

Experiments and utopias of a sustainable architecture

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Sustainable architecture is a recent paradigm that reclassifies experiences and orients them into a new narrative. It is not always easy to go beyond the ideological and propaganda dimension of the sustainable idea and converting it into an operating parameter in the architectural project is a complicated step. The text proposes the analysis of some notable works and courageous strategies, also applied in developing societies, to lead sustainable mythologies into the bed of architectural design's technical and political tools. The examples, attempts, and successes of the recent past are not few, and it is crucial to analyze and remember them; it is from them that the resources of an architecture ready to face the challenges of the present come.

Keywords: sustainable architecture; humanitarian architecture; architectural design

Esperimenti e utopie per un'architettura sostenibile

L'architettura sostenibile è un paradigma recente che riclassifica le esperienze e le orienta in una narrazione nuova. Non è sempre facile oltrepassare la dimensione ideologica e propagandistica dell'idea sostenibile e convertirla in un parametro operante nel progetto architettonico è un passaggio complicato. Il testo propone l'analisi di alcune opere notevoli e di strategie coraggiose, applicate anche nelle società in via di sviluppo, per condurre le mitologie sostenibili nell'alveo degli strumenti, tecnici e politici, del progetto architettonico. Gli esempi, i tentativi e i successi del recente passato non sono pochi ed è importante analizzarli e ricordarli, è da loro che provengono le risorse di un'architettura pronta a sostenere le sfide del tempo presente.

Parole chiave: architettura sostenibile; architettura umanitaria; progetto architettonico

«In an in-depth climate analysis of Villa Sarabhai, M. Susan Ubbelohde finds excellent ideas but also an insufficient understanding of environmental conditions. Le Corbusier had visited India numerous times but always in the cooler periods. Still, he seems to have based his understanding on his own experiences. His August holidays in Cap Martin did not offer temperatures even remotely comparable to the 46° that was reached, on summer afternoons, in the garden of the villa in Ahmedabad» (Ubbelohde, 2015: 61).

The theme of sustainability in the technical and cultural field of architecture has been the subject of continuous oscillations and interpretations. It is a phenomenon that we must carefully analyze to understand, beyond ideological convictions, how to orient the premises, tools, and objectives of architectural design. In many ways, sustainability objectives ask us to redirect our interests and, more difficult, to forget, or perhaps unlearn, the concepts and notions that underlie our culture (Borella, 2016).

In this text, we try to put in evidence some experiences which, following different aims, give a quite varied and multiple interpretation to the challenge of developing sustainability in architectural design.

One of the protagonists of a specific variation of sustainable architecture, Yasmeen Lari, recounted the personal and professional regeneration process she faced in 2000 when, at the age of fifty-eight, she decided to close her studio to devote herself to what she calls Barefoot Social Architecture. «Having been trained as an architect in the West, for me, there was a period of unlearning as I tried to relate to the reality of the country [Pakistan] and roamed our amazing historic towns for inspiration» (Berlingieri *et al.*, 2021: 29). In Lari's biography, approaching sustainability can therefore question the entire context of one's business, asking to redefine relations with the profession, the financial world, the construction industry, technology, and with people in a renewed collective and social commitment. The story of Lari, in its radicalism, critical reflections, and existential turning points, represents well the broad and changing spectrum of the issues that shake the way towards sustainability, which is more promising the more it manages to be inclusive of different and contradictory aspirations.

In recent decades, the goal of sustainable architecture has focused above all on the energy issue, placing great emphasis on controlling the climate with solutions that optimize the coefficients of insulation, exploitation of solar energy, and natural

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1. Photo taken by Richard King, Director of the U.S. Department of Energy Solar Decathlon. It was uploaded to the National Renewable Energy Laboratory (NREL) photo archives directly from Richard King's camera. The panoramic view shows the public touring of 20 solar-powered houses displayed on the National Mall in Washington, D.C., for Solar Decathlon 2009.

ventilation. It was the climate, for example, the principal parameter in the energy evaluation of the most famous certification agency, which, since 2002, has been operating under the bilingual brand of KlimaHaus / CasaClima (Franzelin, 2007; Schmitt *et al.*, 2007; Olivero, Kessel, 2014). Born in South Tyrol, the agency brings to certification a series of experiences carried out in the Germanic world, where leading architects have developed an architecture based on passive devices capable of rewriting the building's energy sustainability parameters. The most relevant examples are Thomas Herzog (Munich, 1941) and Georg Reinberg (Vienna, 1950), pioneers and experimenters of ecological thought and practice (Architekturburo Reinberg, 2020. Bovati, Reinberg, 2017). The approach they follow and develop has a centuries-old tradition in German-speaking countries. There, the architects of early Modernism in the 1920s produced an essential climatic dogmatism with studies on the heliothermic axis. Avoiding analyzing differences that exist, it can be said, in a synthetic way, that the buildings of Herzog and Reinberg fully interpret an ideal of ethical architecture where every design decision responds, first, to the dictates of ecological, measurable, and scientific verifiable parameters. With them, architecture becomes science; one could say, reaching a goal in which it is essential to recognize the strength of radical thought, let's even say integralist, where a single parameter dominates over many others. A second fixed point concerning these experiences is the undisputed dominion of technology; if the performative objectives are clear and measurable, it is no doubt logical always to use the most efficient technical solutions. They realize the aim of machinist architecture, of the LeCorbusian *machine à habiter* (Le Corbusier, 1925: ix, 73, 83, 100, 235), which had remained a myth represented through formal elaboration rather than a goal to be achieved in terms of performance. But solar architecture, which was its name at the dawn of the sustainable question, is part of a phenomenon that, beyond the individual performance of architects, has produced a wide range of research, products, and design techniques.

Some of these experiences appear particularly helpful for understanding the potential, the hesitations, and the possible future trajectories of this composite movement that grows between ecology, sustainability, and new technologies. In recent decades, German radicalism has not been the only way forward. Other designers have ventured into the search for sustainable architecture with greater attention in specifically architectural and, therefore, compositional, and formal aspects. The most important are undoubtedly the Anglo-Australian Glenn Murcutt and the French studio of Anne Lacaton and Jean-Philippe Vassal. It is significant that both have obtained the Pritzker Prize, respectively, in 2002 and 2020, and that the international architectural culture has therefore recognized them as designers of absolute value, important not only in the ranking of sustainable architecture.

Murcutt's experience centers on the coexistence of two tensions: on the one hand, a staunch belonging to the principles of modernist architecture; on the other hand, an extraordinary ability to read, understand and respond to an environment, the Australian one, with particular and often challenging climatic and cultural characteristics. A meaningful example in Murcutt's production is the Marika-Alderton House (Yirrkala Community, Eastern Arnhem Land, Northern Territory, 1991-94), designed

for Banduk Marika, an environmental leader and artist who passed away in 2021, and for his partner Mark Alderton. Here Murcutt abandoned the refined rural Modernism that distinguishes most of his single-family home projects and worked for simplification, space, and elementary components, focusing on an elaborate control of light and natural ventilation (Murcutt. 2019). Prefabricated in Gosford, north of Sydney, all parts were packed in two containers and transported to the site for assembly, which took four months. In this project, Murcutt looks for an alternative prototype to the client's house, a masonry building with small windows, a typical example of social housing intended for the Aboriginal population. He tries to overturn the standardized and defensive approach with an idea of deep symbiosis with an environment with complicated characteristics, with a tropical climate subject to monsoon rains, cyclones, and frequent floods.

Looking at the work of Lacaton & Vassal, it's evident that all their projects are inspired by issues concerning sustainability, even in an economic sense. From the first houses built in the Bordeaux region, adapting the structures of prefabricated greenhouses, to the integral conservation strategy followed for the restoration of the Palais de Tokyo (2012-14), the creative revision of the budget seems a decisive step for obtaining an unexpected surplus value. One of the projects that better represents this strategy is the social housing block in Mulhouse, 2005, where the typological innovation, fueled by budget constraints, is remarkable. Each apartment has two zones, one air-conditioned and one cold, adopting a strategy that makes larger apartments possible compared to the standard. The lessons of Glenn Murcutt and Lacaton & Vassal inspired many architects who today can refer, in very different ways, to those lines of research, such as Sean Godsell, in Australia and, in France, the Bruther and Muoto firms and the radical experiments of Encore Heureux Architectes.

Technical and performative sustainability

A technological and performance idea, linked above all to living, has found one of the most fertile grounds for experimentation and propaganda in the *Solar Decathlon*, the competition in which groups of students compete in the best sustainable construction, creating with their own hands, or a little plus, a model home. Founded in 2002 in the United States, the event has changed several times and spread widely in Europe and other continents, maintaining a solid educational echo. Hosted in the first editions in the National Mall in Washington, one of the most symbolically representative places of American identity, the Solar Decathlon forcefully spreads the ideal of responsible architecture among students and the public. The main questions explore the tension, sometimes the conflict, between the needs for comfort and the coefficients of energetic and environmental sustainability. The message is explicitly educational and points to technological advancement as the problem solver of our complicated ecological situation. 'Decathlon' derives from the idea of making a competition ruled along ten parameters: Energy Performance, Engineering, Financial Feasibility and Affordability, Resilience, Architecture, Operations, Market Potential, Comfort and Environmental Quality, Innovation, and Presentation.

On the one hand, it is ironic that the 'Architecture' category is only valid for a tenth of the project; on the other hand, it can sound strange that architecture is a category in evaluating an architectural project. Instead, on the opposite side, we could argue that architecture is that thing that is achieved by correctly responding to the other nine categories of the Decalogue. In other words, I think that all the categories used by the Solar Decathlon are referred to architectural quality, and, vice versa, there are many categories that cooperate in defining architecture that the Solar Decathlon doesn't consider. In Solar Decathlon philosophy, architecture is a tool, a necessary but not dominant knowledge, to collect in a unitary production a sum of different and, in many cases, divergent objectives.

To understand the nature of the competition, one must go back to the origins, to the initiative of Richard King. He, after working for ten years in the United States Department of Energy on the development of solar panels, set about looking for a way to inform and educate the construction of solar-powered homes that were beautiful and welcoming. King, who graduated with a bachelor's degree in physics, had realized how much technological drift was harmful to architecture and, at the same time, believed that the thankless task of giving an acceptable, and perhaps even seductive, appearance fell to the architects. In the architecture promoted by SD, shapes, materials, and systems, are increasingly intrusive, and all elements find their definition according to a purely technical logic. This policy pushes with all evidence an idea of architecture where the technical solutions and devices need a sartorial intervention of spatial organization and packaging. Architecture, in this logic, must emphasize and showcase the technical and ecological contents, considering them the more valuable, and more spectacular, aspects of the pavilions.

Humanitarian sustainability

If the Solar Decathlon entirely put the energy on the energetic performance, Architecture for Humanity developed in an original manner the possibility of a new social sustainability, for architecture. Founded in 1999 by a twenty-eight-year-old British designer, Cameron Sinclair with Kate Stohr, the agency intervened with targeted actions in situations of humanitarian crises in Kosovo, Afghanistan, Haiti, Myanmar, Sri Lanka, Rwanda, and many other places affected by war or natural disasters. For the organization, adopting sustainability criteria was undoubtedly not an ecological creed but rather the consequence of a very pragmatic, efficient approach aimed at obtaining the maximum result with minimum resources. The clearest example of the type of sustainability practiced by Cameron's association is the adoption of the *Open Architecture Network*, an open-source platform anyone can pick up and use projects donated by benefactor architects. The utopian Modernist myth of repetition becomes a practical resource, easily spreadable and accessible, making clear one of the possible transitions from an analogic to a digital architecture (Carpo, 2011). Cameron's open source, on the other hand, represents a solidarity utopia that has had essential but limited results, breaking against the economic unsustainability of the project and, in 2015, closing for bankruptcy. The causes of the end are not very clear. Still, it was indeed a project that grew very quickly and probably had to face a process of globalization that, in some way, overwhelmed a structure that was not robust

enough, as reported in a documented correspondence published in *Architectural Record* (McKnight, 2016. Walker, 2016).

Alongside Sinclair's humanitarian ecology, other lines of thought have established themselves, perhaps to the degree that is dominant today, which intertwine sustainability with the circularity not only of ideas and projects, as for AfH, but also and above all of the materials (Zanotto, 2020). The first consequence for architecture is the consolidation of two parallel objectives. On the one hand, the limitation of CO₂ emissions is an intent that has led to favoring the use of natural materials such as wood, raw earth, and straw over concrete and steel. In the wake of this trend were generated projects of great interest. Sarah Wigglesworth's residence on Stock Orchard Street, Islington (2001), is a sustainable and affordable building manifesto. It is a single-family house with a budget of just 600,000 pounds, an abacus of low-cost and low-cost technical solutions that allude to do-it-yourself and has achieved great diffusion and success. The most iconic image remains the famous sound-absorbing wall, a quilt made up of sandbags designed to dampen the noise of railway traffic that flows very loudly a short distance away. Despite the apparent spontaneity of the project, it is a sophisticated operation conducted by Wigglesworth and his partner Jeremy Till who is not only co-owner of the house but also one of the most astute critics of architecture on the English scene. The project perfectly captured the spirit of the times, in a phase of ideological transition, and promptly developed a blatantly alternative option to the glossy high-tech of the British star architects.

Compared to the ironic and posh ecology of Wigglesworth and Tillman, the thirty-year history of Rural Studio proposes different strategies based on the spirit of education, community, and solidarity, where the recycling of materials connects with more economical than ecological sustainability. (Wigglesworth, 2022). Founded in 1993 by Samuel 'Sambo' Mockbee (1944-2001) and D.K. Ruth (1944-2009), the Studio worked with students from the University of Auburn, Alabama, creating over two hundred buildings. Including the most varied functions, like residences, teaching, and community facilities, always followed low-cost criteria, containment of the ecological footprint, and social inclusion. The 'learning by doing' methodology, set up for Auburn students, survived the founders and continues to produce architecture while remaining faithful to the principles of simplification and productive effectiveness, where you can only build what you can do with your hands (or just a little more).

A brief provisional conclusion

The teaching of the many recent experiences, mentioned only a tiny part of them, constitutes a wealth of knowledge and architectural experimentation that must be acquired and valued. It is unthinkable to obtain significant results without a meditated reflection on the basic concepts of the discipline, its history, experiments, and theoretical and practical considerations. At the same time, it is mandatory to match with the set of ideas, precepts, beliefs, and objectives, but also fears, simplifications, and prejudices, which come together under the complicated concept of sustainability. Sustainable architecture is essentially an oxymoron, and it makes sense that the most radical ecologists habitually fight against the projects which generate a consistent environmental alteration. On the other hand, architectural design

mainly focuses on transformation processes and establishing another reality, an alternative truth. This fluidity of the design progress tends to conflict with the ecologists' habit of setting principles and guidelines. Even the power of architecture in asserting and spreading social values creates problems. In the end, every good project and building doesn't give a repeatable solution but conversely opens a discussion, takes in new topics, challenges the previous beliefs, and shows something, under the various aspects, that was unpredicted. The dialogue between architecture and sustainability has a history as long as human-kind; it is deeply rooted in the more distant past and projected into our next future. Facing the permanent and emerging needs, the architects remain an irreplaceable resource, as the lonely technicians able to manage human feelings and as the lonely artists capable of breaking the split between the human minds and hearts and the world.

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