

**75 ARCHITECTS
FOR A
SUSTAINABLE
WORLD**

Agata Toromanoff

75 ARCHITECTS FOR A SUSTAINABLE WORLD

Foreword by
Charles Wu

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BUILDING AS AN ACT OF OPTIMISM

Charles Wu,
Founder and Director
of Polysmiths

The act of building is rarely just a response to necessity – it is a profound expression of optimism. We build because we are optimists who believe in investing wisely for a better future. This optimism drives us to not only meet our current needs, but to find new ways of interpreting the knowledge, technology and materials available to us, and create a better quality of life for future generations.

There is no better time than now to remind ourselves of the importance of optimism. Humanity is facing a major collective challenge of making our built environment more sustainable. This task requires our collective input to care about, and demand, better ways forward. Sustainability in architecture means investing this good will wisely, integrating technological innovations and millennia-old wisdom, to shape a better quality of living. Although this challenge could hardly be greater, there are architects, engineers and builders around the world who are developing creative and innovative solutions that can lead to new forms of architecture, with a deeper understanding of sustainability principles. Even more encouraging is how some of these trail-blazing ideas have become possible with the support of active local communities, courageous clients and responsible investors.

The exemplary projects collected in this book from around the world have demonstrated this collective optimism. These projects are architecture at their highest quality, with each also carrying the unique story of how to best take advantage of its environment, available materials and construction know-how. Some pioneering examples push the boundaries of active sustainability technology: spectacular tensile roof structures entirely covered in photovoltaic tiles, or 3D-printed structures that are highly optimised to use only the minimum amount of building material.

However, there are also project examples that successfully integrate passive sustainability design methods for highly sustainable buildings: adaptive reuse of building materials, use of thermal mass for absorbing, storing and releasing heat. It is easy to forget how a humble courtyard for natural cross-ventilation, or a building that's shaped to precisely respond to the sun and prevailing wind and rain conditions, can yield highly sustainable, ingenious architectural solutions.

In the coming years, we will no doubt learn a great deal more about sustainability. Some of the new approaches will work, many others will not. It is nevertheless important to collect these ideas, as a reminder and encouragement to politicians, potential clients, construction practitioners and users of what is available and possible, so that we all can be bolder and take up responsibility to build a better, more sustainable future for everyone.

We have just recovered from a global pandemic, with a lot more uncertainty caused by increasing living costs, wars, artificial intelligence, political changes and the climate crisis. By constantly striving for improvement, being willing to learn from our mistakes and investing our resources wisely, we create the basis for a sustainable future worth living in. Even in difficult times, remember: we build because we are optimists.

THE ARCHITECTURE OF POSSIBILITIES

“Sustainability” is probably the most overused and debatable word in today’s discussions of architecture. At the same time, it is at the core of the discipline, which requires fundamental changes, with sustainability as the new status quo from the outset of the design process. The facts are scary – according to the World Resources Institute, the building industry, more than any other, is responsible for around forty percent of global carbon emissions. If we factor in the climate crisis, extreme weather patterns, pollution and the world’s rapidly growing population, there is only one way for the industry to respond to these challenges. An immediate adaptation of sustainable methods, resources and approaches is necessary to reduce this harmful impact. The technological advancements developed over the last century, the never-satiated consumerism and the ever-growing need for comfort have also led to these catastrophic circumstances.

Architects today have a pivotal responsibility in making choices, both material and structural, to define the ways they contribute to continuously extending the built environment. What are the best ways to build and renovate responsibly, to reduce the side effects of building material production and construction, and to eliminate the harmful impact on the natural environment? World-changing solutions are, and actually have already been for a while, within architects’ reach. The main goal now is to change the focus of the earlier mentality, to bear in mind that the quality of architecture lies indeed in designing low-carbon constructions and circular buildings built from bio-based resources. No single material or individual solution will provide the answer. Architectural practices have to integrate sustainability together with tradition, context, function,

aesthetics and modern requirements into one coherent vision. The approach to making architecture sustainable on a number of levels should embrace all its aspects in a holistic manner.

In his interesting book *Architecture of Defeat*, Kengo Kuma remarks that there are many negative aspects of architecture that make it easy to hate. “Buildings are the biggest things with which we come into contact each day”, and “it is an extravagant use of material”; “Once constructed, a building is not easily modified or demolished.” Today, luckily, a transition in architecture is underway. The perspective that Kuma has long hoped for, filled with buildings connected with their surroundings and the use of mundane, local and circularly used materials, is becoming a reality. Architects are envisioning buildings that shift our attention to major problems and are devising efficient solutions to them by designing new types of architecture.

The exemplary visions gathered in this book are presented in six chapters.

The first part, focusing on “Sustainable Materials”, discusses the use of timber, rammed earth, paper and cork as construction materials. Highlighting their numerous valuable qualities, these projects are often an enlightening return to traditional techniques of the past. Architects also emphasise the use of local sources to eliminate transportation, quick-to-assemble systems for short construction times and bio-based, easily renewable materials.

“The New Dimension of Innovation” not only highlights the latest technological advancements but also tries to show that innovation is the way

of complex thinking about solving problems. In the face of the climate crisis, extreme weather effects, and a demographic explosion, architects are rethinking urban environments and circularity to come up with ideas that can be systematically used in other realisations, including flexible spaces that are adaptable over time and social sustainability, among others.

The next chapter, “Architecture, Greenery & Landscape”, shows how crucial it is to bring architecture and nature closer together, as realised in various ways. Architects have taken inspiration from nature, in both form and function, with impressive buildings that draw directly from the organic world. Sensitive strategies also include envisioning buildings that blend effortlessly into their surroundings and incorporating greenery into structures with an essential climate-regulating effect, particularly in urban contexts and as a way of addressing extreme weather conditions.

“Reinventing by Converting” demonstrates the essence of circularity with many examples of ever-growing renovations of existing buildings. The revolution has progressed so far that not only are whole buildings refurbished and transformed, but their reconditioned parts are also often reused in new buildings. Architects are pushing the boundaries of material recovery by using bricks made of debris from demolitions. Many technologies are still being tested but the ultimate goal is to construct buildings with materials that are reusable.

And last but not least, the final chapter is dedicated to “Visions of the Future”, some of which are still on paper, patiently waiting to be realised,

while others are in the construction phase. Thematically they touch upon all issues discussed in the book and boldly challenge them. This is a real glimpse into the future.

Despite this abundance of ideas, I have to admit to all willing to point out any flaws of this selection: yes, architects around the globe must make more effort and, most of all, take greater accountability for the impact of their work. We still cannot label any of them as entirely “sustainable”, although the portfolios of some practices are indeed filled with more ambitious and effective projects than others. There is still a long way to go, many strategies to experiment with and many changes to implement, yet in the course of these intensive and dynamic processes, it is worth pointing out each successful attempt. I hope this book will be a great inspiration for many readers, architecture aficionados, students and professionals to push the changes further and with greater impact. The transition we are currently experiencing is time consuming and complex, and may sometimes result in disappointment due to its slow pace, but the direction has been set and the foundations have been laid. This fascinating selection of future-oriented projects is the best proof of this. Writing this book was an exceptional adventure and an opportunity to immerse myself into the ingenious philosophies and architecture of tomorrow. My first impression upon becoming aware of the impact of the industry and its global scale was devastating. However, my research, discussions with architects and learning more about the newest projects have brought promising hope.

I would like to thank all the architects for accepting my invitation to participate in this

special project. The title mentions 75 architects, but if we count all the studios' members, we are actually dealing with thousands of voices building a better future. I appreciate all of our exchanges so much, and you sharing your expertise and visions. The road to sustainability is neither easy nor short, but what has been achieved so far certainly gives us good reason to rejoice and fantastic motivation for further developments. The architects' ingenious projects are presented within chapters dedicated to certain aspects of sustainability to highlight focal issues, but all realisations are environmentally friendly along the lines of more than one individual theme, which only proves the need to embrace the subject holistically.

Finally, I am dedicating this book to my beloved daughters, Émilie, aged seven, and Mathilde, aged one. I hope that the inspiring projects featured in this volume will pave the way for architecture that will not need to discuss sustainability, as all its aspects will seamlessly become part of the design process and the DNA of the discipline, so that you and the generations to come, can live on a healthier and safer planet.

Agata Toromanoff



SUSTAINABLE MATERIALS

Bamboo, cork, straw, rammed earth and timber are some of the most popular sustainable materials used today. They reduce heat loss, support ventilation and are made from renewable resources. They are also natural and often sourced locally, not only to avoid the pollution connected with typical transportation from afar, but also to reduce the energy needed to extract them. Furthermore, they allow structures to be built in remote locations without damaging nature; when set in an urban context, they are striking thanks to their original features. Perfectly adjustable for various climatic conditions, sustainable materials effectively reduce the amount of waste and foster natural solutions throughout entire buildings. As such, they contribute to high-quality living standards with impressive potential for the future. Many of these materials have been known and used for centuries, wrongly associated with rudimentary

architecture, and are just now being rediscovered by architects, who are fiercely striving to lower the infamous impact of the building industry, responsible for forty percent of global carbon emissions. Studios around the world have drawn on traditional techniques to fulfil their bold visions, bridging the past and the future. Employed with a modern twist and without any compromise on aesthetics, sustainable resources are expressions of today, redefining the materiality of contemporary buildings and comprising an important approach to making architecture in a far less artificial manner. The numerous inspiring examples featured in this chapter certainly give us hope that in the near future construction materials will be mainly made from waste or reusable sources, demountable and not only carbon neutral but actually able to absorb more carbon dioxide than was emitted while producing them.

Anna Heringer

“From climate-neutral production to socially just implementation, earthen structures help mitigate the biggest problems of our times: climate change and poverty.”



Educational Training Campus in Tatale, Ghana (ongoing)

The architectural career of Anna Heringer focuses on developing solutions that exclusively include natural building materials that can be sourced locally and built by hand by local communities, which is essential given the challenging locations she typically works with. Inspired by a year spent volunteering in Bangladesh more than two decades ago, the architect demonstrates a holistic approach to sustainability. A newly envisioned building should be harmonious – through its design, technique and materials – with the location, its environment and the users. An honorary professor of the UNESCO Chair of Earthen Architecture, Building Cultures and Sustainable Development, Heringer not only treats architecture as a tool that improves lives but also creates groundbreaking solutions that make the change real. The architect has gained international recognition for working with raw earth, a material that is free, available on site, as well as healthy and sustainable. Walls made of earth are durable and perfect for extreme weather – they age naturally

without requiring significant maintenance. The construction process can be realised by local communities, who train in the technique, know the structure and can thus easily repair it. This engagement is essential to Heringer's approach.

With a great sense of local context, the architect envisions innovative and harmonious buildings that serve both people and the environment, following her motto "architecture is a tool to improve lives."



Educational Training Campus in Tatale, Ghana (ongoing)

Using earth as a high-quality building material in large-scale structures

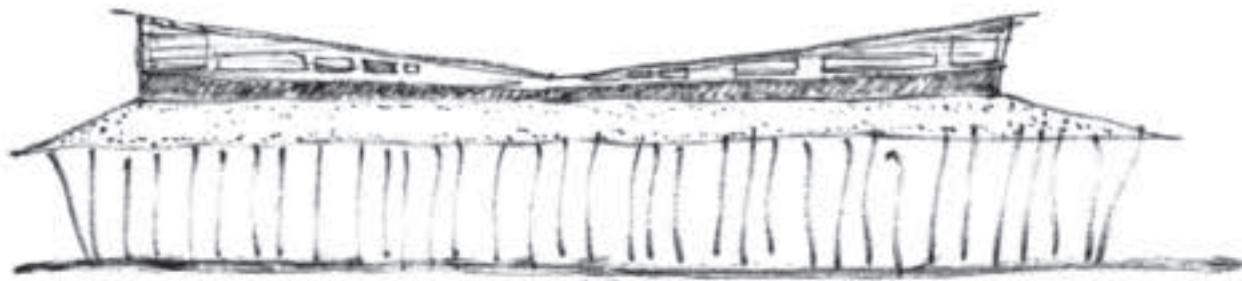
The signature in her approach is drawing from each country's traditional building techniques, going to the roots and looking into the culture. The architect tries not only to express the local specifics, but also to match the form and style of each building, independent of its role, with the identity of the particular community. Her greatest contribution, however, is the techniques she has developed in working with natural and widely available resources, particularly raw earth. Rediscovering this traditional material has led to amazing results demonstrating the abilities of mud. Constructing with it is both

labour- and time-intensive but can be realised without any heavy equipment. The handmade structures can in some cases be complemented with rammed-earth prefabricated elements. This seemingly basic material performs extremely well structurally, even in large-scale buildings like schools, and is perfect for climatic conditions in terms of ventilation and providing shelter from strong sunlight. On top of all these advantages, Anna Heringer demonstrates that earth can be aesthetically interesting. Its various hues and textures help to create a pleasant environment.

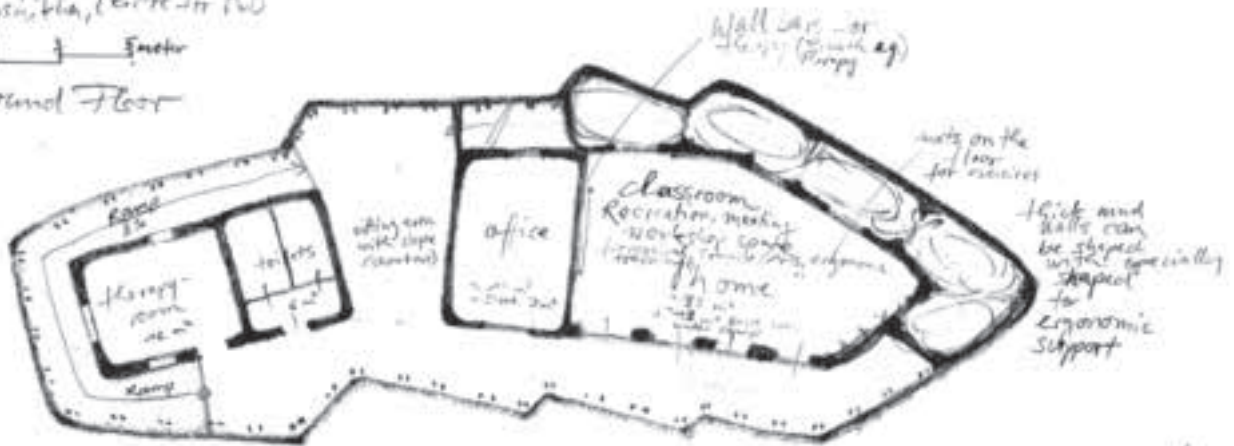
ANNA HERINGER

At the core of the practice of German architect Anna Heringer is the experience of sustainable development work she gained while spending a year in Bangladesh at the age of nineteen. She has transferred the philosophy of using existing and easily available resources to the field of architecture.

Her work is dedicated to developing the use of natural building materials, and together with Martin Rauch, she has developed the method of Clay Storming. She has realised numerous sustainable structures in Africa, Asia and Europe. Heringer also teaches and lectures at various universities around the world.



Dipsikha, Centre for PD
5 meter
Ground Floor



April 7, 2016

Anandaloy Centre, Bangladesh, 2020



Anandaloy Centre, Rudrapur, Bangladesh, 2020

The Anandaloy Centre for people with disabilities was built with a particular mud technique called *cob* that allows for easy shaping of the walls, both curved and straight. Elegantly combined with the bamboo pillars, ceiling and roof structures, the earthen edifice pleases the eye and is perfectly functional, not to mention low in cost and with qualities adapted to the hot climate. With the ramp dominating the structure, the building becomes a symbol of inclusion that makes the community centre accessible to everyone. Envisioned with full respect for the cultural context and identity, and drawing from local building traditions and vernacular architecture, the Educational Training Campus in Tatale, Ghana (ongoing), will consist of a series of schools to prevent the rural exodus and migration of the local community. Freely and locally available natural materials are at the core of the project.



Shigeru Ban

“My designs are always problem solving.”



Cardboard Cathedral, Christchurch, New Zealand, 2013

In parallel to his star-architect career and working on numerous prestigious commissions, Shigeru Ban remains devoted to developing disaster-relief projects. Solutions for emergency situations and people forced to leave their homes, whether as a result of natural disaster or conflicts of war, are particularly challenging. Not only must the shelters be quick and affordable, but they should also provide a sense of stability and safety. Ban adds to these criteria two more aspects – sustainability and aesthetics. An advocate of timber in architecture, as the most renewable and visually pleasant material he commonly uses in many projects, the

architect has also invented a revolutionary system made of cardboard tubes. Initially they were employed for interiors in exhibition displays, but thanks to his ingenious structural engineering skills, Ban developed a functional way to support the load of a large-scale building. To prove his thesis that the strength of the building does not depend on the strength of the material, in 1995 the architect envisioned the Paper House, a weekend retreat on Lake Yamanaka in Japan made of one hundred and ten paper tubes that formed a curvaceous colonnade. The integrity of the structure earned a certification and initiated a