Chapter 5

HOUSEHOLD-PARCEL LINKAGES IN NANG RONG, THAILAND

Challenges of Large Samples

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Abstract

An understanding of the dynamic connections between human behavior and the biophysical environment requires that people and land be spatially linked, conceptually and operationally. This paper describes the design and execution of a plan for spatially linking at a fine grain level: households and land parcels in Nang Rong, Thailand. The overall goal was to relate household dynamics to land use. There were several challenges that had to be surmounted: the large number of links to be determined given the sample size; a residential pattern with clustered dwelling units located away from the land farmed; a complex pattern of ownership and use; and the absence of a clear one-to-one relationship between households and parcels (a household using several plots; several households using the same plot). The paper reviews decisions about the design of the data collection, including the decision to start with households and then link to plots, to focus on use rather than ownership, to rely on a village headman informant to collect GPS data on the location of dwelling units, to collect information from households about each plot used and its proximate neighbors, to collect locational information about the plots used by each household from a group interview, and to manually match the last two. The paper describes in detail the options available at each point in the design process, and the reasons for choosing as we did; the map products that
were prepared, their cost, and mode of use; the interviewing that took place; problems that arose; and the quality of the links, as far as we are able to evaluate at this point.

**Keywords:** household-land-use links, theoretical and applied considerations, social-spatial data collection, northeast Thailand

### 1. INTRODUCTION

Scientists from a variety of fields are increasingly acknowledging the need to understand the nature and causes of change in land cover. In turn, this has led to recognition of the necessity to comprehend the role of human behavior in changes in land cover and the accompanying distinction between “land cover” and “land use.” It has also led to the examination of the nature of feedbacks between population and the environment. If we are to understand the causes in the change in land cover—and especially if we are to move toward prediction—we need to be able to know initial conditions, how people are using the land, the factors that lead to trajectories of land-use change, whether land-use change also involves land-cover change, and how people relate to composition and change.

Identifying land use and the factors leading to land-use change requires data on the social entities that influence or make land-use decisions. We also need to know how initial land-cover conditions affect these decisions. There is a range of such social entities, including international and governmental bodies, corporations, religious and other organizations, households, and individuals. This range can be thought of as the social organization of people and behavior, and such social organization is itself subject to change over time. Further, just as social organization affects the nature of decision making influencing land use, there is also a biophysical and geographical organization of the land that affects land use and land cover. Examples here include elevation, slope, soil fertility, and water quality, as well as land fragmentation and geographic accessibility.

For linguistic ease, consider the components of social organization and the spatial organization of land as being scaled. On the social side, the smallest element is an individual and then a household. On the spatial side, the smallest element is the finest areal unit that can be measured with available measuring instruments. The minimum mapping unit—the pixel—and the instantaneous field of view of imaging devices are applicable concepts for remote sensing characterization and ground-based locational referencing. Finally, on both the social and spatial side, there is a temporal scale.