STRATEGIES FOR AFFORDABLE HOUSING: COHOUSING'S POTENTIAL ROLE IN CREATING DWELLINGS EQUALLY ACCESSIBLE TO ALL

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**STRATEGIES FOR AFFORDABLE HOUSING:
COHOUSING'S POTENTIAL ROLE IN CREATING DWELLINGS
EQUALLY ACCESSIBLE TO ALL**

submitted by **ŞEVKET DENİZ GÖKÇE** in partial fulfillment of the requirements for the degree of **Master of Architecture** in **Architecture, Middle East Technical University** by,

Prof. Dr. Halil Kalıpçılar
Dean, Graduate School of **Natural and Applied Sciences** _____

Prof. Dr. F. Cânâ Bilsel
Head of the Department, **Architecture** _____

Prof. Dr. Mualla Erkılıç
Supervisor, **Architecture, METU** _____

Examining Committee Members:

Assoc. Prof. Dr. Ayşe Tavukçuoğlu
Architecture, METU _____

Prof. Dr. Mualla Erkılıç
Architecture, METU _____

Prof. Dr. Ali İhsan Ünay
Architecture, Gazi University _____

Date: 01.09.2022

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name Last name : Şevket Deniz Gökçe

Signature :

ABSTRACT

STRATEGIES FOR AFFORDABLE HOUSING: COHOUSING'S POTENTIAL ROLE IN CREATING DWELLINGS EQUALLY ACCESSIBLE TO ALL

Gökçe, Şevket Deniz
Master of Architecture, Architecture
Supervisor: Prof. Dr. Mualla Erkılıç

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Today, the need for affordable and adequate housing is more urgent than it has ever been before. Rapid urbanization, population growth and economic inequalities are causing problems worldwide when access to adequate housing is concerned. The right to adequate housing is recognized as a human right and it is essential for social inclusion. However, access to a decent dwelling is usually problematic for most of low-income population and even middle-income groups. These groups are being coerced into living in informal settlements or inadequate housing units. Therefore, affordable housing is an important topic to investigate in order to respond to these issues and create dwellings equally accessible to all. There are also arguments about the cohousing model's capabilities in achieving housing affordability. On this basis, this thesis intends to illustrate what affordable housing can benefit on different scales, explore what the responsible parties can do around the globe and uncover the correlation between affordable housing and cohousing. The study is conducted by surveying the existing literature about affordable housing and cohousing while investigating various cost-effective strategies to be followed in different phases of affordable housing provision through examples and researching cohousing projects

as case studies. As a result, findings suggest that the cohousing model can play an active role in the supply of affordable housing. That being said, it is not possible for cohousing to achieve housing affordability alone. In conjunction with cost-effective strategies, alternative tenure models, interdisciplinary approach and collaboration between responsible parties, cohousing can make a significant contribution to affordable housing provision.

Keywords: Cohousing, Affordable Housing, Shared Resources, Sustainable Urbanization, Cost-effective Strategies

ÖZ

ALIM GÜCÜNE UYGUN KONUT STRATEJİLERİ: HERKES İÇİN EŞİT DERECEDE ERİŞİLEBİLİR KONUT ÜRETİMİNDE ORTAK KONUTUN POTANSİYEL ROLÜ

Gökçe, Şevket Deniz
Yüksek Lisans, Mimarlık
Tez Yöneticisi: Prof. Dr. Mualla Erkılıç

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Günümüzde, alım gücüne uygun ve elverişli konut ihtiyacı daha önce hiç olmadığı kadar acil bir hal almaktadır. Hızlı kentleşme, nüfus artışı ve ekonomik eşitsizlikler, elverişli konuta erişim konusunda dünya çapında sorunlara neden olmaktadır. Elverişli konut hakkı bir insan hakkı olarak kabul edilmektedir ve sosyal kapsayıcılık için büyük önem taşımaktadır. Ancak, uygun bir konuta erişim, düşük gelirli nüfusun çoğunluğu ve hatta orta gelirli gruplar için genellikle sorun teşkil etmektedir. Bu gruplar gecekondu gibi gayriresmî yerleşimlerde ya da yetersiz konutlarda yaşamaya zorlanmaktadırlar. Bu nedenle, alım gücüne uygun konut, bu sorunlara çözüm üretmek ve herkes için eşit derecede erişilebilir konutlar yaratmak için araştırılması gereken önemli bir konudur. Buna ek olarak, konut alım gücünü iyileştirmede, ortak konut modelinin kabiliyetlerine ilişkin görüşler de bulunmaktadır. Bu görüşlerden yola çıkarak, bu tez, alım gücüne uygun konutun farklı ölçeklerde ne gibi faydalar sağlayabileceğini göstermeyi, sorumlu tarafların dünya çapında neler yapabileceğini araştırmayı ve alım gücüne uygun konut ile ortak konut arasındaki ilişkiyi ortaya çıkarmayı amaçlamaktadır. Bu tez çalışması, alım gücüne uygun konut ve ortak

konut ile ilgili mevcut literatürün taranması, alım gücüne uygun konut tedariğinin farklı aşamalarında izlenebilecek çeşitli maliyet etkin stratejilerin örnekler üzerinden incelenmesi ve ortak konut projelerinin vaka çalışması olarak araştırılması ile yürütülmektedir. Çalışmanın sonucunda, bulgular ortak konut modelinin alım gücüne uygun konut arzında etkin bir rol oynayabileceğini göstermektedir. Bununla birlikte, ortak konut modelinin tek başına konut satın alınabilirliğini sağlaması mümkün değildir. Maliyet etkin stratejiler, alternatif mülkiyet biçimleri, disiplinlerarası yaklaşım ve sorumlu tarafların iş birliği ile ortak konut modeli alım gücüne uygun konut tedariğine önemli bir katkıda bulunabilir.

Anahtar Kelimeler: Ortak Konut, Alım Gücüne Uygun Konut, Ortak Kaynaklar, Sürdürülebilir Kentleşme, Maliyet Etkin Stratejiler

To an egalitarian society

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CHAPTER 1

INTRODUCTION

Although access to adequate housing is defined as a human right (OHCHR, 2009), according to the *United Nations Human Settlements Programme*, it is estimated that around 150 million people are homeless, while approximately 1.6 billion people are living in inadequate dwellings worldwide (UN-Habitat, 2020b). Furthermore, in 2015, the population of urban slums was estimated approximately 1 billion which corresponded to 32 percent of the global urban population at the time, and it was reported that this number will increase over the next 30 years to nearly 2 billion (UN-Habitat, 2015). This means that as the urban population grows, there will be an increase in the number of people living in urban slums and informal settlements as well. Moreover, population growth will be higher in the least developed and developing countries and these countries will face more severe outcomes with the associated problems of poor sanitation, and access to healthcare and education (Aravena, 2014; OECD/European Commission, 2020; UN-Habitat, 2020a, 2020b). Similarly, Chilean architect *Alejandro Aravena* (2014) explains this rapid urbanization challenge as follows:

> Let us start with the global challenge of urbanization. It is a fact that people are moving towards cities. For you to have an idea, out of the three billion people living in cities today, one billion are under the line of poverty. By 2030, out of the five billion people that will be living in cities, two billion are going to be under the line of poverty. That means that we will have to build a one-million-person city per week with 10.000 dollars per family during the next 15 years. A one-million-person city per week with 10.000 dollars per family. If we do not solve this equation, it is not that people will stop coming to cities. They will come anyhow, but they will live in slums, favelas and informal settlements.

Unfortunately, due to low supply of affordable housing and its lack of quality, housing crisis has been going on for years and affecting the middle-income groups as well as the low-income groups (Maschaykh, 2015; Mullin, 2021; OECD, 2019, 2020a). For instance, even 150 years ago, in 1872, Friedrich Engels (as cited in Teige, 2002, p. 32) wrote about the ongoing and increasing danger of housing crisis caused by rapidly urbanizing population as follows:

> The term "housing crisis", as it is currently understood, essentially stands for nothing other than the worsening of the already miserable housing conditions, caused by the influx of people into the cities... [and] increases in rent..., a calamity that is not confined only to the working class, but one that is also starting to affect the small bourgeoisie as well.

1.1 Problem Definition

Today, rapid urbanization, population growth, and economic inequalities are causing problems worldwide when access to adequate housing is concerned (UN-Habitat, 2020a, 2020b). Access to a decent dwelling is usually problematic for low-income groups and people under the poverty line. These groups are being coerced into either living in slums, squatter settlements, unsatisfactory social housing units or moving into dwellings located far from amenities in the urban fringe, in order to afford a dwelling which does not even provide the necessary life quality (Aravena, 2014; OECD/European Commission, 2020; UN-Habitat, 2020a, 2020b). Similarly, in the Turkish context, low-income households are having issues in terms of affording house running costs even in social housing units provided by the Housing Development Administration[1] (Toplu Konut İdaresi-TOKİ) (Emekci, 2021).

[1] In Turkey, social housing is only provided by the Housing Development Administration (TOKİ) since the 1980s (Emekci, 2021). However, TOKİ has its shortcomings in that regard (Bican, 2020; Emekci, 2021). In most cases, social housing units neither conform to residents' needs nor to urban context since TOKİ focuses more on quantity rather than quality (Bican, 2020). Moreover, social housing in Turkey cannot be considered affordable in terms of life cycle costs (e.g., house running costs) (Emekci, 2021). Furthermore, social housing beneficiaries—especially low-income households—are experiencing even more difficulties covering household expenses with the emergence of the COVID-19 pandemic (Emekci, 2021). As a consequence of wrong and incomplete policies, TOKİ exacerbates urban segregation and social exclusion and does not offer a concrete solution to the affordable housing problem of Turkey (Bican, 2020; Emekci, 2021).

Additionally, difficulty affording housing has negative impacts on the larger scale of world population, not just on those who cannot afford adequate housing or the homeless. For instance, during the COVID-19 pandemic, *staying home* was not an option for the homeless or those who need to work in order to keep a roof over their head, thus endangering many lives since "our collective well-being [depended] not only on our own ability to "stay home", but the ability of others to do the same" (Farha, 2020).

Furthermore, with the emergence of COVID-19 as a global pandemic and its socio-economic impact, housing prices are skyrocketing all over the world. According to recent statistics, real house prices among the OECD countries increased by approximately 7 percent between the last quarter of 2019 and the third quarter of 2021, showing "the fastest year-to-year growth over the past two decades" (OECD, 2021, p. 3). Moreover, as previously mentioned, affordable housing is not just a problem of the poor, the homeless and low-income households. Moderate-income groups need affordable dwellings as well (Maschaykh, 2015). According to Judy and Michael Corbett (2000) this problem is associated

> with housing prices and the cost of construction increasing faster than wages. [Consequently], many moderate-income families and almost all lower-income families have been priced out of the homeownership market. Unless they have owned their home for years, they must rent (p. 75).

For instance, the *High Line* project in New York increased the nearby residential property values, "thus denying access to affordable housing in the area for most of the citizens of New York City by virtue of rapidly rising rents" (Harvey, 2012, p. 75). Recent data shows that 80 percent of cities worldwide cannot provide affordable housing (for rental or purchase) for half of their population (Sharif, 2020). Furthermore, large cities suffer more from this problem. According to OECD (2020b), residents of large cities are, on average, approximately 10 percent less satisfied with the availability of adequate, affordable housing in their area when compared to rural residents (Fig. 1.1.).

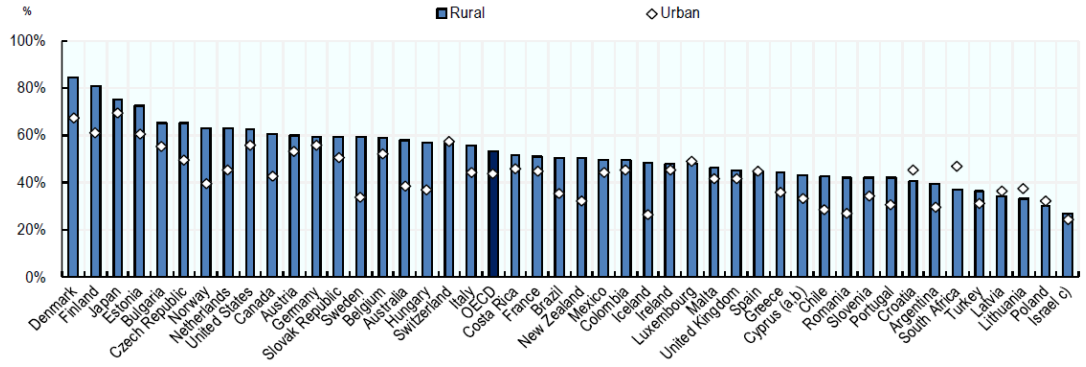


Figure 1.1. Percentage of people satisfied with the availability of good, affordable housing in urban vs. rural areas, across OECD and partner countries, 2017-2019 (OECD, 2020b)

In summary, the need for affordable and adequate housing is increasing each single day. It is projected that approximately 3 billion people will need "adequate and affordable housing by 2030" (United Nations, 2019, p. 44). One of the goals of *the 2030 Agenda for Sustainable Development* is to "ensure access for all to adequate, safe and affordable housing and basic services" (UN General Assembly, 2015, p. 21). With all these factors considered, providing the community with affordable housing should be in architecture's mainstream agenda. Similarly, Woodcraft et al. (2012, p. 5) assert that "creating cities, towns and communities that are economically, environmentally and socially sustainable, and which meet the challenges of population growth, migration and climate change will be one of the biggest tasks of this century".

For architects to respond to these challenges and create dwellings equally accessible to all, affordable housing is an important topic to explore. Correspondingly, there are various strategies to cope with the ongoing housing crisis and provide affordable housing. For instance, the approaches during *the interwar period* which intended to provide affordable housing based upon *minimum quality standards* (e.g., *Existenzminimum—minimum dwelling*) still maintain their importance today (Brysch, 2019; Teige, 2002). Similarly, it is being argued that *cohousing*—also known as collaborative or collective housing—can be helpful in achieving housing affordability with its *shared and collaborative living* experience (e.g., shared spaces, resources, and expenses) (Brysch, 2018; Henley, 2013; Jarvis et al., 2016;

McCamant & Durrett, 2011; Winter & Durrett, 2013). Consequently, cohousing can be positioned among those strategies to be a part of the solution. In other words, it is possible for the cohousing model to play an effective role in addressing the affordable housing shortage. Therefore, it will be beneficial to study the cohousing model and how it correlates with affordable housing.

1.2 Aim and Scope of the Thesis

This study calls attention to the ongoing housing crisis and stresses the importance and urgency of affordable housing provision. Most importantly, by taking the arguments about cohousing and affordability into account, one main question is formed: *Can the cohousing model be implemented as a strategy for affordable housing provision?* Related to the main question, underlying research questions are as follows:

1) *How does cohousing correlate with affordable housing?*
2) *What can we learn from cohousing projects in terms of affordability?*
3) *How does cohousing contribute to affordable housing paradigm?*
4) *What are the economic outcomes yielded by cohousing?*
5) *How does the cohousing model influence running costs of a house?*
6) *Can the cohousing model make homes cheaper?*

Based upon the research questions, this study aims to:

- investigate some of the strategies that belong to policymaking, design and construction phases of affordable housing.
- in light of those strategies, examine the cohousing model and explore the correlation between cohousing and affordable housing.
- analyze the case studies to discover how affordability is achieved in different cohousing projects and determine whether the cohousing model can be implemented as an affordable housing strategy.

Since large cities suffer more from the affordable housing shortage and the projections indicate that this problem is likely to worsen as a result of rapid urbanization in the upcoming years, this study focuses on affordable housing within the urban (and suburban) context. Additionally, this study is limited to strategies and case studies from developed countries that can set a precedent for future affordable housing projects—in both developed and developing nations. The criteria used to select the cases are to be a recently completed cohousing project, to have affordability as one of the project's goals and to have a participatory process.

1.3 Methodology and Structure of the Thesis

This study consists of literature reviews about affordable housing and cohousing, and case studies of cohousing projects from different countries. The cases are also identified and investigated by means of literature review alongside e-mail correspondence with the architects.

The thesis consists mainly of two parts; research of affordable housing and cohousing, and case studies. Chapter 1 describes the ongoing affordable housing problem alongside recent statistics to demonstrate the urgency of the situation. Chapter 2 defines affordable housing, illustrates its importance and explores various cost-effective strategies that play role in the different phases of affordable housing provision through examples. These strategies are categorized as government policies, design considerations and construction strategies. Chapter 3 defines cohousing and explores related concepts and terminology. Then, it briefly discusses cohousing's historical background. In addition, the chapter explores cohousing's general characteristics, spatial organization, benefits, and relation to affordable housing. Chapter 4 examines four different cohousing projects as case studies and evaluates their approaches. In light of the case studies and literature survey about affordable housing and cohousing, chapter 5 concludes the thesis by evaluating the potential role of the cohousing model within affordable housing strategies and discusses the necessary actions to be taken for the affordable housing provision.

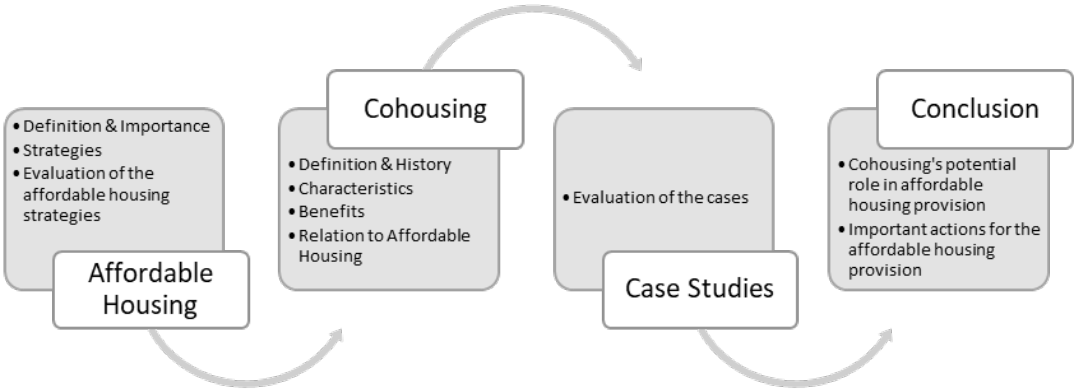


Figure 1.2. Structure of the study (author)

CHAPTER 2

AFFORDABLE HOUSING

2.1 Definition and Importance of Affordable Housing

In the Revised European Social Charter (RESC) of 1996, affordable housing is defined as housing for which a household

> can afford to pay the initial costs (deposit, advance rent), the current rent and/or other costs (utility, maintenance and management charges) on a long-term basis and still be able to maintain a minimum standard of living, as defined by the society in which the household is located (www.coe.int, as cited in Maschaykh, 2015).

According to another, more basic definition (known as 30 percent rule), a housing is deemed affordable if the household is not paying more than 30 percent of their income for it, including utilities (Belsky et al., 2005; Woetzel et al., 2014). That being said, since there are some critiques[2] regarding the 30 percent rule and a dissensus on how to correctly measure affordability, it is better to define affordable housing as a dwelling which allows the household to spend a portion of the income for housing costs (including running costs such as utilities and maintenance costs) while being able to save the rest for other priorities such as food, healthcare, clothing and education to maintain a good standard of life (Emekci, 2021; Maschaykh, 2015; O'Dell et al., 2004; Pivo, 2013).

Consequently, "housing affordability is not just about financial viability. It is also about positive functional aspect of a housing to provide a reasonable quality of living conditions" (Maschaykh, 2015).

[2] For more information, see Pivo, G. (2013). *The definition of affordable housing: Concerns and related evidence*.

In *the Istanbul Declaration on Human Settlements* (UN-Habitat, 1996) affordability is indicated as one of the criteria while defining adequate shelter as

> more than a roof over one's head, it means adequate privacy, adequate space, physical accessibility, adequate security of tenure, structural stability and durability, adequate lighting, heating and ventilation, adequate basic infrastructure such as water, sanitation, and waste management facilities, suitable environmental quality and health factors and adequate and accessible location with regard to work and basic facilities: all of which should be available at an affordable cost (p. 34).

Usually, a large portion of the household income is used for housing costs (OECD, 2016). When choosing an accommodation, households usually prioritize the dwelling quality (e.g., size) and its accessibility (location). Yet, for the low-income groups, their priority can be either the location, thus the distance to job opportunities, or the dwelling size, which means they must make compromises (OECD, 2016). However, as Wiesel et al. (2012) suggests that

> improved [housing] affordability allows people with lower incomes to access housing of decent standard that they could not have afforded in the private market. Furthermore, affordable housing reduces income stress, allowing households to spend more of their income on other essentials such as food, health, and education. For some households, affordable housing provides a pathway into homeownership in the future, by allowing them to save more of their income (pp. 18-19).

Similarly, "the less people have to spend on housing, the more money they have for other things, such as leisure activities, education, clothes or travelling. This again boosts the economy and is something that appeals to governments" (Maschaykh, 2015, p. 7).

Affordable housing is also important because "the way people dwell has a significant impact on their well-being, sense of belonging and social interactions" (Maschaykh, 2015, p. 1). "In other words, housing affordability is integral to the two other principles of social sustainability: well-being and inclusion" (Wiesel et al., 2012, p. 19). Inclusion encourages all segments of the urban population "independently of their socio-economic background, place of residence, gender or ethnic origin" to participate in the economic, political and social activities within a city and gives

equal access to "dividends of increased prosperity" which also benefits the well-being of the entire society and achieve social cohesion (OECD, 2016, p. 26).

Well-being of the least advantaged groups is especially important since "a chain is only as strong as its weakest link". Similarly, it is being discussed that affordable housing ensuring equity for the disadvantaged citizens can improve a city's resilience on a daily basis and in times of crisis (Vale et al., 2014, p. 22). With the aid of affordable housing design, this resilience can be established by

> making communities better equipped to withstand climate change, security threats, and other disasters…, more energy efficient, environmentally sensitive, broadly affordable, well-managed, socially connected, and physically attractive (Vale et al., 2014, p. 23).

According to Vale et al. (p. 25), a well-designed affordable housing is crucial for a resilient city, and it should fulfill as many as possible of the following four criteria:

1. *Support the community social structure and economic livelihoods of residents.*
2. *Reduce the vulnerability of residents to environmental risks and stresses.*
3. *Enhance the personal security of residents in the face of violence or threats of displacement.*
4. *Empower communities through enhanced capacity to share in their own governance.*

For example, in *Elemental*'s *Quinta Monroy* incremental housing[3] project in Chile (Figs. 2.1. & 2.2.), the *participatory design* process helped form a sense of ownership among residents, protect local ties and achieve community empowerment by giving them an active role in the project (Vale et al., 2014, p. 36). Likewise, in the *Lilac* cohousing project[4] in England, inclusion of future residents into the design process and not being forced upon to certain design decisions, led to creating a sense of community (Chatterton, 2014, p. 87). Additionally, *North Beach Place* project in

[3] Incremental housing is a type of housing construction in which the housing is constructed by residents over time (Vale et al., 2014). In this case, the residents made customized additions and constructed the expansion units.

[4] See chapter 4 for the case study.

San Francisco contributed to the city's economy by giving its low-income residents access to job opportunities, thus supporting their economic livelihoods (Vale et al., 2014, p. 29).



Figure 2.1. Workshop with the residents at Quinta Monroy (https://www.moma.org/interactives/exhibitions/2010/smallscalebigchange/projects/quinta_monroy_housing.html)



Figure 2.2. Quinta Monroy Housing units before and after the expansion (https://dac.dk/en/knowledgebase/architecture/quinta-monroy)

Moreover, living conditions can affect a person's future life. For instance, if a child is introduced to a better socio-economic environment at a neighborhood scale with the aid of improved housing affordability, his or her chances of economic mobility can be better later in life (Chetty et al., 2015, as cited in OECD, 2016, p. 26). On the other hand, living in an overcrowded household with inadequate conditions can affect the child's academic performance negatively (Goux & Maurin, 2005, as cited in OECD, 2016, p. 42).

Additionally, in terms of health, since most of low-income households can only afford substandard dwellings, due to exposure to toxic building materials, low indoor air quality and lack of green space, they can face physical and mental health problems (International Living Future Institute [ILFI], 2019, p. 15). For example, low indoor

environmental quality can trigger attacks for children with asthma (Krieger et al., 2002, p. 311). In contrast, an affordable dwelling that provides a good living standard as well as access to nature can promote good health for residents (ILFI, 2019, p. 130).

2.2 Strategies for Affordable Housing

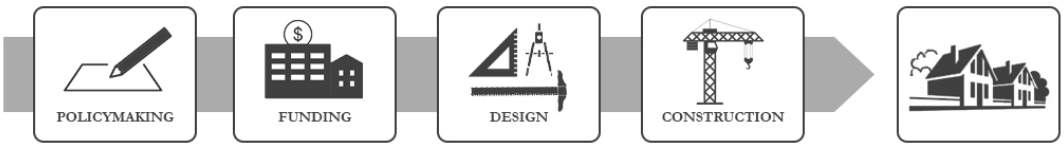


Figure 2.3. Strategic phases of affordable housing supply (author)

In addition to the general perception of housing as a commodity rather than a right, there are different cost drivers for housing varying from land and infrastructure costs, building standards and regulations, design and construction costs (including labor and materials), supply and demand relationship to maintenance costs which include repair and operational costs such as heating (Hartl, 2018; Jocher, 2018; World Economic Forum [WEF], 2019). Therefore, in order to achieve housing affordability, a range of strategies are required in policymaking, funding, design and construction phases of affordable housing. In the following section, some of these strategies will be explored.

2.2.1 Government Policies

2.2.1.1 Housing Policies

For the provision of affordable housing, a good housing policy that regulates the housing sector on a national or local scale while corresponding with other affordable housing strategies is a key element (Steiner, 2018). Additionally, minimizing bureaucracy and speeding up the project approval process are also important since they drive up housing costs as well (Greene & Gonzalez, 2019).

Vienna's *social housing*[5] strategy, dating back to the interwar period, is a good example for the effectiveness of housing policies (Fig. 2.4.). Today, most of the urban population in Vienna lives in *council houses*[6] and "rented flats from state-funded housing construction" (Steiner, 2018, p. 7). Almost half of all housing in Vienna "are socially contracted on a permanent basis" which means that these dwellings remain affordable for a long time, preventing random rent increases and allowing them to be *inheritable* by family members under suitable conditions (Steiner, 2018, p. 8). As a result, by protecting the affordable housing sector the city provides the necessary amount of affordable housing on a permanent basis.



Figure 2.4. Built in 1930, *Karl Marx-Hof* was one of the social housing complexes of Red Vienna (dasrotewien-waschsalon.at/karl-marx-hof; Steiner, 2018)

Moreover, in Vienna, a residential fund called *wohnfonds_wien* which was founded in 1984, supervises the subsidized renovation of existing buildings and controls the quality of new subsidized housing projects while providing land for them (wohnfonds_wien, n.d.). By organizing competitions in which an advisory council appointed by the fund reviews the residential projects, the city provides approximately 10.000 subsidized residential units per year (Steiner, 2018, p. 11).

[5] Social housing can be categorized as a part of affordable housing definition however it differs from affordable housing in terms of eligibility and ownership. Households need to be eligible to rent social housing units owned by local authorities or not-for-profit organizations whereas other affordable housing units do not have eligibility criteria and can be rented or sold in the private sector. In other words, a housing unit may be affordable without being social housing (NSW Department of Communities and Justice, n.d.).

[6] Council house is a house that is owned by the local authorities and that people rent at a low cost (Cambridge Dictionary, n.d.).

2.2.1.2 Land Policies

A coherent urban land policy that controls the increases in land prices is especially important for housing affordability, "since the actual cost driver for housing is not the high building standards, but the price of land" (Jocher, 2018, p. 16). For instance, the city of Ulm has a land policy that protects construction land from speculators since 1891 (Geiser, 1912; Jocher, 2018): by acquiring new plots (i.e., public ownership) "the city itself controls the development and free-space reservation of its land areas" (Jocher, 2018, p. 17).

Moreover, zoning and land-use regulations have a significant effect on affordable housing supply and housing prices (WEF, 2019). Zoning restrictions (e.g., exclusionary zoning) and obsolete land-use regulations can limit housing supply and cause increase in housing costs. Therefore, "innovative zoning and land-use reforms" are substantial for affordable housing supply (Greene & Gonzalez, 2019). For instance, to increase density, spur growth in housing supply and reduce housing costs, the city of Minneapolis removed its outdated single-family zoning code (Greene & Gonzalez, 2019). Similarly, the city of San Jose created a new zoning code for "co-living" by collaborating with the developers in order to realize the *Starcity*'s project with 800 residential units and shared facilities (Jaffe & Quirk, 2019).

One of the zoning strategies to support housing affordability is "*mandatory inclusionary zoning*, which requires developers to set aside a share of apartments that are affordable to households at different income bands" (Greene & Gonzalez, 2019). Another strategy is *transit-oriented development* (TOD) in which urban transit infrastructure is improved and affordable housing supply near transit areas are encouraged (WEF, 2019). As an example of TOD and mandatory inclusionary zoning, in order to guarantee affordability for mass transit users, the Los Angeles County Metropolitan Transit Authority implemented a policy which requires "that 35 percent of all housing built on its land must be affordable to households earning less than 60 percent of the area's median income" (Riggs, 2018, as cited in WEF,

2019). An alternative to mandatory inclusionary zoning is *incentivized inclusionary zoning* in which developers get incentives (e.g., expedited approval process, density bonuses, relaxed parking requirements) for building affordable units (WEF, 2019). For example, the city of Austin and Arlington County are giving density bonuses "which incentivize the production of affordable housing in exchange for increases in allowable building heights" (Greene & Gonzalez, 2019). This can be further developed by incentivizing housing projects with respect to their proximity to jobs and necessary amenities, and contribution to the community (Crichton, 2018, as cited in WEF, 2019). Concurrently, inclusionary zoning policies encourage diversity and improve social cohesion.

Another strategy is giving priority to affordable housing development during the disposal of "surplus public land" (Greene & Gonzalez, 2019). Furthermore, developing more housing units on underused land can improve housing affordability. An analysis in 2016 showed that "28 percent of parcels zoned for multifamily development in Los Angeles were underused and could add more than 300.000 units to the city's housing inventory" (McKinsey Global Institute, 2016, as cited in WEF, 2019, p. 21). A similar challenge applies to vacant land and properties. This can be overcome by implementing vacancy taxes to encourage residential development on idle plots and expropriating unoccupied or uncared homes for the social housing sector (WEF, 2019). Likewise, with conversion ordinances, repurposing of offices, retail spaces and hotels into affordable housing can also be beneficial (WEF, 2019).

As a result, these zoning and land-use strategies not only help improve housing affordability but also lead to sustainable urbanization by controlling urban sprawl and "encouraging the use of mass transit, walking and cycling" (Neptis, 2010, as cited in WEF, 2019, p. 19).

2.2.1.3 Funding

Contractual and collective savings programs (e.g., housing provident funds) can assist buyers accumulate down payments and fund low-interest mortgages to program participants (Woetzel et al., 2014). Alongside funding from "private-equity funds, insurance companies, pension funds, banks, development finance institutions and wholesale debt markets" (WEF, 2019, p. 25), role of the government in funding at national and local scale and initiating affordable housing programs is also important. Governments can incentivize concerned parties (e.g., nonprofit, for-profit developers) for their role in affordable housing construction by giving grants or tax exemptions (WEF, 2019). Likewise, they can provide low interest rates for developers and act as guarantor for small-scale and nonprofit organizations. For instance, due to Vienna's *Limited Profit Housing Act*, developers are allowed to make a limited profit from housing construction, but in return they are incentivized with low interest rate of 1 percent for 30 years (Maschaykh, 2017). Similarly, with the *Investing in Opportunity Act* of United States, real estate developers are eligible for tax breaks for their investment in designated low-income "opportunity zones" (Bertoni, 2018).

Another funding method is rental assistance by national or local authorities which "allows developers to serve lower-income renters while still ensuring necessary revenue to operate the property and pay debt service" (Blumenthal et al., 2016). Similarly, government-guaranteed tenants or buyers for finished units could help reduce the financing costs of developers and expedite the process of receiving investments or loans for the development, thus rendering affordable housing projects less risky (Woetzel et al., 2014).

Besides governments, employers can also invest in development of affordable housing. For instance, companies such as Google, Facebook, Ikea (in Reykjavik) and Lego (in Billund) are constructing affordable residential units for employees (Forrest, 2018).

2.2.2 Design Considerations

In addition to planning accordingly with the construction strategies, various design considerations come into play in order to achieve a well-designed affordable housing. It is also crucial to make the right decisions aimed at the house running costs during the design phase of an affordable housing. For example, selection of cheaper materials to reduce the initial purchase price of a house may lead to an increase in the running costs of the house (e.g., utility and maintenance costs) in the long term if the selected materials are poor quality (Emekci, 2021).

2.2.2.1 Space Optimization

In the big cities of Asia, it is possible to see more and more of the micro apartments with built-in wall cabinets and foldable beds leading to a floor area of approximately 10 m^2 (Jocher, 2018). Following in the footsteps of *Existenzminimum*, this concept of small and compact residential units that reduce the floor area size can help lower housing prices and since smaller spaces use less energy for heating and cooling, the utility costs can be lower too. Furthermore, with innovative solutions such as *Ori Studio Suite*, it is possible to add more functions (i.e., bed, extra storage space, workspace) into much smaller spaces (Fig. 2.5.). Similarly, minimizing the circulation areas can be cost-efficient as well. This can also lead to fitting more units into a building which means accommodating more people.



Figure 2.5. Ori Studio Suite allows easily dividing the space at the touch of a button (https://www.oriliving.com/products/studio-suite)

Since “most spaces in [a dwelling] are only used at certain times of the day”, instead of allocating space for every individual activity (e.g., sleeping, working, and dining), designing flexible spaces can be effective as well (Jocher, 2018, p. 16). Likewise, designing flexible layouts that can respond to the different needs of residents and allow for a change in spatial organization for the future (e.g., open plan) can also be cost-efficient (Hartl, 2018).

Moreover, instead of including a kitchen and a washing machine in each unit, these functions can be embedded into shared facilities (e.g., shared kitchen, laundry), thus enabling to design more compact residential units. Additionally, with semi-private (e.g., rooftop garden, dining hall) and communal spaces linked to these units, it is possible to enhance communal ties and achieve a social cohesion within the residents (Jaffe & Quirk, 2019; Jocher, 2018).

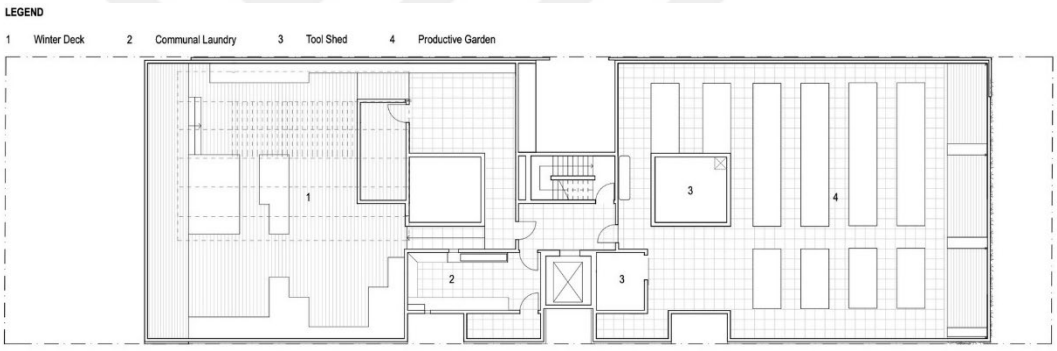


Figure 2.6. Rooftop plan of the Commons housing project with its shared spaces (https://www.archdaily.com/921283/the-commons-housing-breathe-architecture)



Figure 2.7. Winter deck of the Commons with laundry drying racks (https://www.archdaily.com/921283/the-commons-housing-breathe-architecture)

2.2.2.2 Sustainable and Creative Solutions

Sustainable building design can help achieve the goals of a well-designed affordable housing. For example, designing an *energy efficient* dwelling following the *passivhaus* principles can lower the utility costs (e.g., heating and cooling) of the building, improve its durability so that it would not require much maintenance and promote the residents' health by selecting low carbon footprint, non-toxic building materials and improving the indoor air quality (Bradshaw et. al, 2005, p. 17; Emekci, 2021). Concurrently, selecting locally sourced and simple materials with low carbon footprint can not only be environmentally sustainable, but also cost-efficient when their low transportation costs are considered.

"Creative interpretation of building regulations" with "cost-pushing articles" (e.g., parking space regulations) can also contribute to cost reduction (Hartl, 2018, p. 30). For instance, instead of building a car park, promoting car sharing can save construction costs of a parking space (Hartl, 2018). Similarly, architect Jeremy McLeod explains that in the *Commons* affordable housing project in Melbourne; due to the project's close location to public transport, building a parking space for bicycles rather than a basement car park saved them 750.000 AUD while promoting sustainable transportation (TEDx Talks, 2015). Additionally, by removing unnecessary second bathrooms they saved 200.000 AUD more (TEDx Talks, 2015). An additional 200.000 AUD is saved by designing for passive heating and cooling instead of using air conditioning units. From leaving concrete surfaces unfinished to eliminating the use of ceramic tiles and chrome plated doorknobs (both of which have high carbon footprint), every minor detail counted towards achieving an affordable and sustainable dwelling (Fig. 2.8.). Consequently, a total of 1.3 million AUD is saved from construction costs through sustainable and creative solutions (TEDx Talks, 2015).

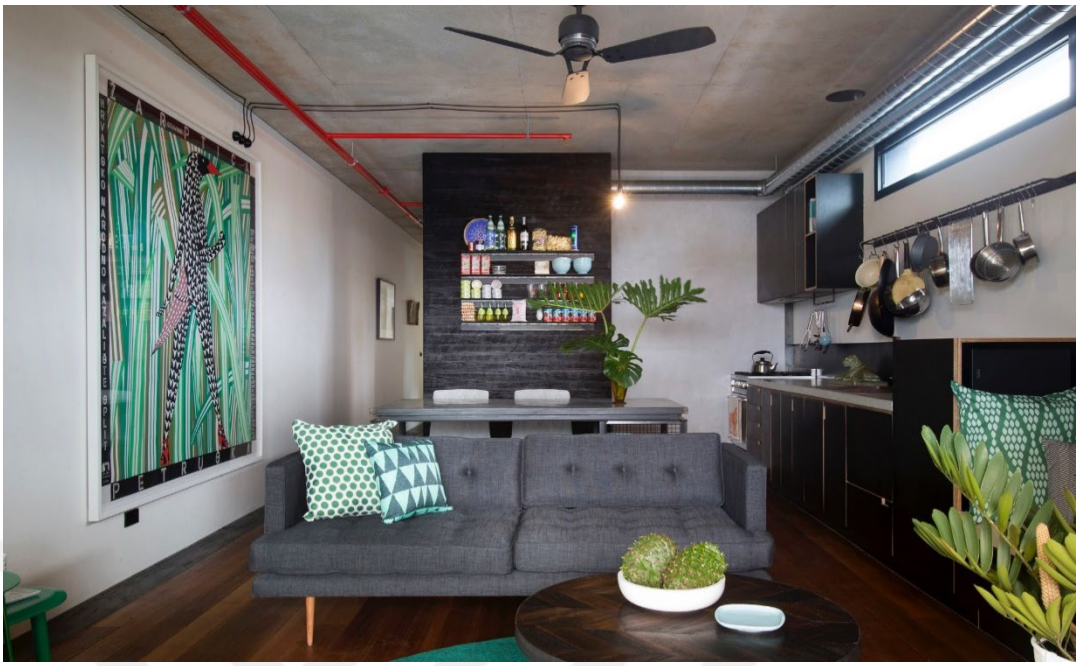


Figure 2.8. Interior of an apartment unit with unfinished concrete surfaces and tile-free kitchen (https://dac.dk/en/knowledgebase/architecture/the-commons/)

2.2.3 Construction Strategies

Generally, around half of the total construction costs consists of structural works and labor costs "comprise approximately 45 percent of construction costs in highly developed industrialized countries" (Hartl, 2018, p. 31). Based on the consumer price index of the previous 15 years, a commission founded in Berlin to reduce construction costs made a report in 2015. According to this report, building installations (e.g., mechanical ventilation systems, sanitary and electrical installations)—referred to as cost group 400—are responsible for most of the increase in construction costs.

Additionally, selecting "thin external walls with several highly specialized layers" for insulation over "massive, simple, monolithic components" contributes to this increase (Jocher, 2018, p. 16). For that reason, selecting simple, cost-efficient insulation components in addition to "well-planned and short installation conduits as well as the bundling of wet zones" can help lower the costs (Hartl, 2018, p. 31). Similarly, this simplification can also be made in construction phase by avoiding

complicated construction methods, simplifying building components and load-bearing systems, and opting for strategies that can increase construction productivity and lower costs (Hartl, 2018).

2.2.3.1 Prefabrication

One of the effective construction strategies for the supply of affordable housing is prefabrication. With the aid of prefabricated mass timber (e.g., cross-laminated timber) and concrete (i.e., precast concrete) construction components, it is possible to build housing "efficiently in terms of time, materials, and costs" (Pawlitschko, 2018, p. 21). In other words, "factory-based construction"—in which off-site production of the building components is followed by their on-site assembly—can allow constructing more buildings quickly while "improv[ing] cost predictability". (Jaffe, 2019; Jaffe & Quirk, 2019). Moreover,

> prefabrication allows for reduced assembly times on the building site, optimized building site facilities, shorter utilization periods for cranes, construction machines, and scaffoldings, but also less of a burden on the residential environment due to noise, dust, and delivery traffic (Pawlitschko, 2018, p. 23).

With increased construction speeds, "developers can recover their investments more quickly, reduce exposure to interest rate changes, and potentially complete more projects over the same time period" (Jaffe, 2019). Consequently, this can affect the housing prices positively. Therefore, prefabrication can increase savings for both developers and residents (Jaffe, 2019).

Sidewalk Labs claim that their factory-based construction method with mass timber—proposed for the city of Toronto—can expedite the construction process by 35 percent, lower the waste by 75 percent and reduce overall project costs by 20 percent "if a construction factory runs at its peak efficiency" (Jaffe, 2019). Besides its lightness and earthquake resilience, timber is a sustainable building material due to its carbon-storing capacity, low carbon footprint and renewable characteristics (Pawlitschko, 2018). For that reason, many countries are making changes in their

building codes to promote the use of cross-laminated timber (CLT) in construction (WEF, 2019). Similarly, for the city of Los Angeles, there are suggestions about giving incentives to endorse affordable mass timber housing construction (Central City Association of Los Angeles, 2019).

Prefabrication can also be used for the transformation of existing residential buildings. In 2011, French architects Anne Lacaton, Jean-Philippe Vassal, and Frédéric Druot redesigned the *Tour Bois le Prêtre* social housing by using prefabricated elements to extend the living areas with winter gardens, create balconies and increase daylight level while the residents kept living in their apartments during the renovation (Frearson, 2013; Jocher, 2018).

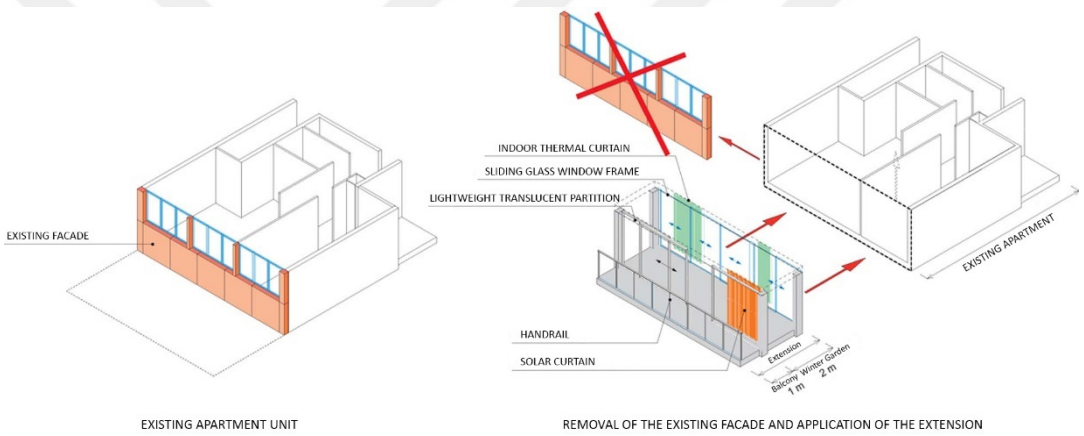


Figure 2.9. Diagram of the façade renovation with prefabricated elements in the Tour Bois le Prêtre (amc-archi.com/mediatheque/8/3/5/000003538/axonometrie-principe-d-intervention-tour.jpg)

2.2.3.2 Modular Construction

Modular construction is a "special type of prefabrication where not only individual elements, but entire spatial units are manufactured and transported to the building site" (Pawlitschko, 2018, p. 22). This method in which modules—including structural components, windows, doors, furniture, and technical installations—are usually stacked on top of each other is especially effective for repetitive residential units to lower construction periods and costs (Pawlitschko, 2018).

For instance, the *Carmel Place* affordable housing project by *nArchitects* which is realized as a result of a contest held by New York city, used modular construction as primary construction method (Figs. 2.10. & 2.11.) (Jaffe & Quirk, 2019). As Manhattan's first micro unit apartment building consisting of 55 units ranging in size from 24 to 33 m^2, the project also affected the zoning regulations of the New York City: after its completion, the city revised the zoning code to support modular construction and make housing with micro units more available (nArchitects, n.d.).



Figure 2.10. Stacking of the modular units
(https://remakebox.com/carmel-place-modular-tiny-apartments-narchitects)

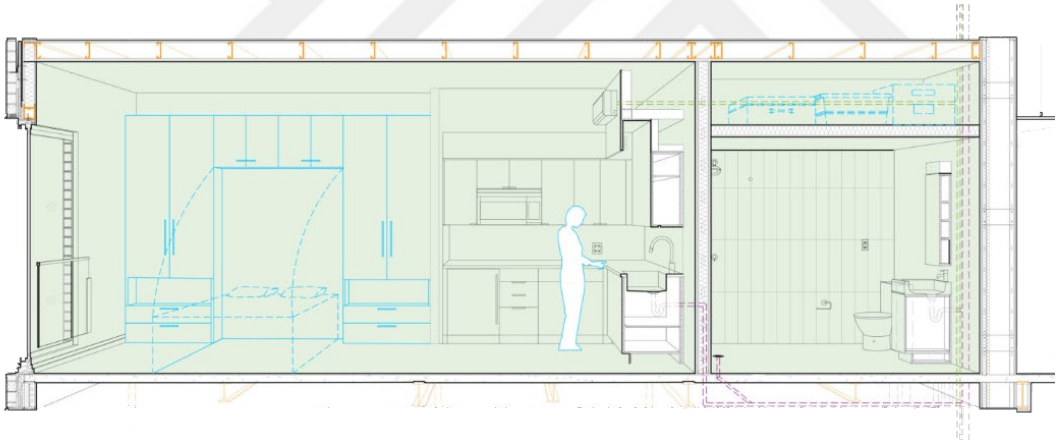


Figure 2.11. Section of a modular unit (https://narchitects.com/work/carmel-place)

2.2.3.3 Automated Procedures

In terms of efficiency, alongside *bricklaying robots*, there are also ongoing studies about autonomous production of reinforced concrete walls and timber components with robotic systems (Pawlitschko, 2018). Furthermore, by collaborating with the nonprofit organization *New Story* and social housing developer *ÉCHALE*, construction technologies company *ICON* 3D-printed a 46 m^2 home in 24 hours for

4.000 USD which paved the way in creating world's first 3D-printed community in Mexico for low-income families (Boissonneault, 2019; ICON Team, 2019). Although automated production is a relatively new term for the construction sector and has not been put into practice aside from few projects, it has the potential to lead to cost-efficient housing in the future.

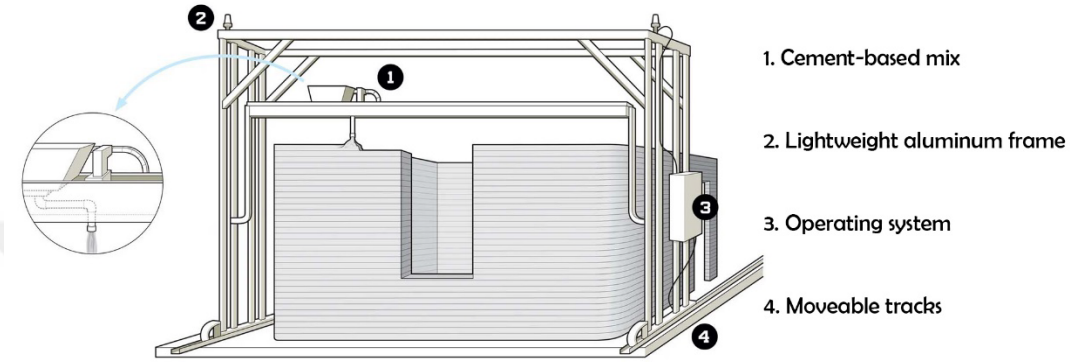


Figure 2.12. 3D-printer diagram
(https://www.wired.com/story/icon-house-3d-printer)



Figure 2.13. 3D-printed house in Tabasco, Mexico
(https://www.archdaily.com/930556/worlds-first-3d-printed-community-minimises-homelessness-in-mexico)

2.3 Evaluation of the Chapter

In the light of the literature survey about affordable housing and the investigation of the strategies, it is apparent that housing affordability signifies more than financial viability. Affordable housing does not only benefit individuals but entire communities: it is essential in creating equitable communities. It has social, economic and environmental advantages; hence it is also integral to sustainable development.

Additionally, affordable housing is not just an architectural challenge. Architecture alone cannot deliver affordable housing to a rapidly urbanizing society. Architecture is only a part of the equation in the supply of affordable housing. There are other responsible parties ranging from policymakers, urban planners, legal experts, and engineers to developers. Similarly, Associate Director for Development at *Sidewalk Labs* Annie Koo (Jaffe & Quirk, 2019) explains this complex nature of affordable housing as follows:

> Housing is really complicated. There is an entire ecosystem of players who are participating in housing, ranging from governments who are critical to provide the funding, creating the zoning, down to the builders and construction companies, down to the architects and engineers thinking about the experience of housing for residents. And no one player in that whole ecosystem, has enough of a stake in the whole pie to single handedly create more affordability.

Since housing affordability is a multidimensional issue, it requires a multidisciplinary approach and needs to be addressed cooperatively by all stakeholders. Furthermore, it calls for interdisciplinary collaboration. Alongside short-term solutions, it is important for local and national authorities to implement long-term strategies supporting public and private sector, and nonprofit organizations rather than seeking to save the day. Governments' role is also important in minimizing bureaucracy, revising existing building, zoning, and land-use regulations, or writing special regulations in compliance with affordable housing development. Furthermore, controlling the quality of housing is just important as supplying the necessary quantity. In addition to ensuring cost-efficiency, it is

important to assure long-term affordability which guarantees that housing will remain affordable until the end of its life cycle. As Benedikt Hartl (2018) asserts:

> Cost-efficient construction should be viewed across the entire life cycle of a building. On the one hand, the construction costs per square meter are important, in order to comparatively evaluate individual building measures; on the other, however, sustainability, durability of construction, and architectural quality contribute towards making a building project profitable and economically efficient in the long run. It is important to distinguish between “cheap”, profit-maximizing investment thinking and “cost-efficient”, sustainable strategies (p. 32).

CHAPTER 3

COHOUSING

3.1 Definition of Cohousing - Concepts and Terminology

Cohousing is the most common term used in the English-speaking world and it is also "spreading rapidly as the universal term" (Vestbro, 2010a, p. 25). Based on their research of the Danish *bofællesskaber* (living communities), the term was coined by architects *Charles Durrett* and *Kathryn McCamant* in 1988. In their book, the Danish living community is described as follows:

> Each household has a private residence, but also shares extensive common facilities with the larger group, such as a kitchen and dining hall, children's playrooms, workshops, guest rooms, and laundry facilities. Although individual dwellings are designed to be self-sufficient and each has its own kitchen, the common facilities, and particularly common dinners, are an important aspect of community life both for social and practical reasons (McCamant & Durrett, 1988, p. 10).

In Merriam-Webster dictionary (n.d.), cohousing is defined as a "semi-communal housing consisting of a cluster of private homes and a shared community space (as for cooking or laundry facilities)".

Grace Kim (2017), an expert in cohousing, defines cohousing as an *intentional community* in which neighbors work together and take care of each other. The residents of cohousing communities have the same "intention to live collaboratively".

Likewise, the *Cohousing Association of the United States* (CohoUs, n.d.) defines cohousing as a "community *intentionally* designed with ample common spaces surrounded by private homes". These common spaces—referred to as *collaborative spaces* by the association—are "managed and maintained by community members, [thus] providing even more opportunities for growing relationships" (CohoUs, n.d.).



Figure 3.1. Site design for *Muir Commons*: Designed by McCamant and Durrett, it is the first cohousing community modeled after the Danish cohousing in the United States. (McCamant & Durrett, 2011)

According to the *Canadian Cohousing Network* (2022), cohousing is "a type of *collaborative housing* that attempts to overcome the alienation of modern housing" in which the neighborly ties are weak, and the sense of community is scarce. Moreover, the network stresses the important role of future inhabitants in "the design and development of community" and adds that

> cohousing combines the autonomy of compact self-contained private dwellings with the benefits of shared, spacious community amenities that typically include a large dining room, kitchen, recreation spaces, meeting rooms, children's play spaces, guest rooms, workshops, and gardens. Cohousing neighborhoods tend to offer environmentally sensitive design with a pedestrian orientation and have documented lower vehicle use than conventional neighborhoods.



Figure 3.2. Site plan and the common house of *Trudeslund Cohousing* in Denmark (https://coco.substack.com/p/approaching-shared-living-through)

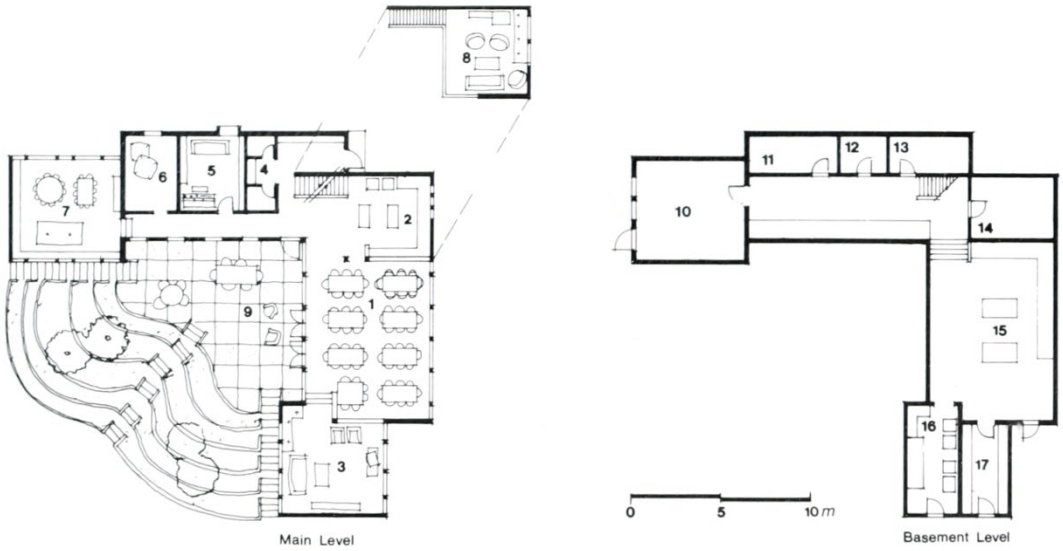


Figure 3.3. Floor plans of *Trudeslund Cohousing*'s common house:
1. dining room, 2. kitchen, 3. TV room, 4. bathrooms, 5. guest room, 6. children's pillow room, 7. children's room, 8. library, 9. terrace, 10. teen room, 11. storage, 12. photography darkroom, 13. freezer, 14. furnace, 15. workshop, 16. laundry, 17. store
(McCamant & Durrett, 1988)

It is possible to encounter overlapping terms and concepts such as ***collaborative housing***, ***collective housing***, ***communal housing***, ***cooperative housing***, ***intentional community*** and their equivalents in other languages as alternatives to conventional housing (Jakobsen & Larsen, 2019; Vestbro, 2010). They can be categorized under the wider concept of cohousing since they differ from each other with small nuances. Vestbro (2010a) explains this as follows:

> The concept cohousing does not state exactly what **co** stands for. It could be **co**llaborative, **co**operative, **co**llective or **co**mmunal. Therefore, it is logical to see cohousing as the wider concept (p. 25).

Therefore, it is important to investigate these intersecting concepts to get a better understanding of cohousing as the umbrella term.

Based upon Dorit Fromm's definition[7] and conference[8] report, **collaborative housing** consists of various types of private housing units (including kitchen and bath) connected with common facilities as "the most important design factor" (Vestbro, 2010a, p. 21). It is designed to enhance social contact and it is important to have a common vision and collaboration among residents. However, collaborative housing does not require "complete resident management, strong participation in the development process, or dining together" (p. 22).

The term **collective housing**, or in Swedish, ***kollektivhus*** (literally meaning *collective building*) is used for housing which consists of private apartments with shared spaces and facilities such as a large kitchen, a dining room, and spaces for various activities (Vestbro, 2010a). Swedish collective housing is "often established by housing companies without a specific interest group being formed in advance, or without" the participatory design process (p. 23). Therefore, similar to the collaborative housing concept, collective housing does not require resident participation as a criterion, however it acknowledges the positive aspect of that type of participation.

[7] For more information, see Fromm, D. (1991). *Collaborative communities: Cohousing, central living, and other new forms of housing with shared facilities*. Van Nostrand Reinhold.

[8] International Collaborative Housing Conference in Stockholm 5–9 May 2010

It is suggested that the term "**communal housing** may be used when referring particularly to housing for togetherness and sense of community" (Vestbro, 2010a, p. 29).

Cooperative housing or **co-op housing** is an alternative type of housing "which offers collective responsibility for the ownership or management of dwellings" (Clapham, 2012, p. 243). In some cases, the property is jointly owned by an organization formed by residents and is sold as shares to residents, whereas in others, the residents collectively manage dwellings owned by a landlord. Most cooperatives focus on individual dwellings rather than shared facilities (Clapham, 2012; Vestbro, 2010a). However, there are successful cooperative housing projects with shared spaces which were developed using cohousing principles (e.g., *Spreefeld Berlin*).

An **intentional community** can be described as a "close-knit" community shaped around a common ideology—religious or secular—with "an intention towards alternative [shared] living" (Grinde et al., 2018; ScottHanson & ScottHanson, 2004; Vestbro, 2010a). Intentional communities "often emphasize community at the expense of privacy". That being said, most cohousing communities do not have a common ideology or purpose—especially religious—other than sustainably living together while maintaining the balance between privacy and community (ScottHanson & ScottHanson, 2004, p. 5).

In Germany, ***wohngemeinschaft*** (housing community) and ***gemeinschaftliche wohnformen*** (community-oriented forms of housing) are the most common concepts (Vestbro, 2010a). Cohousing developments in Germany can be categorized as "self-organized building collaboratives, traditional and new cooperatives, and community-driven housing within the rental sector" (Droste, 2015, p. 79). They can be self-built by the future residents or by collaborating with architects. Additionally, ***Baugruppe*** (building group) is another popular concept that "stands for a long tradition of self-initiated, community-oriented living and the shared responsibility of building" (Ring, 2016). It is a type of *joint building venture* in which the development costs are split between the future residents (Anderton, 2015a).

In the Netherlands, ***centraal wonen*** (central living) and in the Flemish region of Belgium, ***samenhuizen*** (together houses) are the key concepts (Vestbro, 2010a). Dutch central living communities are developed using principal characteristics of Danish cohousing—shared spaces planned by the residents, intentional neighborhood design, and complete resident management—with minor differences (McCamant & Durrett, 1988). At the project level, all clusters share facilities such as a youth center, a meeting hall, guest rooms and a workshop (Fig. 3.4.). At the cluster level, each four to five private units are formed around shared kitchen, laundry, and storage (Fig. 3.5.) (De Vos & Spoormans, 2022).

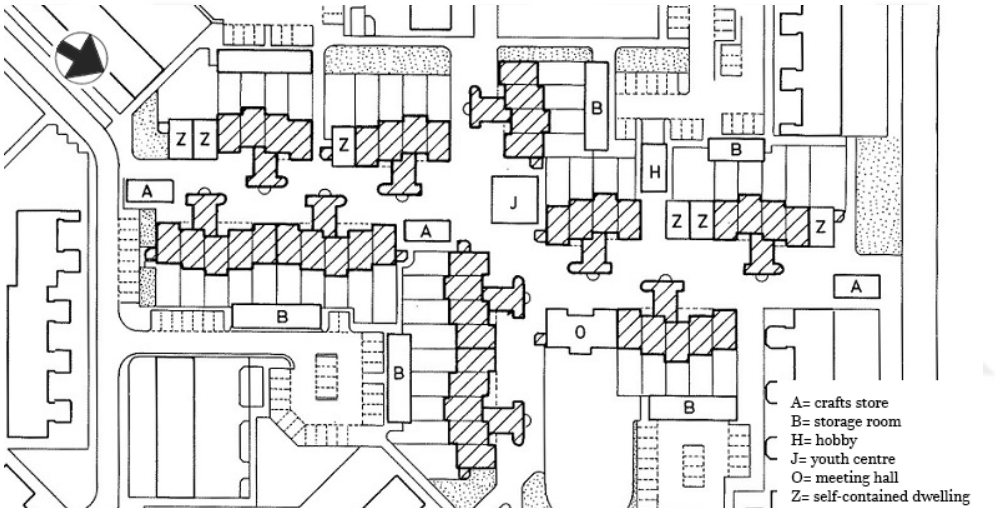


Figure 3.4. Site plan of *Wandelmeent*, the first cohousing community in the Netherlands (https://wandelmeent.nl/geschiedenis/)



Figure 3.5. Plan of the private units sharing a cluster room and the view of the courtyard (https://wandelmeent.nl/geschiedenis-2)

3.2 Brief History of Cohousing

In the early European history, dating back to the 1500s, there were already visions of ideal communities (e.g., *Thomas More*'s *Utopia*, *Charles Fourier*'s *Phalanstère* and *Robert Owen*'s *Parallelogram*) (Vestbro, 2010b). These visions were made into reality throughout the course of time while evolving in accordance with people's changing needs and developed into the cohousing communities of today. As a result, the idea of collective living in alternative housing forms emerged in several European countries. Then, the concept spread to North America, Australia, New Zealand, and Japan (Jarvis, 2015; Williams, 2005). In this respect, *Denmark* and *Sweden* can be regarded as the pioneers of cohousing development followed by countries such as *the Netherlands* and *Germany*. There were also early British, French, and Soviet "experiments" on cohousing; nevertheless, the concept made significant progress mostly in Sweden and Denmark, thus providing a basis for the contemporary cohousing communities (Vestbro, 2010b).



Figure 3.6. View of Fourier's cooperative community phalanstery, by Charles-François Daubigny: In Fourier's vision, the community is formed and managed by *the working class* who collectively owns the means of production. Individual dwellings are connected to communal spaces through an arcade (Vestbro, 2010b). (https://commons.wikimedia.org/wiki/File:Houghton_Soc_860.05_-_Fug%C3%A8re,_phalanst%C3%A8re.jpg)

Inspired by *Thomas More*'s *utopian* concept for ideal community—among many others—first steps to build the Danish cohousing (*bofællesskab*) were taken by Danish architect *Jan Gudmand-Høyer* and his friends in 1964 (Larsen, 2019b; McCamant & Durrett, 1988). In search of an alternative to the suburban single-family house and the multi-story apartment building, the aim was to form a housing community with shared facilities to "encourage social interaction between neighbors", thus creating "a true sense of community" (McCamant & Durrett, 1988). As a result, Jan Gudmand-Høyer designed the proposal for the *Hareskov* project—a community comprised of 12 houses around a common house (Fig. 3.7).

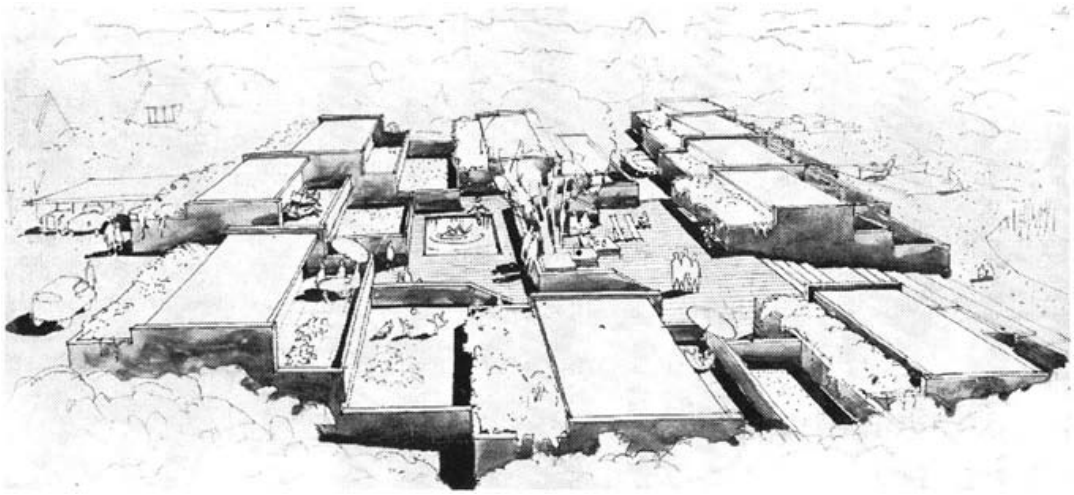


Figure 3.7. Sketch of the Hareskov Cohousing proposal (McCamant & Durrett, 1988)

However, the project was not actualized due to mixed reactions. That being said, after an article written by Gudmand-Høyer to delineate the Hareskov project and the ideas for housing alternatives, the cohousing concept gained popularity and paved the way for Denmark's first cohousing community *Sættedammen* with 27 households—designed by Teo Bjerg and Falle Dyreborg and built in 1970 (Fig. 3.8.). This was followed by *Skråplanet* with 33 residences—designed by Gudman-Høyer and built in 1973 (Fig. 3.9.) (McCamant & Durrett, 1988, 2011).

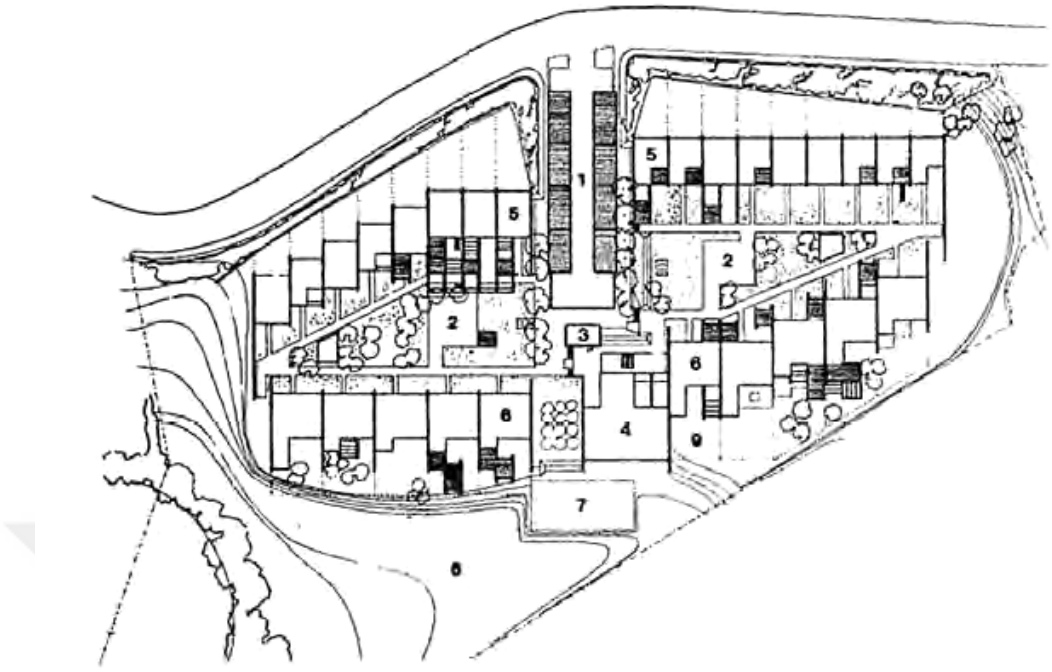


Figure 3.8. Site plan of Sættedammen: 1. parking, 2. common yard, 3. heating plant, 4. communal building, 5. two-story houses, 6. one-story houses, 7. swimming pool, 8. outdoor sitting area (Vestbro, 2010a)

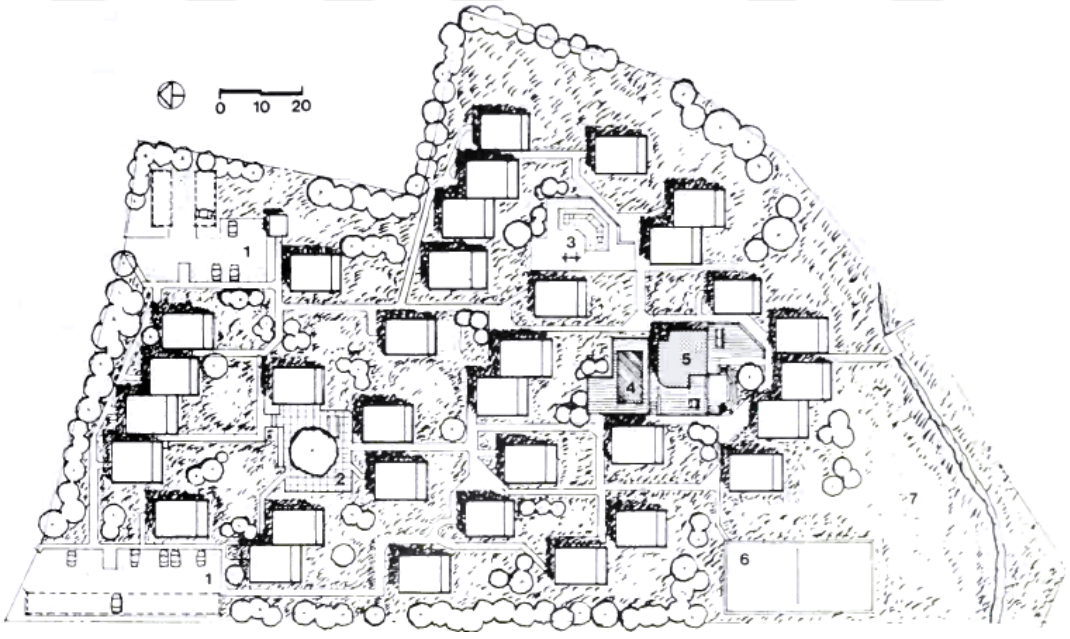


Figure 3.9. Site plan of Skråplanet: 1. parking, 2. community plaza, 3. playground, 4. swimming pool, 5. common house, 6. tennis court, 7. football pitch (McCamant & Durrett, 1988)

During 1970s, Denmark experienced a rapid increase in cohousing experiments. U.S. architects Charles Durrett and Kathryn McCamant were inspired from these experiments during their visit in the 1980s (Egerö, 2010; McCamant & Durrett, 1988; Vestbro, 2010a). Referred to as "the gold standard for cohousing worldwide" by McCamant and Durrett (2011), Danish cohousing was then successfully promoted in the United States[9].

In Sweden, based upon the *utopian socialists* (e.g., Charles Fourier, Robert Owen), *Carl Jonas Love Almqvist* conceived the concept of *Universal Hotel* in which "housework [such as preparing meal] would be done collectively to allow women to engage in gainful work" (Vestbro, 2010b, p. 44). Combined with the concept of *central kitchen*, the goal of reducing women's household workload in order for them to participate in public life brought forth the concept of *kollektivhus* (collective housing). (Vestbro, 2010a, 2010b). In this case, childcare, food preparation and laundry were the desired services in the cohousing of the 1930s (Egerö, 2010). Accordingly, the 1930s Swedish collective housing focused on "the collective organization of [services in] housing", but not on the collaboration between neighbors or on "the idea of community of residents" (Vestbro, 2010a, p. 22). Initial projects "were based on services through employed staff and included a reception, a laundry, [a restaurant], a local shop and a day care center for children" (p. 23). It was intended for the restaurant to deliver meals to residents through food lifts. Moreover, households could send their laundry to the staff downstairs via laundry chutes (Figs. 3.10. & 3.11.) (Vestbro, 2010a, 2010b). Palm Lindén (1992) describes the 1930s collective house as follows:

> In collective houses from this period, employed personnel served the families by washing and ironing the private wash in a laundry down in the basement, and serving dinner in the common dining room, arranged and [furnished] like a traditional upper class dining hall. The privacy was protected by design elements such as a food elevator leading from the common kitchen to every apartment, to make it possible to get a dinner directly to the private kitchen table (p. 1).

[9] It is important to note that there were already other forms of collective living in the United States before the implementation of Danish cohousing model (Fromm, 2000).

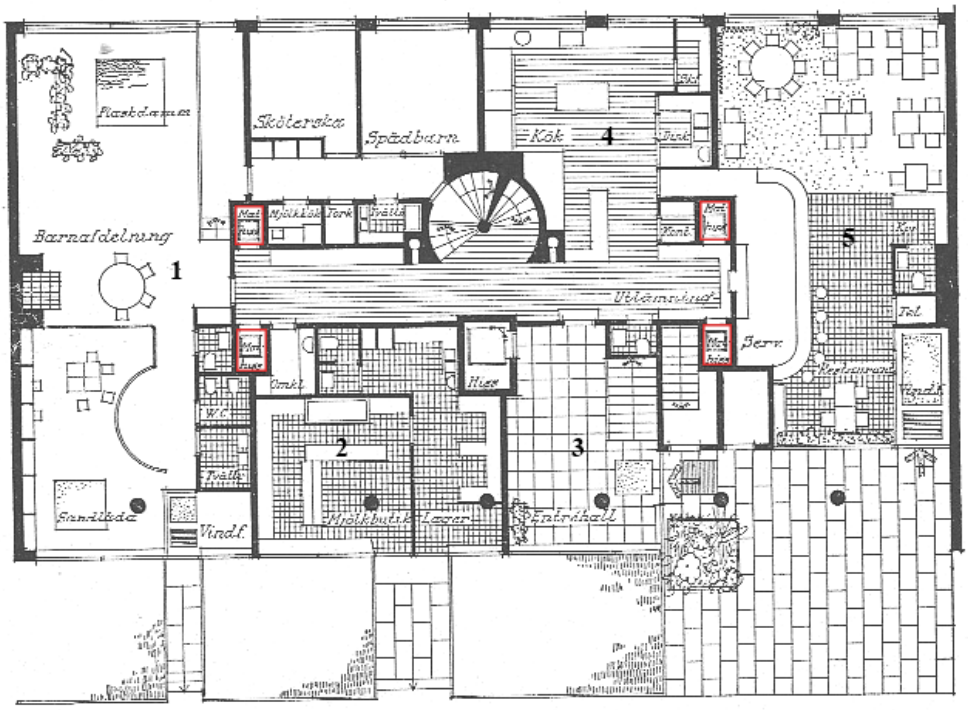


Figure 3.10. Ground floor plan of *John Ericssonsgatan 6*: 1. kindergarten, 2. dairy store, 3. entrance, 4. kitchen, 5. restaurant, and food lifts (marked red) (Vestbro, 2014)

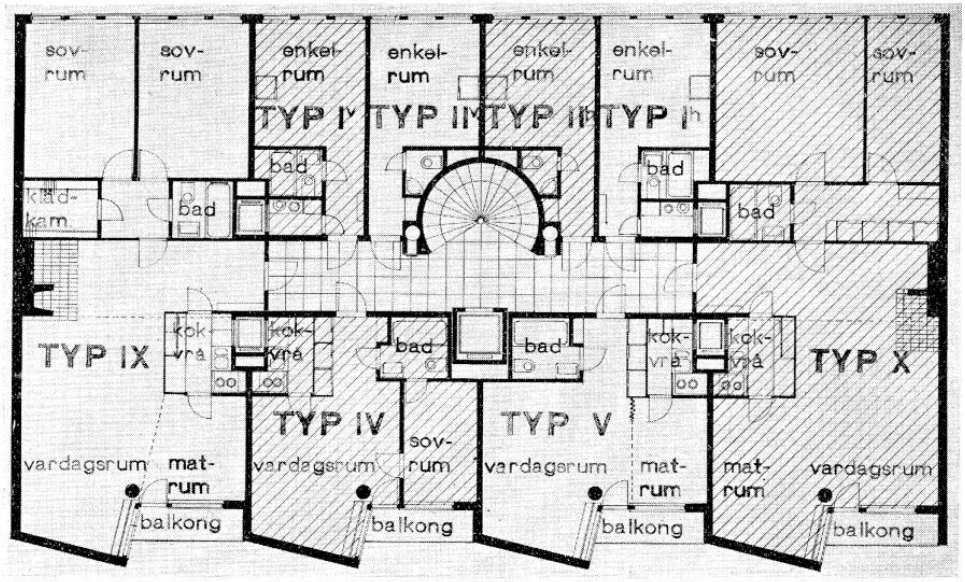


Figure 3.11. Typical floor plan of *John Ericssonsgatan 6*: Note the small apartments and smaller kitchens with food lifts (Vestbro & Horelli, 2012)

However, in the 1980s, a new *self-work* model of kollektivhus with shared spaces and facilities was formed, based on the "sense of community and cooperation between residents" (Figs. 3.12. & 3.13.) (Vestbro, 2010a, p. 23). Organization in this new model of collective house is described by Palm Lindén (1992) as follows:

> For common use, the building should contain a big common kitchen, a [living room] and other facilities. Those areas were, according to the [program], intended to be "the families' enlarged dwelling space". In the common kitchen, no longer hired personnel, but the inhabitants themselves take responsibility for preparing a common dinner some days of the week. The inhabitants also are responsible for the upkeep of the building. In addition, the families should have their own apartment, equal to ordinary apartment houses, [i.e.,] fully equipped with kitchen, bathroom, [living room], and bedrooms (p. 2).

It is also important to note that early Swedish collective housing communities were mostly "developed by housing professionals or local authorities" in high-rise buildings, thus differing from Danish cohousing communities which were usually developed by residents in low-rise housing clusters (McCamant & Durrett, 1988, p. 148).

Moreover, in the beginning stages, most of the cohousing developments—whether in Europe or United States—were responding to the needs of already retired or soon-to-be-retired "relatively resource-rich urban families" (Egerö, 2010, p. 12). Over the years, cohousing development is influenced by several factors such as social, political, and economic circumstances. Consequently, resident types have varied over time from *dual income households* to *mixed income families*, *single parents*, *singles*, *students*, *seniors*, *intergenerational households*, and *people with different social backgrounds* (ScottHanson & ScottHanson, 2004; Vestbro, 2010b). Besides resident types, the drivers of the cohousing communities have evolved through time as well. Starting with the intention of *strengthening the sense of community* through an alternative settlement, cohousing adopted notions such as *gender equality*, *environmental protection*, *sustainability*, *affordability*, *accessibility*, and *social inclusion* (Czischke, 2018; Jarvis, 2015; Williams, 2005).

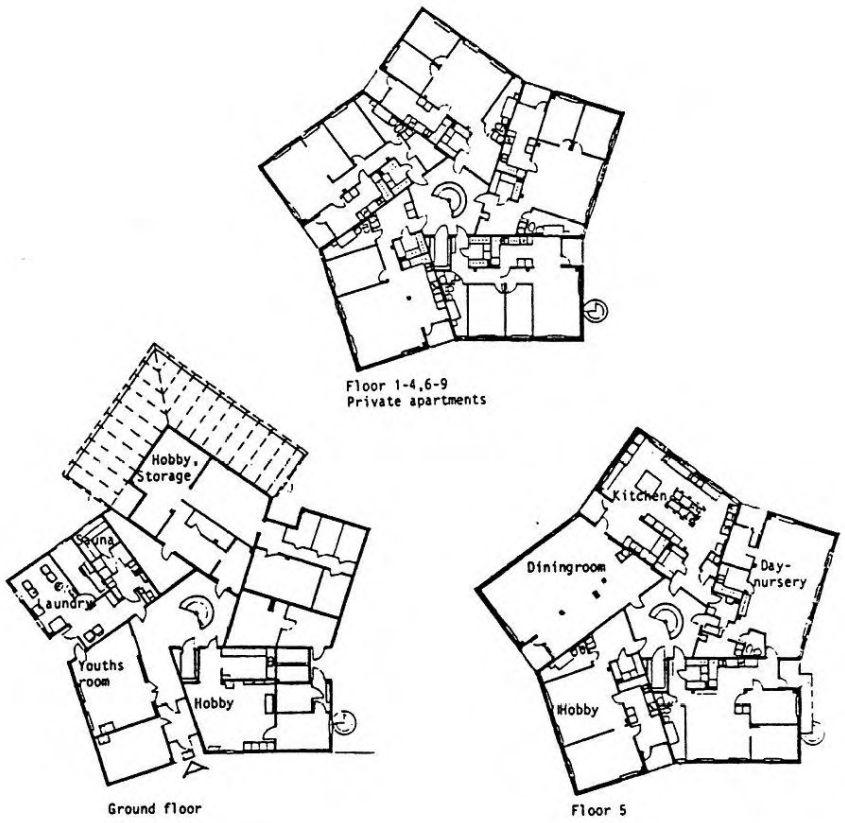


Figure 3.12. Floor plans of the first self-work collective house model *Stacken*, established in 1979 (Palm Lindén, 1992)

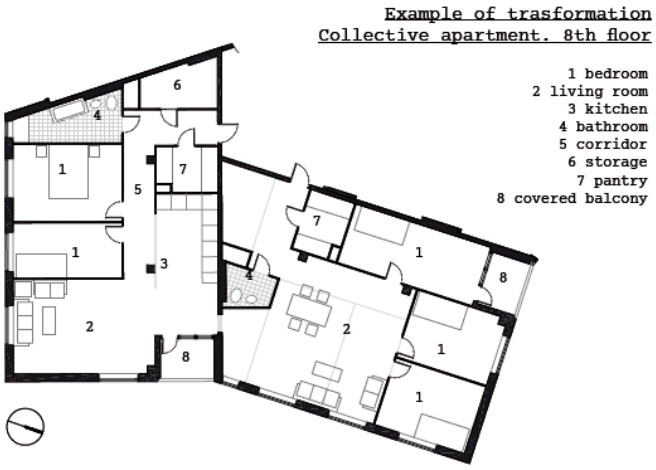


Figure 3.13. Plan of the two retrofitted apartment units in *Stacken* (https://www.plataformaarquitectura.cl/cl/925419/stacken-el-primer-modelo-de-cohousing-con-autogestion-trabajo-comunitario-y-feminismo-en-suecia)

3.3 General Characteristics of Cohousing

Cohousing communities are often established with the combination of *social capital* and *adequate incomes* (Droste, 2015). For the development of a cohousing community, "a cohesive group, common goals and a physical site" are essential (Ruiu, 2015, p. 633). Tummers (2015) describes cohousing as "an expression of contemporary citizenship [in which] citizens actively taking the housing and environment situation in their own hand" and states that cohousing residents share similar "ambitions" such as "[creating] a 'non anonymous' [neighborhood]; nonspeculative, affordable housing; energy-efficiency buildings and a reduced ecological footprint" (p. 65). Likewise, as stated by La Fond (n.d.),

> cohousing refers to self-organized, community-oriented, and sustainable housing. Ideally, these projects are integrating and inclusive, [nonspeculative] and open to the neighborhood. Often motivated by a search for ecological, affordable, and socially designed homes, cohousing supports collaborative and self-managed social architectures.

Moreover, according to Vestbro (2010b), throughout history, main objectives of cohousing communities have been

- to share responsibilities fairly between men and women,
- to promote collaboration between residents,
- to achieve a sense of community,
- and to facilitate access to shared amenities (p. 42).

Cohousing developments may differ from one another in terms of "size, location, [resident profile], type of ownership, design, and priorities, but share some of the same characteristics" (McCamant & Durrett, 1988; ScottHanson & ScottHanson, 2004; Vestbro, 2010a). Those defining characteristics can be listed as:

1) **Participatory Process:** Future residents take an active part in the development process (i.e., planning and design processes) of their communities. The final decisions are made as a group. As a result, participatory process inspires future inhabitants to get to know each other, helps them to *develop a sense of ownership* and *establishes the neighborly ties* (Brenton, 2008; McCamant & Durrett, 1988).

In addition, this type of collective process contributes to creating more *cost-effective* housing typologies (Brysch, 2018).

2) **Intentional Neighborhood Design:** It is intended for the physical design of cohousing to *foster a sense of community and belonging* by *facilitating neighborly interactions*. For this reason, *well-established connections between private and common spaces* are substantial (Cohen & Kerovuori, 2010; McCamant & Durrett, 1988).

3) **Extensive Common Facilities:** Easily accessible shared facilities are "an integral part" of cohousing. With practical and social benefits, they are designed to "supplement" individual dwellings on a daily basis (McCamant & Durrett, 1988, p. 38). These shared facilities can not only be comprised of a common house—with kitchen, dining hall and guest rooms—but also other common spaces such as a swimming pool, a tennis court, and an allotment garden. Moreover, extensive common facilities enable residents to live in *smaller homes* while "[functioning] as the heart of the community and [offering] many opportunities for social interaction" (Canadian Cohousing Network, 2022).

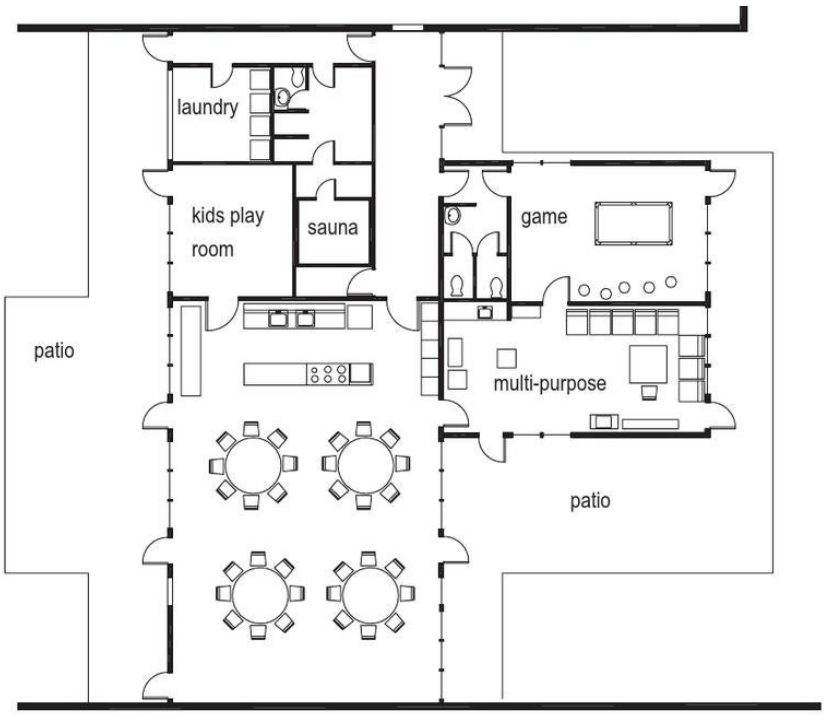


Figure 3.14. Common house plan of Sættedammen Cohousing (Kim, 2006)

4) **Resident Management (i.e., self-management):** Cohousing communities are mostly managed by residents through regular meetings. Residents have various responsibilities (e.g., maintenance, administration) and there is generally a *nonhierarchical structure* during *collective decision-making* (ScottHanson & ScottHanson, 2004).

5) **Separate Incomes:** Except for special cases, cohousing developments do not have shared income concept (ScottHanson & ScottHanson, 2004).

In summary, cohousing consists of individual (i.e., private residential units) and collective spaces (e.g., common house, workshop, laundry, shared kitchen, dining room) with "activities such as childcare and gardening" (Henley, 2013). Residents collaboratively manage these collective spaces (Jarvis et al., 2016). The collective spaces can be "semi-public" with shared services for the surrounding neighborhoods or can be exclusive for the cohousing community (Becker et al., 2015; Tummers, 2015). Homes can also be smaller and cheaper due to shared spaces (Henley, 2013).

Cohousing concept focuses on *communality rather individualism* (Henley, 2013). It aspires to create a sense of belonging and encourage social interaction while promoting a sustainable lifestyle (Jarvis, 2011; Ruiu, 2015; Tummers, 2015; Williams, 2005). Therefore, *social cohesion* is another driving factor for cohousing developments, and it is substantial for retired people and seniors with weak family ties or no family tie whatsoever. Members of senior cohousing communities are expected to support each other through ailments and other age-related difficulties (Egerö, 2010). Similarly, in an intergenerational community, seniors can help taking care of children while they receive aid from other members of the community to cope with age related difficulties (Henley, 2013).

Moreover, communal activities improve the social cohesion. To preserve neighborly ties, cohousing communities occasionally organize shared meals and can even grow their own produce together in some cases (Figs. 3.15. & 3.16.) (Chatterton, 2014; Jarvis et al., 2016).



Figure 3.15. Dinner at the common house of Trudeslund Community
(McCamant & Durrett, 1988)



Figure 3.16. Rooftop allotment of *Capitol Hill Urban Cohousing*
(https://bergerpartnership.com/work/capitol-hill-co-housing)

3.4 Spatial Organization of Cohousing

Cohousing communities can be formed in urban, suburban, or rural areas (e.g., ecovillages) (ScottHanson & ScottHanson, 2004; Tummers, 2015; Vestbro, 2010a). Based on the location, land size, and the residents' needs and economic resources, cohousing can generally be either formed as a low-rise terraced or clustered housing built around shared spaces (e.g., common house, workshop, allotment garden) or in an apartment block whereas shared spaces comprise one or multiple floors (Cohen & Kerovuori, 2010; Kähler, 2010; Palm Lindén, 1992).

Cohousing within multistory apartment blocks is usually located in dense urban areas while low-rise cluster (or terraced) cohousing is more common in suburban and rural areas (Ahn et al., 2018). In addition, tightly clustered units reduce the *development footprint* and thus lower costs (ScottHanson & ScottHanson, 2004). Low-rise cluster cohousing mostly varies in size from six to forty households (Henley, 2013; Jarvis, 2015). On the other hand, multistory blocks can accommodate more than fifty households (ArchDaily, 2015a).

Moreover, cohousing communities can consist of newly built or retrofitted units (Kozeny, 2005; Tummers, 2015). For instance, two of the early examples of self-work model collective housing, *Stacken* and *Trädet* communities in Sweden were formed by converting municipally owned buildings into cohousing in 1979 and 1983, respectively (Scheller & Thörn, 2019; Vestbro, 2010b). Similarly, *Jernstøberiet Cohousing* in Denmark was completed in 1983 by retrofitting an old iron foundry (Fig. 3.17.) (Kim, 2006). Another example for *retrofit cohousing* is *N Street Cohousing* in Davis, California (Fig. 3.18.) (Kozeny, 2005; Sanguinetti, 2015). Since 1986, *N Street Cohousing* community "grew gradually" by removing the fences between the houses and expanded to 19 households (N Street Cohousing, n.d.; Sanguinetti, 2015, p. 70).

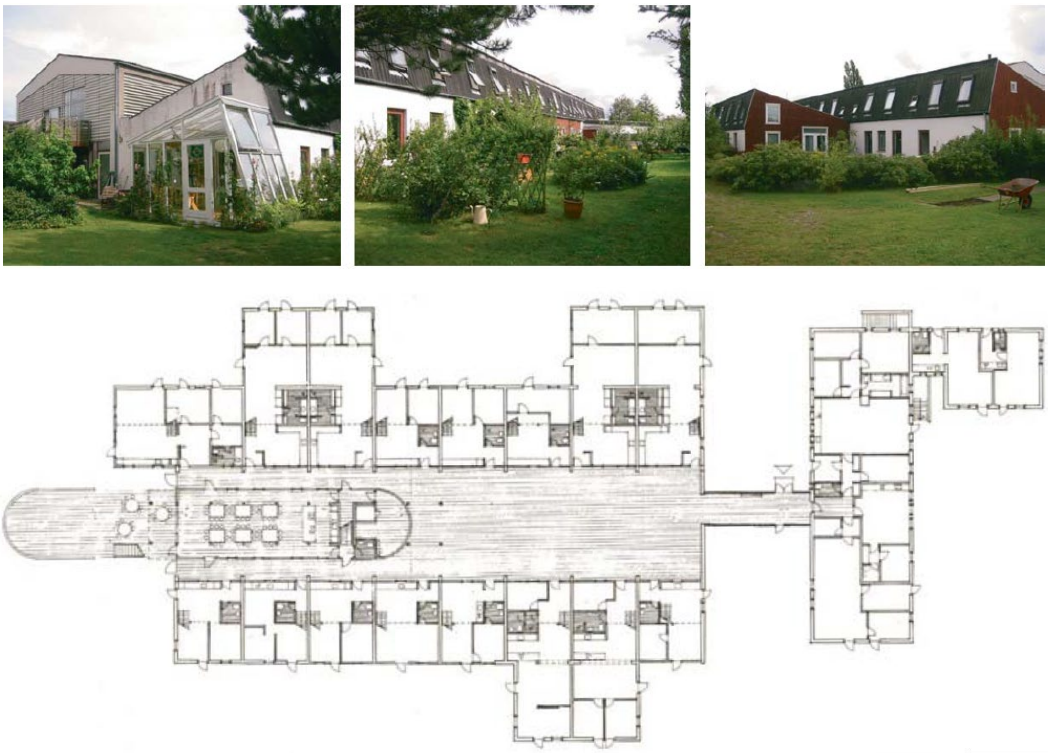


Figure 3.17. Exterior views and plan of Jernstøberiet Cohousing located in Roskilde, Denmark (https://www.schemataworkshop.com/passions-cohousing)



Figure 3.18. Site plan of N Street Cohousing in 2011 (Sanguinetti, 2015)

3.4.1 Relation Between the Common and Private Spaces

Optimization of private space is essential in maximizing shared spaces. To put it another way, individual spaces are reduced in accordance with optimum standards to have ample common spaces (Jarvis, 2011; Marckmann et al., 2012; Tummers, 2016). Spaces such as guest rooms, laundry, hobby rooms and workshops are located in shared spaces instead of taking up room in each individual unit. Consequently, this type of organization encourages residents to spend more time in shared spaces and facilitates social interaction between them (McCamant & Durrett, 1988; ScottHanson & ScottHanson, 2004).

Additionally, in cohousing projects, the connection of private units with shared spaces plays a pivotal role in uniting residents and enhancing the sense of community (Cohen & Kerovuori, 2010; Jarvis, 2015; Williams, 2005). For that reason, in low-rise cluster cohousing, common spaces (e.g., common house) are usually located in the center of housing units to maintain visual connection and to be easily accessible (Fig. 3.19.) (Cohen & Kerovuori, 2010; McCamant & Durrett, 1988).

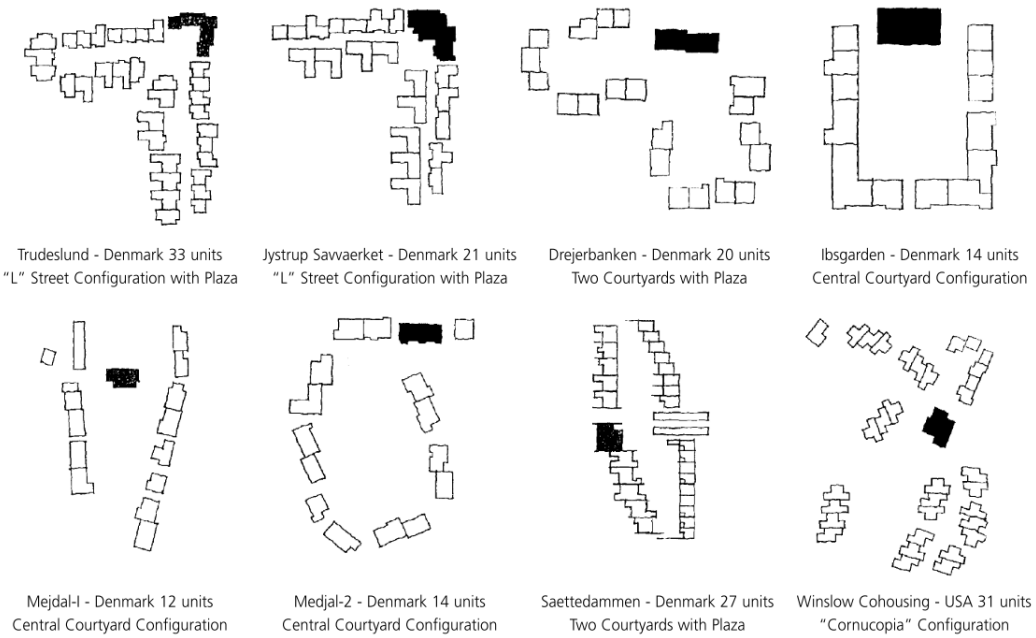


Figure 3.19. Various configurations of cohousing site plans in relation to the common house (ScottHanson & ScottHanson, 2004)

Moreover, Henley (2013) illustrates the impact of development size in cohousing as "big enough to make shared space viable, small enough for residents to know and trust each other". Therefore, in larger cohousing developments, the community "can be subdivided into smaller clusters" with separate common spaces to preserve intimacy (Fig. 3.20.) (McCamant & Durrett, 1988, p. 157).

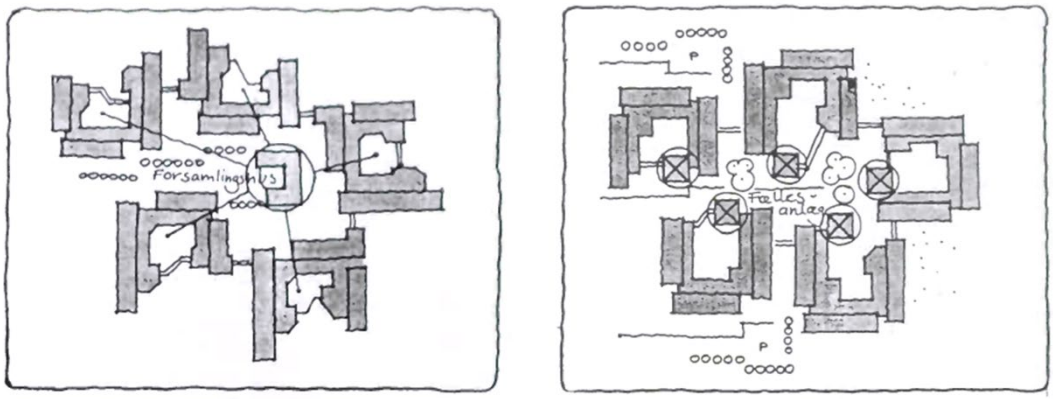


Figure 3.20. Smaller common houses for each cluster instead of a big one
(McCamant & Durrett, 1988)

In low-rise cluster cohousing, shared and private spaces are connected to each other through car-free streets and pedestrian pathways or "plazalike" courtyards (Fig. 3.21.) (McCamant & Durrett, 1988, p. 175).

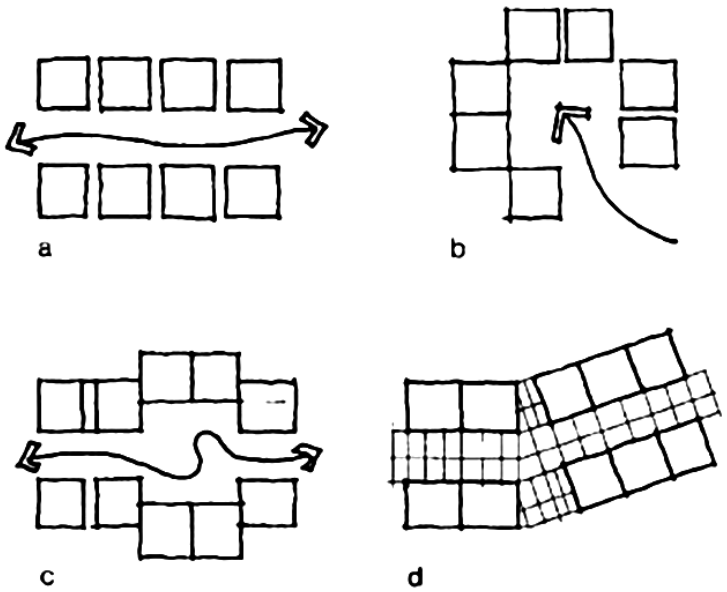


Figure 3.21. Different types of circulation in low-rise cohousing: a. pedestrian street, b. courtyard, c. combination of street and courtyard, d. glass-covered street (one building)
(McCamant & Durrett, 1988)

On the other hand, in cohousing consisting of apartment blocks, it is possible to encounter two types of connection to shared spaces: vertical and horizontal. Mainly, connection to the common spaces is established by means of vertical circulation. Besides, horizontal circulation systems such as galleries and corridors can connect private spaces to each other and to common spaces (Fig. 3.22.) (Palm Lindén, 1992).

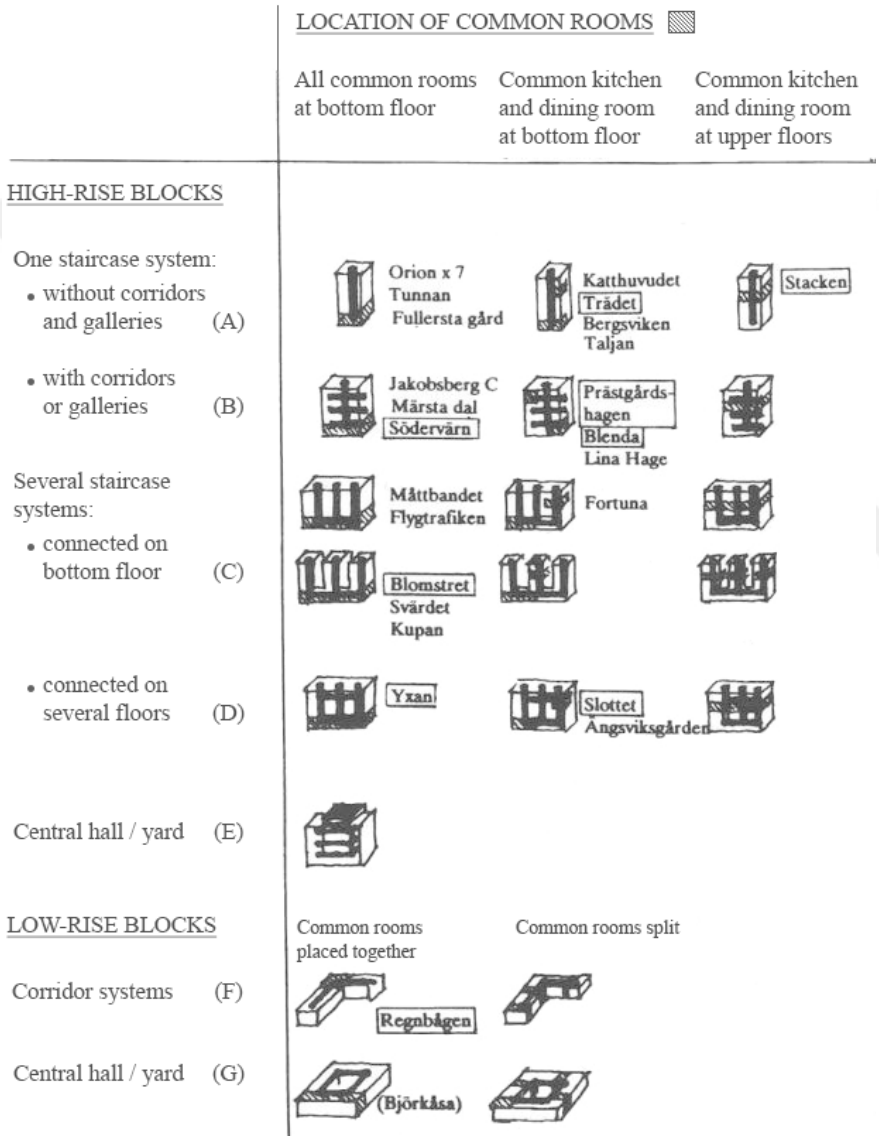


Figure 3.22. Location of common rooms and their connection to circulation systems in different building types (Palm Lindén, 1992)

In cohousing blocks, it is also important for the design of circulation areas as part of collective spaces to create an opportunity for social interaction between neighbors. For this reason, preserving the visual connection—through atriums or balconies that overlook the courtyard—is especially important (Fig. 3.23.) (Cohen & Kerovuori, 2010).

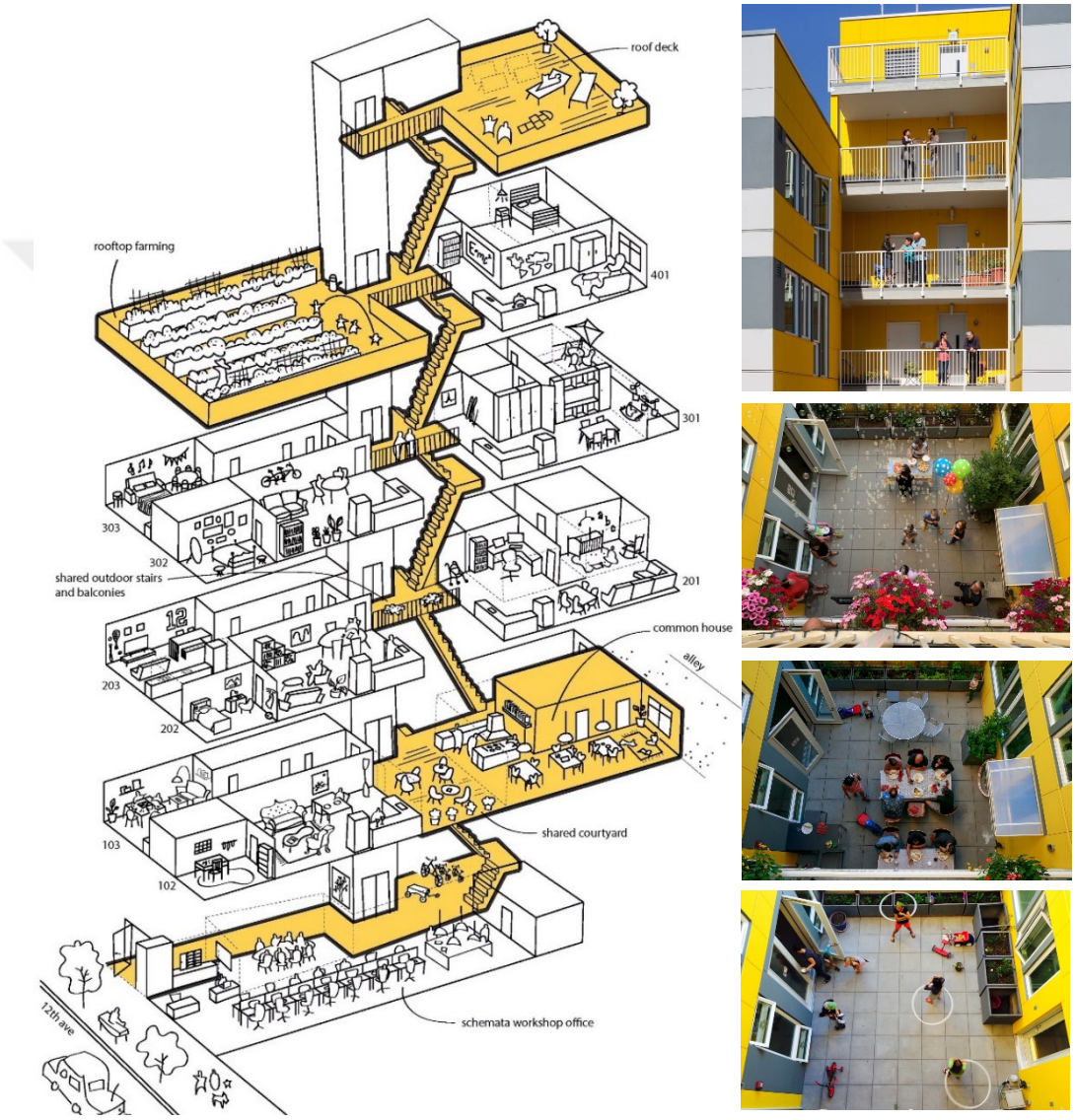


Figure 3.23. Diagram of Capitol Hill Urban Cohousing and view of outdoor balconies and the shared courtyard: Shared balconies encourage neighborly interactions while providing a view to different activities in the courtyard. (https://architizer.com/projects/capitol-hill-urban-cohousing)

3.5 Benefits of Cohousing

It is claimed that cohousing yields a wide range of benefits. Marckmann et al. (2012) suggest that cohousing encourages its residents to live a more sustainable lifestyle—socially, economically, and environmentally. Moreover, it is asserted that cohousing developments have the capacity to benefit their wider neighborhood and community (Droste, 2015; Hudson et al., 2019). On that ground, benefits of cohousing can be categorized into two groups: **benefits to residents** and **the wider community**.

3.5.1 Benefits to Residents

According to the existing literature, cohousing's benefits to its residents can be listed as follows:

1) **Increased social interaction:** Social interactions lie at the heart of cohousing. While the participatory process establishes the social ties between residents during the development phase, intentional community design yields better physical environments (e.g., shared facilities) for social interaction (Hudson et al., 2019). As the social ties enhance so does the sharing (Kim, 2017). For example, neighbors start borrowing tools from each other or carpool as they share the expenses. Moreover, this improves the sense of community.

2) **Mutual support:** Strong social ties foster mutual care among residents (Jarvis et al., 2016). In cohousing communities where neighbors know each other, they support one another by means of collaboration and "compassionate caring" (p. 9). For instance, through social networks and interdependent living, cohousing helps retirees "combat loneliness after professional life" (Kähler, 2010; Tummers, 2015, p. 66). Similarly, residents share chores or help each other in childcare (Henley, 2013; Tummers, 2015).

3) **Improved quality of life and well-being:** A good social network is an important factor in promoting health and quality of life. According to medical studies,

social isolation increases the risk of premature death—especially in older people (Kim, 2017; Rico-Uribe et al., 2018). On the other hand, with social support, sense of community and sense of security, cohousing yields "psychosocial health benefits" to its community members (Carrere et al., 2020, p. 26). Since cohousing communities can be beneficial in preventing social isolation, they can improve the quality of life and the well-being of their residents. In other words, cohousing can help coping with loneliness and thus taking the first step in living longer and happier (Carrere et al., 2020; Kim, 2017). This also results in an improvement of residents' *social and physical resilience* (Jarvis et al., 2016).

4) **High degree of agency:** Since most of the cohousing residents organize and manage their communities themselves (i.e., self-organization and self-management), they have a *higher degree of agency* in comparison to conventional housing residents (Hudson et al., 2019). Consequently, this increases their sense of belonging and ownership (Jarvis, 2015; McCamant & Durrett, 1988).

5) **Resource efficiency:** Compared to conventional speculative owner-occupied housing, cohousing can yield better results both economically and ecologically. The notion of sharing resources and facilities—which is intrinsic to cohousing—can effectively reduce daily living expenses as well as minimizing households' carbon footprint (Hudson et al., 2019; Jarvis et al., 2016; Williams, 2008). According to Williams (2008), cohousing residents save up to 31 percent on space, 57 percent on electricity and 8 percent on goods. For instance, due to shared laundry facilities, residents do not need to have washing machines and tumble driers at their homes (Williams, 2008). Similarly, collective sustainable behavior (e.g., cross ventilation, reuse) can lead to a reduction in energy use which also ensures lower utility costs (Jarvis et al., 2016).

3.5.2 Benefits to Wider Community

In terms of sustainable and inclusive urban development, cohousing also has a significant potential (Droste, 2015). In other words, the cohousing concept generates benefits not only to its inhabitants but also to the wider population if applied correctly within socially inclusive urban development. It enhances the *resilience* of cities. Therefore, it can also have a strategic role in urban and housing policies (Droste, 2015). On this basis, cohousing's benefits to wider community can be listed as:

1) **Provision of affordable housing to local housing stock:** Achieving housing affordability is one of the goals of most cohousing communities. Through different financial and tenure schemes as well as subsidies, either entirety or some part of cohousing developments can include affordable housing[10] units (Hudson et al., 2019).

2) **Provision of spaces and amenities for the local community:** Many cohousing developments actively interact with the surrounding communities. This interaction can be realized by the inclusion of public spaces (e.g., social and cultural facilities) in the projects or simply by "inviting local residents to use their resources (e.g., opening their gardens to the community or hosting a children's nursery in the cohouse)" (Droste, 2015; Hudson et al., 2019, p. 4). Similarly, in England, *Bridport Cohousing* is planning to provide housing and parking spaces for the adjoining hospital staff. Moreover, purposefully designed cohousing communities "can enhance their [neighborhoods] visually and contribute to a sense of place" (Hudson et al., 2019, p. 5).

3) **Engagement in civil society and neighborhood social life:** According to Berggren (2017), cohousing residents are more engaged in civil society and politics than conventional housing residents. Moreover, cohousing communities reach out the wider community by including "people from outside" in their

[10] Cohousing's relation to affordable housing is explored in detail in section 3.6.

common activities and by “participating in [neighborhood] social life” (Ruiu, 2016, pp. 410-411).

4) **Lowering demand for public services:** Since cohousing enhances the well-being and health of its residents, it has the capacity to ease some of the burden on social welfare providers when it is successfully integrated into strategic housing policies (Droste, 2015; Hudson et al., 2019). Similarly, cohousing projects can share the load of public housing sector by providing affordable units.

5) **Mitigation of climate change and promotion of environmental sustainability:** Hagbert (2019) describes environmental sustainability concept in cohousing as “a way of both ensuring a more resource-efficient residential design and as part of promoting a pro-environmental lifestyle within the building itself” (p. 184). Therefore, it is asserted that cohousing has a lower ecological impact in contrast to conventional housing (Chatterton, 2013). For instance, sharing spaces and resources reduces private consumption, thus ecological footprint of each cohousing resident (Hagbert, 2019).

   Moreover, cohousing communities are more willing to opt for sustainable and experimental technologies (e.g., PV panels, composting toilets) (Marckmann et al., 2012). Also, it is possible for community members to encourage each other for more sustainable everyday practices (e.g., recycling) (Hagbert, 2019). As a result, cohousing residents are different from conventional housing residents as “co-actors rather than merely responsible consumers” since they are more engaged, pro-active and have potential to be pioneers in topics such as sustainable living (Hagbert, 2019, p. 197).

3.6 Cohousing's Relation to Affordable Housing

The re-emergence of the cohousing concept in recent years is particularly related to the idea of tackling the ongoing affordable housing crisis (Brysch, 2018; Czischke, 2018; Jarvis, 2011). Correspondingly, Droste (2015) states that cohousing introduces people to *economically secure homeownership* while providing a modern lifestyle. Additionally, Egerö (2010) draws attention to "the economy of collective living" in cohousing which refers to "[cutting] cost by sharing things, by collective meals [and] by energy-saving collective devices" (p. 17). According to Brysch (2018), collectively designed cohousing creates more *cost-effective* housing typologies. Similarly, Simon Henley (2013) summarizes cohousing development process, and its cost-effective nature as follows:

> The process involves finding a group of like-minded folks, searching for a site and funding the design and construction, but against a backdrop of rising house prices and with little choice on the market, this model enables people to shape their homes and build a community—on a budget.

Furthermore, as *an alternative to conventional housing*, cohousing has the potential to help tackling the commodification of housing (Rico-Uribe et al., 2018). More importantly, today's cohousing initiatives are also "challenging the notion of property" with *alternative tenure models* that "[grant] access to housing" without speculation (Brysch, 2018).

Based upon the existing literature, factors that reduce cohousing costs and make cohousing an affordable housing alternative can be investigated in five categories: ***participatory process***, ***shared spaces***, ***shared resources***, ***self-management*** and ***alternative tenure models***.

3.6.1 Participatory Process

Cohousing model can pave a new way "of financing homeownership" by allowing residents to participate in the design and development process (Cutieru, 2021). Especially with the participatory design process, residents can set their priorities

according to their budget. In the participatory process, future residents collectively develop the project to provide an affordable housing with “an adequate layout” that corresponds to their needs (Brysch, 2018). In order to reduce costs, this type of collective development involves “collective decisions” about the design such as “spatial configuration, use of space (individual and shared space), circulation and accesses, materials, energy efficiency/environmental standards, levels of comfort and finishing” (Brysch, 2018).

3.6.2 Shared Spaces

Reducing private space (i.e., space optimization) to have shared spaces in cohousing is another factor in reducing building costs. In cohousing, reducing the size of each private unit—by 10 percent in Swedish collective housing—enables the equal distribution of the cost of shared spaces among residents, thus allowing for common spaces such as “communal kitchens, dining/living rooms, workshops and playrooms” without bringing additional costs (Cohen & Kerovuori, 2010, p. 143).

For instance, instead of designing a guest room in each private unit, guest rooms can be designed inside the common house where residents could book the rooms in advance for their guests (ArchDaily, 2019; Cohen & Kerovuori, 2010). Similarly, in student cohousing, instead of including a private bathroom and a kitchen in each unit, shared bathroom and kitchen can help reduce the floor area, thus housing costs.

3.6.3 Shared Resources

Besides shared facilities, shared resources can contribute to achieving affordability (Jarvis et al., 2016). Canadian Cohousing Network (2022) describes cohousing’s influence on the cost of living and, consequently, on affordability as follows:

> An aspect not often considered when looking at affordability is the cost of living. Because of the social structure and easy access to shared resources, cohousing homes provide opportunities for reducing living costs that are not available in conventional neighborhoods. The homes can be smaller

without negatively impacting lifestyle and the sharing reduces consumption. As a result, cohousing contributes to the affordable housing continuum.

Similarly, Winter and Durrett (2013) assert that cohousing is inherently an affordable model since "limiting resource consumption by sharing resources" help residents save money to pay for housing costs (i.e., utilities and food). This type of sharing can range from sharing household appliances and tools to collective meals and even carpooling. According to a survey of 200 cohousing residents, it was possible for a household to save at least 200 USD per month. For some households, monthly savings were more than 2.000 USD. Moreover, it can even be possible for the residents to earn money by selling electricity back to the grid with the aid of photovoltaic panels as in the case of *Nevada City Cohousing* (Winter & Durrett, 2013).

3.6.4 Self-management

Residents' self-management (i.e., *self-governance*, *autonomy*) is another factor that influences costs in cohousing. In Sweden, as a self-governing nonprofit cohousing cooperative, *Stacken* community organizes monthly meetings in which administrative decisions, maintenance responsibilities and the community's economy (e.g., rent) are discussed. As one of the results, the community keeps rents at affordable rates without relying "on changes in national and local housing policies" (Scheller & Thörn, 2019, pp. 101-102). In addition, to become more energy efficient, Stacken is committed to retrofit the building to passive house standards[11] without a rent increase. Therefore, photovoltaic panels are installed on the exterior of the building (i.e., façade and roof) (Fig. 3.24.). As a result, the building's energy consumption (i.e., heating and electricity), and thus residents' utility bills are

[11] One-third of this energy-efficiency renovation is funded by nongovernmental and public organizations, since it could serve as a model for future renovation projects (Hagbert, 2019; Scheller & Thörn, 2019).

lowered. Moreover, it is even possible for the community to sell energy back to the grid since the building produces more energy than it uses (Scheller & Thörn, 2019).



Figure 3.24. Before and after the installation of *building-integrated photovoltaics* (BIPV) (https://www.stacken.org/passivhusprojektet)

Having said that, there are also cohousing communities—mostly new buildings—in Sweden which struggle to keep the rents and property prices at affordable rates because of insufficient support from responsible parties (i.e., lack of subsidies from authorities) and inflated land prices. For that reason, local authorities (e.g., *Gothenburg Municipality*) have started to introduce certain rules to control the increases in land prices (Scheller & Thörn, 2019). Moreover, Gothenburg Municipality is considering giving municipally owned housing to cohousing cooperatives while "reducing rents in exchange for handing over maintenance responsibilities under a model of self-governance" (Scheller & Thörn, 2019, p. 100).

Similarly, the Danish *SocialHousing Plus* (*AlmenBolig+*) scheme relies on *resident self-management* concept as one of the strategies to reduce housing costs. This means that residents are responsible for the operation of shared areas and most parts of the

building instead of a staff from a housing organization (Jensen & Stensgaard, 2017). Alongside practical tasks (i.e., maintenance), residents also have administrative tasks such as holding meetings and accounting. That being said, different than the case of Stacken, it is not possible to mention complete autonomy in this scheme. *Copenhagen Social Housing Association* (*KAB*) annually reviews the buildings' conditions and operation expenses to guarantee the sustainability of the concept. Additionally, participating in practical and administrative tasks is a requirement for the residents (i.e., tenants) while "free riders" can face fines or termination of their leases. As a result, self-management concept constitutes 19 percent of total savings. Furthermore, with other strategies, total savings ensure a reduction of 21 percent in rent when compared to newly built conventional social housing in the same area (Jensen & Stensgaard, 2017).



Figure 3.25. One of the first examples of SocialHousing Plus scheme in Dortheavej, Copenhagen (https://www.kab-selvbetjening.dk/Ansoger/Bolig-praesentation/1801)

3.6.5 Alternative Tenure Models

Forms of ownership (i.e., housing tenure) also play a significant role in accessing affordable housing (Larsen, 2019c). It is claimed that *owner-occupied* cohousing promotes the commodification of housing and land, thus making cohousing affordable just for a small group of people (Larsen, 2019b). Consequently, there are remarks about cohousing's risks of generating inequalities, homogeneity, exclusion (e.g., gentrification) and becoming an enclave for "the relatively privileged" (e.g., gated community) (Droste, 2015; Larsen, 2019b, p. 34; Williams, 2008).

However, *partnerships with housing associations* (chiefly social and nonprofit housing associations) and *alternative tenure models* can help achieve affordable cohousing, thus lead to more heterogenous communities instead of risking being "exclusive" (Larsen, 2019b; Ruiu, 2015). In other words, favoring alternative models of housing tenure in cohousing (e.g., cooperative, community land trust, shared equity, co-ownership) rather than private homeownership—which promotes commodification—also contributes to *achieving affordability* and creating *more diverse communities* (Larsen, 2019b).

The Danish *Andel* (share) model is a good example of an alternative tenure form. It is a *cooperative* housing model in which "the property is owned collectively". Cooperative members purchase a share and pay monthly fees to gain access to a housing unit. Most importantly, share prices are "regulated by law rather than the market" (Larsen, 2019b, p. 29). As a result, housing affordability is maintained over the long term.

Moreover, Larsen (2019c) stresses the importance of public housing sector to achieve affordability within cohousing projects as follows:

> The greatest potential for affordable cohousing today lies in the sector of nonprofit public housing, because apart from not having to take out a mortgage or purchase a share, as in owner-occupied housing or housing cooperatives, residents in public housing can also receive public housing benefits (p. 1363).

Similarly, in England, there are cohousing communities that keep the housing prices at affordable rates by using *self-building* processes, offering *mixed tenure models*, and partnering with housing associations (Ruiu, 2015). In *the Threshold Centre* cohousing where 50 percent of units are reserved for social housing, "residents can be owners (shareholders), renters, and co-owners (they own a part of their house and pay an affordable rent to [housing association] for the remaining portion)" (Ruiu, 2015, p. 636).



Figure 3.26. The Threshold Centre was formed by renovating an existing farm site (Ruiu, 2015). (http://brugestozer.co.uk/projects/threshold)

To put it another way, inclusive tenure models such as cooperative and "rental housing in [nonprofit] housing associations" pave the way for ownership in cohousing (Thörn et al., 2019, p. 13). Furthermore, alternative models such as cooperative tenure allow residents to develop, organize and manage their own properties and they are more affordable than owner-occupancy (Larsen, 2019c). Therefore, "tenure forms must be accorded greater attention if cohousing is to develop into a wider and more accessible housing alternative" (Larsen, 2019c, p. 1365).

There are also arguments regarding cohousing's **high capital costs**. As stated by Kozeny (2005), "based on analysis of completed projects, the average cohousing development costs at least as much as conventional developments, and in some cases as much as 10 to 20 percent more" (Kozeny, 2005). Similarly, Canadian Cohousing Network (2022) argues that

> the cohousing development process does not of itself generate below market priced homes. Although the development process does not include profit if the resident group is the developer. [The] homes are often of higher quality with more green-built features then conventional housing. This makes them less costly to maintain and operate but does contribute to higher construction costs.

However, in terms of life cycle cost, "the savings in energy, maintenance costs, and food outweigh the apparent up-front costs" (Winter & Durrett, 2013). For example, upgrading the lighting system in Winslow Cohousing community cost 15.000 USD but in the long term the community saved approximately 5.000 USD per year (ScottHanson & ScottHanson, 2004).

Moreover, financing, land acquisition, legal processes and planning can be burdensome for cohousing initiatives (Jarvis et al., 2016). For that reason, subsidizing cohousing projects ("in the form of grants or low-interest loans from public agencies or charitable organizations" on the condition that the projects "include a certain percentage of affordable units") as well as implementation of different payment schemes and tenure models can alleviate the economic burden (Kozeny, 2005, p. 80).

CHAPTER 4

CASE STUDIES

In the following section, to better illustrate the impact of cost-effective strategies and the cohousing concept in affordable housing provision, four exemplary cohousing projects are explored. The cases are identified and studied through a literature survey and personal communications with relevant persons—namely architects. The criteria used to select the cases are

- to be a recently completed cohousing project (after 2010)
- to have affordability as one of the project's goals
- and to have a participatory design process.

Based upon the literature review—regarding affordable housing strategies and cohousing—and the analytical framework of Brysch and Czischke[12], the cases are investigated by asking the following questions:

1) *How was the project initiated?*
2) *How was the project financed?*
3) *What type of housing tenure model is being used?*
4) *How did the participatory process influence the project?*
5) *What type of strategies were used to reduce the construction costs?*
6) *Did the project opt out for an alternative construction method to reduce costs?*
7) *What type of strategies were used to lower house running costs?*
8) *What are the outcomes of the cost-effective decisions?*

[12] For more information, see Brysch, S. L., & Czischke, D. (2021). Affordability through design: the role of building costs in collaborative housing, *Housing Studies*.

4.1 La Borda

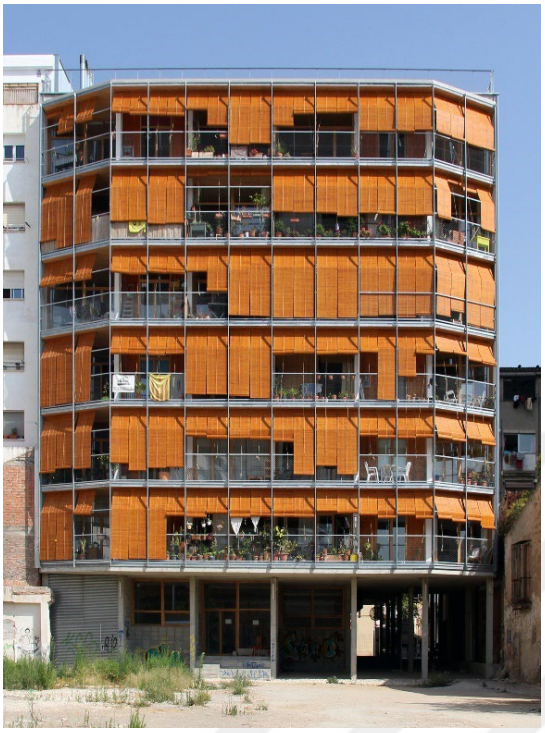


Figure 4.1. La Borda Cohousing (Lacol, 2019)

Location: Barcelona, Spain

Initiation: 2012

Completion: 2018

Architects: Lacol

Residential units: 28

Total area: 3000 m^2

Tenure model: Cooperative

Construction system: Concrete first floor & CLT

La Borda is a cohousing project developed by a cooperative formed by the future residents (Brysch, 2018). In other words, according to the *Lacol* architecture cooperative, La Borda housing cooperative is "a development self-organized by its users to access decent, non-speculative housing that places its use value in the center, through a collective structure" (Lacol, 2019). Located in the former industrial site of *Can Batlló*, in Barcelona, it is the tallest timber building in Spain (Brysch, 2018).

Initiation of the development

In search of an alternative housing, La Borda was conceived in 2012 as part of the social movement to recuperate Can Battló (*Recuperem Can Batlló*)—in order to retrofit the abandoned industrial area for "self-managed functions and activities" instead of the municipality's high-end housing and park proposal (Larsen, 2019a, p. 84) (Fig. 4.2.). Afterwards, in 2014, the residents formed a cooperative and started

collaborating with a local architects' cooperative, Lacol for the design of La Borda (Brysch, 2018; Cabré & Andrés, 2018). Initially, the resident cooperative described their goals as follows:

> We…aim to meet the need to access socially, economically and environmentally sustainable living spaces, while bypassing the conventional real estate market. For us it is essential to generate forms of collective property that put the focus on the effective use of living space, rather than its exchange value in the capitalist market. At the same time, we want to promote more communal forms of living, that facilitate the interrelationship between neighbors and the division of housework and care needs through communal spaces (as cited in Larsen, 2019a, p. 74).

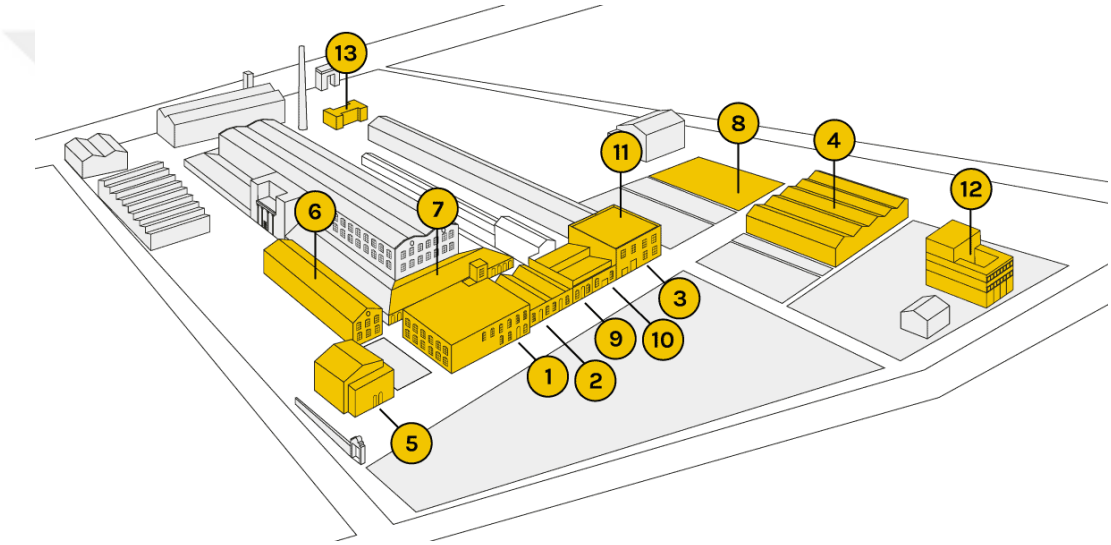


Figure 4.2. Projects of the Can Battló movement: 1. BlocOnze, 2. community kitchen, 3. graphic arts studio and brewery, 4. vehicle workshop, warehouse and multipurpose space, 5. Masia Palleria, 6. Bloc 2, 7. Bloc Central, 8. allotment, 9. workshops, 10. carpentry workshop, 11. documentation center, 12. *La Borda*, 13. canteen (https://canbatllo.org/can-batllo)

During the development process, there were also challenges regarding contractual issues (e.g., insurance of the timber building structure) and construction requirements (Brysch, 2018). For instance, at the time, the construction of parking lots was obligatory even though the project was planning to be car-free. However, after several negotiations, La Borda dissuaded the authorities from including a parking lot in the project (Kafka, 2020). This also resulted in a modification of car park regulations for new buildings in order to promote sustainable mobility. Due to these challenges, *La Dinamo Foundation* was established to "[develop] a replicable

model" as a facilitator for the planning and construction processes of ongoing and future affordable [cohousing] projects (Brysch, 2018). Additionally, the foundation intends to promote the non-speculative housing cooperative model "as an alternative to conventional housing models" (Larsen, 2019a, p. 82).

Financing and tenure

In terms of financing, each household "[contributed] with an initial share of 18.000 EUR to guarantee the feasibility of the project" and collaborated with a cooperative bank (*Coop57*) besides receiving grants (Brysch, 2018; Kafka, 2020). The project's tenure model was developed after the Danish cooperative model, *Andel*. In this *non-speculative* model (i.e., *grant of use* or *cession of use* model), the residents (i.e., cooperative members) gain access to housing by the virtue of monthly payments to the housing cooperative, unlike the conventional private ownership or rental models (Brysch, 2018; Cabré & Andrés, 2018; Larsen, 2019a). Similarly, the land is owned by the municipality and leased to the cooperative for 75 years—as a means of ensuring long-term affordability.

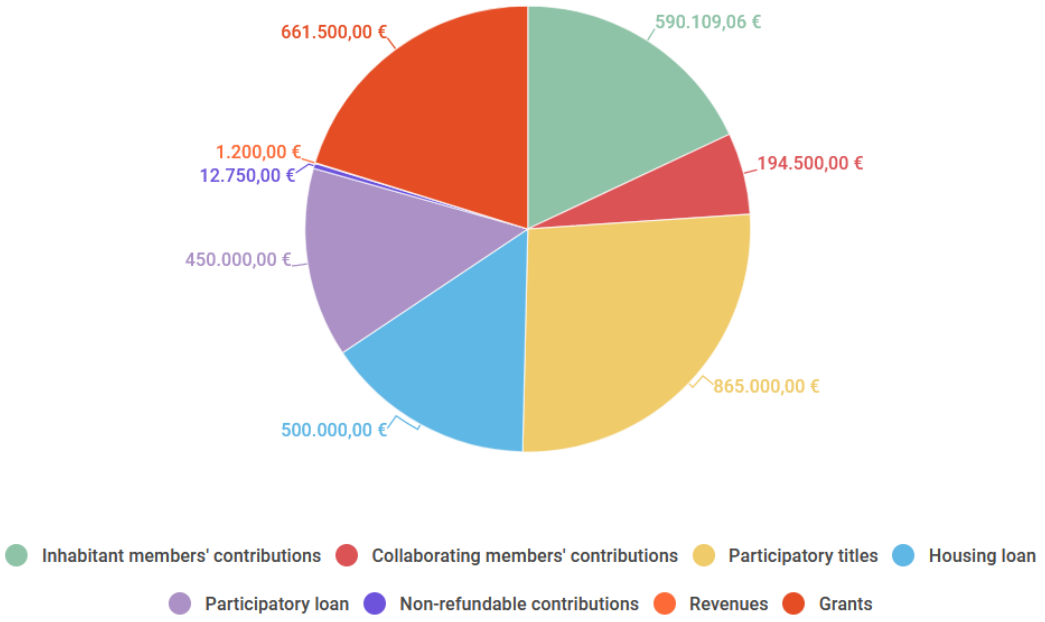


Figure 4.3. Funding distribution of the project
(http://www.laborda.coop/en/project/funding-structure)

Participatory process

As necessitated by the participatory process (i.e., *collective decision-making*), there were monthly gatherings (i.e., general assembly) attended by multiple commissions consisting of architecture, shared-living, communication, legal, administration, economy and funding commissions, and a coordination board (Brysch, 2018). The project was "collectively designed" by the residents under the guidance of the architects—as the design experts—in accordance with the construction and legal requirements (Brysch, 2018). In terms of energy consumption, architects also

> interviewed the future residents to gain a detailed understanding of their individual energy usage and needs, while increasing their collective awareness of energy poverty and the climatic performance of different buildings and materials (Kafka, 2020).



Figure 4.4. General assembly of La Borda and a presentation for the residents (Brysch, 2019; Lacol, 2016)



Figure 4.5. Participatory design process of La Borda (Lacol, 2015; 2016)

Design

The building program consists of 28 residential units alongside a commercial space and "community spaces" such as laundry, multipurpose space, kitchen/dining area, bicycle parking space, roof terrace and guest rooms (Kafka, 2020; Lacol, 2019). La Borda successfully adopts cohousing's idea of reducing private area in order to maximize common spaces while preserving the balance between private and communal. One of the residents describes this as follows:

> To live with less in your individual space and to live with more at a collective level, for me it is an advantage. Also, I think that, although we have small spaces, La Borda allows you a very good balance between the private and the collective. You are not forced one way or the other. You have both: you have your level of intimacy and you have your level of community (as cited in Brysch, 2018).

The private units and the common spaces interconnect through a central courtyard, inspired by the *corrala*—a common typology in central and southern parts of Spain (Lacol, 2019). Covered with a polycarbonate roof, the central courtyard serves as a greenhouse for passive heating and cooling (Kafka, 2020).



Figure 4.6. Views from the central courtyard (L'IMHAB, n.d.; Valdecantos, n.d.)



Figure 4.7. Ground floor and first floor plan with common spaces highlighted in yellow (Brysch, 2019)

In terms of unit size, there are fundamentally 3 different types: a small unit of 40 m^2 (typology 'S'), a medium unit of 60 m^2 (typology 'M') and a large unit of 75 m^2 (typology 'L') (Brysch, 2018; Lacol, 2019).



Figure 4.8. Typologies S, M and L
(http://www.laborda.coop/en/project/architectural-project)

The layouts of the private units are based on the individual decisions of the households, open to change "as a continuous process" (Fig. 4.9.) (Brysch, 2018). This means that the units are flexible to change in size for future household adaptations in compliance with the required minimum standards. For that reason, there are "empty" spaces in the building for "potential dwelling expansions" based upon the incremental housing concept (Brysch, 2018) For instance, units ('M' and 'L') can be combined together, thus resulting in a bigger unit of 135 m^2 (typology 'XL') (urbanNext, n.d.).

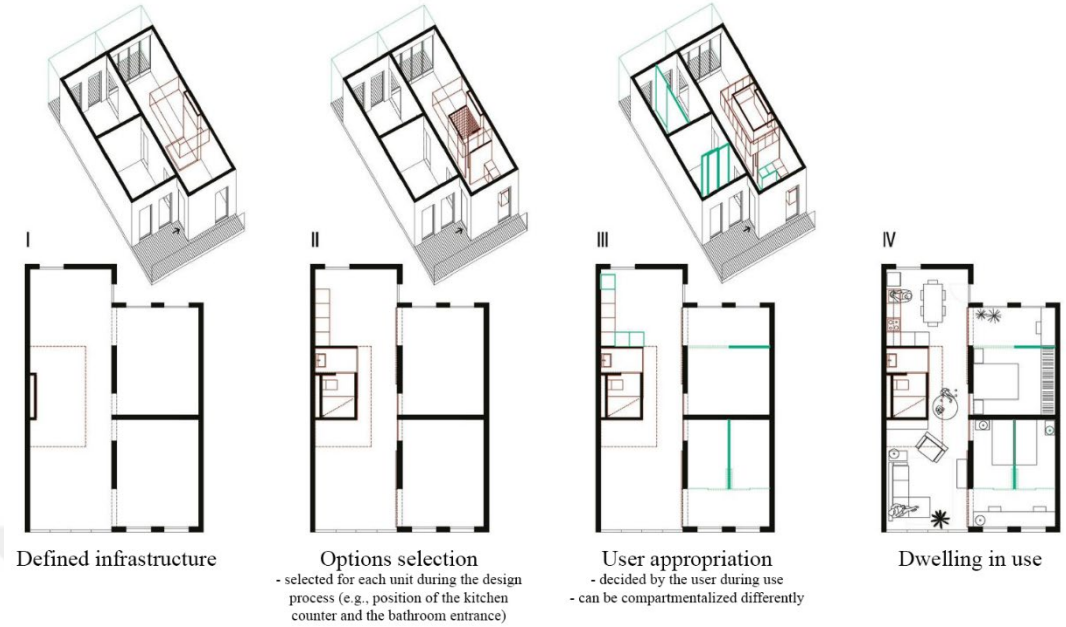


Figure 4.9. Individual layout decisions (https://arquitecturaviva.com/works/lacol-arquitectura-cooperativa-la-borda-28-en-barcelona-zs6o2-1)



Figure 4.10. Interiors of different units and the view from the balcony
(Chopo, 2019; Lacol, 2019; L'IMHAB, n.d.; Miralpeix, 2018; Valdecantos, n.d.)

Cost-effective decisions

In order to reduce both short-term (i.e., construction) and long-term costs (i.e., maintenance, utilities), and thus creating a more affordable housing, certain collective decisions were taken (Brysch, 2018). These decisions are as follows:

1) **Environmental sustainability:** The aim was to reduce "the ecological footprint" of the building as well as the construction costs and "long-term energy consumption" (Brysch, 2018). Accordingly, timber was selected as the structural material. Besides its low carbon footprint and minimal construction waste, the use of cross-laminated timber (CLT) had a positive effect on the construction speed as well (Kafka, 2020). Structural designer Miguel Nevado states that for "the construction, all that was needed were six lorryloads, carrying a total of 500 CLT panels with a volume of 720m³—approximately 350 [tons] of timber—and 150,000 screws" (Kafka, 2020). Consequently, on-site assembly of the structure "lasted just over a month".

   Moreover, due to its lightweight and slender form, CLT "[reduced] the volume of the [concrete] foundations, the insulation on façades [and] the number of internal walls" while eliminating "the need for internal cladding or suspended ceilings" (Kafka, 2020). Overall, despite being an expensive material, the selection of CLT resulted in a cost reduction of approximately 20 percent compared to concrete (Brysch, 2018).

   Additionally, with the implementation of passive house principles, the building's ecological footprint was 70 percent smaller in comparison to similar housing (Fig. 4.12.) (Brysch, 2018). Similarly, eliminating the underground parking lot reduced the CO_2 emissions of the building—between 500 and 800 tons over the next 75 years—as well as the construction costs (Kafka, 2020). Furthermore, with the installation of photovoltaic panels on the roof in 2020, the building now generates 30 percent of its energy consumption (Kafka, 2020).

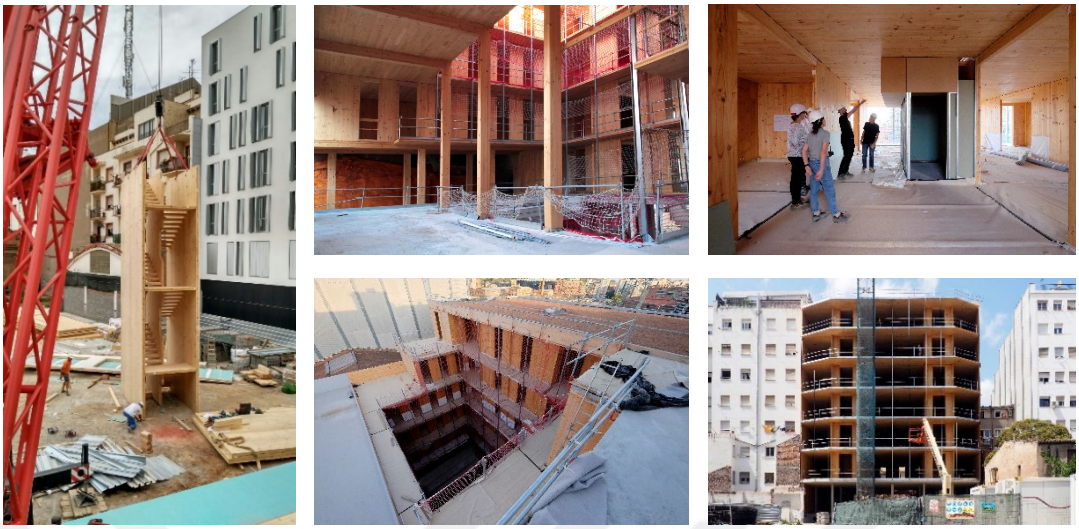


Figure 4.11. Photos from the construction (Lacol, 2017)

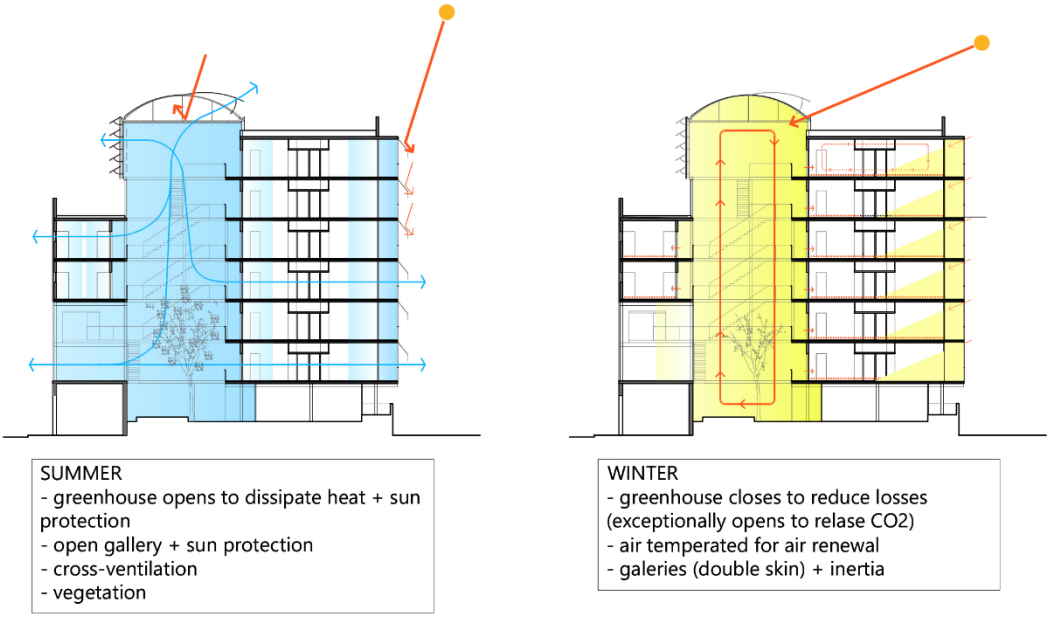


Figure 4.12. Passive house scheme of La Borda (Lacol, 2019)

2) **Collective purchase of services and goods:** Collectively buying services and goods "ranging from electricity to kitchen appliances" resulted in lower overall costs. For example, by sharing a single energy meter (which results in a single invoice), residents saved up to 40 percent on the taxes of electricity bills (Brysch, 2018).

3) **Collective intervention in individual decisions:** "To reduce the energy consumption of the building and, consequently, the monthly bill", collective decisions were made in topics such as "opening the windows" for "the right time to ventilate" (i.e., *cross ventilation*) (Brysch, 2018).

4) **Shared spaces and facilities:** In order to save space and money, the building has a multipurpose space, a common laundry and a large common kitchen (Fig. 4.13.) (Brysch, 2018; Kafka, 2020). Moreover, instead of overcrowding their private units, creating additional storage spaces for shared tools and cleaning appliances in each floor is in consideration of the residents (Brysch, 2018). In a similar collaborative spirit, residents also started "to exchange furniture between them" to reduce waste and save money (Brysch, 2018).

In addition to these decisions, the cooperative is also preparing a guide for "the correct use and maintenance of the building" (both for individual and shared spaces), regarding the self-management of La Borda (Brysch, 2018).



Figure 4.13. Multipurpose space, laundry and common kitchen/dining area (Lacol, 2019; http://www.laborda.coop/en/project/life-in-common)

As a result of the collective decision, most of the surfaces were left unfinished to be completed by the residents "upon their arrival, through **self-building** and **DIY** [(**do-it-yourself**)] processes" (Brysch, 2018). Consequently, to finish the common and individual spaces, workshops were regularly held by a "self-building" group of residents.

> For instance, the wooden leftovers from the construction site [were] recycled and reused in the floor of the common kitchen. In addition, some residents with expertise in building techniques [created] specific workshops to help the residents to finish their individual units. In these sessions, they [gave] instructions on how to assemble the kitchen modules, how to do an electric installation, and how to build an interior wall, among others (Brysch, 2018).

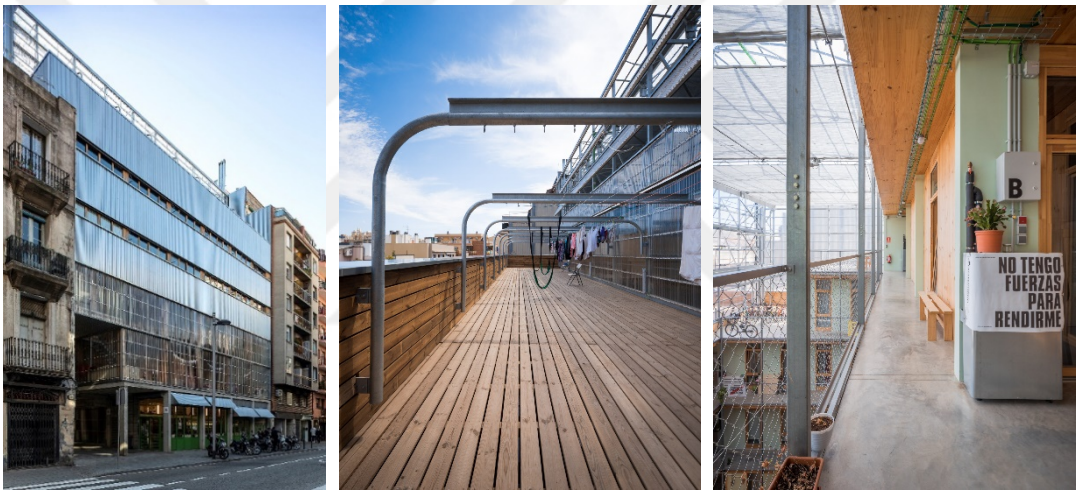


Figure 4.14. The view of La Borda from the street, rooftop terrace and entrance of a unit (Akazawa, 2021; Miralles, 2019)

In consequence of shared resources, collective decisions towards reducing costs and energy efficiency, residents pay approximately 20 percent less for rent in comparison to "the local private-sector average" (Kafka, 2020). All in all, with its alternative and innovative approaches to affordable housing production (e.g., *self-building*, *DIY*), La Borda plays a pivotal role in "inspiring and encouraging" upcoming projects (Brysch, 2018).

4.2 Spreefeld Berlin



Figure 4.15. Spreefeld Cohousing (fatkoehl architekten, n.d.)

Location: Berlin, Germany

Initiation: 2007

Completion: 2014

Architects: BARarchitekten, carpaneto architekten, fatkoehl architekten

Residential units: 65

Total area: 10000 m^2

Tenure model: Owner-occupancy & cooperative

Construction system: Concrete frame & timber infill

Located next to the Spree River in Berlin's Mitte neighborhood—adjoining Kreuzberg—Spreefeld Cohousing is a mixed-use "cooperative development for affordable housing" (fatkoehl architekten, n.d.; PLANE-SITE, 2016a). It was designed by three architecture offices: *BARarchitekten*, *carpaneto architekten* and *fatkoehl architekten*. LaFond et al. (2021) describe Spreefeld Berlin as a "[school] for urban democracy where people are able to learn how to participate and understand how a better life can be achieved together" (p. 200).

Initiation of the development

Spreefeld Berlin's conception is closely linked to the activist movement called *Mediaspree Versenken* (Stop the Spree Media Complex) (National Custom and Self Build Association [NaCSBA], n.d.). The project was initiated in 2007 as an alternative to the office buildings proposal of Mediaspree in order to keep the Spree

riverbank open for public use (Becker et al., 2015). Following the initiation of Spreefeld Berlin by a group of architects—namely *Christian Schöningh*, *Die Zusammenarbeiter*—and "private individuals" in June 2007, the formation of a cooperative from an intergenerational resident group with various sociocultural backgrounds started in four months (BARarchitekten, n.d.; Becker et al., 2015). Social and ecological sustainability were some of the main drivers of the project (LaFond et al., 2021). Moreover, the project's initial goals included low-cost building, elimination of wasted space and being affordable for low-income groups (ArchDaily, 2015a). In the earlier stages of the development, Spreefeld Cooperative also established an initiative called *Spreeacker* (Spree Acres) to develop the landscape around the project area with the local community while offering cultural and educational projects (LaFond et al., 2021).

Financing and tenure

The project was privately financed. 40 percent of the funding consisted of capital assets (Becker et al., 2015). The resident group also applied for a low-interest passive house loan from Umweltbank (Becker et al., 2015; J. Patzak-Poor, personal communication, July 3, 2022). Similarly, as a self-organized project, the cooperative purchased the land from the federal government without any external financing (LaFond et al., 2021). The plot was secured with an *option agreement* on the open market while the price was kept stable for 18 months (Becker et al., 2015). Within that period, the necessary negotiations and planning agreements were conducted.

Although Spreefeld Berlin is originally structured as a cooperative, it has a mixed tenure model: owner-occupancy and cooperative (J. Patzak-Poor, personal communication, July 3, 2022). Jürgen Patzak-Poor of BARarchitekten explains the reason behind this as follows:

> Those who had put in a lot of money in the beginning did not want to abstain from their right of ownership [which means] to be able to sell and profit from the risen value of the flat…Thus, in the end, the project is split between homeowners and a cooperative.

Participatory process

The resident group was involved in the development of the project "from an early stage, with focus on the design of the communal aspects rather than individual interests" (Becker et al., 2015). That being said, there were different opinions regarding residential units (J. Patzak-Poor, personal communication, July 3, 2022). Since the resident group comprised people with various income levels, some of the residents demanded cheap cluster flats whereas the others asked for big balconies in their units. Moreover, for the design meetings, the architects prepared floor plan catalogues from which the residents "[chose] a particular type of flat" based upon their demands (e.g., type of bathrooms, size of rooms, position of windows) (J. Patzak-Poor, personal communication, July 3, 2022). Correspondingly, layouts of the residential units are different from one another.

In terms of self-management, the Spreefeld community—consisting of residents from various socioeconomic backgrounds—organizes monthly meetings as well as biannual general assemblies for collective decision-making (LaFond et al., 2021).

Design

Spreefeld Berlin comprises 65 residential units within three seven-story apartment blocks (Becker et al., 2015; Hofer, 2019). The project's design was realized by the collaboration of three architecture offices. Each office designed a block: BARarchitekten (House 1), fatkoehl architekten (House 2) and carpaneto architekten (House 3) (ArchDaily, 2015a; Hofer, 2019). Although each block's design belongs to a different architecture office, each office "[followed] common design principles" (Becker et al., 2015, p. 169). The project's design concept was formed around the idea of "[making] the external areas and ground floor open to the public" in exchange for "[providing the residents] spacious terraces as communal outdoor spaces over and above the apartment balconies" (Becker et al., 2015, p. 169).

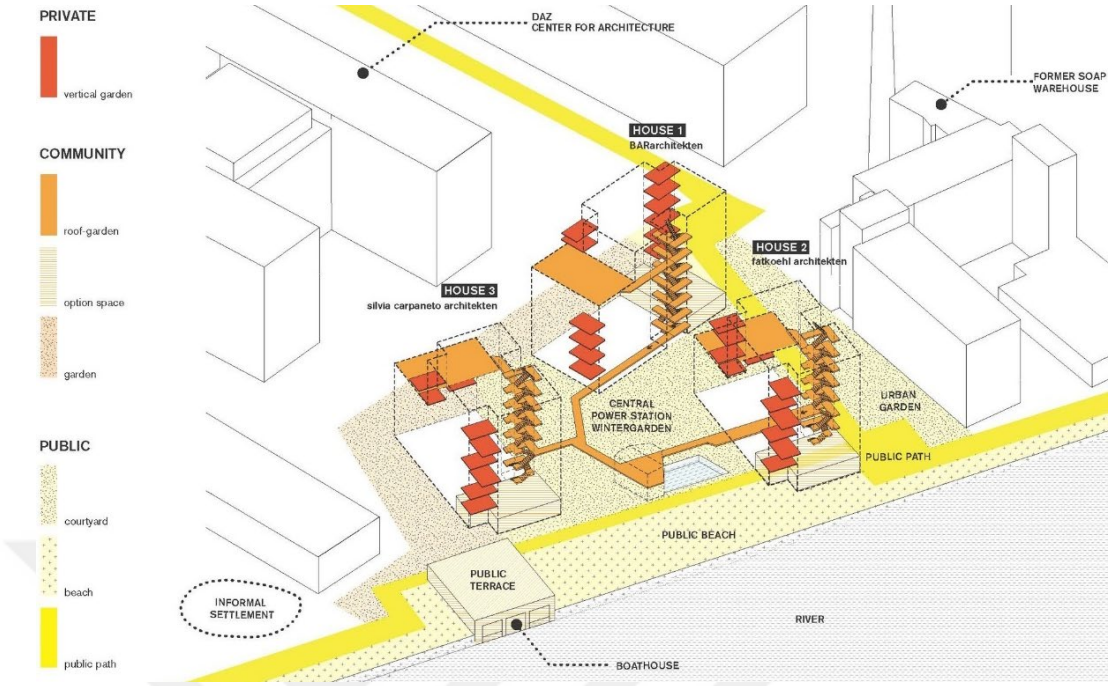


Figure 4.16. Concept diagram of Spreefeld Berlin (ArchDaily, 2015a)



Figure 4.17. Roof terraces and balconies of Spreefeld Berlin (fatkoehl architekten, n.d.)

At the ground level, the project includes shared spaces such as day care, carpentry workshop, communal laundry, catering community kitchen, commercial spaces (i.e., studios and co-working spaces) and double-height *option rooms* (i.e., multipurpose rooms) (ArchDaily, 2015a; BARarchitekten, n.d.; Hofer, 2019; LaFond et al., 2021). There is also an old boathouse in the project area—dating back to the Cold War era as part of the Berlin Wall construction—which is now being used for events (LaFond et al., 2021; PLANE-SITE, 2016a). These common spaces not only serve the cohousing community but also serve the surrounding neighborhoods (PLANE-SITE, 2016a).

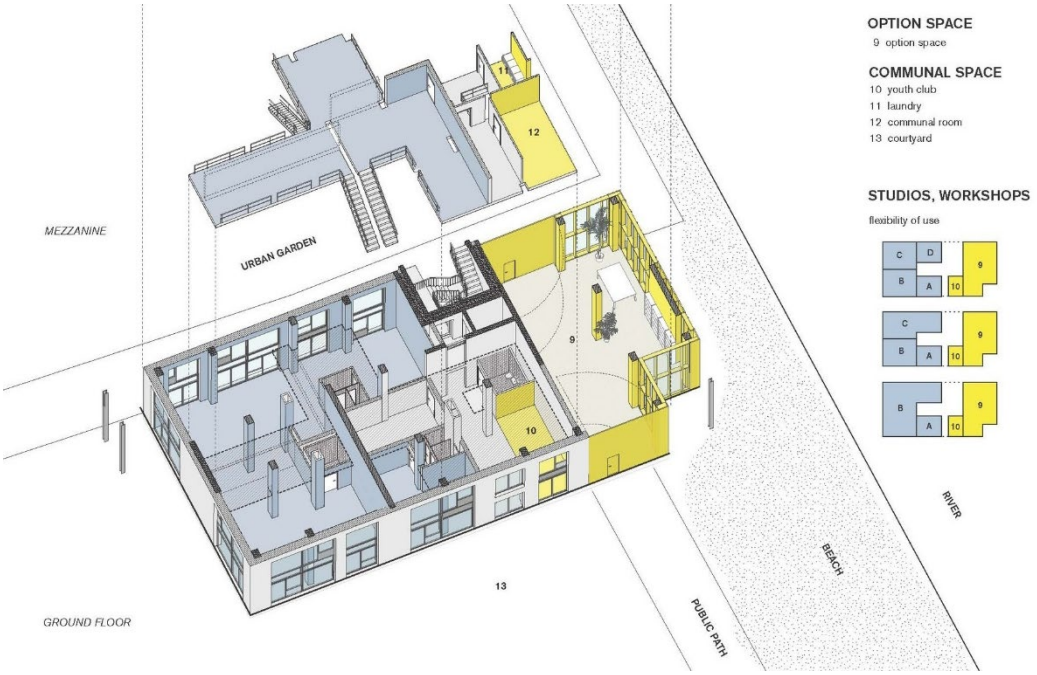


Figure 4.18. Ground and mezzanine floor diagram of House 2 with common spaces (ArchDaily, 2015a)



Figure 4.19. Interiors of the carpentry workshop and the boathouse (ArchDaily, 2015a)

The use of option rooms is decided by the general assembly (Hofer, 2019). Correspondingly, the cooperative rents out the option rooms for various activities (e.g., workshops, meetings, meals, yoga, acrobatics and dance classes) from 7 a.m. to 10 p.m. (LaFond et al., 2021; Spreefeld, n.d.). Moreover, commercial spaces are flexible; thus, their layouts can be changed in parallel with the requirements (ArchDaily, 2015a).



Figure 4.20. Interiors of Option Room 2 and 3 (Spreefeld, n.d.)

Furthermore, the project has an edible landscape (i.e., allotments) which was developed in collaboration with Spreeacker (LaFond et al., 2021). Consequently, with its shared spaces, Spreefeld Berlin adds value to the neighborhood and enhances the ties between the residents and adjoining communities (J. Patzak-Poor, personal communication, July 3, 2022).



Figure 4.21. Edible landscape of Spreefeld Berlin
(Creative Arts and Industries - the University of Auckland, 2019)

The project consists of various residential typologies. In addition to standard private residential units, there are also cluster apartments (private units) with communal spaces (i.e., large kitchen, living room, bathroom, and shared terrace) in each block (ArchDaily, 2015a; LaFond et al., 2021; NaCSBA, n.d.). For instance, Christian Schöningh—one of the initiators and architects of Spreefeld Berlin—lives in a small one room unit within the cluster apartments (PLANE-SITE, 2016a).



Figure 4.22. Cluster apartment diagram of House 2 (ArchDaily, 2015a)



Figure 4.23. Section drawing A of Spreefeld Berlin (ArchDaily, 2015a)

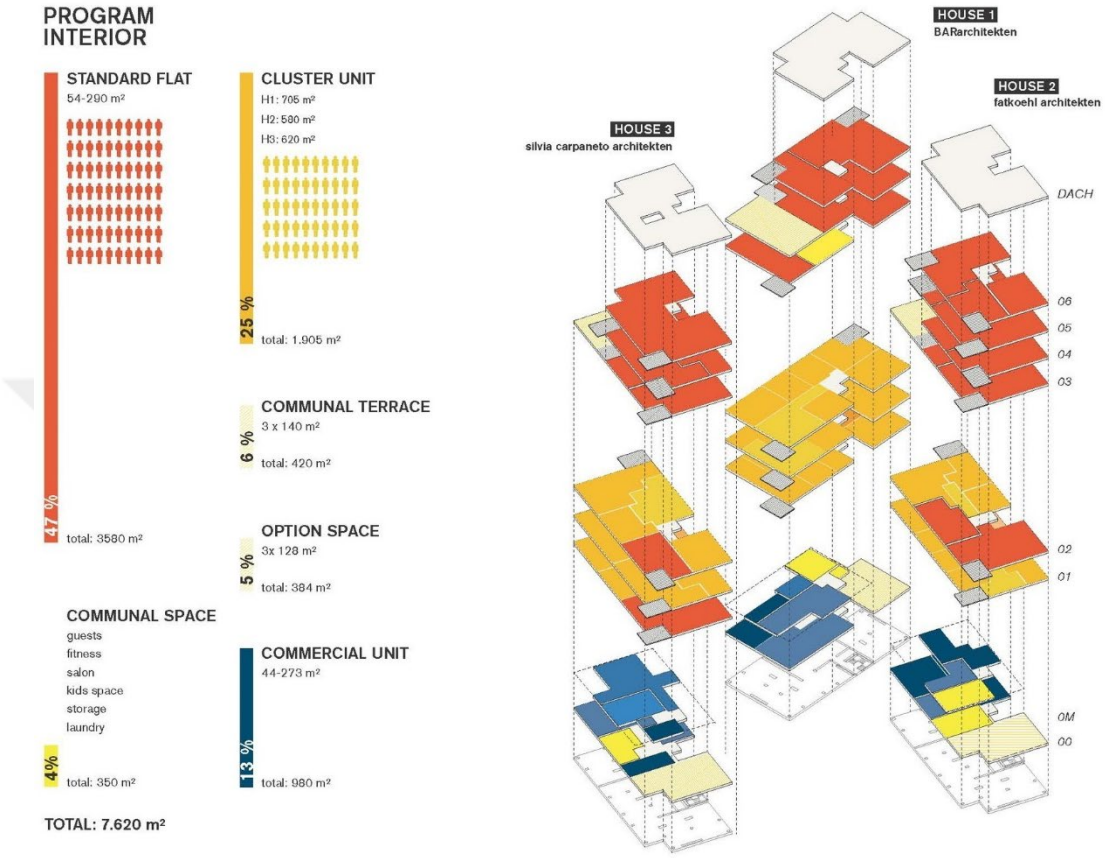


Figure 4.24. Program diagram of the apartment blocks (ArchDaily, 2015a)



Figure 4.25. Section drawing B of Spreefeld Berlin (ArchDaily, 2015a)

Cost-effective decisions

In order to reduce construction costs, a hybrid system was selected: simple concrete skeleton with timber infill (J. Patzak-Poor, personal communication, July 3, 2022). "[All three] buildings share a common structural system and a box of standardized elements that allows a high degree of flexibility" (BARarchitekten, n.d.). Due to its environmental sustainability, wood was also used for the balcony floors (ArchDaily, 2015a). To eliminate wasted space, circulation systems were minimized. Similarly, to save space and reduce costs, "a simple modular design" was preferred (NaCSBA, n.d.). Additionally, key elements such as windows were bulk purchased. Overall, simple finishes were preferred for the building (Becker et al., 2015). Correspondingly, uniform fixtures and fittings were "sparingly used in the apartments" (ArchDaily, 2015a). However, apartment interiors can be customized based on the residents' needs and financial capabilities during their life cycle (J. Patzak-Poor, personal communication, July 3, 2022).

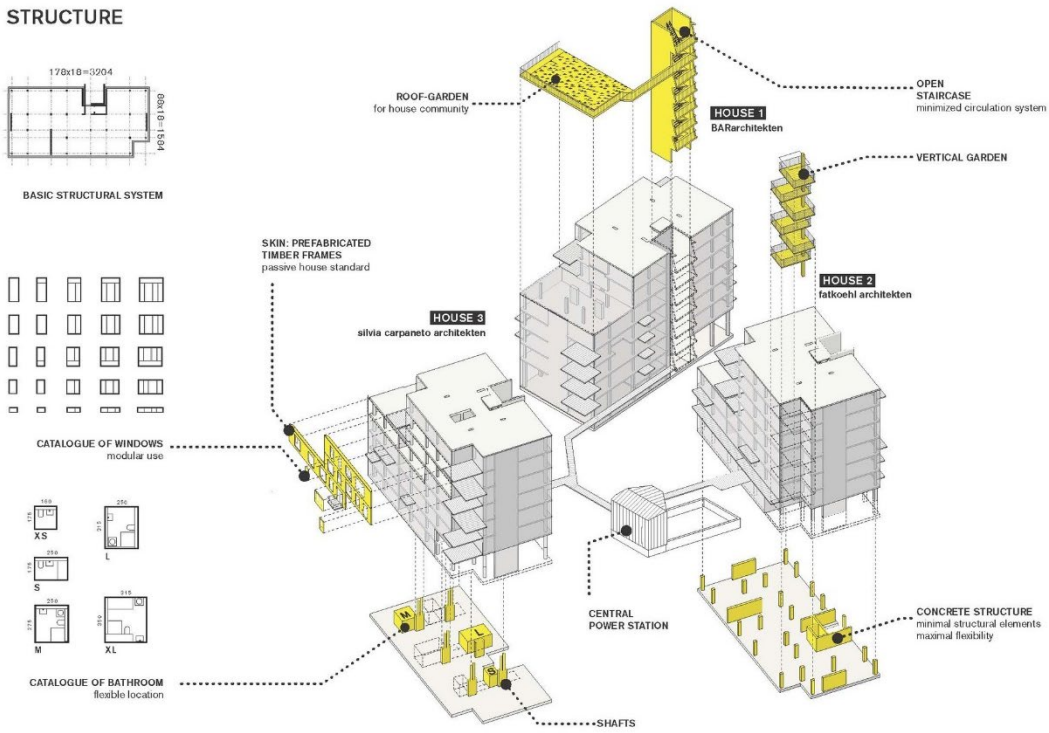


Figure 4.26. Structure diagram (ArchDaily, 2015a)

In addition to the implementation of passive house standards, Spreefeld Berlin also features a cogeneration unit, a geothermal system and photovoltaic panels to generate its own energy (ArchDaily, 2015a). Maintaining the big green space and not building a parking lot, and thus becoming car-free also contributed to cost reductions since the Berlin municipality does not require the construction of parking lots for housing developments (Creative Arts and Industries - the University of Auckland, 2019).

As a result of the cost-effective decisions, the project's housing units are three times cheaper—2.100 EUR per square meter—in comparison to similar sized flats in private developments nearby (Becker et al., 2015; National Custom and Self Build Association [NaCSBA], n.d.). Similarly, even though Spreefeld Berlin does not receive any subsidy, rents start at the same level as government subsidized housing (ArchDaily, 2015a). In addition, two apartments are provided to refugees (LaFond et al., 2021). Consequently, the low-income residents of Spreefeld Berlin can afford to live in the city center.



Figure 4.27. Photos from Spreefeld Berlin (fatkoehl architekten, n.d.)

4.3 R50 Cohousing



Figure 4.28. R50 Cohousing (ArchDaily, 2015b)

Location: Berlin, Germany

Initiation: 2010

Completion: 2013

Architects: Heide & von Beckerath, ifau und Jesko Fezer

Residential units: 19

Total area: 2780 m^2

Tenure model: Owner-occupancy & collectively owned shared areas

Construction system: Concrete frame & timber infill

R50 Cohousing is a resident funded *Baugruppe* (building group) development led by architects (Bridger, 2015). The project is located in Berlin's Kreuzberg neighborhood at Ritterstrasse 50—hence the name, R50—surrounded by postwar housing (Anderton, 2015b; ArchDaily, 2015b). It was both developed and designed by the future residents and the architects, namely *Heide & von Beckerath* and *ifau und Jesko Fezer*. Two of the project's architects, Jesko Fezer and cofounder of ifau, Christoph Schmidt are also residents at R50 (Anderton, 2015a; Bridger 2015).

Initiation of the development

As a response to Berlin's affordable housing shortage, the project's residents chose to "act as developers of their own [housing]" alongside architects rather than collaborating with profit-driven developers in a conventional development (Bridger, 2015; Cutieru, 2021; J. Jürgensen, personal communication, July 20, 2022).

Consequently, in 2010, the architects initiated the project and placed advertisements on related websites as well as making contact through social networks to gather prospective residents (Anderton, 2015a; Becker et al., 2015). Subsequently, a core group was formed within three months (Becker et al., 2015).

Financing and tenure

The project was privately financed by the residents (Becker et al., 2015). The resident group applied for a loan from the same bank, Nürnberg's UmweltBank and 25 percent of each household budget was used for the common spaces (Becker et al., 2015; Royal College of Art [RCA], 2018).

The plot was purchased for a fixed price through a concept-based tender organized by the Berlin municipality (Becker et al., 2015). The municipality "[offered] the land to [the Baugruppe] in a bidding process based not on price but on the quality of their residential concept" and kept the land price stable while residents and architects continued to raise funds (Anderton, 2015b). This process was pivotal to building affordably. Moreover, only half of the future residents were part of the building group when they bid for the land (RCA, 2018). Christoph Schmidt of ifau expresses that the number of the building group members—which guaranteed a loan from a bank—was as influential as the design proposal during the application process for the plot since there were other architecture offices with less building group members (RCA, 2018). For this reason, Heide von Beckerath stresses the importance of forming a building group before land acquisition (Anderton, 2015a).

The Baugruppe model combines the private ownership of residential units with the collective ownership of common areas (Cutieru, 2021). Since the residential units are privately owned, it is possible to sell them for profit. Unlike the cooperative model, there is no approval process of the prospective residents nor a resale price limit (Anderton, 2015b). However, residents of R50 are relying on a manifesto "based on trust" to prevent negative outcomes.

Participatory process

Architects held around 45 meetings with the core group while searching for more residents during the process. There were meetings every two weeks over one and a half years (Anderton, 2015a). During these meetings, common areas were collectively designed whereas apartment interiors were individually designed based upon the residents' needs (RCA, 2018). As a result, apartment layouts (i.e., location of the rooms, room numbers and sizes) are different from one another (Becker et al., 2015).

Initially, architects proposed a concept involving smaller shared areas (20 m^2) on each floor but during the meetings it was decided to have a bigger common area (i.e., multipurpose space) at the ground floor since the residents also wanted their units to be as big as possible (PLANE-SITE, 2016b; RCA, 2018).

Design

With an attic and a basement, the project comprises eight floors (Becker et al., 2015). It has 19 private residential units alongside a double-height multipurpose space with a guest room (130 m^2), a laundry room (14 m^2), a workshop (10 m^2), a roof terrace with summer kitchen (40 m^2), perimeter galleries (i.e., wraparound balconies) (483 m^2) and a garden (1480 m^2) as shared spaces (ArchDaily, 2015b; Becker et al., 2015; Bridger, 2015). Located at the basement/ground level, the multipurpose space "connects the building's main access with the public street space" (ArchDaily, 2015b). By contract, it is also provided to the neighborhood and various organizations once a month (RCA, 2018). Additionally, the building has an open floor plan with one circulation and two service cores (ArchDaily, 2015b; RCA, 2018).

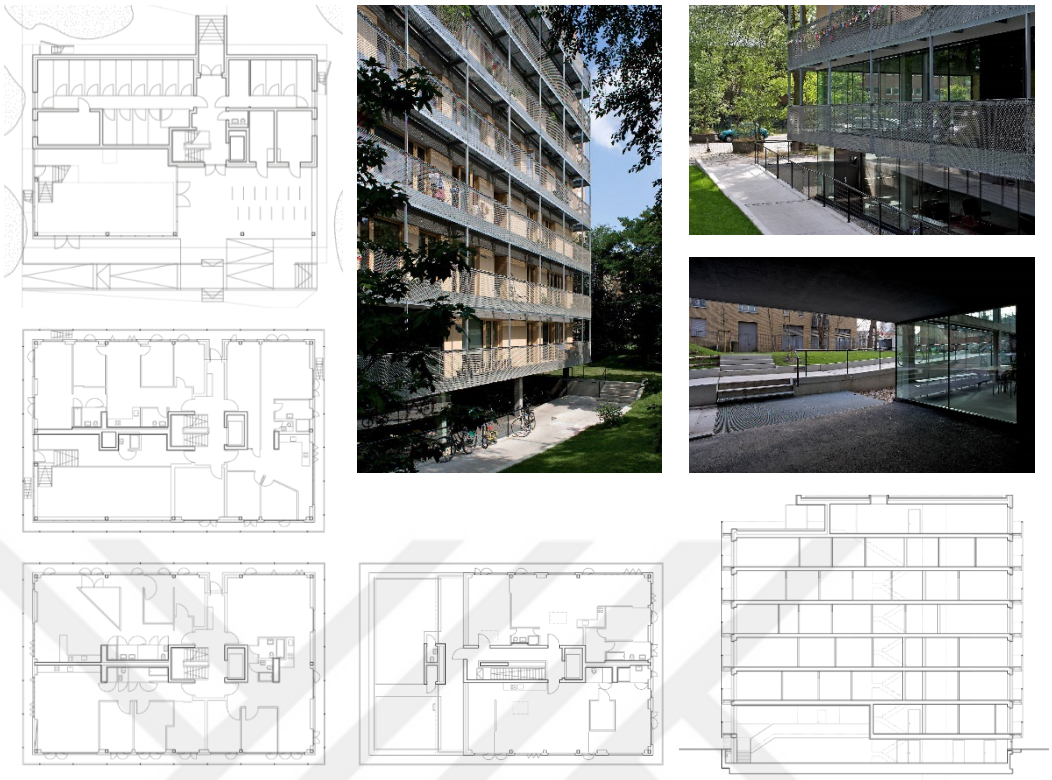


Figure 4.29. Floor plans (ground, 1., 6. and roof level), section and photos from the entrance of R50 (https://heidevonbeckerath.com/single/r50-cohousing)

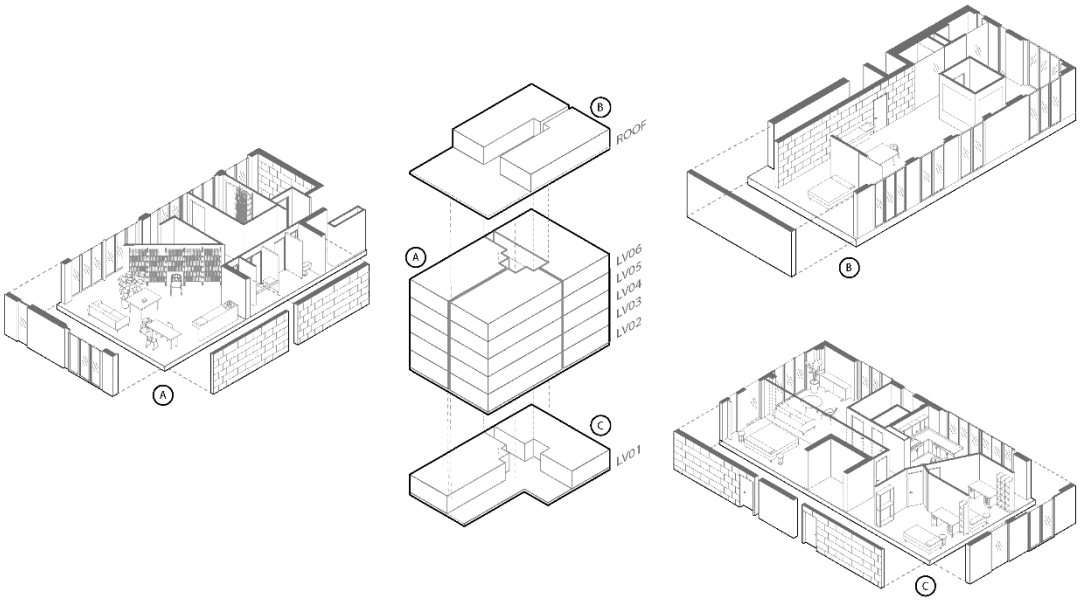


Figure 4.30. Axonometric diagram of various residential units (Khedri et al., 2020)

The building's structure comprises of reinforced concrete (as the load-bearing structure) alongside prefabricated timber elements for the façades and interior walls (Anderton, 2015b; J. Jürgensen, personal communication, July 20, 2022). For the façades, "a modular timber…with custom-designed fixed and flexible [outward-opening] glass doors" was used (Anderton, 2015b; ArchDaily, 2015b). The perimeter galleries are steel construction (Becker et al., 2015).

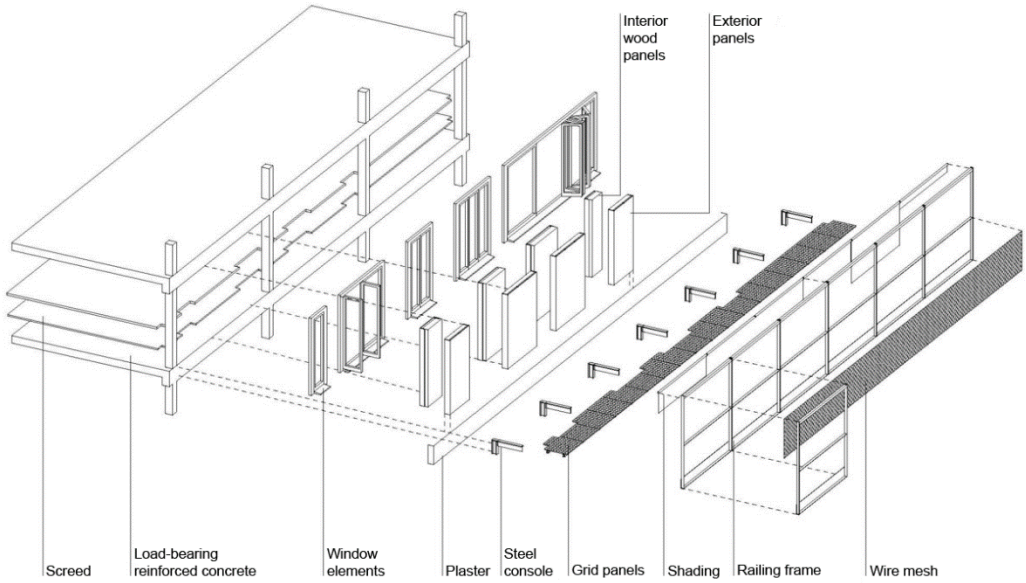


Figure 4.31. Composition diagram of the perimeter gallery and the façades (ArchDaily, 2015a)

The project's perimeter galleries constitute a distinctive feature of the design (Becker et al., 2015). Designing galleries with a wraparound form instead of creating subdivided private balconies was also a result of the collective decision (Becker et al., 2015). The perimeter galleries serve both as balconies and "secondary exterior circulation [routes] between apartments" while encouraging interaction between the residents (Becker et al., 2015; Bridger, 2015). Additionally, they also act as a scaffolding for the residents to maintain their wooden façades (RCA, 2018).

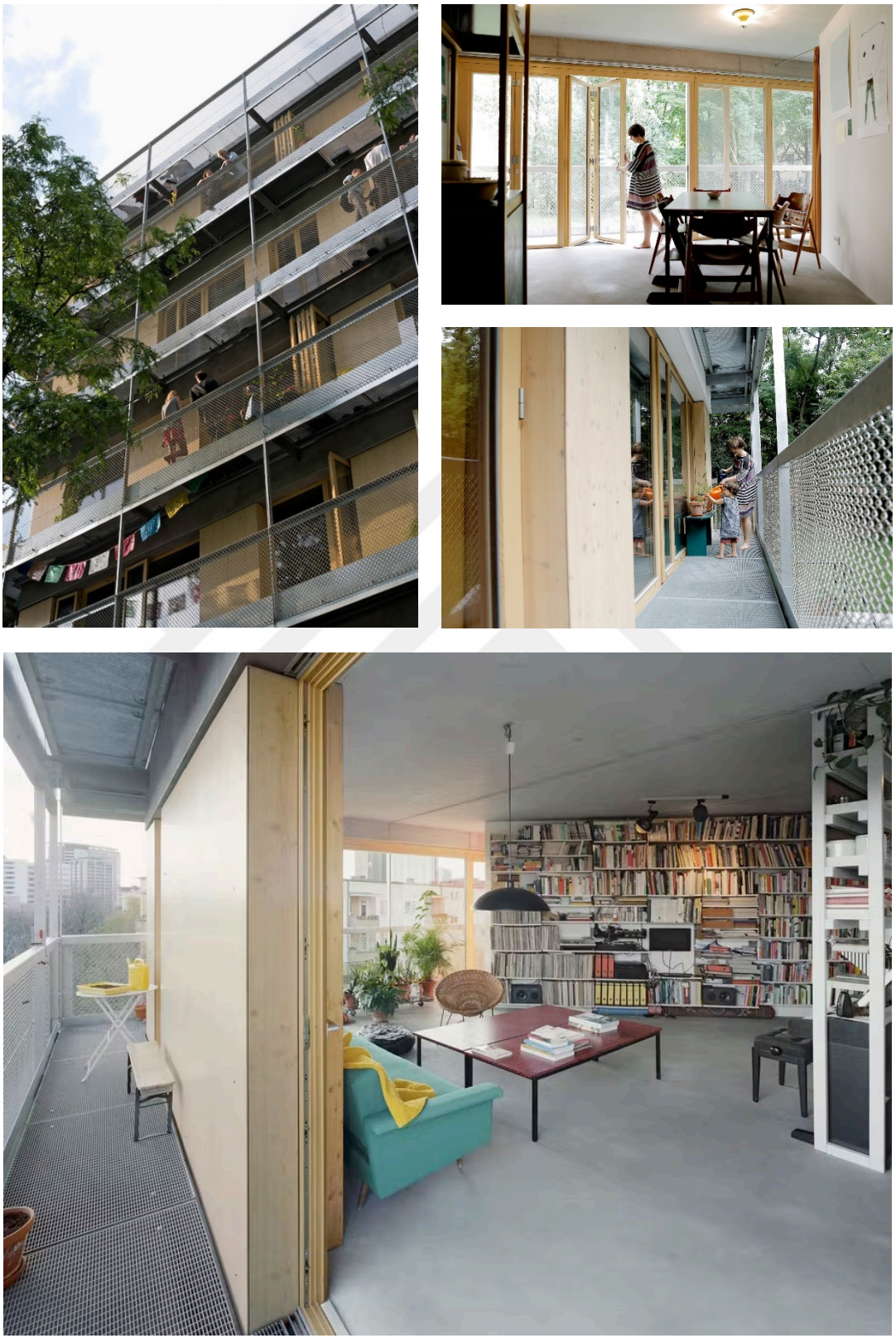


Figure 4.32. R50 Cohousing's perimeter galleries and their relation to the apartment interiors (https://heidevonbeckerath.com/single/r50-cohousing; Ring, 2016)

Cost-effective decisions

As Tim Müller-Heidelberg—a resident of R50—states, one of the goals of the R50 Cohousing was "to build as affordably as possible" (PLANE-SITE, 2016b). To reduce costs and save space, it was aimed to use concrete as little as possible during the structural design (RCA, 2018). For that reason, in accordance with the minimum requirements, a simple and generic structure system—as Schmidt likens to the "Corbusian Dom-Ino style"—was selected alongside prefabricated elements (J. Jürgensen, personal communication, July 20, 2022; RCA, 2018).

Residents collectively decided on the materials for R50. To reduce costs, simple finishes were preferred (e.g., surface-mounted installations, exposed concrete) (Becker et al., 2015). Instead of complex materials, simple, flexible materials—that can be individually customized by each unit—were used (Anderton, 2015a). One of the architects of the project, Verena von Beckerath explains the idea of customization in R50 as adapting the apartment unit to its residents' needs while preserving affordability (Anderton, 2015a). Similarly, Jesko Fezer explains that "the units were delivered finished, but not entirely done" as a consequence of cost-effectiveness, flexibility and customizability (Bridger, 2015).



Figure 4.33. Simple finishes both for the exterior and interior of the apartments (https://heidevonbeckerath.com/single/r50-cohousing)

The collective decisions resulted in a cost of around 2.700 USD per square meter, including the shared space (Anderton, 2015a, 2015b). In consequence, at the time, a residential unit in R50 was around 20 percent cheaper than a unit in the same area (Bridger, 2015). In terms of energy efficiency, the building's energy consumption is 30 percent lower than the limit set by German Energy Saving Regulations (EnEV 2009) (ArchDaily, 2015b).

With its successful typology for low-cost and affordable housing, R50 Cohousing also paved the way for housing projects in bigger scale (e.g., *IBeB Berlin* by Heide & von Beckerath and ifau) (Anderton, 2015a; Bridger, 2015).



Figure 4.34. Multipurpose space and roof terrace of R50 Cohousing (ArchDaily, 2015b; Bridger, 2015; https://heidevonbeckerath.com/single/r50-cohousing)

4.4 Lilac



Figure 4.35. Lilac
(https://www.lilac.coop/image-gallery)

Location: Leeds, England

Initiation: 2006

Completion: 2013

Architects: White Design Associates

Residential units: 20

Total area: 7000 m^2

Tenure model: Mutual Home Ownership Society

Construction system: Prefab timber with straw infill

Lilac—which stands for *Low Impact Living Affordable Community*—is an ecological, affordable, and nonprofit community-led cohousing project "located in a suburban area of Leeds in the north of England" (Chatterton, 2013; TEDx Talks, 2013; World Habitat, 2015). Developed on a former school site, Lilac consists of a multigenerational community with various socioeconomic backgrounds (Chatterton, 2013; Hopkins, 2014; Lawton, 2019). According to Paul Chatterton—a cofounder and a resident of the project—Lilac is "the first affordable low impact mutual cohousing project in the United Kingdom" (TEDx Talks, 2013).

Initiation of the development

The concept was conceived in 2006, in search of an ideal community with shared values and a better place to raise children (Lawton, 2019). Ideas such as cooperative living, prevention of social isolation, low environmental impact and affordability

were also on the agenda (Hopkins, 2014). In 2009, a small group of people officially founded the Lilac initiative (Chatterton, 2013). As stated by Chatterton, after 2011, the project had three main challenges: to *respond to the economic crisis of 2008* (by being affordable), to *tackle climate change* and to *restore social cohesion after the 2011 England riots* by reacting "at a community level" (TEDx Talks, 2013). Similarly, according to Chatterton, there are three main issues with the conventional housing model (Hopkins, 2014). It has a high ecological footprint. It is not affordable, and it does not encourage social interaction. Conversely, it promotes "corrosive individualism" with the owner-occupancy model (Hopkins, 2014). Therefore, Lilac aims to provide "a direct response" to all of these issues (Chatterton, 2014, p. 8).

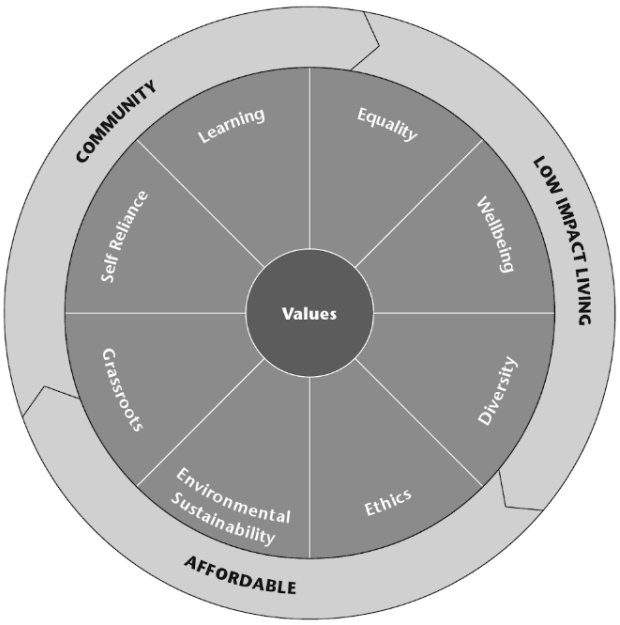


Figure 4.36. Values of Lilac (Chatterton, 2014)

Financing and tenure

Lilac was primarily financed by the capital of the residents alongside "a mortgage from an ethical lender" (Lawton, 2019). The project also received various grants during different stages of the development (Chatterton, 2013). For instance, Lilac received a 420.000 GBP grant from *the Department of Energy and Climate Change* for the use of sustainable construction materials (i.e., prefabricated timber and straw

bale) (Chatterton, 2013, 2014). On the other hand, the plot was purchased from the local authority at market level (Chatterton, 2013).

As an affordability approach, Lilac features a new model of tenure called *Mutual Home Ownership Society* (*MHOS*) and it is the first community in the United Kingdom that uses this model (Chatterton, 2013). In the MHOS model, the property is owned by a cooperative in which the residents own a share (Lawton, 2019). One of the residents, Joe Atkinson describes this model as "being [their] own landlord" (Lawton, 2019). Similar to the cooperative model, members (i.e., residents) buy a share by monthly paying *35 percent of their net income* to the society (Hopkins, 2014). Those payments are then allocated to pay the society's mortgage. In this model, it is also possible for the residents to sell their share—after some deductions for depreciation—when they leave the community (Fig. 4.37.) (Chatterton, 2013; Hopkins, 2014).

The model's share prices are directly related to the net income and home sizes of the residents, not to the local housing prices (Hopkins, 2014; Lawton, 2019). Thus, the MHOS model "creates an intermediate housing market where rents are above those of social housing but below market price" (Wilcox, 2006, as cited in Chatterton, 2013, p. 1663). According to Lilac's report of 2021, even though a housing in Lilac cost higher—around 3.500 GBP—than Leeds averages in 2013, in 2019 a Lilac housing was approximately 21.500 GBP cheaper than the average due to the MHOS model which is based upon the increases in wages and not the increases in local housing prices (Fig. 4.38.) (LILAC, 2021). As a consequence, "[this] model promotes access to less wealthy groups and discourages wealthier groups who are seeking speculative returns from housing" (p. 1664).

However, this model has a minimum net income requirement depending on the house size (Hopkins, 2014). For that reason, people with "fairly modest incomes" can afford to live in Lilac. That being said, in this tenure model, high-income residents can also buy bigger shares and hence a bigger house (Lawton, 2019). Consequently, as the shares of high-income residents increase, shares of other residents decrease.

Correspondingly, other homes become cheaper depending on their size. This creates the opportunity for low-income groups to access affordable housing in Lilac in the future (Lawton, 2019). All in all, the MHOS model prevents "the speculation and the commodification of housing" while ensuring security of tenure for less wealthy groups (Chatterton, 2013; Hopkins, 2014).

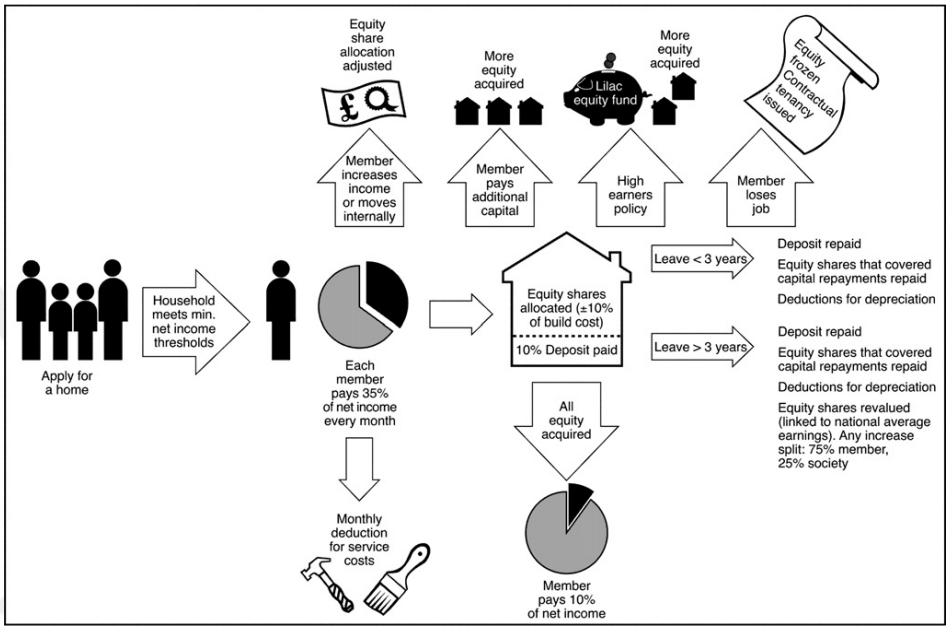


Figure 4.37. Mutual Home Ownership Society model of Lilac (Chatterton, 2013)

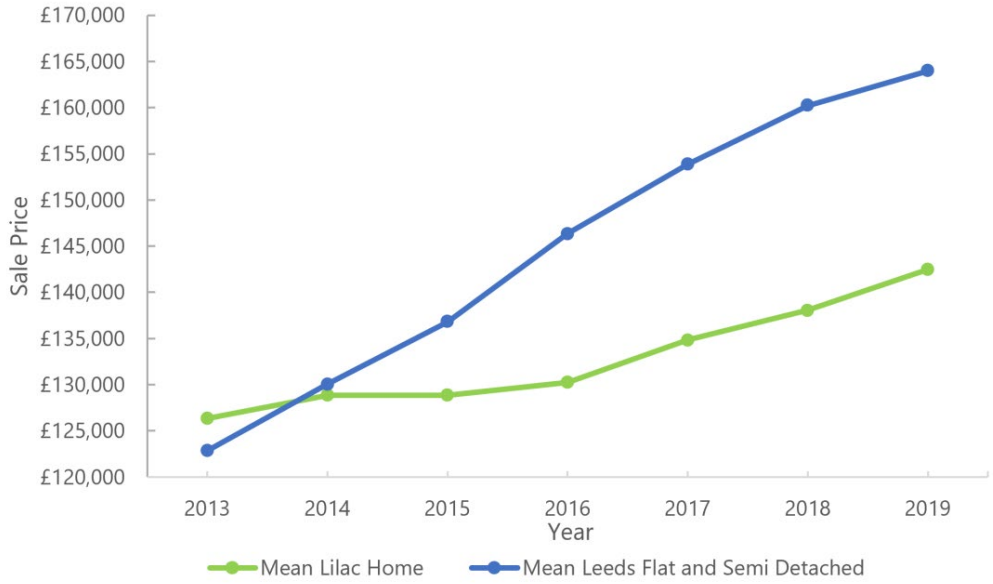


Figure 4.38. Lilac housing prices compared to Leeds average (LILAC, 2021)

Participatory process

Lilac was designed after mutual decisions. In other words, community members co-designed their homes and the entire neighborhood. Chatterton (2014) describes this participatory process as follows:

> Designing together meant that we all collectively owned the design process. It [was not] being forced upon us. We were taking back control of our [neighborhood] brick by brick, or bale by bale! (p. 87).

In terms of self-management, Lilac has an elective board of directors alongside task teams consisting of community members (Chatterton, 2013). Accordingly, the community organizes bimonthly general meetings based on consensus decision-making.

Design

The project's design was realized by *White Design Associates,* and it consists of 20 residential units with different sizes—varying from one bedroom to four-bedroom houses—arranged in five blocks around a common house and a pond (Chatterton, 2014; Hopkins, 2014). Residential units in Lilac are smaller compared to the British average; however, with shared spaces they are sufficient enough. Joe Atkinson explains the idea of living in a smaller home—a single bedroom unit in his case—with shared facilities as follows:

> We do not all need to live in massive mansions [instead of] living somewhere like this where we [have] a common house and all the rest of it. I do not need to live in a big house because I have all [the] shared assets that I can use as well (Lawton, 2019).

As shared spaces, Lilac has a two-story common house, a playground and an allotment garden adjoining a pocket park (Chatterton, 2014; Hopkins, 2014). There are two parking lots located at the edges of the site and they only have five parking spots each since the community promotes sustainable transportation (e.g., carpooling, cycling) (Hopkins, 2014; LILAC, 2021). Correspondingly, there are parking spaces for bicycles (Chatterton, 2013). The common house comprises a laundry, a mail room, an office, a workshop, a multipurpose room, a communal

kitchen and a dining room (Chatterton, 2013; LILAC, 2021). Most of the amenities in the common house can also be used by the local community (Chatterton, 2013).



Figure 4.39. Site plan of Lilac (LILAC, 2021)



Figure 4.40. Photos from the common house (https://www.harperperry.co.uk/news/thoughts-on-lilac-2; LILAC, 2021)

Cost-effective decisions

Initial decision was to use "low impact and high-performance natural building materials" (Chatterton, 2013, p. 1660). Therefore, straw and timber were chosen as building materials to contribute to local supply chains in addition to their high carbon sequestration capacities (Chatterton, 2014; Hopkins, 2014). The community then selected a prefabricated timber and straw bale construction system called *ModCell* which has "advantages over traditional [straw bale] building in terms of structural strength, building insurance, ease and speed of construction" (Chatterton, 2013, p. 1660). Although the system was expensive compared to "other traditional construction techniques such as brick and block", it was chosen due to its sustainable qualities (p. 1660). That being said, the use of the prefabricated ModCell technology helped reducing construction costs by standardizing every home type (Chatterton, 2014). Additionally, a housing constructed with ModCell consumes around 66 percent less energy—thus has lower energy bills—in comparison to the existing housing stock in England (Chatterton, 2013).

The simplicity of the construction materials also helped the community to play an active role in building their homes (i.e., self-build) while enhancing communal ties. Since ModCell's structural timber panels with straw bale infill were "built in a temporary 'flying factory' near the construction site, residents [had the chance to] take part in their construction" (Chatterton, 2013, p. 1660; Hopkins, 2014). As a simple finishing material, lime—which also has a high carbon sequestration capacity—was used for the walls and the ceilings (Hopkins, 2014; Lawton, 2019).

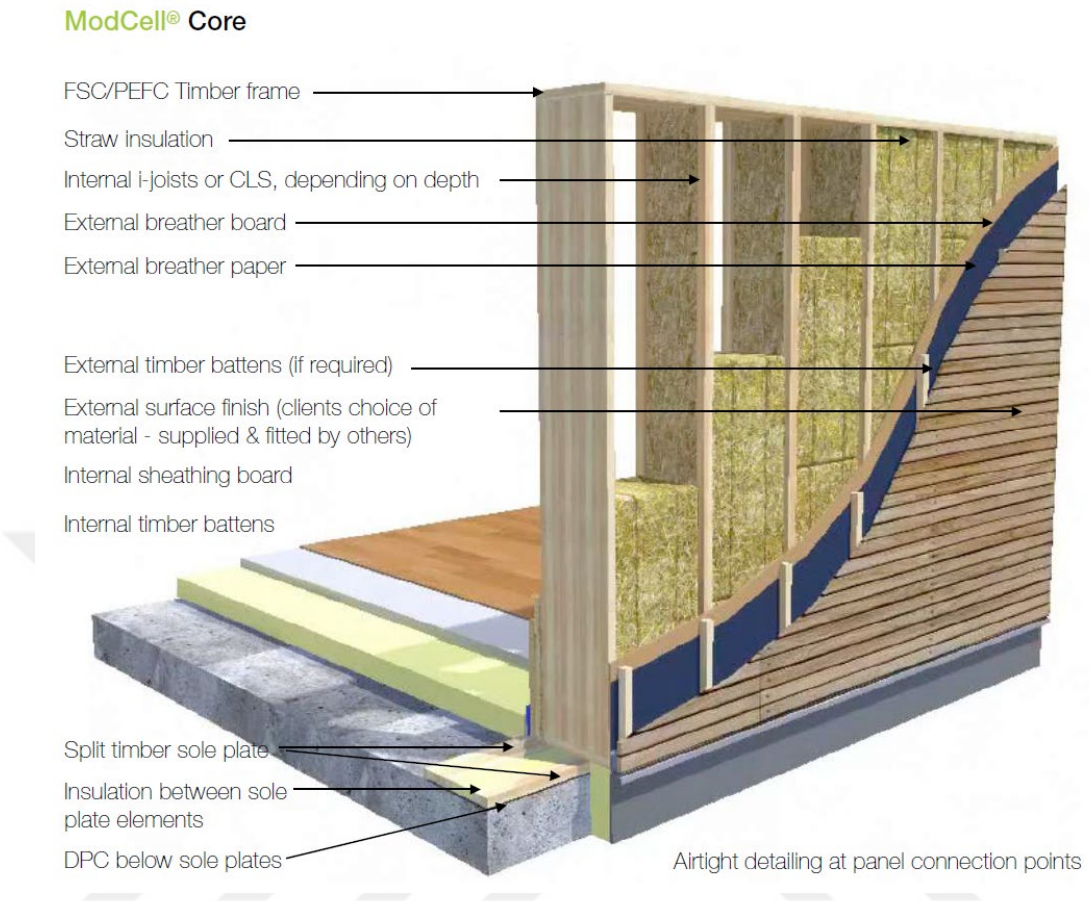


Figure 4.41. ModCell system detail (https://www.modcell.com/technical)



Figure 4.42. Assembly of a ModCell roof cassette (http://www.coho-ltd.co.uk/case-studies/3/lilac)

For their low impact energy strategy, Lilac consulted an energy consultancy firm in Spain called *Progetic* (Chatterton, 2014). As a result, to meet *Level 4 of the UK Code for Sustainable Homes* (*CSH4*), the community decided to use solar photovoltaic and thermal panels, mechanical ventilation with heat recovery (MVHR) systems and high-efficiency gas boilers in each home. Consequently, in terms of energy bills (i.e., gas and electricity), there is a considerable difference in comparison to an average house (Lawton, 2019). Chatterton (2014) expresses that his gas bills—of a four-bedroom house—are five times lower compared to his old house. Similarly, Joe Atkinson states that he pays around 340 GBP per year for the energy bill whereas a conventional British house pays approximately 1.200 GBP (Lawton, 2019). Chatterton (2014) adds that it was even possible to achieve the highest rating and better results, but only at a greater capital cost. Moreover, with its photovoltaic panels, Lilac sells electricity back to the grid and pays the heating and lighting bills of communal areas (LILAC, 2021). Overall, in terms of energy use, Lilac shows great results and has a B rating for energy efficiency (LILAC, 2021).



Figure 4.43. View of Lilac's courtyard and the solar panels on the roof (https://www.lilac.coop/image-gallery)

In terms of water consumption, a Lilac household consumes 48 percent less water than an average household, resulting in lower water bills (LILAC, 2021). Likewise, the community uses rainwater for the garden by means of a rainwater harvesting system (i.e., water butts) (Lawton, 2019). Moreover, Lilac features a *sustainable urban drainage system* (SuDS) (LILAC, 2021). In this system, the excess rainwater is collected in the communal pond of Lilac—which is then slowly discharged to a public drainage system—and thus the risk of flooding is reduced during a heavy rain event (Lawton, 2019).

Besides growing its own food (around 10 percent), the community also buys groceries in bulk from ethical suppliers which results in lower expenses as well as reduced waste (LILAC, 2021).



Figure 4.44. Views of the communal pond, the central courtyard, and the allotments (https://www.harperperry.co.uk/news/thoughts-on-lilac-2; https://www.lilac.coop/image-gallery)

As a result of Lilac's environmentally sustainable strategies, a household in Lilac has approximately 65 percent less greenhouse gas emission than an average household (LILAC, 2021). Moreover, the community is planning to become carbon-neutral by 2030.

4.5 Evaluation of the Case Studies

The cases have two different typologies based on their location: multistory apartment block(s) located in dense urban areas (i.e., La Borda, Spreefeld and R50 Cohousing) and low-rise cluster housing located in suburbs (i.e., Lilac).

Most of the projects had long development periods with the exception of R50 which had a relatively short process compared to the others. This may be related to difficulties during financing, resident recruitment, planning, land acquisition and other legal processes. In terms of financing, La Borda and Lilac received government grants in addition to the capital of residents whereas Spreefeld Berlin and R50 were privately financed without any external financing. That being said, Spreefeld Berlin and R50 were supported by local authorities during the land acquisition with fixed plot prices.

All four cohousing projects include shared spaces based upon the needs and collective decisions of the residents. Although their contribution to cost reduction is uncertain in these cases, La Borda and Spreefeld Berlin's rental spaces bring revenue to the communities.

La Borda and Lilac can be defined as resident-led projects whereas Spreefeld Berlin and R50 Cohousing were initiated by architects alongside future residents. Whether initiated by architects or residents, all of the projects had extensive participatory processes during their development. Shared spaces were collectively designed while the design of the residential units was based on individual decisions. Moreover, cost-effective decisions were made during these processes based on consensus instead of being forced upon the residents. Consequently, all of the projects used various strategies to reduce construction costs (e.g., simplification, standardization, prefabrication) as well as house running costs (e.g., passive house standards, renewable energy).

In terms of finishing material, simple, minimal, and budget-friendly choices were made. Some surfaces were left unfinished (e.g., exposed concrete, timber façade)

whereas simple plastering was used for the others (e.g., lime render). Moreover, the unfinished surfaces are customizable during the buildings' life cycles. Likewise, in the cases of La Borda, Spreefeld Berlin and R50, some spaces were left unfinished to be customized (Spreefeld and R50) or completed (La Borda) by residents upon moving in. These spaces are also flexible to be adapted to the residents' needs in the future.

All projects preferred environmentally sustainable and energy-efficient methods for their buildings (e.g., timber construction, passive house standards, solar energy). This resulted in a reduction both in construction and house running costs. As a matter of fact, in the cases of Spreefeld Berlin and Lilac, environmentally friendly and energy-efficient strategies were preferred despite the high capital costs. However, these strategies proved to be useful in reducing energy bills over the long-term.

As a result of the cost-effective strategies, all projects are more affordable compared to conventional housing projects in their area. Housing tenure models also have a key role in achieving affordability within the projects. Correspondingly, La Borda, Spreefeld Berlin and Lilac are especially affordable due to their alternative tenure models (i.e., cooperative and MHOS).

Table 4.1 Characteristics of the cohousing cases (author)

	Setting	*Scale*	*Typology*	*Development type*	*Tenure model*
La Borda	Urban	28 units	Apartment block	Resident-led	Cooperative
Spreefeld Berlin	Urban	65 units	Apartment blocks	Architect-led	Cooperative & Owner-occupancy
R50 Cohousing	Urban	19 units	Apartment block	Architect-led	Owner-occupancy
Lilac	Suburban	20 units	Low-rise cluster	Resident-led	MHOS (cooperative)

CHAPTER 5

CONCLUSION

Based upon the case studies alongside the literature review regarding affordable housing and cohousing, it is evident that there is an important connection between affordable housing and cohousing. Achieving affordable housing is one of the goals of contemporary cohousing. Furthermore, most aspects of the cohousing model already overlap affordable housing strategies. In other words, cohousing principles share some of the same strategies for affordable housing such as space optimization (i.e., reduction of private space) and sustainable solutions (e.g., energy efficiency). Moreover, cohousing's participatory process enables the strategic decision-making for cost-effectiveness. In addition, sharing resources and collaboration between neighbors (e.g., carpooling, childcare, common meals) help saving money on household expenses. As a consequence, the cohousing model ensures significant reductions both for construction and house running costs.

Additionally, cohousing as a concept—or some of its principles—can be applied to social housing projects as well as other affordable housing projects. According to Winter and Durrett (2013),

> communities and housing developers can also apply cohousing principles to non-cohousing communities to increase their affordability (and of course their level of social capital, which provides measurable benefits to low-income families) (p. 35).

To put it another way, introducing the cohousing model to the context of social housing can generate affordability even more effectively. For instance, the Danish AlmenBolig+ makes a good case for the self-management's influence on housing costs. Cohousing principles can also be implemented to existing housing stock by means of retrofit as in the cases of Stacken and N Street Cohousing. Most importantly, cohousing's predisposition towards using alternative tenure models—chiefly cooperative—facilitates access to housing for low-income groups,

encourages social mixing of groups with different income levels and assures long-term affordability. Similarly, Droste (2015) stresses the importance of including "weaker social groups" (i.e., disadvantaged and marginalized groups) in cohousing projects and cites cooperatives' success in that regard (p. 89). As a result, the cohousing model and affordable housing have similar benefits both for the residents and the wider population. They both play an essential role in sustainable and inclusive urban development.

As previously mentioned at the end of chapter 2, affordable housing provision is a multidimensional issue. Therefore, the cohousing model cannot provide affordable housing all by itself. Multidisciplinary approach and interdisciplinary collaboration are crucial for the supply of affordable housing. There are multiple stakeholders. As one of the stakeholders, local and national authorities are particularly important in affordable housing supply. They should act as facilitators rather than being—intentionally or unintentionally—obstructive legislators, develop land use policies in accordance with cohousing's and affordable housing's requirements and support them with subsidies and incentives (Droste, 2015; Thörn et al., 2019). Correspondingly, authorities can play an active role in enabling affordable cohousing projects.

Droste (2015) mentions three ways for municipalities to support cohousing: direct promotion of the concept, encouragement of "private investors and owners to include…cohousing in projects" and facilitation of "new projects in a public-private partnership" through "external partners" (pp. 82-83). For instance, the state of *North Rhine-Westphalia* "guarantee[s] seed capital loans" to small cooperatives, if at least 50 percent of their group are "eligible for social housing" (p. 83). Likewise, social welfare recipients' "down payment for cooperative membership" are being paid by some municipalities. Governments can also determine which cohousing developments are qualified for support or incentives (Droste, 2015). This can be done by assessing their benefits to society. Correspondingly, cohousing projects with "social or cultural facilities that also serve the wider neighborhood" can be subsidized (p. 83). Similarly, governments can subsidize or incentivize cohousing—

and conventional housing—providers on the condition that they contribute to city's affordable housing stock not just for low- and middle-income households but also for the disadvantaged groups while providing spaces (e.g., social, commercial, workspaces) for "the surrounding neighborhoods" (Droste, 2015, p. 88).

Land price is another factor in the provision of affordable housing. Since land prices are open to speculation and continue to soar, cost-effective construction strategies, architectural design considerations and collaborative living concepts cannot achieve housing affordability alone. For that reason, government and nonprofit sector support is crucial. In terms of governmental support, "provision of public land at moderate prices" to cohousing groups is essential (Scheller & Thörn, 2019, p. 116). Additionally, governments can "lease land or buildings" to cohousing initiatives in order to ease the initial "financial burden on projects" (p. 83). Similarly, with regard to public-private partnership, municipalities can provide "affordable public land to (private) [cohousing] groups" while ensuring its nonspeculative use with "hereditary leasehold" (p. 84). Moreover, partnerships with social and nonprofit housing associations are crucial for low-income groups since they do not possess the necessary capital to initiate new cohousing projects.

Another important step is to mainstream cohousing as an affordable housing model rather than marketing it as a niche product (Droste, 2015). Firstly, there is limited literature about cohousing with a focus on affordability. Moreover, there is a lack of knowledge regarding "the long-term perspectives of cohousing projects for residents, [prospective] projects and the city" (Droste, 2015, p. 90). Therefore, post-occupancy evaluation, SWOT and cost-benefit analyses are necessary to promote cohousing within affordable housing provision (Droste, 2015). In addition, it is important to encourage knowledge transfer between "cohousing actors, [policymakers], administration, planners, and the broader public" (Droste, 2015, p. 86). According to Jarvis et al. (2016),

> cohousing could become much more widely adopted if planning, financial and institutional infrastructures were better designed to support it (as in the USA and many countries in Europe). Detailed agreements and models must

> define the roles and responsibilities of residents and other stakeholders at the outset so as to avoid confusion later on (p. 6).

Similarly, raising awareness of "public and private investors, policy makers and administrations, as well as potentially interested residents" about the advantages of cohousing and increasing cohousing's popularity are also part of necessary actions (Droste, 2015, p. 80).



Figure 5.1. Cohousing's potential role in affordable housing provision (author)

With all of the necessary actions, cohousing can reach its full potential to be placed in the policy agenda for the supply of affordable housing among other strategies and thus make a significant contribution to affordable housing provision. Finally, if all necessary strategies for affordable housing are implemented while participatory and inclusive approaches to urbanization are embraced, a crucial step will be taken towards creating truly future-proofed sustainable cities capable of responding to environmental, economic and social challenges. Only then it will be possible to solve settlement problems and homelessness and create equal living conditions for all.

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APPENDICES

A. Interview with Jürgen Patzak-Poor on behalf of BARarchitekten about Spreefeld Berlin

Interviewer: Şevket Deniz Gökçe (Abbreviation: SDG)

Interviewee: Jürgen Patzak-Poor (Abbreviation: JPP)

The interview was conducted via electronic mail.

SDG: *Could you briefly describe the design process of Spreefeld Cohousing?*

JPP: The design process is closely linked to the buying and financing of the lot, which was sold by the BIM (Bundesimmobilienmanagement). Christian and Silvia (who are a couple) started to investigate about the lot (around 2010) and managed to form a starter group of about 10 (rich) people, who bought the lot (at that time about 2.5 Mil €). The project started as a social enterprise (see article Mieter mit Spreeblick), but because it had to be financed privately, it changed and became something more complex. Those who had put in a lot of money in the beginning did not want to abstain from their right of ownership, meaning to be able to sell and profit from the risen value of the flat (see article Aufteilung). Thus, in the end, the project is split between homeowners and a cooperative (Very much like the IBeB in Berlin Blumengroßmarkt by Heide Beckerath and ifau).

SDG: *Could you explain the affordability aspect of the project?*

JPP: At that time, due to Berlin's financial problems, there was no social housing. And even worse, communal housing stock was being sold to commercial investors (which turned out to be a huge political problem in the following years). Thus, as architects, we were interested to develop a new model for social housing by means

of standardization. And it turned out to be very economic project with building costs of 2100 €/sqm.

SDG: *How did cohousing as a concept influence building costs?*

JPP: The cohousing group consisted of rather rich and rather poor people. Therefore, the demands were very different. Some members emphasized their needs for big balconies on all sides of the building, others demanded cheap cluster flats. As architects, we had to make up our own mind, to decide what makes sense and what does not and communicate it to the group. But in general, this worked very well.

SDG: *Did you use participatory design during the development process? If so, how did it influence the project?*

JPP: There is a model, that is in a way how we conceived the process based on the floor plan catalogue (drawings) from which people could choose a particular type of flat. Within 10 hours of architect support, the design had to be finalized, e.g., which type of bathrooms, size of rooms, position of windows etc. Every architect was responsible for one building (approximately 20 flats). The agreement worked very well. In the end, we developed very different types of flats but also the standards of the flats were very different from very basic to more ambitious furnishing. The latter dependent on the users demands and financial possibilities.

SDG: *How do shared spaces of Spreefeld Cohousing contribute to creating an affordable housing?*

JPP: I do not think that shared spaces really reduce building costs, even if there is a concept of sufficiency, e.g., people abstain from big flats and reduce their amount of habitable surface in order to save money for a shared space on the ground floor or on the roof (San Riemo in Münich is a very good example). But still, these spaces have to be built and managed (long-term) costs. But what they really do, they add an extra value to the project, as usually they can not only be shared within the cohousing

group but also can be rented by external parties, in the case of Spreefeld even with catering. Those spaces create exchange between people and enrich the neighborhood.

SDG: *How did the building regulations and space standards affect building costs?*

JPP: The regulations that cause most costs are those for energy saving. However, the cohousing group wanted to go beyond the standard regulation and build using the "passive house standards". For this, the financing bank (Umweltbank, Nürnberg) handed out a loan with better conditions.

SDG: *Did you opt for an alternative construction technique to reduce building costs?*

JPP: The building consists of a hybrid construction, concrete structure with wooden infills.

B. Interview with Jochen Jürgensen on behalf of Heide & von Beckerath about R50 Cohousing

Interviewer: Şevket Deniz Gökçe (Abbreviation: SDG)

Interviewee: Jochen Jürgensen (Abbreviation: JJ)

The interview was conducted via electronic mail.

SDG: *Could you explain the affordability aspect of the project?*

JJ: In Berlin, rents have been rising extremely for years and for many people it is now almost impossible to buy property within the city. It was the owners' aspiration to build a collective and affordable building for living and working by their own, that combines individual apartments with shared spaces like a big community space in the souterrain, a workshop, a laundry room and a roof terrace with a summer kitchen.

SDG: *How did cohousing as a concept influence building costs?*

JJ: The project was chosen during the course of a so-called concept-based award procedure for building plots, which is an instrument of the municipality of Berlin to sell a building plot not to the highest bidder but based on a suggested concept. This procedure has lowered the overall price/sqm as the price for the land was fixed. Moreover, a refined economic approach to the overall building structure including the circulation as well as the integration of prefabricated elements has helped to manage the building costs. Due to the organization and financing of the Baugruppe which did not involve profit-oriented investors, the price per sqm was up to 25 percent cheaper than the usual market price.

SDG: *What kind of design decisions did you make to reduce building costs?*

JJ: The savings were made mainly by leaving out certain finishings, like using visible raw concrete surfaces and visible installations. These solutions were the result of collective negotiations.

SDG: *How did the building regulations and space standards affect building costs?*

JJ: As it is a free-standing building which has a very simple basic structure, there were no particular building law difficulties that had an impact on the costs. Due to the joint planning of the building by the future residents, there were no regulations regarding to the standards that normally exist through investors or the funding guidelines for social housing. Instead, the standards of the spaces could be rethought collectively and thus savings could be achieved. For some building elements, special approval had to be applied for (e.g., the use of an ordinary wire mesh fence as a railing for the balconies).

SDG: *Did you opt for an alternative construction technique to reduce building costs?*

JJ: Yes, the hybrid construction combines a concrete skeleton with prefabricated timber elements for the walls and facades. The concrete structure was designed to minimum requirements and combined with a partly exposed infrastructure. The modules of the facades are either fixed or door elements that can be opened to the all-around balconies.