

DESIGN.BUILD.BETTER

2021 Impact Report



Breaking the Bias: BuildX Studio Team on International Women's Day in Nairobi





We are an innovative architecture, engineering and construction company. We see a world where all buildings are radically better: buildings that are net zero carbon, more inclusively designed, and enhance the quality of life and wellbeing of building users.

Certified



®

Corporation

BuildX Studio is B CORP™ Certified

BuildX Studio, the first architecture, engineering or construction company in Africa to become B Corp™ certified, has been renowned for its commitment to social and environmental impact. B Corps inspire all businesses to not only be the best in the world, but to be the best for the world. There are just over 3,000 Certified B Corporations in the world with 1 unifying goal – to redefine success in business.

As a B Corp™ certified company, we believe in using business as a force for good.

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DESIGN.BUILD.BETTER

We pioneer sustainable design and construction in East Africa. We provide design and construction services under one roof. Our projects range from healthcare and education to multi-unit residential housing to masterplanning.



◀ “BuildX **cares**. We care about **what** kind of work we do, for **whom**, for **what** purpose, and **how** we go about doing that work. This makes us different from many other companies.”
Etta Madete Mukuba, Affordable Housing Lead

“Having **different disciplines** working together under one roof presents an opportunity for innovation. As an architect, I engage and collaborate with our engineers and quantity surveyors. I become a more **creative problem solver**.” *Tshepo Mokholo, Architect & Inclusivity Champion*



◀ “As an engineer, I believe that designs have an impact on the planet and that innovation does not only happen in expensive laboratories in a far away place. **I can innovate in Nairobi**.”
Esther Segero, Civil & Structural Engineer, Climate Champion

“As an architect, I develop impact driven design solutions through sustainable use of materials and minimising waste. In my role as **Quality of Life and Wellbeing Champion** I developed a tool to maximise quality of life and wellbeing impacts across all our projects.” *George Wekesa, Architect & Quality of Life and Wellbeing Champion*



◀ “We aim to create positive social, economical and environmental impact through our designs. This can be seen in one of our projects where we have used **modular design** which will be prefabricated and assembled on site, making construction **time and cost efficient**. Involving the local community in the construction will further ensure that the design responds to their **local preference and climatic conditions** of the area.”
Viva Mugambi, Graduate Architect

“We have always had a strong impact mission. Yet we still have a long way to go to achieve our goals. **We cannot do it alone**. By being transparent about our aims, our progress, our challenges and our learnings **we want to enable and inspire others**.”
Carolin Schramm, Impact Lead



2021 IMPACT HIGHLIGHTS

Green Building Certification. We adopted IFC's EDGE ("Excellence in Design for Greater Efficiencies") as a design and certification tool. Our team has three EDGE experts and our first two projects are in the process to be EDGE certified.

Embodied Carbon Assessment. We developed an embodied carbon calculator as a design and measurement tool for all our design projects.

Low Carbon Building. We completed a two-year R&D project on mass timber construction in East Africa, launched the first mass timber prototype in Kenya, and were selected as a lead partner for the East Africa Breakthrough Initiative under the Climate Smart Forest Economy Programme.

Alternative Building Materials. We piloted engineered Earthen construction for one of our projects in Northern Kenya.

Quality of Life and Wellbeing Design Tool. Building on existing frameworks and certification schemes such as WELL, the Living Building Challenge and the World Green Building Council, we adopted a BuildX design tool for maximising quality of life and wellbeing in our buildings.

Sustainability Champions. We appointed three internal impact champions to lead the implementation of our impact management strategy.

Impact Research. We launched three research projects on green and affordable building, affordable financing for homeownership and gender-lens design alongside one of our affordable housing developments.

Sector Advocacy. We were selected as one of two African companies for the COP26 virtual pavilion of the UKGBC Build Better Now, and curated a contribution for the Barbican's Our Time on Earth exhibition.

Collective Action. We signed up for the C40 Cities Clean Construction Action Coalition



**Climate Smart
Forest Economy
Program**





“ We work towards delivering buildings that are net zero carbon, more equitably designed, and that enhance people’s quality of life, wellbeing, equity, and access. We are committed to working with our clients to create a world where all buildings are radically better by making wiser energy and material decisions, while also assisting them in learning, adapting, and flourishing in the face of change.”

Munene Mathenge
Managing Director
BuildX Studio

WHAT WE DO

We are an innovative architecture, engineering and construction company. We build radically better buildings to create value for our clients and impact for people and the planet.

2021 Project Highlights

Dry Gro

Naivasha

- Water collection dam on a 20,000m² site
- Build

Zima Homes

Wangige

- 137-unit affordable housing development
- Design-Build-Develop
- EDGE certification

Wanda

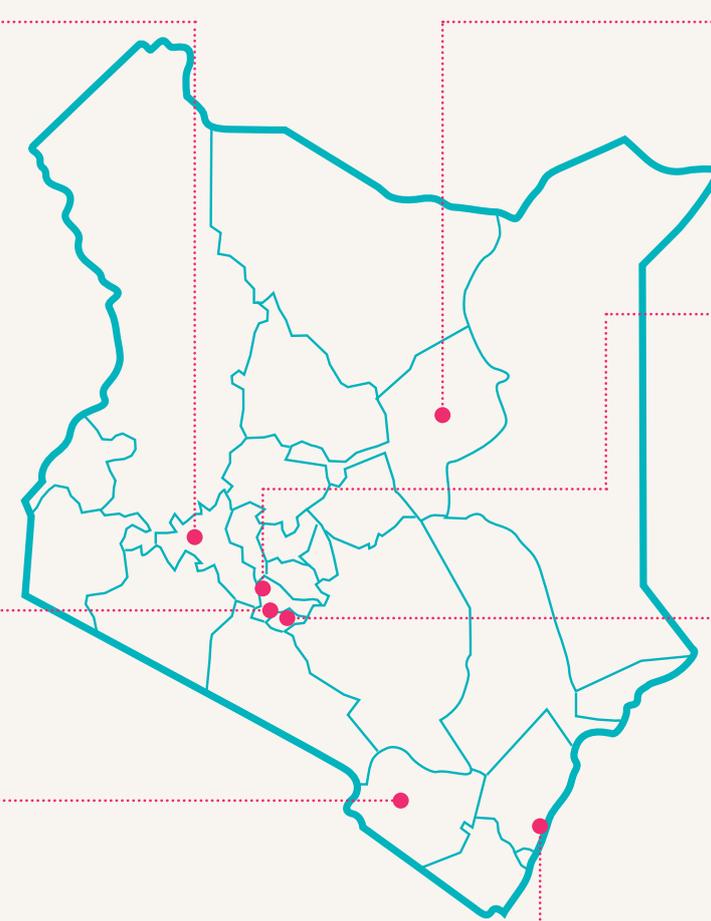
Taita Taveta

- Agricultural Hub and Collection Centres
- Design-Build
- Use of earth and wood as main materials

Moonberg

Taita Taveta

- Organic farm support facilities
- Design-Build
- Circular system design



Kalama

Isiolo

- Resource Centre
- Design-Build
- Rammed earth building

The Rewildings

Tigoni

- 8 Family Homes
- Design-Build-Develop
- Regenerative design, zero cement

The Alchemist

Nairobi

- 40-bed Backpacker Hostel
- Design-Build
- EDGE certification

Green Heart Village

Kilifi

- 16 middle-income housing units
- Design-Build
- 80% of materials to be procured locally

Green Heart of Kenya

Kilifi

- 750 acres regenerative town and productive landscape development
- Masterplan & sustainability framework

MODUL

Nairobi

- Flat-pack CLT urban housing concept
- Design
- Mass timber construction

Since 2016...

we fully constructed

> 15 buildings

our team has grown to

35 staff members



“ Before we submit proposals for working with new clients, we complete an internal project selection criteria questionnaire to determine if the project is a fit for BuildX. A project’s potential for innovation and impact is a core element of that. ”

Carolina Larrazábal
Co-Founder & Design Director
BuildX Studio

OUR IMPACT MODEL

We develop innovative building solutions that go beyond business as usual and maximise impact: buildings that are net zero carbon, more equitably designed, and enhance quality of life and wellbeing. Why?

Rapid population growth, urbanisation and a severe skills gap in the construction industry in East Africa are placing huge strain on our built environment and pose a major threat to the health of both people and planet. Yet it doesn't need to be like this. If we design smart, centred on climate and human wellbeing, we can create towns and cities which are healthy today and for future generations. Our impact model is based on three core areas:



Climate Change Mitigation

The built environment has enormous potential to mitigate climate change. We take a low carbon approach to design and construction. We set environmental performance targets for all our projects and support our clients who want to find innovative green building solutions.



Quality of Life & Wellbeing

We spend over 90% of our lives indoors. Buildings shape our quality of life and wellbeing more than any other physical environment. Our design improves health and human experience in buildings. Healthy buildings can maximise wellbeing, rehabilitation, and productivity.



Inclusive Design & Construction

Our goal is for all BuildX buildings to be inclusively designed and built. We conduct market research and apply participatory design strategies to achieve our goals. We prioritise labour for women and youth within the communities where we work. We implement sustainable construction strategies to achieve social and environmental targets.

We take a holistic approach to maximising impact. We aim to go beyond minimising negative results and work towards creating positive value for our clients, partners, building users and the environment. We seek opportunities to learn and innovate through research, strategic initiatives and working with others.



“ BuildX strives to achieve sustainability through local, sustainable material sourcing. Since inception, BuildX have delivered an impressive number of projects. In partnership with Reall, they are looking to deliver 10,000 green affordable homes by 2030. This goal is realised through circular economy principles to minimise waste and emissions and to maximise recycling and reuse. Using a mixture of bio-based materials and modular construction, BuildX is delivering high quality, low emissions homes. ”

Ed Byron
Project Manager
Reall

CLIMATE CHANGE MITIGATION

Global carbon emissions continue to rise at exponential rates. We must make urgent changes, globally. Buildings and construction are responsible for 39% of global CO₂ emissions (11% embodied carbon and 28% operating emissions).

Rapid population growth in Africa means that >35% of all expected new construction will take place on the continent, substantially increasing Africa's contribution to global carbon emissions if we follow a business-as-usual approach.

Types of carbon in buildings

- **Embodied Carbon:** The emissions from manufacturing, transportation, and installation of building materials
- **Operational Carbon:** The emissions from a building's energy consumption

In Kenya, the green building sector is still in its infancy. At BuildX, we aim to do better than 'business-as-usual' for every project. For example, by reducing the amount of concrete and replacing high-carbon materials by local and sustainable materials such as Compressed Stabilised Earth Blocks, dry stone walls, engineered timber or rammed earth. We set environmental performance targets for all our projects and use carbon assessment as a design and measurement tool during our design process.

We are certified **EDGE experts**. EDGE is a green building certification tool focusing on energy, water and materials savings. It has been developed with a specific focus on emerging markets.

We aim for all our design projects to achieve the requirements of EDGE certification. This means 20% or more savings in energy, water and embodied energy in materials compared to the local base case. Three of our projects are in the process to be EDGE certified.



Our Approach



Re-use

Only build new where essential. For example, conversion, renovation of old buildings.



Our work with **Penda Health**, a chain of outpatient medical centres in Nairobi, focuses on designing medical centres in existing buildings in semi-formal neighbourhoods. To date, we have designed 30 clinics providing access to medical services in some of the most densely populated neighbourhoods in Nairobi while avoiding the need for new construction.



Reduce

More design, less material. For example, prefabrication and efficient structures.



Many of our design decisions for **Zima Homes**, an affordable 137-unit housing development on the outskirts of Nairobi, have been driven by environmental performance targets. For example, we are pioneering a vaulted block system that would reduce material volumes needed for blocks and beams by 30%.

Zima Homes will be EDGE certified with about 60% embodied carbon efficiency.



Replace

Change the materials we use to build. For example, use bio-based materials such as timber and earth.



Our **MODUL project**, “Model for Decarbonised Urban Living” is a flat-pack cross laminated timber (CLT) urban housing concept. CLT is a climate-positive, faster and potentially more affordable solution for urban buildings.

Earth, coral and wood are the main materials for our work with **Green Heart Village** to design and build 16 middle-income housing units in Kilifi.



“ East Africa offers a strong sustainable mass timber market proposition, with high reforestation potential and a rapidly growing construction industry. Kenya in particular, offers a dynamic real estate market, which is conducive for the development of mass timber, especially in and around Nairobi. ”

James Mitchell
Co-Founder & CEO
BuildX Studio

FROM FOREST TO FRAME

Global emerging evidence indicates that making 90% of all new buildings from wood, rather than concrete and steel, could cut global CO2 emissions by 4% - more than the carbon footprint of flying.

In 2021, we concluded a two-year R&D project to explore opportunities to tackle both the affordable housing shortage in Kenya and the negative climate impacts of buildings and construction at scale. We identified timber - in particular, mass timber - construction as the most compelling solution.

Mass timber is an innovation in wood products consisting of multiple solid wood pieces bonded together to create larger panels of exceptional strength.

Our mass timber prototype in Nairobi serves as an exhibition for visitors to experience and learn about wood buildings.



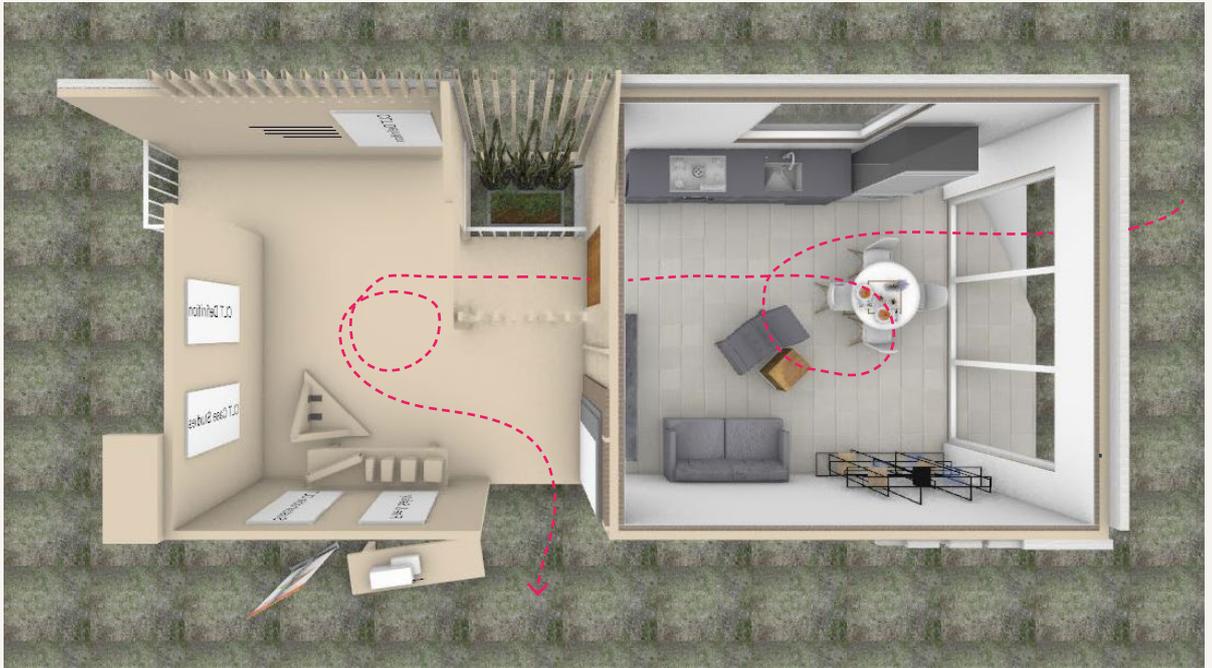
Production

The CLT panels for the prototype were manufactured by XLAM in South Africa and shipped to Kenya in a single container.



Prototype Objectives

Our prototype aims to create market awareness and explore market interest from real estate development actors and the general public.

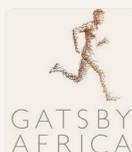


Visitor Experience

It's not always easy to visually spot CLT buildings from the outside, since some kind of exterior-quality material (e.g. brick or stone) is required to clad the CLT structure. As such, visitors to our prototype have no initial indication that it is made from wood. Inside, the first room is fully finished and furnished as a mock apartment, with gypsum hiding the CLT panels. Visitors provide feedback in this first space - Do they like it? What do they think of the quality? Can they guess what it's made from? - before discovering the CLT construction in the second space alongside exhibition information and other sample materials.

Having developed a clear case for developing a mass timber construction market in East Africa, in 2022 we will focus on developing a mass timber pioneer building for commercial and other mixed uses in Nairobi.

To find out more about our BuildX LT initiative visit <https://youtu.be/CxQvv18YDpo> and watch our prototype in Nairobi.





“ My drive to see a better built environment beyond the accepted standards within the Kenyan context inspires me to explore ways in which we can better influence the perceptions of quality of life and well being. I want to share the right message to the key players to not only make this a BuildX mission but a mission for all. ”

George Wekesa
Architect & Quality of Life and
Wellbeing Champion
BuildX Studio

QUALITY OF LIFE & WELLBEING

We spend over 90% of our time in buildings, and close to 100% of our time in the built environment as a whole.

By designing and building innovative green buildings we aim to positively impact the quality of life and wellbeing of people using them. Key building elements such as air quality, natural light and green space all impact on quality of life and wellbeing of building users.

For example, improving the energy efficiency of buildings can reduce the negative health impacts of both overheating and leaky, cold homes. Addressing indoor and outdoor air quality can reduce instances of illness, and green spaces can improve mental health.

Our approach



We focus on **'healthy materials' and design principles**. For example, Biophilic Design (from ancient Greek "biophilia": the love of living things) is proven to have positive effects on physical and mental health of building occupants. The concept aims to increase occupant connectivity to the natural environment through the use of direct nature, indirect nature, and space and place conditions.



Building on existing standards and frameworks, including the WELL certification scheme, the Living Building Challenge and the Health and Wellbeing Framework of the World Green Building Council, we have developed an internal **design tool to maximise Quality and Life and Wellbeing** aspects. The tool combines design choices with the simulation of quantitative metrics such as daylight, air quality and thermal comfort based on international and local benchmarks.



Where possible we **collect occupancy data**. For example, our Zima Homes pilot for affordable housing evaluates if our design has positive impacts on residents' quality of life. We will assess aspects of subjective wellbeing, incomes, overcrowding, affordability, access to water and sanitation, distance to workplace, schools and services and analyse results based on a **"Quality of Life Index"** developed by our partner Reall.



“ Our buildings need to fulfil the needs of the local farmers. So including the local community in the design and build process is critical for our long term success as a business. The greater upfront investment will pay off later, it’s a risk mitigation strategy for us. BuildX has forced us to think through a lot of detail and some of the decisions we are making. This has been a very powerful process. ”

Marion Atieno Moon
Founding Director
Wanda Agricultural Group Limited

INCLUSIVE DESIGN & CONSTRUCTION

Most buildings are designed and built by teams that look very different to the people who will use them. Women, in particular, are heavily under-represented.

In Kenya, only 11.8% of registered architects and 7.3% of engineers are women. Female representation for construction jobs is even lower. Less than 3% of accredited artisans (construction workers and site supervisors) are female.

We have inclusive hiring and staffing policies. More than 60% of our team are women. We aim to achieve equal gender representation for all our design project teams.

Buildher

We work with our sister company Buildher to have at least 30% female construction workers on all our sites. To achieve this we conduct community engagement activities prior to all construction projects and employ Buildher graduates.

While women are an important focus we take a holistic approach to inclusion. [Participatory design processes](#) are a core element of our work: we seek to directly engage users in our design process.



To inform strategy and design for Zima Homes, we carried out various market research activities with more than 300 participants. We aimed to understand the housing demand and preferences of the local population living and working around the project site.



As part of our design of collection centres for agricultural produce for Wanda Agriculture Group, we interviewed local farmers before starting with the design, and then did follow up workshops to check our suggested design works for them. The local community will also be involved in the construction through putting up the walls, slabs, foundations and finishes such as ceiling and floor as per their local preference and climatic conditions of the area.



“ The Green Heart of Kenya is determined to pioneer the Future of Living in East Africa. We believe that current building practices are simply not sustainable and that we need to innovate low carbon, biodiversity positive building and development methods. We know that we need to support the growing population, but think that this can be done while having a positive impact on our environment - protecting the natural world for future generations. BuildX have been invaluable partners in the process of understanding what is truly sustainable, as well as guiding us towards our ultimate goals of being a regenerative force in an otherwise destructive industry. ”

Lachie Gordon Athié
Managing Director
The Green Heart of Kenya

WHAT WE LEARNED

- **We need context-specific solutions for global issues.** There is growing global awareness about the need and opportunity for the built environment to address climate change. Yet, to date, in countries like Kenya, experience and data is still limited. For example, currently, we work with global assumptions for carbon emissions and benchmarks. Initiatives like IFC's EDGE, a green building certification tool with a particular focus on emerging economies, are a great start to find contextualised solutions. But there is enormous potential to do more.
- **Early stage markets require companies and clients to be the first movers.** In countries where the green building sector is still in its infancy the business case for green building is less obvious compared to more mature markets. Some of our clients already see commercial advantages of green building apart from 'wanting to do the right thing'. However, many green choices do still come at a premium. There is a need for more innovative policy and financial instruments to advance green building innovation and scale.
- **Practicing innovation and impact takes time.** We are at the beginning of our impact journey. Our main focus so far has been to formalise our impact model. Practical implementation requires learning and adjusting. Finding the right balance between piloting new processes and approaches and meeting day-to-day client deadlines can be challenging for a young company.
- **As pioneers, we need to catalyse sector change.** We believe that by making vast leaps forward in green building innovation we can accelerate market transformation. Yet, the issues we aim to address and the goals we want to achieve go beyond our capacity as a single firm. We need to activate other stakeholders towards our vision. For this building partnerships to optimize results and to enable replication at scale is critical. We decided to take an honest and transparent approach to sharing progress and challenges to inspire exchange and learning with and from others.



“ What we build today will form the Africa and the Africans of tomorrow. Companies like BuildX Studio are pioneering innovative solutions for low carbon, healthy buildings in East Africa. The only demonstration we need for climate action is action! ”

Elizabeth Wangeci Chege
BuildX Board Member
Vice Chair - World Green Building Council
Chair - World Green Building Council: Africa Regional Network

2022 OUTLOOK

Combining outstanding design and construction with maximising social and environmental impacts has always been a key driver of our work.

Driven by the desire to produce tangible results and evidence, in 2021, we reviewed our impact model and developed an approach for impact management as part of our day-to-day operations. As we enter 2022 we are looking forward to the next phase of our impact journey.

» Fully integrate our impact management system into all client projects.

- Perform carbon assessment as standard practice for all projects during early design stages.
- Design all projects to meet the minimum standards of EDGE certification.
- Set company targets and milestones towards net zero building.
- Pilot sustainable construction strategies to manage water use, energy use and waste generation.
- Employ at least 30% female construction workers on all sites.
- Roll out BuildX quality of life and wellbeing design framework.

» Inspire clients and partners to go beyond business as usual.

- Talk to our clients to help them see the opportunities to impact our environment, e.g. by supporting the use of materials that they may not be accustomed to, but which have an environmental benefit.
- Empower our designers to learn and innovate. We must transform ourselves from enablers of a carbon hungry industry to innovators who can design healthy and low embodied carbon buildings.
- Engage with our contractor partners. We need to get contractors on board earlier so that we may better partner with them to reduce our embodied carbon without increasing the cost of construction.



“ I lead a team of 18 designers, engineers and quantity surveyors from seven different countries. The breadth and depths of experience is inspiring. ”

Josine Lambert
Head of Design
BuildX Studio

OUR TEAM

Our Team is 62.5% women, multicultural and multidisciplinary, with expertise across the design, build and development disciplines.

Founders



Team



Board



THANK YOU

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