

Globethics Repository

The logo for Globethics, featuring the word "Globethics" in white sans-serif font on a blue rectangular background.

Architecture studios for sustainable cities and communities : a radically inclusive perspective : a response to SDG 11 : sustainable cities and communities

This page was generated automatically upon download from the Globethics Repository. More information on Globethics see <https://www.globethics.net>. Data and content policy of Globethics Repository see <https://repository.globethics.net/pages/policy>.

Item Type	Book chapter
Authors	Delport, Hermie;Morkel, Jolanda;Gorman, Michele
DOI	10.58863/20.500.12424/4278458
Publisher	Globethics Publications
Rights	Globethics Publications;Attribution-NonCommercial-NoDerivatives 4.0 International
Download date	2026-07-15 14:19:48
Item License	http://creativecommons.org/licenses/by-nc-nd/4.0/
Link to Item	http://hdl.handle.net/20.500.12424/4278458

**ARCHITECTURE STUDIOS
FOR SUSTAINABLE CITIES
AND COMMUNITIES:
A RADICALLY INCLUSIVE PERSPECTIVE**

A RESPONSE TO SDG 11:
SUSTAINABLE CITIES AND COMMUNITIES

*Hermie Elizabeth Delpont, Jolanda Morkel, Michele Gorman,
Lindy Osborne Burton*

Keywords

Architectural design studio; inclusivity; integrated learning.

Abstract

“Sustainability is not just about energy efficiency, but rather a complex and overarching multidisciplinary field that requires appropriate expertise, as well as a moral obligation and an opportunity for inspired architecture.” (Almonte, 2012, 17)

Cities are collectives of buildings that “are complex socio-technical entities, embedded in a social–cultural–economic–climatic context” (Passe 2020: 566). The design and development of cities and hence the quality of lives of resident communities are directly impacted by the practices of the architectural profession.

Our aim with this chapter is to explore the Sustainable Development Goals (SDGs) within architectural education with specific attention given to the architectural studio. Although there have been many actions taken and attempts made to include sustainability in architectural curricula and guidelines provided for the inclusion of the SDGs there is limited research that provides a perspective of sustainability in architectural schools globally.

Our perspective is from the position of the Radically Inclusive Studio (Gorman et al. 2021) which we conceptualise as part of the cities and communities and ultimately the world that we live in. The Radically Inclusive Studio is not an isolated space, but forms part of an ecosystem, defined as “a system of people, content, technology, culture, and strategy, existing both within and outside... which has an impact on both... formal and informal learning” (Eudy, 2018, 3), in which it supports and is simultaneously supported.

We present the Radically Inclusive Studio and its structuring 6S Conceptual Framework of Inclusive Contexts (Gorman et al. in-press) as a theoretical framework for conceptually (re)organising the SDGs and for exploring the Radically Inclusive Studio principles that could serve as guidelines for sustainable development in architectural and other education. We use an integrative literature review to investigate articles, books, and other published texts with the “aim to assess, critique, and synthesize the literature... in a way that enables new theoretical frameworks and perspectives to emerge” (Snyder, 2019, 335). We include sustainable architectural solutions from both practice and education to present an overview of how architectural projects address the SDGs. As authors we present aspects of our own work and we propose that the pedagogic principles of the Radically Inclusive Studio could serve as a guideline for sustainable development education. *

* Corresponding authors: Dr Hermie Elizabeth Delpont: Project Leader Architecture and Spatial Design, STADIO, Bellville, South Africa,

Introduction

In this chapter, we investigate how the Sustainable Development Goals (SDGs), and specifically SDG11, are addressed and integrated in and enacted through the architectural profession and in architectural education. Our aim is to explore how the pedagogy and practice of an architectural studio that is radically inclusive could foreground the SDGs and how the principles of such a radically inclusive architectural studio could be adopted and be of benefit to other disciplines as a foundational pedagogy.

As authors, our perspective is through our collective lens as architects, architectural educators, ecofeminists, and researchers with a specific focus on the architectural studio as a space of learning, a space where “the functional and the structural, the social and the technical (are) successfully blended” (Kuhn 2001, 349). We concur that “there is an infinitely ethical dimension to every aspect of architecture” (Ameri & Dagg 2018, n.p.). We are motivated by our shared values and we accept

hermied@stadio.co.za, Jolanda Morkel: Head Instructional Design, STADIO, Durbanville, South Africa, Michele Gorman: Associate Professor in Pratt Institute’s School of Architecture, Brooklyn, NY, USA and Assistant Professor of Interiors, Objects and Technology, Parsons School of Constructed Environments at The New School, NY, NY, Dr Lindy Osborne Burton: Senior Lecturer in Architecture, School of Architecture and Built Environment, Queensland University of Technology, Brisbane, Australia.

To quote this chapter: Delpont, Hermie Elizabeth (et al.), “Architecture Studios for Sustainable Cities and Communities: A Radically Inclusive Perspective” in: Amélé Adamavi-Aho Ekué, Divya Singh, and Jane Usher (Eds.), *Leading Ethical Leaders: Higher Education, Business Schools and the Sustainable Development Goals*, Geneva: Globethics Publications, 2023, pp.451-517, DOI: 10.58863/20.500.12424/4278458 © Globethics Publications. CC BY-NC-ND 4.0. Visit: <https://www.globethics.net/publications>

our situated approach to knowledge and that our “reality (is) necessarily from a specific angle” (Reiter, B. 2017, 132).

We conceptualise the Radically Inclusive Studio (Gorman et al. 2021) as an ecosystem of the cities and communities and ultimately the world that we live in. The Radically Inclusive Studio is not an isolated space, but forms part of an ecosystem, defined as “a system of people, content, technology, culture, and strategy, existing both within and outside ... which has an impact on both ... formal and informal learning” (Eudy 2018, 3), in which it supports and is simultaneously supported.

Architects can provide basic ideas and proposals for regulations that make it possible for us to have sustainable cities and communities in the future. (Mossin et al. 2020a, 7)

Architects are involved in the design of the buildings in cities and towns but many resource-poor areas are developing without access to formal design input, their occupants excluded from economic opportunities and professional services. Aspiring to achieve a more sustainable world includes a striving for inclusion, decarbonisation, and environmental justice which we acknowledge as “at its core, an anti-colonial struggle” (Upadhva 2014, 1).

Buildings, cities, and towns create places and spaces which house communities and which determine the quality of life, including the well-being and health of those communities. This quality of life is hugely impacted by the design and development of these places and spaces as “the built environment affects the people who use it in a variety of ways including psychologically, socially and physiologically” (Bardage 2017, 335).

The built environment is a substantial user of energy and a major contributor to environmental pollution (Yao et al. 2020, 2). The life-cycle and ecosystem of the structure and infrastructure of buildings and

cities involve the conceptual design and development, the sourcing, and manufacturing of construction materials, the construction processes, the energies and the resources used before and during occupation, and the eventual demolition or demise of the buildings and cities. These life-cycle stages have a broad and very definite environmental impact (Siddiqi et al., 2002).

How are architects currently contributing to the design and development of buildings and cities in response to the objectives of the SDGs? To a large extent, the architectural profession takes sustainability quite seriously and professional institutions and collectives are instrumental in calling their constituents to action. There are a wealth of examples of buildings and cities that are aligned to the advancement of the SDGs (Mossin et al., 2020b). In a survey by the Royal Institute of British Architects (RIBA 2018) which gathered the views of architects on who is “leading the way” on the SDGs, 59% of the respondents said it was the “design consultants, such as architects”, 14% of the respondents said it was clients, and 3% said it was the contractors (RIBA 2018, 20). Does this imply that the leading role of architects demands that they display greater both insight and motivation to address the SDGs and consequently have an important responsibility to bring across the message of the SDGs to their clients, contractors, and the public at large?

Unfortunately it cannot be automatically assumed that all architects aim to address the SDGs in the design and development of buildings and cities, the Architects Climate Action Network explains that:

“The manner in which we produce, operate and renew our built environment continues to curtail biodiversity, pollute ecosystems and encourage unsustainable lifestyles. This state of emergency calls for a new kind of professionalism. We can no longer remain secluded within our personal and professional silos. Instead we

are harnessing our collective agency; as citizens with a shared professional background and a common goal, mobilising to bring about necessary changes to our industry.” (Architects! Climate Action Network, 2020, n.p.)

Another reality is that not all buildings and cities are influenced or designed by architects or other built environment professionals. Many of the largest cities on earth expand organically through intervention by their citizens who are building informal structures in the absence of formal supporting infrastructure, often without access to basics such as running water and sanitation. The exclusion of these communities from the formalised processes of the professional world, raises the question: Where are the architecture and built environment services for “the other 99%” (Fisher, 2012).

Architectural education similarly to professional practice reaches only a minority of the world’s population. Architectural studies are complicated, lengthy, and expensive. Traditionally, students from marginalised or poorer communities would not be sufficiently prepared through schooling in the first place. If they are selected they would most likely drop out early in their studies because they typically lack the required cultural and design capital which students from more affluent communities would have. Although this exclusionary situation might have improved in the past decade or so, there is still room to move towards radical inclusivity, which is part of what we address in the conceptualisation of the Radically Inclusive Studio (Gorman et al., 2021). The Radically Inclusive Studio ultimately asks how architectural education considers the other 99%.

We agree with Cerulli (in RIBA 2020, 29) that we need to “*focus on creating a shift ... towards a more integrated view of sustainability that looks holistically at the environment, including society, and challenges established professional norms and praxes*” in our quest to reach the SDGs. This focus includes Goal 11 which addresses sustainable cities

and communities and which aim is to “*make cities inclusive, safe, resilient and sustainable*” and to address “*inequality ... unrest ... insecurity ... health ... productivity ...economy ... and ... quality of life*” (United Nations, n.d., 1, 2).

We also concur with Altomonte et al. (2012) that we should be working towards a curriculum “*that fully endorses and promotes the ethical values of sustainability, and motivates students towards responsible practices* (and that has) *sustainability literacy as a ‘core competence’*” (2012, 24, 20) and we agree with Antonini et al. (2021) that we require “*the capacity to generate a visionary and forefront design approach in the young generation, with an aim to stimulate their reaction attitude rather than providing consolidated tools from past conditions that no longer exist or will rapidly evolve*” (2021, 2).

Our aim with this chapter is to explore the Sustainable Development Goals (SDGs) within architectural education with specific attention given to the architectural studio. Although there have been many actions taken and attempts made to include sustainability in architectural curricula and guidelines provided for the inclusion of the SDGs there is limited research that provides a perspective of sustainability in architectural schools globally.

We present the Radically Inclusive Studio and its structuring 6S Conceptual Framework of Inclusive Contexts (Gorman et al., in-press) as a theoretical framework for conceptually (re)organising the SDGs and for exploring the Radically Inclusive Studio principles that could serve as guidelines for sustainable development in architectural and other education. We specifically ask how the principles of a Radically Inclusive Studio may enhance or aid the adoption of the SDGs by architectural students as future practitioners, and also how these principles could be transferred to other disciplines. Of equal importance in this conversation is the impact that the concept of a Radically

Inclusive Studio may have on the communities and cities within which such a studio conceptualises and executes its practices and projects. Does a Radically Inclusive Studio have the potential to reach beyond architectural education and the architectural profession to bring the process, practice, and ethics of a sustainable (built) environment to these communities and cities? Can a Radically Inclusive Studio contribute to that which “defines architecture as an agent of empowerment, self-development and civic rights”? (Cité Architecture & Patrimoine, n.d., n.p.).

In order to structure the chapter and guide the conversation and exploration we present perspectives from the literature on the ethical position of architecture, a synopsis of the alignment of SDGs with architectural practice and architectural education, and an overview of the pedagogy of the architectural studio. We then introduce the Radically Inclusive Studio and the 6S Conceptual Framework of Inclusive Contexts (Gorman et al. in-press) and proceed to use the 6S Conceptual Framework of Inclusive Contexts as a theoretical framework for conceptually (re)organising the SDGs and for presenting sustainable architectural solutions from practice and education to give an overview of the incorporation of the SDGs in architectural practice and projects through an integrative literature review investigating articles, books, and other published texts with the ‘aim to assess, critique, and synthesize the literature... in a way that enables new theoretical frameworks and perspectives to emerge’ (Snyder, 2019, 335). Included are some of our own work.

We acknowledge that the Radically Inclusive Studio is still under development and that the exploration within this chapter is also partially an exploration of how the Radically Inclusive Studio itself has been shaped by the practices of the authors prior to the conceptualisation of the Radically Inclusive Studio. We are from different parts of the world and have been involved in different schools of architecture over the past

two decades. We are all involved with the ongoing development of the architectural curriculum with a focus on inclusivity and sustainability and our purpose is to develop the Radically Inclusive Studio through our collective research.

The Ethics of Architecture

“In its material, cultural, and economic effects, architecture poses essential and unavoidable ethical quandaries and challenges. In its performative capacity to express ideology, architecture is inexorably entangled in questions of power and legitimation. As part of an interconnected global economic infrastructure that consumes natural resources at an alarming rate, architecture raises new and pressing questions with which educators, practitioners, and students must engage.” (Ameri & Dagg, 2018, n.p.)

Decisions are made during the design and development of buildings have a far-reaching impact on the environment, the economy, and society. Architects are part of those decisions and have therefore an ethical responsibility to understand the implications of the decision they make. In effect a building can serve “as a form of expression of ethical attitudes” (Daugelaite & Grazuleviciute-Vileniske, 2021, 1). A high-rise building in a city does not only impact that city. This high-rise building also impacts the global environment and to climate change. This change is “felt by everyone, but the poorest people in the world will be the least able to adapt” (Wendt 2009:5). The responsibility of the architect’s decisions is therefore not confined to the immediate context of the building.

Professional and voluntary bodies for architects and architectural practitioners have codes of conduct or codes of ethics which outline the

responsibilities of the architectural professional. These codes address responsibility and respect towards the natural environment, the conservation of natural resources, quality of life, some reference human rights and social justice, ecologically sustainable, and energy efficient design and development (South African Institute of Architecture, 2010; Australian Institute of Architects 2017; American Institute of Architects, 2020).

Architect Craig Wilkins explains that architects need to understand where their responsibility lies and know that the practice of architecture is not a right, but a privilege “given to you by the society in which you live ...there is a social contract”. He continues to explain that the foremost duty of a licensed or professionally registered architect (the term varies according to the country) is “to protect the health, safety and welfare of the public” (Novara, 2021, 6). Architect Benjamin Dockter (2011, n.p.) proposed an oath which requires the architect to acknowledge that “every element of architecture is connected to the world as a whole”, that there is a responsibility to “preserve and help regenerate the environment, both natural and built”, and that in practice the architect will not waste materials but rather reuse and recycle with an emphasis on quality materials and craftsmanship and with dedication to “make the world a better place to live in”.

In the context of the Radically Inclusive Studio we believe that professional architects are legally obligated to do no harm. To this end architects should integrate the three core concepts of sustainable development: economic, social, and environmental in the making of all decisions, should by default consider the intersection and integration of the 17 SDGs, and take responsibility to educate clients and the public at large.

The SDGs and Architectural Practice

Globally, the architectural profession has made extensive efforts to introduce awareness and actionable processes and methods towards achieving the SDGs. In this section we review the efforts made by key professional bodies, collectives, and voluntary associations who are providing guidelines and directives to their professional and educational members. The sustainable contribution of architects are recognised by the global architectural community in numerous awards such as the Pritzker Architecture Prize and the Global Award for Sustainable Architecture. Some examples of such recognitions are given below.

The Union of International Architects (UIA) established the UIA Commission on the UN SDGs to answer “directly to the SDGs (and to) ... be influential in raising awareness, creating knowledge, facilitating communication and disseminating information across its global network of members” (UIA, 2018, 4). Through this UIA Commission two guides were published which present examples of good architectural practice for each of the 17 SDGs and, amongst other objectives, “is dedicated to the architecture students who will shape the future of architecture” (Mossin et al., 2020a, 8). The UIA also awards outstanding architectural work. In 2021, the prizes which aligned with the SDGs were the Robert Matthew Prize for Sustainable and Humane Environments and the Vassilis Sgoutas Prize for Implemented Architecture Serving the Impoverished. Francis Kéré received the first in recognition for the “use of local building techniques and sensitivity to culture and community (which) are emblematic of a commitment to fundamental values and sustainable architecture on a human scale”. There were three winners for the second namely, a couple, David Kaunitz and Ka Wai Yeung, Nadia Tromp, and Jiansong Lu who were respectively acknowledged for “their profound commitment to innovative design and sustainable construction, implemented with local participation”, a “deep sense of social

commitment grounded in pragmatic and simple design solutions, which foster human dignity and community engagement”, and a “pragmatic and elegant approach to modern architectural technology (that) has improved the quality of life for ... an ethnic minority” (UIA 2021, n.p.).

The Royal Institute of British Architects (RIBA) signed the UN Global Compact in 2015. Through the RIBA Ethics and Sustainable Development Commission, founded in 2017, two reports were published, respectively in 2018 and in 2020, which focus on the SDGs and the application in the profession, including education. The 2018 report mentions the RIBA’s *“unequivocal commitment to placing public interest, social purpose, ethical behaviour and sustainable development at the heart of the Institute’s activities and to develop a plan of action based on the UN’s 2030 SDGs”* (RIBA 2018, 4). One of the recommendations of the 2018 report was to *“(e)nsure that all teaching staff in validated schools of architecture have appropriate knowledge of ethics and sustainable development”* (RIBA 2018:14) and it was proposed that teaching staff receive assistance and training towards reaching this goal. The 2020 report asks how the SDGs can be “meaningfully supported ... from schools of architecture to specific projects to business strategy and leadership” (RIBA 2020, 5). The 2020 report also declared that *“(n)ow, at the beginning of a Decade of Action for the SDGs, the RIBA is seeking to drive forward all 17 goals”* (RIBA, 2020, 4). The RIBA confers annual Sustainability Awards as part of their Regional Awards. These awards recognise buildings which meet “the challenges of climate change, resource depletion, pollution, biodiversity decline and raising our collective understanding of the measures that must be taken to integrate sustainable solutions within the management and curation of our built environment” (Michelmersh 2021, n.p.).

The Architects Climate Action Network (ACAN) “is a network of individuals within architecture who are taking action to address climate

and ecological breakdown” (Future Architecture n.d.1). The ACAN operates on collaborative principles and aims to empower the public, the architectural profession, and architectural students with knowledge towards the SDGs. To this end, the Students! Climate Action Network (Architects! Climate Action Network 2020, n.p.) hosts dedicated events for architectural students. The ACAN has further developed an Education Toolkit and hosts Educators Workshops as part of their Climate Curriculum Campaign (Architects! Climate Action Network 2020). As ACAN member Mina Hasman puts it, "ACAN reminds official bodies of the impact of today's decisions on the much longer-term future" (Architects! Climate Action Network, n.p.).

The 2021 Pritzker Architecture Prize, the architectural community's most prestigious award which signals what the profession values, was endowed to Anne Lacaton and Jean-Philippe Vassal for their exceptional work in sustainable urban housing. Their approach is one of adaptive reuse in reaction to “the climatic and ecological emergencies of our time, as well as (the) social urgencies” (Pintos et al. 2021, n.p.) the world is facing. The Dezeen Awards for 2021 has numerous categories for sustainable buildings, too many to credit in this chapter. These awards include buildings such as the Jungle House (WTTJH) which is a typology for future sustainable carbon neutral living, the Kamikatsu Zero Waste Center by Hiroshi Nakamura & NAP which is built from waste and serves as a community centre for the reduction of waste, and the The Kendeda Building for Innovative Sustainable Design by The Miller Hull Partnership which focuses on environmental solutions through education, research, and community engagement (Dezeen Awards 2021). The Global Award for Sustainable Architecture, supported by UNESCO and the Cité de l'Architecture & du Patrimoine, takes into account architecture which portrays “durability, flexibility, economic, technical and ecological adequacy, cultural and social

acceptance (and aims to) fight... inequality, cultural disrespect and unreflected functionalism” (Cité Architecture & Patrimoine, n.d.).

A review of sustainability in architectural practice cannot be complete without referencing Architecture for Humanity. Architecture for Humanity was the seminal non-profit architectural programme and was founded in 1999 by Cameron Sinclair and Kate Stohr (Quirk, 2012, 2). As an organisation they worked predominantly in under-resourced communities, designing and building with the communities with a focus on sustainability in all its facets as part of the design solutions. Architecture for Humanity was dissolved in 2015 and transformed into the Open Architecture Collective (Open Architecture Collaborative, n.d.) who has a global footprint and focuses on inclusion and participatory design and provides architectural services to underserved communities whilst also educating and training local participants (Lau 2016:3). Architects contributing predominantly on a pro-bono basis to under-resourced and underserved communities is quite an established practice. Such work is referred to as public interest design, social architecture, public architecture, community architecture, participatory design or the new professionalism (Tovivich, 2009, Delport, 2016). Architects view these community projects as “rooted in ethical values” where one can do “more with less means (and) a lot of originality incorporating local design and vernacular building” (Melitonov in Fedderley, 2019, n.p.). The question begs why not all architectural projects are treated as rooted in ethical values and are searching for a means to do more with less?

These few examples from architectural practice demonstrate an emphasis on context or locality, community and socially relevant solutions for environmental and ecological sustainability, collaborative efforts, and integrative solutions. The acknowledgement and recognition of architectural interventions that display sustainable approaches and the application of the SDGs may aid the promotion and adoption of such

practices on a larger scale. These examples and awards embody values which architecture students can learn from and include in their own work.

The SDGs and Architectural Education

In architectural education there is widespread acknowledgement and awareness that all aspects of sustainability should be addressed in the architectural curriculum (Antonini et al., 2021). This section of the chapter aims to give a broad overview of the approach of architectural schools as a representation of the global position. Most architectural schools incorporate sustainability, and by extension the SDGs, as part of their curriculum. However, according to the Architects Climate Action Network architecture studios are not doing enough to address sustainability and that “knowledge now needs to be embedded within curriculums, educating on the environmental impact of architectural practice and the wider construction industry. We believe teaching around environmental design must be incorporated into every module, utterly normalising it and removing its specialist status” (Architects! Climate Action Network 2020, n.p.).

A 2012 study (Altomonte, 2012) which reviewed 70 architectural schools globally describes three models of sustainability integration in the architectural curriculum: as satellite structure, where sustainability resides outside the studio as theoretical standalone modules, as partially integrated structure where theory lectures are delivered outside of the studio with practical application in studio, and as fully integrated structure where sustainability is completely embedded in the studio and assessment is an integral part of studio projects. The study found that there is a great variance in application amongst schools. Further, many schools still have sustainable modules as optional, which implies that it might be “possible for students to choose different pedagogical paths

and therefore complete their degree without having comprehensively considered sustainable environmental design” (Altomonte, 2012, 12).

The RIBA Ethics and Sustainable Development Commission report of 2020 introduces various schools in the United Kingdom and their approaches to sustainability and by extension the SDGs. The London School of Architecture is an example of a school which includes the SDGs as “a formal reference” (RIBA 2020, 23). The London School of Architecture sees the SDGs as “*a blueprint to achieve a better and more sustainable future for all*” and value this blueprint above the philosophical positions of formally-based resolutions which often dominate architectural design solutions in the studio. The Welsh School of Architecture follows a fully integrated approach and has as its mission to “create a built environment that enhances people’s lives, without destroying the planet for future generations” and aim to “optimise the delivery of a sustainable future, to be ethical, creative, curious and critical” (RIBA 2020, 25, 26).

The Architectural Association School of Architecture (the AA) focuses on few key areas of expertise to develop in students, including: environmental, theoretical, philosophical and ethical in an approach where sustainability is deeply embedded in the context and condition of studio projects. The School of Architecture at Sheffield Hallam University is a fairly new school of architecture which developed their curriculum and project approach explicitly with an integrated, holistic lens on sustainability and which supports an “environmental agenda, framed within wider social and political discourses” (RIBA 2020, 26).

These few examples are a fair representation of the global position of sustainable integration in architecture schools. The approach, process, and method varies, but one would have to search far to find an architectural school which does not address sustainability to some extent.

The Pedagogy of the Architectural Studio

The tradition and pedagogy of the architectural studio is quite specific to the discipline. In this section we aim to explain this pedagogy.

The architectural studio is the signature pedagogy of professional architectural education (Cuff, 1992; Brown, 2020). Compared to the traditional classroom, which is predominantly based on theory assessed through a test or exam as prove of knowledge gain, the architectural studio centres on the execution of design projects through the application of knowledge. This design studio process led to Schon's (1983) development of the well-known concept of reflective practice or the reflective practitioner as a "dominant 'theory of practice' for all professional and vocational education" (Schon, 1983, 64).

The process of learning in the architectural studio is a key aspect which has been analysed and adopted by various other disciplines. For example, Kuhn (2001) explored architectural design studio education as "a provocative and fruitful model for engineering and software design education" and described features of the design studio which are valuable and transferable to other disciplines. These features include projects that are "complex and open-ended", solutions (that) "undergo multiple and rapid iterations", frequent formal and informal critique from varied sources including peers and experts, and dealing with heterogeneous issues which "are considered, often in the same conversation" (Kuhn, 2001, 349-351). These projects can "simulate the complexities of real life projects" (Webster, 2008, 63) and the process of design and development is supported by interactive dialogue and close relationships between students and their design tutors. As a concept, it is possible to transfer the essence of the architectural design studio to project-based learning experiences in other disciplines. It is however

important to recognise and learn from the shortcomings of the architectural studio and to identify its essence.

The architectural studio is inherently a space where the “cultural capital of architecture” (Stevens, 1995, 115) is foregrounded. Dutton (1987, 16) argued that there “is a rough correspondence between (architectural) schooling and larger societal practices” and that knowledge transfer is affected by the power relations present in society. This studio culture and the hidden curriculum of the studio is lauded by educators and students alike, but is also challenged and criticised.

For those directly observing and experiencing the architectural studio, namely its own faculty and students, it is and has been clear that the studio sometimes exhibits exclusionary practices (Stevens, 1995; Crysler, 1995), that it tends to award the individual at the cost of collaboration and the collective (Cuff, 1992, Harriss & Widder, 2014, Delport 2016), and that it often deals with fictional projects which are far removed from reality (Cuff, 1992; Salama, 2008, Bashier, 2014; Delport 2016). Stevens (1995) argued that the studio automatically excludes those who are economically and culturally disadvantaged or simply different. He added that the inherent privileges of the studio are “sanctified” by not acknowledging it and that it promotes a certain “giftedness” which comes from having specific experiences linked to background, social and economic status, and upbringing, and not hereditary talents. This “giftedness” becomes a must for success in the studio and contributes to the misconstruing of the “inculcation” power of the studio. Crysler pointed to the “one-directional flow of skills and knowledge (which ignores) gender, race, class, or sexual orientation” and references only “self-actualizing, white, heterosexual, Euro-American male consciousness” (1995, 208) and asserted that the “Spirit of competition” (1995, 215) prevails within the studio.

The American Institute of Architecture Students produced a seminal report in 2005 which addressed studio culture. This report pointed to the

positive aspects of the studio, such as “direct one- on-one interaction between faculty and students, whereby students receive immediate feedback on their work (and that the) studio model offers tremendous potential for creative discovery, exploration of ideas, critical discussions, and risk-taking” (Koch et al., 2002, 4). However the report predominantly addressed the shortcomings of the architectural studio and presented ideas for a change in studio culture and moving away from beliefs which until today are still a part of many studios. Some of these beliefs relevant to the current discussion include that the “creation of architecture should be a solo, artistic struggle”, that “collaboration with other students means giving up the best ideas”, that it is “possible to learn about complex social and cultural issues while spending the majority of time sitting at a studio desk”, and that “students do not have the power to make changes within architecture programs or the design studio” (Koch et al., 2002, 6). The report proposed that the studio becomes a space where students are aware of the “value of collaboration” (Koch et al. 2002:12) and a space in which there is “(a)ccptance of all individuals regardless of race, gender, creed, religion, sexuality, socio-economic background, or physical disability” (Koch et al., 2002, 4). The report also asked for the studio to offer students the opportunity to engage with the real world, where they can learn about their surrounding communities and their needs, and build interdisciplinary relationships for the future. The values proposed in this regard were “optimism, respect, sharing, engagement, and innovation” (Koch et al., 2002, 19).

Although some of the negative aspects of the studio are still present, change has been introduced into many architectural studios globally informed by extensive research into studio pedagogy in the last 20 years. Already in 1987 Dutton proposed a “transformative studio pedagogy” which was meant to interrogate the “value systems of students” and tried

to “break-down ... the social relations of hierarchy and competition”. In 1994 the Rural Studio was established as a seminal design-build studio which took the studio and students into the real world. At the Rural Studio students work collaboratively to solve real problems in a space which “encourage(s) aspiring young architects to address the ethical responsibility for the social, political, and environmental consequences of what they design and build” (Rural Studio n.d., n.p.). The Rural Studio was one of the first of many design-build and live project studios throughout the globe. Design-build and live projects address real-world problems with usable outcome and have an inherent requirement for student collaboration (Delpont, 2016), interdisciplinary collaboration (Harris & Widder, 2014) is a space for the practice of critical pedagogies (Brown, 2012) and more often than not have a strong community, contextual, environmental, and sustainable grounding.

In 2008, Salama conceptualised a theory “for integrating knowledge in architectural design education” (2008, 100) which is “a more responsive architectural design pedagogy, enabling future architects to create livable environments (that) emerges from and responds to societal, cultural, and environmental needs” (2008, 101). His theory is partly in response to studios which present projects that are “hypothetical, largely unconcerned with real life situations, and neglect equally important skills that can be enhanced through experiential learning, research, or real interaction with the realities being studied” (Salama, 2008, 103). Salama’s theory is premised on a number of main concepts which include an ethnographic architectural approach, appreciative inquiry, and active and experiential learning (Salama, 2008). These concepts respectively acknowledge the differences that are present in the studio as well as in the world and attempt to introduce and address these in design solutions. The concepts reference a holistic perspective which reflect on “how human systems function (and)

involve participatory design activities... students... doing things and thinking about what they are doing”.

In the following section we will introduce the Radically Inclusive Studio and its perspective on the pedagogy of the architecture studio.

Introducing the Radically Inclusive Studio

The Radically Inclusive Studio is an international collective founded during the early stages of the COVID-19 pandemic after an online meeting of the minds. As architectural educators we explore the design studio as a radically inclusive space for teaching and learning (Gorman et al. in-press), a space which we contemplate as an integral part of an ecosystem-of-learning (Morkel & Delpont, 2020). We collaboratively practice as the Radically Inclusive Studio through pedagogical design research writing, workshops, and as a collective to share ideas and issues around equity, inclusion, and social justice from our own perspectives. We have all been and still are concerned with architectural pedagogy and the architectural curriculum from research and practice positions in different corners of the world and in vastly different contexts. In this section we start by introducing our personal, geographic, and disciplinary positions to contextualise the chapter. We use our own voices for this personalised introduction. Expressing and acknowledging one's own voice, position, and context is a part of what we value in the Radically Inclusive Studio. We then proceed to explain the inception of the Radically Inclusive Studio and the *6S Conceptual Framework of Inclusive Contexts* (Gorman et al. in-press) which is the underpinning theoretical position.

Hermie Delpont

I am an architect, artist, and educator living and working in Cape Town, South Africa. I have been involved with architectural education

for the past twenty years and during this time I have strived to develop more inclusionary practices with a focus on assisting a diverse body of students to excel in the architectural programme. My continued participation in curriculum development focuses on the transformation of outdated, colonialist content and practices and the development of curricula that is underpinned by context, sustainability, and community engagement. I am currently part of a team at the private higher education institution, STADIO. We are developing a new School of Architecture and Spatial Design. One stream of our curricula is sustainable living, which explores the intersection of architecture with livelihoods, sustainable agriculture, urban design and other spatial and built environment practices and disciplines. I am also part of the management team of various other STADIO schools and have the opportunity to discuss the concept of sustainability with disciplines such as fashion design, visual design, and commerce. I have a strong interest and practice experience in natural building, community engagement, and design-build studios.

Jolanda Morkel

My current career focus is on learning experience design, which presents a natural culmination of my love for design, education and innovation. What was meant to be a temporary venture into Higher Education, coupled with architectural practice, led me to a 20-year academic career at the Cape Peninsula University of Technology (CPUT), where I taught in the Department of Architectural Technology and Interior Design in the Faculty of Informatics and Design, in Cape Town, South Africa. During this time, supported by like-minded colleagues, inspired by educational technology mentors, and motivated students, I had the privilege to co-design various transformative learning and teaching interventions employing innovative learning technologies at the undergraduate level. In response to my students asking for more

flexible and blended learning experiences, I was determined to help them demonstrate that alternative studio-based learning journeys can be crafted through the recognition of prior learning (RPL), in combination with online and blended learning technologies, and that these strategies can serve culturally diverse, non-traditional, and working students to promote access, diversity, and inclusion at the university. My recent move to STADIO offers new opportunities and challenges for me to explore the private Higher Education space. The collaborative feminist research and learning space shared with Hermie, Lindy and Michele, has helped me through the pandemic, and provided much inspiration and support, to continue with this work.

Michele Gorman

I am a practicing feminist, designer (architecture and interiors), mother, technologist and activist in Brooklyn, NY (USA). Currently a program Director and full time faculty member within Parsons School of Constructed Environments at the New School, I work in interdisciplinary contexts that address issues around equity, inclusion and social justice within design. Understanding that climate justice and mitigation within design is not just a scientific problem but a social and collaborative one. Working within the New School, I have been able to work collaboratively across disciplines while considering the ethics of our design disciplines. Rethinking hierarchies between our disciplines is critical in approaching the goals of sustainable development. Bringing scientists, philosophers, radical pedagogues, artists, technologists, environmental, ethnographic, interior, architectural, lighting, industrial designers, political leaders to the table is critical to radically rethink the way we design the built environment. It is with great pleasure to find Hermie, Jolanda and Lindy during the global pandemic as feminist allies, collectively creating a Radically Inclusive Studio design framework based on our experiences as women in design between our

global contexts. This framework has been diversely explored within our institutions.

The table is a recurring design element in my practice as a space to share knowledge, stories, experiences, crafts, break hierarchies, and build community. Being part of well renowned feminist design collectives, ArchiteXX and Mistresses of Architecture, in addition to the Radically Inclusive Studio, has provided opportunities to be brave and bring feminism and inclusivity into the design curriculum within my positions at the Pratt School of Architecture and Parsons School of Design.

Lindy Burton

It's impossible to be raised and educated in South Africa, and not be impacted by architectural responses to racial segregation from the past. Spaces and places are a constant reminder of how people were once racially classified. I have built a new identity as an Australian architect and academic, but my African foundations will always underpin my sensitivities to indigenous perspectives, and my approach to design and teaching. My research interests centre on transformative architectural education, the design of innovative learning spaces, and diversity, inclusion and equity in architecture. I am appointed as a board member of the BOAQ, and I provide leadership in AACA Accreditation and SAGE Athena SWAN committees. I am a Senior Fellow of the Higher Education Academy and my teaching excellence has been awarded nationally.

The global event of the COVID-19 pandemic which started in 2020 necessitated a rapid, emergency shift from physical into online space for all realms of education. Many disciplines, including architecture, which traditionally relied on face-to-face interaction and creation as learning opportunities through making (ACSA 2020) - such as creating drawings and the building of models - had to re-invent hands-on interactive

spaces. Architectural studio staff and students were compelled to change and adapt their practices. This sudden move foregrounded how students are often excluded from studio participation by not having access to the required resources, such as data, airtime or even a physical space to work in at home (Mathiba, 2020).

Our collective research into the studio as a radically inclusive space was inspired by this online shift and these explicitly exposed inequalities. By reflecting on our own practices and searching for a means of inclusivity in the studio, we studied the Inclusive Excellence Framework of Williams, Berger and McClendon (Williams et al., 2005). We aligned and expanded this framework into the *6S Conceptual Framework of Inclusive Contexts* (Gorman et al., in-press). The 6S Conceptual Framework includes the Structural Inclusive Context³⁰⁵, the Systemic Inclusive Context, the Support Inclusive Context³⁰⁶, the Social Justice Inclusive Context³⁰⁷, the Symbolic Inclusive Context³⁰⁸, and the Spatial Inclusive Context³⁰⁹. The Structural Inclusive Context³¹⁰ emphasises adaptability and flexibility as necessary practices for transformation. The Systemic Inclusive Context addresses the possibilities and capacities to adapt and respond rapidly to change and barriers in both education and the profession. The Support Inclusive

³⁰⁵ <https://theradicallyinclusivestudio.org/2021/03/17/structural-inclusive-context/>

³⁰⁶ <https://theradicallyinclusivestudio.org/2021/03/17/support-inclusive-context/>

³⁰⁷ <https://theradicallyinclusivestudio.org/2021/03/17/social-justice-inclusive-context/>

³⁰⁸ <https://theradicallyinclusivestudio.org/2021/03/17/symbolic-inclusive-context/>

³⁰⁹ <https://theradicallyinclusivestudio.org/2021/03/17/spatial-inclusive-context/>

³¹⁰ <https://theradicallyinclusivestudio.org/2021/03/17/structural-inclusive-context/>

Context³¹¹ places the student centrally with an emphasis on mental health and well-being. The Social Justice Inclusive Context³¹² addresses oppression and injustices of both the past and present. The Symbolic Inclusive Context³¹³ acknowledges that architectural education is a powerful creator of culture which is articulated in the world through the architectural student as well as the graduated architect and their design solutions. Finally, the Spatial Inclusive Context addresses those boundaries that exist and that can be created with the ability to exclude, including, but not limited to space, time, knowledge, power, and practice.

How do we define inclusivity in the Radically Inclusive Studio? In the context of architectural education, we frame inclusivity as all-encompassing and addressing the needs of staff, students, and the communities that are affected by the teaching and practice of architecture. Projects that address the history of racial, cultural, and gender exclusion from the design discussion is central to a feminist design practice. We consider who is excluded and oppressed in our built environment in order to propose new inclusive design futures. In terms of sustainable development, we acknowledge that there “are four dimensions ... society, environment, culture and economy – which are intertwined, not separate” (UNESCO, n.d.). We define radical inclusion towards achieving the purpose of the SDGs as the inclusion of marginalized voices and communities on the topic of climate solutions. We posit that radical inclusivity acknowledges the intersection of decolonisation and decarbonisation of the environment and that it

³¹¹ <https://theradicallyinclusivestudio.org/2021/03/17/support-inclusive-context/>

³¹² <https://theradicallyinclusivestudio.org/2021/03/17/social-justice-inclusive-context/>

³¹³ <https://theradicallyinclusivestudio.org/2021/03/17/symbolic-inclusive-context/>

addressed the shifting of power and making of spaces for all intelligences and practices.

One of the core concepts of a Racially Inclusive Studio is that of a community (Williams, 2017, 89) of inclusive practitioners, which include the staff and students who participate in the studio as well as the broader communities of the varied contexts within which these studios operate. The 6-S Conceptual Framework promotes flexibility and a supportive environment, it speaks to diversity in the studio as an advantage, encourages the building of strong relationships and has a culture of sharing, it emphasises collaboration, equity, empowerment and self-determination, stresses inclusivity, and resilience, and works towards the expansion and variation of learning settings (Gorman et al. in-press). The Radically Inclusive Studio is part of an ecosystem, and we agree with Lambrou that analyses of “the environment as a set of ecosystems asks that we move away from linear investigations in favor of assessing the interaction of people with their surroundings” (in UrbanNext, 2018, n.p.).

For the Radically Inclusive Studio we place emphasis on a curriculum with studio projects which are integrative (Salama, 2008) and considers contextual, adaptive, real-world, experiential, collaborative, and interdisciplinary perspectives. We highlight that everyone who participates should bring their own voice, opinion and experience to the project in a space that is inclusive as we work together towards an anti-oppressive, decarbonised and decolonised world.

An integrative project approach resonates Kioupi & Voulvoulis who propose, as a means to achieve the aim of the SDGs, an “integrative approach that addresses all 17 SDGs” which they see as essential for “our societies and economies... to transform from the current unsustainable state onto a sustainable and resilient path” (2019, 4). We agree with Almonte who describes integrated education as a way to

“explore knowledge within the context of its application - where students speculate, investigate and make propositions in a creative and rigorous manner” (Almonte, 2012, 24).

Contextual perspectives references the ethnographic approach of Salama (2008) and acknowledges and emphasises a thorough knowledge of and response to the context of the project. This is also emphasised by Shahbazi who speaks about a building as a tiny aspect of “contextual architecture”. He further mentions “contextualism as one of the main principles of sustainability” and asserts that “sustainable architecture is a multi-value combination” of contextual responses (Shahbazi, 2016, 306). Farmer (2013, 107) argues that sustainable architectural design is often “presented either as a challenge of rational, prescriptive problem solving or alternatively as an instrumental means of specifying technologies that satisfy predefined environmental target” without taking into account the complexities of the context, such as the “practical, theoretical, technical or social issues”. Farmer (2013) also speaks of the integrative and reflexive processes which are necessary to acknowledge the meaning of architectural technological solutions and the impact of and on the context. He references a design-build project by students with high design engagement with the users and says that such “reflexive processes would help to reframe design problems in a way that enables ‘designers, constructors, users and, crucially, communities [to] confront environmental problems, learn about their (and others’) values, beliefs and practices, and adjust and progressively enhance the ecology of built environments’.” (Harald in Farmer 2013, 115).

Design-build and live projects (Harris & Widder, 2014) are placed in real-world communities and contexts and inherently rely on collaboration amongst all participants (Delpont, 2016). These types of projects are also typically interdisciplinary and/or in collaboration with practitioners and deal with the solving of real problems with an outcome

that directly affects the lives of people. These projects are ideal vehicles for inclusionary practices.

We value the approach of the School of Architecture at Sheffield Hallam University that from inception to the end of the design process encourages their students “to ask and try to answer the following questions: Who does what and with what resources? Who gains, who loses out? Who pays the highest price? Who is excluded? And, crucially, how could projects and processes be radically improved to make them more fair and inclusive?” (RIBA 2020, 30)

As we consider the call to address environmental justice within our built environment, we must consider the power dynamics and social justice impacts that current and future laws and policies will exert on our communities. As architects, we embody spatial, social, indigenous, and material practices that work towards a socially just approach to the reduction of global warming and CO₂, circular economies, and decarbonising practices. We therefore believe that the Radically Inclusive Studio approach can address the need to successfully include and address the SDGs in studio and problem-based learning experiences.

The SDGs through the Lens of 6S Conceptual Framework

In this section we align the 6S Conceptual Framework of Inclusive Contexts, which is the underpinning framework of the Radically Inclusive Studio, with the intention and implementation of the SDGs. We posit that as much as the six contexts of the 6S Conceptual Framework are connected, sometimes intertwined, and often overlapping (Morgan et al. in print), the SDGs are similarly connected, intertwined and overlapping. By aligning the SDGs with the 6S Conceptual Framework we (re)organise the SDGs for the purpose of this exploration. For this alignment which takes the focus to the SDGs we

have adapted the original naming of the Inclusive Contexts. For example, Structural Inclusive Context becomes Structural Inclusivity. The motivation for this adaptation is that *Inclusive Contexts* can be interpreted as place-based or circumstance-based, referencing the studio as place and experience, whereas *Inclusivity* more directly references the “practice or policy of providing equal access to opportunities and resources for people who might otherwise be excluded or marginalized” (Lexico, n.d.). The concepts of practice and policy resonate with the nature of the application of the SDGs. We have as objective to present the 6S Inclusivity Framework for sustainable action as the foundational approach towards incorporating the SDGs in a Radically Inclusive Studio and in other disciplines through studio or project-based learning experiences.

The 6S Inclusivity Framework includes Structural Inclusivity which speaks about the underlying structures supporting every aspect of life and livelihoods. As a construct, it has a physical and/or formal dimension which provides the space and context for our daily operations and engagements. The SDGs which align with this structural framework are 6: Clean Water and Sanitation, 7: Affordable and Clean Energy, 14: Life Below Water, and 15: Life on Land. Without these structures in place, none of the other SDGs would be achievable.

Systemic Inclusivity references those SDGs which are developed within the structural framework as response mechanisms and support tools and systems to enable inclusivity as an overarching aim of the SDGs. The associated SDGs are 4: Quality Education, 8: Decent Work and Economic Growth, 9: Industry, Innovation and Infrastructure.

Social Justice Inclusivity relates directly to the inclusion of people and communities who are affected. Here we include 1: No Poverty, 2: Zero Hunger, 3: Good Health and Well-being, 5: Gender Equality, 10 Reduced Inequalities.

Symbolic Inclusivity speaks to goals achievable by each individual and accountable collectives and includes SDGs 12: Responsible Consumption and Production, 13: Climate Action, and 16: Peace and Justice Strong Institutions.

Supportive Inclusivity involves SDG 17: Partnerships to Achieve the Goal and SDG 3: Good Health and Well-being. None of the SDGs will be achievable without strategic and constructive collaboration and partnerships, whether the goal relates to practice or education. In addition, to ensure Supportive Inclusivity, it is essential that the users, the community as the inhabitants of cities are placed at the centre to support their collective health and well-being.

Spatial Inclusivity addresses 11: Sustainable Cities and Communities which speaks directly to the built environment and spatial design disciplines and industries.

For each of the *Inclusivity* dimensions we share examples below. These examples present how the SDGs and sustainable concepts are interpreted, included, and actioned in current architectural practice and education. Some examples from the practice of the authors or their affiliated higher education institutions are also included.

With these examples we intend to highlight the overlapping concerns expressed and actions taken by architects and students to address the SDGs. Presented through the lens of the six *Inclusivity* dimensions, we have as objective to define a set of principles which represent a foundational approach towards incorporating the SDGs in a Radically Inclusive Studio and also in other disciplines and teaching methodologies/ approaches.

Structural Inclusivity

The SDGs which align with Structural Inclusivity are 6: Clean Water and Sanitation, 7: Affordable and Clean Energy, 14: Life Below Water, and 15: Life on Land.

Buildings and urban design can assist in the collection of rainwater, the provision of safe drinking water, washing and cleaning facilities, and the treatment of wastewater (Mossin et al., 2020a; Mossin et al., 2020b). However, in many parts of the world clean drinking water and a safe, accessible toilet is still not a part of everyday life. In Vietnam, for example, many children do not have toilet facilities at school. To solve this problem, H&P architects designed a beautiful and robust toilet and wash building which harvests and reuses greywater (Stevens, 2015; Mossin et al., 2020b). Since this problem is widespread in Vietnam, the architects designed the building so that it could be constructed at low cost, quickly, and with local skills and labour, which makes it possible to replicate easily on other sites. Furthermore, the vegetation structures which form the four edges of the building not only help to regulate the temperature, but also to strengthen the load-bearing structure and provide a place for growing food and therefore the building offers multiple solutions at once (Mossin et al., 2020b, 92).

The township Imizamo Yethu in Hout Bay near Cape Town, South Africa, has very poor infrastructure and a ratio of approximately 60 households per toilet and 390 households per tap (Tensile Cables, 2017). To address this the second year architecture students of the University of Cape Town designed and built a number of washing platforms which was significantly improved over the course of these projects. The washing platforms provide "more dignified places for water collection, spaces for the washing of clothes and the integration of these with shared toilet facilities" (UCT, 2012, 3) and include built-in furniture and wash tops with decorative tiles and concrete and shade structures (IOL, 2018).

The built environment predominantly affects the oceans through waste such as plastic and untreated pollutants in water run-off that enters the oceans. The selection of building materials and methods plays an important part in managing the pollutants generated in the construction

and maintenance processes. Projects such as the ReUsed Materials project that investigates the re-use of ocean plastic waste in building and other materials start to contribute to the solution (Mossin et al., 2020b, 202; Cestari, 2020).

The intentional design of urbanscapes, parks, roads, rainwater harvesting and stormwater systems can make a significant contribution to “reduce stormwater runoff, erosion, and contamination of water surfaces with pesticides” (Bartolacci, n.d.). Architects often visually communicate or celebrate the harvesting of rainwater as part of a building’s formal solution through devices such as inverted roofs or water tanks that announce an entrance. Even in small projects, for instance the design of freestanding public toilets in San Francisco, architects are making an effort by integrating rainwater harvesting and local vegetation (Wang, 2019).

Conscious design can reduce the amount of energy required to build and operate buildings. Designing with passive design principles and the use of local materials and labour are some of the ways that architects like Francis Kéré contribute to minimise the use of energy. Kéré’s work, including the Gando Primary School and Lycee Schorge Secondary School in Burkina Faso, uses passive design strategies such as overhanging roofs to keep the sun off the walls, locally made mud bricks and locally harvested stone, and passive design devices such as wind-catching towers (González, 2017).

The SDG *Life on Land* refers to how we should “(p)rotect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss” (Mossin et al., 2020b, 206). The built environment can contribute here with the smallest design interventions, such as providing insect hotels or green animal corridors in cities, by contributing to biodiversity and including all forms of life.

Architects should promote the use of materials, especially wood, that come from sustainable sources and design with the principle of circular design allowing for the disassembly and future re-use of material.

From a pedagogic perspective the integration of sustainable and inclusive principles in a curriculum is essential to inform what is taught, from which position, and how studio projects are conceptualised. At STADIO, author Hermie Delpont and her team design the architecture and spatial design qualifications and programmes underpinned by inclusivity, design thinking, ecosystem approaches, and regenerative and sustainable futures. To put this in practice STADIO in 2021 hosted a series of webinars focused on sustainable built environments in collaboration with the Sustainable Built Environment Conference for which STADIO is the co-host in 2022 (SBE, n.d.). The webinars focused on sharing current thinking patterns and tools with built environment professionals and prompting discussion for action. The discussions reflected on implemented strategies, whether successful or not, and centred around theories, case studies, and reflections on the conceptualisation of sustainable environments. Despite a diverse collection of opinions and proposed solutions the overall consensus was that collaboration and a unified effort from practitioners and academics alike are required to guide architectural involvement in the development of a sustainable, regenerative, and renewable future.

Systemic Inclusivity

The SDGs included in Systemic Inclusivity are 4: Quality Education, 8: Decent Work and Economic Growth, 9: Industry, Innovation and Infrastructure.

Architects can contribute to the provision of quality educational spaces through the design of learning environments by questioning traditional or outdated educational models as part of the conceptual development and by finding appropriate and alternative ways of making

new educational spaces. The design, building, and operational process can in itself play an educational role by involving the surrounding community and future occupants of the building. Sadly this strategy is often only part of the development of educational buildings for under-resourced and outright poor communities.

Quality educational spaces have the potential to contribute to the health of its users. This is just what the Frederiksbjerg School in Denmark by a team of Henning Larsen, Hoffmann, GPP Architects, Niras Møller og Grønborg, and the City of Aarhus does. The design of the spaces and structures encourage physical activity by providing alternatives for vertical circulation, such as a climbing wall, doing away with tables and chairs and providing other innovative “physical challenges” (Mossin et al., 2020a, 38). A more low-tech but equally progressive solution is the “Handmade School” in Bangladesh. Here architects Anna Aeringer and Eike Roswag conceptualised a school which was built collectively by the architects, local craftspeople, and the pupils, parents, and teachers. The construction methods referenced local techniques and included new methods based on the traditional which could afterwards be implemented to improve the construction of local houses. The local materials and passive design strategies create an environment conducive to learning and spaces in which children can climb into and over contribute to their physical learning and well-being (Fiona 2010).

The Design Build Research Studio (DBRS) of the Cape Peninsula University of Technology, of which author Hermie Delpont was a founding member, designed and built projects at an under-resourced multi-grade school in the rural area of Grabouw close to Cape Town. The school had no undercover gathering space for the 300 primary school children. The DBRS built a roofed outdoor space which became a multi-functional place for teaching, assembly, concerts, and simply for the

children to sit outside on the deck, built from local recycled fruit crates, to eat their meal which is provided by the school. In subsequent projects at the same school a shade structure for the library, housed in a shipping container, and a playground/entrance defining structure was built. Funding is always an issue for these types of design-build student projects and the use of recycled and of locally available resources was both a necessity and an attempt to leave as small an environmental footprint as possible (Delpont, 2016).

Design-build and live project studios are at-present widespread in architectural education with international bodies dedicated to the research and facilitation of these projects. These include the Live Projects Network (Live Projects Network, n.d.) and the Design Build Xchange platform (Design Build Xchange, n.d.). Architecture schools include design-build and live projects in their teaching, either as stand-alone projects or as integral parts of their curricula (Sutter, 2014; Harris & Widder, 2015).

Design-build and live projects are typically situated in under-resourced communities, and focus on sustainable, collaborative, and interdisciplinary practices. (Design Build Xchange n.d.; Delpont, 2016). These projects give students a sense of purpose through the contribution they make to improve the lives of real communities through design solutions. The pedagogy and practice of design-build and live projects have been extensively researched in the past decade, yet the ethics and long-term and economic sustainability of some of these projects are still questioned, especially where a built project is left to the community to complete or manage after the participating school, often from abroad, had returned home after completing their work.

The Unit for Urban Citizenship (UUC) at the University of Pretoria in South Africa is an example of a studio which is invested in working in the upliftment of their local communities. They follow a theoretically informed, research-based, participatory design approach to include the

voice of the community in their design proposals. Their aims, mentioned here since it echoes the aims of similar studios, include “transdisciplinary research on urban citizenship ... social impact through evidenced-based multi-scalar interventions ... socio-economic and spatial transformation imperatives (and to enable) the UN Sustainable Development Goals” (University of Pretoria, n.d.).

To address the goal of decent work and economic growth in the built environment translates to designing spaces, systems and structures that enable the movement of people through circulation and transportation, creating living and working conditions that are pleasant, productive, and adhere to health and safety regulations. On a construction level it translates to the inclusion of local labour where economic opportunity is tied to building processes, which is typical in lower income communities (Mossin et al., 2020a). An example of an architectural practice working towards decent work and economic growth is Local Works in Uganda. Local Works collaborates with international and local partners to produce buildings such as the RUCID College for Organic Agriculture which is built exclusively with local materials, methods, and labour. (Local Works n.d.).

Innovation in terms of building products, materials, and systems include conceptual approaches, and experimentation with new building materials. Architect Winy Maas³¹⁴ of MVRDV³¹⁵ recently proposed a “new inhabitable geological layer called The Sponge” that would cover the earth and “would be a giant, multilayered biostructure capable of nurturing both people and planet” (Maas 2021:n.p.). Conceptual ideas like this plant the seed towards future thinking and possible solutions for environmental sustainability for human life. Entities such as TerraForm ONE, which researches and develops socio-ecological solutions

³¹⁴ <http://www.dezeen.com/tag/winy-maas>

³¹⁵ <http://www.dezeen.com/tag/mvrdv>

collaboratively and through the disciplines of art, architecture, and urban design and “cultivates resilience through innovations in building, transportation, infrastructure, water, food, waste treatment, air quality, and energy” (TerreForm. n.d.) is moving innovation forward through conceptual and constructed projects. Their projects include an Anti-Extinction Library, which was built as an exhibition space and permanent home for the “embryonic cells and DNA of rare lifeforms” (TerreForm. n.d., n.p.) and Home Alive, which is a home prototype “made from grafted living woody plants and old growth trees” (TerreForm. n.d., n.p.) and which combined a timber and aluminium structure.

Mycelium, a fungus that can be grown to produce building blocks, is being researched in various contexts as a new alternative solution to cement and concrete. The growing medium for the fungi can include waste materials such as sawdust (GreenBuildingAfrica, 2020). In Namibia in the BioHAB project a multidisciplinary team is working with two architectural firms, Redhouse Studio and Kamau Architects, using alien vegetation as a substrate to grow both food and building material for affordable housing (BioHAB, n.d.). In the USA, The Living Studio and Ecovative Design collaborated on the Hy-FI Project where mycelium bricks were used to build a 12 meter high, three-tower exhibition space outside the MoMA in New York. After the exhibition the towers were dismantled and composted (Stott, 2014).

Working with recycled materials, whether plastic, glass, brick, or building components such as windows, requires a rethink of the “fixed and standard way of designing” and a move towards “new approaches in fields we did not fully imagine before”. This is according to Peter van Assche of Dutch architecture studio Bureau SLA³¹⁶, who experiments with reducing ecological footprints and taking the “circular idea to a maximum level” (Frearson, 2017, n.p.). The Parsons Healthy Materials Lab, in which author Michele Gorman participates, researches, educates,

³¹⁶ <http://www.bureausla.nl/>

and collaborates with manufacturers to find and develop non-toxic material for building sustainably. The School of Architectural and Spatial Design at STADIO, of which author Hermie Delpont is a part, collaborates with the Natural Building Collective to promote the use of natural and recycled building technologies through short learning programmes and hands-on workshops for students and design professionals.

Social Justice Inclusivity

The Social Justice Inclusivity includes the SDGs 1: No Poverty, 2: Zero Hunger, 5: Gender Equality, 10: Reduced Inequalities.

The hidden language of architecture can aid and abet racial and income-based inequalities; understanding that truth is a step toward changing it... (we need to promote) design as a tool for social justice. (Our) mission is to “organize, advocate, and design for racial, social, and cultural equity” (Mortice, 2017, 1, 2).

Where people live everyday impacts how they access services, food, education, and other resources, which in turn is influenced by visible and invisible hierarchies and power structures in society. In the built environment buildings and spaces can exclude when lacking access and permeability, presenting large undefined facades to public spaces, introducing economically out-of-scale developments, and using “punitive design for security” (Mortice, 2017:1-4). Examples include social housing which disconnects people from opportunities either by being far from work environments or food sources or instances of gentrification which leads to displacement (Mortice, 2017, 1-4).

Examples of social and refugee housing designed by architects in an attempt to address poverty include the work of architect Alejandro Aravena who designed four social housing typologies, which his firm, Elemental, made available for free online. His intent is that these

typologies should be downloaded and adapted to other contexts in the quest to provide affordable and quality housing globally. One of the four designs is an incremental building in which recipients receive only half a house that they can adapt and complete over time as the means arrive (Busta, 2016; Zilliacus³¹⁷, 2016). Architect Shigeru Ban has developed numerous disaster relief projects by “finding structural uses for fugitive materials, including paper and cardboard” (Capps, 2014). Examples of his work include paper log houses for several countries affected by earthquakes, a cardboard cathedral and an elementary school made from paper. Both Aravena and Ban are Pritzker Prize winners.

Other architects work on improving local methods of building to assist communities to use what is available in a manner which drastically improves their living conditions. The architectural practice LocalWorks in Uganda worked with the Batwa people who were evicted from their forest home, ironically for the preservation of local wildlife. The Batwa people constructed their own shelters in their new context, but these were not robust enough to withstand the local conditions. With the assistance of LocalWorks the technology of the local materials were improved and the Batwa people now have sound houses and a small community centre (Localworks, n.d.). In India the architectural practice Anupama Kundoo designed the Volontariat Home for Homeless Children. The buildings are constructed with mud bricks which are baked in-situ, the house is basically constructed as a kiln, which saves time, money, and energy in the construction process and produces additional baked bricks which are baked in the centre of the in-situ house during the firing process (Mossin et al., 2020a, 12).

To address inclusion in the architectural profession, the Royal Institute for British Architects (RIBA) encourages its members to employ an Equality, Diversity and Inclusion Strategy in their practice to address the SDGs. RIBA believes that such a strategy is imperative for

³¹⁷ <https://www.archdaily.com/author/ariana-zilliacus>

“creating opportunity and enabling success” and that it is “through ensuring equality, diversity and inclusion that practices can build and maintain a creative, cultural, and commercial competitive advantage” (RIBA 2020, 12).

“The built environment contributes to the securing of food supplies through planning, landscape and building designs that protect existing ecosystems and prioritise the preservation and expansion of areas for food production” (Mossin et al., 2020a, 27).

Architecture and agriculture has become somewhat entwined in the past decade and the term “agritecture” has emerged as an describing term (Agritecture, n.d.). Architects are conceptualising and building urban food gardens and farms in collaboration with urban designers and agricultural practitioners in an attempt to eradicate food deserts, which are “concentrated in low-income and historically marginalized areas” (Charles, 2021, 2). Although the effectiveness of these strategies are still being investigated, research suggests that urban farms “advances food justice, access, and economic equality... (and) have an important role to play in localized, just food systems.” (Siegnier et al., 2018, 23). Architects are contributing conceptual ideas on the design of vertical and other urban farms from Brooklyn to Shanghai (Dezeen, n.d.) but most of these are still in the project phase. An interesting example is Impact Farm which is a small moveable 50m green house. It uses hydroponic systems, and has the capacity to produce up to three tonnes of food per year. It has been built in Harlem and Copenhagen and acts as an educational space (Human Habitat, n.d.).

Architectural student projects in the space of food justice are often linked to design-build or live project studios. Examples include the design-build of a mobile greenhouse for the Center for Urban Ecology in Indianapolis by the College of Architecture and Planning of Ball State

University (Renze-Rhodes, 2016). Another example is the work of the School of Architecture and the Department of Landscape Architecture at Clemson University in collaboration with Feed & Seed, a non-profit organisation with the mission of “addressing the social inequities present within the disenfranchised, and predominantly, African American neighborhoods” (Hambricht-Belue & Holland, 2016, n.p.). Student work in the Feed & Seed Studio is informed by thorough research which inform sustainable solutions and include strategies to integrate the community with the Feed & Seed farm, educational initiatives about food production, farming, and the related buildings and site infrastructure, collaborations with local business to find place to sell the farm’s produce, and the design of a food hub (Hambricht-Belue & Holland, 2016). Some of the students of Ball State University had this to say about their participation in the project: “The professors set us up not just for a concept but for an actual product. You can’t ignore how it will affect real people, and that’s real life. The building has to work; it can’t just be a concept. It was always the first thing we talked about in our classes — how we’re going to affect a community. But to actually be a part of that, and see how you’ve impacted lives for the better, well... ” (Renze-Rhodes, 2016, 21-22).

In a pursuit for social justice, chapter author Michele Gorman has hosted feminist design roundtables around topics such as “Can Design Save the Refugee Crisis”, Feminist Domestic Mutations, new feminist design practices and pedagogies. In 2018, she designed and hosted an exhibition for the feminist group ArchiteXX, titled “Now What?! Advocacy, Activism, and Alliances in American Architecture since 1968”³¹⁸. The exhibition examined the overlooked history of architects and designers who were — and still remain — at the forefront of the profession's participation in the larger civil rights, women's, and

³¹⁸ <http://bustler.net/events/10966/now-what-advocacy-activism-and-alliances-in-american-architecture-since-1968>

LGBTQ movements over the last 50 years. This exhibition was invited to the Chicago Architecture Biennial. When it was found that the sponsorship for the Biennial was by the fossil fuel industry, the invitation was declined. The exhibition has travelled internationally since, inviting participants to add under-represented groups in their quest towards equity and inclusion within architecture. In 2020, Michele also collaboratively launched The Dinner Party³¹⁹, inspired by Judy Chicago's, for the feminist group, Mistresses of Architecture, where 40 under-recognized women who have made a significant contribution to the field of architecture were recognized and archived.

From an educational perspective and focusing on Radically Inclusive Studio principles, Michele has introduced alternative and inclusive design reviews and gradeless assessment in her studio practice to give more agency to the students to be responsive to real world issues from their diverse experiences and communities. Students are treated as collaborators in a spirit of experimentation and opening up new research territories. Grades have been documented as reinforcing hierarchies within the classroom, placing judgement and rating over discussion, meaningful feedback and learning (Blum, 2020). Michele explains that the process of grading in assessment results in students working towards a grade, seeking approval from their professor instead of engaging in the learning process. Instead, with gradeless assessment, students are focusing on meaningful feedback that gives graduate students more agency in guiding their own research. Students are able to take risks and weigh feedback from a number of perspectives, building experience in decision making to build confidence in self-guiding their own research.

³¹⁹ https://news.pratt.edu/article/soa-launches-mistresses-of-pratt-to-recognize-the-work-of-women-educators/?_ga=2.118849737.1304353347.1641328327-827110643.1631641759

Symbolic Inclusivity

Symbolic Inclusivity includes SDGs 12: Responsible Consumption and Production, 13: Climate Action and 16: Peace and Justice Strong Institutions.

“the design of space communicates power dynamics and value systems” (Mortice, 2017, n.p.)

The symbolic meaning of the buildings and spaces that address these SDGs can inspire communities to act collectively and accordingly and can instill confidence and trust in the systems that are meant to serve and protect and implement. Civic buildings, where people participate in processes that regulate and organise society, and community buildings, where people congregate to worship and share resources are physical spaces and places in which the values of society are made visible through practice. The design of these spaces and places should be “inclusive, welcoming, secure and non-discriminatory” (Mossin et al., 2020a, 137).

From a built environment perspective responsible consumption and production speaks to the circular systems necessary in the built environment. Ironically, traditional/vernacular buildings which were built using natural materials and methods were able to return to the earth once the building served no purpose any more. Today there is widespread, indiscriminate use of unsustainable materials such as concrete, which has a huge ecological and energy footprint.

Sustainable solutions include the use of materials and methods that allow for disassembly and re-use and the design of flexible and adaptable spaces, which can change its function over time as required. Recycling and upcycling is another way of addressing the huge amount of building waste. Interesting, and beautiful, examples of recycling and upcycling include the use of plastic chairs (Froelich, 2017), plastic baskets (AD Editorial Team, 2017), or plastic ice cream containers

(SHAU Indonesia, 2016) as the facades of buildings. Making these plastic waste products a visible part of the building structure serves as a reminder that products we consume ends up somewhere, if not on a building, possibly in landfill. This action in itself becomes a comment on our consumerist lives and serves as an educational strategy.

In celebrating the symbolic significance of water in the Uthai Thani province, a design-build collaborative project between the students of the International Program in Design and Architecture (INDA) at the Chulalongkorn University in Bangkok, the architectural practice Pareid, and Mitsubishi Elevator Thailand resulted in a mixed-use water collecting structure at a primary school. Water holds a specific symbolic meaning in this context since it has “cultural and practical significance linked to agriculture, tradition, and festivities” (Navarro, 2020, 1). The project was part of the “Design Build for Community” summer programme of INDA with the objective to create socially relevant spaces at schools. Here the celebrated visibility of water collection and response to the climatic context, which varies between monsoons and droughts, serve to remind students of the environmental condition and their heritage in a functional and beautiful multi-purpose gathering space.

On a symbolic level Parsons New School awarded Michele Gorman, MFA Interior Design Director, and her collaborator, MFA Industrial Design Director, Yvette Chapparo, funding for a Decarbonized and Decolonized Dinner Party that will collaboratively be launch between Parsons Healthy Materials Lab, Zolberg Institute on Migration and Mobility, and Parsons School of Design graduate programs in 2022. The proposed public program is an outdoor open dinner party, a performative act, to bring attention to the climate crisis and its intersection with the impacted New York City communities. The dinner embodies a material practice that works towards the mitigation of carbon through the design

process and materials used. The performance aspect is a discussion about who is affected; guests (New York City politicians, scientists, community groups, civil rights activists) discuss a socially just approach to the reduction of global warming, circular economies, and decarbonizing practices and addresses the link to decolonisation. “Decolonizing recenters the conversation away from who is around the table to the systemic forces that reproduce inequality and marginalization” (Hadjiyanni, 2020).

In terms of practice governance, as part of addressing peace and justice, architects have the responsibility to ensure that “procurement and construction processes ... discourage theft, corruption, bribery and all other forms of organized crime. The building industry must also ensure that the extraction, production and handling of building materials do not rely on abuse, exploitation, human trafficking or child labour.” (Mossin et al., 2020a, 137).

It’s incumbent on the designer to bring the voice of community end users to the table—a strategy that’s a good place to start, in the effort to turn design toward the service of inclusion and equality. (Mortice, 2017, n.p.)

Supportive Inclusivity

Supportive Inclusivity addresses Goals 17 and 3. SDG 17 focuses on Partnerships to Achieve the Goal and SDG3: focuses on Good Health and Well-being.

Resilient communities can withstand both acute shocks and chronic stressors brought about by climate change, disaster, poverty and conflict. STADIO Higher Education, under the leadership of author Jolanda Morkel, participates in such a project that aims to explore and develop transdisciplinary frameworks for resilient design education targeting university students across a range of study areas. The multi-disciplinary, multi-institutional, global partnership comprising practitioners and

educators from Scotland (Heriot-Watt University and Icecream Architecture), Australia (Queensland University and University of Sydney), New Zealand (University of Waikato), Nigeria (University of Lagos), and, South Africa (STADIO Higher Education), was first initiated at a Royal Academy of Engineering Symposium in Kuala Lumpur. The core team was expanded to include eight members across six Higher Education Institutions and a multi-disciplinary architectural practice secured funding from the Royal Academy of Engineering's (RAEng) Frontiers of Development Scheme to host a workshop at the University of Lagos scheduled for April 2020, to develop a curriculum for place-based resilience education. Because of the Coronavirus outbreak in early 2020, travel was prohibited, which required a resilient approach to collaboration and research design. The revised set of objectives to accommodate this disruption include the aim to build a community of practice and a library of shared resources to support teaching and learning for community resilience in higher education.

Community resilience describes the ability of communities to “take meaningful, deliberate, and collective action to remedy the effect of a problem, including the ability to interpret the environment, intervene, and move on. More than the ability of members to cope individually, community resilience involves interactions as a collective unit” (Pfefferbaum et al., 2008). The website, <https://www.learningforresilience.com/>, outlines the work since the start of 2020, including research, virtual events, blended learning methodologies and open source content, and the establishment of a learning for resilience network. Through the global collaboration, the formulation and sharing of community resilience research and practice from around the world is facilitated, workshops, webinars and global networking events are hosted, engaging pedagogical resources and methodologies are shared, a global network of practitioners, academics, and community members are

invited to collaborate and share, across a range of fields including design, science, social science and others.

Contributing to good health and well-being the Healthy Materials Lab at the Parsons New School, of which author Michele Gorman is a part, promotes change at a systemic level by educating communities, students, teachers and professionals about the dangers of toxic building materials and the healthy alternatives that are available. The Lab also assists under-resourced communities to remove toxic materials from their environments and supports manufacturers to “promote transparency and drive innovation” (Healthy Materials Lab, n.d, n.p.).

Another interdisciplinary initiative, but in this case addressing SDG3, is the Healthcare Excellence Acceleration Lab (HEAL) of the Queensland University of Technology (QUT). Co-author Lindy Osborne Burton is the Chief Investigator for this project that explores the improvement of the Queensland healthcare system, spaces, community interactions and communication through co-design. The impact of the HEAL project recently received two 2021 Good Design Australian awards, namely for the 'social impact' and 'service design' categories, for demonstrating tangible benefits of design thinking in positively transforming healthcare in Australia. (QUT Design Lab, 2021).

“Architecture, simply put, plays a crucial part in creating a built environment that supports good health and well-being. Examples of this span greatly and can be found in housing that reduces the risk of infection with malaria, in patient-community buildings and in the design of workout equipment for public parks.” (Mossin et al., 2020a, 23).

Spatial Inclusivity

Spatial Inclusivity addresses SDG 11: Sustainable Cities and Communities which speaks directly to the built environment and spatial design disciplines and industries.

The everyday practice of professional architects and architectural education is centered on the design of cities and communities. From a spatial inclusivity perspective the profession, both professionally and educationally, can and does play a role in the broader built environment. Architects are often consulted outside the scope of their disciplinary boundaries because of the broad and holistic way of thinking that is taught in the architectural studio. This allows architectural practitioners to add value beyond the boundary of their immediate disciplinary context.

Professor Douglas MacLeod, Chair of the Centre for Architecture at Athabasca University, Canada, published a fictional work entitled *The Architecture of Hope*. Hope is a town a decade or two in the future. The story contributes concepts and ideas of what regenerative way of life could look like and comments on our current cities (or towns) and communities, which are “overpriced, poisonous, overcrowded, unhealthy ... not because they have to be but because it suits the vested interests that build, operate, and control them ...” (McLeod 2020, 11). In the town of Hope the people of the community: “Restore more of the natural environment than they occupy; Purify more water than they contaminate; Produce more energy than they consume; Grow more food than they need; Create income for their inhabitants; Recycle more than the waste they generate; Absorb and sequester more greenhouse gases than they emit; Maximize the use of natural light; Minimize the need for artificial lighting and Contain no toxic chemicals”. Written in non-academic language and with an intriguing storyline makes this book into a symbolic message and the principles behind it accessible to people outside the architectural discipline.

Conclusion

From a Radically Inclusive Studio point of view we want to position the studio ultimately as a community of inclusive practitioners which links purposefully and progressively to the cities and communities within which the architectural studio, student, staff, and ultimately the architectural practitioner operate. As radically inclusive designers, we heed the call to address environmental justice within our built environment with cognisance of past and present power dynamics and social justice impacts that policies have on our communities. We believe that a radically inclusive approach towards sustainable development could be informed by the principles of a Radically Inclusive Studio which are embedded in the 6S *Inclusivity* dimensions as a foundational pedagogy.

In the built environment, this means that each time we build, each time we renovate or develop an element of the built environment, we must ask ourselves: who are the furthest behind here? And we must take it upon ourselves to reach those people first, to make sure that what we build is promoting their inclusion, rather than allowing what we build to limit the participation in society of vulnerable persons. (Mossin et al., 2020b, 13)

The projects presented in this chapter, both professionally and educationally, speak to the principles of the Radically Inclusive Studio. The educational projects were purposefully selected, based on the researchers' practice and education experience for their qualities that are, in varying degrees, integrative, contextual, adaptive, real-world, experiential, collaborative, and interdisciplinary. We found strong alignment of the purposefully selected inclusive architectural practice and education examples that we identified, with the 6-S *Inclusivity* dimensions. Although each example was mapped according to its most

prominent inclusive condition, it was also possible to identify alignment, to a lesser degree, of the other 5 S's of the 6-S conceptual framework. Just as the SDGs are intertwined, where the one goal is dependent on and inclusive of the others, so studio and other project- or problem-based education should never be divorced from the real world and real communities in order to make a substantial contribution and promote inclusive sustainable development.

Many of the projects presented here are situated within communities and aim to include voices from outside the studio. These communities are predominantly poor and under-resourced. This context is where the most impact is made, but begs the question why more well-resourced and affluent communities are not seen to participate in sustainable built environment solutions? Working in poorer communities addresses social justice, but without the rest of society's awareness of these interventions, how is knowledge of the solutions and principles of sustainable living expanded?

May we conclude with the words of Alejandro Aravena:

“We would like to learn from architectures that despite the scarcity of means intensify what is available instead of complaining about what is missing. We would like to understand what design tools are needed to subvert the forces that privilege the individual gain over the collective benefit, reducing We to just Me” (AD Editorial Team, 2015, 4).

Bibliography

Altomonte, S. ed. (2012). *EDUCATE - Education for Sustainable Environmental Design*. [online]. Available from:
https://www.researchgate.net/publication/331528095_EDUCA

TION_FOR_SUSTAINABLE_ENVIRONMENTAL_DESIGN
_THE_EDUCATE_PROJECT [2 August 2021].

ACSA. (2020). *Analog Meets Digital: Physical Modeling and Virtual Collaboration* [video online]. Available from:
<https://youtu.be/Srbf9G7PRnk> [27 March 2020].

AD Editorial Team. (2015). Venice Biennale Announces Theme for 2016 Event: "Reporting From the Front". In: ArchDaily [online]. Available from: <https://www.archdaily.com/772776/venice-biennale-announces-theme-for-2016-event-reporting-from-the-front> [19 December 2021].

Agritecture. (n.d.). *What is Agritecture?* [online]. Available from:
<https://www.agritecture.com/agritecture-definition>
[19 December 2021].

Ameri, A., & Dagg, R. O. (Eds.). (2018). The ethical imperative. In *The ethical the imperative: 106th Annual meeting Project Proceedings* (p. 183). ACSA Press.

Anderson, J., & Priest, C. (2015). *Live Projects Network* [online}. Available from: <http://liveprojectsnetwork.org/>
[13 December 2021].

Antonini, E., Gaspari, J., & Visconti, C. (2021). Collaborative learning experiences in a changing environment: Innovative educational approaches in architecture. *Sustainability (Switzerland)*, 13(16) [online]. Available from: <https://doi.org/10.3390/su13168895>
[20 November 2021].

Architects! Climate Action Network. (2020). *Architects CAN!* [online]. Available from: <https://www.architectscan.org/>
[2 August 2021].

- Bashier, F. (2014). Reflections on architectural design education: The return of rationalism in the studio. *Frontiers of Architectural Research*, 3(4), 424–430 [online]. Available from: <https://doi.org/10.1016/j.foar.2014.08.004> [10 December 2021].
- Bardage, S.L. (2017). Performance of Buildings. In: Jones, D. Brischke, C. eds. *Performance of Bio-based Building Materials*. Woodhead Publishing Series in Civil and Structural Engineering. Cambridge. 335-383.
- Bartolacci, J. (n.d.). Let It Pour: 8 Architectural Details to Harvest Rainwater. In: *Architizer* [online]. Available from: <https://architizer.com/blog/projects/xapo-bank-headquarters/> [22 December 2021].
- BioHAB. (n.d.) BioHAB [online]. Available from: <https://www.bio-hab.org/team> [23 December 2021].
- Blum, S. (2020). *Ungrading: why rating students undermines learning (and what to do instead)*. West Virginia University Press, Morgantown.
- Brown, J. B. (2012). *A critique of the live project* (Vol. 1). Queen's University of Belfast.
- Busta, H. (2016). 2016 Pritzker Laureate Alejandro Aravena Makes His Public Housing Designs Open Source. In: *Architect Magazine* [online]. Available from: https://www.architectmagazine.com/design/alejandro-aravena-makes-his-public-housing-design-open-source_o [23 December 2021].
- Capps, K. (2014). *12 Disaster Relief Projects by Shigeru Ban Architects*. In ArchDaily [online]. Available from: https://www.architectmagazine.com/design/12-disaster-relief-projects-by-shigeru-ban-architects_o [23 December 2023].

Cestari, S. (2020). Plastics could help build a sustainable future – here’s how. In: *The Conversation* [online]. Available from: <https://theconversation.com/plastics-could-help-build-a-sustainable-future-heres-how-133585> [22December 2021].

Charles, A. (2021). What Are Food Deserts? All You Need to Know. In: Healthline [online]. Available from: <https://www.healthline.com/nutrition/food-deserts> [19 December 2021].

Cité Architecture & Patrimoine. (n.d.). *Global Award for Sustainable Architecture* [online]. Available from: (n.d.).<https://www.citedelarchitecture.fr/en/article/global-award-sustainable-architecture> [5 December 2021].

Crysler, C. (1995). Critical pedagogy and architectural education. *Journal of Architectural Education*, 48(4), 208–217 [online]. Available from: <http://www.tandfonline.com/doi/abs/10.1080/10464883.1995.10734644> [3 December 2021].

Cuff, D. (1992). *Architecture: The Story of Practice* (1st ed.). MIT Press.

Daugelaite, A., & Grazuleviciute-Vileniske, I. (2021). The relationship between ethics and aesthetics in sustainable architecture of the baltic sea region. *Sustainability (Switzerland)*, 13(4), 1–15 [online]. Available from: <https://doi.org/10.3390/su13042259> [12 November 2021].

Delpont, H. E. (2016). *Towards Design-Build Architectural Education and Practice*. CPUT [online]. Available from: <http://etd.cput.ac.za/handle/20.500.11838/2393?show=full> [5 June 2021].

- Dezeen Awards 2021. (2021). Dezeen Awards 2021. *Dezeen* [online]. Available from: <https://www.dezeen.com/awards/2021/longlists/categories/sustainability/sustainable-building/> [18 December 2021].
- Dezeen. (n.d.). *Vertical farms* [online]. Available from: <https://www.dezeen.com/tag/vertical-farms/> [19 December 2023].
- DesignBuildxChange. (n.d.). *DesignBuildxChange _Building Knowledge Worldwide* [online]. Available from: <https://www.dbxchange.eu/> [22 December 2021].
- Dutton, T. A. (1987). Design and studio pedagogy. *Journal of Architectural Education*, 54(2), 16–25 [online]. <http://www.jstor.org/stable/1424904> [3 December 2021].
- Eudy, R. (2018). *What is a Learning Ecosystem? And How Does it Support Corporate Strategy?* [online]. Available from: <https://www.ej4.com/blog/what-is-a-learning-ecosystem> [21 November 2021].
- Farmer, G. (2013). Re-contextualising design: Three ways of practising sustainable architecture. *Architectural Research Quarterly*, 17(2), 106–119 [online]. Available from: <https://doi.org/10.1017/S1359135513000468> [21 June 2021].
- Fedderley, E. (2019). Leading Architects' Best Pro-Bono Projects. *Architectural Digest* [online]. Available from: <https://www.architecturaldigest.com/story/best-architecture-pro-bono-projects-2019> [21 December 2021].
- Fiona, D.B. (2010). Earth architecture: handmade school in Bangladesh In: *DesignBoom* [online]. Available from:

<https://www.designboom.com/architecture/earth-architecture-handmade-school-bangladesh/> [22 December 2021].

Fisher (2012). Post-Meltdown, The Rise of Architecture for the 99%. *Metropolis* [online]. Available from: <https://metropolismag.com/projects/architecture-for-the-other-99/> [5 November 2021].

Frearson, A. (2017). People's Pavilion "has almost no ecological footprint" say designers. In: Dezeen [online]. Available from: <https://www.dezeen.com/2017/10/27/peoples-pavilion-dutch-design-week-low-ecological-footprint-bureau-sla-overtreders-w/> [23 December 2021].

Froelich, A. (2017). This crazy building's facade is made from 900 black plastic chairs. In: Inhabitat [online]. Available from: <https://inhabitat.com/this-crazy-buildings-facade-is-made-from-900-black-plastic-chairs/> [19 December 2021].

Future Architecture. 2020. *Architects! Climate Action Network* [online]. Available from <https://futurearchitectureplatform.org/projects/9069ab22-bbc5-4a0b-8463-ce1af7789a5c/> [30 November 2021].

Green Building Africa. (2020). Mushroom Buildings? The Possibilities of Using Mycelium in Architecture. In *Green Building Africa* [online]. Available from: <https://www.greenbuildingafrica.co.za/mushroom-buildings-the-possibilities-of-using-mycelium-in-architecture/> [23 December 2021].

González, M.F. (2016). Lycee Schorge Secondary School / Kéré Architecture. In: *ArchDaily* [online]. Available from: <https://www.archdaily.com/885677/lycee-schorge-secondary-school-kere-architecture> [22 December 2021].

- Gorman, M. Morkel, J. Delport, H. Osborne, L. (2021). *The Radically Inclusive Studio* [online]. Available from <https://theradicallyinclusivestudio.org/> [accessed 20 November 2021].
- Gorman, M., Morkel, J. Delport, H. Burton. (in press). The Radically Inclusive Studio: an open access conversation on radically inclusive practices in the architectural design studio. In Salama, A. Harriss, H. Gonzalez, A. *The Routledge Companion to Architectural Pedagogies of the Global South*. Routledge.
- Hambricht-Belue, S. & Holland, M.J. (2016). Social Impact through Design: Experiments in Urban Agriculture. *The Plan Journal* [online]. Vol 1/2016 - Issue 2. Available from: <https://www.theplanjournal.com/article/social-impact-through-design-experiments-urban-agriculture> [19 December 2021].
- Harriss, H., & Widder, L. (Eds.). (2014). *Architecture Live Projects: Pedagogy Into Practice* (1st ed., Issue 1). Routledge Taylor & Francis Group [online]. Available from: http://books.google.com/books?hl=en&lr=&id=lt6hAwAAQB-AJ&oi=fnd&pg=PP1&dq=Architecture+Live+Projects:+Pedagogy+into+Practice&ots=YlxTW9vzS1&sig=s7NZA9mTsreTCAa9Aqc9yM_n96w [1 December 2021].
- Healthy Materials Lab. (n.d.). *Resources to Design a Healthier Future* [online]. Available from: <https://healthymaterialslab.org/> [18 December 2021].
- Human Habitat. (n.d.). *Human Habitat* [online]. Available from: <http://www.humanhabitat.dk/> [19 December 2021].

- Iftikhar, N., Crowther, P., & Burton, L. O. (2018). Constructing the Conversational Roles of Studio Design Education Stakeholders in Times of Change. *The European Conference on Education*.
- IOL. (2018). Platforms for water towers planned for Imizamo Yethu. In: *IOL* [online]. Available from: <https://www.iol.co.za/capetimes/news/platforms-for-water-towers-planned-for-imizamo-yethu-17145094> [22 December 2021].
- Kioupis, V., & Voulvoulis, N. (2019). Education for sustainable development: A systemic framework for connecting the SDGs to educational outcomes. *Sustainability* (Switzerland), 11(21) [online]. <https://doi.org/10.3390/su11216104> [5 December 2021].
- Koch, A., Schwennsen, K., & Dutton, T. A. (2002). The Redesign of Studio Culture A Report of the AIAS Studio Culture Task Force The American Institute of Architecture Students AIAS Studio Culture Task Force. In *New York* [online]. Available from: http://archdesign.vt.edu/students/images/Studio_Culture_Report_2002.pdf [13 December 2021].
- Kuhn, S. (2001). Learning from the Architecture Studio : Implications for Project-Based Pedagogy*. *International Journal of Engineering Education*, 17, 349–352.
- Lau, W. (2016). Architecture for Humanity Announces a New Name and a Fresh Start. *Architect Magazine* [online]. Available from: <https://www.architectmagazine.com/practice/architecture-for-humanity-announces-a-new-name-and-a-fresh-start> [20 December 2021].
- Hadjiyanni, T. (2020). Decolonizing Interior Design Education [online]. Available from: https://zbook.org/read/6e4a_

decolonizing-interior-design-education.html [18 December 21021].

Lexico. (n.d.). *Inclusivity* [online]. Available from: <https://www.lexico.com/definition/inclusivity> [21 December 2021].

Live Projects Network. (n.d.). *Live Projects Network* [online]. Available from: <https://liveprojectsnetwork.org/> [22 December 2021].

Localworks. (n.d.). RUCID College for Organic Agriculture [online]. Available from: <http://localworks.ug/project/rucid-college-organic-agriculture#> [23 December 2021].

Maas, W. (2021). "What if we create a new layer on the Earth that incorporates growing human habitation and consumption?" asks Winy Maas. In: *Dezeen* [online]. Available from: <https://www.dezeen.com/2021/11/02/the-sponge-winy-maas-manifesto-dezeen-15/> [23December 2021].

MacLeod, D. (2020). *The Architecture of Hope*. Wood Lake Publishing Inc. Canada.

Mathiba, G. (2020) Covid-19 and South African universities: A raft of problems to ponder. In: *Daily Maverick* [online]. Available from: <https://www.dailymaverick.co.za/opinionista/2020-04-09-covid-19-and-south-african-universities-a-raft-of-problems-to-ponder/> [2 August 2020].

Michelmersh. (2021). *Michelmersh sponsors RIBA's Sustainability Award 2021 – A mark of sustainability excellence* [online]. Available from: <https://www.mbhplc.co.uk/riba-sustainability-award-2021-sponsors-2> [18 December 2021].

- Morkel, J. Delport, H. (2020). Towards an Ecosystem-of-Learning for Architectural Education: Random Concepts as Prompts and Provocations. In: *Distance Design Education* [online]. Available from: <https://distancedesignededucation.com/2020/06/04/towards-an-ecosystem-of-learning-for-architectural-education-exploring-random-concepts/> [30 August 2021].
- Mortice, Z. (2017). *Decoding Oppression in Architecture: Design as a Tool for Social Justice* [online]. Available from: <https://redshift.autodesk.com/design-for-social-justice/> [23 December 2021].
- Mossin, N., Stilling, S., Bøjstrup, T. C., Hau, I. C., Møller, C. S., & Blegvad, A. (2020a). *An Architecture Guide to the UN 17 Sustainable Development Goals Volume 1 (Vol. 1)* [online]. Available from: *An Architecture Guide to the UN 17 Sustainable Development Goals Volume 1 (Vol. 1)* [online]. Available from: https://uia2023cph.org/uploads/AN_ARCHITECTURE_GUIDE.pdf [2 July 2021].
- Mossin, N., Stilling, S., Bøjstrup, T. C., Hau, I. C., Møller, C. S., & Blegvad, A. (2020b). *An Architecture Guide to the UN 17 Sustainable Development Goals Volume 2*. In *Published by Royal Danish Academy* (Vol. 2) [online]. Available from: https://issuu.com/kadk/docs/aechitecture_guide_un17_vol.2_web_single_pages [13 December 2021].
- Navarro, P. (2020). Pylonesque. Mixed-Use Structure To Collect Water In A School, By Pareid + Inda [online]. Available from: <https://www.metalocus.es/en/news/pylonesque-mixed-use-structure-collect-water-a-school-pareid-inda> [18 December 2021].

- Passe, U. 2020. A design workflow for integrating performance into architectural education. *Buildings & Cities*. 1(1), 565–578 [online]. <https://journal-buildingscities.org/articles/10.5334/bc.48/> [accessed 1 December 2021].
- Pfefferbaum B.J., Reissman D.B., Pfefferbaum R.L., Klomp R.W., Gurwitch R.H. (2008) Building Resilience to Mass Trauma Events. In: Doll L.S., Bonzo S.E., Sleet D.A., Mercy J.A. (eds) *Handbook of Injury and Violence Prevention* [online]. Springer, Boston, MA. https://doi.org/10.1007/978-0-387-29457-5_19 [2 December 2021].
- Pintos, P & Ott, C. (2021). Lacaton & Vassal: Get to Know 2021 Pritzker Winners' Built Work. *ArchDaily* [online]. Available from: https://www.archdaily.com/958569/lacaton-and-vassal-get-to-know-2021-pritzker-winners-built-work?ad_medium=widget&ad_name=related-article&ad_content=958565 [20 December 2021].
- Open Architecture Collaborative. (n.d.). *Open Architecture Collaborative* [online]. Available from: <https://openarchcollab.org/> [20 December 2021].
- Quirk, V. (2012). Design Like You Give A Damn [2]/Architecture for Humanity. *ArchDaily* [online]. Available from: <https://www.archdaily.com/235080/design-like-you-give-a-damn-2-architecture-for-humanity> [2 August 2021].
- QUT Design Lab. (2020). *HEAL: Health Excellence Accelerator Lab: Future of Healthcare* [video online]. Available from: https://www.youtube.com/watch?v=5CG_JHitQh4 [17 December 2021].

- Reiter, B. (2017). Theory and Methodology of Exploratory Social Science Research www.ijssrm.humanjournals.com. *Human Journals Review Article February Citation: Bernd Reiter. Ijssrm.Human*, 5(54), 129–150 [online]. Available from: http://scholarcommons.usf.edu/gia_facpub%0Ahttp://scholarcommons.usf.edu/gia_facpub/132 [13 September 2021].
- Renze-Rhodes, L. (2016). Students design, build a mobile greenhouse to help urban farm flourish. In: Ball State Magazine [online]. Available from: <https://magazine.bsu.edu/2016/12/20/MOBILE-GREENHOUSE-URBAN-FARM/> [19 December 2021].
- RIBA. (2018). *Findings of the RIBA Ethics and Sustainable Development Commission*. Available from: <https://www.architecture.com/-/media/GatherContent/Work-with-Us/Additional-Documents/Ethics-and-Sustainable-Development-Commission--Full-findingspdf.pdf> [30 November 2021].
- RIBA. (2020). *A Decade of Action. RIBA Members and the Sustainable Development Goals* [online]. Available from: <https://www.architecture.com/-/media/GatherContent/RIBA-Part-3-examination-information/Additional-Documents/A-Decade-of-Action-RIBA-Members-and-the-Sustainable-Development-Goalspdf.pdf> [3 August 2021].
- Rural Studio. (n.d.). *Educating Citizen Architects* [online]. Available from: <http://ruralstudio.org/about/> [21 December 2021].
- Salama, A. M. (2008). A theory for integrating knowledge in architectural design education. *ArchNet-IJAR: International Journal of Architectural ...*, 2(1), 100–128 [online]. Available from: <http://scholar.google.com/scholar?hl=en&btnG=Search&q=intit>

le:A+theory+for+integrating+knowledge+in+architectural+design+education#0 [15 June 2021].

SBE. (2021). SBE 2022: SUSTAINABLE BUILT ENVIRONMENTS [online]. Available from: <https://www.sustainablebuiltenvironments.co.za/index.php> [22 December 2021].

Schön, D. A. (1983). *The Reflective Practitioner – how professionals think in action*. London. Temple Smith

Sedrez, M., Xie, J., & Cheshmehzangi, A. (2021). Integrating water sensitive design in the architectural design studio in China: Challenges and outcomes. *Sustainability (Switzerland)*, 13(9), 1–22 [online]. Available from: <https://doi.org/10.3390/su13094853> [13 September 2021].

Shahbazi, S. (2016). Contextualism : A Strategy for Achieving Sustainable Architecture. *European Online Journal of Natural and Social Sciences*, 5(3), 306–314.

SHAU Indonesia. (2016). Bima Microlibrary / SHAU Indonesia. In *ArchDaily* [online]. Available from: <https://www.archdaily.com/790591/bima-microlibrary-shau-bandung> [18 December 2021].

Siddiqi, Z. A., Chaudhry, M. A., & Ashraf, M. (2002). Effects of Construction Activities on Environment. *Challenges of Concrete Construction: Volume 5, Sustainable Concrete Construction*, 5(3), 23–32 [online]. Available from: <https://doi.org/10.1680/scc.31777.0003> [12 July 2021].

Siegner, A., Sowerwine, J., & Acey, C. (2018). Does urban agriculture improve food security? Examining the nexus of food access and distribution of urban produced foods in the United States: A

systematic review. *Sustainability (Switzerland)*, 10(9), 8–12 [online]. Available from: <https://doi.org/10.3390/su10092988> [21 October 2021].

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, 104(July), 333–339 [online]. Available from: <https://doi.org/10.1016/j.jbusres.2019.07.039> [13 June 2021].

Stevens, G. (1995). Struggle in the studio: a Bourdivin look at architectural pedagogy. *Journal of Architectural Education*, 49(2), 105–122 [online]. Available from: <https://doi.org/10.2307/1425401> [10 May 2021].

Stevens, P. (2015). H&P architects encircles Vietnamese toilet block with structural bamboo. In *DesignBoom* [online]. Available from: <https://www.designboom.com/architecture/hp-architects-toigetation-toilet-block-vietnam-01-10-2015/> [21 December 2021].

Stott, R. (2014). Hy-Fi, The Organic Mushroom-Brick Tower Opens At MoMA's PS1 Courtyard. In: *ArchDaily* [online]. Available from: https://www.archdaily.com/521266/hy-fi-the-organic-mushroom-brick-tower-opens-at-moma-s-ps1-courtyard?ad_source=search&ad_medium=search_result_all [23 December 2021].

Sutter, M. K. (2014). *Design / Build in Architectural Education : studying community-focused curriculum* (Issue May 2014).

TerreForm (n.d.). Design Against Extinction [online]. Available from: <https://www.terreform.org/> [23 December 2021].

Tesile Cables. (2017). *Imizamo Yethu Water Platform in Digest of SA Architecture* [online].

Available from: <http://tensilecables.co.za/imizamo-yethu-water-platform-in-digest-of-sa-architecture/> [22 December 2021].

Tovivich, S. (2009). Learning from Informal Settlements: the New ‘Professionalism’ for Architectural Practice. *CEBE Transactions*, 6(1), 62–85 [online]. Available from: <https://doi.org/10.11120/tran.2009.06010062> [12 October 2021].

UCT. (2012). *University of Cape Town*. Platforms to Bring Dignity to Township Open Spaces [online]. Available from: <http://www.uct.ac.za/dailynews/?id=8211> [2 June 2021].

UIA. (2018). *The UIA Commission on the UN Sustainable Development Goals* [online]. Available from: https://www.uia-architectes.org/webApi/uploads/ressourcefile/26/180516_uia_s_dgc_council_meeting_oaxaca.pdf [8 March 2021].

UIA. (2021). Winners: *2021 UIA Gold Medal and Prizes* [online]. Available from: <https://www.uia-architectes.org/webApi/en/news/winners:-2021-uia-gold-medal-and-prizes.html> [18 December 2021].

UNESCO. (n.d.). *Sustainable Development* [online]. Available from: <https://en.unesco.org/themes/education-sustainable-development/what-is-esd/sd#:~:text=There%20are%20four%20dimensions%20to,an%20improved%20quality%20of%20life.> [21 December 2021].

United Nations. (n.d.). *Goal 11: Make cities inclusive, safe, resilient and sustainable* [online]. Available from: <https://www.un.org/sustainabledevelopment/cities/> [10 June 2021].

- University of Pretoria (n.d.). *Urban Citizenship* [online]. Available from: <https://www.up.ac.za/architecture/article/2933010/Urban-Citizenship> [22 December 2021].
- Upadhyay, R.K. (2014). *Decarbonization as Decolonization: The Case of the Northern Bay Area*. [online]. Available from: <https://kurukshetra1.wordpress.com/2014/01/12/decarbonization-as-decolonization-the-case-of-the-northern-bay-area/> [5 December 2021].
- UrbanNext. (2018). *Ecological Ethics and the Role of the Architect* [online]. Available from: <https://urbannext.net/ecological-ethics-and-the-role-of-the-architect/> [30 September 2021].
- Wang, L. (2019). High-tech public toilets proposed for San Francisco can recycle rainwater for reuse. In: *Inhabitat* [online]. Available from: <https://inhabitat.com/high-tech-public-toilets-proposed-for-san-francisco-can-recycle-rainwater-for-reuse/> [22 December 2021].
- Webster, H. (2008). Architectural Education after Schön: Cracks, blurs, boundaries and beyond. *Journal for Education in the Built Environment*, 3(2), 63–74.
- Williams, D. A., Berger, J. B., & McClendon, S. A. (2005). Toward a Model of Inclusive Excellence and Change in Postsecondary Institutions. *Association of American Colleges and Universities*, 39 [online]. Available from: <https://doi.org/10.1.1.129.2597> [2 September 2021].
- Williams, J. (2017). Design Studio: A Community of Practitioners? *Charrette*, 4(1), 88–100.
- Yao, F., Liu, G., Ji, Y., Tong, W., Du, X., Li, K., Shrestha, A., & Martek, I. (2020). Evaluating the environmental impact of

construction within the industrialized building process: A monetization and building information modelling approach. *International Journal of Environmental Research and Public Health*, 17 (22), 1–22 [online]. Available from: <https://doi.org/10.3390/ijerph17228396> [13 December 2021].

Zilliacus, A. (2016). Half A House Builds A Whole Community: Elemental's Controversial Social Housin. In *ArchDaily* [online]. Available from: <https://www.archdaily.com/797779/half-a-house-builds-a-whole-community-elementals-controversial-social-housing> [23 December 2021].