

Village Morphology and the Construction of Place Identity in the Aihui Area along the Heilongjiang River, China

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Abstract:

Place identity is the emotional connection between people and a place. It is significant for local development and people's satisfaction and happiness in where they reside. The physical environment is one of the most important factors affecting people's emotions toward a place. In order to clarify the theoretical analytical framework of the process from village space morphology to place identity, this study takes the area of Aihui along the Heilongjiang River, China, as an example. The research was conducted regarding two aspects: First, we analyzed the space morphology of the villages in the Aihui district and interpreted their locality. On this basis, we conducted a survey of villagers' subjective perceptions of the village space and their place identity through in-depth interviews. From the collected interview texts, we extracted, verified, and analyzed the role of morphological constituents in the construction of place identity. Finally, a comprehensive framework was established. The features of space morphology are the projections of locality in physical space. People use morphological constituents to construct an image of the village and scenes of local life; morphological constituents with local characteristics can help enhance people's place identity.

Keywords: Village morphology; Place identity; Locality; Heilongjiang River; Aihui

1. Introduction

The Heilongjiang River is the third-largest river in China and the longest “boundary river” in the world. The areas along the Heilongjiang River host a unique native culture that has evolved from life in the mountains and forests, and from fishing and hunting activities, combined with the cultures of Han, Russian, and other immigrant ethnicities (Xie, 2010). Diverse cultures and the unique scenery of the “boundary river” have shaped the living environment as a distinct locality and molded ethnic characteristics. However, China’s vast rural areas are undergoing or are about to undergo a dramatic spatial evolution with development transformations, which is unprecedented and inevitable. With the rise in globalization and modernization, traditional agricultural production methods, rural lifestyles, and folk customs have gradually changed or disappeared. Meanwhile, due to rapid construction, new techniques and standards have infiltrated the countryside from the cities, which have further overwhelmed local traditional architectural forms. These factors have led to the convergence of village morphology and landscape (Bao & Zhou, 2014; Li, Wang, & Li, 2019). In addition, the surge in the urban economy and the degradation of agriculture have forced large numbers of the rural population to rush into cities, leaving behind “hollow” or “aged” villages. Like all rural areas in China, the villages along the Heilongjiang River are losing their youth population and local characteristics, thus facing a severe crisis in development and identity.

Place identity is constructed in a long-term process of people-place interactions (Figure 1) (Peng, Dirk, & Wu, 2020). The place identity of a place is a special feature that makes a specific area distinguishable. It refers to the characteristics of the place itself, including its physical environment, culture, history, and so on. For individuals, place identity forms a part of one’s self-identity and it is related to the physical environment (Proshansky, 1978). People’s place identity is expressed through individuals and groups defining themselves as members of a particular place, thereby asserting their position and role in society (Hernández et al., 2007). These two aspects of place identity can exert a profound influence on each other. In the people-place interactions, people perceive and cognize the various characteristics of a place and establish a connection with it, thereby constructing their place identity.

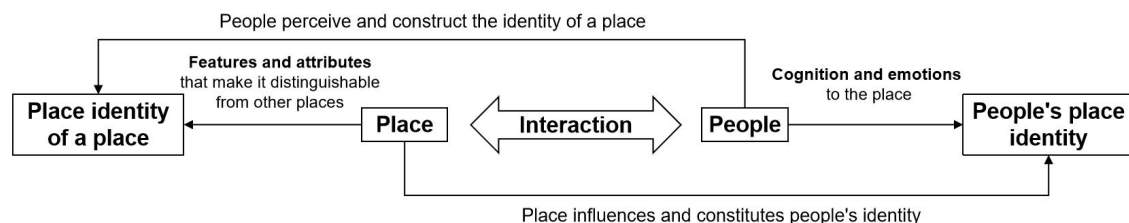


Figure 1: Construction of place identity

People’s place identity has a positive effect on their residential satisfaction and happiness. Furthermore, the place identity of a specific place is regarded as a resource

1 for development. It plays an important role in maintaining regional vitality and
2 locality, as well as promoting regional integration and development. Place identity has
3 thus received extensive attention in many fields, such as planning, regional
4 regeneration, heritage protection, and tourism. Prior research has focused more on the
5 influences of social and cultural factors; the physical environment has received less
6 attention. However, studies have shown that specific aspects of urban morphology
7 such as architectural heritage (Gospodini, 2004) and green space (Knez, Ode,
8 Gunnarsson, & Hedblom, 2018) can impact one's place identity.

9 Compared with cities, a village is a type of human settlement system that is more
10 intricately connected to nature. Therefore, village morphology reflects localities that
11 have adapted to the natural and geographical environment more vividly. Although
12 there are a large number of relevant studies on village morphology in China, most
13 have analyzed the distribution of villages across macro-regions (Xue, Wang, Dou, &
14 Wang, 2020; Hou et al., 2020) or conducted case studies on a micro-scale (Wang &
15 Zhou, 2011; Chen, Xie & Li, 2020). Few have limited their scope to similar local
16 characteristics (Zhou, Li, & Qian, 2016). Further, no studies have established a
17 connection between village morphology and place identity.

18 Because of its location at the edge of the country, the cumbersome transportation
19 system, and severely cold weather, Heilongjiang Province, particularly the area along
20 the Heilongjiang River, has largely been ignored by researchers. However, in recent
21 years, driven by the development of border tourism (Zhou et al., 2013) and China's
22 rural revitalization strategy, local villages are in urgent need of construction. How to
23 maintain the locality of rural landscapes and enhance the place identity in the next
24 round of development has become a focal point of discussion. Therefore, this research
25 seeks to explore the role of space morphology in the construction of place identity
26 based on the analysis and summary of the features of village morphology in Aihui.
27 Ultimately, this study advances a comprehensive theoretical analysis framework that
28 may provide a reference for the solution to similar problems.

29 **2. Research Overview**

30 **2.1 Study Area**

31 **(1) General Information**

32 The Heilongjiang River is an important international river flowing through three
33 countries. The river basin covers a vast area that includes China's Heilongjiang
34 Province, Jilin Province, northeast of the Inner Mongolia Autonomous Region, and a
35 small part of Liaoning Province (Dai et al., 2015).

36 Aihui is a district of Heihe City, Heilongjiang Province. It is located on the
37 northeast border of China, the north end of the Lesser Khingan Mountains, and the
38 west bank of the Heilongjiang River (Figure 2). Heihe is an important border city in
39 China, facing Russia's Blagoveshchensk across the river. It evolved from the old

1 Aihui City, which was built for frontier defense during the Qing Dynasty. The Aihui
2 District has a total area of 14,446 km² and the border line is 184.3 km long. The
3 administrative area includes the main urban area of Heihe City, three towns and eight
4 townships, with 115 natural villages, and the residents come from 25 ethnic minorities.
5 Affected by the natural environment and resources such as cultivated land and aquatic
6 resources, the villages in Aihui District are mostly distributed along the river. There
7 are 27 villages within 1 km of the buffer zone of the Heilongjiang River (Figure 2),
8 accounting for 23.5% of the total number of natural villages in the district. Most of
9 these villages have special historical and cultural significance and 12 of them are
10 ethnic minority villages, accounting for more than 40% of the 28 ethnic villages in the
11 district.

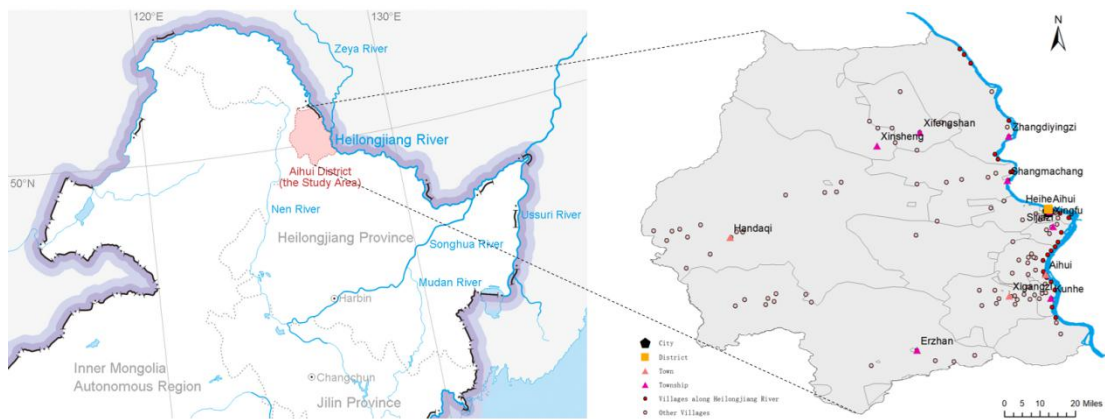


Figure 2: Location and distribution of villages in the Aihui District

(2) History and Development

15 The earliest human activities in the Aihui area along the Heilongjiang River can
16 be traced back to the Paleolithic Age. As the nomadic fishing and hunting territory of
17 ancestors of the ethnic minorities living there today, it formed the foundation of the
18 native culture. Villages along the river were first formed in the Ming and Qing
19 Dynasties. Most were the habitats of the Daur, Oroqen, Ewenki, and other minority
20 peoples, and some used to be the campsites of border troops, such as Huangqiyingzi
21 Village and Kalunshan Village. Other villages were formed after the 1900 Amur
22 anti-Chinese pogroms. Refugees of the Han, Russian, and other ethnicities had fled
23 from Blagoveshchensk and Jiangdong Sixty-Four Tun. They settled along the river
24 and formed multi-ethnic villages, such as Xiaoxintun Village and Waisidaogou
25 Village (Wang, 2020). In the last century, Aihui has experienced and witnessed many
26 historical events such as the Anti-Russian War, the Anti-Japanese War, immigration
27 for land reclamation, and the Down to the Countryside Movement. The area has rich
28 historical and cultural connotations.

29 The government of Aihui is currently promoting the construction of a zone of
30 special cultural and ecological tour along the river named the “Heihe–Aihui Country
31 Park.” The villages along the Heilongjiang River are thus not only concentrated

1 representations of the locality but also hot spots of future development. Our research,
2 therefore, considers these villages as major objects.

3 **2.2 Methods**

4 We first analyzed and summarized the features of village morphology through
5 ArcGIS analysis and field survey and interpreted how the locality is expressed in
6 physical space. The analysis of locations and morphological features at the macro
7 scale predominantly made use of geographic information obtained from China's
8 National Catalogue Service for Geographic Information and the Institute of
9 Geographic Sciences and Research Resources at the Chinese Academy of Sciences
10 (CAS). The information pertained to administrative boundaries, hydrology, residential
11 areas, data from the digital elevation model (DEM), and land use. On the meso and
12 micro-scale, the morphological features are summarized according to satellite images
13 provided by Google Maps and supplementary information from field survey.

14 On this basis, we conducted in-depth interviews with native residents to better
15 understand their daily lives, spatial perceptions, sense of identity, and the images of
16 the village in their minds. Thereafter, the interview texts were collected, coded, and
17 the mentioned constituents of village morphology were extracted. Finally, we
18 analyzed the role of these morphological constituents in the construction of place
19 identity.

20 **3. Analysis of Village Morphology**

21 Since ancient times, rivers have been essential factors affecting human
22 settlements through the geographical divisions of “river basins”. Within these basins
23 similar production methods, lifestyles, and regional cultures form. With further
24 development, the basins shape the localities of the living environment with both
25 commonalities and diversities. The influence of the Heilongjiang River on village
26 morphology is reflected in many aspects, including the site, layout, space structure,
27 and architectural style.

28 **3.1 Site**

29 The Aihui District is a mountainous landform with the Lesser Khingan Mountains
30 running throughout its entire territory, but the overall terrain is relatively low. For the
31 most part, the altitudes are between 400–900 m. Along the river, the northern part is a
32 gentle mid-level area, and the southern is a broad plain with more farmland. The
33 distribution thus reveals that there are more villages in the south and fewer in the
34 north (Figure 3). From the perspective of natural geographical conditions, the villages
35 are mainly located on plains or mild slopes along the river. Most villages are located
36 at the confluence of the Heilongjiang River and its tributary rivers or on the convex
37 bank. There is massive sedimentation of sand at these locations so that the land is
38 fertile and suitable for cultivation. Some villages have islands in the facing river,
39 providing additional land and resources.

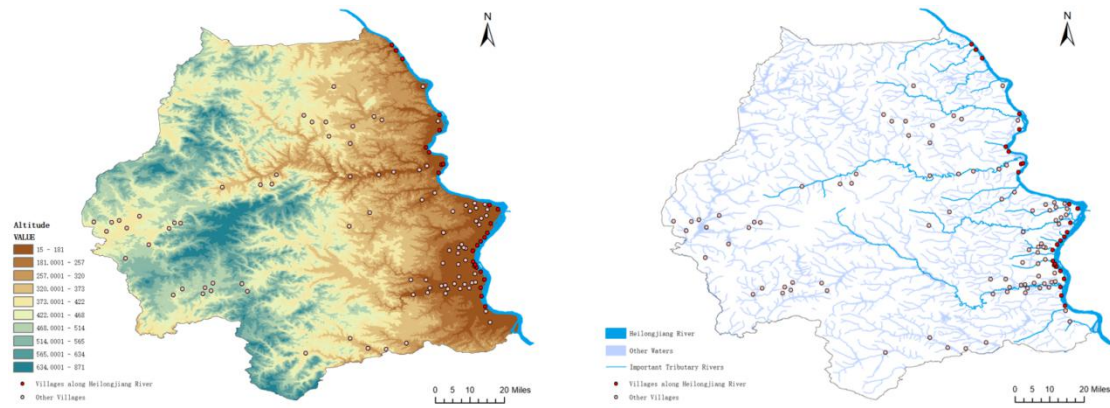


Figure 3: Village distribution with topography and hydrology in the Aihui District

3.2 Landscape

According to the classifications of land use (Figure 4), the forest coverage rate of Aihui is approximately 70%. The natural environment in the district can be summarized as seven tenths forest, one tenth grassland, one tenth water, and one tenth farmland. Valleys and expansive plains exist along the river, providing a good foundation for agriculture. In the mid-level area on the northern part near the mountains and beside the river, a general spatial pattern emerges: mountain, forest, farmland, village, river. In the plains area of the southern part far from the mountains but along the river, the general pattern is farmland, forest, village, river. In addition, tributary rivers, ponds, lakes, islands, and other constituents jointly constitute the diversified landscape patterns (Table 1).

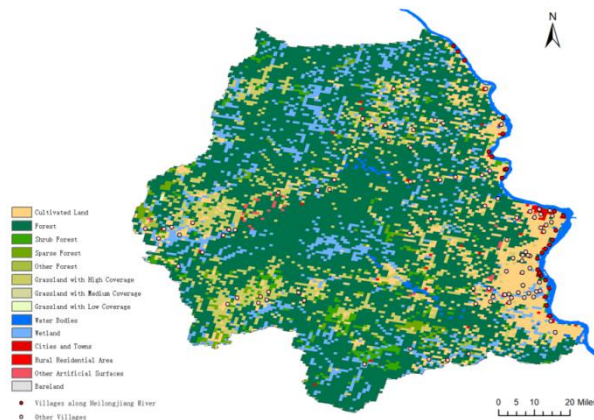
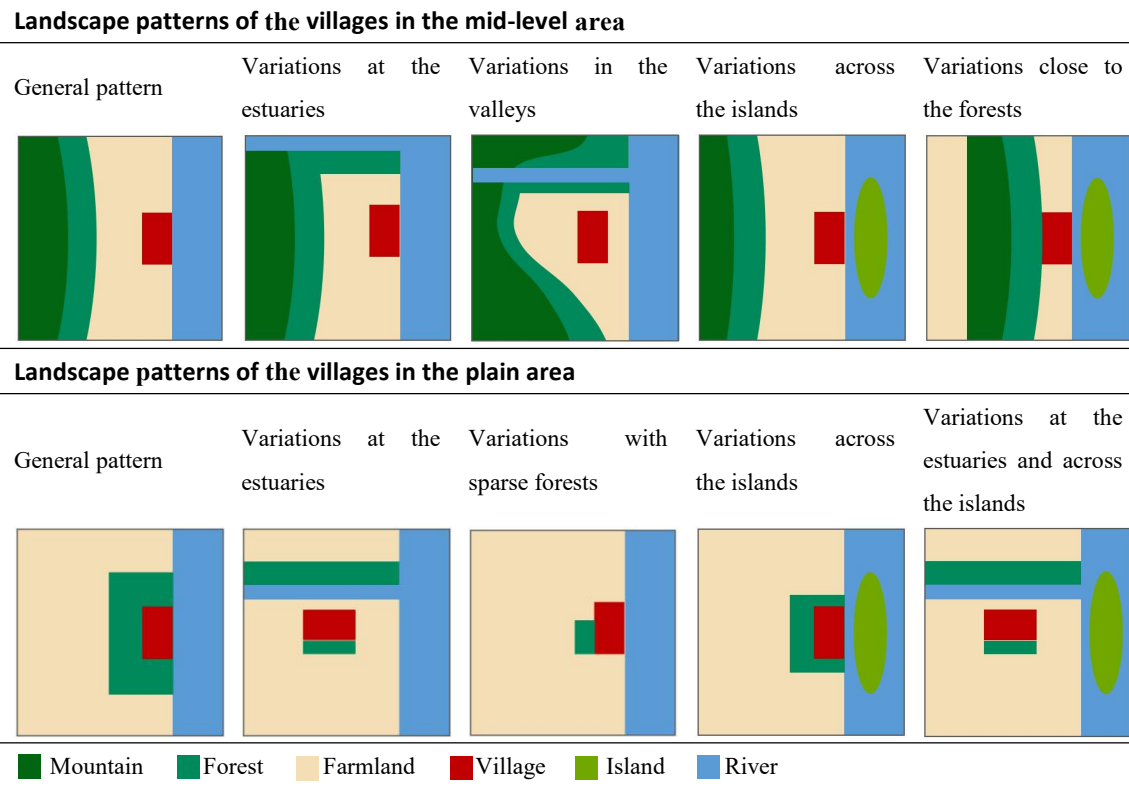


Figure 4: Village distribution with land use in the Aihui District

1 **Table 1:** Landscape patterns of villages along the river



2 **3.3 Space Composition**

3 **(1) Streets**

4 The organization of the village streets is clearly influenced by the Heilongjiang
5 River. Most of the streets lie either parallel or perpendicular to the river, while a few
6 are at particular angles to it due to the limitations of other factors such as mountains
7 and forests. Generally, the modes of the street organizations can be divided into three
8 types: fishbone type, grid type, and curve type (Table 2). The foremost feature of the
9 fishbone type is that there is an obvious main street serving as the axis with a large
10 number of side streets vertically distributed on either both sides or on one side. This
11 mode is common to the strip villages built alongside the river where the axial street
12 usually runs parallel to the Heilongjiang River or a tributary river. The grid type is
13 relatively homogeneous. In this mode, there are roughly equal numbers of streets
14 running in different directions and the village area is divided into grids of similar sizes.
15 The curve type more strongly reflects the specific features of the terrain and the
16 influence of ponds, lakes, and forests. Many villages feature a combination of these
17 three types.

18 In terms of spatial scale, most of the internal streets in the villages have mixed
19 traffic comprising both pedestrians and vehicles, with a width ranging from 4–7 m.
20 Along the streets are fences and gates set up by each household with native trees on
21 both sides, such as poplars, pines, and willows, which form the facades of the streets
22 (Table 3). With the development of tourism, several special streets have been

1 developed in some villages, such as the Russian Commercial Street in Waisidaogou
 2 Village.

3 **Table 2:** Streets organizations of the villages along the river

Fishbone type	Grid type
<div>Typical village</div> <div>Huangqiyingzi Village</div> <div>Others</div> <div>Huoerqin Village,</div> <div>Xiaowusili Village,</div> <div>Fulaerji Village</div>	<div>Typical village</div> <div>Waierdaogou Village</div> <div>Others</div> <div>Xiaoxintun Village,</div> <div>Dainshan Village,</div> <div>Kunhe Village</div>
<div>Curve type</div> <div>Typical village</div> <div>Daxintun Village</div> <div>Others</div> <div>Changfa Village</div>	<div>Mixed type</div> <div>Typical village</div> <div>Waisidaogou Village</div> <div>Others</div> <div>Kalunshan Village,</div> <div>Waisandaogou Village</div>

4 (2) Courtyards

5 Courtyards and dwellings, which constitute the main parts of the villages, are
 6 connected to the streets. By virtue of the vast land area and sparse populations, each
 7 family has a courtyard with ample space. The shape of the courtyard is usually a
 8 rectangle adapted to the street network. The yard always contains a house, a small
 9 square at the front used as a car park or for drying grains, and a farm garden at the
 10 back (Table 3). The green rate of the courtyard can reach 40%–50% in spring and
 11 summer. The courtyards not only function as the site of families' daily activities but
 12 also serve as the agricultural production of their food consumption, thereby reflecting
 13 the characteristics of courtyard agriculture.

14 (3) Public Space

1 The primary types of public spaces include a community center, a sports square,
2 and a drying field for grain, most of which are arranged along the main road. In some
3 small villages, these functions usually occur at the same site, which becomes a core
4 space. Other kinds of public spaces include the folk yards (a space used for cultural
5 practices), cultural squares, and leisure venues built by the river such as a memorial
6 square, walkway, pavilion, or small park. Moreover, there are symbolic objects set at
7 the entrances to some villages or on the riverside, including monuments, signposts,
8 and sculptures, which act as landmarks and create public spaces (Table 3).

9 **Table 3:** Streets, Courtyards, and various public space in the villages along the river

Streets



Ordinary street
in Waierdaogou Village



Ordinary street
in Waisandaogou Village



Russian Street
in Waisidaogou Village

Courtyards



Courtyard in Xiaowusili Village



Courtyard in Kalunshan Village



Courtyard in Waisandaogou Village

Public space



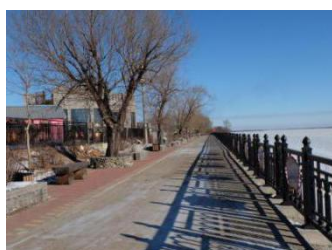
Sports square
in Xiaowusili Village



Community center
in Kalunshan Village



Cultural stage
in Waisandaogou Village



3.4 Architectural Style

(1) Ordinary Architecture

Forms of ordinary architecture in villages mainly include residential houses built by the villagers themselves and public buildings such as community centers (Table 4). Most residential houses are single-storied with simple decorative lines on the facades. The exterior walls are mostly white and warm yellow or the natural colors of red and gray bricks, while the roofs are relatively consistent in being either blue or red. In some villages, the houses are colorful in pink, orange, yellow, or light green. Some are painted with murals to show the ethnic and historical culture of the village. The forms of public buildings are not much different from those of residential dwellings but are larger in size. Signal patterns and symbols reflecting cultural characteristics are used more commonly in the decorations of public buildings.

(2) Special Architecture

In addition to ordinary forms of architecture, which comprise the majority, there are special forms of architecture in some villages, including galleries showcasing historical or ethnic art, traditional dwellings, etc. (Table 4). Most of these special architectures are built in folk yards, and the styles, materials, and decorative arts are restored according to ethnic traditions as far as possible. For example, in Xiaowusili Village, the traditional Manchu dwelling is built with wooden materials, including the rafters, architrave, and balustrades, thereby recreating the architectural form of the Qing Dynasty. In the Amur Manor of Waisidaogou Village, the Russian cabins are decorated with special patterns and carvings at the edges of the eaves and window frames according to Russian customs.

Table 4: Architectural styles in the villages along the river

Ordinary Architectures



Residential house
in Kalunshan Village



Residential house
in Waisidaogou Village



Activity Room
in Waierdaogou Village



Treatment room
in Waisidaogou Village

Special Architectures



4. The Spatial Perception of Residents

To investigate the villagers' subjective perceptions of the above-mentioned features of village morphology, as well as the impacts on their place identity, we conducted in-depth interviews, each lasting at least 30 minutes. We collected a total of 27 interview texts. The interviewees came from six villages, including Xiaowusili Village, Kalunshan Village, and Waisidaogou Village. The respondents comprised 17 males and 10 females aged 17–62. They had been living in their villages for more than 10 years; 21 interviewees still lived in the village and the others lived in a city or town for work or school. The topics covered in the interviews mainly included the following aspects:

1) cognition, emotion, and evaluation of the village, which are three dimensions of one's place identity (Ellemers, Kortekaas, & Ouwerkerk, 1999; Belanche, Casaló, & Flavián, 2017);

2) activities and spatial scope in their daily lives;

3) familiar, impressive, and favorite things or places in the village;

4) migration intentions.

There were six village officials among the interviewees. They offered information pertaining to the economies, populations, construction plans, and specific scopes of the villages.

Regarding spatial perception, we extracted the morphological constituents that villagers mentioned as well as the corresponding descriptions and coded and classified them (Table 5). Finally, we obtained 82 morphological constituents and divided them into four groups: natural, productive, functional, and cultural. The corresponding descriptions are summarized as location, possession, use, aesthetic, and change.

Table 5: Analysis of element extraction and coding

Number	Morphological constituent	Code	Classification	Description	Code	Classification
1	a1 Estuary	A1 River	Natural	b1 The village is near the estuary	B1 Position	Location

	a2 Shijin River	A1 River	Natural	b2 A tributary of the river	B1 Position	Location
	a3 Statue of fishing boats	A2 Landscape sketch	Cultural	b3 A statue at the entrance of the village	B2 Site mark	Location
	a4 Folk museum	A3 Gallery	Cultural	b4 Ethnic characteristics of the Manchu	B3 Cultural expression	Aesthetic
	a5 Mural	A4 Characteristic decoration	Cultural	b5 The Manchus in painting	B3 Cultural expression	Aesthetic
	a6 Square	A5 Open space	Functional	b6 I often come here for activities	B4 Leisure and entertainment	Use
	a7 Village committee	A6 Public service facilities	Functional	b6 I often come here for activities	B4 Leisure and entertainment	Use
	a8 Fishing ground	A7 Fishing facilities	Productive	b7 There used to be a lot of people living by the fishing	B5 Collective memory	Change
	a9 Divine tree	A8 Folk space	Cultural	b8 Previously used for worship	B5 Collective memory	Change
	a10 Courtyard	A9 Residence	Functional	b9 Our courtyard	B6 Territory and property	Possession
	a11 Activity room	A6 Public service facilities	Functional	b10 Chess with friends	B4 Leisure and entertainment	Use
2	a12 Heilongjiang River	A1 River	Natural	b11 The village is by the river	B1 Position	Location
	a3 Statue of fishing boats	A2 Landscape sketch	Cultural	b12 You can see it at the entrance	B2 Site mark	Location
	a13 Archway	A2 Landscape sketch	Cultural	b13 It is at the entrance of the village	B2 Site mark	Location
	a4 Folk museum	A3 Gallery	Cultural	b14 Museum of Manchu	B3 Cultural expression	Aesthetic
	a5 Mural	A4 Characteristic decoration	Cultural	B15 Characteristics of Manchu	B3 Cultural expression	Aesthetic
					

4.1 Natural Morphological Constituents

Most interviewees mentioned the Heilongjiang River (or its tributary rivers) and other natural morphological constituents in the interviews—including the islands, mountains, and forests—when they described the location of their villages or homes. Many villagers were familiar with the natural environments around their residences and they could accurately describe the geographical locations and landscape patterns of their villages through the positional relationships between the village and various natural morphological constituents. As the largest and most important natural

1 morphological constituent of the region, the Heilongjiang River was repeatedly
2 mentioned in the descriptions of the locations. Some villagers could tell the certain
3 distance from their home to the river; they all believed that they live by the river
4 despite their houses not being closest to the river.

5 *“Our village is near the estuary. It is a tributary river, the Shijin River. Our*
6 *village is at the confluence of the Shijin River and the Heilongjiang River.”*

7 *Interviewee 1, Xiaowusili Village*

8 *“The river (Heilongjiang River) is in front of us (our village) and the forest is*
9 *behind. It is a natural pine forest. There is also an island in the river.”*

10 *Interviewee 5, Kalunshan Village*

11 *“I live beside the river and the river is just 100 meters from my home.”*

12 *Interviewee 24, Waisidaogou Village*

13 Almost all the interviewees said that they go for walks and enjoy the scenery on
14 the riverside. They described that it’s “picturesque” there. Forests, wildflowers, and
15 other natural morphological constituents also entice them outdoors. The aesthetic
16 experience of natural environments encouraged them to give positive evaluations of
17 their village, such as good scenery and fresh air. It is also one of the reasons why they
18 prefer to live in the villages.

19 *“When I go back to the village in summer, I would go for a walk along the river.*
20 *There is beautiful scenery by the riverside. There are many people in this area. In the*
21 *evening, we sit there together and chat with each other... The riverside is my favorite*
22 *place... I prefer to stay in the village because the environment is nice and*
23 *comfortable.”*

24 *Interviewee 20, Waisandaogou Village*

25 *“We walk back and forth in the White Birch Forest. In spring, when the oak trees*
26 *and ailanthus trees blossom, there will be fresh air and the sweet smell of flowers.”*

27 *Interviewee 24, Waisidaogou Village*

28 **4.2 Productive Morphological Constituents**

29 The local economy of the villages is still dominated by agriculture, including
30 planting, breeding, and agricultural services. The development of tourism only began
31 in recent years. The most important productive morphological constituent is thus the
32 extensive farmland; the others include fishponds, vegetable gardens, and greenhouses.
33 These productive morphological constituents constitute the local productive landscape,
34 which is also worthy of appreciation, as same as the nature landscape. The farmlands
35 of some interviewees were far away from the villages; some were even located even
36 in the mountains. However, villagers always regard these sites as workplaces rather
37 than scenery. They described the positions of their farmlands and the difficulties in
38 the journey there rather than any aesthetic experience.

1 occurred in different periods. Most of these sites are hidden in the mountains and
2 forests. However, the interviewees nevertheless mentioned these sites and discussed
3 the histories of their villages. In some villages, there is still a simple traditional belief
4 in nature worship. Villagers consider an old tree as the “divine tree” and on certain
5 days hold rituals around it to pray for a good harvest. These customs attach cultural
6 meanings to the natural morphological constituents.

7 *“Our village has a long history. There are ancient tombs of the Liao Dynasty in*
8 *the forest, ruins of the Anti-Russian War, blockhouses, and watchtowers of the*
9 *Anti-Japanese War... It was a guard post in the Qing Dynasty. The meaning of*
10 *‘Kalun’ is ‘guard post,’ and now there is also a border post in the south of our*
11 *village.”*

12 *Interviewee 7, Kalunshan Village*

13 *“The divine tree is quite far away from our village. Formerly, we worshipped it*
14 *to pray for a good harvest. When someone was sick, people who believed would go*
15 *there to worship for good fortune. But now we only go there for festivals. It has*
16 *becomes a cultural activity of Manchu.”*

17 *Interviewee 2, Xiaowusili Village*

18 Cultural morphological constituents are not absolutely independent but are often
19 integrated with other types of constituents. Many villages are trying to convert to
20 characteristic ethnic minority villages and develop rural tourism, which has made this
21 phenomenon more widespread. New morphological constituents built for tourism
22 have often appeared in the discussions, including the manors, tourist centers, pavilions,
23 guide boards, signage, and statues. These constituents are decorated with symbolic
24 patterns. Most interviewees believe that it can strengthen the ethnic and cultural
25 characteristics of their villages.

26 *“Russian style. What has been built in recent years is of the Russian style such as*
27 *the renovated houses, street lamps, Matryoshka dolls (sculptures) and murals on the*
28 *walls. We also have Russian manors and traditional dwellings. Houses in the manor*
29 *are all of the Russian style, and there are also cabins. They are very beautiful... Our*
30 *village used to be an ordinary village, and the cultural characteristics are expressed*
31 *by virtue of the tourism.”*

32 *Interviewee 23, Waisidaogou Village*

33 **5. Construction of Place Identity**

34 **5.1 Place Identity of a Place**

35 The place identity of a place is a series of features and qualities that make it
36 distinct from other places. Unlike abstract and invisible characteristics such as history,
37 economy, and culture, morphological features are direct expressions of local

characteristics in physical space. Through an analysis of the morphological features at different scales, we can better understand the human settlement as a “place”.

(1) Macro Scale: The Decisive Impact of Geographical Location

In China, geographical location is widely used in the name of a place, which is a practice commonly followed in naming administrative units at all levels. For example, Heilongjiang Province is thus named because it is located beside the Heilongjiang River, and “Songbei District” means that the district is located to the north of the Songhua River. The names of the villages in the study area also reveal the same rule, such as Dayinshan Village (the village near Dayin Mountain) and Toudaogou Village (the village beside the first ditch to the north of the town of Aihui). This demonstrates that geographical location is an important component of place identity.

Furthermore, geographical location determines the natural environment of an area—climate, topography, resources, etc.—which have essential impacts on human production and life and thus play a decisive role in the construction of a place. Villages in the area along the Heilongjiang River generally contain the same types of natural morphological constituents, namely rivers, mountains, forests, and islands. Almost all of these villages have a similar history of fishing and hunting, which has resulted in the native culture. As people settled the area, broad land was reclaimed for cultivation, displacing the fishing and hunting industries to become the main mode of production. In the long process of constant interaction, human activities have endowed these places with history, economy, culture, and other attributes, which constitute place identity together with the natural attributes.

(2) Meso Scale: Space Structure Adapting to the Natural Environment

Due to the limitations of capital and technology in rural areas, the construction of villages cannot completely satisfy peoples’ desires as it does in cities. Therefore, village morphology reflects its adaptation to the natural environment, revealing the locality more obviously. The plane form and spatial structure of the villages along the river are obviously influenced by the natural geographical environment, which is dominated by the Heilongjiang River. Specifically, the built-up areas extend along the river and the streets lie parallel or perpendicular to it. Flat and vast land makes it possible to realize regular and straight road networks, but adjustments are needed when the topography changes. Houses are aligned with the streets, thus forming consistent orientations to the river.

The architectural form here is influenced more by the climate. The planes of the houses are simple rectangles, which can greatly reduce the contact between exterior surfaces and the cold environment. Sloped roofs can help reduce the accumulation of snow, and the materials have good compression resistance.

(3) Micro Scale: Architectural Aesthetics and Widely Used Symbols

1 The morphological features at the micro-scale, like the color and decorative art of
2 the architectures, are predominantly influenced by social and cultural factors such as
3 ethnicity and history. For example, the exterior walls of the houses in Manchu
4 villages are mostly white and decorated with red patterns, while the houses of Russian
5 villages are more colorful and the decorations are of the Russian style.

6 Symbols, which are used repeatedly in decoration, can strengthen the expression
7 of the culture. Accordingly, different symbols are widely used on fences, signage, and
8 other components. For example, the “red star” represents the culture of educated
9 youth in Waisandaogou Village and the “Matryoshka dolls” is part of a Russian
10 custom in Waisidaogou Village.

11 In the Aihui area along the Heilongjiang River, ethnicity, history, as well as many
12 other social and cultural factors, are all influenced by its nature of the “boundary
13 river.” Therefore, whether it is due to the natural geographic environment or social
14 factors, the river plays a decisive role in the construction of Aihui's place identity.

15 **5.2 People's Place Identity**

16 People's sense of identity and attachment to a place may be derived from any
17 spatial morphological constituent at any scale because it is possible for them to be
18 combined with personal memories and emotions. For example, Heilongjiang River
19 bears witness to villagers' life events, the courtyard is where they spent their
20 childhoods, and the White Birch Forest is where they go for a walk every day.

21 **(1) Natural and Cultural Constituents: Constructing the Image of a Village**

22 Throughout the interviews, we found that villagers use natural and cultural
23 morphological constituents more frequently when they construct the image of their
24 village and describe the place in which they live.

25 Natural morphological constituents can provide a reference to mark and describe
26 the location of a village, thereby helping people know where they are. Cultural
27 constituents can strengthen people's cognition of local history and cultural
28 characteristics, helping to form easily recognizable labels like “Manchu Village,”
29 “Russian Village,” and “Century Fishing Village.” In addition, natural and cultural
30 morphological constituents offer two types of aesthetic experiences. One is the
31 creation of nature and the other is that of humans. Both can inspire people's
32 appreciation and love for a place. Therefore, characteristics of the living environment
33 in both natural and cultural aspects can enhance people's place identity.

34 **(2) Productive and Functional Constituents: Constructing the Scenes of** 35 **Local Life**

36 In contrast, villagers' perceptions of productive and functional morphological
37 constituents, as well as their impacts on the construction of place identity, are both
38 implicit. These constituents were rarely mentioned independently in the interviews,

and the relevant comments are almost mixed with descriptions of people's daily lives. The emotions caused by these constituents are not always expressed but are contained in the corresponding habits of life. Nonetheless, the aggregation of the same kind of constituents, and their combination with other types, can enhance people's perception of the functional constituents. For instance, villagers are more impressed with the main streets, which connect the community centers, squares, and several shops. And compared to the ordinary streets, they appreciate the Russian Commercial Street or the walkways on the riverside more.

5.3 Comprehensive Theoretical Framework

According to the above analysis, village morphology can be incorporated into the framework of the construction of place identity (Figure 5) and it is to some extent a necessary component. Both village morphology and place identity are formed in the long-term interactions between people and places. Morphological features are the direct expressions of differences between a place and others. For people, village morphology includes the space, landscape, and environment that they perceive and give meanings to, which have crucial influences on one's cognition, emotion, and evaluation of that place. In general terms, morphological constituents with local characteristics can help construct a unique image of a place and enhance people's place identity.

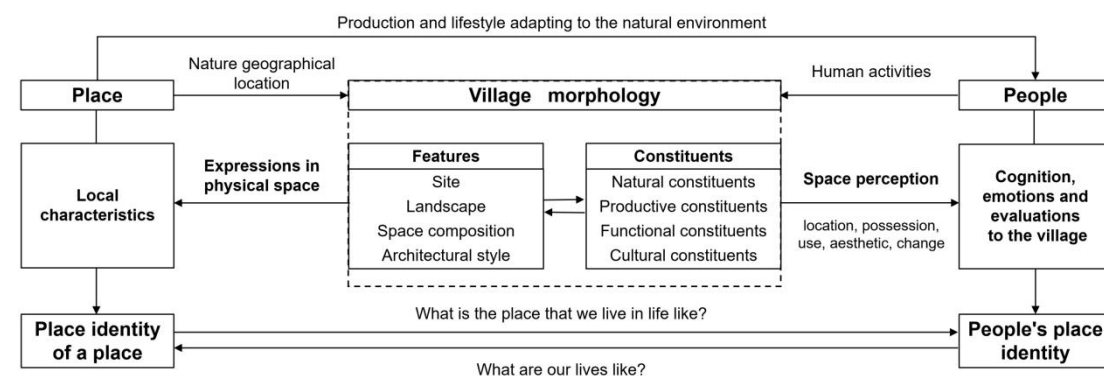


Figure 5: Construction of place identity including village morphology

If we replace village morphology with city morphology, the framework remains practicable. This study focuses on rural areas for the following reasons:

1) The construction of cities demonstrates humans' power to transform nature; village morphology, on the other hand, is a combination of natural and built environments that can reveal the framework of people-place interactions more completely.

2) Under the background of rapid urbanization and modernization, China's rural areas are undergoing a drastic change. The people-place system that used to be stable is being shaken; therefore, there is an urgent need for research and planning interventions from a perspective of "place".

6. Discussion

6.1 Identity Crisis in Changes

For thousands of years, China's villages have been self-sufficient, self-built, and self-governing, thereby forming a relatively closed system. People-place interactions in rural area are extremely stable and can be summarized within the above framework. However, under the pressure of external forces such as urbanization, modernization, and globalization, the rural system has gradually become more open and susceptible to external influences. With the changes in local production modes and lifestyles, increases in population mobility, and the convergence of the living environment, an identity crisis has emerged.

According to the statuses of the villages in the Aihui area along the Heilongjiang River, people performed positively in the cognition and emotion dimensions of place identity. Whether they still live in the villages or not, they all considered themselves to be the natives and indicated that they regard the village as their homeland. They love living there. Many people believe that they would miss their villages if they were to leave.

However, the interviewees performed quite differently in the evaluation dimension, especially between the youth and the elderly. The elderly have lived through hard years and they know little about the outside world. Even if there is only one store in some villages and no sports squares or activity rooms, they believe that the village can satisfy all their daily needs. On the contrary, younger people think that the development of their villages does not meet all their needs and they leave for the towns or cities more frequently. Most interviewees do not have the intention of moving away but they express anxieties about the decreasing population of the next generation; some even believe that there will not be anyone living there after 15 years. The permanent populations of many villages are less than half of the registered populations. Most of the people living here are middle-aged or elderly (over 45 years old), which makes them worry about the future development of their villages.

Perceptions and positive evaluations of the changes in the space and environment can help alleviate these worries. Most villagers regard the changes in recent years as satisfactory; the renovations of houses and additions of facilities have not only improved their living environments but also reflect some of the ethnic and cultural characteristics of their villages. However, in the long run, they believe that only increased jobs and opportunities would help retain the youth.

6.2 Planning Response

In China, urban and rural planning takes spatial planning as the main content, which has a considerable influence on space morphology. Through this research, it is clear that village morphology plays an important role in the construction of place identity. Consequently, in view of the diversities of human settlements and people's

1 life happiness, rural planning programs should in future switch the focus of its objects
2 and outcomes from “space” to “place”. The local characteristics of village
3 morphology should be retained and strengthened. As most changes in village
4 morphology are irreversible, rural construction should receive more planning
5 intervention and support. If possible, on the basis of sufficient investigations and
6 research, planners should put forward a catalog of morphological constituents that
7 reflect the local characteristics as a guiding manual for local construction processes.
8 According to the above framework, these constituents should be extracted from a
9 full-scale morphological analysis, and the spatial perceptions of the locals should also
10 be taken into consideration. Furthermore, planning should help these places adapt to
11 the various changes brought about by modern development and better mediate them to
12 the space morphology so as to optimize the living environment and promote local
13 development.

14 Consider the villages in the Aihui area as an example. Although measures such as
15 the New Rural Construction and the village improvement movement did make
16 short-term achievements, they never solved the core issues of local development.
17 Because these measures directly acted on the space morphology. The main actions
18 were building community centers and sports squares consistently and using symbolic
19 decorations to beautify the streetlights and fences. However, the addition of functional
20 constituents disregarded the real needs of villagers; they wanted a ground for drying
21 grain instead of a sports square. In the meantime, standardized constructions
22 destroyed the locality. Exterior decorations strengthened the villagers' cognition of
23 local characteristics, but the sense of identity in the cognition dimension could not
24 reverse the alienation between the people and the village. The sustainable
25 development of villages requires a more complete industry system as well as facilities
26 and public services of higher quality. Planning should deal with the relationship
27 between these issues and the locality (Wang, Li, & Prominski, 2014).

28 Rural tourism, as the villages in the Aihui area have demonstrated, seems to be a
29 feasible initiative. Tourism not only promotes local construction but also encourages
30 people to maintain and strengthen local characteristics. In addition, it can create job
31 opportunities and increase villagers' incomes. But not all the villages are suitable for
32 developing tourism industry and market rules are not able to support extensive
33 development everywhere. Further, it is another problem that how to keep balance
34 between the “place” that tourists want and the “place” that villagers want (Wang,
35 Huang, & Yu, 2009; Hu & Bai, 2015). Excessively catering to tourists may damage
36 the authenticity of a place, but preserving too much may be detrimental to making a
37 profit.

38 7. Conclusion

39 The intention of this paper is to show that the space morphology of a place is
40 shaped by both the natural geographical environments and local residents in a

continuous long-term interaction. The construction of place identity is also a part of this mutual and dynamic process (Ramos, Bernardo, Ribeiro, & Van Eetvelde, 2016). In rural areas, planning should consider the natural environment to a greater degree, as it plays an essential role in the locality and place identity.

Through an analysis of the villages in the Aihui area, the plight of local developments and the shortcomings in current construction projects is made clear in this comprehensive framework. Space morphology is the expression of locality in the physical environment and it influences the construction of place identity in various ways, including being attached to one's memory and emotion, marking and describing the location, meeting the needs of space use in people's daily lives, and strengthening local characteristics of history and culture. However, the identity crises of the locals are mainly derived from anxieties about future developments. Retaining the constituents attached to memories or strengthening local characteristics with exterior decorations does not enhance peoples' confidence in their villages. Planning processes should deal with the relationship between locality maintenance and development and seek a path to modernization with local characteristics. Changes in space morphology should be the result instead of the precursor.

There are still many deficiencies in the data collection and analysis methods used in this research, and the above conclusions are only summaries of what is currently occurring in villages along the Heilongjiang River in the Aihui District. Under the influence of the Heilongjiang River, the Aihui area is a very special location with distinct local characteristics, making it an ideal research site. So more extensive research is needed to verify whether the conclusions are universal. In addition, this research only discussed the construction of the place identity in villages and did not deeply consider the influences of towns and cities at a higher level. It is also a significant problem that the strengthening of place identity should be conducted at various scales and levels, which is a matter deserving of further research and discussion.

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12 **Data Availability Statement:**

13 The data used in this research were derived from the following resources
14 available in the public domain:

15 <https://www.webmap.cn/commres.do?method=result25W>

16 <http://www.resdc.cn/data.aspx?DATAID=335>

17 <http://www.gscloud.cn/search>

18 The analyzed interview texts were collected by the authors in a field survey.