages in this study had all three key resources, villages with one resource were very likely (80–85%) to have at least a second. Rather than a heterarchical distribution of resources (where some villages have schools and others have shops or petrol pumps), then, there were clearly resource-rich and resource-poor villages akin to Satcher's (2022) multiply-resource deserts. Both maps show that resource-poor villages were more common in the south-east and in the smaller municipalities (by land area), representing the 'boring bits' in between the more 'exotic' high-amenity mountain range and the urbanised coast (Koster & Carson 2019). Even in these, however, distances to resources can be substantial. For example, Blåviksjön at the western edge of Lycksele municipality is nearly 50 km from the municipal centre. A Blåviksjön resident could get petrol and basic foodstuffs at the small grocery store in Kattisavan (10 km away) and send their young children to school in Umgransele (25 km away), but even this level of access would not be available to a resident of nearby Björksele, Pauträsk or Lauker (which are off the main highway and bus routes).

An interesting feature of these (multiply) resource deserts in the south and east is the number of resource-poor villages which have increased in population since the year 2000. Many of these (including larger villages such as Stensele, Skansholm and Betssele) are relatively proximate to their municipal centres, which, in the east at least, are somewhat 'central places' in a geographic sense. However, an assumption that proximity to municipal centres is 'good enough' for resource access is dangerous when applied to village populations as a whole (Humer & Granqvist 2020). As demonstrated in the case of Latikberg, village residents with private transport are readily able to (or prefer to) access services in the centre, but they then have a greater impact on service distribution decisions (school closure in this case) than residents who do not have that level of mobility. With village populations expected to continue to age, this is of course not just an issue of school access. The increasing disparities in levels of mobility will exacerbate the resource desert impacts for the more vulnerable village populations (Sallan 2020).

While we can identify (multiply) resource deserts, we do not have good guidance from the literature as to what the maps 'should' look like, such as we would in urban areas where concepts of access have been more explicitly defined in terms of walking distance or commute times (Sharkey 2009). Measures around equal access by walking or easy public transport distance are clearly impractical in SPAs, but those with ambitions of equity in Sweden should be concerned about the lived experience in many villages of 90-minute or 2-hour roundtrips for basic necessities (if you have private transport or live near the few public transport routes). Some other organisation of resource distribution (or distribution of people to resources) is clearly required. There is, thus, a need for more research on what alternative service models could work or are already in use in other SPAs, and how local service allocations can be planned for in a more consistent and transparent way. While ideas around the sharing of services across SPAs are not new (Wiberg & Limani 2015), more work needs to be done to understand how increased connectivity among villages and better functioning network structures or heterarchies could emerge, for example through more localised public or community transport. There is likely no single solution to address service problems in SPAs, and a more equitable service model for villages will therefore require a mix of strategies, including increased use of digital services, mobile outreach services, service hubs co-locating with other social and community infrastructure, individual citizen contracts, and supported volunteer service work.

Resource-rich villages in total have larger populations than resource-poor ones, but there are important exceptions when looking from village to village. In any case, it is hard to argue that the continued presence of resources contributes to rich villages being larger than poor ones. In fact, more resource-poor villages have experienced population growth. There are just a handful of exceptional experiences of growth in resource-rich villages (Hemavan and Ammarnäs) and population loss in resource-poor villages (Kristineberg, Moskosel, and Stensele) which 'balance the ledger' for the summary statistics. Generally, however, it appears that some people are quite content to live in resource-poor villages (and even seek them out). Yet, these are likely to be highly mobile and contribute to hiding the negative impacts of resource deserts for others.

Distance is more definitively related to presence and absence of resources, but even here other factors seem to be at play. Some of these may include legacy effects (Quinn & Ciugudean 2018). Many legacy parish centres are distant from their now municipal centres (particularly those in the mountains, but also Fredrika and Örträsk in the east), and the distant ones seemed to have retained resources (and, for the moment, population) more than the proximate ones (like Stensele, Björksele and Åskilje). Legacy centres also tend to have active community groups, suggesting a residual political organisation that may be effective in preventing the removal of services.

It was not possible to access consistent data about community groups and even private sector business activity in these villages, so it is difficult to make judgements about the role of local action and social capital (Meijer & Sysner 2017). The example of Moskosel and Glommersträsk is insightful in positioning local action in relation to the idea of ideology. Glommersträsk, it appears, has been more closely aligned with the municipality's development ideals, largely because of lingering perceptions that it has a more prosperous private sector and a reputation of being more entrepreneurial and pro-active, more public-facing and community-oriented, more visible within the municipality, and facing in the 'right direction' in terms of connections with the preferred regional centre. The data hint at other aspects of ideology including a preference for 'modern' economies (e.g. relatively large-scale tourism in Hemavan) over traditional ones (forestry or mining), 'exotic' location (mountains) over the 'boring bits in between' (the south-east), and possibly the increasing political attention to the needs of Sámi people. Future research needs to monitor how such development ideals and village hierarchies may change as a result of shifting economic priorities (e.g. the coming and going of contested mining proposals) or the increasing internationalisation of visitor economies (e.g. tourism and car testing) with their associated impacts on key access infrastructure. In any case, as we have seen, these ideological factors may work in combination, with the shifting of resources from Tärnaby to Hemavan showing 'mountain, large-scale tourism and modern development' beats 'mountain and medium-scale tourism and dated development' (Müller 2019).

The shifting of resources between the mountain village pairs (tourism and residential) might ultimately work in favour of both villages if it results in a balance of resource distribution that benefits from the collective catchment. Unless this is planned, however, it is more likely that the non-favoured villages will simply become resource-poor. Likewise, planning is required to realise the potential of digital services in this context. The three key resources used in this research have limited current potential for digital transformation. While online shopping is ubiquitous globally, its village-level effectiveness depends on postal delivery services which continue to be reduced across much of Southern Lapland. Digital education is also increasingly popular, but not (yet) for the youngest learners, and the increased mobility demanded in a digital society makes access to physical fuel distribution sites even more important. Reflecting on digitalisation potential also serves as a reminder that these resources are not just uni-functional, but are places where people meet and interact. Digitalisation risks cutting people off (even further) from their village communities. Digitalisation also decreases the visibility of villages and their access to the human resources (e.g. teachers, nurses or entrepreneurs) that come with key resources. The VHR program recognised the former through the decision to create 'rooms' rather than roll out technologies to people's homes or mobile devices. Its failure to recognise the latter may be part of the explanation for slow uptake of the service model. Once you take the physical-digital approach, however, you face the same site-selection challenges as with 'bricks and mortar' services, and these may be exacerbated by the inexperience of planners in Southern Lapland with investing in villages (rather than disinvesting).

Conclusions

This paper has contributed to the discussion of 'decline and adaptation' of small villages in SPAs (Carson *et al.* 2016; Sysner 2020) by bringing in some new theoretical considerations around resource deserts and settlement hierarchies. These reveal in more depth the importance of local experiences that may be hidden in summary statistics and political discourses. They also suggest that 'decline' is a process which can both be driven or reinforced by planning decisions and operate independently therefrom. Removing resources may be coupled with population loss in some places, but not in

others. The paper has been based on three key resources – grocery store, preschool, and petrol pump – and these may or may not be the most important resources in all cases. Other resources such as public transport connections, recreational infrastructure, hospitality businesses, community halls, and highspeed internet access, may better reflect the status of villages in the eyes of their residents and outsiders. Hence, there is more work to be done on mapping village resources for this purpose.

The 'decline' approach to planning in Southern Lapland has long focused on disinvestment, with just the VHR experience presented here as an insight into the potential for a 'de-growth' approach, focusing on new models of service delivery. As yet, we do not have sufficient evidence to envision a Southern Lapland managing de-growth – whether this might entail closer links between villages (in network or heterarchy models) or digitalisation. We know that new initiatives are occurring (Habibipour *et al.* 2022), which may change village hierarchies and the nature of resource distribution. What is clear, however, is the need to have a more strategic and transparent approach to these initiatives to ensure that vulnerable populations and unfavoured villages do not continue to experience lack of equity and access to even the most basic services.

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