

Article

Developing a Holistic Approach for Constructing Rural Living Circles in the Loess Plateau—Taking Yongning Village as an Example

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Abstract: Insufficient public service facilities in rural areas, which leads to failures in meeting the needs of villagers, has become a significant barrier to the high-quality development of rural regions. This issue is particularly acute in the Loess Plateau area, where the complex topography leads to scattered and independent village layouts, making it challenging to allocate service facilities based simply on distance and population. Aiming to arrange public service facilities efficiently and intensively from a “bottom-up” approach, this study, from the perspective of living circles, attempts to summarize the current usage and needs of villagers at the “village–town–county” levels, as well as to seek strategies for facility allocation in villages. This provides a scientific basis for optimizing the configuration of service facilities in the Loess Plateau area. Through field surveys based on questionnaires and interviews with over 60 households and more than 100 villagers, this study authentically reproduces a picture of their daily lives and summarizes their needs for well-configured services and facilities. The findings of this study include the following: (1) The village domain serves as a space of daily production and living for villagers, necessitating facilities for everyday purchases, activities, and elderly care; the town domain supplements the daily production and living needs of villagers, with a higher demand for production materials; the county domain, integrating urban and rural spaces, provides higher-level medical, educational, and other service facilities. (2) Within the village domain, villagers’ demands for facilities lean towards miniaturization and integration. With the increasingly aging population, the demand for elderly care and health facilities is becoming more urgent. Facilities such as activity rooms, fitness equipment, and stores with a wide range of products at reasonable prices can effectively improve levels of convenience and happiness in villagers’ lives. This study summarizes, from a “bottom-up” approach, the villagers’ facility layout needs within the rural living circle, providing a scientific basis for establishing a human-centered rural living circle and enhancing the quality of rural living environments.

Keywords: rural living circle; public service facilities; mountainous countryside; Loess Plateau



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1. Introduction

Since the 1990s, the annual migration of over ten million individuals from rural to urban areas has become the primary mode of urbanization in China. This significant demographic shift has led to a reduction in the size of villages and a decrease in the sustainability and accessibility of rural service facilities [1,2]. The geographic remoteness of villages and their low population density pose substantial challenges to the provision of high-quality

and accessible service facilities [3,4]. This severe “hollowing out” phenomenon in rural China has resulted in the inadequate layout of public basic service facilities, leading to failures in meeting the evolving demographic characteristics of the rural populace [5]. Therefore, optimizing rural settlement spaces has emerged as a pivotal task in rural development [6,7]. The Loess Plateau region, characterized by its complex terrain, rugged roads, and dispersed residential architecture, demands higher travel costs for villagers, necessitating increased investments in transportation, medical facilities, and public services [8]. In the context of the Loess Plateau, facility configurations are heavily reliant on administrative hierarchies for centralized planning, leading to a distinct stratification of service availability. This stratification often results in villagers’ passive utilization of facilities, which, in turn, shapes their travel patterns into a clear hierarchical structure. By integrating the concept of daily living circles into rural planning, there is the potential to significantly enhance rural inhabitants’ satisfaction with their living conditions. This approach could also contribute to the sustainable management of rural resettlement [9].

The differential development of villages is influenced by a complex interplay of population dynamics, socio-economic factors, and geographical conditions [10]. The Loess Plateau, which accounts for 6.67% of China’s land area, is a vast, arid zone located inland. Its largest proportion is made up of the Loess hills and ravines, which represent the most complex terrain within the region; these topographical constraints severely impact the development of rural habitation environments [11]. The complexity of the terrain makes traditional GIS-based methods, such as Thiessen polygons and buffer zones, inadequate for capturing the spatial characteristics of the area. Consequently, facility configurations based on uniform population standards can lead to resource wastage.

This study adopted the village as the smallest unit of habitation, combining real planning cases to restore villagers’ real-life scenarios from a “bottom-up” perspective through surveys and interviews. In summarizing the characteristics of facility utilization, we aimed to match rural living circles with villagers’ needs, thereby providing a scientific basis for and enhancing the quality of rural living environments.

2. Literature Review

In investigating the optimization of rural service facility configurations, this research draws upon and is underpinned by a broad spectrum of related studies. These include the following: (1) studies on existing development strategies for rural areas: the strategies formulated by the international community for the future development of rural areas, as well as the focal points of local governments and planners, provide valuable references for this study; (2) the grading of rural living circles and facility needs at various levels: research into the classification of living circles and the determination of facility needs at each level offers important insights for this study; and (3) methods for configuring rural service facilities: relevant research, and the associated methodologies, data, and conclusions, provide significant support for this study.

2.1. Strategies for Rural Development

In addressing the challenges of rural development, various countries have formulated a series of strategies tailored to their specific national conditions. Since the 20th century, many developed nations have been exploring countermeasures to improve the declining trajectory of rural life. For instance, the United States has implemented the “New Town Development”; the United Kingdom has pursued “Targeted Resettlement” strategies; Germany has focused on village renewal; Japan initiated the “Creation Movement”; and South Korea launched the “New Village Movement” [12]. Since 1974, Japan, against a backdrop of rural decline and population hollowing, has utilized specific population sizes and distances to delineate living circles [13], establishing four main levels of living circles: “national-wide-prefectural-municipal”, achieving linkage and interconnectivity between levels through “compactification and gridization” [14]. Similar to living circles in terms of

both concept and development pace are the “20-Minute Neighborhoods” and “15-Minute Cities”, both of which aim to adjust urban–rural relations and invigorate rural vitality [15].

China’s rural development has been notably imbalanced, with significant disparities in income, infrastructure construction, medical care, and social security [16–18]. Following the enactment of the “Urban and Rural Planning Law” in 2008, China has gradually shifted from urban planning to integrated urban–rural planning [19], favoring a unified approach to spatial layout and facility configuration. The “Rural Revitalization Strategy Plan (2018–2022)” classifies rural areas for agglomeration and upgrading, urban–suburban integration, characteristic protection, and relocation and consolidation, offering development suggestions and service facility configuration strategies for different types of rural areas at the national level [20]. Research topics related to service facility configuration include the coordination mechanism between rural spatial governance subjects and participating communities [21,22]; methods to adjust the spatial hierarchy of villages and towns using economic, technological, and policy means [23]; strategies for rural classification based on location, population, land, economy, industry, etc.; providing a theoretical foundation for planning and design [24,25]; planning models for rural facilities from the perspective of rural tourism development [26]; methods for assessing rural development potential [27], planning strategies for rural complexes [28]; development strategies for “livable and workable” rural areas led by the e-commerce industry under the “digital village” initiative [29]; explorations into development models that promote service facility and industry synergies, sharing, and co-construction between villages [30]; and methods for reconstructing public cultural spaces in rural areas [31].

2.2. Construction Methods for Rural Living Circles

Research on living circles has predominantly focused on urban communities, addressing measurements of urban living circles [32,33], facility configuration methods [34–36], and residents’ behavioral characteristics [37,38]. In December 2021, the “Shanghai Rural Community Living Circle Planning Guidelines (Trial)” were published, prompting the academic community to gradually engage in discussions about rural living circles. The primary focus of existing research on rural living circles includes the grading of rural community living circles and the construction methods for daily rural living circles.

Most studies have concentrated on plain areas, attempting to improve the existing dispersed and isolated states of villages through the establishment of layers and grid-based management systems, thereby enhancing the convenience of overall spatial resource allocation. Some research integrates the suitability of rural settlements with weighted Voronoi diagrams, determining primary, general, extended, and cross-regional daily living circles based on frequency, self-rated importance, and activity ratios [39]. Based on different population travel times, rural living circles have been classified into basic living circles (approximately 1 km), first-level living circles (approximately 4 km), second-level living circles (6–8 km), and third-level living circles (15–30 km), with facility configuration recommendations proposed for each level [40]. According to travel practices with different transportation modes, rural community service levels are divided into basic living circles, 30 min walking share circles, 15 min driving share circles, 30 min driving share circles, and 1 h driving share circles [41]. Employing smart shrinkage theory, the living circle levels are categorized into advanced living circles (county level), daily living circles (town level), and primary living circles (central village, general village), combining rigidity and flexibility to propose configuration requirements for various types of facilities [42]. Rural living circles have been delineated as “town-center village–general village”, summarizing the essence of shrinkage and suggesting pathways for active adjustments in ecological community-coupled development, living space category integration, and the intensification of public resources [43].

Research on living circles in the Loess Plateau region and mountainous villages is relatively scarce. Studies integrating “living circle” theory with the requirements of ecological civilization construction have delineated rural living circles coupled with “facility

units” and “watershed units”, proposing a three-tier living circle configuration strategy of “primary living circle–secondary living circle–comprehensive living circle” [44]. Additionally, other related themes include the composition model of “production–living–ecology” spaces [45], sustainable zoning methods, and development strategies for human settlements from a watershed perspective [46,47], as well as studies on the characteristics of residential distribution [48]; all of these provide references for the delineation of living circles in the Loess Plateau area.

2.3. Methods for Configuring Rural Service Facilities

Researchers have classified villages from various analytical perspectives to propose planning suggestions for future land use, industrial structures, and public service support. Studies adopting a lifecycle perspective classify villages by growth type (GT), maturity, prosperity transformations, temporary regressions, and decline phases, offering facility configuration recommendations accordingly [6]. Similarly, from a socio-ecological viewpoint, villages have been categorized, based on rural development potential and ecosystem resilience, into relocation and consolidation, aggregation and upgrading, key development, and stabilization and improvement, in order to pursue more targeted resource and facility configuration [49,50]. Detailed investigations into the daily living circles of village domains have explored the alignment between walking and driving circles of the elderly and facility layouts [51], focusing on the preferences of different demographic groups, such as children, women, and the elderly, including according to socio-economic status and ethnicity, to explore the matching of supply and demand for public service facilities [52]. The Tyson polygon village-siting model and village development potential evaluation techniques have been employed for village layout planning, proposing a living circle perspective-based village layout planning method [53]. Concentration and sharing degrees are key indicators for measuring and optimizing public service facilities within community living circles [54]. The complementary relationship between community-assisted “co-assistance” places and public service facilities has been studied [55] from a human geography relationship perspective, investigating the impact of population mobility and geographical space on public service facilities and proposing optimization strategies [56]. Other studies have focused on the importance of and construction strategies for cultural facilities [57]. These studies provide references for configuring rural service facility strategies in different regions.

In summary, rural living circles serve as the basic unit linking urban and rural areas. Under the backdrop of rapid urbanization, equalizing facility distribution based on the living circle model is the future development trend of international and domestic research. It is also a reliable path for China to promote people-centered new urbanization. Existing research has comprehensively covered planning strategies for rural areas, living circle layer division, rural classification, and village service facility configuration models. However, most studies are based on macro-scale planning and primarily focus on the eastern coastal regions of China, where villages are concentrated and the economic development base is stronger. There is a scarcity of research on service facility configuration strategies for mountainous villages, and existing surveys often rely on objective data analysis and planners’ rational judgments, and thus lack micro, detailed observations and provide insufficient data regarding villagers’ subjective desires. This article, based on practical planning cases and field research, questionnaires, and interviews, summarizes the existing problems in service facility configurations in relation to villagers’ demands. By painting a real-life picture of villagers and their future living aspirations, it reflects the construction model of the rural basic living circle that villagers truly anticipate, thus providing important references for future planning.

3. Materials and Methods

3.1. Research Area

Yongning Village, situated at an elevation of approximately 900 m (Figure 1), is a typical Loess Plateau gully region plateau-type village. According to the “Fourteenth

Five-Year Plan of Yichuan County” [58] and the “2023 Government Work Report of Yichuan County” [59], as well as the “Rural Revitalization Strategic Plan of Yichuan County” (an unpublished document), the following information is worth noting: (1) within the county, there are 559 natural villages, of which 393 are plateau-type natural villages, accounting for 70.30%. (2) Based on the “Rural Revitalization Strategy (2018–2022)” [20], 84.57% of villages are classified into aggregation and upgrading type. Of these, Yongning Village has been selected by the county government as one of the first batch of model villages, aiming to improve the settlement rate of villagers by enhancing facility configurations and ultimately addressing issues of hollowing out and population aging. (3) The total population of the county is 120,000, with an agricultural population of 85,000, of which the aging rate is 28.9%. Yongning Village has a household registration aging rate of 27.74%—slightly below the average—but a concerning permanent population aging rate of 40.89%. (4) The county’s economy is predominantly agricultural, with most villages, including Yongning, relying on fruit farming as the predominant industry. Given the village’s characteristic topography, demographic composition, and industrial structure, the conclusions of this study hold significant reference value for villages in the Loess Plateau region.

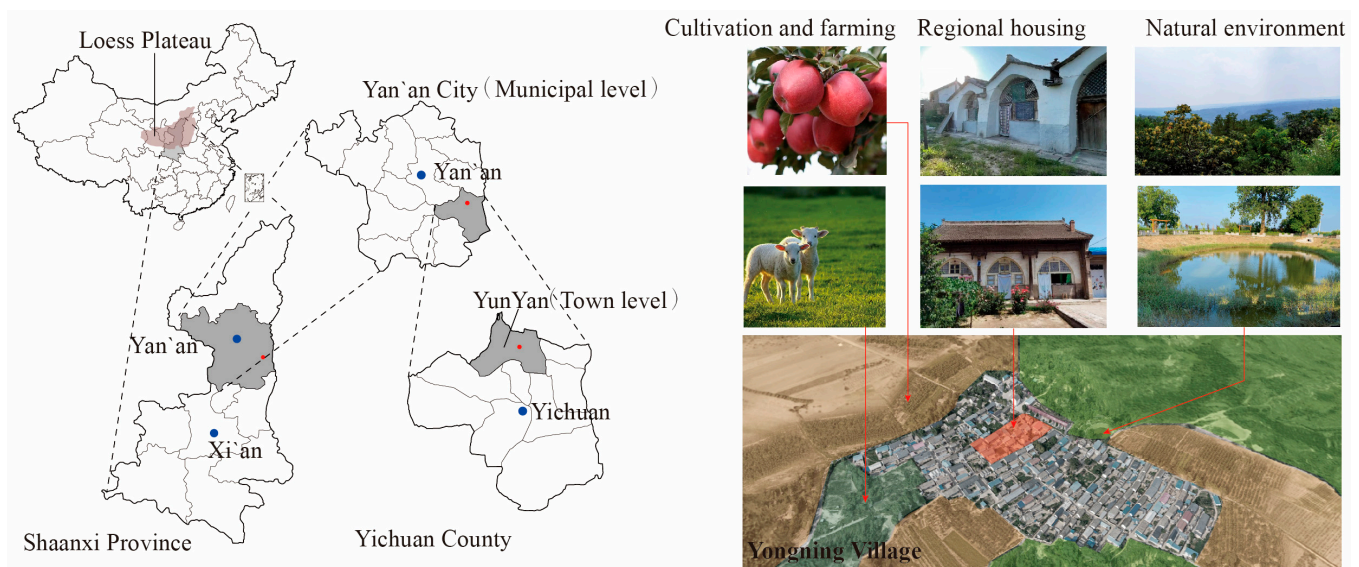


Figure 1. Location map of the study area.

Yongning Village covers an area of 6.64 km². The initial layout of the village was established during the Ming Dynasty, and it currently has 132 residential courtyards. Historical buildings, such as the Guandi Temple and the opera stage, were constructed in the thirty-first year of Guangxu (1905), marking over a century of history. The village has 212 households registered with 536 individuals and a permanent population of 313 across 153 households, including 128 individuals over the age of 60 (the standard retirement age in China). According to the village committee’s 2021 annual report (unpublished), the per capita net income was RMB 8000 (approximately USD 1120), with agriculture (specifically apple cultivation and sales) being the dominant industry, and many families relying on income from migrant work.

3.2. Data Collection

The research methodology for this study is depicted in Figure 2, and encompasses the following steps:

- (1) Extraction of planning information at higher levels: (a) obtain county and township “Fourteenth Five-Year Plan” documents from local government sources to clarify the characteristics and classification of villages within the area; (b) summarize current lo-

- cal policies targeting rural development; acquire relevant information about Yongning Village (village area, registered population, historical overview, etc.).
- (2) Surveys and interviews with villagers (for detailed information on the questionnaire, please refer to Supplementary Materials): the research team distributed 102 questionnaires over 5 days in November 2023, retrieving 97 valid responses and conducting interviews with 60 households. Information was collected on four main aspects: (a) basic information (age, family composition, land ownership, and possession of transportation means); (b) health conditions (prevalence of chronic diseases among the elderly and expected modes of elderly care); (c) utilization of daily facilities (frequency of outings and facility usage, dissatisfaction with current facilities within the village domain, and future facility needs); and (d) utilization of medical facilities.
 - (3) Geographic information data: acquire the third national land survey data and high-precision DEM (digital elevation model) data for typical villages from the Yichuan County Land Department, in preparation for the analysis of villagers' travel accessibility.

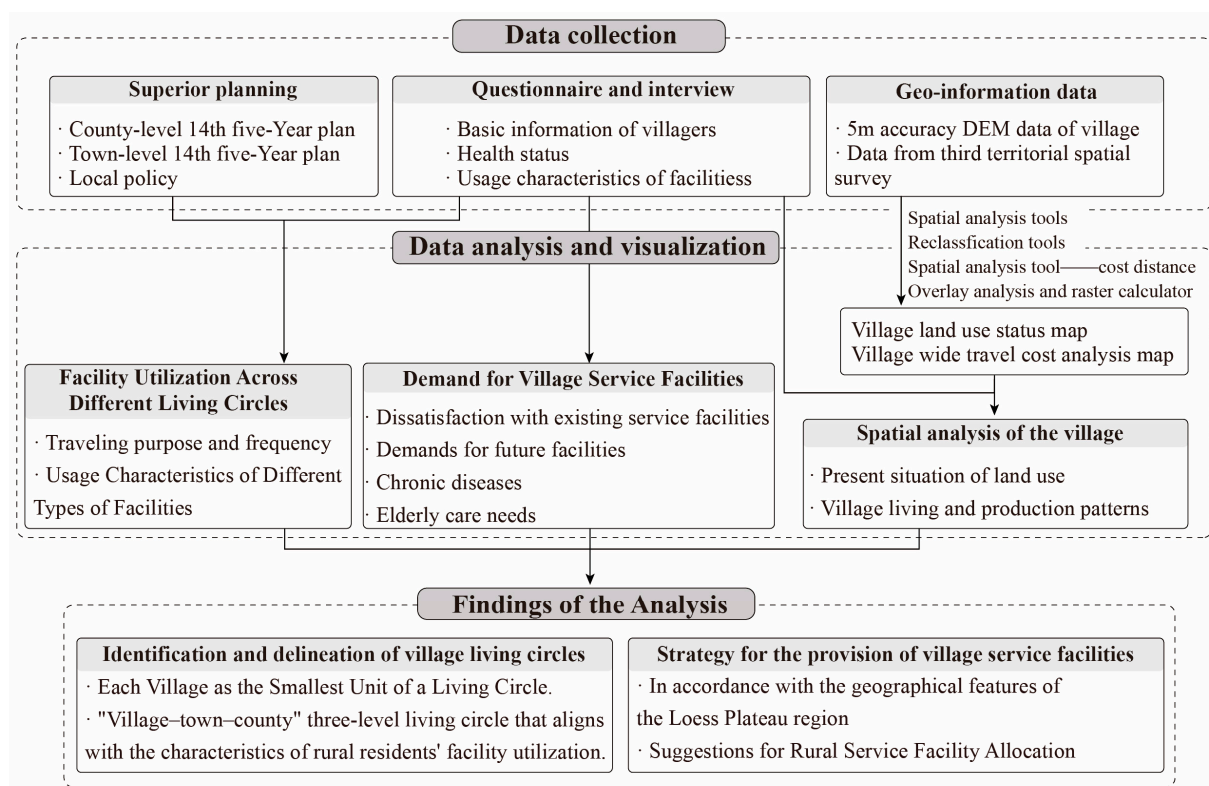


Figure 2. Methodological framework.

This structured approach combines top-down planning information extraction with bottom-up empirical data collection, including detailed surveys and interviews with villagers, complemented by geographic information system (GIS) data analysis. This methodology ensures a comprehensive understanding of the current state and future needs of rural service facility configurations, providing valuable insights for the enhancement of living standards in Yongning Village and similar locales within the Loess Plateau region.

3.3. Data Analysis and Visualization

To comprehensively analyze and articulate the results of the questionnaires and interviews, the study employed mathematical statistics and graphic visualization techniques. Additionally, an accessibility analysis within the village domain was conducted to visualize the ease of travel between rural residents' production and living spaces. The methodology involved the following steps:

- (1) Deep analysis and expression of survey and interview results: utilizing mathematical statistics to interpret the data; applying graphic visualization methods to present the findings in an accessible and understandable manner.
- (2) Accessibility analysis within the village domain.

To visualize the accessibility of production and living spaces for rural residents, raster cost distance analysis was performed on the ArcGIS platform [60]. The steps taken were as follows: (i) slope information was extracted using ArcGIS's 3D Analysis tool and 5 m resolution DEM data; (ii) the neighborhood analysis function within ArcGIS's spatial analysis tools was applied to calculate terrain ruggedness; (iii) combining land use data, the analytic hierarchy process (AHP) and expert scoring methods were used to quantify the ease of passage, a comprehensive dataset of terrain and land use costs was established, and slope and terrain ruggedness were reclassified; (iv) by conducting a comprehensive assessment and weighted overlay analysis of the passage costs for three types of raster data, a map of the passage costs per grid within the village domain was created. This effectively mapped the ease of passage across the surface space.

4. Result

This section visualizes the results of the questionnaire and interview surveys, reflecting the daily production and living patterns of villagers and providing references for the future selection of service facility locations and the division of living circle levels. Investigation into population information and facility demands revealed the subjective wishes and real needs of villagers, offering data support for the types and scales of village service facilities. Medical facility usage, and the utilization of facilities at different levels, reflect the villagers' demands within various layers of the rural living circle.

4.1. Spatial Analysis of Villages

Based on the third national land survey data, contemporary land use types are primarily categorized into residential land, public service facility land, farmland, and forestland. As per the statistics from the village committee at the end of 2021, villagers primarily derive their income from primary industries, with additional income sources including labor migration and the picking and selling of medicinal herbs. There are 896 mu (approximately 0.6 km²) of orchards, with apple cultivation and sales typically conducted on a household basis. The survey found that 15% of households do not own land, often consisting of elderly families unable to continue agricultural labor (Figure 3). Regarding transportation, 80% of villagers own tricycles, and 16% have cars (Figure 4). Tricycles are not only the main mode of transportation for villagers traveling to and from orchards, but also an important means of transporting goods to the town center. In the Loess Plateau region, tricycles are favored by villagers for their economy and safety.

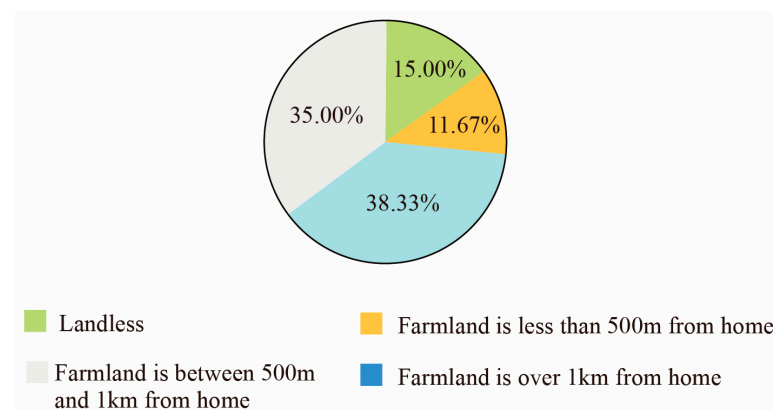


Figure 3. Farmland ownership status.

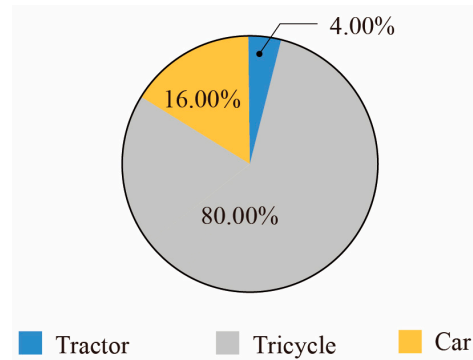


Figure 4. Vehicle ownership status.

Using the ArcGIS platform, the study applied raster cost distance analysis to assess the accessibility between production spaces (farmlands and orchards) and living spaces (residential areas of the village). Figure 5a displays the basic pattern of land use in Yongning Village and the relationship between agricultural activities and the natural environment. It is evident from the figure that orchards and cultivated lands, as the main production spaces, surround the village, with residential areas concentrated in the village's central region. Figure 5b shows the travel costs for Yongning Village residents, indicating good accessibility from living spaces to production spaces, facilitated by tricycles. Conversely, daily travel between villages poses greater difficulties. Figure 5c further details the range of villagers' living and production activities. Living activities are mainly concentrated in the village center and are predominantly pedestrian, suggesting that villagers' daily social and service needs are relatively centralized, allowing for a concentrated layout of facilities.

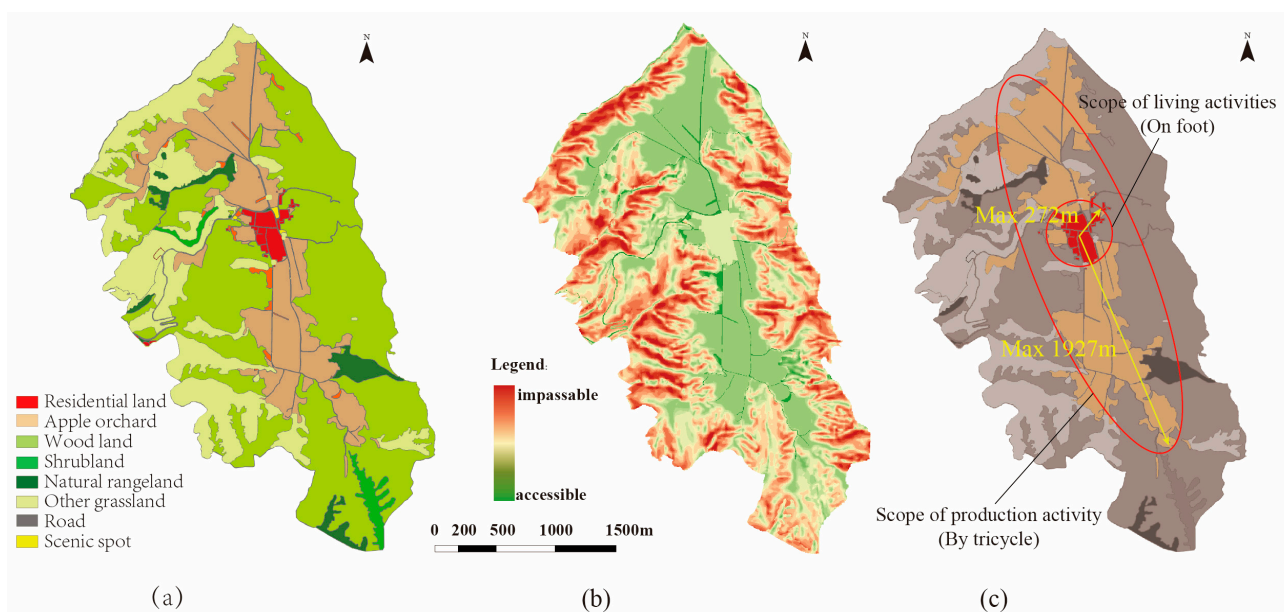


Figure 5. Analysis of land use types and travel costs in village: (a) land use type; (b) village-wide travel cost; and (c) analysis of village activities.

4.2. Basic Information on Villagers

Household living types are categorized into solitary individuals, couple-only households, and two-generation cohabiting families. Figure 6 uses the age of the eldest family member as the vertical axis to statistically represent family structures. It was found that the long-term solitary living population accounted for 20% of the surveyed families, with individuals aged 60 and above constituting 75% of this group. This demographic has a higher need for public assistance in areas such as agricultural labor, diseases, and diet. Ad-

ditionally, families living as couples make up 45% of the participants, while two-generation cohabiting families account for 35%. Families with two generations living together tend to prefer aging at home, showing a passive attitude towards the establishment of elderly care facilities within the village. Figure 7 provides a statistical overview of chronic diseases among 90 individuals aged 60 and above from 60 families. Nearly half of the villagers do not suffer from chronic diseases, while the remaining population primarily suffers from hypertension, joint pain, cerebral infarction, and pulmonary diseases, in descending order of prevalence. For the elderly, hypertension, pneumonia, and diabetes are common and serious health concerns.

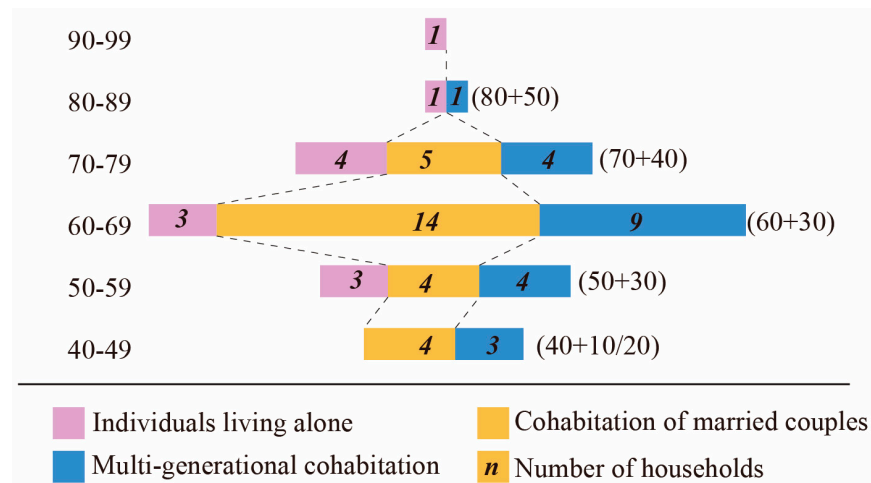


Figure 6. Household living patterns.

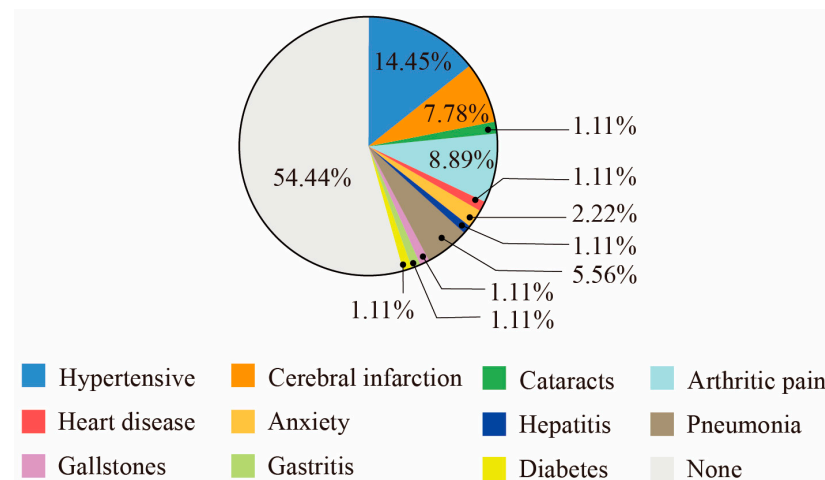


Figure 7. Prevalence of chronic diseases in the elderly.

Although some families have a passive attitude towards elderly care and nursing facilities within the village, for those living alone, especially those with chronic diseases, there is a high dependency on the village's medical and elderly care facilities.

4.3. Village Facility Needs

The existing basic service facilities within the village include a medical room (for regular check-ups only), convenience stores, outdoor fitness equipment, a senior activity room, and a library. The questionnaire results regarding villagers' dissatisfaction with and demands for the current facility configuration within the village domain are summarized in Figures 8 and 9.

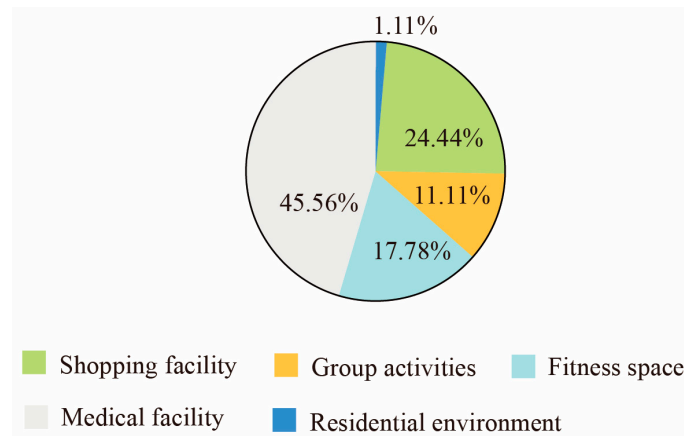


Figure 8. Dissatisfaction with the current state of facilities.

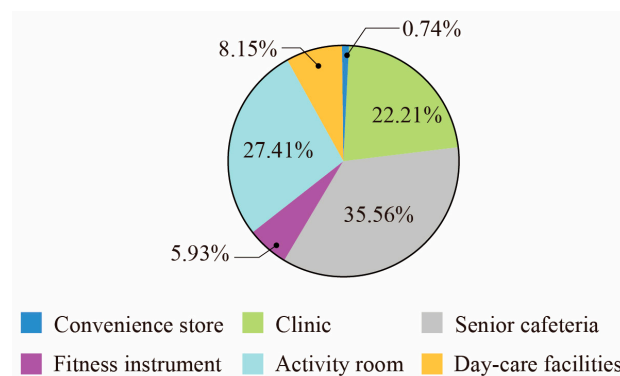


Figure 9. Facility requirements.

From these two analytical figures, the following can be concluded:

- (1) In total, 45.56% of the villagers are dissatisfied with the medical facilities in the village domain. Although there is a health room set up in the village, it only serves for regular volunteer medical consultations and nucleic acid testing, and cannot meet the daily needs for medical consultations and medication purchases. Therefore, 22.21% of the residents wish to establish small clinics within the village, but most villagers believe that the living and working conditions in the countryside are not sufficient to retain doctors for long-term work. They would prefer the sale of commonly used medications instead.
- (2) In total, 24.44% of the villagers are dissatisfied with the current shopping conditions. There are only two small convenience stores in the village, with a limited product range and higher prices than the supermarkets in the town center. Some residents choose to shop in Yunyan Town for more economical daily necessities.
- (3) Some villagers feel that the indoor activity spaces are limited, lacking outdoor fitness equipment and indoor leisure and entertainment spaces; they look forward to more group activities.
- (4) In total, 35.56% of the villagers expressed the need for a senior restaurant, considering the inconvenience of cooking while ill or in old age, and some villagers also hope to dine in the restaurant during busy farming periods to save time. In addition, 8.15% of the villagers believe that daytime care and other elderly care facilities are very necessary.

Hence, the issues that can be resolved through spatial planning include establishing senior restaurants, activity rooms, pharmacies, daytime care institutions, fitness facilities, and shops with a complete range of products and reasonable prices.

4.4. Utilization Characteristics of Medical Facilities by Villagers

The spatial distribution of medical facilities affects effective user behavior and demand, which is key in implementing the equalization of basic public services from a spatial perspective [61]. The reason for individually listing and analyzing medical facilities is that they are utilized by all age groups, and the distribution of medical facilities directly affects the hierarchical division of villagers' living circles. The frequency of use of medical facilities by villagers is divided into six levels, where 0 represents almost no use, 1 represents rare use, 2 represents occasional use, 3 represents frequent use, 4 represents regular use, and 5 represents constant use. The size of the circle represents the number of people choosing that score. Orange lines represent the average score obtained by the facility, while purple lines indicate the variance in the scores for the facility, with a smaller variance indicating more concentrated scoring (Figure 10). Among them, Yunyan Town is the town to which Yongning Village administratively belongs, while Lin Town is a town close to Yongning Village.

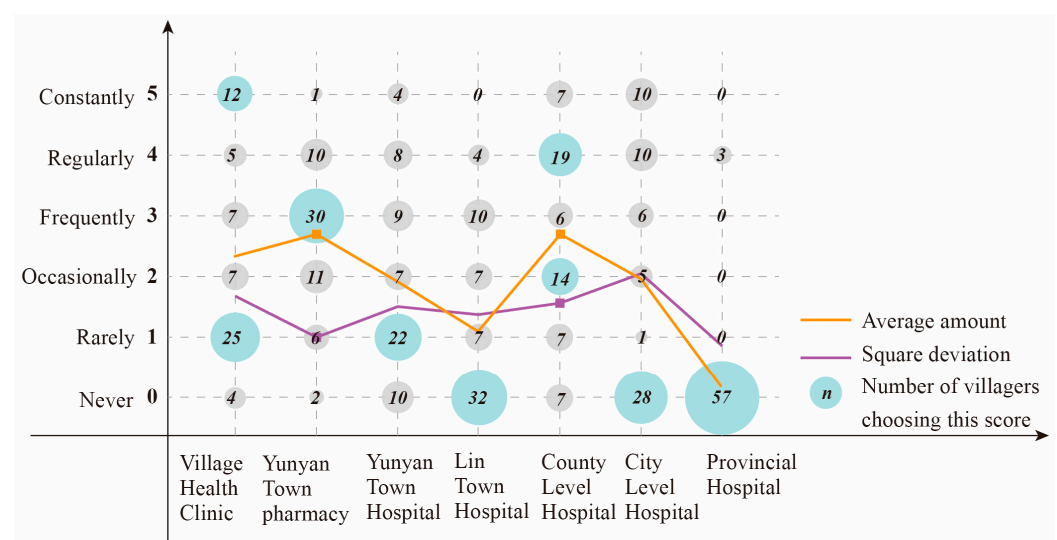


Figure 10. Characteristics of villagers' use of medical facilities.

The results show that the frequency of use and the small variance of drugstores in the town domain, and of hospitals at the county level, are relatively important facilities for most villagers. Based on the interview results, for common diseases that can be treated with over-the-counter medication, villagers tend to go to drugstores in Yunyan Town. However, for diseases requiring a doctor's diagnosis, villagers often choose to visit the higher-level comprehensive hospitals in the county. In the event of more serious illnesses, villagers will utilize city-level or provincial-level medical facilities.

4.5. Villagers' Utilization of Facilities at All Levels

Villagers' daily travel can be categorized into productive travel and living travel, where productive travel includes field labor, purchasing production materials (agricultural tools, fertilizers, pesticides, etc.), selling agricultural products, and seeking agricultural technology services; living travel includes buying daily necessities, seeking medical treatment and medication, visiting relatives and friends, etc. [62]. Through the villagers' responses to the questionnaire, we interpreted the villagers' use of service facilities at different levels, attempting to understand the demands of villagers in terms of service facilities at different layers and from the perspective of living circles (Figure 11).

According to the questionnaire and interview results, as the living circle expands, the frequency of villagers' travel gradually decreases. In total, 11.67% of villagers rely on online shopping and delivery services, and their daily needs can be met through existing facilities within the village and through online shopping, almost eliminating the need to

leave the village. Town-level facilities provide villagers with essential living materials and agricultural necessities, such as seeds and pesticides, as well as medical and entertainment services. Villagers' frequency of travel to Yichuan County is lower, and is mainly for the purpose of using facilities such as comprehensive hospitals and large shopping centers. Moreover, although the town domain also has primary and secondary schools, a significant number of children still choose to attend county schools with higher teaching standards. The purposes of villagers' traveling to the city center and provincial capital cities are predominantly for visiting relatives and for seeking medical treatment, which are not daily needs. Therefore, in constructing rural living circles, the county domain can be considered as the largest circle, building a "village–town–county" three-level system.

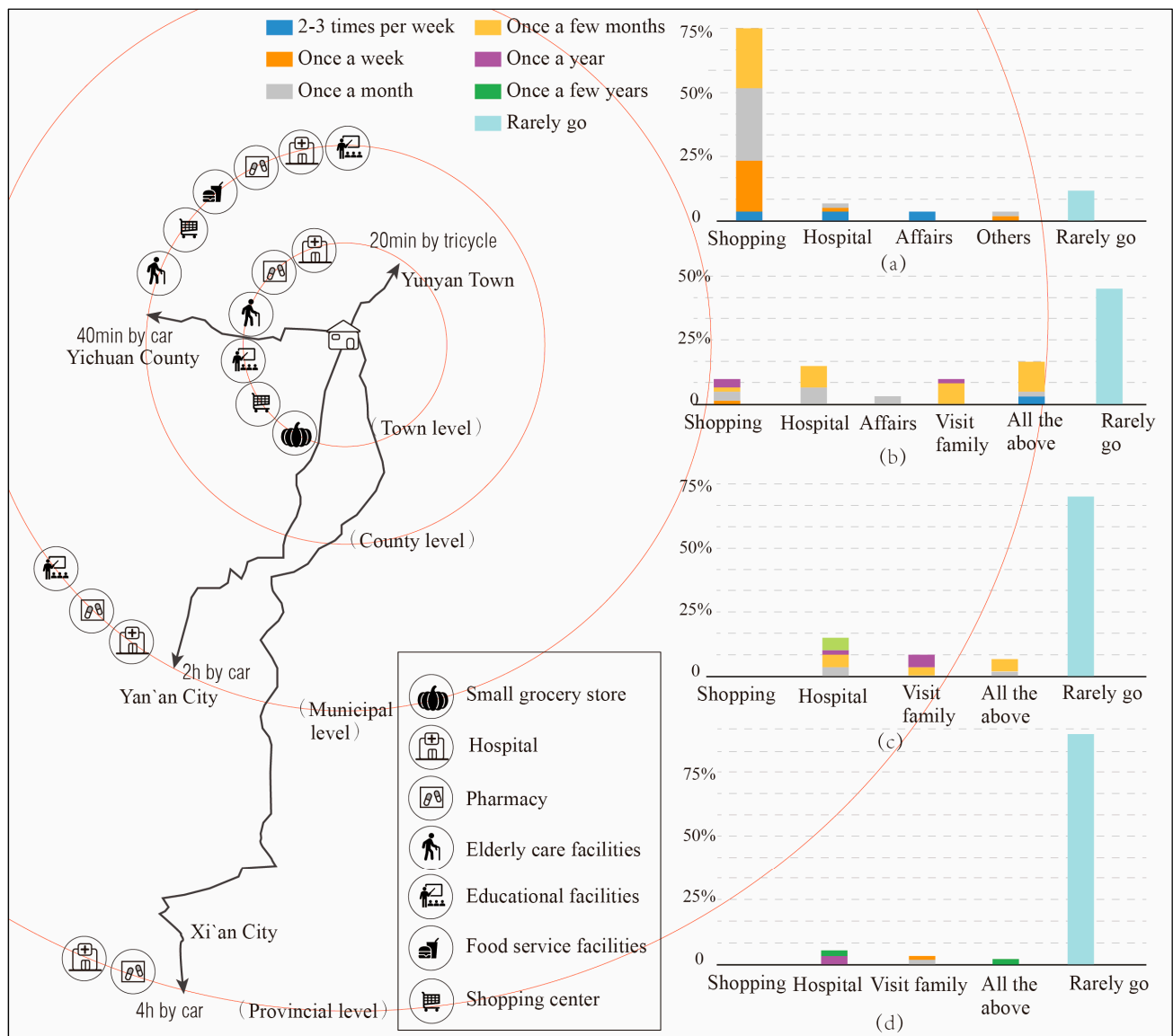


Figure 11. Characteristics of facility utilization by villagers across different administrative layers: (a) objective for visiting Yuanyan Town (town level); (b) objective for visiting Yichuan county (county level); (c) objective for visiting Yan'an city (municipal level); and (d) objective for visiting Xi'an city (provincial level).

5. Discussion

5.1. Construction of the Living Circle System

The planning of China's rural revitalization corresponds to national land space planning, dividing levels into "province-city-county-town-village" [63], with future planning more inclined towards integration with cities [16–19]. The ideal model of a living circle is a layered structure, where the spatial layout of service facilities is determined by the frequency of residents' needs, differing from the starting points and focal points of planning at various administrative levels. The former focuses on villagers' living behaviors from a "bottom-up" approach, while the latter involves facility layout planning from a "top-down" approach. How to supplement or reduce existing service facilities to better match villagers' demands will be the focus of future work.

In existing research, the size of rural living circles in plain areas is often defined by travel time or distance [39–43]. By calculating public service energy levels, identifying living circle centers, and creating service systems, the results conform to a three-tier configuration of "village-town-county" [41]. Based on the travel time of different populations, rural living circles are divided into a basic living circle for infants and the elderly within a 15–30-min walk (about 1 km), a primary living circle for primary school students within a 1-h walk (about 4 km), a secondary living circle for middle school students within a 1.5-h walk or 20 min by bike (6–8 km), and a tertiary living circle within 30 min by motor vehicle (15–30 km), with suggestions for facility configurations at different levels [39]. Based on the travel practices with different transportation tools, rural community service levels are classified into a basic living circle, a 30 min walking sharing circle, a 15 min driving sharing circle, a 30 min driving sharing circle, and a 1 h driving sharing circle [40]. From the analysis of the village space in Section 4.1, we know that most villagers own tricycles, forming a "village-town-county" three-tier layer corresponding to modes of transportation, i.e., "walking-tricycling-driving". In the case of Yongning Village, this conforms to the maximum range defined in other studies: a 15 min walk within the village domain, a 30 min tricycle ride in the town domain, and a 1 h car ride in the county domain. According to the survey results in Sections 4.4 and 4.5, the use of city-level and provincial-level facilities is limited to medical facilities, with a small proportion of villagers using them and at a low frequency, allowing the county domain to be considered the largest layer of the rural daily living circle.

Furthermore, in the Loess Plateau region and other mountainous village areas, villagers' travel costs are greatly affected by the terrain, making it difficult to form a complementary network between villages. Combining watershed divisions for living circles is an effective method. Facilities are managed and configured within the same watershed unit as a single "primary living circle". The secondary living circle is divided by 5 km, focusing on facility configuration around the core village; the comprehensive living circle is centered around the town center within an 8.5 km range [44]. This division method is theoretically innovative and reasonable, but requires individual measurement and analysis for each town domain, and the central village and town center need to gradually form and develop over the long-term, making artificially constructed facility centers weak in practice. Combining the analysis of Section 4.5 with the interview results, this study still considers that an individual village should be treated as a basic living circle, configuring the facilities needed for villagers' daily life, with the town and county domains serving as supplements and enhancements, configuring larger-scale and higher-level facilities.

Considering both the existing research results and the findings of this paper, Figure 12 presents the viewpoint of this study. A village serves as the basic unit of villagers' daily lives, forming a relatively complete living system that meets villagers' daily needs for service facilities. Small towns are the main places for rural villagers to obtain daily necessities, agricultural product transactions, non-agricultural employment, basic education, and primary medical services; and for services requiring a certain population size and technical support, such as education and medical facilities, there is a preference for facilities located in the county domain [64].

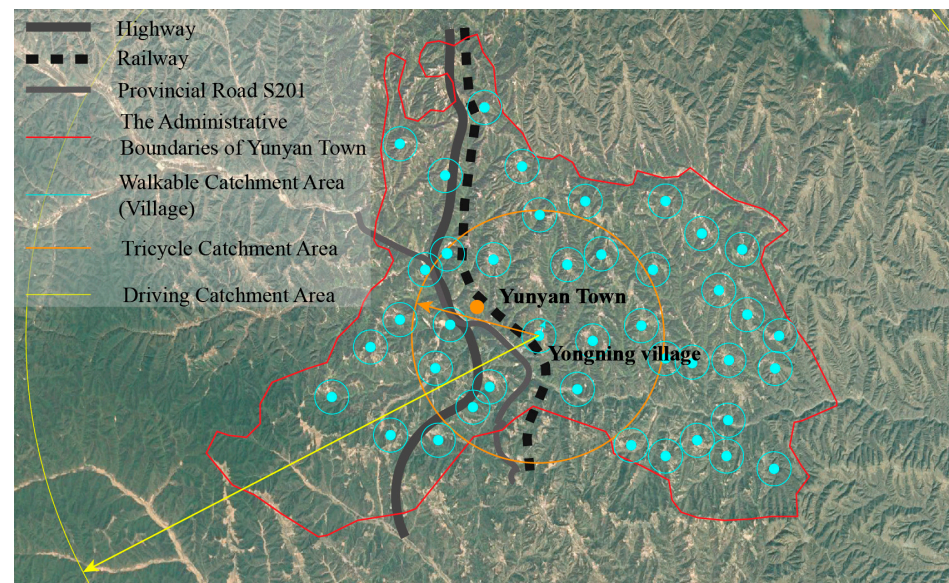


Figure 12. Conceptual model of rural community living circles.

5.2. Configuration of Services in the Village

The development and enhancement of villages follow this pattern of consideration: the conditions of basic infrastructure > natural environmental conditions of public service level > living conditions > human social convenience conditions [65]. The social attributes of rural spaces are both a spatial functional demand and a result of spatial production. The configuration of public service facilities needs to match rural living and production scenarios. Facility distribution points need to be compatible with modes of travel, matching residents' walking and driving circles [51]. As analyzed in Section 4.1, in Yongning Village, which is affected by mountainous terrain, the village distribution sees concentrated farmlands surrounding the area, and "life-production" maintains a certain distance. Service facilities within the village domain can adopt a centralized layout method.

Existing research on configuration methods for village service facilities is mostly based on population size and industry characteristics, i.e., a "top-down" rational analysis. When the research area differs, the methods for evaluating and laying out facilities also vary; village service facility types can generally be divided into seven categories: culture, education, health, elderly care, commercial services, governance, and publicity [66]. Referring to existing research [49–57] on the configuration methods of village service facilities, facility types can be summarized as follows: (1) protection class: emergency shelters, disaster prevention facilities, health rooms, and kindergartens; (2) enhancement class: life class (senior activity rooms, convenience stores, express stations, sports fields, primary schools, cultural activity rooms, folk activities, and financial services); and (3) industry class (tourism service facilities, historical resource protection, logistics service centers, and small exhibition halls).

Combining the existing research results, and based on the analysis in Section 4 of this study, after multiple consultations between the government, villagers, and planners, the final configuration plan of service facilities for Yongning Village was summarized (Figure 13). These facilities include libraries (book materials room and elderly classroom), comprehensive service centers (senior restaurant, daytime care, and senior activity room), village committees (offices and meeting rooms), outdoor activity plazas (villager activities and fitness), convenience stores (with daily necessities and commonly used medications), and fruit processing and sales centers (product processing and sales). The reason for not setting up kindergartens and primary schools is that, after 2000, the school-age population in the village did not reach the basic number required to open schools, and educational facilities within the village domain gradually merged and concentrated in the town and county domains. This is partly due to the decrease in the number of young people and school-aged children in the village and partly because, as villagers' living standards im-

prove, the belief in providing the next generation with a higher level of education becomes stronger. This phenomenon is also confirmed in other studies [24].

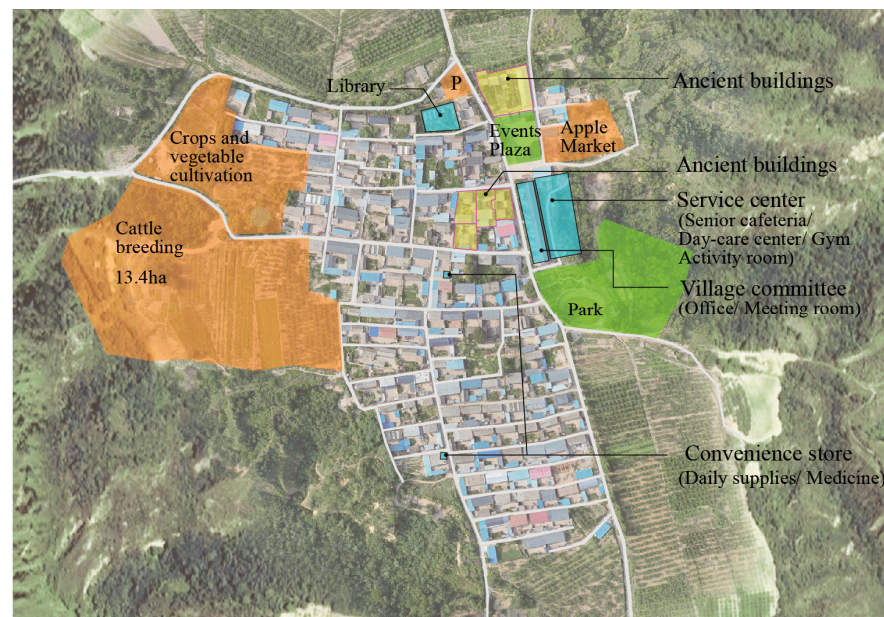


Figure 13. Facility configuration of Yongning village.

6. Conclusions

This study addresses the dilemma that existing service facilities in villages in the Loess Plateau region do not meet villagers' needs. Through questionnaires, interviews, and by reconstructing the real-life scenarios of villagers, this study has explored methods of configuring rural service facilities from the villagers' perspectives, providing references for enhancing the quality of the village living environment.

- (1) In the Loess Plateau region, villagers' travel is greatly influenced by the terrain, and the actual use of facilities strongly depends on the administrative hierarchy, presenting a clear "village–town–county" layered structure. The modes of facility use are accessible by walking, tricycle, and motor vehicle. The village domain is the daily production and living space for villagers, which must provide facilities related to daily administrative management, elderly care, health, and activities, while the town domain supplies villagers' daily production and living needs, mainly including purchasing production materials, medicines, and school education. The county domain integrates urban and rural spaces, serving as a complete living unit for rural residents, and is thus required to provide quality education and medical facilities.
- (2) The aging population problem in villages is quite severe; ensuring the safety and convenience of the elderly will thus be the focus of future work in rural community construction. According to the survey results, facilities with high demand among villagers include senior restaurants, senior activity rooms, and clinics selling commonly used medications. Additionally, it is necessary to have readily available medications for treating chronic diseases such as hypertension, joint pain, cerebral infarction, and pneumonia, providing services for health management and monitoring.
- (3) According to the survey, villagers have a high dependence on online shopping and delivery services, and the configuration of convenience stores needs to consider villagers' actual needs in terms of offline shopping. This study's strategy for configuring facilities in the basic living circles of rural areas in the Loess Plateau can be summarized as cultural facilities, health and elderly care facilities (senior restaurants, daytime care, and senior activity centers), administrative facilities (village committees), recreational facilities (outdoor activity plazas), and commercial facilities (convenience stores with

daily medication sales, fruit processing, and sales centers). Among these, villagers' needs for health and elderly care facilities are the most urgent.

Lastly, this study has certain limitations. Firstly, it took Yongning Village as a typical case for planning and study, but it could not cover the uniqueness of other villages. Future research still needs to investigate other types of villages to gather more diverse samples. Secondly, the planning methods proposed in this study are still at the planning proposal stage and have not been verified in practice. The feasibility and effectiveness of facility use require follow-up through subsequent deeper research. In conclusion, it is necessary to further refine the planning strategies for rural living circles in the Loess Plateau region through more comprehensive and in-depth surveys and interdisciplinary collaborative research.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/buildings14020514/s1>, Supplementary File S1: Survey on the Community Living Circle in Yongning Village.

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References

1. Powe, N.A.; Connelly, S.; Nel, E. Planning for small town reorientation: Key policy choices within external support. *J. Rural. Stud.* **2022**, *90*, 65–75. [\[CrossRef\]](#)
2. Ge, D.Z.; Long, H.L.; Qiao, W.F.; Wang, Z.W.; Sun, D.Q.; Yang, R. Effects of rural–urban migration on agricultural transformation: A case of Yucheng City, China. *J. Rural. Stud.* **2020**, *76*, 85–95. [\[CrossRef\]](#)
3. Li, Y.R.; Qiao, L.Y.; Wang, Q.Y.; Karacsonyi, D. Towards the evaluation of rural livability in China: Theoretical framework and empirical case study. *Habitat Int.* **2020**, *105*, 102241.
4. Zhao, P.J.; Yu, Z. Rural poverty and mobility in China: A national-level survey. *J. Transp. Geogr.* **2021**, *93*, 103083. [\[CrossRef\]](#)
5. Liu, Y.S. Research on the urban–rural integration and rural revitalization in the new era in China. *Acta Geogr. Sin.* **2018**, *73*, 637–650.
6. Li, Y.J.; He, J.H.; Yue, Q.B.; Kong, X.S.; Zhang, M.M. Linking rural settlements optimization with village development stages: A life cycle perspective. *Habitat Int.* **2022**, *130*, 102696. [\[CrossRef\]](#)
7. Li, Y.R.; Liu, Y.S.; Long, H.L.; Cui, W.G. Community-based rural residential land consolidation and allocation can help to revitalize hollowed villages in traditional agricultural areas of China: Evidence from Dancheng County, Henan Province. *Land Use Policy* **2014**, *39*, 188–198. [\[CrossRef\]](#)
8. Tian, Y.S.; Liu, Y.F.; Liu, X.J.; Kong, X.S.; Liu, G.G. Restructuring rural settlements based on subjective well-being (SWB): A case study in Hubei province, central China. *Land Use Policy* **2017**, *63*, 255–265. [\[CrossRef\]](#)
9. Tian, Y.S.; Liu, Y.F.; Kong, X.S. Restructuring rural settlements based on mutualism at a patch scale: A case study of Huangpi District, central China. *Appl. Geogr.* **2018**, *92*, 74–84. [\[CrossRef\]](#)
10. Shi, Z.H.; Ma, L.B.; Zhang, W.B.; Gong, M. Differentiation and correlation of spatial pattern and multifunction in rural settlements considering topographic gradients: Evidence from Loess Hilly Region, China. *J. Environ. Manag.* **2022**, *315*, 115127. [\[CrossRef\]](#)
11. Tian, D.R.; Zhou, Q.H. Suitable urban–rural land use form in gully area in the Loess Plateau from the perspective of fractal theory: A case study of Mizhi, northern Shannxi province. *City Plan. Rev.* **2017**, *41*, 33–40.

12. Zang, Y.Z.; Liu, Y.S.; Yang, Y.Y.; Woods, M.; Fois, F. Rural decline or restructuring? Implications for sustainability transitions in rural China. *Land Use Policy* **2020**, *94*, 104531. [CrossRef]
13. Zhang, R.; Feng, X.; Hedefumi, Y. Evolution and Enlightenment of Rural Planning Research in Japan from the Perspective of Human Settlements Science. *Urban Plan. Int.* **2023**, *38*, 113–123.
14. Feng, X.; Wang, K.; Mao, Q.Z. Rural Development Strategy, Rural Planning and Governing after Urbanization Rate Reached a Plateau: Taking Yuzhi City and Kobe City in Japan as Examples. *Dev. Small Cities Towns* **2019**, *37*, 109–115.
15. Khavarian-Garmsir, A.R.; Sharifi, A.; Sadeghi, A. The 15-minute city: Urban planning and design efforts toward creating sustainable neighborhoods. *Cities* **2023**, *132*, 104101. [CrossRef]
16. Liu, Y.S.; Zang, Y.Z.; Yang, Y.Y. China's rural revitalization and development: Theory, technology and management. *J. Geogr. Sci.* **2020**, *30*, 1923–1942. [CrossRef]
17. Huang, Y.F.; Hui, E.C.M.; Zhou, J.M.; Lang, W.; Chen, T.T.; Li, X. Rural revitalization in China: Land-use optimization through the practice of place-making. *Land Use Policy* **2020**, *97*, 104788. [CrossRef]
18. Lin, B. Population Ageing in rural China: Trends Impacts and Suggestions. *West Forum* **2015**, *25*, 73–81.
19. Quan, Y.; Jin, D.; Liu, X. On the Problems of the Present Stage of our Country Rural Planning. *Chin. Overseas Archit.* **2015**, *4*, 102–103.
20. The Central Committee of the Communist Party of China and the State Council Issued the Strategic Plan for Rural Revitalization (2018–2022). China Government Network; 2018. Available online: https://www.gov.cn/zhengce/2018-09/26/content_5325534.htm (accessed on 5 February 2024).
21. Meng, Y.; Dai, S.Z.; Wen, X.F. The Problems and Measures of Rural Planning. *Planners* **2015**, *31*, 143–147.
22. Yang, R.; Luo, X.L. Progress and prospects in rural space diversification, reconstruction, and governance from a development perspective. *Trop. Geogr.* **2020**, *40*, 575–588.
23. Tu, S.S.; Long, H.L. Rural restructuring in China: Theory, approaches and research prospect. *J. Geogr. Sci.* **2017**, *27*, 1169–1184. [CrossRef]
24. Ma, L.B.; Liu, S.C.; Tao, T.M.; Gong, M.; Bai, J. Spatial reconstruction of rural settlements based on livability and population flow. *Habitat Int.* **2022**, *126*, 102614. [CrossRef]
25. Tian, C.Y.; Guan, X.T.; Tian, H.W. Spatial distribution characteristic and its influencing factor of key rural tourism villages in the yellow river basin. *Tour. Trib.* **2023**, *38*, 32–44.
26. Yuan, Y.; Gong, B.H.; Ai, Z.G.; Lei, W.Q. Fuxi Village Preservation and Renovation from Rural Tourism Viewpoint. *Planners* **2016**, *32*, 134–141.
27. Dai, B.W.; Zeng, L.T. The Function Zoning Base the Development Potential Evaluation of Rural Tourism: A Chengdu Case. *Planners* **2015**, *31*, 80–83+88.
28. Zhao, B.; Zheng, Z.M.; Wang, Z.Y. New Countryside Complex Planning from Rural Tourism Viewpoint: Xinhua Village Complex, Deyang City. *Planners* **2015**, *31*, 138–142.
29. Lin, X.; Liu, L.Y.; Li, X.; Zheng, Y.S. The Digital Rural Development Strategy of “Being Suitable for Business and Living” Enabled by E-Commerce under Rural Revitalization. *Urban. Archit.* **2023**, *20*, 97–100.
30. Rao, Y.X.; Chen, M.; Mou, L.L. Research on the Path of Coordinated Development of Villages under the Background of Digital Villages: Taking Changleping Town, Hubei Province as an Example. *Dev. Small Cities Towns* **2022**, *40*, 17–26.
31. Chen, M.; Chu, Z.Q. Research on the Reconstruction of Public Cultural Space from the Perspective of Digital Village. *Dev. Small Cities Towns* **2022**, *40*, 27–34.
32. Sun, D.F.; Shen, S.; Wu, T.H. Life Circle Theory Based County Public Service Distribution: Jiangsu Pizhou Case. *Planners* **2012**, *28*, 68–72.
33. Niu, Q.; Yi, S.; Gu, C.T.; Zhu, Y.R.; Wang, P. New Concept and Approaches to the Reconfiguration of Service Facilities of Online and Offline Community Life Circle: A Case Study of Wuhan. *China City Plan. Rev.* **2019**, *6*, 81–86.
34. Ma, W.J.; Li, L.; Gu, J.; Zhu, Y.G. Research on Spatial Layout and Accessibility of Infrastructural Public Service Facilities in the 15 Minute Life Circle, Shanghai. *Planners* **2020**, *36*, 11–19.
35. Liu, H.L.; Zheng, T.M.; Nie, J.X. On the Spatial Allocation of the Quantity and Diversity of Basic Urban Public Service Facilities: A Case Study of Wuhan Inner City. *City Plan. Rev.* **2021**, *45*, 84–91.
36. Zhao, P.J.; Luo, J.; Hu, H.Y. Spatial match between residents' daily life circle and public service facilities using big data analytics: A case of Beijing. *Prog. Geogr.* **2021**, *40*, 541–553. [CrossRef]
37. Chai, Y.W.; Zhang, X.; Sun, D.S. A Study on Life Circle Planning Based on Space Time Behavioral Analysis: A Case Study of Beijing. *China City Plan. Rev.* **2015**, *3*, 61–69.
38. Xiao, F.Y.; Yi, X.X.; Yang, X.L. Development Trend, Problems and Strategies of Public Service Facility Provision For Traditional Communities. *China City Plan. Rev.* **2019**, *2*, 54–60.
39. Shi, Y.; Hui, Y.; Wang, T.Y.; Li, G.Y. Study on the Demarcation of Rural Life Circle in Loess Hilly-gully Region under the Guidance of Facility Demand. *Dev. Small Cities Towns* **2021**, *39*, 5–13.
40. Wu, T.H. Research on the Planning of Town Center Layout Oriented towards Public Service Facilities Configuration. *Dev. Small Cities Towns* **2014**, *11*, 39–47.
41. Zhao, W.; Feng, M.; Li, Y. Coordination and Sharing of Public Service Facilities in Towns and Villages. *Planner* **2017**, *33*, 78–83.
42. Zeng, P.; Wang, S.; Zhu, L.H. A Study on the Optimization of Rural Community Living Circles Guided by Shrink Smart Theory: A Case Study of Suning County, Hebei Province. *Planners* **2021**, *37*, 34–42.

43. Wei, Y.; Song, K.; Li, H. Analysis of the current situation and strategies of response to the living space of rural communities in southwest Shandong from the perspective of “smart shrinkage”. *Chin. J. Agric. Resour. Reg. Plan.* **2021**, *42*, 136–145.
44. Tian, Y.S.; Kong, X.S.; Liu, Y.L. Combining weighted daily life circles and land suitability for rural settlement reconstruction. *Habitat Int.* **2018**, *76*, 1–9. [\[CrossRef\]](#)
45. Yang, J.H.; Zhou, T.X.; Nie, Z.; Xing, P.J. “Production-Living-Ecological” Space Pattern of Traditional Villages on the Loess Plateau (Shaanxi). *Landsc. Archit.* **2022**, *29*, 118–123.
46. Yu, C.L.; Dang, X.X. Discussion on the Sustainable Zoning Method of Human Settlement Base on Watershed: Take the Jinghe River Basin for Example. *Dev. Small Cities Towns* **2018**, *2*, 66–70+79.
47. Yu, C.L.; Dang, X.X. Spatial Structure and Coordinated Development Strategy of Urban System in Loess Plateau Based on Watershed: Taking the Jinghe River Basin as an Example. *J. Archit.* **2017**, *S1*, 143–147.
48. Wu, C.; Zhang, W.; Xiang, Y.L.; Tian, D.R. Distribution of rural settlements in the Loess Plateau of Northern Shaanxi Province from the perspective of fractal theory: A case of the Wuding River Basin. *Arid. Land Geogr.* **2017**, *40*, 1307–1316.
49. Wang, J.Y.; Sun, Q.; Zou, L.L. Spatial-temporal evolution and driving mechanism of rural production-living-ecological space in Pingtan islands, China. *Habitat Int.* **2023**, *137*, 102833. [\[CrossRef\]](#)
50. Bai, B.G.; Chen, F.G.; Zhou, G. Functions of village classification based on POI data and social practice in rural revitalization. *Arab. J. Geosci.* **2021**, *14*, 1690. [\[CrossRef\]](#)
51. Nishino, T.; Amemiya, M. Case study and discussion related to actual conditions of the elderly’s living areas in the local city and appropriateness of establishing an official senior care service area. *J. Archit. Plan. (Trans. AIJ)* **2017**, *82*, 2489–2499. [\[CrossRef\]](#)
52. Wei, W.; Ren, X.W.; Guo, S.Y. Evaluation of public service facilities in 19 large cities in China from the perspective of supply and demand. *Land* **2022**, *11*, 149. [\[CrossRef\]](#)
53. Zhou, X.X.; Wang, P.Z.; Yang, F.; Xu, J.G. Life Circle Theory Based Village Layout Planning. *Planners* **2016**, *32*, 114–119.
54. Sun, D.S.; Chai, Y.W. Study on the Urban Community Life Sphere System and the Optimization of Public Service Facilities: A Case Study of Qinghe Area in Beijing. *Urban Dev. Stud.* **2017**, *24*, 7–14+25+2.
55. Nishino, T.; Kuwaki, S. A case study on places of coexistence where informal supports by inhabitants are seen in a community, from the point of lives of the elderly coming to a day care center. *J. Archit. Plan. (Trans. AIJ)* **2009**, *74*, 1707–1715. [\[CrossRef\]](#)
56. Duan, D.G.; Li, K.X. Optimization of Rural Public Service Facilities Layout in Loess Hilly and Gully Region from the Perspective of Human Land Relationship: Taking Zizhou County in Shaanxi Province as an Example. *Dev. Small Cities Towns* **2023**, *41*, 73–82.
57. Cho, J.Y.; Park, S.K. Key factors for sustainable operation of smart rural communities in aging societies: Voices of Korean community leaders. *Technol. Soc.* **2023**, *74*, 102306. [\[CrossRef\]](#)
58. The Fourteenth Five-Year Plan for the National Economic and Social Development of Yichuan County and the Outline of Long-Term Goals for 2035. Available online: <http://www.ycx.gov.cn/zfxxgk/fdxdgknr/qlyxgk/jcygk/1534094463314542593.html?eqid=a5af09cc000072d00000000056493b96e> (accessed on 5 February 2024).
59. Yichuan County 2023 Government Work Report. Available online: <http://www.ycx.gov.cn/zfxxgk/fdxdgknr/zfgzbg/1624939306902642690.html?eqid=caa52f570001439e0000000066475bf52> (accessed on 5 February 2024).
60. Wu, Y.; Li, M.C.; Mao, L. Quantitative Analysis on the Spatial Structure of Town System in County-Scope Supported by GIS: A Case Study in Lin’an County, Zhejiang Province. *Geogr. Geo-Inf. Sci.* **2006**, *2*, 73–77.
61. Wang, F.H. Measurement, optimization, and impact of health care accessibility: A methodological review. *Ann. Assoc. Am. Geogr.* **2012**, *102*, 1104–1112. [\[CrossRef\]](#)
62. Luan, C.X. A study on the travel characteristics of rural residents in Hani terraced heritage area. *Smart City* **2017**, *3*, 239–240.
63. Feng, X.; Wang, K. Spatial Planning and implementation path of rural revitalization strategy in the municipal administrative area: A case study on Tongren city, Guizhou Province. *City Plan. Rev.* **2022**, *6*, 77–89+112.
64. Yu, Z.; Yuan, D.D.; Zhao, P.J.; Lyu, D.; Zhao, Z.F. The role of small towns in rural villagers’ use of public services in China: Evidence from a national-level survey. *J. Rural. Stud.* **2023**, *100*, 103011. [\[CrossRef\]](#)
65. Wang, Y.; Zhu, Y.M. Exploring the effects of rural human settlement on rural development: Evidence from Xianju County in Zhejiang Province, China. *Environ. Dev.* **2023**, *46*, 100845. [\[CrossRef\]](#)
66. Ge, D.D.; Liang, H.Y.; Tong, L.; Zheng, Y.Y. Research on the Construction of Rural Life Circle in Fangcun, Quzhou under the Guidance of Community. *Mod. Urban Res.* **2021**, *10*, 30–35.

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