

Impact Report

SOLUTIONS FOR SUSTAINABLE HOUSING





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INTRODUCTION

Easy Housing Concept

Easy Housing is a circular, resilient and carbonnegative building technology based on sustainable timber. We offer a physical building system, together with the technical information and support that is needed to adopt our sustainable building concept.

The Climate and Housing Crisis

The climate is changing faster than expected [2]. Alongside the increasing climate crisis, the housing crisis in emerging countries continues to become a growing concern. Already individually challenging, the interlinkage of these two crises further exacerbates the vulnerability of emerging countries.

In only ten years, the annual carbon dioxide (CO2) emissions - the most abundant greenhouse gas (GHG) - have increased by 19 ppm to a total of 410 ppm in 2021 [1, 2]. Although the GHG emissions of developed countries have decreased by 9% over the last years, the GHG emissions of emerging countries have increased to 130% [3]. The construction sector knows high levels of emissions, waste, and resource extraction. Therefore, the construction sector plays an important role in reducing global emissions.

In 2020, 1.8 billion people lived in inadequate housing [14]. Urbanization and population growth drives the global housing deficit. This poses a challenge for urban management in the 21st century [4], especially within emerging countries [5].



In addition, due to the climate crisis, natural disasters are occurring more often and are increasingly damaging to houses [6]. This puts immense pressure on the housing sector for more resilient buildings. Together with increasing population and urbanization, this forms a major challenge.

Population growth and human migration are on the rise, and climate change is poised to have dramatic effects, which means we're approaching a tipping point for the safety of cities all over the world. 99

Ede Ijjaz-Vasquez, World Bank





MISSION & VISION

Our Core Values:

Climate Resilient & Carbon Negative Circular & Biobased Building Technology Cultural Integration & Local Labour Scalable & Standardized Concept

Our Mission:



Affordability

The consequences of climate change will affect the poorest people and countries in the world the most, as they have the least means to adapt to or mitigate the local consequences of climate change. Easy Housing, therefore, aims to offer affordable housing specifically for emerging countries.



Sustainability

The concept of Easy Housing is developed to be as environmentally friendly as possible. Easy Housing is a circular and carbon-negative building technology based on sustainably sourced and certified timber.



Resilience

The Easy Housing concept is climate-resilient and can withstand natural disasters like floods, earthquakes, and hurricanes. Easy Housing has been engineered to be safe, comfortable and durable.

Our Vision:

Reducing CO2 Emissions

The climate crisis asks for a reduction of GHG emissions in which the construction sector plays a significant role. Easy Housing therefore provides a carbon-negative concept, storing atmospheric CO2 in its construction through the process of carbon sequestration (carbon banking).



Creating a Circular Economy

Circular options for the building sector have the potential to reduce detrimental environmental impacts significantly [7]. Easy Housing offers a circular building concept that maintains material value and does not cause waste. The circular homes can be incremented, reused, relocated, and rebuilt.

Working Towards the Sustainable Development Goals (SDGs)

Reporting on the SDGs is important in communicating the organization's commitment to contributing to the Global Goals to stakeholders; claiming accountability and responsibility to take the necessary actions; and measuring progress over time. Almost all SDGs are integrated or directly benefitting from our concept.





CO2 EMISSIONS

Most houses are still built the from the polluting materials concrete and steel. Our buildings consist completely out of sustainable timber. Concrete is known to be CO2 intensive, whereas timber has the ability to store CO2. Hence, Easy Housing offers a carbonnegative building technology and contributes to CO2 emission reduction. The current building sector is a major contributor to the global CO2 emissions.

In 2019, from the global CO2 emissions [17][18]:





was caused by the build environment



was caused by the construction sector

Timber vs. Concrete

Comparing the CO2 emissions of a 100 sqm dwelling of Easy Housing (timber) and a traditional concrete brick structure.



Paris Agreement

Remaining carbon budget for 1.5°C scenario is

450 billion tonnes



while global annual emissions are

36.4 billion tonnes

= 12 years left! [20][21]

The impact of building with timber on the CO2 emissions reduction is bifold:

Timber prevents the use of concrete which avoids 14 tonnes of CO2 emissions per home.

Timber stores CO2 through carbon sequestration which saves 22 tonnes CO2 emissions per home.



This reduction is equal to [22][23]:

For an average 100 sqm house, the design of Easy Housing can reduce CO2 emissions by 36 tonnes per home. 400,000 km

250,000 km

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CIRCULAR ECONOMY

Easy Housing aims to put the concepts of circular economy into practice in its building design. The circular homes can be reused, repurposed, relocated, rebuilt, incrementally expanded, stored and shipped flat-pack, and repaired or maintained by replacing individual components.

Currently, of the total amount of solid waste:

35%

comes from construction and demolition projects [8, 19]

This causes huge societal and environmental problems such as air and water pollution, risks to public health, and the loss of natural resources since a lot of this waste ends up in landfills and uncontrolled places [8]. The biggest contributor to construction and demolition waste is concrete.

Concrete is seen as the most unsustainable building material as it consumes the maximum number of natural resources. Concrete is a nondecaying waste material which will remain in the environment for many years and therefore contributes to a waste disposal crisis and environmental problems [9].

In order to keep up with the demand, concrete production would have to be doubled in the coming 30 years.

[24]

In South Africa, 2011:

The share of construction and demolition waste sent to landfills was [15, 16]



was concrete.

Landfills are the least preferable option on the waste hierarchy to dispose of waste.





CLIMATE RESILIENCE

The frequency and impact of natural disasters have grown exponentially in the past decades [10]. From 2005 to 2019, more than 2.5 billion people were affected, meaning they needed immediate assistance because of a natural disaster [11]. More than 1.5 billion US dollars of damage resulted from these disasters and at least 28 million people got homeless [11]. Hence, urban resilience against natural disasters is extremely important in combating the housing crisis.

Percentage of people that became homeless due to a natural disaster per year: [25]

Annually, this accounts for 27,9 million people becoming homeless due to natural disasters.



29% Are homeless due to earthquakes



On average annually, floods make more than 1 million people homeless and cause 30,5 billion US dollars of damage [25]. Most of the costs for damage reparation were needed in developing countries because those countries are struck the hardest. 77 million people could fall back into poverty again because of a natural disaster in 2030 [12]. Climate-resilient housing can strongly reduce the expected post-natural disaster costs and reduce the number of people who fall back into poverty.

The share of total costs due to natural disasters: [25]



 It is important to have good understanding of the specific natural disaster risks of a local context before determining the design of housing.

Easy Housing Contribution to Climate Resilience:

1. FLOOD RESILIENT

The timber foundation can be:

a. elevated above ground level by small concrete blocks, timber poles or screw foundation

b. reinforced depending on the soil type, so that it will not erode or sink during flood events.

2. EARTHQUAKE PROOF

Timber is a well-known construction material that has a high resilience against earthquakes. It is a flexible material because wood fibres in the structural beams and columns have elastic properties [26].





WORKING TOWARDS THE SDGS

Several SDGs were identified to be inherently part of the Easy Housing concept, namely: #1, #9, #11, #12, and #13. These goals Adequate Housing is can be considered as the integrated set of goals (see Figure 2). However, adequate housing means more than being low in CO2 emissions, circular and resilient. There is also a catalyst effect of Easy Housing on SDGs #3, #10, #16, and #17. Indirectly, housing has the ability to contribute to all other SDGs. For Easy Housing, this impact is highly dependent on local context, long-term effects, and partnerships.

not just a roof, it is a catalyst for accessing other rights.

UN Habitat [14]





Sustainable Cities & Communities:



For cities to be truly sustainable and thrive economically and socially, it is very important to have inclusive and mixed city planning. Easy Housing is a sustainable building system that offers many options for housing typologies, clusters and neighbourhoods, all within its standardised system.



Overview of Pilot Program

Together with our partners **Empowa** and **Casa Real**, we will realize a pilot project in Mozambique. We will build two sustainable and affordable houses for lower income families. The project will be located in a new neighbourhood in Beira. The houses will include a solar home system and rainwater collection system.

Housing Demand

There is a large demand for sustainable and affordable housing in Mozambique, as 77% of the population lives in slums and 2 million additional houses are needed. In response, cheap concrete residential towers are built, which often do not comply with safety requirements. The building of 2 million concrete houses would have devastating impacts on the environment. Easy Housing can help to solve this problem, providing sustainable and affordable housing.

Materials & Design

The project entails two semi-detached homes for starters, of around 33 sqm. each and can be expanded incrementally. They will be built entirely out of locally and sustainably sourced FSC Messassa timber produced by Levas Flor, a FSC-certified forestry company. The façade will be made of sustainable coconut palm planks, delivered by Pedra a Pedra.





Partnerships

Casa Real is a leading housing development company in Mozambique that aims at providing quality, affordable and sustainable housing for low and middle income families.



Empowa is specialized in providing decentralized and innovative financing systems using blockchain-technology, especially focused on financing housing.

CONCLUSION

Easy Housing is a climate-neutral, circular and resilient building technology. Our housing solution addresses the global housing shortage with a standardised and scalable concept that can be tailored to local cultural and geographical needs. This combination of a standardised sustainable building system that can still be tailored to local cultural demand and project design criteria, makes Easy Housing a unique solution that has a positive impact on nearly all SDGs.



Low Carbon Emissions

- Due to the use of concrete, the construction sector is a major contributor to CO2 emissions.
- Through the use of timber, Easy Housing can reduce up to 36 tonnes of CO2 per house.

Circular Building & Materials

- Concrete is one of the most unsustainable materials for construction.
- The circular homes of Easy housing can be reused, repurposed, relocated, rebuilt and incremented.





Climate Resilient Homes

- Floods and earthquakes are cost intensive threaths to developing countries.
- Easy Housing are resistant to natural disasters, reducing risks and damage costs.

Working Towards the SDGs

- Easy Housing has integrated almost all SDGs in its concept.
- Easy Housing can be a catalyst for supporting other SDGs.





Understanding Local Context

• The Mozambique pilot program will provide valuable insights on the cultural integration, sustainable sourcing, and cost-effectiveness of the Easy Housing concept.

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To view the full academic report, please visit www.easyhousing.org.

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