

# Visualizing Forest Culture in the Hira Mountain Foothills



## -An Analysis of Citizen-Selected Resources in Walking Maps-

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### 1. Introduction

Across Japan's low mountain belts, satoyama—secondary forests and farmland managed for firewood, charcoal, and mushroom logs—historically sustained early- to mid-successional deciduous broad-leaved stands and high biodiversity. The Otsu City Historical and Cultural Master Plan (2019, Shiga Prefecture) frames heritage as an integrated cultural landscape linking forests, waterways, settlements, and practices rather than isolated sites. Building on this framework, this study examines how forest and non-forest cultural resources are distributed and represented in administrative inventories and citizen-produced walking maps. Adopting an ecomuseum perspective emphasizing residents' memories, in-situ learning, and collaborative curation, we interpret how community groups select "outdoor resources" and what this implies for shared stewardship.

### 2. Objectives

- 1) Clarify the structure of forest-related and non-forest cultural resources in the Hira foothills.
- 2) Compare administrative datasets and citizen walking maps to identify selection tendencies.
- 3) Discuss implications for ecomuseum development and inclusive communication of the cultural landscape.

### 3. Study Area

The study focuses on northern Otsu—especially the Komatsu (Kitakomatsu and Minamikomatsu) and Kido districts, former villages at the Hira Mountain foothills. Here, prolonged human–environment interactions produced rich forest culture alongside stonework, shrine approaches, waterways, and terraced fields.

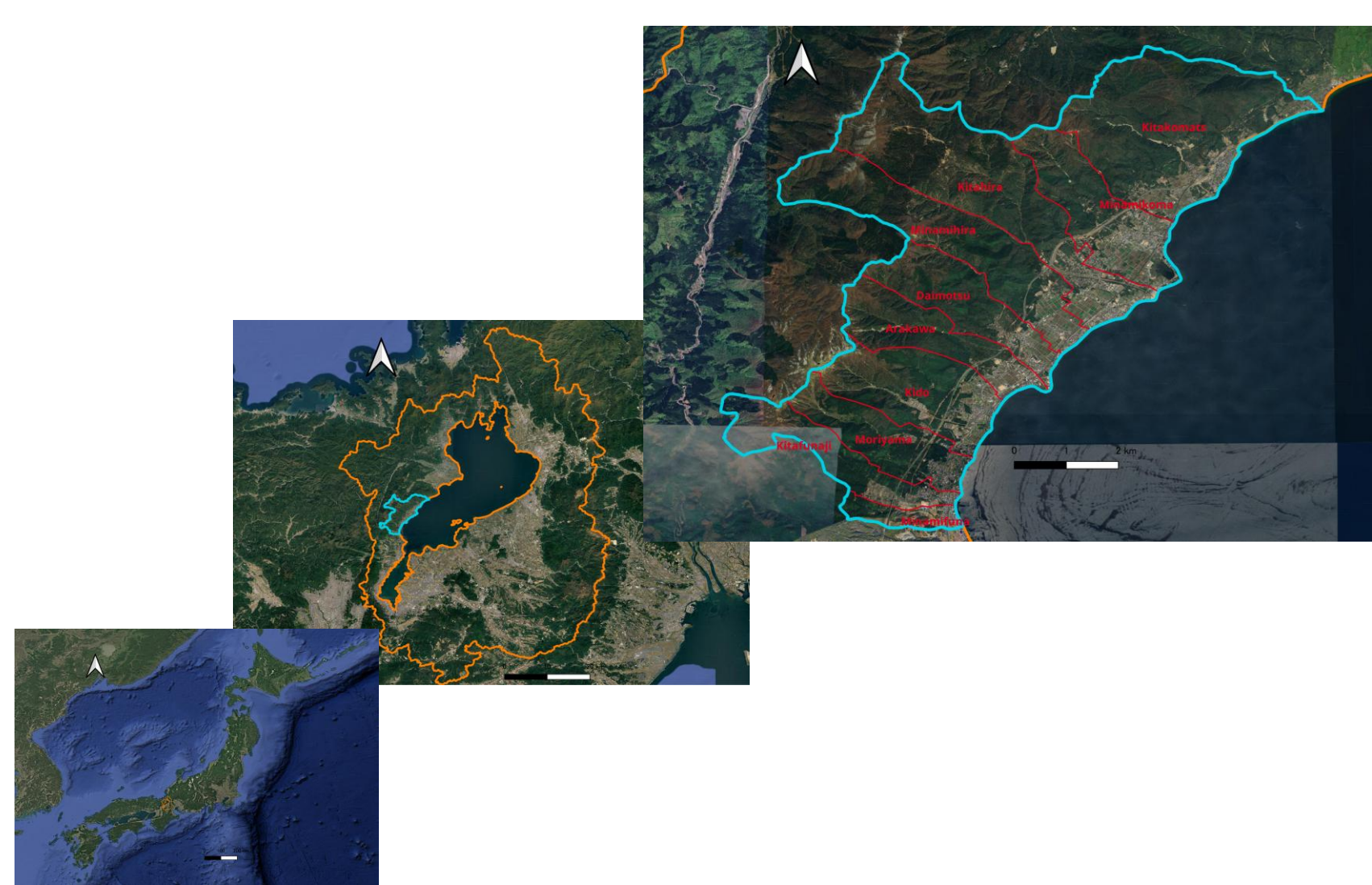


Fig. 1 Study area and villages

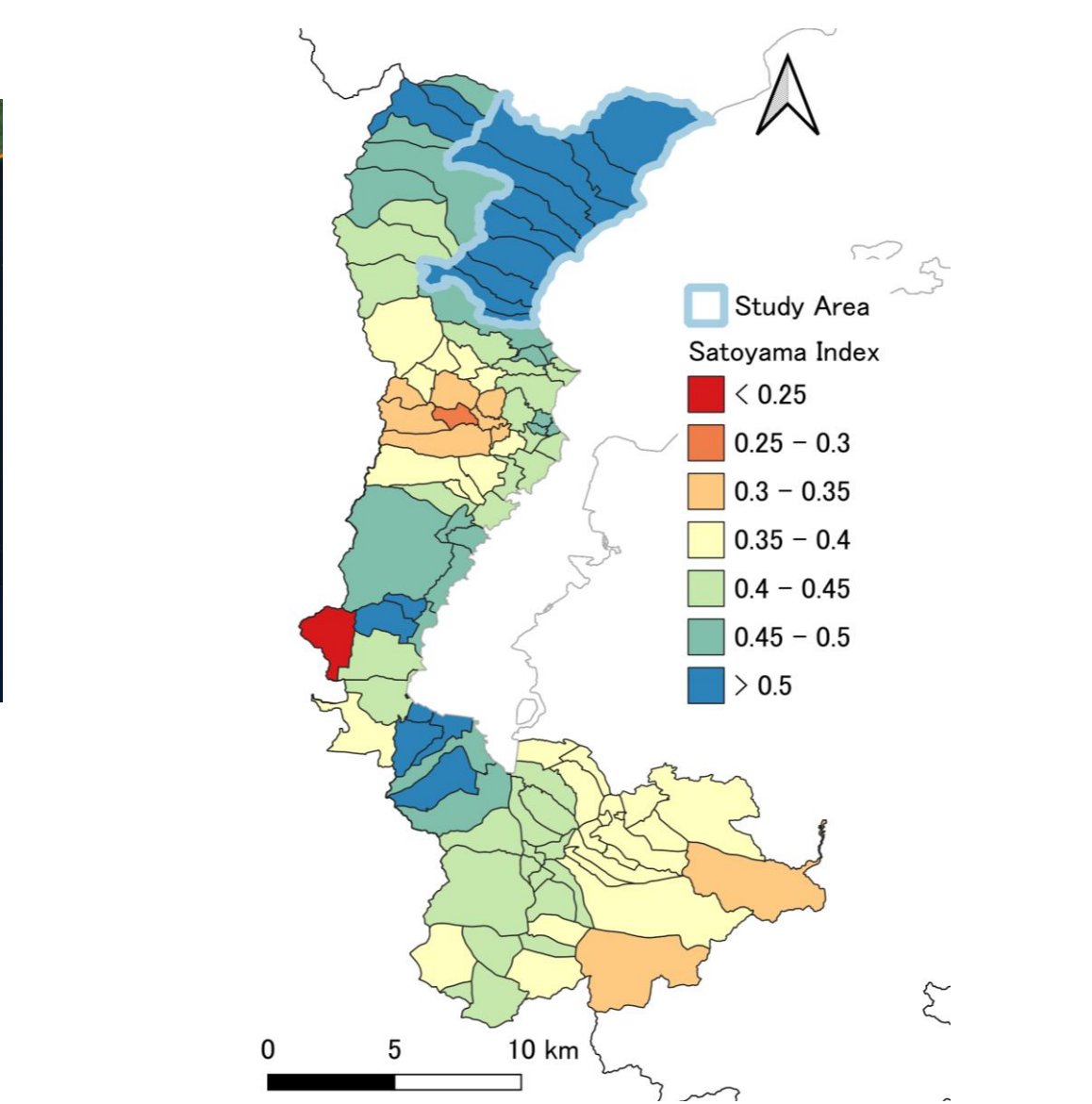


Fig. 2 Satoyama Index (>0.5) for target districts

### 4. Data and Methods

**Administrative dataset:** Master Plan's appendices were reorganized into a database of non-designated cultural resources, classified into Structures, Stone Monuments, Intangible Folk Culture, Cultural Landscapes, and Natural Sites/Environment (e.g., sacred trees, shrine forests, waterfalls).

**Citizen-produced maps:** Items extracted from three walking maps were assigned to identical categories to enable dataset comparison.

**Satoyama Index and fieldwork:** QGIS mapped the Satoyama Index distribution, while in-situ fieldwork verified forest composition and sacred sites.

**Comparative analysis:** Following prior regional ecomuseum research, category proportions were contrasted across sources to interpret selection bias and communication goals in citizen materials.

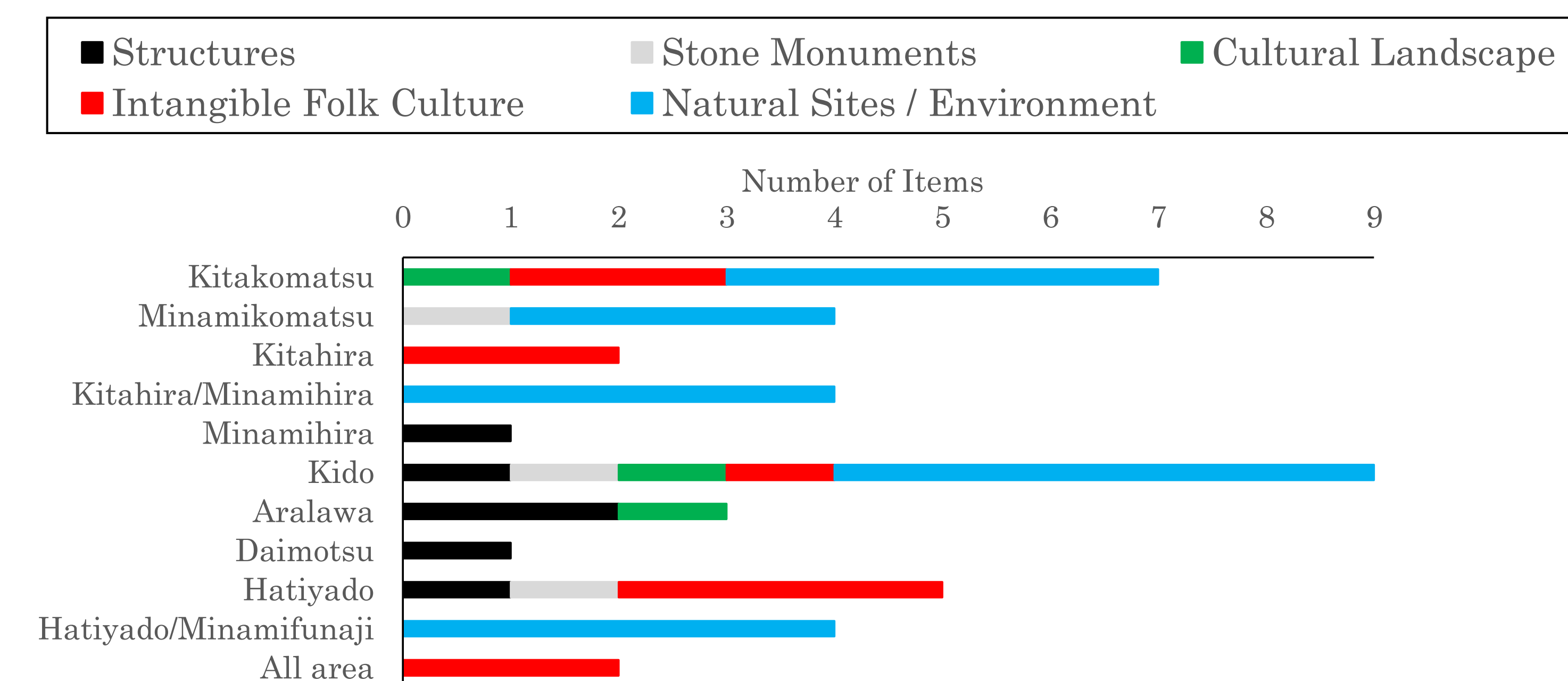


Fig. 3 Category composition from the administrative dataset (village-level). Entries separated by a slash (/) indicate data spanning two villages.

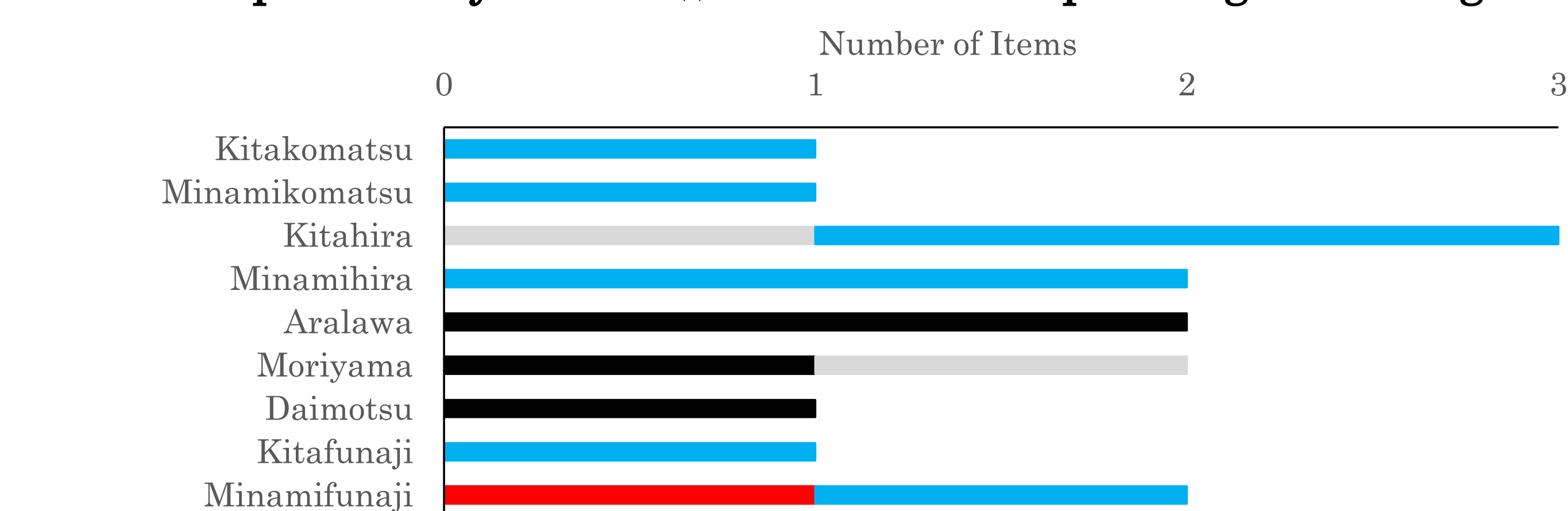


Fig. 4 Category composition from citizen maps (three map sources)

### 5. Results

#### 5.1 Satoyama landscape dominates

The Satoyama Index exceeding 0.5 across target districts indicates well-developed satoyama mosaics; field checks confirmed abundant deciduous oak (*Quercus* spp.) stands.

#### 5.2 Administrative inventory reveals breadth but uneven village coverage

Natural Sites/Environment (e.g., sacred trees, shrine forests) and Intangible Folk Culture (oral traditions, mountain worship, rituals) constitute major shares overall, although counts vary markedly by village. For example, Kido's totals are buoyed by large evergreen sacred trees preserved in shrine forests.

#### 5.3 Citizen maps prioritize walkability

Forest-related items per village are minimal across the three maps; Intangible Folk Culture appears once, while Natural Sites/Environment appear more frequently. This indicates an emphasis on walkability, visibility, and on-site storytelling rather than exhaustive coverage.

Prior regional statistical analyses confirm significant differences between administrative and citizen datasets regarding Cultural Landscapes and Intangible Folk Culture, reflecting distinct purposes and audiences.

#### 5.4 Forest culture extends beyond labels

Although many forest elements lack explicit map labels, guided explanation connects them to forest culture, such as stone-hauling carts tied to quarrying and mountain names rooted in mountain worship. Visual local records, including the Minamihira folding screen ("屏風byoubu" in Japanese), depicting wood transport and charcoal making, further evidence the entanglement of forests, livelihoods, and beliefs.

#### 5.5 Non-forest cultural elements are important

Both sources highlight stonework rivers and embankments, terraced rice fields, deer fences ("猪垣shishigaki" in Japanese), shrine approaches, settlement landscapes, and canals as key cultural features structuring everyday experiences and walking routes.

### 6. Discussion

#### 6.1 Perspectives on the landscape

Administrative inventories provide breadth and taxonomy (including intangible items and shrine forests) but remain uneven across villages. Conversely, citizen maps curate places optimized for way-finding, narrative potential, and experiential learning, explaining the under-representation of deep-forest and intangible items.

#### 6.2 Forest culture is embedded

Forest culture persists not only in woodland stands and shrine forests but also in ritual calendars, oral traditions, and stonework practices that depend on the surrounding forests. Treating "forest culture" as an embedded layer reconciles category differences and supports a truly integrated cultural landscape approach.

#### 6.3 Implications for an ecomuseum

- Inventory integration: Link administrative and citizen datasets under shared categories and metadata.
- Participatory interpretation: Train guides and teachers to bridge implicit forest ties (e.g., mountain worship, stonework logistics) during walks.
- Digitally supported curation: Co-develop an updateable "outdoor resources" catalog allowing simple mobile authoring by residents for stories, rituals, and seasonal practices.
- Inclusive coverage: Schedule thematic walks to less-represented villages and deep-forest areas to make intangible and forest-embedded items legible to visitors.



Fig. 5 Examples of forest-related cultural resources identified in the survey

- Typical satoyama landscape: A characteristic satoyama scene where mixed deciduous forests surround farmland, forming a traditional mosaic landscape.
- Shrine forest in Minamihira: An old shrine grove dominated by evergreen broad-leaved trees such as *Castanopsis*, preserved as sacred woodland.
- Sacred *Podocarpus macrophyllus*: A large *Podocarpus macrophyllus* tree in a Minamikomatsu shrine, valued as a sacred natural monument.
- Hyakken-tsutsumi embankment: A river embankment in Daimotsu, completed in 1852, illustrating Edo-period water management.
- Local granite komainu: A komainu statue carved from locally quarried granite and dedicated in 1881, reflecting local stonework culture.
- Stone-hauling cart (1934): A 1934 photograph showing a cart used to transport granite from mountain quarries along historical stone-hauling routes.
- Charcoal-making scene: A folding-screen painting depicting traditional charcoal production, a practice that declined with the spread of fossil fuels.
- Traditional log transport: A scene showing manual tree felling and log hauling, practices largely replaced by modern forestry machinery.