NEW CHAPTER
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Rejuvenating Abandoned Schools for Elderly Empowerment

A thesis submitted in partial fulfillment of the requirements for the degree Master of Design in Interior Studies [Adaptive Reuse] in the Department of Interior Architecture of the Rhode Island School of Design

By

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This thesis addresses the challenges posed by rapid aging in Korean society, particularly in depopulated rural areas, where the aging population ratio is significantly higher compared to urban areas. With the predicted elderly population reaching 40% by 2050, it is crucial to develop effective strategies to cope with this demographic shift.

The increasing closure and abandonment of schools in depopulated rural areas further exacerbate the challenges faced by these communities. While efforts have been made to repurpose closed schools, many of them still remain unused. This thesis proposes the reuse of abandoned schools as community centers to tackle both the issue of closed schools and the need for facilities that promote healthy living among the elderly.

As individuals age, various factors contribute to a decline in physical activity, resulting in negative effects on both physical and mental well-being. Additionally, rural areas often lack sufficient infrastructures, such as welfare facilities, sports facilities, and parks, which are essential for supporting a healthy lifestyle.

By leveraging the power of architecture, this thesis suggests a design solution that encourages visitors to engage in physical movement and become more active during their visit to repurposed community centers. The proposed design aims to naturally promote physical activity.

The repurposing of abandoned schools into community centers not only provides a valuable space for social interaction and engagement but also offers an innovative approach to address the challenges faced by aging rural areas. By creating inclusive and accessible environments, these repurposed community centers can contribute to improving the overall quality of life for the elderly and fostering stronger connections within local communities.
Korea is currently facing significant challenges stemming from an aging society and rural depopulation. As mentioned in the abstract, the country’s low birth rates and increasing life expectancy have led to a rapid and profound demographic transformation characterized by a significant rise in the proportion of elderly individuals. This demographic shift poses various social, economic, and welfare-related challenges for Korean society. In particular, rural areas experience the burden of an aging population increase due to the migration of young people to urban centers in search of better opportunities.

The aging of the population and rural depopulation are intertwined issues that warrant close attention and strategic intervention. These phenomena have a profound impact on the social fabric and economic vitality of rural communities, exacerbating existing challenges and creating new ones. One noticeable consequence of rural depopulation is the growing number of closed and abandoned schools in these areas.

Closed and abandoned schools represent a poignant symbol of the challenges faced by rural communities. Beyond their role as educational institutions, these vacant schools underscore the demographic and socioeconomic changes unfolding across the country. The closure of schools not only disrupts educational services but also has broader implications, including the erosion of community identity and the weakening of social infrastructures.

Recognizing the importance of repurposing abandoned schools, this study seeks to explore the potential of transforming them into vibrant community centers. By repurposing these vacant educational facilities, the study aims to address the multifaceted challenges faced by rural communities. Repurposing abandoned schools as community centers holds immense significance, as it enables the utilization of existing infrastructure to simultaneously address the social, cultural, and economic needs of the community.

The primary objective of this research is to analyze and evaluate specific abandoned schools to determine their suitability for transformation into community centers. Through a comprehensive analysis, the study aims to identify the unique characteristics and potential of selected schools that make them well-suited for repurposing. This analysis encompasses an assessment of the current condition, structural features, and spatial qualities of the abandoned schools, highlighting their suitability for adaptation into community spaces.

To achieve this objective, the study will propose design solutions that maximize the use of existing structures while incorporating innovative elements to facilitate a wide range of activities and encourage community engagement. The design and optimization of community centers based on repurposed schools require a holistic understanding of local needs, spatial constraints, and cultural context. By leveraging architectural design principles and participatory approaches, the transformed community centers can serve as catalysts for social integration, cultural expression, and sustainable development.

In conclusion, this study aims to address the challenges posed by an aging society and rural depopulation by repurposing abandoned schools into vibrant community centers. By utilizing existing infrastructure, integrating innovative design solutions, and fostering community engagement, these transformed spaces have the potential to revitalize rural areas, enhance social connectivity, and contribute to the sustainable development of the communities. The subsequent sections of this research will delve deeper into the analysis, design considerations, and potential impact of repurposing abandoned schools as community centers.
Rural is a concept that comprehensively constitutes non-urban areas, so it cannot be clearly distinguished. In general, it is classified according to the number of people, the existence of convenience facilities, and the convenience of transportation. It is usually divided based on the number of people, the presence of convenience facilities, and the convenience of transportation.

The standard Korean Dictionary of the National Institute of Korean Language defines the rural as ‘an area away from the city; mainly a place with fewer populations and less artificial development than the city, making it easy to access nature.’

The increasing number of closed schools in rural areas in Korea can be attributed to factors such as low birth rate, an aging population, and the outflow of young people to urban areas. This trend has led to a concerning social problem, where many closed schools are left neglected and fail to contribute to the local community. As of 2022, out of the 3,896 closed schools nationwide, a significant portion of 351 (11.1%) remains unused.

The neglect and underutilization of these closed schools represent a missed opportunity for rural communities. Instead of being repurposed or utilized for the benefit of the local population, these abandoned schools often place a substantial financial burden on the responsible education offices, resulting in significant losses.

However, these closed schools possess great potential and untapped resources. They can serve as valuable community assets that contribute to the revitalization of rural areas. By repurposing these abandoned school buildings, they can be transformed into multifunctional community centers, providing space for a variety of activities and services that address the needs of the local residents.

By leveraging the existing infrastructure and adapting it to meet the evolving needs of the community, these repurposed schools can serve as catalysts for sustainable development and community empowerment in rural areas.

Status of utilization of closed schools owned by 17 metropolitan and provincial offices of education, Korea

Including 1118 schools out of 3896 closed schools 2023

The number of closed schools in Korea

The Ministry of Education
Major issues of Abandoned Schools

(1) Waste of Resources
- Unutilized site with high potential
- Limited accessibility for residents

(2) Negative Environment
- Negative environment due to poor management
- Increased risk of crime

(3) Financial Loss
- Loss due to maintenance / management costs

Challenges

“Compared to the speed of schools disappearing, the use of closed schools can’t follow it. There are 129 closed schools owned by the Jeollanam-do Office of Education, and five schools, including the island area, have been closed this year alone. However, there are only 44 places that are being used properly, one-third of the total, and the remaining 85 remain a nuisance.”

“In some cases, local governments purchase and entrust it, but the education authorities are not able to come up with measures easily due to the side effects and the burden of purchase costs and residents’ opposition.”

“If the sale process is delayed and the use of the closed school site is delayed, there is a high possibility that this area will become a crime zone. Residents are also pointing to this problem. However, even though there is no proper utilization plan, the field that residents used as the only exercise space has been closed, so residents are more dissatisfied.”

“Reserved for use by the Education Office by the local government and the school, the site is now closed. The owner is now seeking redevelopment for public benefit.”

“However, the site remains closed while the residents are using it for exercise.”

“There are 129 schools that have been leased, and there are, currently, 65 unused closed schools. The profit from leasing 129 closed schools was only 1.2 billion won per year, of which 500 million won has not been recovered in the past five years. In particular, 800 million won is spent annually to manage unused closed schools, but some unused closed schools have difficulties in leasing due to aging facilities or lack of accessibility, and some do not have basic facilities such as electricity and water supply.”

“Several cases of abandoned schools leading to crime have been reported.”

“Rental income from closed schools has decreased due to delays in lease agreements.”

“With the increase in the number of schools being closed, there is a possibility that the number of unused schools will increase.”

“Even though there are unused schools, there are no proper utilization plans, and the residents are using the site for exercise.”

“Closed schools can be turned into community centers or parks.”

“Despite the possibility of turning the site into a community center or park, the residents are dissatisfied because they are using the site for exercise.”


After the Korean War, the first wave of the baby boom led to a rapid increase in the number of students, demanding the urgent construction of a large number of school facilities. In 1962, the first standardized school facility design was created, and as a result, school facilities were uniformly constructed nationwide, regardless of the regional or site conditions. The initial standardized design for school facilities underwent continuous refinement, modification, and improvement until the 6th revision in 1983, further reinforcing the standardized appearance of school buildings.

Under the principle of providing homogeneous education to all citizens, school facilities were shaped to enhance their uniformity. Guided by the standardized design, school buildings featured south-facing classrooms arranged in a side corridor layout on the northern side of the site, with expansive sportsfields extending to the southern side.

The period of the 1970s and 1980s witnessed the most significant construction of schools in South Korea. This era was characterized by rapid economic growth and an increased recognition of the importance of education at the national level, leading to substantial investments in educational infrastructure.

During this time, Korea experienced a surge in its national economy, prompting the government to prioritize the development of education. As a result, numerous schools were constructed, and existing schools underwent expansion and renovation. The government allocated considerable budgets for school construction, aiming to meet the rising demand for education due to regional development and population growth.

Consequently, the 1970s and 1980s stand out as the period when school construction was most active in Korea. Given the increasing number of school closures, it can be inferred that a significant portion of these schools was built during this period. Therefore, a considerable number of schools are likely to exhibit a similar standardized appearance.

STANDARDIZATION OF SCHOOL ARCHITECTURE

The 1950s in South Korea was a period of national recovery and reconstruction following the Korean War. Many schools were destroyed, and the focus was on quickly rebuilding and recovering from the war's devastation. School architecture aimed to meet functional and economic requirements, with a focus on efficiency. The prevalent design style was characterized by simplicity and functionality.

In the 1960s, South Korea witnessed economic growth and the modernization of its education systems. As a result, there were significant changes in school architectural design. Departing from traditional forms, more modern and functional designs gained attention.

During this period, the pursuit of standardization in school facilities led to the emergence of the standardized school facility design. In 1962, the first standardized school facility design was created, and as a result, school facilities were uniformly constructed nationwide, regardless of the regional or site conditions.

In the 1970s, rapid population growth and the need for national development led to extensive construction projects. Design considerations focused on the efficiency and cost-effectiveness of educational facilities. Additionally, there was a preference for architectural styles that emphasized the public nature and national significance of school buildings to cater to the broader population.

In the 1980s, schools experienced changes in design and education. Schools adopted multi-purpose facilities, student-centered teaching methods, and integrated computers and information technology. There was a focus on environmental considerations and reflecting cultural diversity.
The images on the left are randomly captured from Google Earth, showing abandoned schools in the Gyeongsangbuk-do region. Similar features can be observed among them. The buildings have narrow and long structure, and the well-arranged classrooms face the south. Additionally, they have spacious sportsfields and closely connected to nature.
The two schools featured in the images are abandoned schools situated in the Gyeongsangbuk-do, with a distance of approximately 12 kilometers between them. They were both built in 1971. Upon observing the photographs, it becomes apparent that, apart from the variation in color, they share a strikingly similar architectural form, rendering them challenging to differentiate.

The resemblance in form and attributes observed among these abandoned schools underscores the prospective applicability of the design proposed in this thesis to a wide range of other educational institutions.
Imgo Middle School was approved for the establishment of Imgo Middle School on January 25, 1971, and opened on March 23 of that year, and in 1997, the nearby Yeong Middle School Seonggok Branch was integrated to this day, and a total of 6,023 graduates were produced until the 39th graduate in February 2012. The school closed on March 1, 2016.

The facility had a total area of 17,281m², a school site of 16,994m² (12,818 school site, 4,176m² sports field), an affiliated land of 287m² (13m² practice forest, 274m²), and a total building area of 2,574m². In addition to three general classrooms, there were principal’s office, teacher’s office, administration office, library, multimedia, science lab, music room, art room, computer classroom, English room, math room, technology and home economics classroom, cabine- ria, meeting room, invention workshop, computer lab, broadcasting room, health room, and rest room.
EXISTING CONDITIONS

SELECTED SITE: IMGO MIDDLE SCHOOL
The site predominantly consists of low-rise buildings, exhibiting a low building density, and is characterized by a lack of infrastructure. Moreover, there are few roads, and narrow alleys dominate the area, highlighting the limited transportation network. It is an agriculturally oriented region, surrounded by expansive paddy fields, fields, and orchards, emphasizing the agrarian lifestyle of the community. This rural area is marked by a scarcity of modern amenities and facilities, reflecting the insufficient infrastructure present.

However, despite the limited infrastructure, the region remains closely connected to nature, with its proximity to majestic mountains and meandering streams adding to its charm. These natural elements play a significant role in the daily lives of the residents. While the area may lack modern conveniences, its closeness to nature offers a unique and serene environment. Residents of this rural community rely on the land for their livelihood and maintain a close relationship with the natural surroundings. These features collectively exemplify the typical characteristics of a rural area with limited infrastructure.
In Korea, the definition of old age is not specified in any law. Depending on the statistical and public administrative purposes, however, it can be inferred that the age is defined as 65 years of age or older.

In particular, the rural areas are experiencing a significant impact from the aging population. As of 2021, the proportion of elderly individuals aged 65 or older in the country as a whole was 17.1%. However, in rural areas, this figure was even higher, reaching 46.8%. This growing trend of aging in rural regions highlights the need for dedicated efforts and initiatives to address the challenges faced by the elderly population in these areas.

To tackle the issue of aging in rural communities and to improve the quality of life for elderly individuals, it is crucial to develop and implement infrastructure and programs tailored to their specific needs. By prioritizing the creation of appropriate infrastructure and programs, an environment where elderly individuals in rural areas can age healthily can be created.

As the birth rate decreases, the overall population is gradually declining. Additionally, with an increase in life expectancy, there has been a rise in the proportion of elderly individuals within the total population. In the year 2000, there were 3.4 million people aged 65 or older in Korea, accounting for 7.2% of the total population. However, as of 2022, this number has reached 9 million, constituting 17.5% of the population.

By the year 2050, it is projected that the elderly population will reach 19 million, making up 36% of the total population.
In repurposing closed schools to create facilities for older adults, it is crucial to have a deep understanding of the characteristics and needs of this population. Older adults exhibit unique physical, psychological, and social attributes that must be considered when designing facilities and programs tailored to their well-being.

As individuals age, they undergo a biological, physical, and psychological process of change known as aging, which results in a decline in health and functioning. This process is characterized by a range of physiological changes, including reduced physical capacity, cognitive impairment, and other bodily alterations, which are manifested as the characteristics of older adults.

Older adults and the process of aging are closely intertwined, with aging having a significant impact on the lives of older adults and playing a crucial role in shaping their physical, psychological, and social characteristics. The effects of aging on older adults are complex and diverse, with various factors influencing their health and well-being. Understanding the relationship between aging and older adults is essential for developing effective interventions and policies aimed at promoting healthy aging and enhancing the quality of life for this population.

**PHYSICAL**

Aging causes various physical changes such as decreased physical strength, muscle mass, bone density, flexibility, sensory function, and diminished cardiac and pulmonary function, and weakened immune system. These changes can lead to a decline in overall health and increase the risk of developing chronic illnesses.

**Physical Function and Mobility**

- **Sensory**
  - Sight: The lenses soften, making focusing on close objects harder.
  - The lenses become denser, making seeing in dim light harder.
  - The pupils react more slowly to changes in light.
  - The lens yellows, changing the way colors are perceived.
  - The number of nerve cells decreases, impairing depth perception.
  - The eyes produce less fluid, making them feel dry.

- **Hearing**: Decreased sensitivity to sound makes it difficult to distinguish sounds.
  - Weakened ability to hear high-pitched sounds.
  - Difficulty hearing fast speech, unclear articulation, and speech in noisy environments.
  - Difficulty hearing makes it challenging to determine the direction or location of sounds.

- **Tactile and Thermal Sensitivity**: The skin's thinning reduces tactile sensitivity, making it difficult to discern texture and manipulate objects delicately.
  - The number of nerve cells decreases, causing difficulties in detecting physical stimuli.
  - The ability to perceive sensations such as tension, pain, and temperature decreases, increasing the risk of burns, heat stroke, or hypothermia.

**PSYCHOLOGICAL**

The psychological characteristics of the elderly result from a complex interplay between physical and environmental factors, which can impact their cognitive and emotional well-being.

- Cognitive function such as memory, attention, and concentration decline, and reaction time slows down, making it difficult to search for and process complex information.
- Attachment to the past becomes stronger.
- Learning new things or making decisions becomes more challenging.
- Emotion regulation becomes difficult.
- Interests become limited to things that are personally relevant.
- Feelings of helplessness, discouragement, and depression are more likely to occur.

**SOCIAL**

As the range of mobility becomes limited and social activities decrease, expanding interactions with neighbors becomes difficult and there is more leisure time and longer periods of staying at home. As a result, communication with family and friends decreases, raising the risk of social isolation among the elderly. Additionally, retirement, loss of or separation from family and friends can result in a loss of social status for the elderly.


RESPECT

OPEN

MERGE

CONNECT

MOVEMENT

FLOW

NATURAL
EXISTING  The existing abandoned school building presents a long and narrow linear structure with a single-sided corridor layout. The classrooms are aligned in a row on one side, while the structure itself features stacked concrete slabs.

DOUBLE PROGRAM  By incorporating additional volumes into the existing structure, the building is expanded to accommodate a broader range of programs and functions, providing enhanced flexibility and versatility.

OPEN  By retaining the existing structural columns while removing the walls, the obstruction between spaces is eliminated, thereby fostering a sense of openness and spatial continuity.

DISTORT  By distorting the new volumes, the floors are interconnected, creating fluid and interative spaces. Furthermore, openings are strategically designed in the direction where the wind is most prevalent, facilitating smooth airflow and ventilation.

CONNECT  The floors are split to merge the boundaries between spaces, and internal ramps are installed to connect the first and second floors, while external ramps are placed to link the second floor with the rooftop. These facilitate seamless and effortless movement between different spaces, promoting a natural flow and easy accessibility.

WOOD FACADE  The wood facade reflects the shape of the external ramps and surrounding landscapes, which is characterized by mountains and paddy fields, harmonizing with the natural environment. It imparts an overall warm ambiance to the building while allowing for controlled amounts of sunlight.

GREEN  Gardens are introduced on the rooftop, indoors, and outdoors, creating a lush green environment. At the center of the new volume, a water garden takes its place, seamlessly integrating with the surrounding natural elements, fostering a harmonious and effortless connection with nature.

GLASS FACADE / WALL  The glass facade is designed to enhance the connection with the external surroundings, facilitating the influx of exterior views into the interior space.
PHYSICAL MODEL

1:100 Physical Model

1174 x 615 x 82 (mm)

Museum Board Grey, Chip Board

2023
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