

研究ノート

Delineation and Representation of Settlements as Geographic Entities

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1. Background

During the course of introducing geographical concepts and terminology related to settlements, the author noticed a certain degree of confusion amongst students as to the definition of 'village'. In geographical terminology, villages in the Western context can be defined, such as by Waugh (2003), as settlements which "provide a limited range and number of services" (p.38), normally including a place of worship, post office, small shop, drinking/eating establishment, primary school, etc. The clarity of such a definition is tending to become somewhat precarious as transportation and technology advances allow previously restricted spatial patterns to become more and more flexible, thus clouding the ability to easily categorize a settlement.

In order to support their understanding of the terminology, the author strove to introduce local examples to augment clarity. One barricade to understanding that quickly presented itself was the difficulty of differentiating between terminology used in geography to describe settlements and similar terminology used in describing present-day administrative units. Students naturally try to put the concepts into the context of their experiences. Further complicating this process in Japan is the trend towards merging municipal units into new units occupying ever larger areas of land, a trend whose most recent peak came in the period referred to as 'the Heisei mergers', "a three year-plus period leading up to the deadline of March 2005" (Rausch, 2005). Prior to this spate of municipal agglomerations, where the number of municipalities was reduced to 2,190 by April 1, 2005 ("Municipal mergers and dissolutions in Japan"), were two major incidences described by Nakanishi as occurring "over the period from 1888 to 1889, when the 71,314 identified 'natural settlements' (shizen shuraku) were amalgamated into 15,859 cities, towns and villages" and "over the period from 1953 to

1956, when the 9,868 cities, towns and villages were merged to yield 4,668 municipalities” (as cited in Rausch, 2005). The current number is 1,772 (Ministry of Internal Affairs and Communications).

As Oldham Sixth Form College highlights, it is difficult to define a settlement, such as a city, because “there is no exact definition of its boundaries, of where it starts and where it ends” (Oldham Sixth Form College). The merged municipalities mentioned above do not provide easily workable examples in a geographical sense, because each one may comprise a variety of settlements and land-uses that may not be associated with the definition of that type of settlement in another jurisdiction (country). This complexity may be further illustrated with the example of Shanghai, China, whose administrative boundaries contain “a vast area of 6,000 square km... Thirteen million people live within those boundaries, but the area covers large patches of farmland as well as some villages” (Oldham Sixth Form College).

2. Complexity faced by non-specialists

Settlement boundaries are another example of so-called ‘fiat’ boundaries, which Smith and Varzi (2000) define as “boundaries induced through human demarcation” (Smith, & Varzi, 2000). This type of boundary is in contrast with the more clearly delineated ‘bona fide’ boundary associated with classical topology. The boundaries of a building could be viewed as falling into this latter category.

Contemporary non-geography major college students, with only a basic grounding in geography and its terminology, may naturally find this situation confusing, especially when they are in the position of studying the subject in English, which is a foreign language for all, or almost all, of them. The fundamental meaning of a term such as ‘village’ can be clouded even further when students consult their dictionaries for the Japanese meaning. The word ‘mura’ is the most common and familiar translation, but must be clarified with regard to the nuance of its meaning. As outlined above, the use of this term to define an administrative entity can result in incorrect association with a much larger unit than is actually meant by the geographical term.

Introducing the concepts exclusively in English is a goal, but time constraints in eliciting understanding mean that allowing students to refer to English-Japanese dictionaries, or similar reference materials is not only desirable, but unavoidable. The key point is to inculcate in students enough of an understanding of the concept that they will be able to differentiate between potential candidates introduced in the reference material.

It is necessary to clarify the meaning of geographical terms, such as ‘village’, so as to avoid confusion regarding the use of the same word in identifying administratively designated regions that may be constituted of several settlement units, each of which may represent a separate village

in geographical terminology. Many such historical settlements retain their original names on modern maps, though these are generally shorn of the suffixes attributed to them before incorporation within the larger municipal unit.

3. Towards clarifying understanding

One approach to clarifying understanding in this context is to have students refer to increasingly older maps of the study area to see how administrative delineation, as well as urbanization processes, have proceeded through time. Often in the North American or European context, this timeline can be observed through field studies where buildings have survived for a long time since their construction and their original purposes may be traced or deduced, allowing a clear picture of the distribution of settlements to be seen. However, in Japan, this may often be much more difficult due to construction methods relying more heavily on less long-lived materials, especially wood. Though some wooden structures, such as temples, shrines, and castles have survived, less remarkable structures have tended to be replaced. In such situations, municipal buildings whose functions had become redundant may well have been replaced by structures with completely different functions, thus eliminating a directly visible legacy from the landscape. One means of resurrecting this historical landscape is, naturally, through inspecting maps produced at the time that the former administrative divisions existed.

The ability to view settlements in their historical contexts would not only provide a means to help visualize the original patterns of development in their geographical contexts, but also allow observers to identify historical landmarks affecting these patterns and provide possibilities for further research if the observer is so inclined.

The availability of such cartographic evidence will be researched as one component of the process for creating materials that can be used for a more in-depth study of concrete examples of theory learned from a textbook.

4. Automating the process

A more effective approach could be realized by combining these materials into a format directly accessible to non-specialists; an undertaking likely to involve the construction of a historical database or databases of the study region.

Incorporating this information into databases, though useful in itself, can be taken a step further through the use of geographic information systems (GIS) to present the information in a historically correlated spatial application. Users of the application can take a sort of journey through time to see the spatial processes that have been involved in the transformation of a settlement from its beginnings, or a suitably distant point in time for which data is available, to the urban area familiar to them today. Through such an exercise, even users with relatively little

background in geography can come to understand the interactions and driving forces behind the growth of settlements.

Further enhancements, such as historical notes integrated into layers of the GIS data or associated with GIS objects, can allow users to access pertinent information that might otherwise necessitate combing through large amounts of separate reference materials in order to make the associations.

5. Considering partonomies and taxonomies

Creation of such an application, though appearing straightforward, presents numerous challenges. These range from competent digitalization of spatial data (primarily from paper maps) and attribute data (stored in databases) to establishing a sound theoretical foundation for the data creation itself. Nowacki and Sorokine (2003) highlight the difficulty of categorizing elements of ecosystems according to taxonomies due to their spatial (and thus partonomic, or ‘part-of’) nature, as opposed to the linear or ‘kind-of’ nature of taxonomy (Nowacki and Sorokine, 2003). This can be equally true of some aspects of settlements, especially at their geographic borders, which are most often not distinct.

Sorokine (2003) further emphasizes this by stating that “often geographic boundaries are indeterminate (vague or fuzzy) and may be dependent upon the scale of observation” (Sorokine, 2003).

Chaudhry and Mackansee (2007) concluded that :

Maps and spatial databases at different levels of detail present different information levels. Partonomic relationships reveal the interdependence between different phenomena at different levels of detail. Unlike taxonomies an object can be part of more than one object. Multiple partonomies are not only useful for database transformation from one level of detail to lower levels of detail. But provides (sic) enriched databases that facilitate users in reasoning about space more intuitively. (p.12)

Understanding that settlements may be identified as components of a taxonomy (of settlement hierarchy), yet may also be further subdivided within a partonomy where areas overlap, is a key step in the development of any such application.

6. Conclusion

Conveying geographical meaning involves much that is logically discernible, but also incorporates information that is not as accessible as it may first appear. Deepening an understanding of the complexities involved and creating new and unique ways to present the concepts is a challenging but viable goal. It is always necessary to put oneself into the position of non-specialists who are striving to comprehend the terms and concepts. By doing so, practical ways of compiling and offering the in-

formation can be conceived and eventually realized. The use of spatial data applications, such as GIS, offer the opportunity to move forward with this objective as long as the framework is rigourously worked out and understood beforehand.

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