

## IDENTIFYING EXISTING PROPERTIES FOR REUSE INTO SOCIAL HOUSING

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**Abstract.** Property reuse secures the reuse of developed land as part of new projects, cleans up polluted properties, and reuses and uses the land around development or social housing. Identifying unoccupied land and determining which properties may be used for social housing are significant challenges to regenerating idle land. Most municipalities need appropriate economic incentives to assist in maintaining and restoring unoccupied land, abandoned constructions, cultural assets, and historical buildings. It is challenging to determine deserted terrain using picture classification, since the morphology of such areas can include, among other characteristics, abandoned structures and barren soil. Although it may solve significant issues, social housing offers people a secure, long-term residence. In many countries, social integration remains the main objective of the social housing sector. However, the sector has an increasing proportion of low-income and vulnerable renters and a smaller range of income levels. This may threaten the industry's economic viability and exacerbate the geographical concentration of poverty and disadvantages. What will the total effect of the reuse of property for social housing be? is the research question. What types of properties may be used for social housing? How do you recognise them? Furthermore, what effects would the repurposing of properties for social housing have? This research uses qualitative content analysis to discuss the location of houses for reuse and conversion to social housing. Additionally, the implications of social housing were examined.

**Keywords:** social housing, property reuse, vacant land, affordable, sustainable, real estate market.

### Introduction

Recently, adaptive reuse has been increasingly likely to initiate a dialogue between various components of complex urban systems [1]. Several studies have emphasised adaptive reuse initiatives focussing on economic effects, social interactions, cultural heritage, energy savings, and other factors [2]. Urban planners adopt deliberate measures to increase the sustainability of cities by preserving, renovating and reusing urban cultural heritage and abandoned places [3]. Sustainable urban development requires the city to be regenerated without consuming more nonurbanized territory [4]. However, while the objective of rejuvenating the existing city has been high on national and international administrative agendas for some time, the techniques and means of altering the physical environment have remained more complex. Furthermore, it evaluates the economic benefits of using the existing building stock and building materials by using smart materials [5-7] instead of destruction and reconstruction. [8].

Brownfield regeneration may take various forms, including various land uses (residential, commercial, industrial, or even parks and open spaces) and intensities of regeneration, ranging from small-scale pocket parks to large new mixed-use communities [9]. It is possible that exploiting brownfield land as an energy resource during regeneration and local development could help alleviate fuel poverty by providing low-cost energy [10], determine whether this integrated strategy can achieve both the goal of regenerating brownfield land and the goal of decreasing fuel poverty, brownfield land availability and energy potential in close proximity to energy consumers [11]. In inner cities, industrial facilities were closed or transferred to the metropolitan edge, leaving behind abandoned and underutilized industrial grounds and structures. These ancient industrial properties feature sturdy structures, tall ceilings, and expansive interior areas [12]. Adaptive reuse of obsolete historic buildings is increasingly recognised as essential for sustainable urban development since it may preserve cultural and historical value on site while simultaneously acting as an effective instrument to boost local economic growth [13].

Social housing is at the centre of the housing issue in European cities. Many cities face high levels of homelessness and housing scarcity due to expanding populations, high rental costs, and inadequate construction of new dwellings. The rent assistance programme is the principal mechanism of reaction to the problem of social housing gap and the homelessness [14]. There are several advantages in building communal housing. It not only gives homeless individuals a place to live, but it also contributes to communities and the economy in other ways. A suitable house allows low-income and homeless people

to live healthy and happy lives, improving their life satisfaction [15]. It decreases crime rates, improves educational performance, and strengthens the coherence of the community at the community level [16].

Unemployed or low-income households perceive the immediate advantages of creating social housing. The government must know its implications when expanding or contracting this programme. We want to investigate the following research questions. What types of property could be transformed into social housing? (2) How to select properties suitable for reuse and (3) What are the effects of reusing properties for social housing? We reclassify data based on a qualitative content analysis in general in European countries to address these issues. Then we evaluate the impact of social housing. By doing so, we highlight how social housing might impact other parts of the real estate business, such as economics, sustainability, and management.

### Literature review

Reuse of property is recycling abandoned, vacant or underused properties for redevelopment or repurposing [17]. Property reuse secures the reuse of developed land as part of new projects [18], clean up polluted properties, and reuse or use of used land surrounded by development or local infrastructure. Mixed-use, residential, commercial, or industrial projects and public open spaces, such as urban open spaces used by urban parks, community gardens, or more extensive open spaces reserves, such as regional parks, may result from the reuse of land [19].

Significant hurdles to the redevelopment of unoccupied property are monetary [20]. Most communities lack the appropriate economic incentives to encourage the maintenance and improvement of unoccupied land and abandoned structures, heritage sites [12; 13], and historical buildings [21]. Tax foreclosures [22] and enforcement laws exacerbate the already substantial amount of unmaintained abandoned property not maintained. Both local property prices and the quality of life in nearby communities are badly affected by unmaintained empty land and abandoned structures. Maintenance has an inherent value that might inspire future redevelopment. Municipalities may implement investment programmes on unoccupied property and abandoned structures, such as tax incentives, tax credits, and rehabilitation tax abatements. With financial investment, stabilisation of the neighbourhood is possible [23]. Government and private [24] regulatory techniques, such as empty land enforcement codes, could help with managing these issues; unoccupied property enforcement codes could include maintenance requirements and registration fees to encourage property owners to repair their properties and protect their surroundings.

It is challenging to identify unoccupied land using image classification since the morphology of such land might include different features as abandoned structures, bare soil, vegetation, or a combination of these. Vacant land can be identified using open-source spatial data [25], Vacancy Visual Analytics Method (VVAM) [26], and GIS-based decision support tool [27].

According to [28], a complete evaluation of unoccupied land using a typology may allow planners, designers, and policy makers to participate in more efficient vacant land planning. Local, state, and federal government agencies could establish programme objectives for vacant urban land [8; 29; 30] to promote the use of: 1) post-industrial sites as public amenities [31], 2) abandoned sites as potentially valuable community assets [32] 3) untended vegetation sites as natural city assets and 4) natural and transportation-related sites to improve a green network system [33].

Social housing offers individuals a secure long-term residence, it may solve serious difficulties if built on the unoccupied property [34]. When rents are proportional to local income, they become more affordable [35]. Social housing may contribute to sustained urban revitalisation and provide affordable, accessible housing that is safe [34]. Reductions in social housing and an overly privatised market contribute to a rise in homelessness [14]. According to [16], increasing social housing can help young families with affordability difficulties in the near term without eventually negatively impacting the property market. It contributes to economic development over time [36]. Therefore, the government must strike a balance between the housing market and the economy as a whole [37]. Additionally, social housing has a damaging effect on energy efficiency. Before the implementation of the project, it must be explicitly addressed for social housing [38; 39].

Social housing enables cooperation between the public and private sectors to provide housing, and the private sector receiving subsidies and aid from the local government to construct such homes. Social

housing fills a need in the housing supply for people who are ineligible for public housing, yet cannot afford market rate rentals [40-42].

According to the published literature, there are several techniques to identify unoccupied lands and assets. However, social housing has its advantages and disadvantages. Unfortunately, the conversion of empty land and buildings into social housing must be evaluated.

### Research methodology

The systematic mapping process by research [43] and the guidelines for systematic review of the literature [44] were referred to for the research methodology of this study. The objective of a systematic mapping study is to present an overview of the research topic and quantify the research evidence. Because this research establishes how properties could be reused for social housing, a systematic mapping study was used.

After defining the study, a systematic literature search was conducted without time constraints, and the results were updated in May 2022. The initial emphasis was on high-quality, peer-reviewed studies published in scientific databases (ScienceDirect, Scopus, IEEE Xplore). An extra search was run for “grey literature” related to the top 250 Google Scholar results. The search terms used in this study were as follows: Science Direct: property reuse for social housing; Scopus: property reuse in the construction industry; IEEE Xplore; and Google Scholar: benefits of social housing. These search terms were chosen after a few attempts to find appropriate search terms in the databases.

There are the inclusion and exclusion criteria for paper screening. The articles that met any exclusion criteria and had research titles that did not address the relevance of property reuse for social housing were eliminated. After reviewing the abstracts and keywords, more papers were eliminated.

Then, the 153 papers that matched the inclusion criteria were entered into Excel. A qualitative content analysis was performed to determine the classification of prospective locations for the reuse of property for social housing and the advantages of social housing. Reading key terms and abstracts led to the development of a set of categories. After reading all of the texts and synthesising the gathered data, the categories were finalised.

### Results

The research revealed that answering the first research question about the types of houses that may be repurposed for social housing was crucial. Figure 1 respond to this study topic.

It is crucial to determine whether property or land should be reused. According to the qualitative content study, vacant land is used more often, i.e. 22 times more than other types of accessible, i.e. lands that can be reclaimed from abandonment come second were repeated 19 times. Similar in frequency to de-industrialised and demolished assets, it may be a third priority repeated 14 and 13 times to use them. Unsuitable and reserved areas have the lowest priority based on 2 and 3 times repeated in frequency for the property reuse scheme.

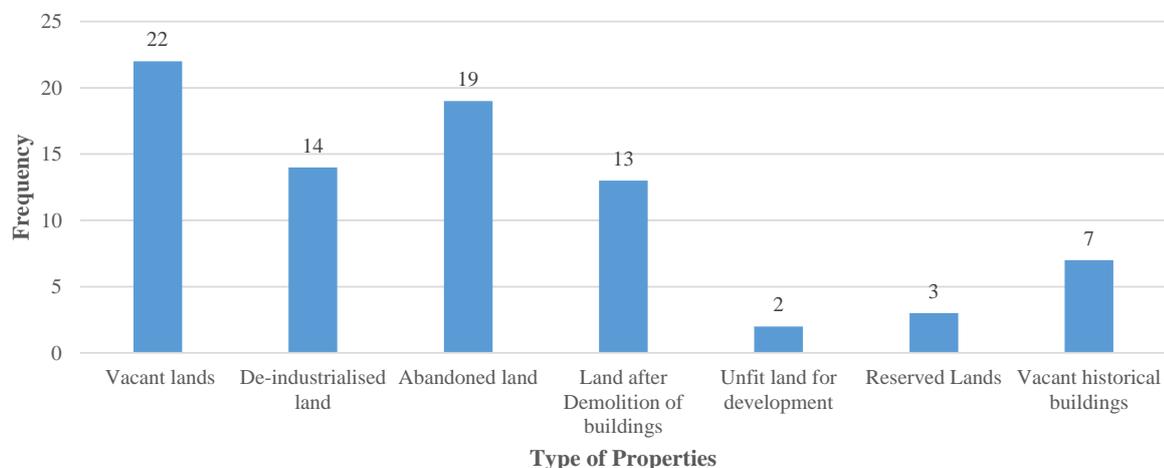


Fig. 1. Frequency graph of type of properties that could be reused for social housing

Regarding the second research topic, “How to Identify Properties for Reuse,” the following information is required: in Figure 2. We have discovered a solution to this research question.

Selection plays a crucial role in the property reuse system. According to qualitative content analysis, locating unoccupied properties for reuse through their physical characteristics is the most appropriate strategy repeated eight times in frequency. Physical factors consist of viewing the property and physically inspecting the location for the reuse of the property. Mathematical modelling is the second most used technique based on photographs, geographic features, and statistical computations. Their repetition frequency was 7. The theory-based examination of the attribute to be reused is the least-used strategy based on the frequency only considered once.

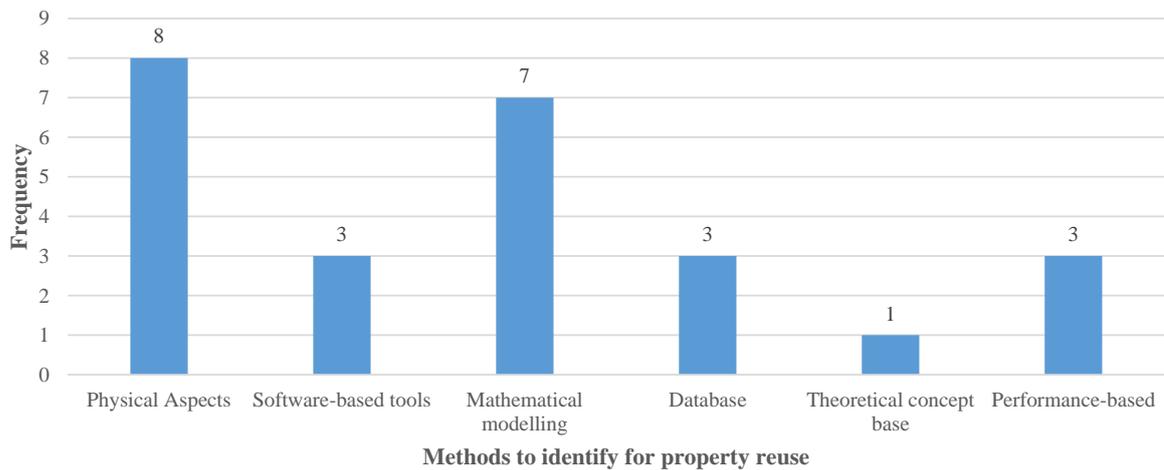


Fig. 2. Frequency graph of type of categories that show how to identify properties for reuse

Regarding the final study question, “What are the consequences of reusing property for social housing?” we discovered the answer to this study topic in Figure 3.

As the objective of this study is to reuse the property for the building of social housing, it is essential to analyse which factors will influence social housing. This technique has yet to be used elsewhere in the world to repurpose properties for social housing. Taking this into account, the direct effect of social housing is explored in this qualitative investigation. Low-income people are impacted with 14 times repetition for social housing, which also provides opportunities for affordable and social housing, which was repeated 11 times in frequency. It has little effect on employment, education and GDP, repeated in frequency 1, 2, and 3 times. Social housing will significantly influence the private and general real estate markets. The frequency of repetition was eight times.

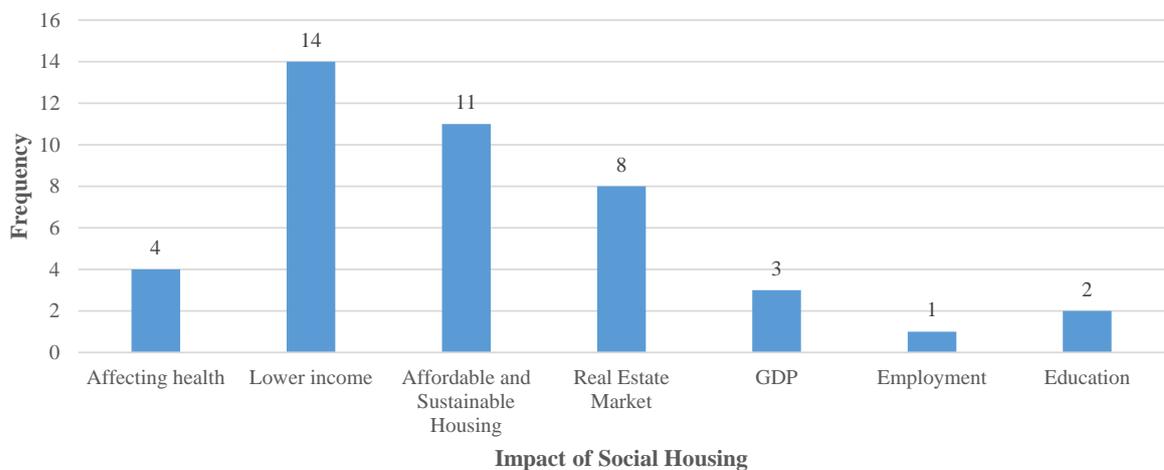


Fig. 3. Frequency graph of the impact of converting properties reuse in social housing

## Discussion

There have yet to be previous studies in which a vacant property has been reused for the development of social housing. However, individual variables considered in the investigation are discussed, which is a method to identify vacant land and the impact of social housing.

Most cities need the right economic incentives to support the care and repair of uninhabited land and abandoned structures, cultural sites, and historical structures. Already large amount of unmaintained abandoned property is exacerbated by tax foreclosures and enforcement regulations. Unmaintained vacant land and abandoned constructions harm neighbouring towns' property values and quality of life. The intrinsic importance of maintenance may encourage future development. It is particularly challenging to identify uninhabited terrain using image classification since the morphology of such areas may contain many elements, such as abandoned constructions. A comprehensive study of empty land based on a typology may help planners, designers, and policy makers engage in more effective planning of vacant land [28]. Increasing social housing might help young families with affordability issues in the short term without eventually damaging the housing market. Social housing permits collaboration between the public and private sectors to create housing, and the private sector obtaining subsidies and assistance from the local government to build these dwellings [45]. It may be further disputed in connection to government policy, since the government would hold vacant land and underused historical buildings [46]. Government policy support would be vital for repurposing and transforming property into social housing [47; 48].

## Conclusions

From the obtained results, the following conclusions could be made which are mentioned below:

1. Vacant land is the most reused type of property, followed by lands that can be reclaimed from abandonment. De-industrialised and demolished assets were also identified as potential options for reuse, although less frequently than vacant land.
2. Property selection is a crucial factor in the property reuse system. Physical characteristics of properties were identified as the most appropriate strategy for selecting properties for reuse, with a focus on viewing the property and physically inspecting the location.
3. The study identified social housing as the objective of the property reuse system. This involves repurposing properties for the building of affordable and social housing, with a focus on providing housing for low-income individuals and families.
4. Social housing will have the greatest impact on low-income individuals and families. Additionally, opportunities for affordable and social housing were identified as important considerations in the property reuse system.
5. Social housing will have a significant impact on the private and general real estate markets. This is likely due to the potential for increased demand for affordable housing, as well as the potential for changes in property values and market dynamics.

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## Author contributions

Conceptualisation, I.G.; methodology, R.J.S and I.G.; validation, I.G.; formal analysis, R.J.S; investigation, R.J.S.; data curation, R.J.S.; writing – original draft preparation, R.J.S.; writing – review and editing, R.J.S.; project administration, I.G.; funding acquisition, I.G. All authors have read and agreed to the published version of the manuscript.

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