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2 Crises and Wellbeing: The Potential of the Built Environment

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Introduction

The changes around us occur at different paces of time: some phenomena are evolving slowly (shrinking, ageing, global warming), and some may culminate suddenly in crises (earthquake, floods, war, etc.). It seems to be equally difficult to be prepared for both kinds of crises. Moreover, the impact of crises related to e.g., the health and social environment like pandemics may have a devastating impact on urban life. These crises are experienced at individual and community levels affecting people's wellbeing. Floods, fires, and landslides may turn into disasters destroying the built environment, people's homes, and infrastructure. Aldrich and Meyer (2015) observed that responses to climate actions related to the built environment have mainly been strengthening physical infrastructure and updating building codes. They argue that any of the responses limited only to physical infrastructure will not be able to fully reduce risks or eliminate vulnerability. Similarly, housing construction for older adults focuses on fire safety regulations, sometimes ignoring the role of the community in resilience. During our study, we collected the experiences of people who have personal experience of hazards in the built environment and have been displaced temporarily or permanently from their homes. These hazards were related to forest and building fires, as well as landslides, causing property damage and loss of services and livelihoods (Fig. 2.1). Semi-structured interviews enabled us to gain further knowledge on home loss, self-perceived wellbeing, and feeling of safety. The interview questions were related to the meaning of home and community in the context of a crisis in the built environment.

The research question was: Which factors in the built environment can support people's perceived wellbeing in these crises?

The results of the interviews emphasize the importance of community and peer support during and after crises. Moreover, cooperation across municipal sectors with local stakeholders and residents can decrease the vulnerability of certain population groups. Cutter et al. (2003) argue that the roots of social vulnerability are in people's limited access to political power and social capital, as well as in the physical characteristics of individuals and of the built environment: building stock and age, and the type and density of infrastructure. The vulnerability can refer to individuals or groups of people, their housing environment, urban systems, and places

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Figure 2.1 Building fire in a senior housing complex. (Photograph by a resident, anonymous)

on various scales. Pineda and Corburn (2020) argue that the disability or vulnerability is not caused by the person but by the system. According to them, policies, land use planning, architecture, and infrastructure may limit people in using their capacities. In this study, older adults living in a senior housing complex that caught fire were interviewed. The results of this study confirm previous findings showing that enhancing community building, improving housing quality, and an inclusive urban environment have an important role in preparedness for hazardous life events as well as in the recovery process. The ability to cope and overcome crises is related to many interacting factors: the built environment, the socio-economic environment, and people's individual resources. Proactive measures to reduce vulnerability in general and to strengthen communities' and individuals' capacities to overcome such crises are needed.

Megatrends Affecting Wellbeing

Urbanization

Globally, the majority of people live in cities. In Europe, in 2015, the share of people living in cities was 72%, and it continues to increase (Vandecasteele et al. 2019, p. 25). The concentration of people in densely built urban areas makes cities vulnerable to natural hazards, social conflicts, and health risks like infectious disease. Cities are largely affected and many lives can be lost in disasters. At the same, the preparedness for hazards in terms of technology and infrastructure is generally greater in urbanized areas. Moreover, after natural hazards, due to better economic

resilience, the rebuilding process may start sooner and be quicker in cities than in remote areas. Cutter et al. (2016) found that the challenges in resilience are different in urban and rural places. Urban areas have a more resilient economic structure and infrastructure, whereas the strength of rural areas may be strong community capital. Therefore, the efforts to improve disaster resilience must be adapted to the local context.

In natural hazards, only rarely is the whole city affected or destroyed. People can be displaced within the city, there are spaces for temporary shelter and housing as well as people available for help and support. Practical help and assistance from neighbors, family, and peers play a crucial role in crises and post-disaster recovery. This is especially true for vulnerable population groups, older adults, children, and people with disabilities who are the most affected and are over-presented as victims of natural hazards (ESCAP and UNISDR 2012, p. 37) and fires (Gjøsund et al. 2016). Older adults interviewed for this study considered support from neighbors and family as the preferred option. They appreciated the help from organizations and the municipality but were hesitant to accept assistance from people they called "strangers". There are, however, an increasing number of people of all ages who live alone and have no family or relatives nearby. This may add to the need for formal help and assistance through various organizations and associations. Therefore, preparedness for hazards should be carried out with the collaboration of local stakeholders.

The overall objective of urban planning is to provide a good living environment for all citizens. A socially inclusive approach and age-friendly design are promoted in many cities. Urban development projects have also been successful in improving people's lives: overcrowded neighborhoods or deteriorating housing have been rebuilt and the standards of housing have been improved. The Human Rights Council (2018) states that human rights and environmental protection are interdependent:

> A safe, clean, healthy and sustainable environment is necessary for the full enjoyment of human rights, including the rights to life, to the highest attainable standard of physical and mental health, to an adequate standard of living.

The urban renewal process, like any changes in the built environment, has an impact on peoples' experiences of the space. In densification and urban renewal processes, the mental images proposed by Lynch (1964) – existing in the minds of the people who experience the city – may no longer be recognizable. Older adults who remain living in their familiar surroundings, *districts*, live through change and may experience the loss of their visual *landmarks* and *edges*. Due to densification and modifications people lose their favorite walking paths and see the *nodes* of the city move further away. This may affect the residential satisfaction of people and increase the residential mobility of those who can afford housing choices. Others may feel stuck in place.

Mouratidis and Andersen (2023) observed that newly densified neighborhoods can lead to moving intentions because they have not been able to fulfill the expectations of residents in terms of the built environment. Densification may lack design

considerations and development of public spaces, parks, greenery, amenities, and building design. Moreover, urban renewal processes can cause gentrification which may lead to an unwanted move from one's housing due to increased rents. Natural hazards can lead to similar results when homes are destroyed, and a decent and affordable dwelling may be hard to find. Those who have less resources are the most exposed to the negative effects of hazards and may not be able to choose their living environment. Their physical and social environment is transformed. The older people interviewed for this study felt unrooted and sad about the disintegration of their familiar community. They pointed out that the building or rebuilding process of a community takes time and requires physical spaces for interaction.

Sustainable development goals have steered cities towards densification of urbanized areas. It has both advantages and disadvantages. Urbanization is a risk for increased inequalities within countries as urbanized areas are developing, and rural areas lose population. Many areas in Europe are ageing and shrinking whereas only a few big cities are growing. Both young people and older adults move to cities near services and social life. Interviews in this study revealed that for older adults age-friendly housing and facilities as well as access to services were pull factors for moving to the senior housing complex. Shrinking areas may lack suitable housing and services for them. This may decrease housing satisfaction leading to increased housing mobility towards cities. Homes and other buildings remain underused or vacant and deteriorate the image and experience of the place.

The literature review by Berghauser Pont et al. (2021) showed that positive impacts of densification are reported in studies related to public infrastructure, transport, and economics. Economic activity increases wealth and people living in high-density areas have better access to public, commercial, and health services as well as public transport. On the other hand, densification and concentration of services may lead to the closing of small neighborhood retail and service spaces. This makes distance to services longer and may decrease accessibility of services for the most vulnerable population groups leading to negative changes in their social environment and social capital. Social capital is an important resource for communities, and it can be a buffer against negative life events. Mixed land use, accessible facilities, and green environment play a significant role in community building, which is an important resource for resilience in crises. Therefore, it is critical to enhance livable, equitable, and inclusive urban densification.

Climate Change

Climate change and global warming have many negative effects on people's well-being, affecting both physical and mental health. Negative effects have an impact, especially on the most vulnerable people: small children, people with poor health, and older adults. Place of residency and its urban form are meaningful for these population groups who spend most of their time at home and in the immediate surroundings. Moreover, air pollution, noise, and extreme temperatures are unevenly distributed within cities, leading to health inequities. The urban form, height of buildings, street networks, and open spaces affect the air flows and temperatures

Figure 2.2 Trees provide shelter from sun and have a cooling effect. Older adults gather in the parks to socialize. (Photograph by the author)

locally. People's adaption to different temperatures varies locally and individually. However, people living in dense urban areas with little green infrastructure and high temperatures have a higher risk of mortality and morbidity than those living in greener areas with lower temperatures (Schinasi et al. 2018). Green areas promote physical and mental health and contribute to community capital (Fig. 2.2). People who have more resources can choose their place of living and move to areas with urban green spaces, low car traffic, and less pollution.

Anxiety, insecurity, and trauma caused by climate change have been related especially to children and youth. It can cause feelings of disempowerment and disengagement (Brophy et al. 2023). At the same, extreme heatwaves increase admissions to hospitals and affect especially older adults. High temperatures are an increased health-related risk and increase the need for healthcare services. Some individuals are more vulnerable to natural hazards resulting from climate change. Vulnerable population groups are exposed to danger during heavy rains, flooding, fires, and storms due to their functional capacity and dependence on others. Physical and sensory impairments, chronic illness, and mental health may limit people's ability to act and evacuate. Information about preparedness for crises can be poor, and refugees and migrants may have language barriers to accessing it.

Environmental effects of high densification are found for the most part to be negative (Berghauser Pont et al. 2021). Housing density together with low permeability

of surfaces correlates for example with an increased risk of flooding and increased absorbed temperatures. People living in densely built urban areas may suffer from "heat island" effects. Similarly, the lack of trees and green infrastructure leads to higher temperatures. People may try to manage increasing temperatures by changing their behavior. They may change their daily rhythm and avoid going out during the hottest hours of the day if possible and stay in the shade of trees or air-conditioned spaces when available. Both extreme heat and cold weather are health risks affecting especially older people and people with chronic conditions. In extreme cold weather, people look for shelter indoors. Due to the shortage of electricity and the high price of energy, not everyone can afford to warm or cool their houses. This may again increase health disparities among people.

Most people are aware of climate change and the risk of natural hazards. However, they often consider that the risks do not affect their immediate surroundings. Local memory and knowledge of hazards are increasing the willingness and ability to prepare and respond to climate change. Previous personal experiences of hazards increase people's belief that there is a probability of having more natural hazards near one's home. In the past, natural hazards, such as earthquakes and landslides, as well as wars, pandemics, and economic crises may have led to the abandonment or destruction of entire communities. Learning from previous events can help to reduce vulnerability. It is important to consider the general resilience of communities in a wider way and choose adaptation strategies to particular crises that do not result in becoming less resilient to others (Miller et al. 2010).

Climate actions are a potential way to reduce existing inequalities within cities. Providing affordable housing with proper insulation, as well as heating and energy-saving solutions, may reduce the overall costs of living. Improving the quality and accessibility of housing and renovations related to indoor air and temperature have a positive impact on people's health. Moreover, adding green infrastructure in areas that are suffering from noise and air pollution can improve the living environment and residents' wellbeing.

Emerging Crises for Urban Life

Impacts on Physical and Mental Health

Unsuitable living environments, densely built cities, and crowded urban spaces are favorable habitats for pandemics. Historically, pandemics have led to improvements in the built environment – cities, houses, and healthcare buildings – leading to more healthy people. They have contributed to the invention of better water and sewage systems, and waste management. Moreover, architects have learned to use the healing effects of natural light, fresh air, and nature in building design. Hussein (2022) observed that historical pandemics have led to the planning of wider streets, the construction of specified healthcare facilities, the improvement of housing, and the development of new building materials.

Our daily living environment also affects our health in terms of encouraging daily physical and social activity behavior. Sedentary life and loneliness are fatal

to people. The need for social distancing during COVID-19 increased the understanding of the importance of open public spaces and the green environment for wellbeing. Access to open spaces and parks gave people a brief relief from lockdown. Poortinga et al. (2021) found that nearby public green spaces were particularly important for those who did not have access to private gardens. Public green areas were enabling the promotion of subjective wellbeing and physical and mental health during lockdown.

Social isolation during the COVID-19 pandemic had many detrimental consequences for people's wellbeing. The restricted access to public spaces, schools, and healthcare facilities may have long-term negative outcomes on mental health. Poor mental health and low perceived wellbeing reduce resilience to different crises. Völker (2023) found that during COVID-19 people focused on strong social ties, contacts with their close family and relatives, while weak ties, mixing with the neighborhood, declined. This may have increased the feeling of loneliness of those who live alone. Students and young people who lost their income due to lockdown may have returned to their parental home feeling a loss of independence. Evandrou et al. (2021) found that those people, especially young adults, whose living arrangements had changed during the COVID-19 pandemic had a higher likelihood of reporting increased stress than those whose living arrangements remained unchanged.

The pandemic has permanently affected the ways and places of working. For place-independent jobs, remote working has become a norm and the number of multilocal people has increased. Multilocal working had already been increasing before the pandemic. Di Marino et al. (2018) found that places that have been traditionally used for leisure time, such as summer cottages, become temporary or more permanent workplaces for some. They found that a few employers have enhanced remote working and multilocality by installing broadband technology in their workers' homes or second homes. Moreover, many municipalities have invested in digital networks. Due to the requirements for social distancing, the pandemic affected the use of non-traditional and multifunctional spaces, such as libraries, coffee places, and co-working spaces for work.

Pandemics differ from other hazards as the built environment and housing is not destroyed. Most people were not displaced and they did not lose their homes, instead, they were isolated within their homes from the rest of the community. This may have affected their feeling of home. Roschel et al. (2020) point out a significant proportion of COVID-19 associated deaths in people with the oldest age cohorts. Social isolation and physical inactivity were further deteriorating their health. Many of these frail people live together in assisted living which makes these places more vulnerable to pandemics. Restriction of visiting and group activities led to physical inactivity, which causes loss of muscle mass and strength. Isolation has a very negative impact on older residents' mental wellbeing as well.

The COVID-19 pandemic raised the importance of the social environment and the role of communal spaces and nature within the city. In June 2023 the European Commission launched a new initiative and funding program putting people and their mental health first.[1]

Potential of Urban Spaces in Crises

Importance of Cultural Heritage and Community

The urban environment is part of our cultural heritage and much of the national wealth is in the built environment. Climate change and international conflicts may pose a risk of losing our wealth and cultural heritage. Adopting the Hague Convention (UNESCO 1954), 134 countries agreed to safeguard and preserve cultural property during armed conflicts. However, the infrastructure, cultural buildings, and people's homes are destroyed in these conflicts. The government resolution for a Cultural Heritage Strategy in Finland recognizes the importance of cultural heritage to one's wellbeing, resilience, and recovery from crises. Culture bridges people together and is a resource for a sustainable future. A rich cultural heritage and shared values enhance crisis resilience as part of the community's comprehensive security (Mattila 2023, p. 14). However, during military conflicts, cultural heritage may be deliberately destroyed and replaced.

Adalgeirsdottir (2021) points out that it is important to understand the sociocultural aspects of local communities for recovery to be successful. A holistic understanding of traditions and customs should be taken into consideration in the rebuilding of the physical environment. People living through community loss need to be included in the urban rebuilding process. The community rebuilding process needs physical spaces for people to meet and socialize. The older adults interviewed in this project experienced sadness at the loss of their senior community and their relationships due to the building fire. They were also disappointed that the restoration process of their homes was carried out without their participation.

Immigrants feel the loss of their homeland and their cultural traditions (Gitterman & Knight 2019). In the process of building temporary shelters for immigrants and housing for displaced people, the need for common use and public spaces is important. This enables them to maintain or create new social connections with their peers. Similarly, older adults reported that the lack of common use spaces was slowing down the rebuilding of their disintegrated community after the fire. Félix et al. (2015) argue that even in a temporary location, a house is more than the physical space. It helps people to feel socially integrated and have a sense of belonging. It is a source of pride and cultural identity. Temporary accommodation actively contributes to helping people overcome the feeling of insecurity caused by the hazard and gradually regain their lives. Urban functions need to be planned from the beginning of the rebuilding process even in temporary shelters. Small shops, cafés, and other places for gatherings are important to support community building. Allowing people who have faced crises to take action to improve their environment and to be active makes them feel in control of their life. Flexible construction will allow residents to adjust the built environment to their needs.

Flexible Use of Public Spaces

The urban environment and the social context affect one's wellbeing and health. Feelings of inclusion and safety are integral parts of life satisfaction. The social

environment and the possibility of mobility are key characteristics of personal wellbeing. Koohsari et al. (2015) argue that a public open space can play different roles. It may be a space for physical activity, a destination to be active and socialize, and a route to a destination. Public open spaces, such as parks and green spaces near housing, are built environment features that provide the possibility to be physically active and meet people. They can enhance social activities, and consequently, community building, which is an important factor for resilience. Urban space can support the community both in daily activities and during natural hazards. Inclusive approaches to urban design and community building are important in improving preparedness for all life hazards. Inclusive communities are built for all citizen groups, regardless of their age, disability, and cultural background. They include the design of the built environment and access to services and information. Cutter (2008) refers to places where people live and work:

> Vulnerability manifests itself geographically in the form of hazardous places (floodplains, remnant waste sites); thus, spatial solutions are required, especially when comparing the relative levels of vulnerability between places or between different groups of people who live or work in those places.

Several studies have found that mixed land use and local services are associated with social capital (e.g., Aldrich & Meyer 2015). Public spaces like libraries and commercial centers have a role in building resilience, for example as cooling centers in extreme heatwaves. They provide rescue for those at health risk due to hot temperatures. Local facilities have also a role as places for the first rescue in building fires, storms, and floods, for example (Fig. 2.3). Older people interviewed in this study were evacuated in a school and library building near the senior housing complex. It was used as the center for assistance and information provided by various organizations. Air-conditioned public spaces can also provide shelter from wildfire smoke pollution. Indoor air filtration can provide shelter, especially for those who suffer from breathing difficulties due to asthma or another similar lung disease (Wheeler et al. 2021). Staying indoors and keeping doors and windows closed can reduce exposure to smoke for short periods, but it is less effective over several days or weeks of reduced air quality.

In hazards not only buildings but the number of people in the buildings is a relevant factor for evacuation. People distribution in cities varies during time and space. Urban density may become a risk factor in emergencies. Housing areas are most crowded and vulnerable at nighttime. Anhorn and Khazai (2015) consider an extreme case, where several high-rise apartment buildings around a single courtyard with only one exit point towards other courtyards before even reaching a road. Connection to the street through a series of courtyards and narrow passages makes evacuation difficult.

Access to healthcare facilities is important in crises. They should be built on sites with low risks of damage from natural hazards. A literature review by Fallah-Aliabadi et al. (2020) revealed that hospital building structural resilience, and infrastructure that enables the functions of the hospital, power, water, and

Figure 2.3 School building is used as temporary shelter for the country's internally displaced people in Ukraine. (Photograph by K. Adalgeirsdöttir)

cybersecurity, are relevant in crises. Moreover, they found that transport routes and access of patients and staff to the hospital are crucial. Collaboration with healthcare professionals, volunteer organizations, and local people increases resilience. Clear evacuation routes for emergencies and information for residents about the nearest public or semi-public buildings that are used for first rescue in fires, floods, heatwaves, and other hazards may help in the evacuation. The buildings that are used for first rescue need to be accessible to all and have good sanitary facilities and water supply.

Multifunctional Green Spaces

Urban nature offers public health benefits in terms of improved mental and physical health. The green environment also has an important role in absorbing rainwater and cooling the urban environment. Communities plan for better urban environments, thus increasing community wellbeing and possibilities for sports and leisure. This desire for an improved urban environment for citizens can be combined with risk management for natural hazards. Natural hazards can become drivers or opportunities for local transformation processes. Local stakeholders play a critical role in initiating and managing local transformation processes, acting as enablers or hindrances. Thaler et al. (2019) point out that local stakeholders or landowners can have different views on how to manage natural hazards. The conflicts between various stakeholders may become a barrier to successful

implementation. Therefore, local engagement, resources, and knowledge are important to successful results.

Community gardens may act as buffer zones for stressful life events as well as for fires. According to French et al. (2019), accessible open spaces such as parks, sports fields, parking areas, and streets have an important role during natural hazards and evacuation. They found that multifunctional open spaces in urban areas with access to water and sanitation are best adapted for evacuation and first shelter. Publicly owned open spaces that are not planned, and parks, gardens, and playgrounds are most suitable for shelter. The nearness of critical health facilities increases their suitability. Access to shelter and street networks is a major consideration in evacuations. In natural hazards like earthquakes or floods public open spaces and green spaces play a fundamental role in evacuation processes. The network of green spaces in cities and the connections between the green areas can become evacuation routes for people. They can also accommodate temporary shelters for local people. The use of urban open spaces varies during the day and people of different ages and abilities have different opportunities to evacuate and act.

People have unequal access to green spaces. Improving quality and access to green spaces in urban environments can lead to improved health outcomes, due to reduced levels of noise and temperatures. Moreover, improved access to urban green space can reduce health inequalities within a city and contribute to social cohesion, as green spaces are important for inclusion and community building (Ganzleben & Kazmierczak 2020).

Use of Underground Spaces

In some cities, underground parking is combined with other underground spaces that are used for rainwater retention and storage. Moreover, citywide networks of tunnels have been built to ensure electricity and communication connections during extreme weather. Underground transportation systems also have a role in building resilience (Admiraal & Cornaro 2020). Underground metro stations have been also used as spaces for rescue in military actions. They have accommodated-people in extreme heatwaves. However, underground spaces must be prepared for sea level rise and flooding. Evacuation may cause additional challenges because of difficulties in orientating underground. A clear indication of directions and evacuation routes is necessary.

As an example of underground construction, Finland has a long history of building civil defense shelters. They are mainly located in big cities, for example in apartment buildings, hospitals, schools, and other large public and commercial spaces. They can protect nearly all citizens against military actions. Before the war in Ukraine, the necessity of these shelters was put into question. They are still mandatory in most building projects. When not used as shelters, they are used as storage spaces, parking areas, or sports facilities. One of the largest civil defense shelters in Helsinki is used as a swimming pool. It is quarried in the natural bedrock, and in conflict situations has rescue space for 3800 persons.

Private Domestic Space

Home Environment

For most people, home is a safe and cozy shelter from the outside world. It is a personal space as well as a space shared with friends and other household members. Home is embedded with personal experiences and memories that are part of our identity. People can feel a sense of belongingness and attachment to a place, enhancing their self-identity and sense of wellbeing. When they are displaced or lose their home, they may feel grief from being uprooted from all that is familiar (Gitterman & Knight 2019). The experience of home may also deteriorate during periods of long illness or disability, and social isolation like COVID-19. Due to the changes in one's home environment, it may not feel safe, and people can feel the loss of control over the space. During the pandemic, the home environment may have turned into a working environment as domestic spaces were used to accommodate work and studies as well. Marco et al. (2022) observed that adaptability and flexibility as well as spaciousness helped people to cope with the "enforced togetherness" of lockdown. According to them, family members had to negotiate and adapt the use of available spaces for work while trying to maintain their wellbeing. They found that connectivity (digital and physical) inside and outside the home became important. During lockdown, the household composition may have also changed. Due to more severe restrictions for the oldest age cohorts, adult children may have decided to move to provide care for an older family member, or older people may have moved in with a younger relative for support.

The loss of a home can be experienced strongly with all unwanted moves. It can result from illness or sudden crises leading to a feeling of insecurity and loss of control. Studies by Elliott and Howell (2017) related to natural hazards revealed that disadvantaged people had more residential mobility after crises, as it was difficult to find affordable housing after crises due to increasing demand. Whereas those who have houses and good insurance rebuild their houses rather than relocate.

Similarly, Johnson and Carswell (2021) point out that unplanned moves seem to occur more often in lower-income populations. The moves can be caused by natural hazards or economic crises, for example. For a person or family, the emotional and psychological distress may be the same regardless of the cause of the crisis. During unplanned moves in crises, the negative experience of the new place of residence can delay the recovery from crises (Johnson & Carswell 2021). Older adults placed in care facilities and children placed in foster homes experience intense feelings of grief associated with the loss of home and family. In this study, due to a building fire, the older adults were displaced temporarily from their apartments that they considered their end-of-life homes. The building fire affected their sense of security and many of the residents did not return to the senior community after the renovation period. The most important loss they reported was the loss of their community.

Temporary Dwellings

Anhorn and Khazai (2015) found that shelter needs after crises can be divided into emergency shelter, temporary shelter, temporary housing, and permanent housing. In crises, people from non-usable, collapsed, or destroyed buildings but also from partly damaged and non-damaged buildings need shelter (Anhorn & Khazai 2015). In the RESCUE project we have observed cases where a fire, flooding, or landslide caused damage to people's homes, and they needed temporary dwellings. Renovation and rebuilding processes can take months or years. Some areas are destroyed and cannot be rebuilt. Even if one's home is not fully destroyed, people may own properties that have lost their value and are not livable or marketable. This may lead people in economic distress.

Many cities are currently trying to deal with refugees, immigrants, and displaced people due to natural hazards or armed conflicts. The lifecycle of a temporary shelter is short when compared to conventional buildings, ranging from some months to some years in most cases. Kuittinen and Winter (2015) found that the highest emissions are caused by shelters that have a short service life. They argue that shelter materials need to be cost-efficient and easy to transport and recyclable or without harmful emissions. If possible, local materials and space resources can be used as shelters.

Abandoned or vacant buildings within a city can offer an opportunity to provide temporary shelter and accommodation for people Fig. 2.4. Finding appropriate and affordable temporary housing and long-term solutions for these people is challenging. Hotels and motels are sometimes offered for short-term use. Until recent years, the urban form has been modified through constant demolition and rebuilding processes. Every building undergoes some changes and modifications throughout its lifecycle. Currently, many buildings in cities remain underused or vacant. These buildings may deteriorate the streetscapes, reduce the attractiveness of the built environment, and lead to vandalism. Often it is better to find temporary uses for vacant buildings instead of leaving them empty. If the buildings are well maintained, they are potential spatial resources in case of hazards and unplanned events. In many cities existing office and industrial buildings have been converted to housing. Temporary shelters and camps are often located far from the rest of the community. Displaced people and immigrants face problems with transport and social interaction, which are basic needs for integrating into the new environment and developing a sense of place attachment. Access to public social, cultural, and economic services enhances integration and community building for displaced people (Razavivand Fard & Mehan 2018, p. 191).

In many countries, the COVID-19 pandemic led to an increased use of second homes as shelters and places for low risk of infection for urban families. In Finland, people stayed overnight at their own or rental cottages almost twice as much as the year before the pandemic. They also purchased more second homes (Pitkänen et al. 2020). Second homes enable people to have an active lifestyle in a natural setting, increasing their wellbeing. Local people may invite displaced people to their homes or second homes. This will help people to integrate into the new community. Some shrinking areas have profited from the internal displacement and gained population.

Figure 2.4 Local buildings are repaired and renovated for temporary accommodation in Ukraine. (Photograph by K. Adalgeirsdöttir)

New people may generate activity and economic growth in the area. However, this also generated fear of urban dwellers spreading the virus and causing an extra burden on healthcare services in rural areas. Many second homes may still have factors that make them resilient: stoves for cooking and warming, wells for fresh water, and outdoor toilets. The Finnish outdoor toilet *Huussi* was presented at the Venice Biennale 2023 as a sustainable alternative to water-toilet-based sanitation systems.

Providing access to normal daily functions as part of the community will help people to overcome crises. Félix et al. (2015) point out that a house is one of the most important needs for people and essential for their wellbeing, providing conditions to live with protection, security, comfort, and privacy. During home loss, people need to move to shelters and temporary housing. Instead of providing short-term shelters the permanent reconstruction should start as soon as possible. It has been observed that the sooner the reconstruction starts the more reduced the future consequences will be.

Vulnerability and Resilience

Vulnerable Communities

Globally, most vulnerable people live in the most inappropriate housing conditions and are most affected by crises. Affordable housing is often located in areas where land value is low. The value of land can be low due to the risk of floods

or landslides. The quality of construction may vary within a country and a city. Buildings in cities and remote areas differ in materials, size, and construction details. Those areas that have more wealth can be more prepared for natural hazards like earthquakes. Need for rapid urbanization can lead to construction on unstable land. Cities are building on coastal areas even though the risk of sea level rise and flooding is well identified. In response to the risk, cities are proposing technical solutions, such as flood barriers and alert systems. Relying only on such technical advancements can make cities increasingly vulnerable to hazards.

In areas where people living there are strongly dependent on only one industry sector, tourism or forestry for example, the impact of natural hazards has a long-lasting effect. When people lose their housing and source of income, they may be forced to move. Crises that affect the whole nation like economic crises and wars may increase solidarity and the feeling of togetherness, leading to peer support and shared resources. Paradoxically, non-affected neighboring communities may have advantages. They may increase their economic activity, services, and housing due to people who are displaced. On the other hand, it is often the most vulnerable population groups that are displaced. Unsupported voluntary moves from affected areas may lead to increased mental, social, and health problems, as a result of community breakdown and loss of homes and income.

A study by Andersson and Hedman (2016) indicated that when crises affect the local economy and people, they increase income segregation and income inequality most in regions and neighborhoods that already had these issues before the crisis. On the other hand, Zwiers et al. (2016) found that crises can enhance social cohesion in disadvantaged neighborhoods when people are not able to move out. The residents may take increasing responsibility for their own neighborhood, take common actions, and feel close to each other, increasing social cohesion. Relocating the whole community after the crisis may help them to preserve the social ties that existed before the disaster (Shiba et al. 2020). The older adults interviewed for this study considered the disintegration of the community to be their biggest loss. They reported that they would have needed a common use space to meet and socialize to maintain their social ties during their stay in temporary housing.

Vulnerable Population Groups

Vulnerable people are defined as persons belonging to national or ethnic minorities, those living in extreme poverty, refugees, migrants, and displaced people. Moreover, age, sexual orientation, and gender identity may lead to vulnerability (United Nations n.d.). Individuals may experience vulnerability differently (Adger 2006). Older people, children, and those in poor health tend to be more adversely affected by environmental health hazards than the general population (Ganzleben & Kazmierczak 2020). People with disabilities are disproportionately affected by disasters. A UN report (2019a) argues that people with disabilities are not sufficiently taken into account or consulted in emergency management planning, and they are not aware of the crises management plan of their community. In crisis, people with disabilities may have difficulties evacuating and accessing basic services, like safe

drinking water and sanitation. They may also need rehabilitation and health services during and after crises (UN 2019, p. 240).

Adger (2006) describes vulnerability as susceptibility to harm due to environmental and social change and a low capacity to adapt. He finds two kinds of human-environment relations to vulnerability: "vulnerability as an outcome" and "contextual vulnerability". Vulnerability may be caused by socio-economic differences, age, and gender, where disadvantaged people and places are often excluded from decision-making and access to power and resources. People of lower socio-economic groups may live in areas with high traffic, air pollution, and noise.

> Poorer households tend to live in riskier areas in urban settlements, putting them at risk from flooding, disease and other chronic stresses.
>
> (Adger 2006)

When natural hazards occur people can lose their housing, belongings, as well as their source of income. Vulnerable people are the most affected by these losses. Natural hazards and other crises also increase the number of persons with impairments or aggravate their impairments. People may not have the financial, physical, or emotional resources to cope with the effects of crises. When housing stock in a community is reduced because of a natural hazard, it will increase the housing prices and rents. This development may force people to move from their community. This affects their social networks and support they may have in their old community.

There is some evidence that individuals experiencing anxiety or distress report a higher personal threat of hazards. Their response to the risks varies. A study by Agho et al. (2010) found that women self-report greater behavior changes related to health and environmental hazards and the prevalence of changed ways of living than males. Older adults who have experienced various hardships in their lives may have better psychological resilience but less physical and financial resources to cope with them. Gjøsund et al. (2016), in a study on fire security, found that there is a disproportionate loss of life among older nursing home residents. Due to age-related frailty, they have less resources to take an active role in crises and are dependent on others.

Conclusion: Building Resilience

Improvements and renovations related to accessibility, quality of public facilities, and open spaces enhance inclusive use of the built environment. They may increase the community's social capital which is a resource in crises. Open green spaces, public transportation, and shelters against extreme weather (cold and hot) protect against some of the effects of climate change. Local stakeholders should agree on the use of public facilities and large commercial spaces in crises. Designated spaces for first rescue with drinking water supply and sanitation as well as healthcare services should be accessible for all resident groups, including the most vulnerable. Inclusive design of the urban environment and buildings is a proactive

measure against crises, as natural hazards are likely to increase the number of people with disabilities.

Preparedness for natural hazards is a potential avenue for improving inclusivity, when the attention is put on the quality of the construction, housing affordability, and social inclusion. During the planning and reconstruction phases, the emphasis should be placed on the accessibility of the built environment, technology, and communication (UN 2019, p. 245). Access to the urban environment may also improve community social capital which is an important resource for community resilience and individuals coping in crises. Social capital can be a buffer against negative life events. In addition to resilient buildings and infrastructure we should prioritize community-building initiatives (Verma et al. 2023). Similarly, temporary housing and the urban rebuilding process should aim to provide opportunities for normal urban functions, including places for private and public life to overcome crises. However, the sustainable development goals encourage the reuse of the existing built environment for future purposes. Cities have many vacant and underused spaces and facilities that may be used for crisis management and preparedness. More flexible use of office buildings, public facilities, and vacant apartments can be considered in times of crisis. Instead of building temporary, for example, housing for those who are affected by crises, the existing built environment should be adapted for their use.

Natural hazards have many negative impacts on people's health and wellbeing. Some individuals are more vulnerable to extreme events because of low income, age, poor health, and disability. Inclusive planning and design of the urban environment may reduce the vulnerability of these resident groups as well as the population in general. Green buffer zones against noise and air pollution can reduce health inequities within cities and improve residents' wellbeing and resilience. As Miller et al. (2020) point out, vulnerability is not a static state, it is constantly evolving, and resilience can be improved. Measures to improve the safety and resilience of vulnerable people are measures that decrease their vulnerability, improve their quality of life in general, and build inclusive communities.

Practical Recommendations

- Enhance inclusive approach to urban environment and citizens
- Maintain and renovate existing housing stock with regard to safety and accessibility
- Increase flexibility and multiuse of public spaces, outdoors and indoors
- Agree on possibilities of temporary uses and adaptive uses of vacant spaces and buildings in crises
- Provide a network of green open spaces with fresh water and sanitary infrastructure in cities to increase wellbeing and resilience of people in natural hazards

Note

1 https://ec.europa.eu/commission/presscorner/detail/en/ip_23_3050

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