Masters dissertation

Rehabilitating Architecture and Food Sovereignty in school feeding schemes



K Smith 2020

PROJECT SUMMARY

Dissertation Title: The role of architecture in rehabilitating food sovereignty and nutritional education within secondary schools through collaborative participation

Project description: Secondary school implementation of a school feeding, nutritional education and sustainable food production programme that extends itself to learners and the surrounding community with the intent to create a holistic educational ecosystem for nutrition and wellbeing.

Site Location: Tsako Thabo Secondary School, Mamelodi East.
13415, Mamelodi 608-Jr, Pretoria, 0122

Primary Programme: School feeding scheme, Nutritional education curriculum & Sustainable food production facilities

Research field of study: Urban Citizenship & Co-design

Client: Department of Basic Education

Year Co-ordinators: Prof. Arthur Barker, Dr Carin Combrinck, Catherine Karusseit
Supervisor: Dr Carin Combrinck

Key Words: Food sovereignty & security, School Feeding, Nutrition education, Sustainable food production, Wellbeing, Co-design.

DECLARATION

Declaration

In accordance with Regulation 4(e) of the General Regulations (G.57) for dissertations and theses, I declare that this dissertation, which I hereby submit for the degree Master of Architecture (Professional) at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

I further state that no part of my dissertation has already been, or is currently being, submitted for any such degree or other qualification.

I further declare that this dissertation is substantially my own work. Where reference is made to the works of others, the extent to which that work has been used is indicated and fully acknowledged in the text and list of references.

Kelsey Smith



EXPRESSION OF THANKS

To my Almighty God, for carrying me through my architectural journey up to this final stage. Thank you for your unwavering love and continuous grace over me.

To my fellow co-authors, Lauren and Purll, I will forever be grateful for the opportunity we had to learn and grow together. You have both taught me so much and I am in continuous awe of your dedication and passion for architecture. Thank you for being such a crucial part of my journey. I am forever grateful for the insight, support and friendship you have given me.

To my exceptional peers, Anne', Conrad, Ides, Pierre, my Urban Citizenship Studio and the Masters Class of Resilience, Oh what a ride it has been! From the coffee runs, late-night calls, tears and laughter, it would not have been the same without such a phenomenal group of people. We have faced adversity in ways I wish upon no other, yet we have pulled through together.

Dr Combrinck, it has been such a privilege to have had you as my supervisor. You have taught me so much about architecture, life and people and inspired the need to discover an architecture of purpose, humanity and inclusivity. I will forever be indebted to you for the kindness, guidance and support you have shown me throughout my postgraduate degrees.

Prof Lise Korsten thank you for your constant support, your willingness to collaborate and encourage interdisciplinary research and your passion for and dedication to ensuring food security and sovereignty for all. You have been a constant inspiration and source of knowledge throughout this project.

To my mum, I am so grateful for the opportunities that you and dad provided me with. Thank you so much for the sacrifices you have made, for your unwavering support, prayers and love and for constantly believing in me. You are and will always be my rock, I love you endlessly.

Lastly, thank you to my all my friends and family outside of the chaotic circle of architecture, who have supported me throughout my journey, your understanding, helping hands and motivation have been instrumental to me.

DEDICATION

To my Dad,

In memory of your absolute love for food and the built environment.
You planted the seed of curiosity for the integration of the two.

You continue to inspire me in all that i do,
designing ,cooking ,dreaming.

I love you, always.

XIII.VIII.MMXX

DISSERTATION STRUCTURE

The document is structured in two Parts. Volume 1 is a co-authored chapter in which three master's students collectively engaged in Tsako Thabo secondary school through the data collection process to co-design. Volume 1 explains the research methodology collectively used and developed by all co-authors as well as gives a background into the research development of the site and school.

Volume 2 is the individual dissertation written independently and focuses on the narrative of the workings of a school feeding scheme at Tsako Thabo secondary school in Mamelodi East.



Volume 1

L. Konstantinou, Naidoo. P, Smith. K

Pg 10 - 77

Volume 2

Smith, K

Pg 78 -317

Volume One

Konstantinou, Naidoo & Smith. 2020.

Investigating the Spatial Consequences of Architecture on the Educational Ecosystem through the Approach of the Unit for Urban Citizenship

Foreword

We dedicate this volume to the Urban Citizen

Herewith lies our discovered passion,
Wherein we hope to inspire like-minded creatives.

“Architecture is about people, [...] it can do more than we expect.” - Francis Kéré

Agents of change,
Kelsey, Lauren & Purll

Glossary

MCLC
(Mamelodi Community of Learning Collaborative) Through the University of Pretoria (UP) Mamelodi Campus, the university has engaged with multiple community upliftment projects. The MCLC is funded by the Kresge Foundation.

Educational Ecosystem
A concept through which there is a large focus on the educational sector of a community, identifying and understanding the interrelationships between stakeholders and how these can be enhanced in order to uplift the educational quality of the community as a whole.

UUC
(Unit for Urban Citizenship) Within the Department of Architecture, this unit involves agents of change, engaging deeply with underserved communities through participatory-based projects.

Tsako Thabo Secondary School
Part of the MCLC's effort to uplift the educational ecosystem within Mamelodi East. The principal is Mr Clement Gama who has worked closely with us during the participatory process of both 2019 and 2020.

JCP
Community engagement course that makes provision for university funded community service projects to be completed by undergraduate students in the EBIT faculty during their second year of study.

STINT
National Research Foundation project titled, Stitching the city: From micro-data to macro-views (STINT), aimed at establishing a "transdisciplinary collaboration" to develop a methodology for collecting and sharing non-traditional types of information, on a digitized platform.

STEM & STEAM
Approach to learning and development that integrates the areas of Science, Technology, Engineering and Mathematics. STEAM was recently created to incorporate the Arts as well, to ensure an all-rounded and inclusive educational system.

PAR
(Participatory Action Research) An approach to investigation that involves participants and researchers working together in order to uncover issues and solutions within a community or topic.

ukuDoba Method
A methodological framework that has been developed for the collection and sharing of non-traditional types of spatial and socioeconomic data at a street and precinct level in an online platform. All three researchers were actively involved in the creation of this method.

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Chapter 1

INTRODUCTION

This document is inclusive in three mini-dissertations in the professional Master of Architecture degree in the Department of Architecture at the University of Pretoria: Lauren Konstantinou, Purll Naidoo and Kelsey Smith. We have collectively been a part of the University of Pretoria's (UP) Unit for Urban Citizenship, in the Department of Architecture, since our Honours year in 2019. As part of our involvement, we have engaged with the topic of investigating the spatial consequences of the architectural discipline on the educational ecosystem, through the approach of the Unit for Urban Citizenship. This engagement began in 2019 and occurred over the year within Mamelodi East, as a collaboration with the Mamelodi Community of Learning Collaborative (MCLC). This resulted in a focused study of Tsako Thabo Secondary School and a continued collaboration into the 2020 Master's year.

The 2019 experience highlighted the power of alternative architectural processes and the depth that can be added to a project when engaging in participatory design methods. There is a desire and need, within us, to challenge conventional architectural processes by focusing on the end-users as knowledgeable and tangible assets to design projects. We were all captivated by our experience during the 2019 Honours year and sought to continue our engagement in the Master's year, 2020. Due to our common foundation and architectural approach, we have closely collaborated during the Master's year. As an outline, each researcher's dissertation is made up of two parts (Fig. 01):

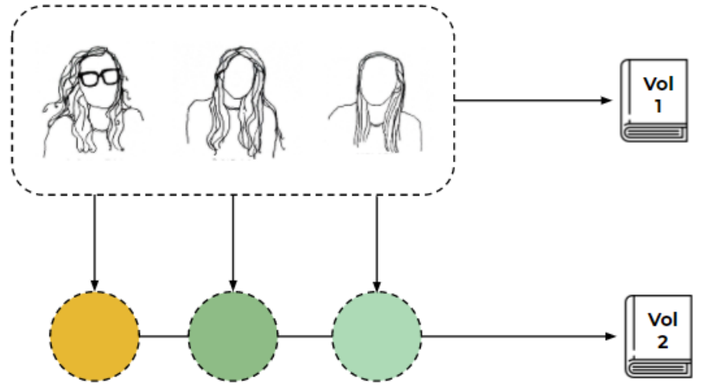


Fig. 1: Dissertation Structure Division (Authors 2020)

Volume One being the co-authored chapters and Volume Two outlining our individually authored chapters. Volume One of this dissertation document engages in our collective experience and foundation that contributed to our individually focused chapters in Volume Two.

Our research methods and architectural approach to the dissertation are influenced by our involvement in the Unit for Urban Citizenship (UUC). The UUC is a collaboration within the Department of Architecture and is currently headed by Dr. Carin Combrinck. Both students and staff from the department form part of the UUC, as well as identified community members who are integral to the success of the unit.

The unit is intended to be used as a platform for civic engagement and participatory development within disadvantaged communities. This is done in an effort to gain real-world understanding and result in community upliftment (Kilfoil 2019). The particular research method, carried out in each dissertation, is the outcome of the unit's involvement in a National Research Foundation

(NRF) project, titled 'Stitching the City" (STINT). This project is a joint effort between the University of Pretoria in South Africa and Chalmers University in Gothenburg, Sweden.

All three researchers were integral to the research project from 2019 to 2020 (See appendix A) and contributed towards the development of the *ukuDoba Method,* a methodology for both data collection and sharing on an easily accessible digital platform. Together with the *ukuDoba* research method (See appendix B), participatory design processes are integral to the approach of the unit, therefore all three dissertations place particular emphasis on this in the design process.

From the start, we set out to change the way we tackle the architectural discourse at UP from a Master's point of view. We intended to actively engage with our participants, site, community members, architectural professionals and peers as well as to be part of a movement of students who actively challenge the standardized process of a Master of Architecture (Professional) degree. We started the year with the intention of adapting the prescribed design format of the Master's year-end exam. This included hosting a winter studio in July that would involve a live-build in partnership with the community and other active participants in our respective projects. The winter studio was to be implemented so that a part of our designs could be physically built and form part of our technical resolution and design outcome for our dissertations. This was to extend and consciously involve ourselves in the participatory design process. Due to the nature of the COVID-19 pandemic and lockdown restrictions within the country, the possibility of a live-build was short-lived. Our shift in thinking happened immediately concerning producing a piece of work that could still possibly be executed in smaller increments and thus contribute to potential future implementation.

The end goal remains for us to be proactive in developing platforms and ways of engaging the end-user under any given circumstance. COVID-19 has posed its set of challenges regarding interaction and design development regarding participatory design processes. The impact of the circumstances surrounding this pandemic has been inevitably consequential to our design process. However, it has encouraged us to think out of the box while remaining in the box more so than ever. Most importantly it has challenged us, as researchers and designers, to become resilient in our architectural approach. To ensure that, even when obstacles present themselves, we are still able to adapt and ground ourselves in our approach, instead of accepting the traditional approach to architecture. The pandemic has also shed light and caused reflection on the outcome of our designs and the role we play as designers going forward into our careers as young architects.

Collectively we adjusted to online engagement to continue our paths and include participants in the design development process. Our resilience as researchers and designers has remained intact throughout our journey to obtain our Master of Architecture (Professional) degree and we have continued and will continue to learn and adapt along the way.

The following information provides the foundation for our three dissertation topics. Lauren Konstantinou's study has a focus on the spatial decentralization of music-making as a platform for positive self-expression to enhance collective community identities. Purll Naidoo considers the redefinition of South African government school typologies to encourage lifelong learning potential and Kelsey Smith explores the role of architecture and its intersection with food sovereignty in an attempt to rehabilitate secondary school feeding schemes within South Africa. Overall, we hope that Volume One of this dissertation document will provide a deeper understanding of the context we are engaging with, our approach to architecture and rationale for our individual dissertations.







Figures of Co-Authors during the collaborative process at Tsako Thabo (Honours 2019)

Chapter 2



BACKGROUND

Fig. 12: Mamelodi (Authors 2020)



Fig. 11: Tsako Thabo (Naidoo 2019)

2.1 Educational Ecosystem

It was Nelson Mandela who declared that "Education is the most powerful weapon which you can use to change the world" (Mandela 2003). To equip children with an engine for development (Mandela 2007) is to equip them with the knowledge and practical learning to maintain a sustainable life.

The educational ecosystem (Fig. 02) is a concept in which there is a large focus on the education sector of a community (Kurshan 2015).



Fig. 2: Educational Ecosystem (Authors 2020)

"Ecosystems are defined by the network of interactions among organisms, and between organisms and their environment" (Mueller & Toutain 2015: 6), therefore when looking at the educational ecosystem it becomes important to understand the interrelationships within that environment. There has been a focus on education as a means to direct a cultural shift, where the school is seen as the medium for moulding the society we envision. It is recognised that an effective educational ecosystem is seen as a nodal point to connect people and to address societal challenges. However, even though it is recognised that our educational ecosystem has the largest impact on society, it, unfortunately, remains the most fragmented (Luksha et al. 2018). Real-world case studies, stakeholders and implementations are used to see how relationships between educational facilities can benefit "urban education environments" (Kurshan 2015). Within a well-functioning ecosystem, educational institutions have the opportunity to work together to improve the current curriculum, equip staff and teachers with more knowledge and skills, and create a more enhanced and engaging learning environment (Kilfoil 2019).

Referring to the educational environment as an ecosystem is to understand the impact of educational institutions as nuclear agents. They have the capabilities of reinforcing existing and creating durable connections within networks in their context. For this reason, it becomes increasingly important to address the role of education within an ecosystemic context.

As part of the United Nations (UN) Sustainable Development Goals (SDG), education is seen as a priority (Fig. 03).

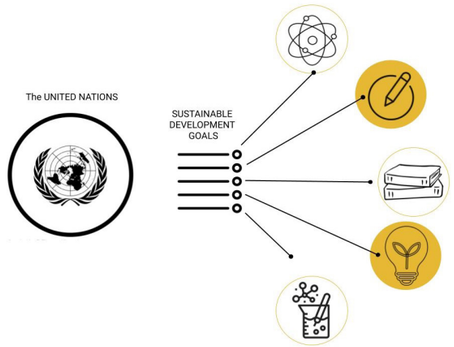


Fig. 3: Sustainable Development Goals (United Nations 2016)

The vision of quality education for all is stressed as an important aspect in the development of better lives and social sustainability, by the year 2030 (United Nations 2016). Education is a primary focus of the UN as it is essential to achieving numerous goals on the SDG list. Importantly, education is seen as the key to addressing the world's poverty cycle. In the same light that education is seen as a determining factor in achieving multiple SDG's, it also functions widely within poverty-stricken areas. Schools serve, not only as a medium for knowledge transfer but are integral in the support they provide to learners and communities, such as the provision of a learners' daily meal source (Peterson 2020).

In 2020, the COVID-19 pandemic resulted in the temporary closure of schools across the majority of the world's countries (United Nations 2020). Specifically, within underprivileged and marginalized areas, the underlying issues of the current education system were suddenly exposed, both globally and locally (Carte Blanche 2020; United Nations 2020). As stated by Basil Manuel from the National Professional Teachers' Organisation of South Africa (NAPTOSA), in South Africa the nation-wide lockdown exposed and exaggerated the inequalities of the education system almost overnight. The issues discussed are particularly related to inclusivity, participation, equality and transformation (Peterson 2020). These issues proved that middle to upper-class learners were able to continue their education through online platforms. However, those who are financially disadvantaged, could not. This stems from a general lack of technological knowledge and skills to the lack of finances to buy internet data or even print notes (Carte Blanche 2020; Peterson 2020). Parents are also often unable to help their children learn from home as in most households, their child is the first to go to school, leaving the rest of the family illiterate (Peterson 2020). As the schools have closed, many are left without a safe learning environment to attend daily, resulting in increased stress and anxiety for both learners and parents (Peterson 2020). Exposing this significant gap in both the economy and the knowledge of these citizens truly highlights the importance of the evolution of the current education system.

When engaging with the educational ecosystem it is important to be aware of the influence of STEM (Science, Technology, Engineering and Mathematics). Both globally and locally, the focus on STEM has a major influence on the educational ecosystem, in terms of curriculum. Since 2009, in South Africa, the subjects Mathematics and Science were seen to result in public schools being in a state of "national crisis" (Pols 2019). This affected the qualitative outcomes of scientists, engineers and health practitioners in the workforce. The concept of STEM was introduced into schools as a way to increase the critical thinking capacity of current school generations (White 2014), ultimately leading to a stronger workforce that is more employable, setting up South Africa's society for success (World Economic Forum 2017). This would contribute to breaking the poverty, crime and unemployment cycle of underprivileged communities within the country (Pols 2019).

However, there have been numerous debates and much research conducted regarding the addition of the arts into STEM to expand scientists' knowledge from critical to humanitarian and empathetic (Lachman 2018). STEAM (Science, Technology, Engineering, Arts and Mathematics) education allows for learners to be critical and analytical while recognizing the personal, social and cultural potentials of what they are doing (Pienaar 2017) (Fig. 04). Such pedagogical methods align and challenge school curricular reform to challenge the current education model.

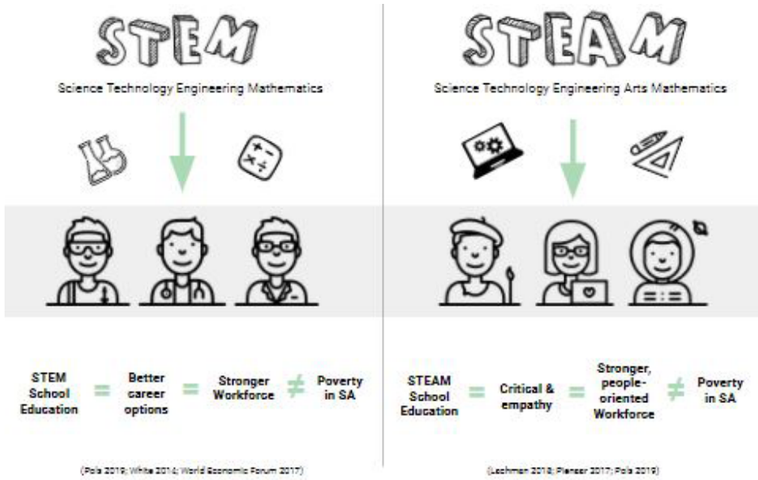


Fig. 4: STEM vs. STEAM (Authors 2020)

Psychologically, this educational concept teaches learners self-expression, wider forms of criticism and ultimately helps to develop them for the working world where they would be more susceptible to taking risks and developing new ideas (Lachman 2018; Pienaar 2017). Initiatives such as Leap Science and Maths schools are a chain of non-fee paying schools that aim at offering quality education to underprivileged, low-income communities. Sustainable models like these are imperative to empowering people as they focus on the fostering of learners' cultural and communal identity while ultimately creating a pathway to future employment (LEAP 2017). Robinson (2010) emphasizes that schools are currently failing to acknowledge and encourage multiple types of intelligence. He states that the traditional standardization of education needs to be revised to develop the youth's ability for creative and practical thinking.

This type of curriculum change impacts the educational ecosystem by allowing more opportunities for the inclusivity of all students, not only those that fit the critical-thinkers mould. As designers and researchers, this is the standpoint from which we approached the educational ecosystem. Robinson (2010) highlights that the future of our economy is dependent on innovation and a person's ability to anticipate future concerns and have the skills and capability to implement solutions. This way of learning encourages students to engage realistically with skills that will help them sustain their lives in the future (Carson 2016).

Within the educational ecosystem, it is crucial to understand the relationship between people and their environments and to engage in how/why these relationships are created and exist (Mueller & Toutain 2015: 8) (Fig. 05).



Fig. 5: Interrelation Between People and Their Environments (Authors 2020)

An understanding of these relationships is crucial to inform our approach as designers. As designers and researchers with a major interest in developing social cohesion within communities, the educational ecosystem becomes a significant influence on design considerations. This is due to thinking beyond the case of standard systems within a community, but rather considering a number of deeper and interconnected themes that accumulate and influence the way communities work. It is about looking beyond surface observations and engaging in uncovering the social interrelations making up a community.

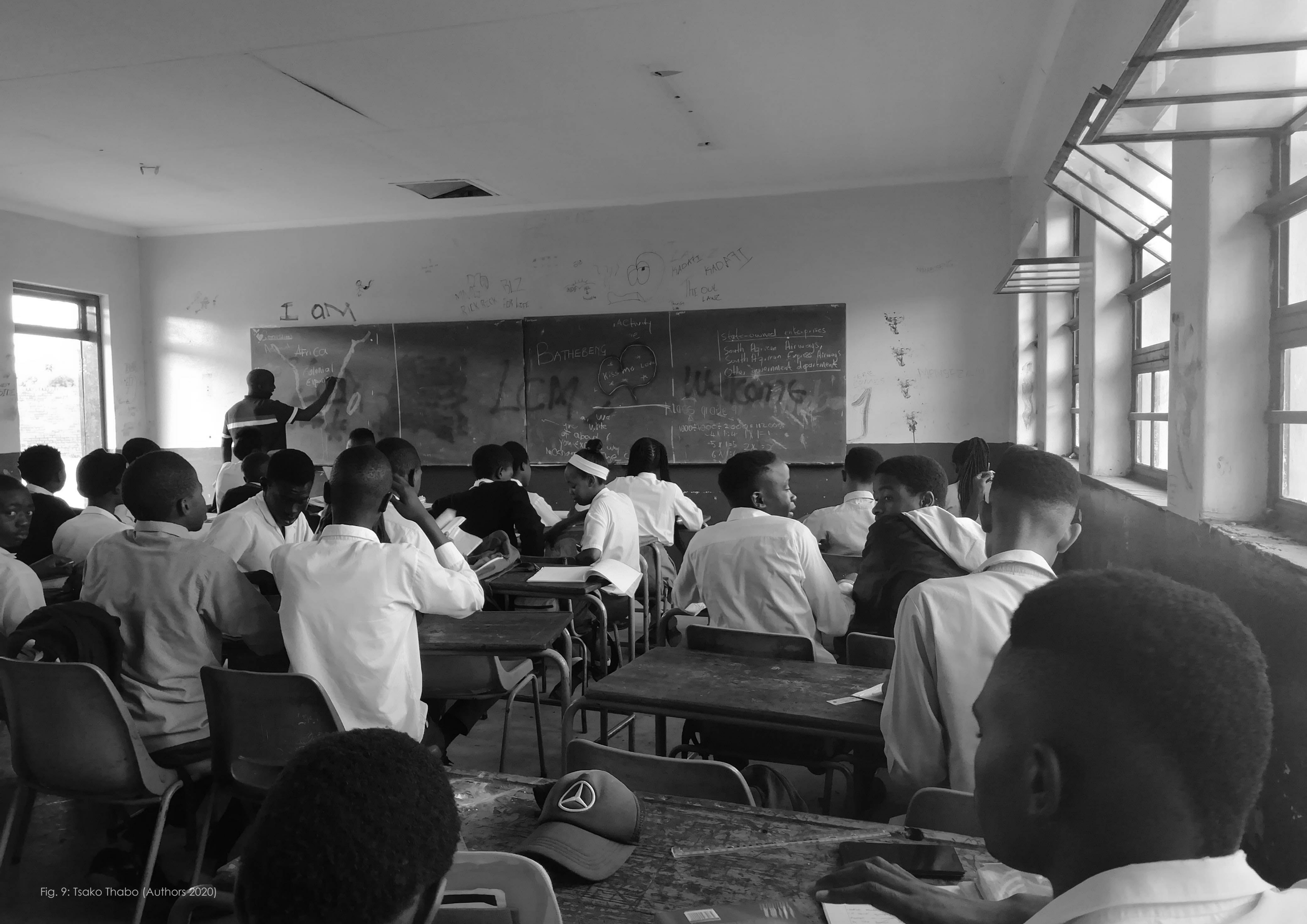


Fig. 9: Tsako Thabo (Authors 2020)

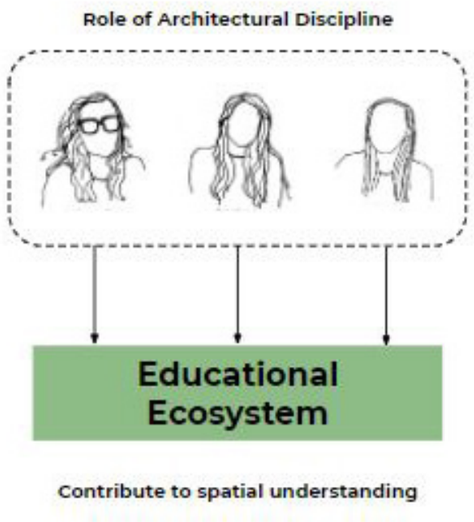


Fig. 6: Relation to Architecture (Authors 2020)

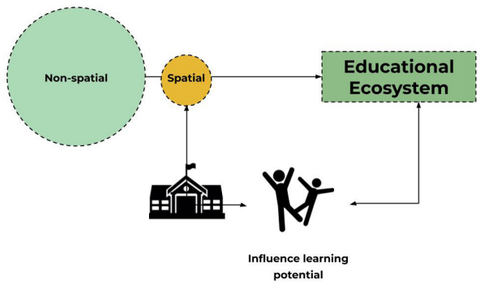


Fig. 7: Non-Spatial and Spatial Contribution (Authors 2020)

The importance of addressing the educational ecosystem has already been established across various disciplines. However, as designers and researchers within the architectural discipline, we must ask ourselves how we can contribute to educational ecosystem discourse. The educational ecosystem has largely been discussed from a non-spatial point of view, however, the role that architecture plays within that discussion is limited in comparison (Cleveland & Fisher 2013:1) (Fig. 07).

The spatial constructs of the educational ecosystem affect a child's ability to learn, however, the design consideration given to these learning environments is significantly under-developed (Higgins et al 2005). Our project motives align with the Action Plan towards schooling 2025 released by the Department of Basic Education (DBE) which focuses on giving priority to the wellbeing of the learner. Goal 24 emphasizes the need to "ensure that the physical infrastructure and environment of every school inspires learners to want to come to school and learn, and teachers to teach "(DBE 2014).

One of the biggest challenges facing South Africa is the development and improvement of the knowledge and skills of its learners, primarily amongst disadvantaged and low-income sectors of the population (Albertyn 2015). Although access to education has improved significantly since the educational reform in 1994, the equality of access does not yet translate to opportunity. According to Dr. Jonathon Clark, director of the Schools Development Unit and Schools Improvement Initiative at the University of Cape Town, the quality of learning outcomes has not escalated in parallel (Albertyn 2015). Clark states the importance of building a network of innovators and educators who are "like-minded change-makers", who are actively willing to transform the educational ecosystem in South Africa to improve the quality of education. We see our dissertation proposals not only contributing to this network but also stretching its outlook to understand the impact of this type of architecture.

An ecosystem, in an academic environment, constructively frames the need for interdependency and sustainability. A schools' functioning through a facility and built environment point of view, is a result of its infrastructure and resource management (NEIMS, 2014). The control and implementation of these elements allow for the creation of a safe and enabling learning environment. Networks are catalysts used to enhance knowledge as well as provide support for innovators. A shift in paradigm that fosters an educational ecosystem is necessary to advocate for education that is facilitated by a network of teachers. Educators are lifelong learners, so to improve learning, the commitment to educator development is crucial. Our research and dissertations unpack key educators and knowledge innovators in the community that form part of a larger educational ecosystem used as part of lifelong learning within the schools, as well as the surrounding communities (Albertyn 2015) (Fig. 08).



Fig. 10: Tsako Thabo (Authors 2020)

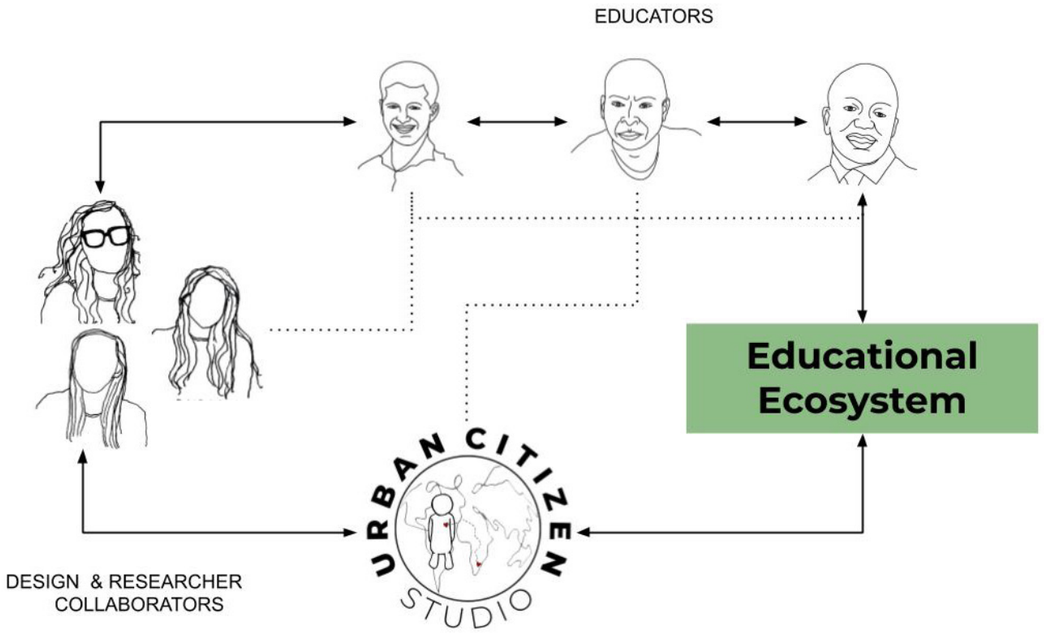


Fig. 8: Educational Ecosystem Collaborators (Authors 2020)

Through investigating the relationship between architecture and education with specific relation to our case study, Tsako Thabo, we found a need to go further into exploration and design, to create a significant change in the education environment.

This can often be perceived as a place that is confining and static. Herman Hertzberger (2008:169) unpacks this concept further when he discusses the culmination of multiple schools within a neighborhood mutually benefiting from their shared resources.

Bringing together multiple schools, all of which have different aspects to add to the success of the ecosystem, results in flexibility, social cohesion and saving of funds (Hertzberger 2008). The learning between the schools becomes far more inclusive for all. Through an architectural lens, to contribute towards a well-functioning educational ecosystem, "new, more stimulating spatial conditions and forms" need to be considered (Hertzberger 2008: 57). Our dissertations serve to contribute to that discussion and engage in the impact of architecture on the educational ecosystem.

Chapter 3

CONTEXT



3.1 Mamelodi Community of Learning Collaborative

The following chapter provides the foundation for the contextual understanding of the dissertations. Our dissertations are based within the context of Mamelodi East, where the University of Pretoria's Mamelodi Campus serves as an anchor institution. As such, the Campus has increased its awareness of the role it plays within its context by contributing to overall community upliftment and individual student success within schools (Kilfoil 2019). The Campus has engaged in multiple community projects within Mamelodi since 2008 (Ogude 2019). These projects are conducted in an effort to uplift the community as a whole and to socially, academically and economically impact the larger society of South Africa.

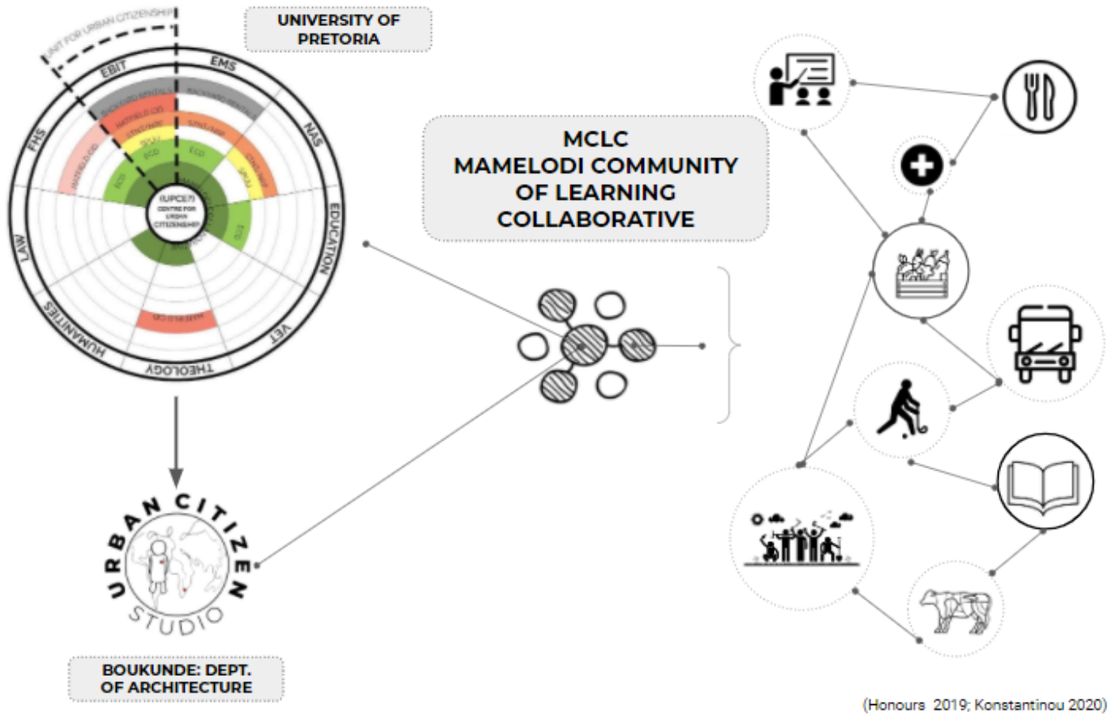


Fig. 13: MCLC Diagram (Authors 2020)

A relationship was established between the UP Mamelodi Campus and Rutgers University in Newark, United States, when the universities recognised that their ambitions, as anchor institutions within their contexts, aligned. An outcome of this relationship is the Collaborative of Learning Community (CLC), funded through the support of the Kresge Foundation. In 2017, the initiatives were officially founded in both Newark (NCLC) and Mamelodi (MCLC) (Ogude 2019). The involvement of the MCLC is influential within the dissertations. The MCLC is composed of numerous faculties within UP, each investigating the educational ecosystem from the perspective of their discipline. The collaborative has identified key partners within the Mamelodi educational ecosystem to engage with, including Early Childhood Development centres (ECDs), Primary and Secondary schools as well as the local and provincial departments of Basic Education. Tsako Thabo Secondary stood out within this selection of partners due to the growing relationship the university has with its principal and MCLC member, Mr. Clement Gama. The school has been open to engaging with the university and its students and is, therefore, a significant collaborating partner.

The Department of Architecture, within the Engineering, Built Environment and Information Technology (EBIT) Faculty is represented in the MCLC through the Unit for Urban Citizenship (UUC). The Unit's contribution to the collaborative is to investigate the educational ecosystem within Mamelodi from the perspective of the architectural discipline. Numerous projects undertaken within the Unit have contributed to our spatial knowledge database of Mamelodi's educational ecosystem. Throughout the Unit's investigations, smaller nodes of activity are recognized as active educational nodes that could potentially contribute to a lifelong learning process within the community.

The MCLC actively intends to contribute to its hyper-local context. As part of its initiative, the collaborative is also involved in the Joint Community Project module (JCP), situated within the EBIT Faculty. This course makes provision for University-funded community service projects to be completed by undergraduate students in the EBIT faculty during their second year of study. The volume of these students makes this course a powerful tool within community action initiatives. Many schools in the Mamelodi East community have collaborated with students from the JCP course. Tsako Thabo is amongst the schools to have received support from these projects, in the form of personal protective equipment (PPE) to maintain health standards for the reopening post-2020 COVID-19 lockdown. Due to our long involvement in Mamelodi, we have become acquainted with pressing areas of concern that have the potential to be addressed through the JCP course. Using this knowledge, we intend to produce directed JCP project briefs for students to undertake at Tsako Thabo.



Fig. 14: Mamelodi Context Map (Authors 2020)

The MCLC provided the direction towards the township of Mamelodi East in the City of Tshwane as our context for the investigation. This township was formed during the Apartheid regime for the African population in 1945 (van der Waal 2000). Like most disadvantaged communities in South Africa, this settlement has a history of government neglect and social struggle. The oldest part of Mamelodi runs along Tsamaya Road and the Moretele River (van der Waal 2000), including the area surrounding the case study school.

The UUC has been actively involved in investigating the spatial qualities of the educational ecosystem in Mamelodi East since 2017. Our engagement began in February 2019. The following timeline sets out our period of involvement.

In 2019, the following themes were uncovered through the participatory process of mapping conducted by the UUC Bachelor of Architecture Honours group:
Routes: pedestrian access and movement in terms of safety and trade (Du Bois and Mulder 2019)

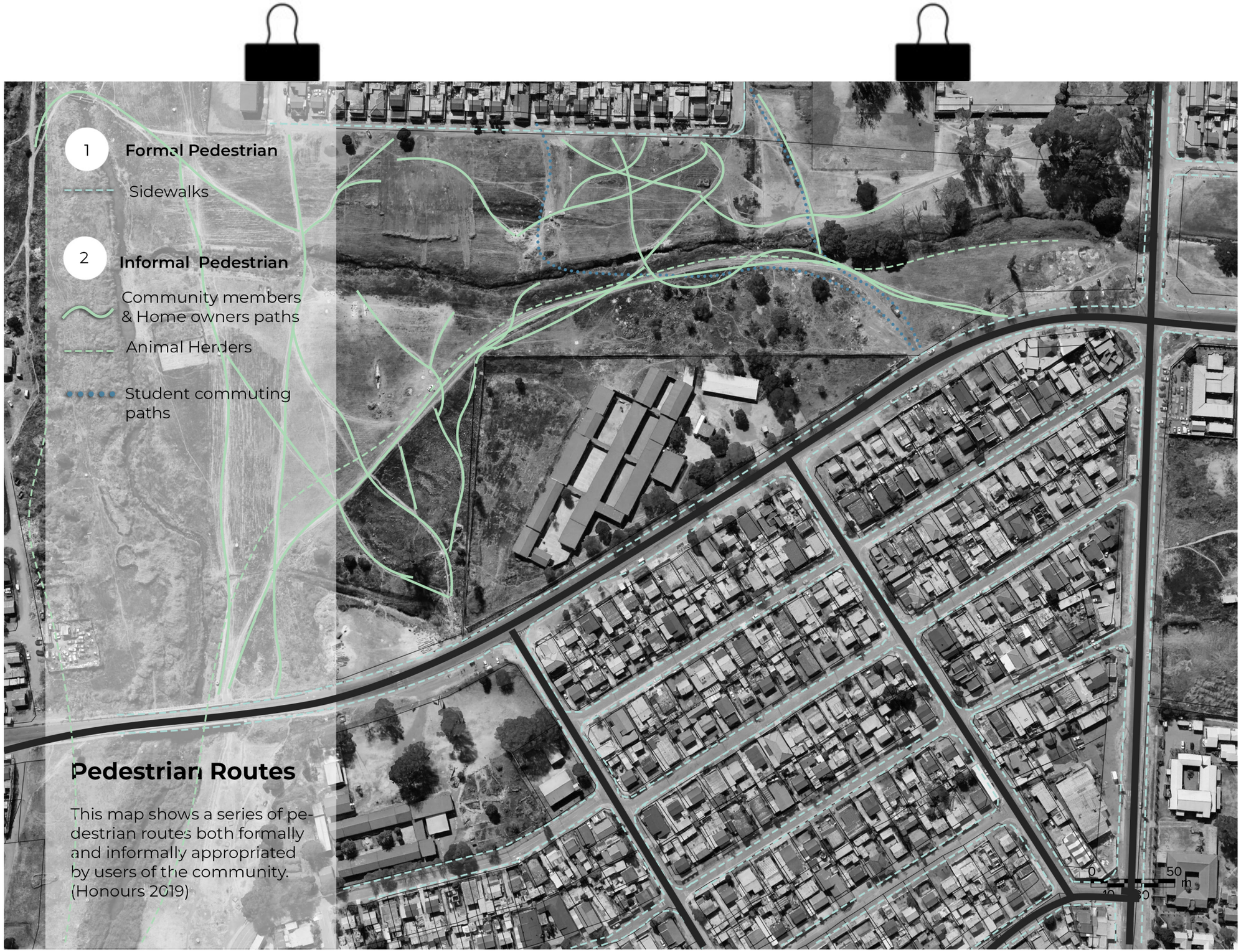


Fig. 18: Pedestrian Routes Mapping (Authors 2020)

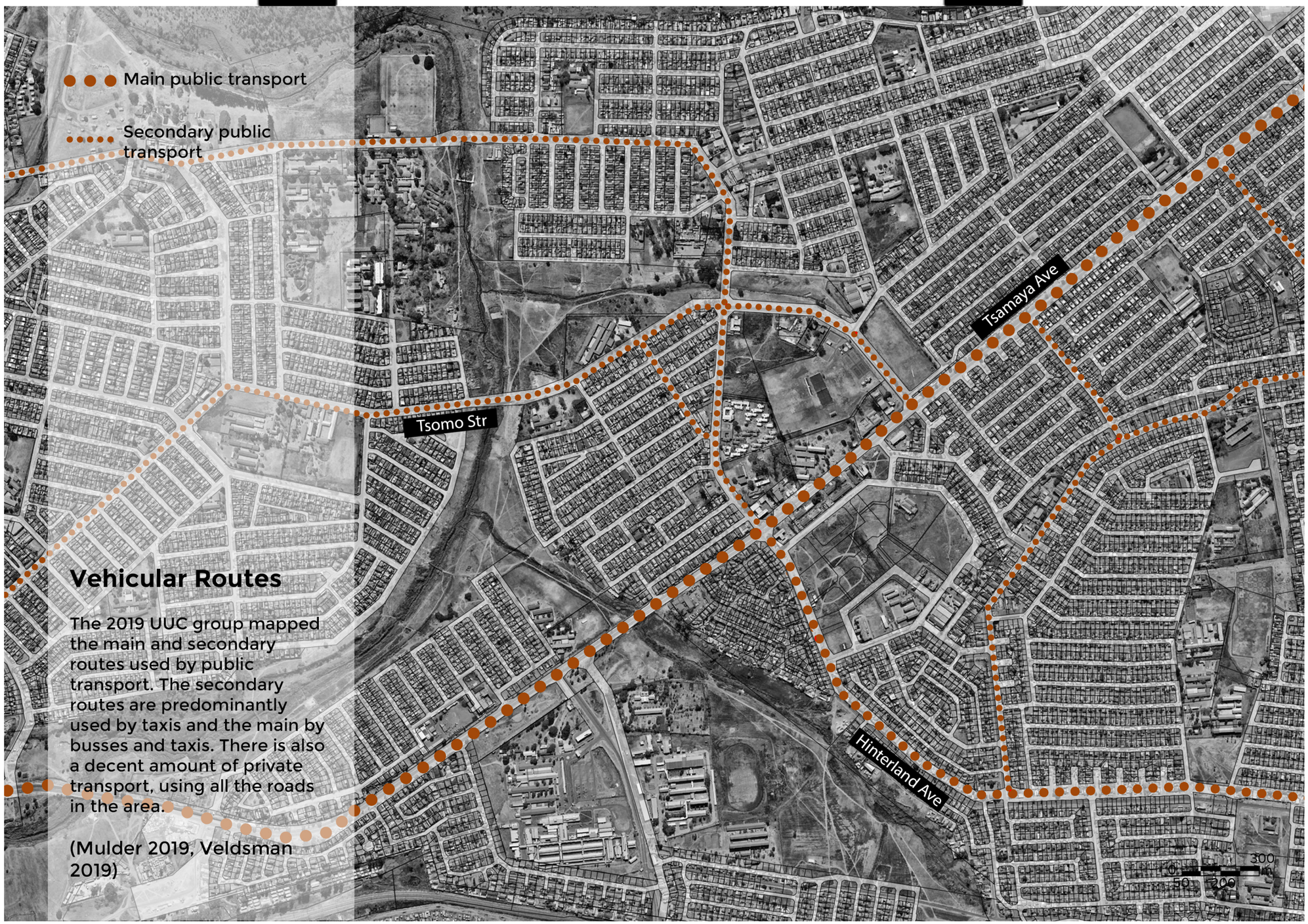


Fig. 19: Vehicular Routes Mapping (Authors 2020)



Fig. 20: Safety Mapping (Authors 2020)

Recreation: sports as a platform for social cohesion and ownership (Ras 2019) (Fig. 21)



Fig. 21: Recreational Mapping (Authors 2020)

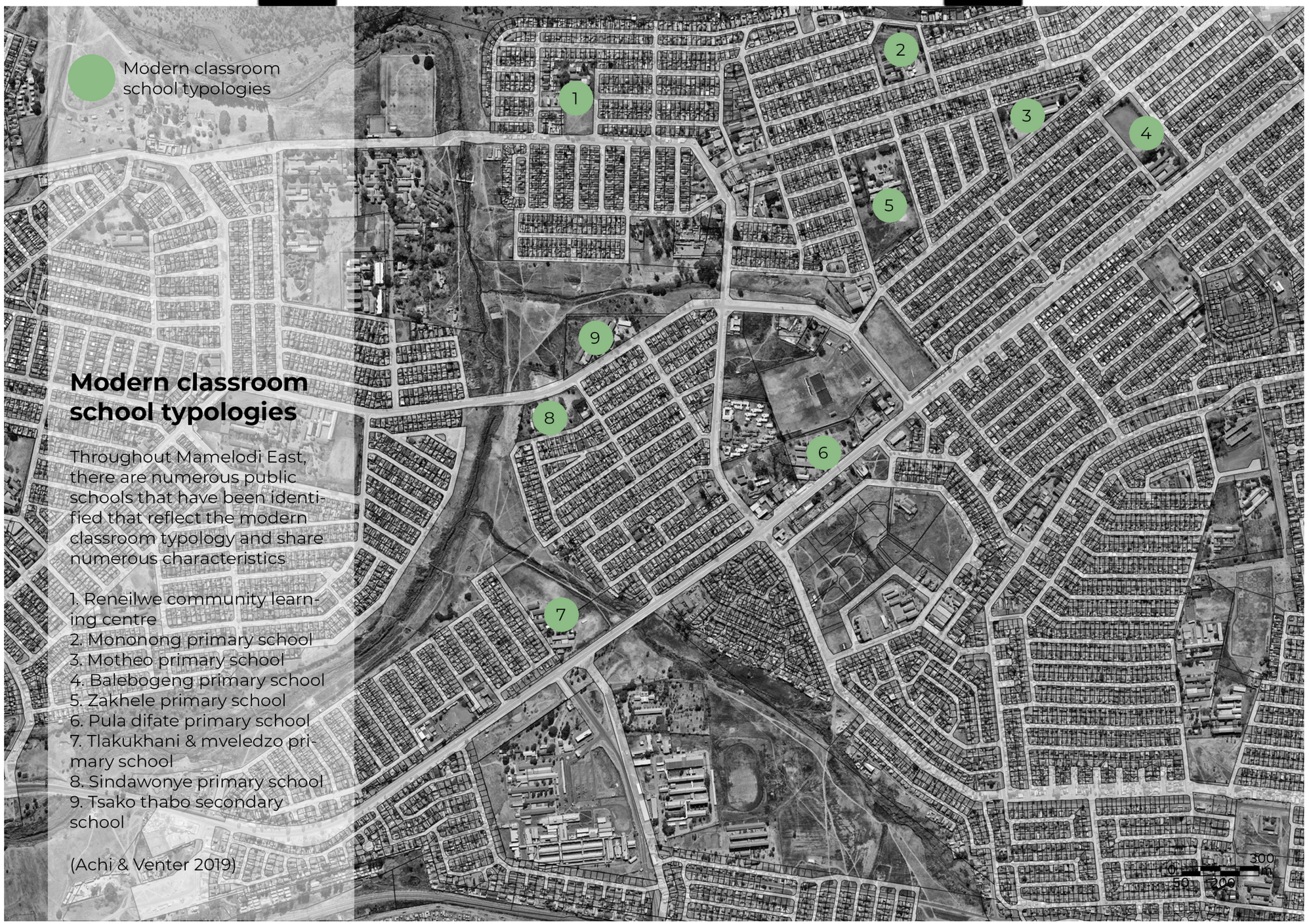
Food culture: informal and formal distribution of food (Smith 2019) (Fig. 22 & 23)



Fig. 22: Food Culture Khalambazo Mapping (Authors 2020)



Fig. 23: Food Culture Tsako Thabo Mapping (Authors 2020)



Modern classroom school typologies

Throughout Mamelodi East, there are numerous public schools that have been identified that reflect the modern classroom typology and share numerous characteristics

1. Reneilwe community learning centre
2. Mononong primary school
3. Motheo primary school
4. Balebogeng primary school
5. Zakhele primary school
6. Pula difate primary school
7. Tlakukhani & mveledzo primary school
8. Sindawonye primary school
9. Tsako thabo secondary school

(Achi & Venter 2019)

Fig. 24: School Typologies Mapping (Authors 2020)

Modern classroom school typologies

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8. Sindawonye primary school
9. Tsako thabo secondary school

(Achi & Venter 2019)



Common Typological Characteristics

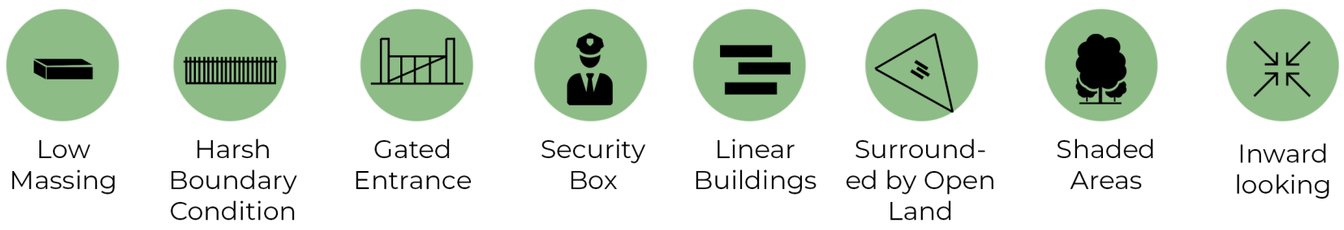

Fig. 25: Classroom Typologies Mapping (Authors 2020)

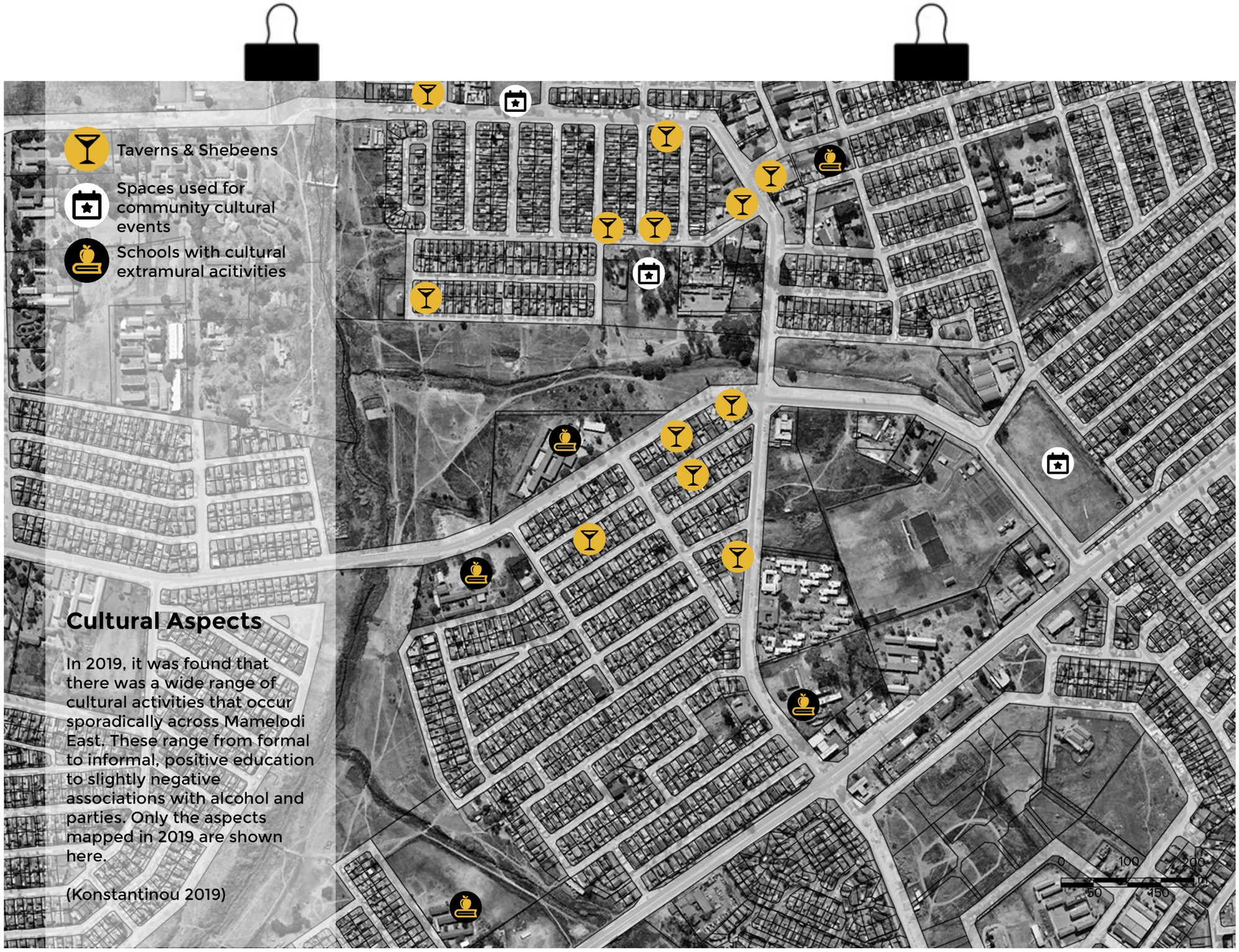

Fig. 26: Cultural Aspects Mamelodi Mapping (Authors 2020)



Cultural Aspects: Tsako Thabo School

Within Tsako Thabo Secondary School there are a few places where cultural activities occur. These are predominantly informal as there are no spaces (except the hall) dedicated to these activities.

(Konstantinou 2019)

Fig. 27: Cultural Aspects Tsako Thabo Mapping (Authors 2020)

Sacred space: understanding ownership and the role sacred space has within the community (Motshabi & Naidoo 2019) (Fig. 28)



Fig. 28: Sacred Space Mapping (Authors 2020)

These themes were all thoroughly unpacked through mapping, unstructured interviews, community action planning and participatory sessions. This information moved beyond the surface of simple observation and assisted in our directed understanding of the context we are dealing with.

All data accumulated over the period, as indicated in the timeline above, has formed a database of information for our dissertations. The type of information mapped and recorded includes patterns of movement, the evolution of the space over the years, activity and program mapping as well as public and private space indicators.

To better understand architecture and the story we are trying to tell, we have to contextualize the environment, the people and the process. These elements involved in our research have influenced our perspective on the community itself and provided us with insightful knowledge on how certain systems, groups and programs function. We have had the privilege to work in and with such a culturally rich community who's potential and passions have remained the drivers during our process of development.

3.3 Tsako Thabo as a Case Study

Due to the relationship with the MCLC and the open engagement with UP, Tsako Thabo Secondary School was identified as a base case study for our dissertations. The intensive mapping conducted within Mamelodi East provided us with contextual grounding for our investigation into the school. Thereafter, the school provided a platform to observe, investigate and explore the current educational ecosystem within Mamelodi East. It was the foundation for identifying opportunities for an expansive educational network that could empower and contribute to the community.

At a postgraduate level, UUC architecture students have worked closely with Tsako Thabo Secondary School, since 2019 (Kilfoil 2019). The school is currently used as the anchor node for postgraduate architecture studies within the UUC. These students actively engaged within the school and the surrounding community, where school learners and community members participated in intensive mapping and participatory research. This methodology was a part of the process that resulted in community action planning strategies, urban visions and responsive architectural interventions (Kilfoil 2019).





Fig. 16 & 17:Mamelodi Context (Honours 2019)

















Fig. 29: Tsako Thabo as a Case Study (Honours 2019)

Our personal involvement with the school began with our introduction to Mamelodi East, in 2019. From an introduction session with the current principal, Mr. Clement Gama, a brief overview of the school was conducted:

> "The aim of the school is to be all-inclusive, however, it is difficult as the staff is not equipped or trained to do so. [...] They have the number one volleyball team in Tshwane but use the community hall to practice (not the school). Their goal is to have a proper art studio. [...] [The school] was built in 1981 in a train layout. Now it looks more like a jail because it has been fortified [due to the many break ins]. People steal metal (cooking pots, chairs, etc.), electronics and food. [...] There are eight or nine unused classrooms that could be used for other [community] activities. This is a good idea as community centres are far from this area. [...] There is a direct correlation between doing well in school and attendance (influenced by the parent's input). Parents try to live their dreams through their children and give pressure in the wrong areas (therefore kids don't enjoy school). However, most parents of the school are not involved (e.g. parent's associations)" (Personal notes during 2019 introduction by L. Konstantinou).

Thereafter, we carried out intensive participatory research at the school. Previous engagements with students in the school ranged across a wide variety of themes.

> Focusing on sport and the current facilities, "Students of the volleyball team, in particular, are extremely proud and their involvement in the sport is a constant grounding and motivator to them" (Personal notes during 2019 introduction by R. Ras). Music focused workshops also took place within the corridors of the school, "the melodies generated from these participants were so evident of their passion and zest for life and clearly illustrates the power music instils for social inclusion" (Personal notes during 2019 introduction by L. Konstantinou). Food Sovereignty was unpacked through design activities involving the students interacting in games that illustrated what food types and proportions are consumed daily [...] " Entrepreneurial activities of food selling ignited negotiators and good sales people within the participant group" and kitchen conversations were welcomed by the kitchen staff as they prepared lunch daily (Personal notes during 2019 introduction by K. Smith). Transect walks in and around the school led by the students provided a perspective of the unseen activity that exists between transition times within the school……(Personal notes during 2019 introduction by P. Naidoo).



Fig. 15: Mamelodi Transect Walk (Honours 2019)

Chapter 4

ARCHITECTURAL APPROACH



Fig. 30: Unit for Urban Citizenship Studio 2019 (Authors 2019)

The Mamelodi East mapping as well as the collected sources of information from the above formed the basis for our dissertations. With this information we hoped to layer on our specific dissertation focus through our 2020 participatory action research (discussed in volume 2 of our individual dissertations), to inform our design interventions that are rooted in the school's ethos and are catalytic contributors to the school and surrounding community.

As a primary participant target group, the dissertations focused on high school learners, between the ages of 13 and 20, that attend Tsako Thabo Secondary School. Each of the student participants was specifically identified through the Honours mapping of 2019, through unstructured interviews and word of mouth through social groups within the school. Within our individual dissertations, we have expanded on this focused target group to include participants related specifically to our dissertation topics. It is important to note that due to each researchers' specific topic and the COVID-19 nation-wide lockdown of 2020, additional participants from other schools and elsewhere, were identified to partake in certain stages of the research and design.

From observations, mappings and analysis done over the last few years within Mamelodi East, a common spatial language was found between most schools in the area (Achi & Venter 2019). This is specifically related to their social context and built form. Although our dissertations are based at Tsako Thabo, it is important to note that we intend to not spatially resolve surfaced issues at a single school. Tsako Thabo Secondary School has been used as a case study to represent other schools in Mamelodi East. Although each school still has its unique characteristics, issues and opportunities, Tsako Thabo has been used as a basis to understand and test the researchers' solutions through proposed design interventions. These proposals are then not limited to the school and can be proposed for other schools across the area, addressing similar social issues. We intend that the lessons learned, information captured and designs developed, through our dissertations, will contribute to the knowledge base for addressing similar issues existing within our country and even globally.

4.1 Unit for Urban Citizenship

The Unit for Urban Citizenship (UUC) has provided a much-needed platform, within the University of Pretoria's (UP) Department of Architecture, to challenge conventional architectural discourse. It was once run as a studio within our Honours year in 2019 (Fig. 30) but has grown in recognition within the Department, in 2020. Urban Citizenship is now one of the three research fields in the department (Fig. 31), along with Heritage and Cultural Landscapes and Environmental Potential.

During the Unit's introduction session, a question was posed to the staff and students of the department to construct a collaborative description of what it meant to be an "Urban Citizen". Collectively the "Urban Citizen" was described to be an agent of change, who strives to create sustainable relationships and maintain unity through diversity and social inclusion.

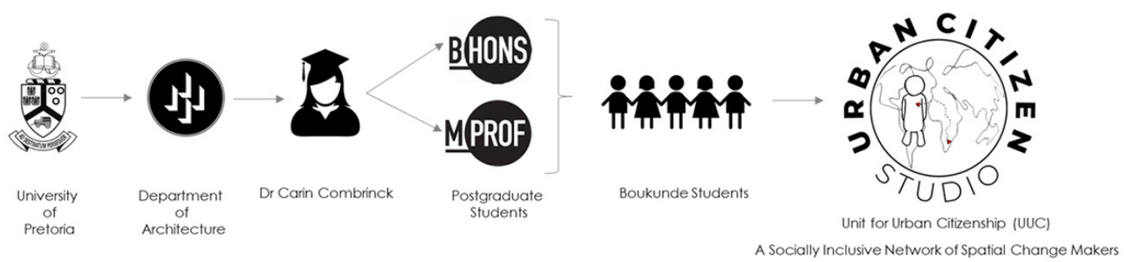

Fig. 31: UUC Programme Development (Authors 2020)



Fig. 34: UUC Studio (Unknown 2019)

The studio is run by urban citizenship enthusiast Dr. Carin Combrinck, who currently oversees both the Honours and Master's Programmes in Architecture at UP. Dr. Combrinck's active involvement in community-driven projects, engagement in the MCLC and passion for urban citizenship contributed to the foundation of the unit. The impact of the UUC is not isolated to postgraduate approaches to architecture. It has influenced all years within the architecture department, from small scale modules in undergraduate years to full-scale studios at a postgraduate level. UUC has been the driving force for our dissertations and has provided the foundation for our research and architectural approach. Urban Citizenship values the diversity of people, cultures and environments and aims at encouraging citizen participation throughout the design process to establish a framework for architecture that is inclusive and empowering to the user.

4.2 Research Approach

Due to the nature of the UUC, the approach to our research was through the interpretive paradigm by collecting and analyzing qualitative data of the real-world context of Mamelodi East. Our particular focus was on participatory action research (PAR) to expand the discourse of architecture. PAR allowed for the process of analysis and critical reflection to happen simultaneously at intervals throughout the design and engagement phase. The research approach values diversity and is focused on positive social change as an outcome (Macbeth 2020). It constantly kept us grounded on the basis to create greater awareness for citizen participation to address issues with a greater sense of agency (Awan et al. 2011). The spatial agency defines the process as working at the intersections between the individual and the collective, the virtual and reality realm (Awan et al. 2011). Qualitative data collection has been integral to our PAR approach. Collecting





Fig. 32: Qualitative Research at Tsako Thabo (du Bois 2019)

Fig. 36: Qualitative Research in Mamelodi East (Combrinck 2020)

qualitative data allowed us to study end-users' lives from a direct and engaged perspective within their own environments, resulting in contextually relevant data sets. This represented the real-life views of the people who would directly be affected by the research conducted (Merriam 2009, Yin 2011) and the potential outcomes that the dissertations posed. This method is supported by professionals, researchers and creatives that use collaborative design strategies from a conceptual approach to the tangible outcome phase.

Mapping and unpacking qualitative data allow researchers to contribute to existing and current emerging ideas within the human social environment. This allows for trends to be noticed and certain events to be explained through existing social concepts (Yin 2011).

It is vital for researchers to be completely transparent with their methodologies when taking a qualitative approach. This is necessary for future researchers to contribute to the data or test the mapped trends for credibility (Merriam 2009, Yin 2011). To do this, analysis of data must be taken from a grounded framework that allows focused reflection and removes the researcher's personal bias (Merriam 2009, Yin 2011). Describing fieldwork should also show that the researcher was "really and fully present - physically, cognitively and emotionally" (Yin 2011: 574). Using the actual language quoted in interviews and collecting data from multiple sources aids in finding patterns and contradictions which ultimately strengthen the credibility and value of qualitative research (Yin 2011).

Through our engagement in the context of Mamelodi East over the two years, qualitative research was conducted through fieldwork observations, interviews and engaging conversations (Yin 2011). Our process was incremental and built up our qualitative data sets through a series of interactions with the context. Firstly, we documented our first impressions through our observations of the site. This set up our biased opinion which was important to reflect upon once we accumulated richer information. Thereafter, we conducted transect walks with community members to gather an educated outlook on the context and to assist us in organising our first impressions of the site. Once this was done, we moved onto semi-structured and formal interviews for more background information on our observations, as well as the intangible information we missed (Hamdi 2010:69). This type of data collection involved asking, watching and reviewing (Wolcott 1992). Data that



Fig. 35: Qualitative Research at Tsako Thabo (Greyling 2019)

was collected in the field was run in parallel with desktop data collection of literature and case studies (Merriam 2009). All of these data sets helped develop a deeper understanding and discover insights relevant to our research problem.

The collective processes and data resulted in the development of the Ukudoba Method, further described in chapter 5, which serves as our research methodology for our dissertations.

It is important to acknowledge that this type of research is only based on a sample of people within the area the researcher is investigating. It does not represent all extents of the issue uncovered but allows for future addition and comparison of research and trends (Yin 2011).

4.3. Design Approach

As architects, we use design to unpack, understand, translate and address issues and opportunities. However, this process is usually biased to the individual outlook of the design practitioner. The process of design starts to evolve when the emphasis is placed on certain characteristics of design thinking methods and tools. Our particular focus on design was through the processes of co-design. Co-design explores a parallel narrative that emphasizes engagement and collaboration. Within the design thinking process, this method of engagement favours participatory involvement throughout the design process, from the discovery of the project to the delivery of a solution (Muller 2002, Steen *et. al* 2007*)*. This collective nature often includes a variety of stakeholders and participants involved in the design process, from design practitioners to end-users (Zamenopoulos et al. 2018). Involving the end-user in the design process is an integral part of effective and efficient design decision-making (Hamdi 2010). Co-design encourages user participation and aids in transferring the power of decision making from design practitioners, who traditionally have it, to the affected marginalized target group within society. It is acknowledged that every participant around the co-design table holds tacit knowledge, integral to the success of the project. Vital contributions from the marginalized group result in higher quality outputs (Ehn 1993, Schuler *et. al* 1993, Spinuzzi 2005) that are socially inclusive and able to live beyond the years of the project development.



Fig. 33: Qualitative Research at Tsako Thabo (Greyling 2019)

Co-design contributes to the design process as well as the lives of the participants involved. The methods are aimed at a specific context and require the input of spatial agents through citizen participation. It uses participatory action research to mediate and facilitate the process of engagement, knowledge sharing and problem-solving. The hope is to create a collaborative approach that democratizes societies and allows citizens to take ownership and control of their environment (Zamenopoulos et al. 2018). Participants benefit from this approach through social interaction and developing a sense of community, through shared values and interests (King 1983). It provides citizen attachment to the particular site of investigation within the community, inspiring action and motivation to protect and improve the location at an individual and community scale (Sanoff 2011).

Professor Nabeel Hamdi, along with other key theorists advocating for co-design processes, has impacted our positioning as researchers. These theorists move away from the traditional approach to design and suggest "other ways of doing architecture" (Awan *et. al* 2011). Co-design moves towards socially engaging architecture. This alternative approach aims to use architecture to uncover existing potentials within communities that can be harnessed for upliftment overall and act as mediators to improve the conditions, wellbeing and functioning of societies. Architecture becomes more about spatial agency and collaboration, focusing on the social implications of the built environment rather than the typical aesthetic and monetary value. Each individual's interpretation of architecture is challenged and criticism is invited into the practitioner's design process, resulting in constant iteration and reflection on the value of social architectural work (Spatial Agency Online *n.d.*). Hamdi focuses on "small-scale change at a grass-roots level" (Spatial Agency Online *n.d.*), where he aims to work with the given, having small changes over time that lead to agency and success in the long run, rather than a quick solution led from the outside.

There are numerous methods to co-design engagement. Model building, sketching, writing, role-playing and design games are amongst the list of interactive and collaborative tools to mediate the co-design process between stakeholders, participants and designers. These are traditionally held face-to-face, to form relationships with one another (Kensing 2003, King 1983, Simonsen and Robertson 2013), that allows for mutual understanding and respect to create an open and supportive environment amongst the group (Markus and Mao 2000). As participatory researchers, we aimed to have multiple face-to-face participatory and co-design sessions. This would add to our co-design workshops that were conducted in our 2019 Honours year. However, due to the COVID-19 pandemic, our co-design methods were adjusted (Fig. 37).
The circumstances of the pandemic, and the resulting country-wide lockdown, pushed the need for digital engagement to interact with participants and collaborate on the design development of our projects. These platforms and methods of engagement included websites, participatory games, conversational platforms and social media platforms to maintain our ability to co-design through social distancing restrictions. Having to adapt to changing circumstances widened our spectrum of co-design experience. Our varied engagement spoke to the resilience of co-design discourse, as we were able to adapt our process along the way, without losing sight of the importance of collaboration.

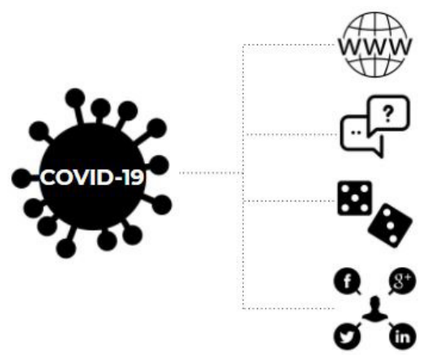

Fig. 37: COVID-19 Impact (Authors 2020)

This method of collaborative design thinking challenges architectural discourse, particularly within our department. Co-design encourages the design practitioner to act as a spatial agent and to look beyond familiar contexts. It focuses on marginalized communities that are often discriminated against and deals with real-life issues present within less fortunate, rural contexts (Zamenopoulos et al. 2018). As we are trying to challenge the current discourse, it is important to point out that small steps are required to incur big change. According to Hamdi (2010:19), "Clever projects have a small number of meaningful indicators". Therefore, throughout our dissertations, co-design has been used at particular stages of our design processes to enrich a design response that is true to the context and community involved.

4.4 Reflection

Layers of rich information were uncovered through our PAR approach within Mamelodi East, highlighting the untapped goldmine of opportunities for upliftment. Numerous qualitative data collection methods were tested throughout our process. Through reflection and iteration throughout the process, we were able to learn and grow in our understanding of how to efficiently and effectively approach participants during our limited time in the area.

Due to the UUC's continual engagement in Mamelodi East, layers of data had accumulated over the years (Fig. 38).

Year after year students aimed at building on the previous years' work to contribute to the existing data collected and to inform a richer design response. Amongst the data set, recurring themes and observations were presented, however, the storage of the data in unorganised folders on a Google Drive hindered access to the information. This made it difficult, during our dissertations, to collate the collected information and fully grasp the richness of the layered data. This stagnant method of data storage led to the need to change the format (later discussed in Chapter 5) and method in which we were capturing this intangible qualitative data, to assist future researchers.

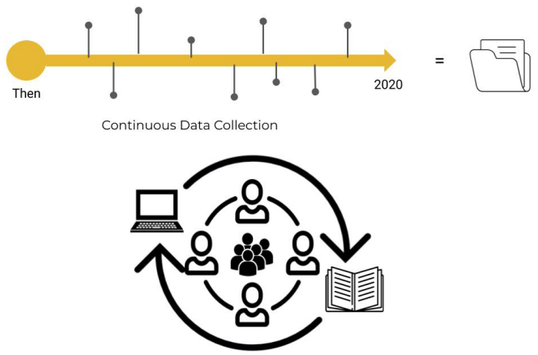

Fig. 38: Continuous Data Collection (Authors 2020)

Chapter 5

RESEARCH & METHODOLOGY

5.1 STINT Research Project



Fig. 41: Hammarkullen: Run-through of digital data collection methods using KoboToolboxTM (Konstantinou 2019)

In 2019 we were afforded the opportunity to be involved in a Departmental National Research Foundation (NRF) project. The NRF project titled, Stitching the City: From micro-data to macro-views (STINT), aimed at establishing a "transdisciplinary collaboration" to develop a "methodological framework and digital platform for the collection, storage, and sharing of spatial, socio-economic data at a street and precinct-level" (Roussou, Brandao, Adelfio & Thuvander 2019). The STINT project was a collaborative effort between the University of Pretoria (UP), South Africa (Departments of Architecture and GeoInformatics) and Chalmers University in Gothenburg, Sweden (Department of Architecture) from 2019 to 2020. In particular, the collaboration was between the Unit for Urban Citizenship (UUC) and the Social Inclusion Studio (SIS) from Chalmers University's architecture department. For many years, both studios worked within similar contexts that were socially marginalised and segregated (Chalmers 2018). The two contexts under investigation were Mamelodi East in the City of Tshwane, South Africa and Hammarkullen in Gothenburg, Sweden.

Due to UP's architecture Head of Department, Prof. Chrisna Du Plessis' working relationship with members of SIS, this collaboration was born. To understand the complex layers of cities and communities of today, it is vital for multiple components of involvement, as a way to inform and shape the social and built environment (Roussou, Brandao, Adelfio & Thuvander 2019). University students routinely collected quantitative and qualitative data. Both studios found common ground in their methods of data collection. This took the form of visual and spatial data from immersive field research sessions. Over the years, this data revealed many significant trends and patterns related to the real-world context and use of the environments investigated. We shared in the issue that layers of rich data were being collected by students within both studios, critical to the holistic understanding of the contexts in question. However, this information piled up in printed notes or shared folders on an online server. These invaluable discoveries were lost due to the ad hoc storage of data in multiple formats. This made it increasingly difficult to effectively access, layer and share the collected data with decision-makers and the end-user to effect change. It became frustrating that the methods of data collection invoked static data storage methods. The STINT project was therefore developed in response to this common issue.



Fig. 42: Hammarkullen: Social Inclusion Studio (Unknown 2019)

The Department of GeoInformatics, at UP, involvement in the STINT/NRF project resulted in the creation of an online server (GeonodeTM), to store the collected data. This platform allows the digitalisation of collected information and the database will continue to develop for future endeavours. The information contributes to a large collaborative database and forms the basis for many design projects and research initiatives. The collaboration between the universities, allows the developed platform to be tested in two areas, to compare the effectiveness of the platform in capturing non-traditional data sets (Chalmers 2018). Part of our involvement in this process was the testing of this through field research for our dissertations.

Collectively, we needed to change the way data was collected, translated, stored and shared within our department, to make a greater contribution to society and research. By acknowledging these shortcomings and actively engaging in the STINT/NRF project we collectively contributed to the development of a framework (ukuDoba Method). The framework allows non-traditional information types to be collected using digital and geospatial tools, thereafter, stored and shared on an online platform. It allows for local and global collaboration between researchers and designers on shared issues and similar contexts (ukuDoba manual 2020). The aim of collecting and sharing data of this nature is to allow informed and responsive urban and socio-economic transformation policies for future development (Chalmers 2018) and identification of contextually relevant development interventions.

5.2. ukuDoba - The Methodological Framework

The ukuDoba Method was created from a collaboration between three Master of Architecture students from Chalmers University of Technology, Sweden (Robin Eskilsson, Mumtaheena Rifat and Markus Zorn) and three Master of Architecture students from the University of Pretoria, South Africa (Lauren Konstantinou, Purll Naidoo and Kelsey Smith). All authors were actively involved in the STINT/NRF research project and have a background in participatory design, social inclusion and urban citizenship within architecture. This background influenced the interest in the creation of the ukuDoba Method. In Zulu, the word ukuDoba means 'fishing'. This methodological framework aims to assist users in 'fishing' for non-traditional types of data that can be collectively stored, openly shared, layered over and analysed qualitatively over time. The ukuDoba Method was developed



Fig. 39: Hammarkullen: First immersion walk (Konstantinou 2019)



Fig. 40: Hammarkullen: Analogue data collection from first immersion walk (Konstantinou 2019)



Fig. 43: Pretoria: Digital Tool Analysis (Naidoo 2020)



Fig. 45: Pretoria: Composing Draft 1.0 of the ukuDoba Framework Booklet (Naidoo 2020)



Fig. 46: Pretoria: Presenting ukuDoba Framework Draft 1.0 to the Honours Urban Citizen studio (Naidoo 2020)



Fig. 48: Pretoria: On site testing of ukuDoba Framework Draft 1.0 with the Honours and Masters Urban Citizen studio (Naidoo 2020)

in response to the STINT/NRF project, to guide researchers, from various fields, in the methods of data collection and translation to efficiently store and access the data thereafter.

ukuDoba - the methodological framework, has been developed for the collection and sharing of non-traditional types of spatial and socioeconomic data at a street and precinct level in an online platform. Cross-disciplinary micro-data can be added over time and easily accessed by researchers from different disciplines as well as students and community members. This makes it susceptible to comparison and trend studies, as well as documenting the rich histories of communities. The developed methodology can eventually replace hard-copy storage that is limited in accessibility and fragmented in data.

The UkuDoba method was developed through multiple trials and tests during the process of collaboration between the two universities. For the duration of the research project, two exchange trips were planned between the two contexts, to test the effectiveness of a digital method. The first exchange trip was hosted by the Social Inclusion Studio from Chalmers University in September 2019. The UP Masters students (Lauren Konstantinou, Purll Naidoo and Kelsey Smith) and supervisor (Dr. Carin Combrinck), involved in the project, travelled to Sweden intending to test the developed data storage platform (Geonode™) in Hammarkullen, Gothenburg. The platform was first tested according to its ability to capture traditional analogue methods of data collection. Thereafter, it was tested against its compatibility with various digital data collection tools. The information and feedback gathered from these sessions were used for further development of the Geonode™ platform. This part of the project was developed further for the remainder of 2019.
In January 2020, the continuation of the STINT/NRF investigation was given a trial in the City of Tshwane, South Africa. The team from SIS joined the UUC's STINT/NRF team in South Africa. The main aim of the exchange in South Africa was to build on the testing of the various tools for data collection and the effectiveness of the storage platform. This was done within Mamelodi East. We intended to see if Geonode™ was able to store the information collected without losing the richness of the data. A recurring issue was the understanding of these tools by the research team. Thereafter, it was decided that due to the complex nature of the process, it needed to be broken down into streamlined steps. This resulted in developing an instruction manual, referred to as ukuDoba - the methodological framework, dictating a simplified but guided process from data collection to storage.

Multiple data collection tools were considered and tested, each against their accessibility and usability. It was important for the research team that the tools selected allowed for the inclusivity of researchers from various fields and the consideration for the use of the framework by the end-user. This consideration widened the contribution that a project of this nature could make. Providing allowance for wider use, meaning that the data collected could not only be layered by time, but also by discipline and community perspective.

The ukuDoba method makes use of three platforms and functions in a three-step systematic process, to make the data capturing and sharing process seamless and productive. Firstly, Kobo Toolbox™ (Data collection tool) was used as a digital platform to geospatially capture information, such as interviews, surveys and conversations. Secondly, QQISTM (Data translation tool) was used as a "middle-man" to translate collected data into an appropriate format to be imported into the third platform, Geonode™ (Data Storage Platform). This platform was used to document all the geospatially collected data. Having Geonode™ as the single platform for data storage allows for the layering of data year after year by researchers from various fields of research.

As part of the Participatory Action Research (PAR) approach of the UUC, the ukuDoba method, allows researchers to do justice to the rich information collected. Using this methodology also provides the opportunity for community members to collect real-time information within their communities and this contributes to their social empowerment, providing them with opportunities to uplift their own surroundings.



Fig. 44: Pretoria: Testing the effectiveness of KoboToolboxTM, on site, in the data collection process (Brandao 2020)

The developed framework has been workshopped by postgraduate students, within the UUC, by the student research team. Feedback from these workshops influenced the refinement of the manual, which later guided the beginnings of our PAR approach within our mini dissertations, in 2020. This method was used for mapping and analysis of existing social trends in Mamelodi East as a way to gain a hands-on understanding of the area and its community. As this method is an iterative process over months and years, it is important for us to reflect on our process and experience with the application of the framework to continuously update the methodology to the current research conditions and development in technology. As Master's students, we have constantly engaged with the method alongside our peers and colleagues. The framework has encouraged this interaction of fieldwork. We hope to influence other fields within the department to take to the method to create opportunities for collaborative data collection and sharing.

Being part of this collaborative process during the development and application phases has been crucial to our understanding of the importance of the data collected in the field. The information, often personal and engaged, allows for a greater perspective of the user and the people in a community and is vital in the field of Urban Citizenship. Collectively, during our Honours year in 2019, we had to recapture data and mapping that was conducted previously, rather than build on it. The STINT/NRF project gave us an opportunity to be part of creating a framework that would not only benefit ourselves but also contribute to the discourse of Urban Citizenship within architecture. Locally and globally we share similar contexts and issues. This project allowed us to collaborate, discuss and have a broader understanding of the issues and possible resolutions.



Fig. 47: Pretoria: Presenting ukuDoba Framework Draft 1.0 to the Masters Urban Citizen studio (Naidoo 2020)

Chapter 6

RESEARCHERS INTENTIONS



Fig. 50: The Team (Unknown 2019)

As active participants in the Unit for Urban Citizenship, we consider ourselves to be Urban Citizens. The Urban Citizen is proactive for change; they challenge rules and constraints and are intentional about their involvement. We strive to be agents of change and to not fall victim to the star architect mindset, but to be receptive to the knowledge that exists within others (Awan et al 2011). It is important for us that we continue to rewrite our own professional code of conduct as we are exposed to the values attached to participatory action methods.

Including participatory action methods in the architectural design process needs to be distinguished from a community outreach project. Participation of all stakeholders is integral, adding to the efficiency and resulting in the effectiveness of the overall project (Hamdi 2010). Architects and other built environment practitioners have loosely implemented community projects over the years. However, these projects deal with surface-level issues due to their lack of engagement with the end-user. Therefore, the intervention is a product of the 'outsiders' interpretation of the community needs. Often these interventions fail due to the lack of ownership and pride by the targeted community. Challenging the conventional methodologies of architecture can be highly influential in the creation of higher-performing interventions that address multi-issued layers (Awan et al 2011, Hamdi 2010, Sanoff 2011).

Ultimately, the dissertations following this Volume One, unpack alternate ways of 'doing architecture' that result in an increased social responsibility within communities, causing upliftment and a stronger sense of belonging for community members (Sanoff 2011). Unfortunately, within the Department of Architecture at the University of Pretoria, there is no precedent for this approach being undertaken by a Master of Architecture (Professional) student. We hope that the participatory design process that we have undertaken in our dissertations opens the conversation within our discipline (Fig. 51).



Fig. 49: Researchers collaboration (Smith 2019)

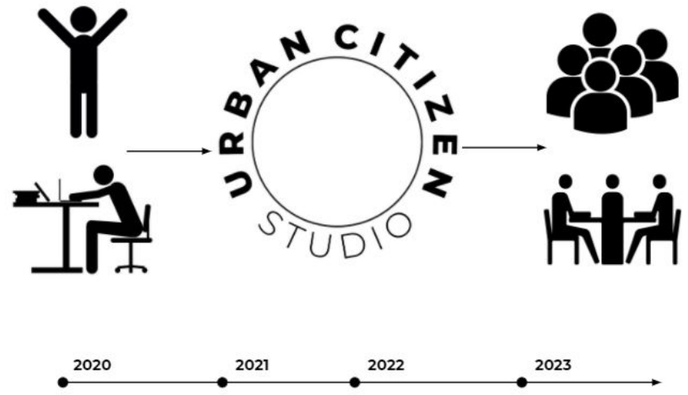

Fig. 51: Recognition of the PAR approach (Authors 2020)

Our contribution to the establishment of the Unit for Urban Citizenship is the hope that we have helped create a foundation for future like-minded students to collectively participate and take on real projects that impact communities in need. The Unit has encouraged us to challenge the authorship of architecture in the design process (Hamdi 2010) and prioritize the participatory action research approach. Our ambition is to encourage others to start thinking and designing by acting as spatial agents who effect change through the empowerment of others (Awan et al 2011). Our research collectively aims at emphasizing architectures' role and capacity in contributing to social inclusion and transformative action (Awan et al 2011:33).

Ultimately we aspire to widen and embrace young, innovative designers' perspectives on the true definition of community engagement in architecture and the opportunity for architecture to be socially inclusive. Our dissertation outcomes intend to pave the way for projects of this nature in the future. Projects that combine elements of interdisciplinary discourse to actively make a change to the community, as well as to contribute to the research development of spatial design within the co-design context locally and globally.



Fig. 52: Dr Carin Combrinck, our supervisor, in the field (Zorn 2020)

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Volume 2

Smith. 2020.

The role of architecture in rehabilitating food sovereignty and nutritional education within secondary schools through collaborative participation

Kelsey Smith

KS

ABSTRACT

Introducing the Narrative

"Food insecurity goes beyond the problem of not having enough food to eat. It includes aspects of food quality, psychological factors such as worry about food sourcing, and nutritional and non-nutritional consequences of inadequate access to food." Audrey Pereira for (UNICEF, 2016).

There is a common saying that says; "As long as we have a roof over our heads and food on the table, we will be fine." To many, that statement might be true, but when contextualizing the issue within a South African environment, we are proved otherwise. The research in this dissertation demonstrates that those two crucial elements, food and shelter, can both be found within in an environment however that does not necessarily mean that they will function to their fullest potential without the correct configuration or know-how.

This study is focused on analysing food sovereignty and architecture with the intention to understand the need and opportunity for design to promote nutritional wellbeing.

This dissertation investigates the influence that spatial design has on feeding schemes in South African secondary schools. It focuses on the intersection of food consumption, as a result of the current school feeding scheme, run by the National School Nutrition Programme (NSNP), and the architecture of the dated existing government school typology. The research considers Tsako Thabo High school in Mamelodi East, Gauteng as a case study school to investigate the spatial conditions, systems and programmes impacting on food security and sovereignty within this school that presents itself with limited resources.

The school's pupils, staff and community members were crucial role players in the research and design proposal.

The research proposal was fostered in 2019 as part of the Urban citizen studio brief focusing on co-design at Tsako Thabo in Mamelodi. The initial data collection and collaboration revealed findings that expressed that although certain programmes and policies are in place in order to feed students in assigned schools, the neglected spatial requirements attached to these are resulting in an unsuccessful implementation of school feeding programmes as well as shed light unto the inaccessibility of school feeding during non-school days and in current circumstances, during a global pandemic.

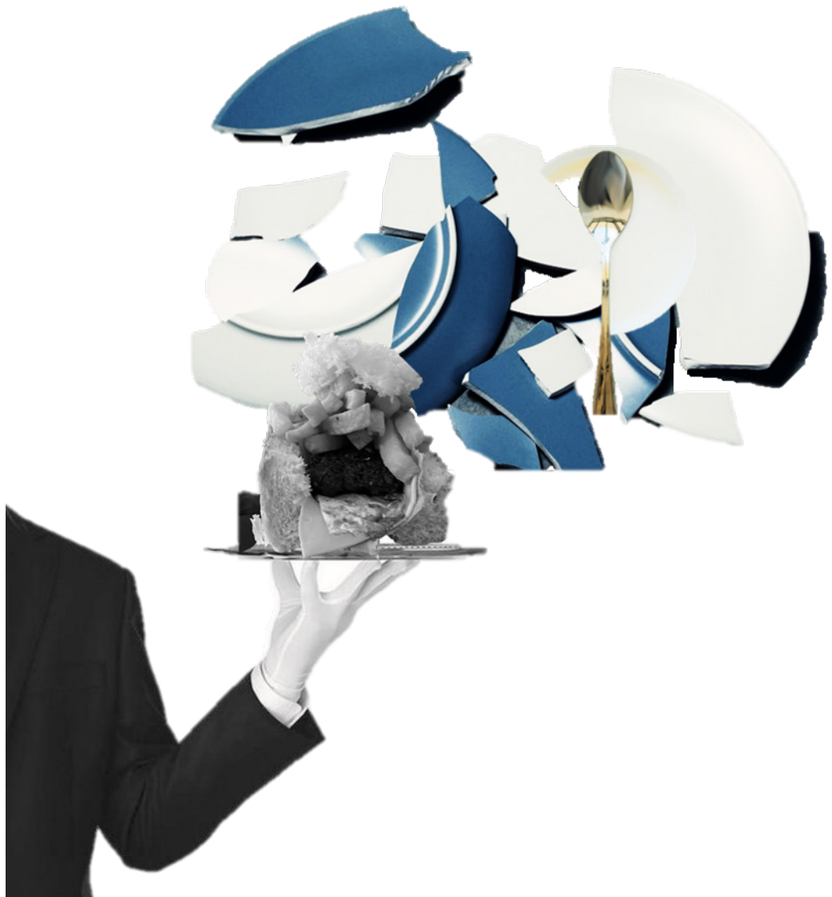
The design development focuses on the restoration of existing classrooms and landscape, the reconfiguration of built space and the addition of a lightweight exoskeleton to the existing school structure. The design informants and generators are a result of practical workshops and investigations done in the existing school and regarding the surrounding Khalambazo communities food culture. The intent is that through the restoration and addition process, programme can meet space seamlessly and that the two may function because of each other. The overall intention proposes to create a place of growth, preparation, production and distribution that catalyses its success to its surrounding environment and creates an educational ecosystem that promotes nutritional wellbeing for all.

FORMAT



Food and architecture notably share a visual connection and simplistic manner of constructing information so that it is understood by its user. Both fields create tangible products created from vast collections and interactions of data, materials, elements and collaborative efforts by people.

The dissertation is inspired and sets out to use the methodology and layout of a recipe book in an effort to break down concepts through the anatomy of data as per the construction of food preparation. In doing so, relating the research through the lens of the user, the cook, the learner, the collaborator and the urban citizen.



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AGROECOLOGY
The ecology of a food system

CO-DESIGN
Collaborative engagement in the design process (Participatory design)

DBE
Department of Education

EDUCATIONAL ECOSYSTEM
Learning network within a

HEDGS
Healthy Eating Design Guidelines

MCLC
Mamelodi Learning Collaborative

NSNP
National Schools Nutrition Programme

NYÉLÉNI DECLARATION
Pathed the way for the inclusion of food sovereignty into legislation and constitutional rights

PAR
Participatory Action Research

6 PILLAR FRAMEWORK
The Nyéléni foundation is translated into 6 pillars that represent a collective vision of what the movement stands for.

QUINTILE 1- 3
DBE divides all government schools in underprivileged areas into categories, 1 being on the lower/worst end and 5 on the higher, better end of the scale. The NSNP ensures learners in quintile 1-3 and non- fee-paying schools are recipients of the school feeding programme.

SAFSC
South African Food Sovereignty campaign

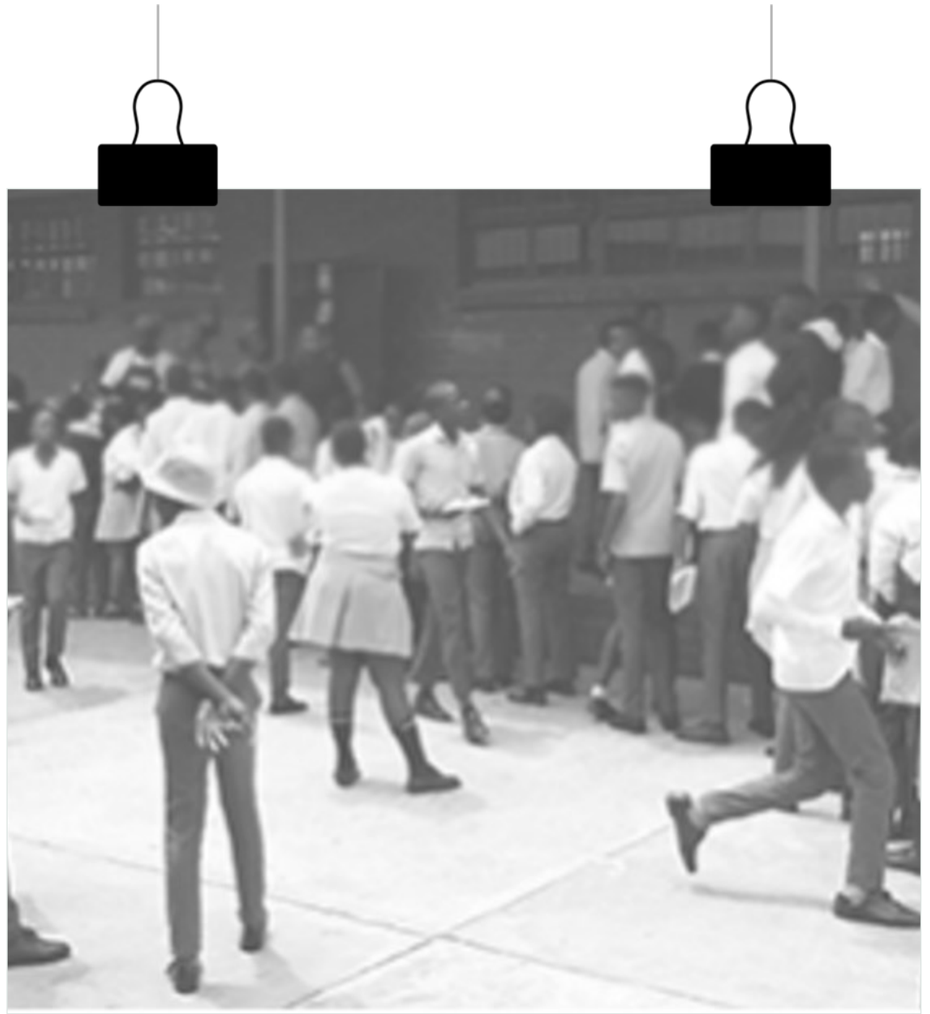
SDGS
Sustainable Development Goals

SPATHLO (KOTA)
A South African delicacy, a sandwich/ bunny chow made from a hollowed-out quarter loaf of bread which is then filled with layers of ingredients, commonly chips, polony, atchar, cheese & lettuce.

STEAM
Science, Technology, Engineering, Arts and Music

UN
The United Nations

Chapter 1



INTRODUCTION

1.1 Overview

Background

In 1994, one hundred days after former president Nelson Mandela took office, his administration put in place various development programmes to aid in starting the Reconstruction and Development Programme (RDP) which was aimed at developing previously disadvantaged communities (DBE 2014). The National School Nutrition Programme (NSNP) was a result of one of those programmes as a response to the critical need for nutritional food sources specifically in rural areas at that time in South Africa (DBE 2014). In 2007, the Nelson Mandela Institute was launched as a response to the education crisis evident in rural Africa (Mandela 2007).

The NSNP 2013/2014 report confirmed the need for nutritional programmes in schools due to the prevalence of child hunger statistics sitting between 3.8% and 33.5% of school learners (DBE 2014). As a result, the NSNP's three new main strategies included school feeding, food education and lastly sustainable food production (DBE 2014). These three outcomes form the basis for the programmatic and spatial development of this dissertation, the project motive also aligns with goal 25 of the Action Plan towards schooling 2025 which focuses on giving priority to the wellbeing of the learner (DBE 2014).

This dissertation is investigated through Participatory Action Research (PAR) that engages with students in Tsako Thabo secondary school environment in the township of Mamelodi East, City of Tshwane, South Africa. The research aligns with the current discourse around the National School Nutrition Programme (NSNP), the Department of Basic Educations (DBE), the National Research Foundation (NRF) and the Peoples' Food Sovereignty Act (SAFSC 2018) alongside the South African Food Sovereignty Campaign (SAFSC) that are all actively attempting to reinforce the implementation of school nutrition programmes and systems throughout South Africa (Devereux et al 2018). These platforms alongside community participation could advocate the role of spatial design in its ability to enable affordable and sustainable space making solutions to aid in nutritional well-being among learners.

1.2 General issue

The main objective is to appropriate food in a context that is relevant and understandable to students. The current implementation of the National School Nutrition Programme (NSNP) ensures meals to over 9.1 million students across the country in non-fee paying and quintile 1-3 schools (Devereux et al. June 2018). The programme, however, does not prioritize the spatial conditions necessary for the successful implementation of school feeding and thus the project investigates the existing school typology and its ability to adapt and integrate school nutrition, food sovereignty and security and health education through architectural design (DBE 2018).

1.3 Urban issue

In the secondary school context, there can be a conflict in nutritional intake and behavioural performance due to a lack of facilities and spaces to consume food before, during and after school. Through the process of creating sustainable design solutions, it is intended that this will encourage wellbeing, camaraderie and entrepreneurship through practical learning and engaging curriculum (Darling-Hammond et al 2020).

Through the adaptive- reuse of existing schools, re-imagining school feeding should focus primarily on space, rights, power distribution and decentralisation (Dekeyser et al 2018). These fundamental elements need to be restored in school communities in an effort to achieve a holistic educational ecosystem that prioritizes the wellbeing of the students (Dekeyser et al 2018). A community integrated school feeding system may allow for a sustainable model of hunger alleviation within low-income communities to withstand and alleviate malnutrition and health issues in times of crises and uncertainty (Bundy et al 2018).

1.4 Architectural Issue

The architectural issue unpacks how design can act as a platform to rehabilitate the role of food sovereignty in a school environment. By investigating the allocation and intentional provision of specific spaces dedicated to food preparation, storage, eating and learning it may contribute to the effectiveness and inclusion of nutritional education and wellbeing within the secondary school environment. The process of collaborative design could encourage social inclusion amongst learners as well as ownership and identity to those in the school community (Awan et al 2011).

The existing school typology presents itself with its own set of limitations which speak to the spatial issues evident within educational facilities. The classroom layouts and functional arrangements are stagnant in their ability to provide shared learning spaces within an environment that should thrive on knowledge sharing. The ability to co-exist within the space is achievable but sharing of space, resources and social inclusion are not apparent. The design opportunity lies in the ability to improve policy's existing spatial requirements, where plausible and to contribute to them in order to address the spatial issues that are restricting learning outcomes (Hertzberger 2008).

The design informants include the workshops done with the learners, spatial analysis of the school, policy influences on building requirements. These informed the theoretical premise in which a research framework was developed. Theory derived from food sovereignty principles and precedents alongside the architectural design principles of Adaptive-reuse, liminal space and systems thinking helped configure the 2-dimensional issues into 3-dimensional possible solutions.

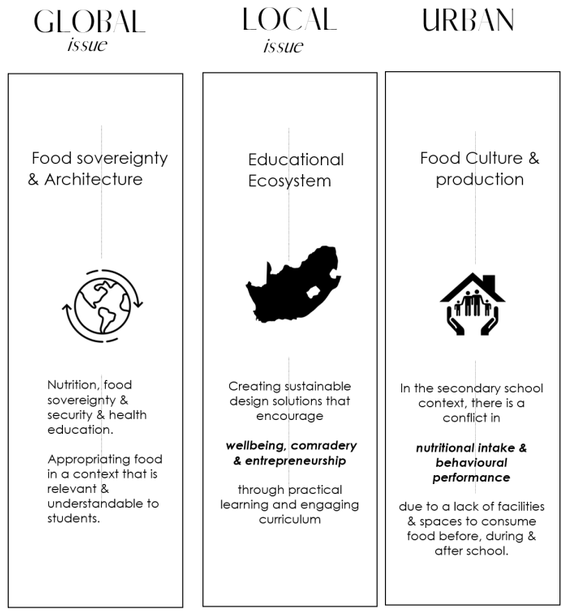


Fig. 1: Global Local & Urban Issue (Author 2020)

1.5 Research Question

RESEARCH QUESTION

How can spatial design aid in the promotion of food sovereignty through the integration of *nutritional pedagogy, feeding schemes* and *sustainable food production* at a secondary school level in order to enhance student learning capacity and wellbeing?

SUB QUESTIONS

1. What is the relationship between architecture and food sovereignty ?
2. What is the impact of nutritional pedagogy and feeding schemes at secondary school level ?
3. What is the effect on wellbeing as a result of sustainable food production

Fig. 2: Research Questions & Sub Questions (Author 2020)

1.6 Research Intention

This proposal aims to highlight the need for versatile food appropriated spaces and programmes that promote nutritional wellbeing and pedagogy that are essential in secondary schools in South Africa (Kwatubana et al 2018). The dissertation will investigate the potential role that architectural design has to spatially contribute to critical conditions that exist in school communities. It aims at responding by creating space making that enables change.

Through the framework lens, the aspects of rights, power, space and distribution from the site analysis through to the technical design will be analysed. The proposal and design investigation will respond to the outcomes of the NSNP, the six pillars from the common framework of the Nyéléni declaration (Dekeyser et al 2018) as well as precedent informants and appropriate design principles.

1.7 Delimitations

The project does not aim to create an ideal school model that is focused on the feeding scheme implemented by the NSNP. Rather it focuses on the adaptation of a school from a space making point of view in an attempt to successfully implement school feeding on a long term, sustainable basis. The transformation of existing spaces will create platforms for engagement, sustainability and a healthy environment for learners, staff and community members to obtain a healthy mental and physical state of wellbeing.

The dissertation does not intend to resolve or reconfigure all existing schools in an uneconomical manner to achieve a holistic food appropriate feeding scheme. The project identifies opportunities in the current school typology and feeding scheme system and the potential architectural role for the facilitation of implementing local school feeding.
The project is an adaptation and addition to the existing Tsako Thabo school which was established in 1979.

The current school building consists of long rectangular classrooms lined up in rows and situated parallel to each other on a sloped site. The buildings are mainly constructed of 230mm exterior brick walls and 115mm interior brick both exposed in exterior appearance and plaster and paint. The existing roofs are either 3° monopitch or 26° gable end and are constructed with I beams and timber trusses respectively. Flat ceiling boards with little to no insulation are present in most classrooms, creating confined volumes and ventilation restrictions. The existing courtyards between the school are concrete slabs and all windows are bolted with burglar bars for safety (Honours 2019). All existing materials are intended to be reused, recycled or reappropriated somewhere on site.

The Pienaars river which extends through the back of the site is at @ 40m North to South and the sub-stream at West to East (Water & Sanitation 2004) and the site generally drains towards the west into the river. Topographically the site has a shallow gradient that inclines to the west. And surface elevations run between the range of 1289m above sea level in the west direction and 1295 masl in the east (Gauteng Department of Infrastructure Development 2015).
Due to no floodline deposits on site, it is assumed that the flood lines lie outside the boundary of the site thus it is assumed if a flood line does exist along the river it is a 1:100 year floodline. (Gauteng Department of Infrastructure Development 2015).

1.8 Limitations

The dissertation intends to pursue a co-design, participatory action methodology. Although much data was collected during the 2019 year and early 2020, due to the unprecedented times of Covid -19, physical interventions and workshops were not able to continue. This resulted in a pre-design collaboration phase and post online collaboration where possible later in the year. The project's foundation is thus a collection of secondary data collected from the previous year's work at Tsako Thabo as well as pre-pandemic interaction with the school and its learners.
The entire site of Tsako Thabo and the surrounding open green landscape is considered in the design proposal. However, the focus and design contribution remains on the adaptation of the existing school, specifically the existing designated kitchen area, unused classrooms and the programmatic redistribution of existing classes. Additions made to the existing school exist mainly in Zone 2, which can be seen on the developed zoning schedule for the site, which houses the kitchen area on the North-East part of the site.

1.9 Research Methodology

The research design is based on a participatory action research approach as a hybrid method of data capturing. The proposal will operate under an interpretive paradigm with the objective to observe, incorporate and involve participants. This method will contribute value, purpose and social inclusion to the dynamics of the project (Patten et al 2018).
Through collaborative design strategies and data capturing the intention was to investigate current secondary schools building layouts and amenities and explore the interaction between food orientated spaces and learners. This process enabled me to establish where and what rehabilitation of specific spaces is needed.

The existing conditions of the schools were mapped, documented and used as design informants as part of a larger scheme within the Urban Citizenship Studio (UCS). The Urban Citizen Studio is made up of students in the honours and masters years within the Department of Architecture at the University of Pretoria. The studio is centred around collaborative design with community members and aims at tackling real-life problems alongside the user.

The studio provides a platform for like-minded people to work together as a means to empower and encourage collaborative data collection, sharing of knowledge, participatory design and social inclusion.

The Unit for Urban Citizenship provided the platform for my dissertation.



Through research by design and collaborative data capturing of interviews, surveys and co-design methods, the methodological approach is a combination of qualitative and quantitative research, which focus on the core logic of intervention, evaluation and participatory action. This method of systematic and participative observation allows for an in-depth understanding of socio-economic and cultural information as understood from a point of view of the people who are being studied (Patten 2018). This is necessary for a co-design-led dissertation.

Fig. 3: Urban Citizen Studio (Author 2020)



Fig. 4: Co-design Entrepreneurship Workshop (Author 2020)

The research was undertaken through the technological platform created as a result of a joint National Research Foundation (NRF) and Swedish Foundation for International Co-operation in Research (STINT) project, Stitching the City: From micro mapping to macro views (Roussou et al 2019). The project was developed to capture local small scale geo-spatial data and make it available online as a platform for collaborative research, evaluation and data comparison.

The intention was to develop a methodological framework (ukuDoba) and digital platform for the collection and sharing of non-traditional types of spatial economic data from a street to precinct level. It is to be developed and adapted to the local and global south and north conditions. The ukuDoba method was developed by the architecture departments at the Chalmers University of Technology, Sweden and the University of Pretoria, South Africa in an attempt to establish a transdisciplinary collaboration. This framework allowed us to collect, convert, store and export data so that it could be appropriated into a similar programme in a different context.

This data warehouse will allow for layers of different types of information to be accumulated and stored each year as well as provides for easily accessible data that is tangible and transferable. The ukuDoba method was implemented as a research methodology.

See Appendix A & B: ukuDoba Booklet

THE UKUDOBA METHODOLOGY

Result of a joint National research Foundation (NRF) project, *Stitching the City* (STINT).



PRETORIA, SOUTH AFRICA

GOTHENBURG, SWEDEN

Aim : To develop a methodological framework & digital platform for the *collection* & *sharing* of non-traditional types of spatial economic data from a street to precinct level. With the intention to be developed & adapted to local and global south and global north conditions.

COLLABORATION

MAMELODI, PRETORIA

HAMMARKULLEN, GOTHENBURG

The *Ukudoba method* was developed by the architecture departments at *Chalmers University of Technology*, Sweden and *the University of Pretoria*, South Africa in order to establish a transdisciplinary collaboration.



Intention: To capture informed data and make it available online as a platform for collaborative research, evaluation and data comparison.

Collect data — KOBO TOOLBOX

Convert data — QGIS

Store data — GEONODE

This framework will allow me to collect, convert, store and export data so that it could possibly be appropriated into a similar programme in a different context.

SEE GROUP WORK FOR UKUDOBA BOOKLET

Fig. 4: The uKudoba Methodology (Author 2020)

1.10 Research Design & Contribution

This proposal intends to define the role architectural space making has in improving the integration of wellbeing, nutrition and food education in the lives of school children, in an effort for them to better understand the importance of food sovereignty in a holistic educational ecosystem and the opportunities it brings for wellness and a healthy environment (Bundy et al 2018). It focuses on understanding food sovereignty and architecture within a school environment considering the aspects of food as a nutritional source, food education and food-oriented spaces. The architectural intervention is intended to advocate for collaborative learning that enhances the students' learning capacity and wellbeing. By fostering an understanding of food as part of a greater educational ecosystem it will in turn promote a practical student-centred learning approach and environment (Claasen et al 2016).

The objective is to enable nutrition through a spatial platform, with the intent of uplifting the well-being and health status of young people and communities, specifically in Mamelodi.

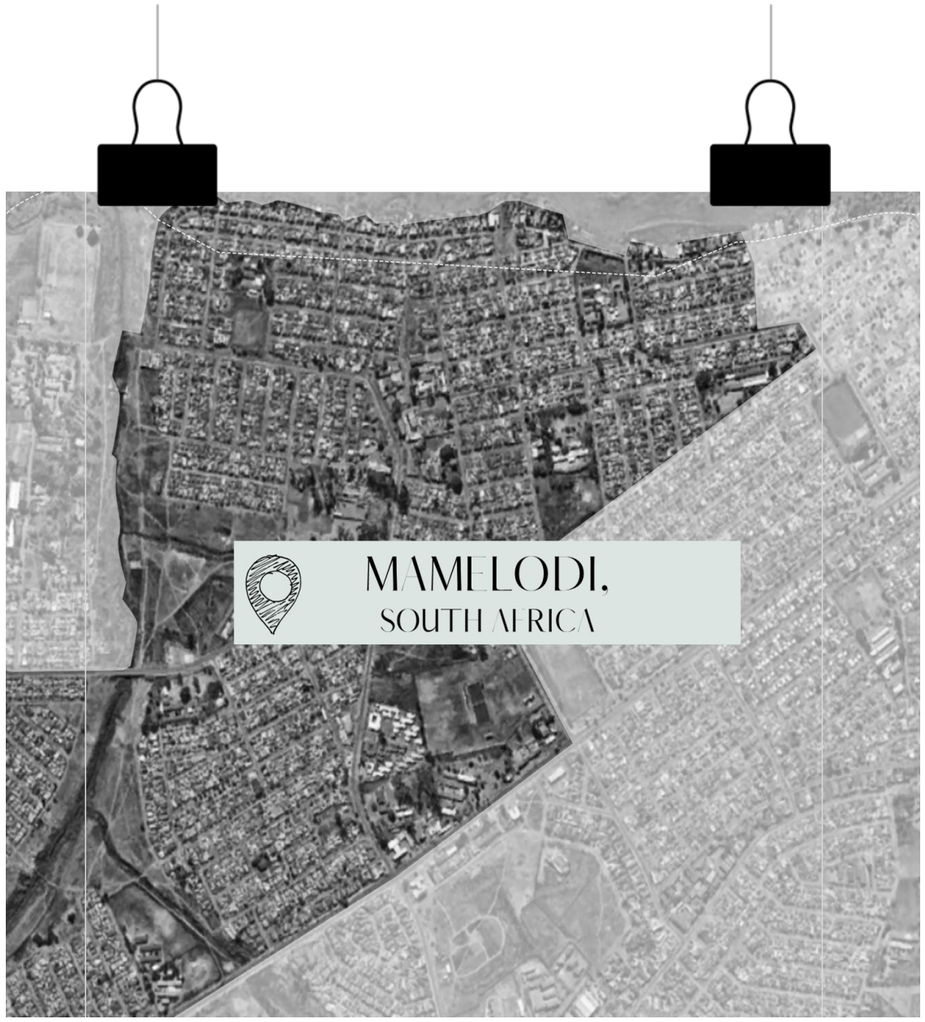
This could subsequently result in a boost of socio-economic growth within the school community as well as promoting nutritional and mental health within the urban context (Fioramonti 2017).

Through the adaptive reuse of existing schools, programmes that primarily focus on saving, producing and preserving resources can be designed (Darling-Hammond et al 2020), thus creating a living laboratory that becomes an inclusive and practical learning opportunity.
The intention is to use Tsako Thabo as a case study school to demonstrate the possible additions and adaptations to be made by existing school typologies. The design contribution lies in the ability to create spatial requirements for school feeding schemes as well as to create a series of incrementally phased interventions that can be realistically applied to different schools based on available funding and resources. This project proposes an opportunity for schools to run food sustainability projects in-house and to include community members in the longevity of sustainable programmes.



Fig. 5: Co-design Workshop Session (Smith 2020)

Chapter 2



CONTEXT

This is a narrative of the workings of a school feeding scheme at Tsako Thabo High school in Mamelodi East, South Africa.

Tsako Thabo secondary school was investigated as part of the Honours Urban Citizen studio 9 (UCS) in 2019. Through Community Action Planning and co-design activities, a variety of topics were unpacked and further investigated. One of these topics was food security and sovereignty within the school and the surrounding Khalambazo Area.

This project intention developed from an initial site visit to the school, in which a single kettle was found positioned on the kitchen floor ready to be switched on to prepare and serve over 600 students.

The touchstone emphasizes the need for transformation by changing the narrative from the power that exists in the system to empowering those who use the system.

As a response, the dissertation embarks on a journey of that can be achieved through design.



Fig. 6: Lunch time line-up at Tsako Thabo (Smith 2020)

KITCHEN CONVERSATIONS

TOUCHSTONE

Narrative

Although a lack of resources at a secondary school in the east of Mamelodi is no surprise, it was a infuriating gentle reminder of the issues at hand.On my first ever visit to the school I pondered around, caught off guard by the aromas of stewed vegetables and pots knocking I was shown the way to the kitchen facility, if you could call it that. Upon arrival I was greeted by four lovely ladies who generously welcomed me from the moment my muddy shoe hit the doorway.

After a brief chat of what's cooking in the pot and what's on the menu for the day, I had a quick look around. I found myself staring as my eye caught the glimpse of two large fridges, depicted by large white rectangles overshadowing to my surprise, a tiny white kettle promptly placed on the floor.

Oblivious to the fluster around me, I stared while my mind raced back and forth and back and forth. Was it the placing of the kettle on the tiles or was it the lack of proportion around it ? Perhaps it was just me thinking about the cup of tea I never had that morning.

I took a quick snap as to preserve this quaint set up and save it for a rainy day of contemplation. As I unlocked my fixed sight from the scene, I started to make my way out, a wave goodbye and a goodbye of gratitude from Gladys peeling some veg across the room.

It wasn't even ten seconds after stepping out that door, that the realisation had kicked in.

That so called kitchen facility has a single kettle, this kettle, call her Polly, is boiled around 700 times a day to prepare food twice daily for all students and staff.

A single vessel, under immense pressure and strain receives a vast amount of responsibility every day. It's cord, peeling by the centimetre barely makes it to the wall plug as if it's stretching itself for oxygen, for power.

I would say this was the moment it clicked for me, I was boiling up a storm inside. It was either a walk away and feel bad moment or am I going to do something about this, moment.

The kettle resembles so much more than a vessel that is used to heat water by being powered by electricity. It represents the over use , the lack of , the under maintained, the daily struggle but more so than that it represents the potential to distribute, to obtain rights and to know that their is great power to be gained. To understand the potential and ability of something, allows you to give it a platform to empower.

I turn around, "Gladys"
"yes " she timidly replies
I'll see you tomorrow.

Fig. 7: Touchstone Narrative (Author 2020)

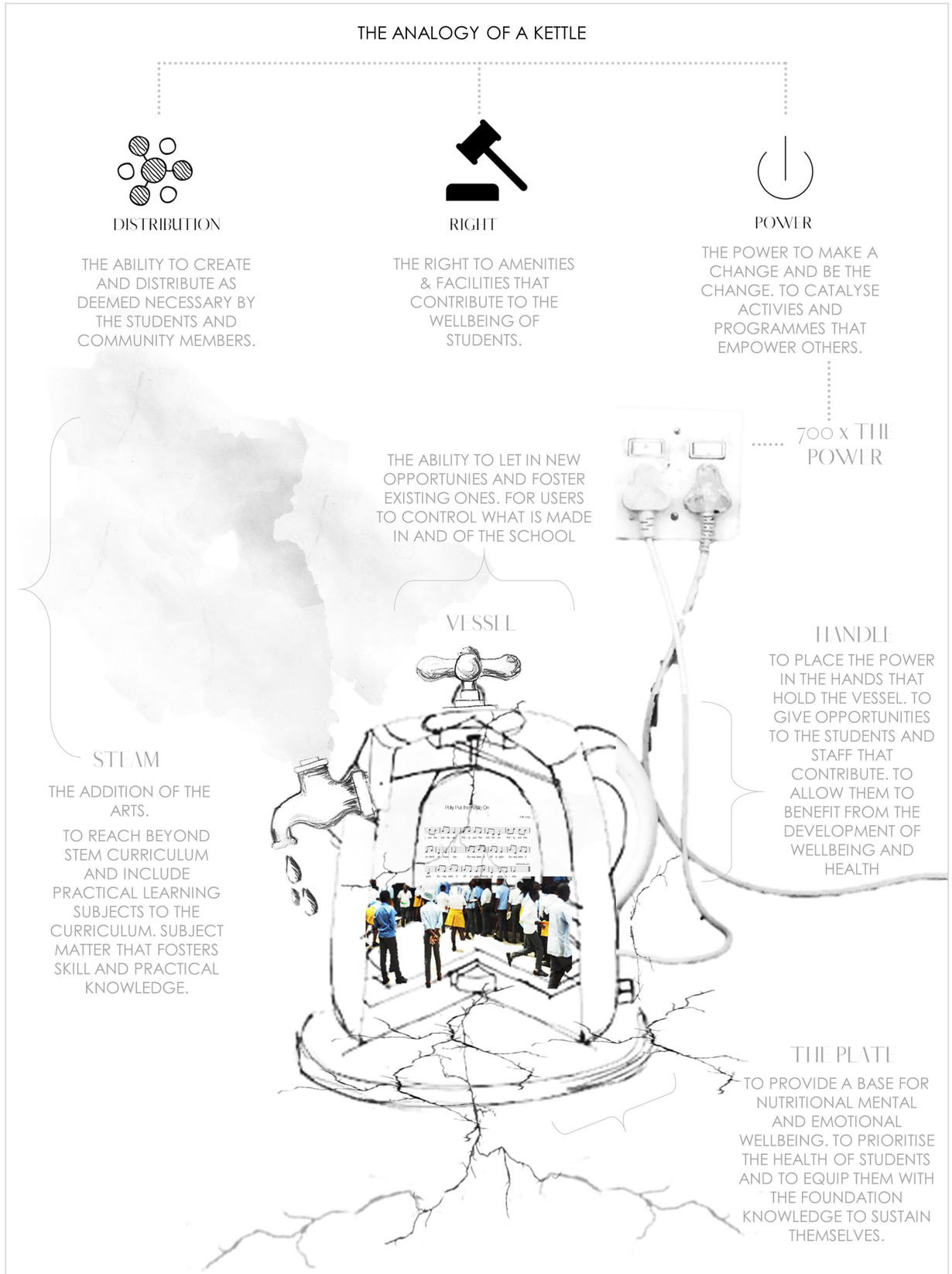
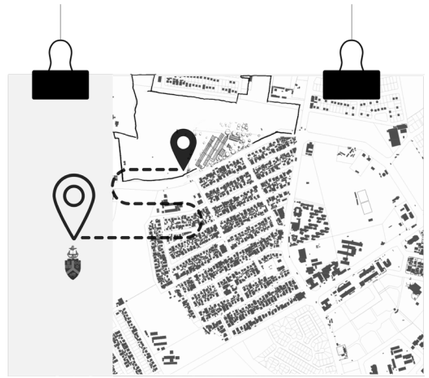


Fig. 8: Touchstone Graphic (Author 2020)

2.1 Context study & analysis



Tsako Thabo secondary school is a high school considered as an Urban Public school with learners from grade 8 – grade 12. The school is considered a Quintile 4, non-fee-paying school with around 600 learners.

Since the school is non-fee paying, it falls under the bracket to receive meals from the NSNP and thus provides breakfast and lunch to its students (DBE 2018). From the start of the investigation, the food culture was evident from the first drive into Mamelodi: The endless aromas of sidewalk spaza shops and kiosks and the lingering smell of food up to and through the school. The relation between food and user was evident from our weekly visits to the school during break times. Students engaged in the exchange of food and stories. Many of my conversations and observations with the students were consumed about food and this inspired my need to know more about the food culture of the school and the community.

The involvement with this particular school was founded as a result of the engagement with the school from the 2018 Honours years as well as the school's link to the Mamelodi Collaborative through the principal Mr Clement Gama. The principal is a key actor in the project as his involvement and commitment to the MCLC was to create opportunities for his students and surrounding community members. We have worked closely with him throughout our research workshops and have gained invaluable information from his perspective as an involved leader.

Situated in the Khalambazo area in Mamelodi East, the school is surrounded by large open green spaces unoccupied and open to the community. The Pienaar's river runs through the back of the site.



Fig. 9: Tsako Thabo Secondary School Context Map (Author 2020)

2.2 Site documentation & analysis



Fig. 10: Tsako Thabo Secondary School Green Spaces (Author 2020)

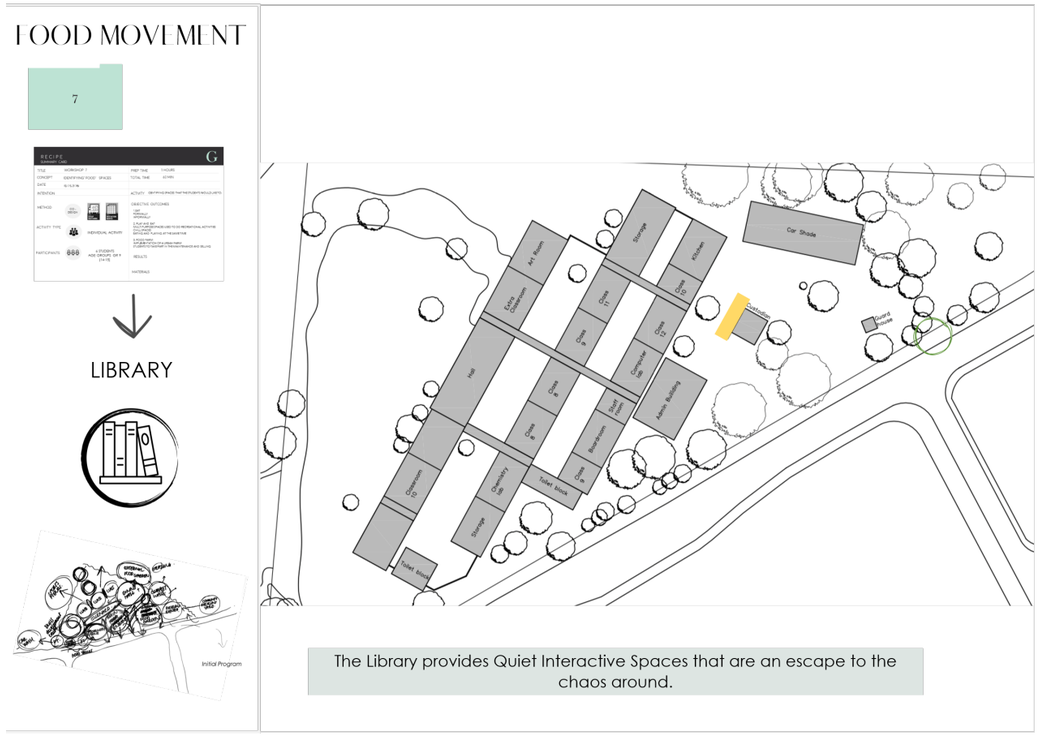


Fig. 11: Tsako Thabo Secondary School Classrooms (Author 2020)



The low water intake is a result of the lack of working and accessible running taps throughout the school.

Fig. 12: Tsako Thabo Secondary Water Access Points (Author 2020)



The Library provides Quiet Interactive Spaces that are an escape to the chaos around.

Fig. 13: Tsako Thabo Secondary Library (Author 2020)

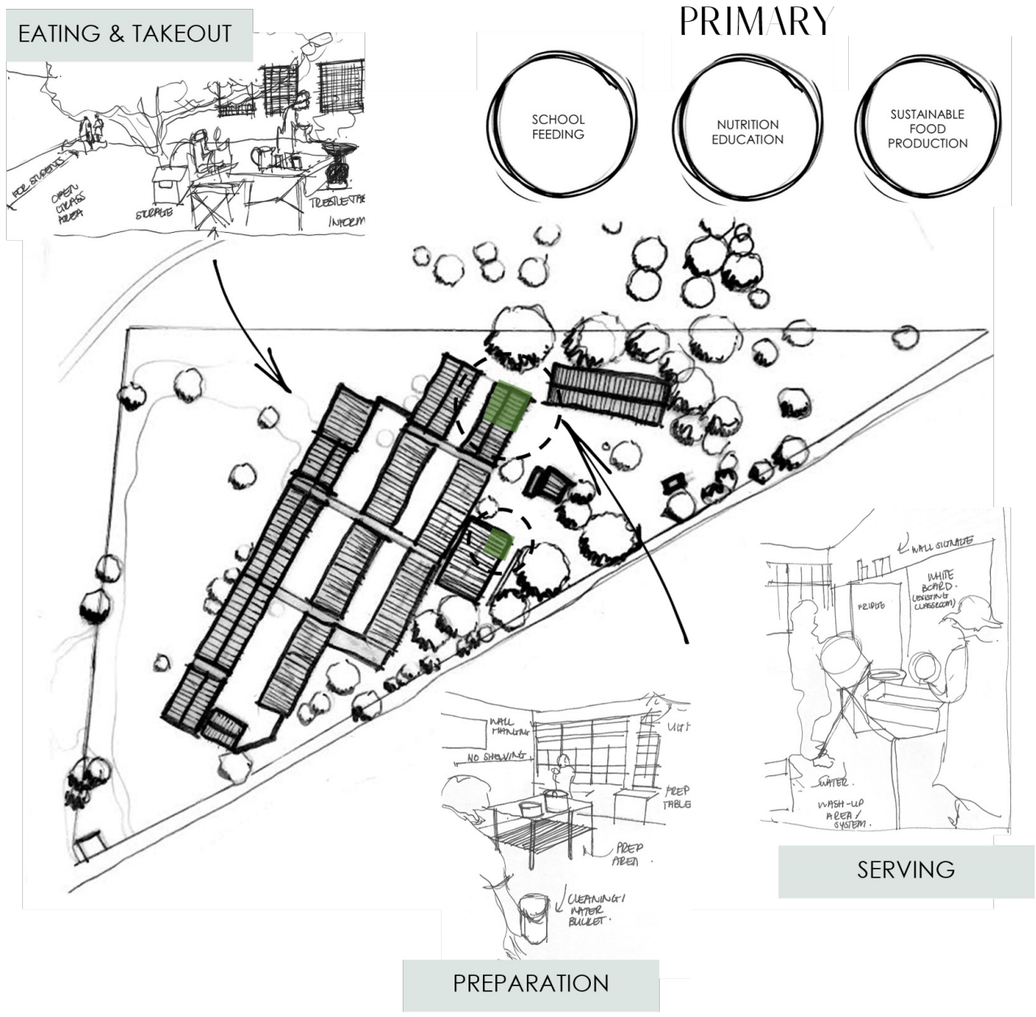


Fig. 14: Tsako Thabo Secondary Food Programme (Author 2020)



Fig. 15: 3D spatial Analysis sketches of the school (Author 2020)



Fig. 16: Site Conceptual Graphic (Author 2020)

2.3 Macro-Meso-Micro scale site mapping

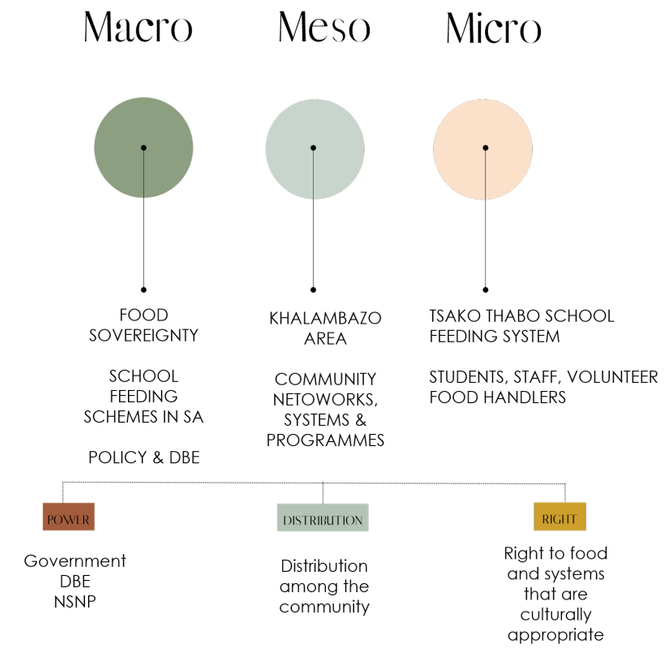


Fig. 17: Macro Meso Micro Scales (Author 2020)

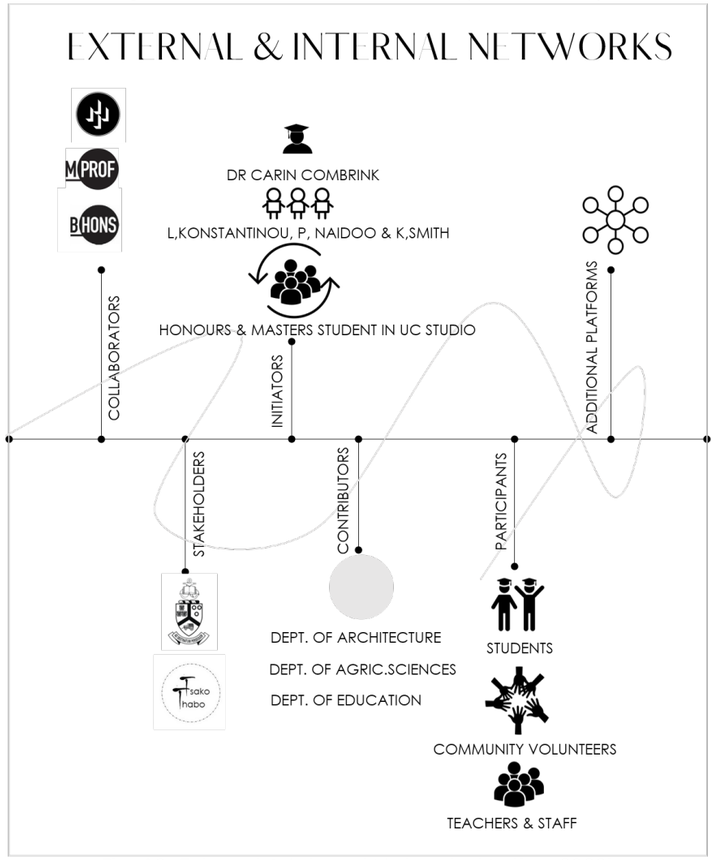


Fig. 18: External & Internal Networks (Author 2020)

2.4 Contextual conditions of the site

In Mamelodi, school feeding is increasingly recognised as a major investment in both human capital and local economies. Mamelodi East is home to several schools that are all recipients of the NSNP. This map represents the primary and the secondary schools around the periphery of Tsako Thabo in the Khalambazo district.

Illustrated through a series of maps from page 108 - 117



Fig. 19: Site Images (Smith & Joseph 2019)

2.4.2 Macro-Meso-Micro scale site mapping

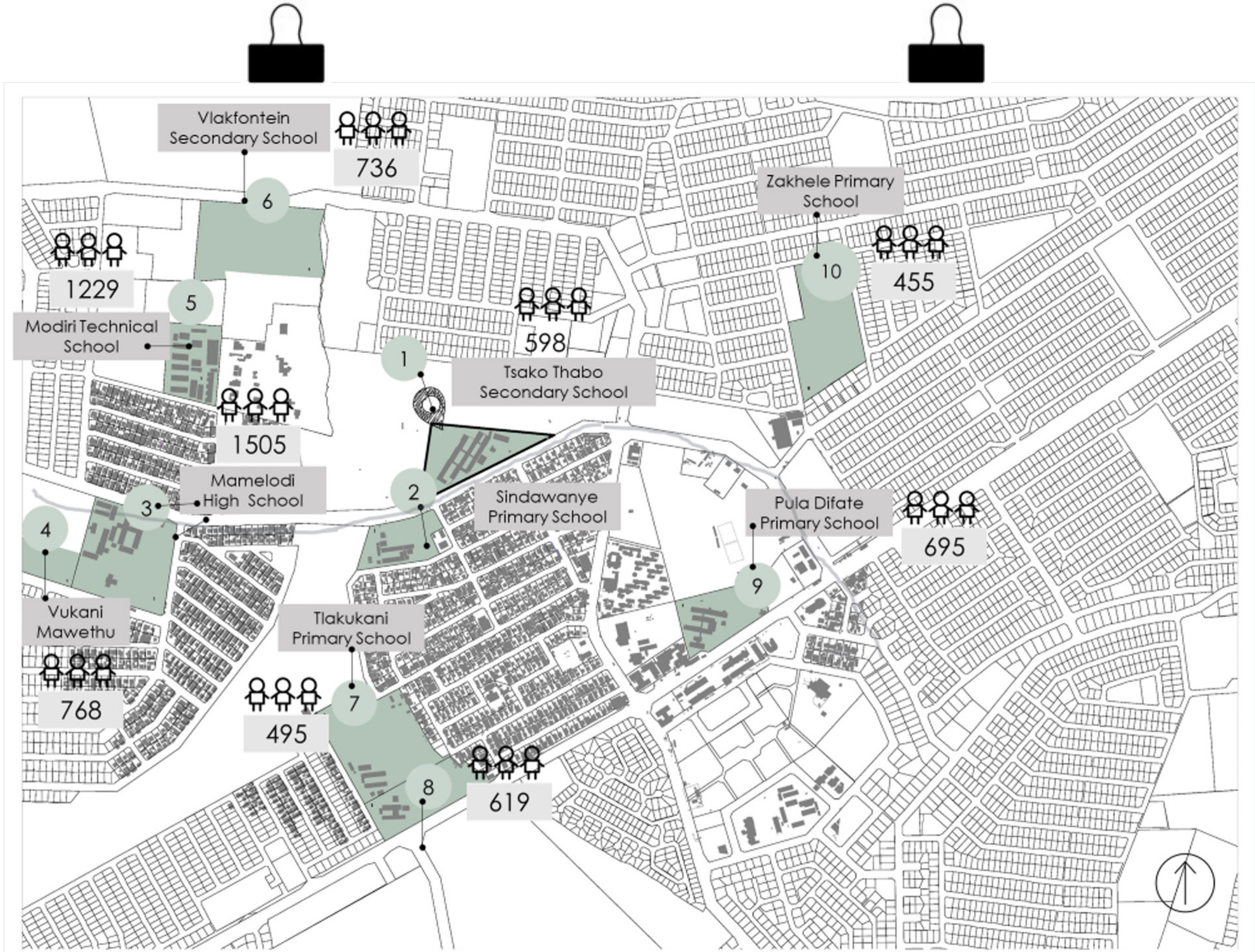


Fig. 20: NSNP Secondary & Primary schools surrounding Tsako Thabo (Author 2020)



Fig. 21: Primary and secondary schools & local food contributors in the Khalambazo network(Author 2020)

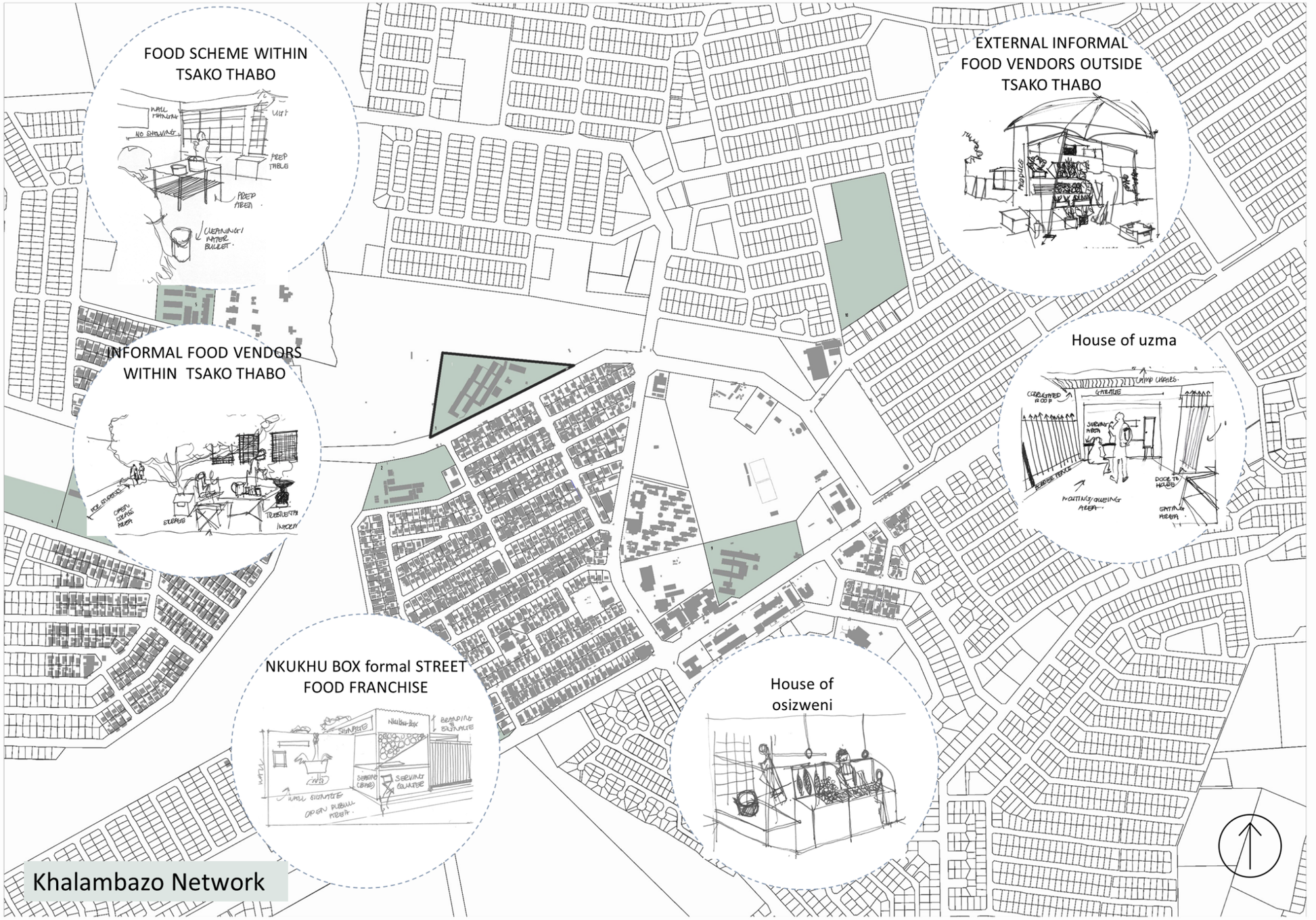


Fig. 22: Khalambazo food networks related to students at the school (Author 2020)



Fig. 23: Food Network in Relation to Tsako Thabo Author (2020)

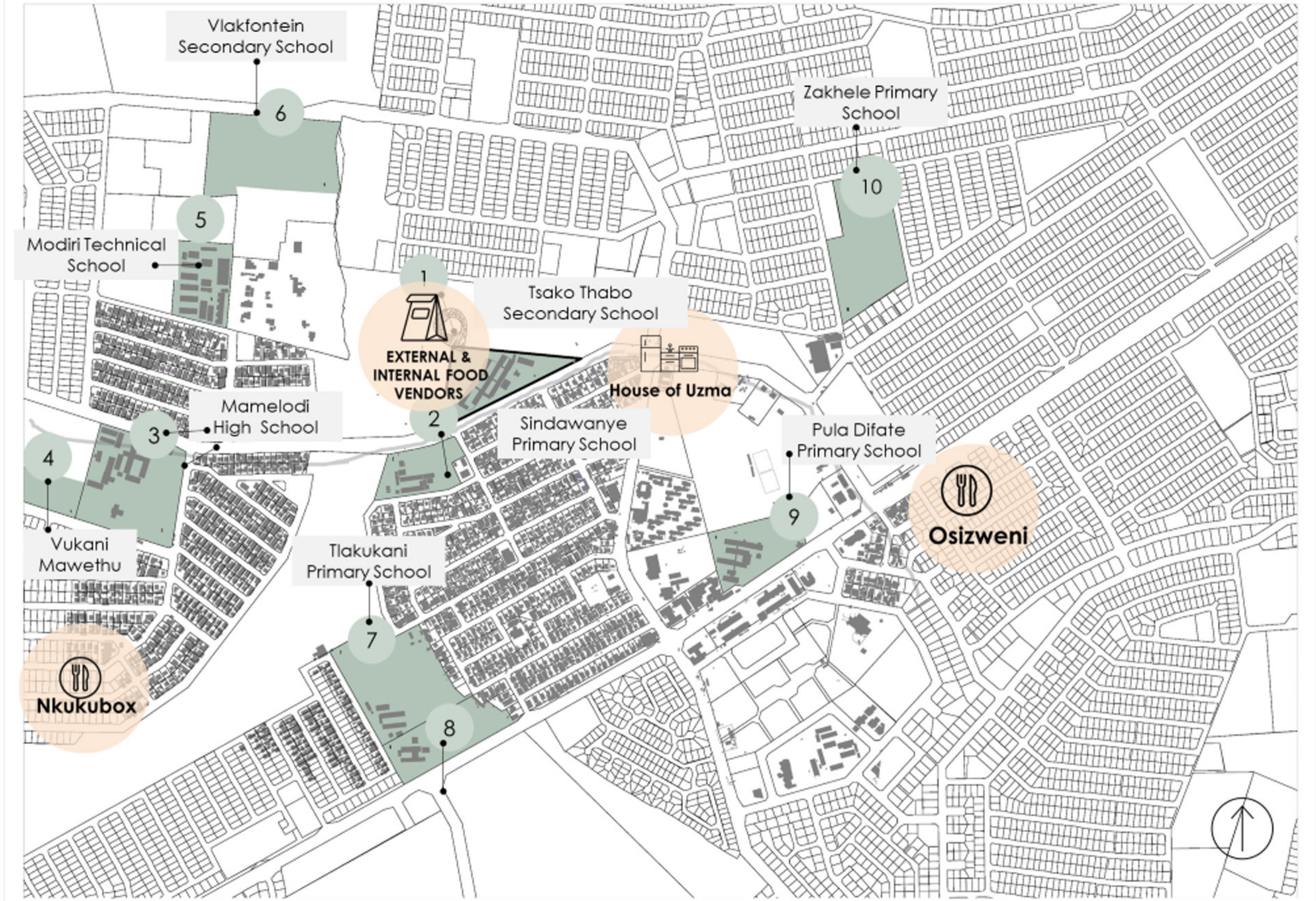


Fig. 24: External food vendors relative to schools (Author 2020)

2.5 Research Methodology

Background

The research was undertaken through participatory action research (PAR) that engaged students in Tsako Thabo secondary school environment in the township of Mamelodi East, City of Tshwane, South Africa. The school was chosen as a case study due to previous engagement with the school during the architecture honours programme, its relation to the Mamelodi Learning Collaborative (MCLC) and ongoing involvement with the University's Joint Community Project (JCP) module.

The research aligns with the current discourse of the National School Nutrition Programme (NSNP), the Department of Basic Education (DBE), the National Research Foundation (NRF) and the Peoples' Food Sovereignty Act (SAFSC 2018) alongside the South African Food Sovereignty Campaign (SAFSC) that are all actively attempting to reinforce the implementation of school nutrition programmes and systems throughout South Africa (Devereux et al 2018).

The research was undertaken through the technological platform created as a result of a joint National Research Foundation (NRF) and Swedish Foundation for International Co-operation in Research (STINT) project, Stitching the City: From micro mapping to macro views (Roussou et al 2019). The project, the ukuDoba Method, was developed to capture local micro-scale geospatial data and make it available online as a platform for collaborative research, evaluation and data comparison. The intention was to develop a methodological framework (ukuDoba) and digital platform for the collection and sharing of non-traditional types of spatial economic data from a street to precinct level. It is to be developed and adapted to the local and global south and north conditions.

The ukuDoba method was developed by the architecture departments at the Chalmers University of Technology, Sweden and the University of Pretoria, South Africa as part of an international collaboration. This framework allowed us to collect, convert, store and export data so that it could be appropriated into a similar programme in a different context.

This data warehouse will allow for layers of different types of information to be accumulated and stored each year as well as provides for easily accessible data that is tangible and transferable. The ukuDoba method was implemented as a research methodology.

See Appendix A & B: ukuDoba Booklet

The phases of engagement documented for this process occurred from April 2019 to April 2020. During this period, co-design research and engagement with the participants took place and different forms of collaborative activities were used to collect and analyse data.
The first set of data collected from April 2019-June 2019 informed the need for the development of the ukuDoba Method. During September 2019, the method was tested and refined in Hammarkullen, a suburb in Gothenburg, Sweden, followed by a further testing period in Mamelodi East in the first quarter of 2020. The ukuDoba Method forms part of my research methodology and contributes to the development of engaging platforms of co-design data collection locally and globally.

This dissertation intends to investigate food sovereignty and architecture within a school environment with consideration for the aspects of food as a nutritional source, food education and food-oriented spaces. It also investigates the role of school food production systems and how they can contribute to the national feeding schemes outcome and possibly alleviate the dependency of families relying on social grants, which 12.5 million receive, to feed their families during uncertain times (Spaull 2020). During this time, learners are in a vulnerable situation when it comes to accessing food during school holidays, lockdowns and closures of schools due to unforeseen circumstances.

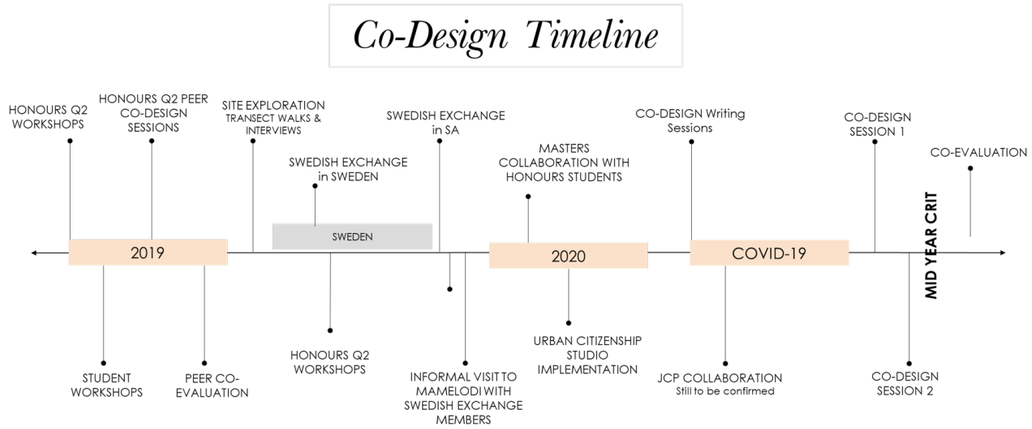


Fig. 25: Co-design Timeline (Author 2020)

April 2019-June 2019

The students took part in a series of workshops that were based on theories of Spatial Agency (Awan et al 2011) and Community Action Planning (Hamdi 2010), that involved the following activities:

September 2019-January 2020

The ukuDoba Method was refined and developed in this time. It uses Kobo Toolbox TM as a platform to digitally capture interviews and locate some geospatial data while in the field. QGIS TM is then used to convert this data so that it can be tangible and used to document all the data geospatially in a program called Geonode TM. This data warehouse allows for layers of different types of information to be accumulated and stored each year as well as providing for easily accessible data that is tangible and transferable.

An interpretive researcher collects quantitative data through surveys and interviews done with the participants involved. This type of data aids in identifying unanticipated responses and phenomena. It is deductive, thus giving perspective and understanding to the researcher about the context of the participants (Yin 2011). Interviews were thus conducted with the students and community members that involved physical feedback forms and audible recorded feedback.

The questions and activities were aimed at emphasizing the importance of nutritional food and were intended to create awareness of the importance of sustaining oneself with knowledge and skills in a resource scarcity environment. Community members and food vendors were asked questions pertaining to food culture, accessibility and methods.

March 2020 -July 2020

Due to the circumstances of COVID-19, a series of online workshops were further created to involve community members (not specific to Mamelodi) as a means to gain information and perspective in the design realm in instances where physical workshops could not be carried through and information gaps were still missing. These workshops were done between peers, collaborators, and professionals.

Methodology

The research is that of a participatory action research approach, which emphasizes the importance of the researcher – participant relationship and allows both parties to actively engage and understand the problem alongside each other. The approach is context-specific and encourages social change and empowerment through its constant cycle of research, reflection and action (Macbeth 2020) which ultimately empowers the participants to have a greater awareness of the situation around them. The collaborative process aims at identifying a problem together and equipping the user with the skills and knowledge to act within their community, create social development and ensure resilience among citizens through participation (Macbeth 2020). The research lens uses a hybrid method of data capturing that includes both qualitative and quantitative data. The research is situated in an interpretive paradigm to observe, incorporate and involve participants (Schuler et al, 1993). This method contributes value, purpose and social inclusion to the dynamics of the research project (Patten et al 2018).

Tsako Thabo secondary school was used as a base case study to investigate the identified issues. The building layouts and amenities were explored which aided in further unpacking and understanding the interaction between food-related spaces and the learners.

Target group

The main target group for the project was the students of Tsako Thabo High school. The students participating in the workshop varied between grade 8 -12 learners. Staff, particularly those involved in the kitchen and food facilitation were also interviewed in the study as they provided insight into how the current food systems and distribution at the school function. Community members around the Khalambazo area in Mamelodi East were also interviewed to establish their relation and expertise to food culture within the community and the school.

The community members selected as part of the research were chosen as key contributors to the school learners' food culture. These selected members were discovered during transect walks through the Khalambazo area which borders the school. These community members are actively engaged with the students from a food culture point of view. They voluntarily agreed to participate in interviews and conversations.

All participants were selected based on their willingness to be interviewed and involved.

All workshops with the students were in sessions of six students at a time. Community interviews consisted of individuals and were mainly local business owners. The inclusion criteria for community members included their businesses being within a 5km radius of Tsako Thabo secondary school, being involved in the food industry from a basic to a more formalized level of sale or service and having some link to the school in terms of selling food to the children, working as a volunteer food handler or even providing produce to the school.



Fig. 26: Workshop Discussion With Learners (Author 2020)

Data Collection Method

This methodology and collaborative data capturing consisted of semi-structured interviews, surveys and co-design activities that included a series of interactive workshops. The methodological approach is a combination of qualitative and quantitative data collection.

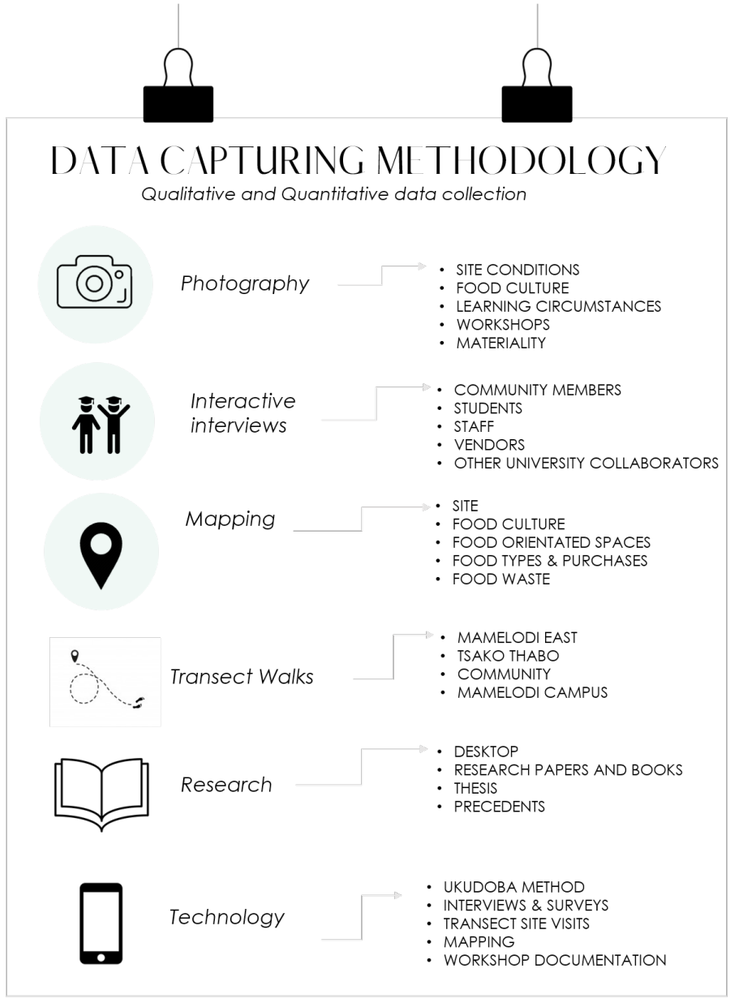


Fig. 27: Data Capturing Methodology (Author 2020)

Quantitative & Qualitative Dimensions

Quantitative data collected included specific quantities and types of food produced as per the DBE and NSNP's regulation, the school building typology indicating room size and equipment designated to food handling within the school and the number of meals allocated and spaces designated to eating were recorded.

Qualitative data was collected through a series of interactive workshops as unpacked below, this type of data collection is engaging and involves the user regarding the information retracted as a key design informant, which is vital to the process required of an interpretive paradigm (Yin 2011).

Co-design

Co-design workshops with physical outcomes such as drawings, models, games and observation and conversations with participants formed the most complex part of the data collection. This method of systemic and participative engagement allowed for an in-depth understanding of socio-economic and cultural information as understood from a point of view of the people who were being studied (Patten 2018).

See Appendix D for Workshops

Ethics

Interview guide protocols ensured that all interviewees grant consent to use all the information gathered in the interview for research purposes only. All participation was voluntary. In order to protect the learners' honest contribution and to respect their rights, needs, values and maintain cultural sensitivity of the participants (Katoppo et al 2015), their confidentiality and anonymity were ensured. All participants' faces are blurred in any media used in an effort to maintain confidentiality and to protect the identity of the participant in consideration of their wellbeing (EBIT/118/2020).

The collective responses allowed for a variety of data sets to be compared and compiled with the intention to respond to this informed data. These interviews ranged from structured, semi-structured and unstructured formats. This approach resulted in data that is inclusive, informed and encourages a life beyond the projection duration (Schuler et al 1993).

2.7 Maps & Data collection

The South African Department of Basic Education (DBE) and the National School Nutrition Programme (NSNP) describe specific requirements for feeding schemes in Quantile 1- 4 schools. Through practical workshops and spatial analysis of Tsako Thabo High school in Mamelodi East, it is evident that a gap exists in what policy dictates as a school feeding system and how those systems exist and function in context. The paper investigates the spatial conditions, systems and programmes impacting on food security and sovereignty within this school that presents with limited resources.

Through Participatory Action Research (PAR) and a series of co-design workshops, issues pertaining to a lack of designated spaces to prepare, store and consume food were uncovered. The data has been analysed through the Nyéléni Framework from a food sovereignty stance, and through the NSNP and DBE outcomes and has together formed the basis for a theoretical framework.

"Only those who are involved in the development process can appreciate the results achieved, develop them further and protect them" (Kéré 2019).



Workshops

Fig. 28: Workshopping on site at Tsako Thabo (Greyling 2019)

The Workshops were done in 2019 and are specific to students at Tsako Thabo secondary school.

Summary Recipe Card (A-D) Represent workshops 1-8. These workshops took place in the period between April 2019- June 2019.

A
Workshop 1: Understanding food places

This workshop focused on the mapping of existing food spaces within the school specifically, where food is prepared, where students eat (breakfast & lunch), where they purchase food with their own money and where they drink water from. The students were required to place a series of pins and string on a scale model to indicate current and future spaces that the students eat, rest, have break time and wait.

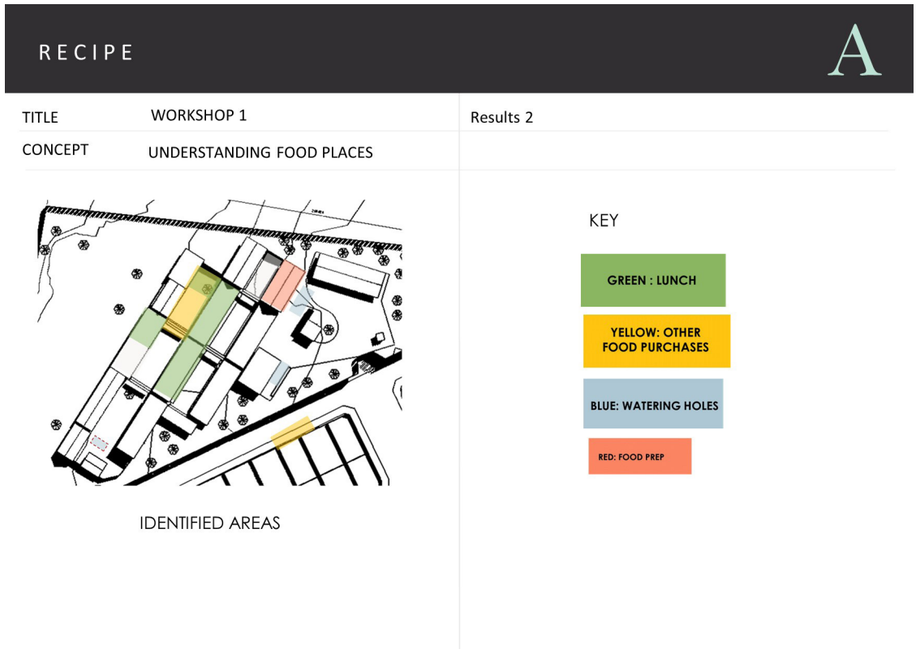


Fig. 29: The Current designated food spaces within Tsako Thabo secondary school (Author 2019)

Students engaged in discussions and placed coloured pins in correlation to the key on a context model of the school to visually represent their understanding of food places within the school.
This activity helped identify current spaces in the school that are used for eating lunch, purchasing food, drinking water and preparing food. This mapping exercise formed the basis for what programmes exist on the site as per reality and not policy. The spaces were confirmed through a site investigation with other honours students working at Tsako Thabo. The results indicate that the kitchen is located in an existing classroom. Lunch is served in the corridor outside this classroom, students' queue for their food in groups in the exposed concrete courtyard. Lunch is mainly eaten in classrooms due to lack of shaded areas and specific facilities made for eating such as a dining hall. Other food is sold by vendors during lunchtime in the one grassed courtyard and externally along the periphery of the school. The existing school typology indicates long narrow classrooms divided by concrete courtyards.

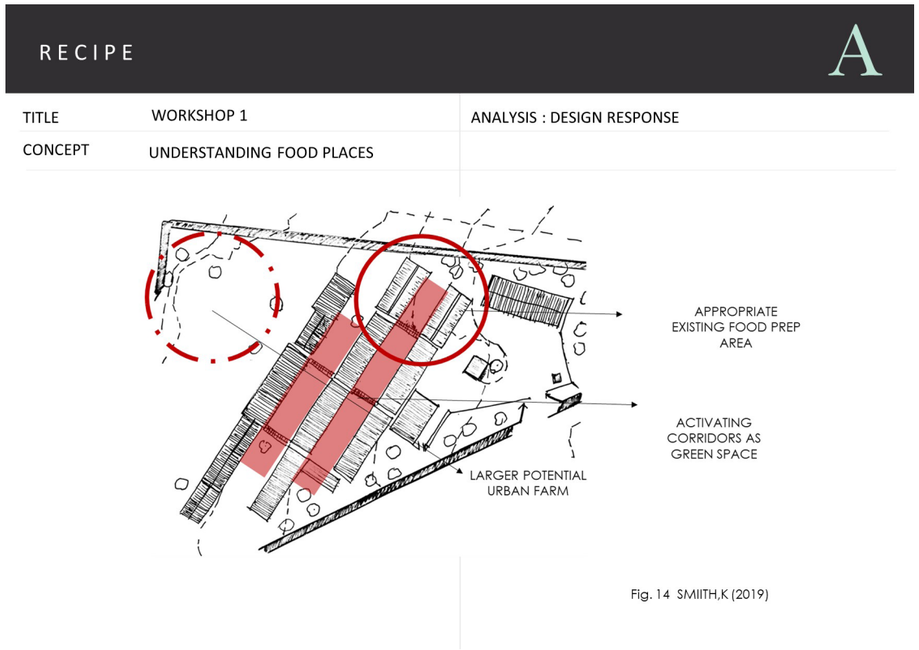


Fig 30: Potential site areas for programme(Author 2019)

As per workshops 2 results, 2 in 6 learners consume regular water intake during the day. The low water intake is a result of the lack of working and accessible running taps throughout the school. While taps are overcrowded during quieter times in the day it provides small break opportunities.

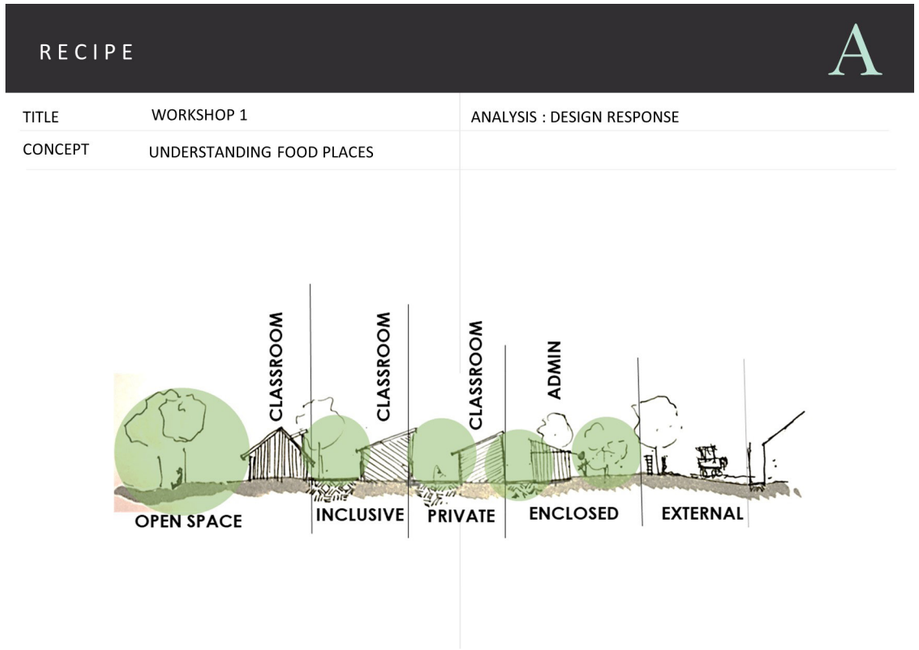


Fig. 31: The green spaces although limited internally Are activated and occupied with movement and swells of conversation and exchange (Author 2019)

Food Movement through Tsako Thabo Image These spaces were analysed according to guidelines produced by MASS Architects in response to health and safety protocols in food spaces during Covid-19 (MASS Design Group 2020.)

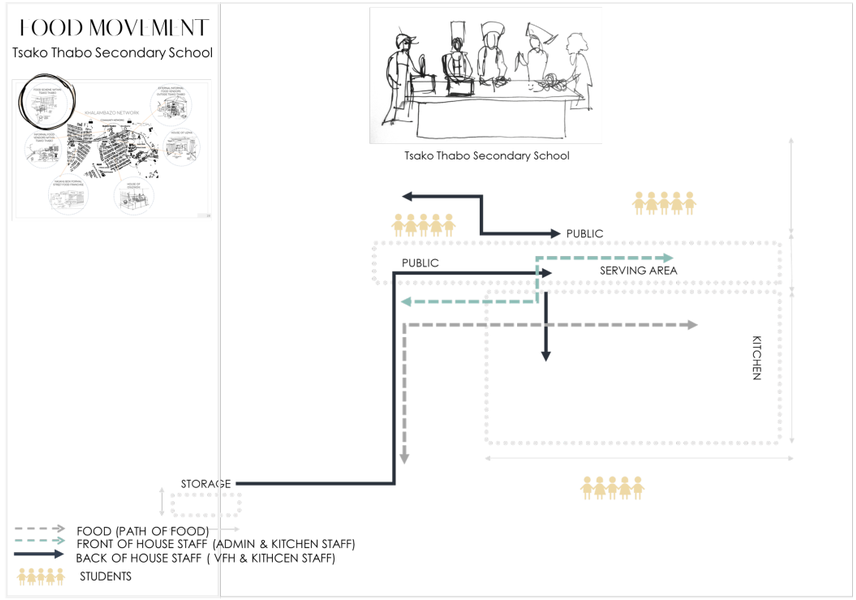


Fig. 32: The path of food, student & staff movement, and public & private spaces (Author 2019)

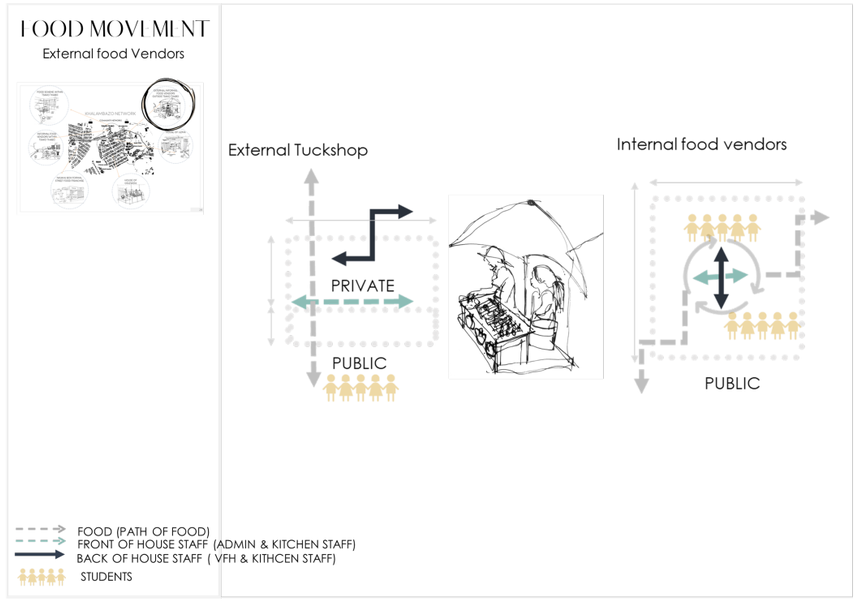


Fig 33: Food movement through internal school vendors (Author 2019)

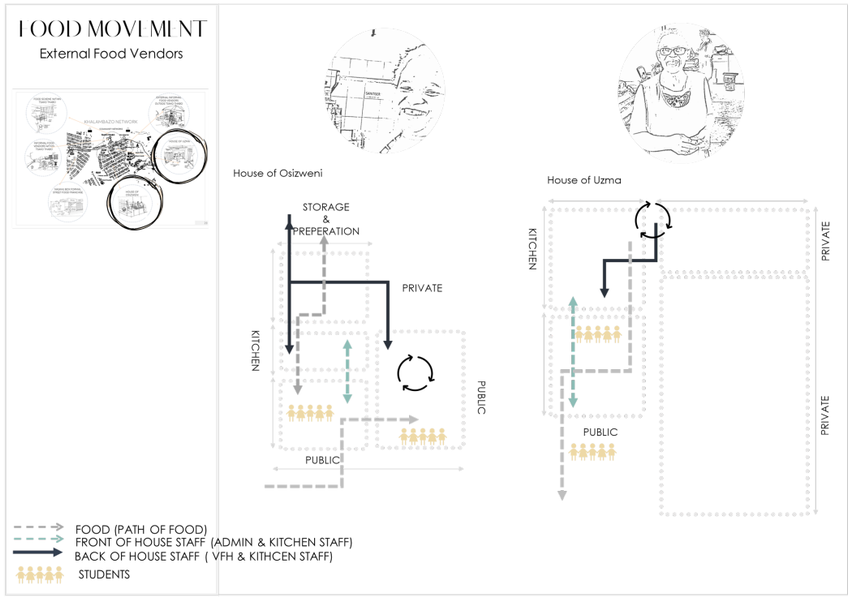


Fig 34: Food movement through external vendors (Author 2019)

The Flow of Production includes designated spatial areas to Preparation, Serving, eating and takeout with clear yet not physical boundaries for Public and Private spaces (MASS Design Group 2020). The interaction that exists in these layouts encourages social relations, knowledge exchange and overall provides food culture experience (Frerichs et al 2015).

Graphic Control and Access are instrumental as outcomes for implementing the food sovereignty program.

Workshop 2: Mapping food types and quantities

The students engaged in a build your plate activity that required them to interpret their nutritional content in the meals they consume daily.

Students are to place shapes according to food groups that they consume. The shape colours represent different food groups and the sizes quantities. The Idaho plate method is used as an indication of the proportion size of the main food groups in one's diet.
The method is commonly used as a teaching philosophy to students how to plan meals, the roles of nutrition, quantity, and proportions as well as the importance of health and wellbeing (Lanting et al 2007).

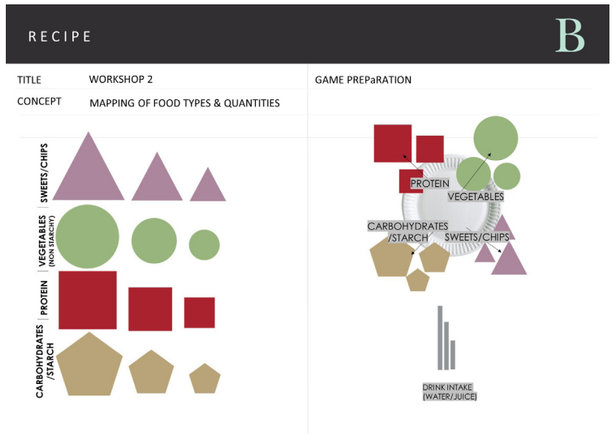
The workshop aided in understanding the importance of food among students. It allowed observation of food types consumed, alongside portion sizes. Seeing food intake from the student's perspective and gaining access to how food affects energy levels throughout the day thus effecting a student's concentration and productivity levels.

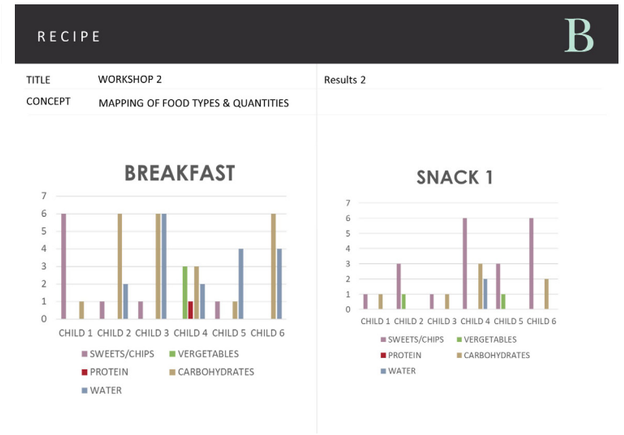


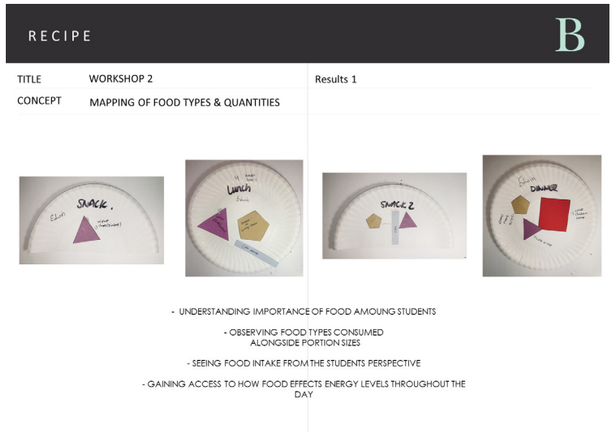


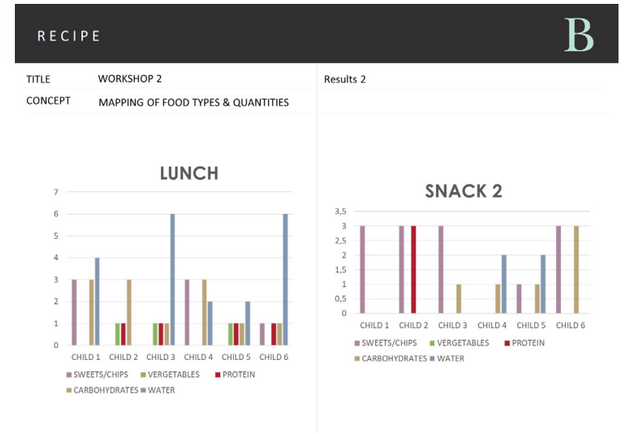
Fig. 20,21 & 22 SMIITH,K (2019)

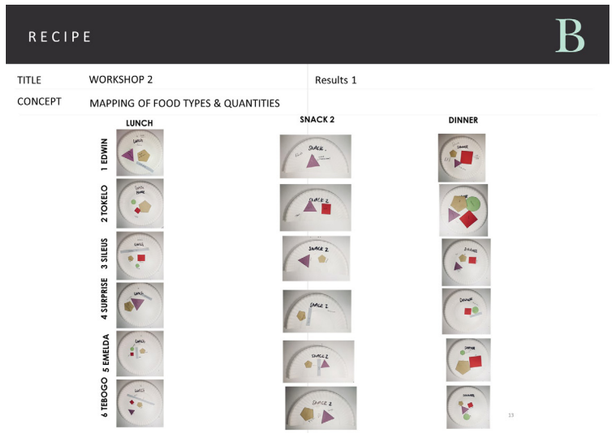
Fig 35: Workshop activities (Author 2019)











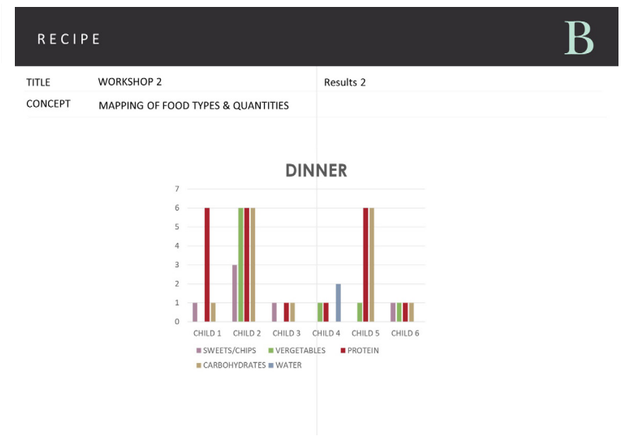


Fig 36: Workshop 2 activity & results (Author 2019)

The existing menu provides a precedent for the type of food crops and sources that could potentially be grown and harvested locally for the food served as part of the feeding scheme. The menu also confirms that there is enough nutritional intake for learners. Many students, however, consume a lot less water intake than required, and this would be a result of the lack of working and accessible running taps throughout the school.

Fig 37: Graphic interpretation of existing menu (Smith 2019)

Analogy of Breakfast

Gauteng 2019/2020 Provincial menu, Secondary school level

Monday & Wednesday

Creamy instant Maize Meal

Monday

(Vanilla)



10 g

Wednesday

(Strawberry)



Tuesday, Thursday & Friday

Instant Sorghum

Tuesday & Friday



10 g

Thursday



Analogy of Monday Lunch

Gauteng 2019/2020 Provincial menu, Secondary school level

Pilchard stew with rice and yellow vegetables in season

Protein



40 g

Vegetable/Fruit



80 g

Starch



60 g

Seasoning



5 g



1 g



2 ml

Analogy of Tuesday Lunch

Gauteng 2019/2020 Provincial menu, Secondary school level

Sugar bean stew with samp and green vegetables in season

Protein



40 g



Vegetable/Fruit



OR



80 g

Starch



60 g

Seasoning



5 g



1 g



5 g

Analogy of Wednesday Lunch

Gauteng 2019/2020 Provincial menu, Secondary school level

UHT milk or Pasteurized Amasi with maize pap and fruit in season

Protein



250 ml



250 ml

Starch





60 g



Fruit in season 1 each









Analogy of Thursday Lunch

Gauteng 2019/2020 Provincial menu, Secondary school level

Sugar bean stew with samp and yellow vegetables in season

Protein



40 g



Vegetable/Fruit



OR



80 g

Starch



60 g

Seasoning



5 g



1 g



5 g

Analogy of Friday Lunch

Gauteng 2019/2020 Provincial menu, Secondary school level

Soya mince stew with maize pap and green vegetables in season

Protein



40 g

Vegetable/Fruit



OR



80 g

Starch





60 g



Seasoning



5 g



1 g



5 g

ANALYSIS

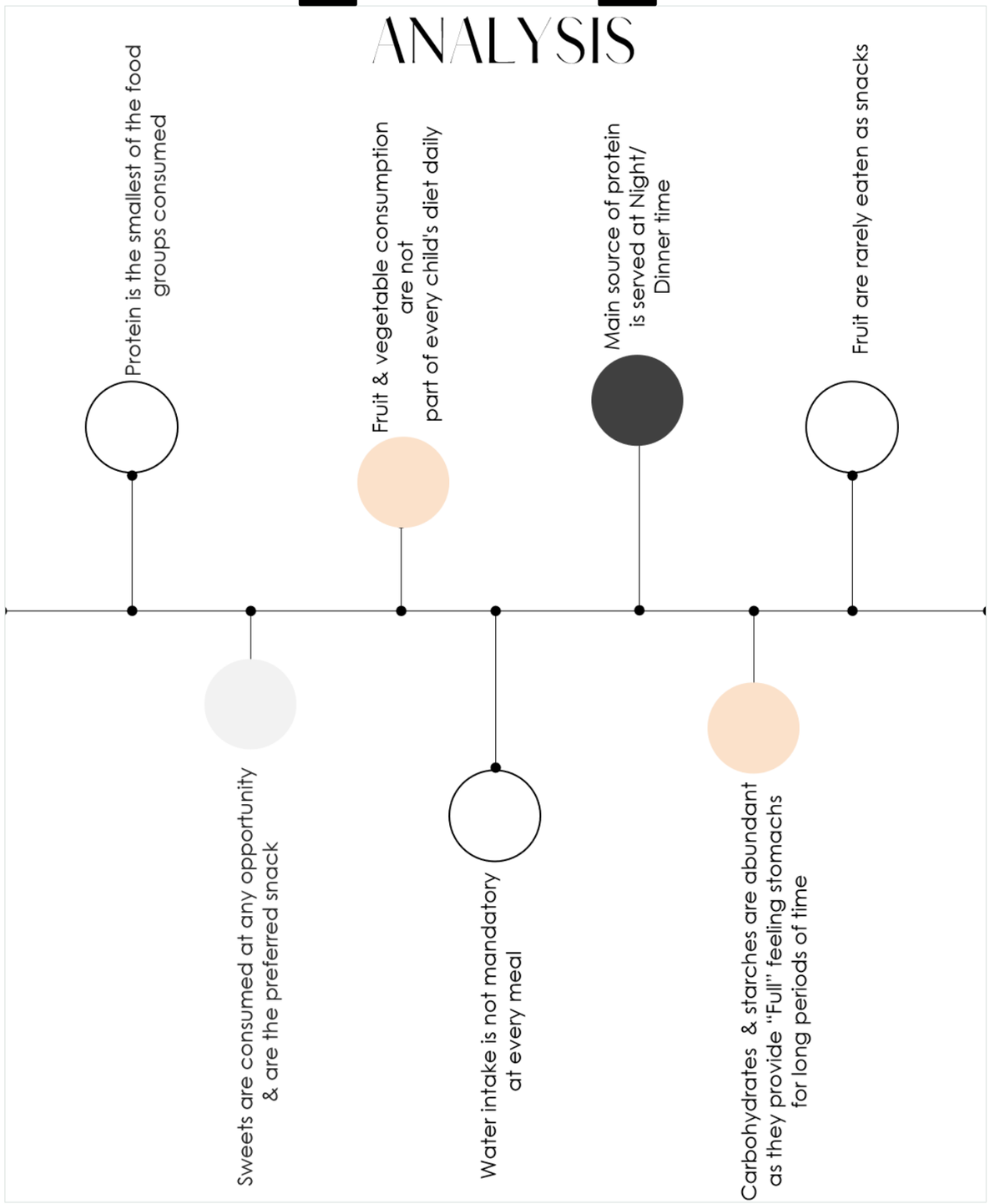


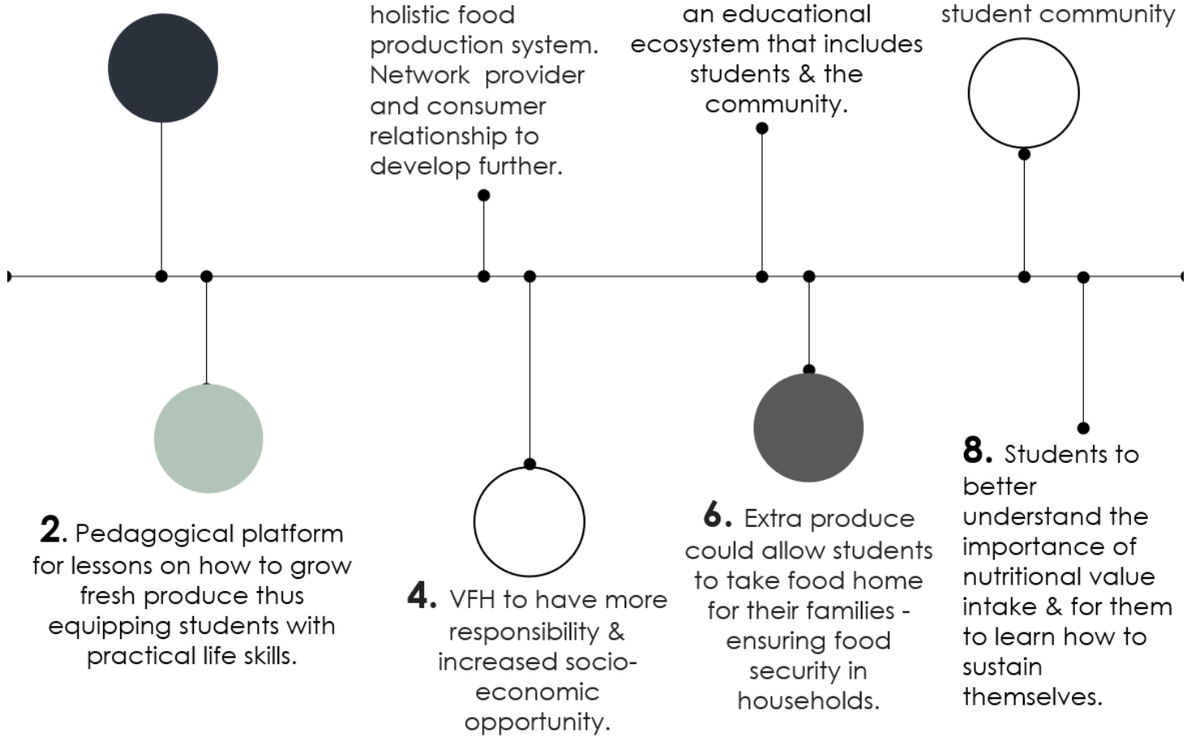
Fig 38: Menu Analogy (Author 2019)

SO WHAT DOES THIS MEAN?

The menu give an indication of the types of food that are served at a secondary school level for quantile 1-4 schools.

These meals are standardized by the government and are a result of the NSNPs outcome for school feeding programmes in South Africa.

The implementation of sustainable food production systems could provide opportunities for :



If food production was more of a focus in feeding schemes then perhaps they would be more valuable to the students . The feeding schemes would be a platform for nutritional education which is part of the life long objective.

Fig 39: Menu probable solutions (Author 2019)

There are two main food nodes at the school, internal school feeding and external vendor food.

The types of food consumed by students were identified in an attempt to understand food consumed alongside portion sizes and gaining access to the energy levels of students throughout the day. The standardized menu provides a precedent for the type of food crops and sources that could potentially be grown and harvested locally as part of the feeding scheme. Food is served twice a day for breakfast and lunch, as a result, we can see only 1 in 6 children consume protein in the morning while there is a high intake in carbohydrates. Many students prefer to eat at home or grab a "hot cake" on their way to school from external vendors, they say it tastes better and sustains them for longer periods (Smith 2020).

The workshop helped put into perspective the student's actual daily intake of nutrition vs what the NSNP provides for students. Conclusions/ observations can be deducted in terms of why students are not consuming school meals, why they prefer to eat from external vendors etc.

B
Workshop 3: Reuse, Recycle & Throwaway

This workshop indicated the students current understanding of food waste and recycling. It aimed to uncover what food is reused, recycled and what their interpretation of wastage and organic waste is.

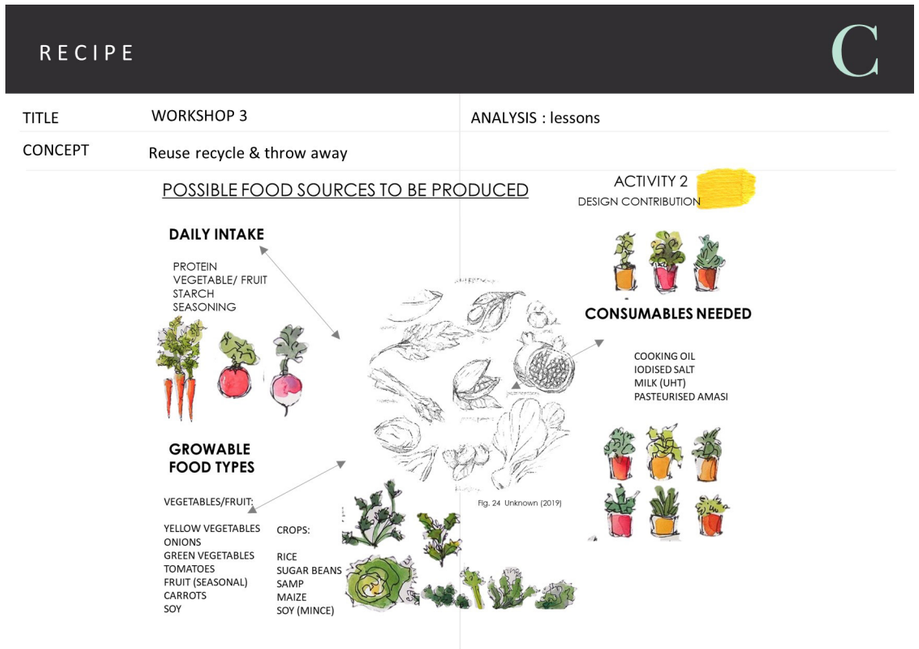


Fig 40: Workshop 3 Lessons (Author 2019)

The information provided indicates that students are aware of recycling processes yet there is no implementation of recycling on the premises. These sustainable habits are not practised due to a lack of programme and facilities at the school. Students' knowledge of the reuse of certain off-products from food was also very negligible. It is evident that the simple process of the decomposition of food or composting is not demonstrated in a practical way that students could have the possibility to learn from and instil at home in their personal lives.

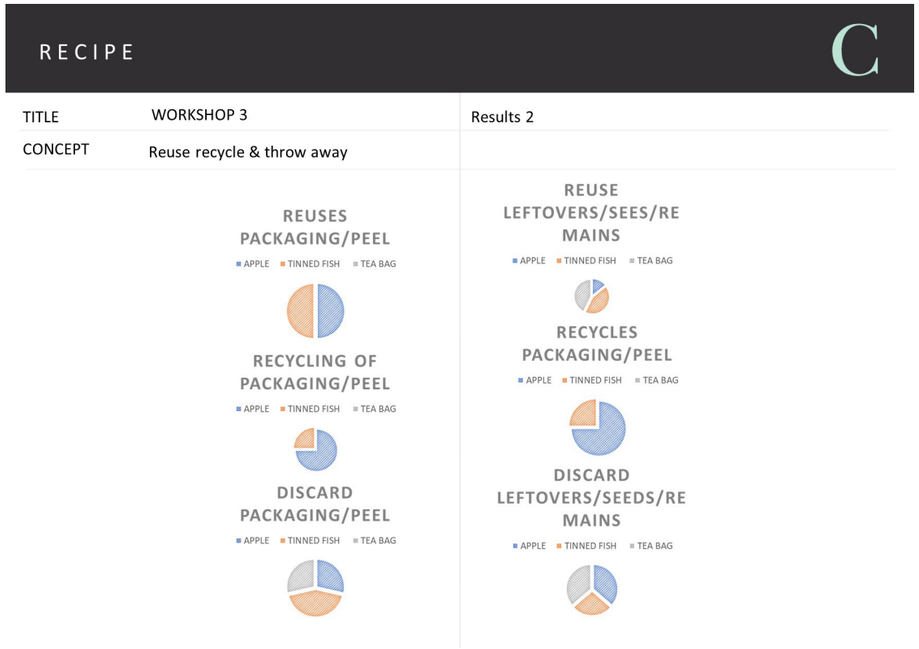


Fig 41: Workshop 3 Results 2 (Author 2019)

Workshop 4: Business & Entrepreneurship

Sir Ken Robinson says that the future of our economy is dependent on innovation & a person's ability to anticipate future concerns and have the skills and capability to implement solutions (Robinson 2010). This type of creative practical learning will allow for the creation of income, generating and skills training facilities that align with core subjects like, business management and home economics within the curriculum.

These core subjects aid in catalytically enhancing the learner's ability to be more focused and engaged as nutrition influences the psychological development and plays a vital role in a child's engagement and interaction (Birch et al 1970).

They took part in entrepreneurship role-playing games that surfaced information regarding what food types students mostly consume and buy.

This workshop intention was to engage in the curriculum in a fun and practical manner to encourage social, practical learning. The specific workshops focusing on entrepreneurship helped identify the possibility of identifying an interest in subjects like business management and home economics and how subjects like these embrace a different approach to learning and teaching.

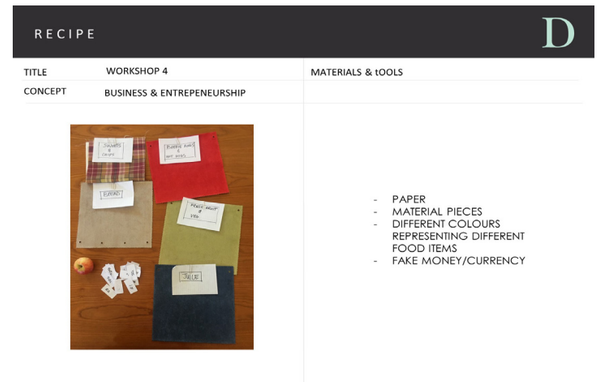


Fig 42: Workshop 4 Materials & Tools (Author 2019)

The workshop used the co-design game theory of Roleplay in which some students took on the role of the vendor and sold different food sources and would stock a specific food category in a variety of sizes and prices. The students came up with their own pricing for the items based on what they are familiar with, in the school environment. Other students would play the role of "students" purchasing these items during the school day. All school children were given R15.00 to purchase food. This amount was based on the average amount the students in the workshop were given.

The objective of the workshop activity was to see from a vendor's point of view, who was able to sell the most food, making the most profit after expenses. From the buyer's perspective, who can purchase the most with the given amount of R15.00.

The activity encouraged camaraderie among the participants involved and demonstrated the ability of the students to negotiate and to be a part of the food cycle not just on the receiving end. Skills that encourage social interaction should also be valued as a key learning objective in a student's curriculum. The activity also demonstrates the simple lesson of the value of money, the distribution of it and how far it can go through intellectual negotiation and ways to intuitively save money.

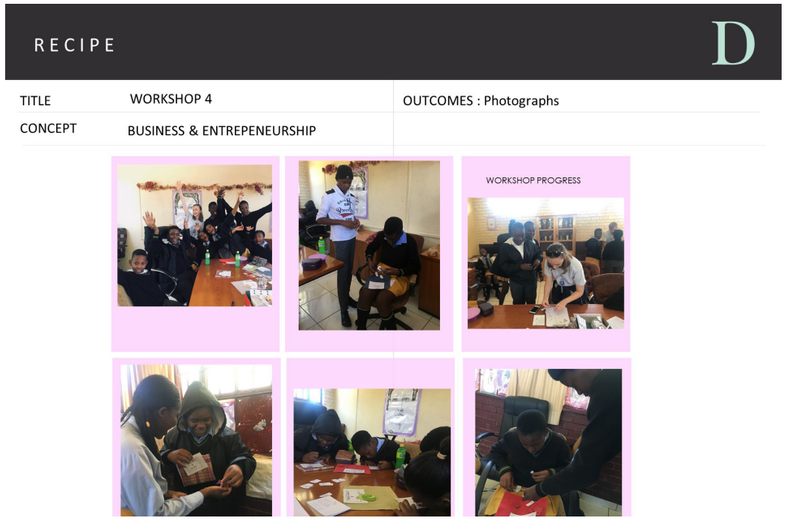


Fig 43: Workshop 4 Photographs (Author 2019)

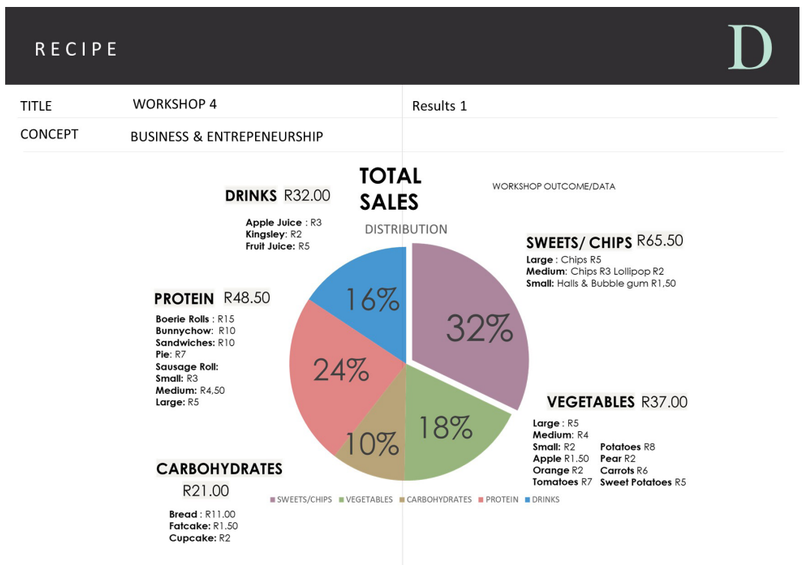


Fig 44: Workshop 4 Results 1 (Author 2019)

C
Workshop 5: The cookie-cutter approach

Deals with the conventional vs the unconventional. Breaking the mould essentially in terms of the education system, the idea of an ideal student and the curriculum fed into schools.
The students were to draw a normal cookie cutter shape as a model, a typical conventional shape they were familiar with. The activity aimed at students understanding of standard norm vs variability. Understanding of freedom of creativity, speech and promoting individualism and uniqueness.

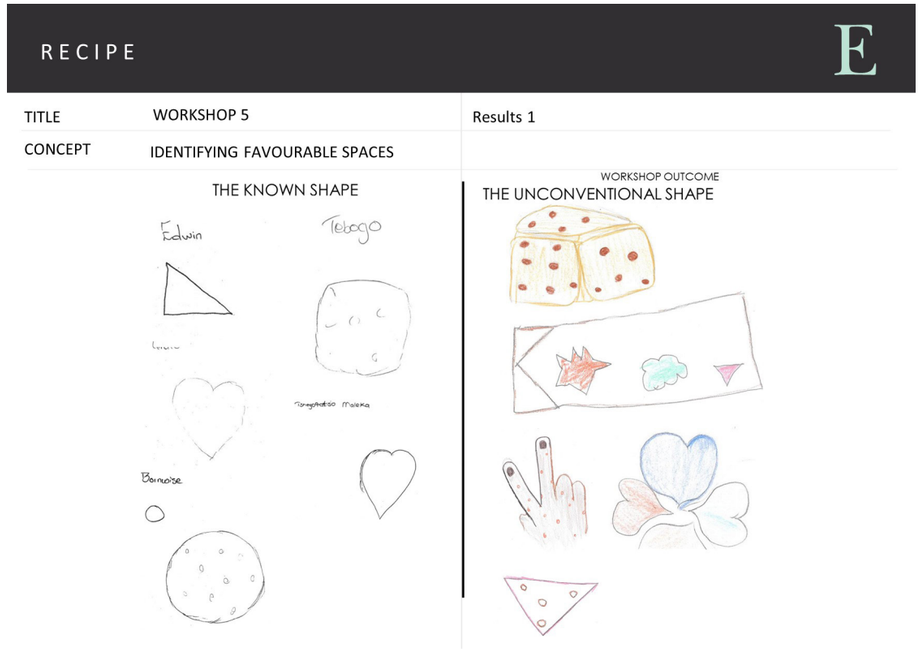


Fig 45: Workshop 5 Results 1 (Author 2019)

The unconventional/broken mould demonstrates how perfect moulds & cookie cutters lack individuality and that school system should maximise the protentional of all students.
The activity showed the need to develop confident learners who thrive in their particular strengths and not try to change themselves or their strengths by moulding them into the status quo shape. By embracing the individual, more confidence is shown and taken. Education and learning are part of an organic process. Encouraging practical learning allows students to engage with skills to help them sustain their lives (Carson 2016).

The cookie-cutter approach was used to prioritize the aim of developing confident learners who strive in their individual capacity and not the status quo. The cookie-cutter theory states that Education and learning is part of an organic process (Robinson 2010).

The unconventional "broken" mould demonstrates a lack of individuality and encourages the school system to maximise the potential of all students creating awareness for a shift in the core standardization curriculum.

Workshop 6: Identifying Food spaces

Students also participated in drawing activities that highlighted probable areas within the school and community in terms of spaces that are socially inclusive, private and public.
This workshop allowed the students the opportunity to draw freely as their imaginations call. Identifying spaces that the students would like to see included in and around the school, facilities, programme, ideas, spatial perception. Allowing the students to draw freely, beyond the boundary, just as their imaginations call.
This activity allows in section, to see a possible programme in proportion and to gain perspective on how an activity is perceived or could be perceived in those spaces.
The students identified the following: The classrooms as a modular confined space, the library as the quiet interactive space. The water fountains as small break moments and the green spaces as open and possible activated spaces.

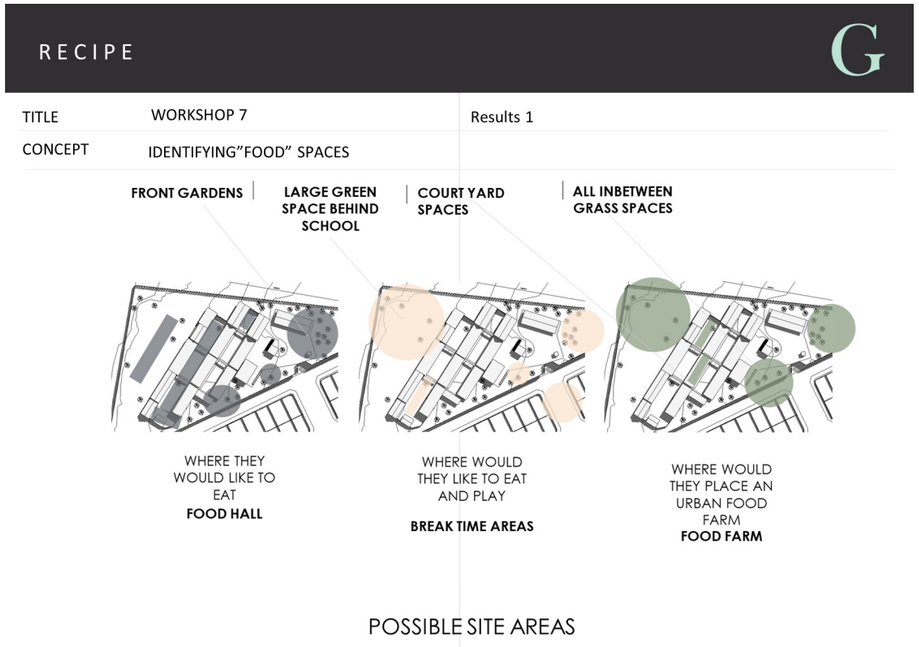


Fig 46: Workshop 7 Results 1 (Author 2019)

D

Workshop 7: Identifying Food Spaces Part 2

Identifying spaces that the students would like to:
1.Eat, formally and informally

2. Play and eat; Multipurpose spaces used to do recreational activities, spaces to chill and spaces that allow for eating and enduring in break time activities.

3. Food farm; Implementation of an urban farm in which students and staff take part in the growing, preparation, production and distributing of produce in which it allows for practical learning to take place to foster socio-economic opportunity.

Workshop 8: Building Food places

Identifying possible locations for food prep, eating and storing.
Furthermore, they engaged in building scale models out of cardboard materials to translate their interpretation of what food preparation, consumption and distribution spaces should be. Conversations and engagement with the students are key as a means to allow the learners to imagine the space themselves. To take into consideration the type of space and environment they relate to and would want. In small groups the students-built models that would be your ideal food hall. They were told to include spaces that one can cook, eat and teach from the perspective a different role-player. Each member was given a role to play as follows:

1. Chef/cook 2. Student 3. Teacher

This demonstrated if students understood the requirements needed for a functioning food hall. It calls for a creative, inclusive approach that plays on the concept of an all-in-one teaching eating space.

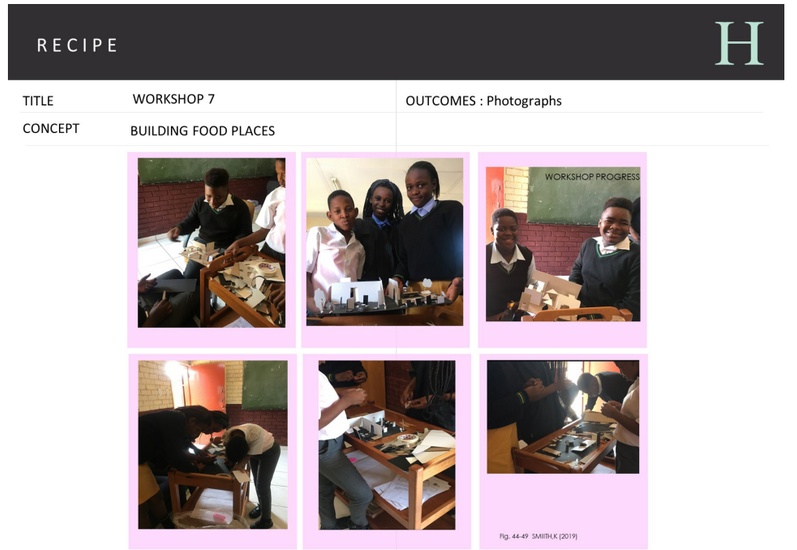


Fig 47: Workshop Photographs (Author 2019)

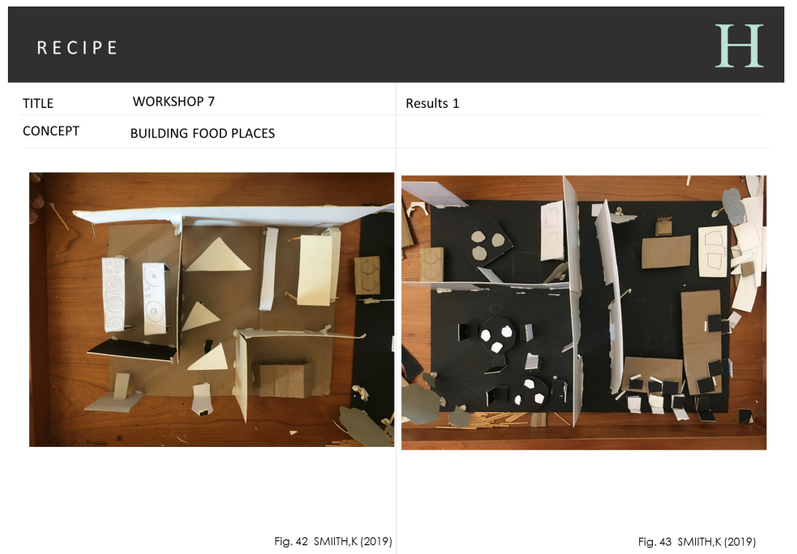


Fig 48: Workshop 7 Results 1 (Author 2019)

Results & Discussion

As a result, students are not all receiving the intended nutritional intake as prescribed in policy. Volunteer food handlers have limited resources and space to prepare meals and students suffer as a result of social hierarchy and bullying in the food distribution lines. A lack of resources and spaces results in increased chaos during lunchtimes and encourages students to purchase food from informal vendors that do not substitute the nutritional intake required.
The findings show that although certain programmes and policies are in place in order to feed students in assigned schools, the neglected spatial requirements attached to these are resulting in an unsuccessful implementation of school feeding programmes as well as shed light unto the inaccessibility of school feeding during non-school days and in current circumstances, during a global pandemic.

CONCLUSION

SDG'S

SUSTIANBALE DEVELOPMENT GOALS



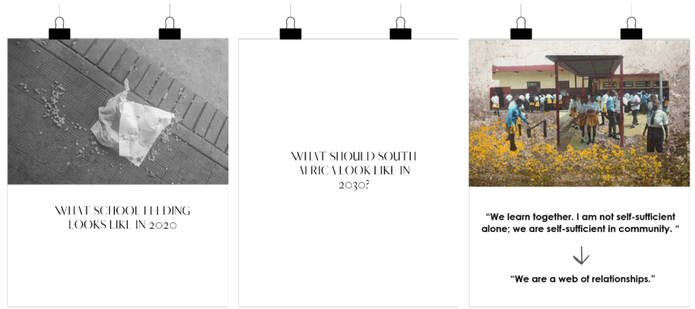
"We are loved, respected and cared for in our homes, communities and public institutions. "

"We are connected by the sounds we hear, the sights we see, the scents we smell, the objects we touch, the food we eat, the liquids we drink, the thoughts we think, the emotions we feel and the dreams we imagine."

"We enjoy our environments varied climate, landscape and vegetation. We live and work in it, with care, preserving for future generations. As it gives life to us, we honour the life in it."

2.6 Site Intentions

The sustainable development goals (SDG's) opening vision statement is inspired by a radical approach to transformation? (Fioramonti 2017). What should South Africa look like in 2030?



Through a series of aspirations, the outcomes emphasize that we are self-sufficient as a community. Going forward the overall possibility of an improved more inclusive food programme without physical boundaries allows for the program to start spilling out into the existing surrounding green areas around the periphery of the school and the community. By extending the food system there is a potential to reconnect people with natural and human systems that keep them and their communities alive, healthy and thriving (Frerichs et al 2015).

Through this, we can start to build resilience into communities with the intention to help people cope with the shock that compromises critical life-sustaining systems.

Fig 49: Sustainable Development goals (Author 2019)

NYBG EDIBLE ACADEMY

PRECEDENT











Fig 50: Edible Academy (Robertson 2016)

2.7 Urban Precedent

The New York Botanical Garden (NYBG) Edible Academy is an educational facility focused on urban edible agriculture. It provides practical learning opportunities for community members to understand the fundamentals of vegetation, the gardening of them in sustainable manners and the nutrition and health to these processes. Facilities like these encourage, not only once off healthy eating, but a lifelong interest in maintaining nutritional health and creating awareness around the subject of nutrition (Robertson 2016).

The site boasts indoor and outdoor facilities. Has sustainable infrastructure, sustainable building technologies and is resource efficient. The focus is on the main teaching classroom which is LEED certified and propagation greenhouse but also provides community gardens open to the community. The site similarly to Tsako Thabo is sloped to the Bronx River. External pavilions provide additional spaces for other activities, demonstrations or events to take place, their layouts are open and adaptable.

The teaching classroom is environmentally sustainable with its technology, green rood, geothermal heating, porous pavements. The programme offers year-round educational gardening classes and programs and includes STEM educational activities in their lessons on growing and cooking thus providing learners with practical learning opportunities that will foster life-long skills(Robertson 2016).

Chapter 3



THEORETICAL APPROACH

Introduction

Over nine million students in South Africa are dependent on school feeding schemes (Spaull 2020). In the rural Education policy 2005 (Mandela 2007), Madiba argued for a holistic approach to special circumstances in underprivileged communities. He emphasized the need to capitalize on the resources currently available within these communities instead of disregarding them.
This dissertation explores the potential role for architecture to address the challenge of undernourishment, unaffordability of food and the lack of locally produced and sourced food. It highlights ways in which architectural design and systems could support healthy and safe food production, consumption and storage within school communities.

In 1994 South Africa implemented the National School Nutrition Programme which ensures nutritious meals to students within Quantile 1-4 schools as articulated by the government (DBE 2014). Over 9 million learners receive these meals daily as part of the school program. During the COVID-19 Pandemic an estimated 60% of those learners were affected by not receiving these meals due to lockdown circumstances (Spaull 2020) and the schools' lack of spatial requirements to provide healthy, sanitized and social distancing facilities further delayed the process. It is assumed that when policy creates a program and implements It within schools it is deemed to be successful. Andy Tembon, World Bank senior health specialist states that we are at the stage where the debate is no longer about whether school feeding is important but rather how best to design and deliver school feeding in normal circumstances and during the current global pandemic (World Bank 2020).

Following on the research and workshops that were undertaken as part of a mini dissertation towards a Master of Architecture degree, this dissertation uncovers the spatial negligence in schools around school feeding and the effect that it has in ensuring that these feeding programmes are implemented successfully.

The research was undertaken through participatory action research (PAR) that engaged students in Tsako Thabo secondary school environment in the township of Mamelodi East, City of Tshwane, South Africa. The school was chosen as a case study due to previous engagement with the school during the architecture honours programme, its relation to the Mamelodi Learning Collaborative (MCLC) and ongoing involvement with the University's Joint Community Project (JCP) module.

The research aligns with the current discourse of the National School Nutrition Programme (NSNP), the Department of Basic Education (DBE), the National Research Foundation (NRF) and the Peoples' Food Sovereignty Act (SAFSC 2018) alongside the South African Food Sovereignty Campaign (SAFSC) that are all actively attempting to reinforce the implementation of school nutrition programmes and systems throughout South Africa (Devereux et al 2018).

3.1 Intersection between Architecture and Food

The dissertation aims to identify where the gap in knowledge regarding the intersection between architectural design and food consumption in schools.
It unpacks food sovereignty from the Nyéléni Framework perspective. Also, it assesses food and nutrition from a policy point of view provided by the DBE through a programme called the National School Nutrition Programme (NSNP). All these frameworks that address programme, spatial implementation, and theoretical premise form the basis for a developed framework that outlines the intersection of food and architecture from the perspective of the user of a school feeding scheme in the South African Context.



3.2 Research Theory

Research Frameworks

Food Sovereignty refers to the healthy and culturally appropriate food within communities (SAFSC 2018) as well as food sources that are ecologically and sustainably grown. It emphasizes the right of people to define their own agricultural and alternative food systems. Food sovereignty implies new social relations between social classes and generations.

The Nyéléni declaration 2007, is the outcome of a food sovereignty movement that laid the foundation for a framework that focuses on shifting debates on democratic food governance by altering the focus of food sovereignty to embrace whole food systems which prioritize and include the roles of the consumers and providers (Dekeyser et al 2018). The Nyéléni definition of food sovereignty includes the importance of rights, the issue of how power is exercised and the importance of spatial requirements/dimension and the distribution of resources with importance placed on the localisation of production (Dekeyser et al 2018).

Thus, space, right, power and distribution are representative of fundamental elements needed to be restored within school communities in an attempt to achieve a holistic educational ecosystem that prioritizes the wellbeing of the students. Through the adaptive- reuse of existing schools, Re-imagining School Feeding focuses primarily on programmes that emphasize on saving, producing, and preserving resources (Carson 2016).

Food Sovereignty development in feeding schemes

The concept of food sovereignty is based on the right to food and provides solutions to food insecurity. The concept calls for reconnecting local and global food security, social justice, and citizen participation in food governance. It was a response, post-world war two, through the generation of a food policy which advocated for the right to freedom of hunger (Dekeyser et al 2018).

In 1994, The Nelson Mandela Rural Education policy alongside the DBE implemented the National School Nutrition Program (NSNP) as a response to the critical need for nutritional food sources specifically in rural areas. The NSNP has 3 main outcomes, **School Feeding, Nutritional Education and Sustainable Food Production.**

94% of the funding is prioritized to School feeding, thus limiting the others. Spatial and user negligence currently prohibits the success of a potential holistic Feeding Program in Tsako Thabo.

The NSNP National School Nutrition Program provides meals to learners in quintile 1-4 schools. The DBE divides all government schools in underprivileged areas into quintile 1-5 categories. The NSNP program ensures learners in quintile 1-3 and non-fee-paying schools are guaranteed nutritional meals while at school. Tsako Thabo secondary school is a quintile 4 non-fee-paying school and thus benefits from the NSNP programme. Furthermore, than the programme itself, there are two models of the NSNP feeding scheme, a centralised and decentralised model. Gauteng follows the centralised model in which the produce and resources for the feeding scheme are contracted out on a tender basis. This process is internal and controlled and would favour the most economical option. The decentralized model grants the allocated budget for the program to the school and they then procure food produce & system costs independently. This process is external and has the freedom for independent sourcing & procurement of foods (DBE 2018).

The centralised model prevents the schools from having the right to independently choose the way they obtain the food sources thus limiting the socio-economic opportunity in their respective communities. Decentralised systems are more likely to adapt to changing needs, showing flexibility and resilience (Fioramonti 2017).

Nutrition Education

It was Nelson Mandela who during a speech in 2003 at Wits university, declared that education was the most powerful weapon one could use to change the world (Mandela 2003). To equip children with the engine for development (Mandela 2007) is to equip them with knowledge and practical learning thus engraving habit and means for a sustainable life. Through architectural design, it is possible to explore this phenomenon of change. Jeremy Till in the spatial agency states that to do so we need "To show architectures capacity for transformative action" (Awan et al 2011).

The United Nations World Food Programme acknowledges that School feeding programmes contribute to the well-being and education of children (WFP 2019). There is a significant correlation between poor health

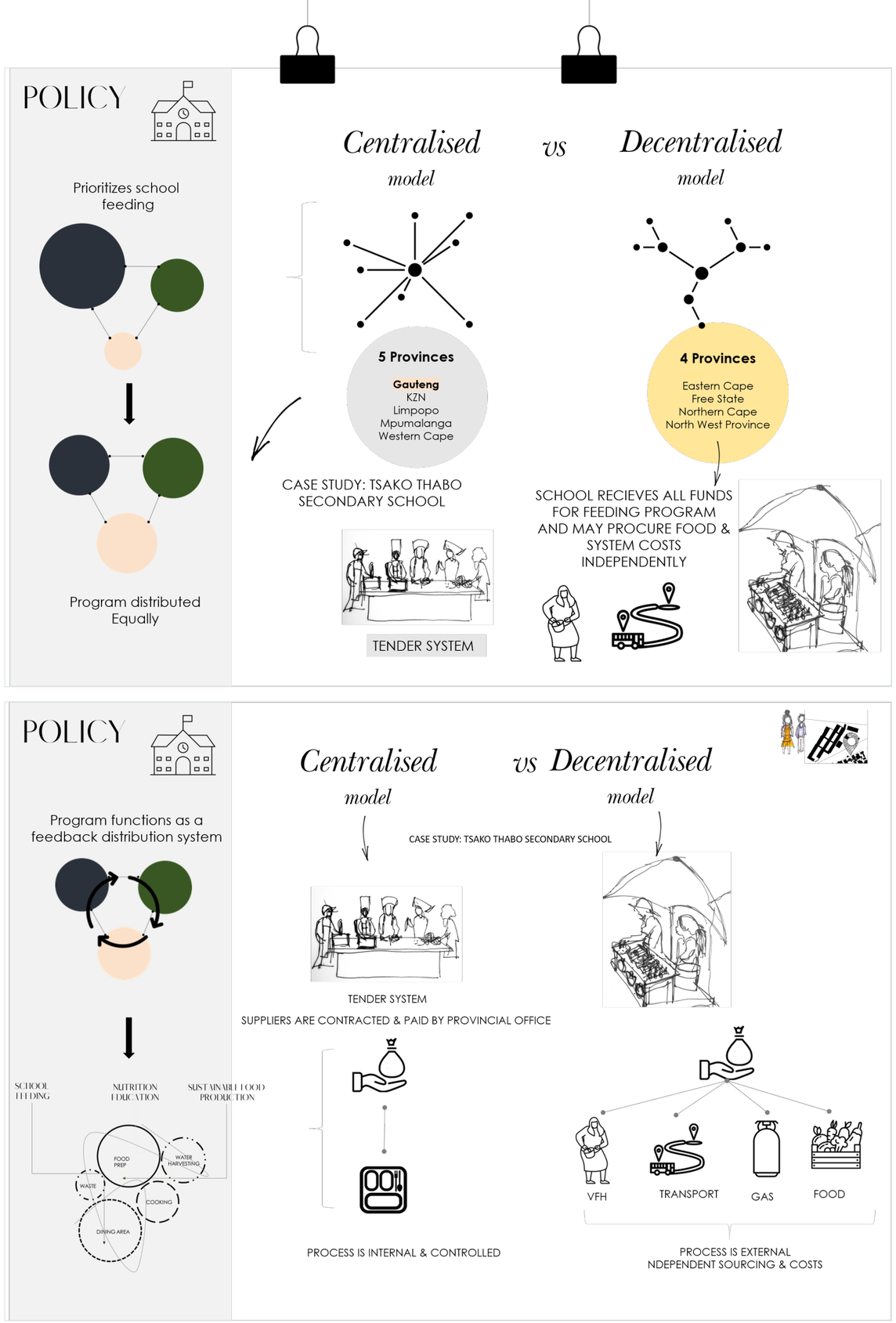


Fig 51: Centralised & Decentralised models (Author 2020)

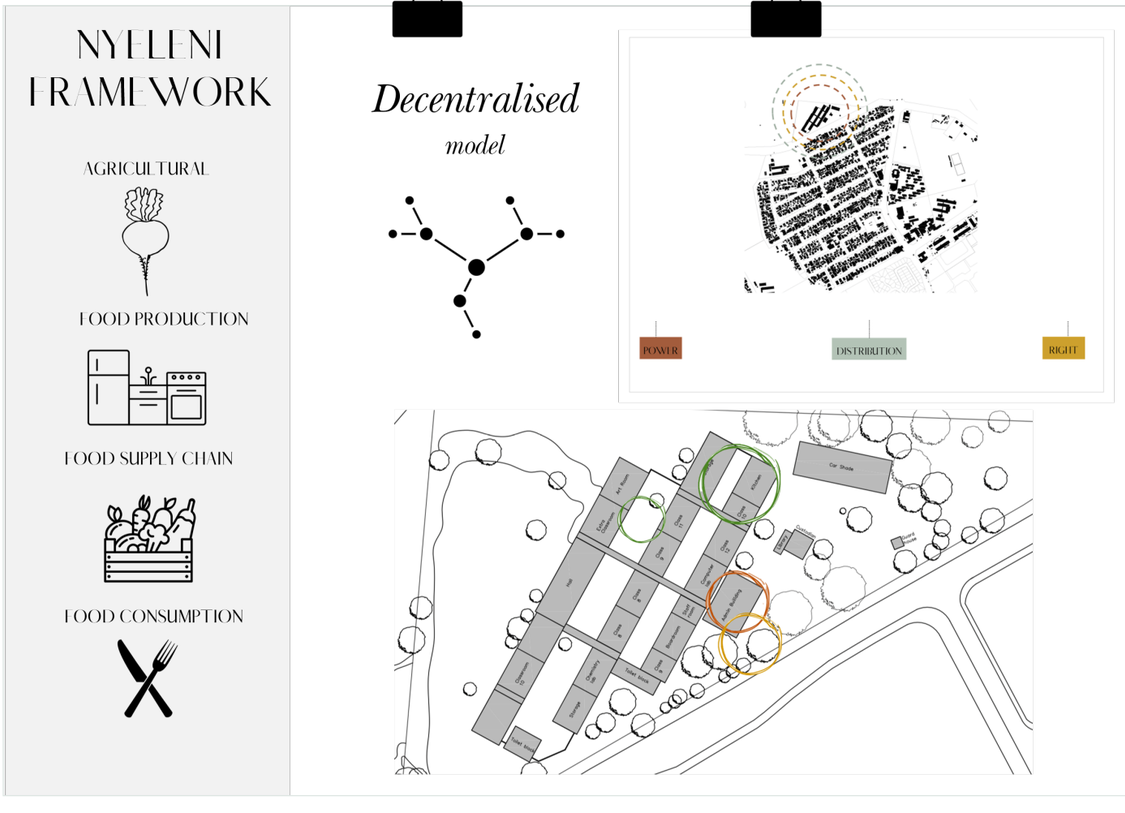
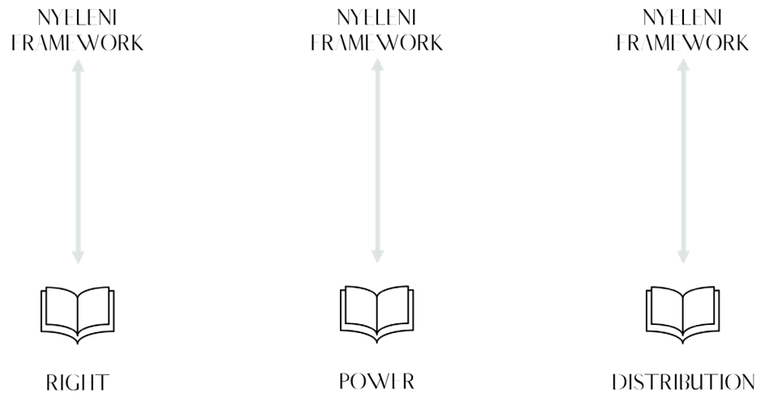


Fig 52: Decentralised school concept (Author 2020)

Overall, by promoting nutritional education and wellbeing amongst learners as well as reinforcing the implementation of nutrition-related interventions (Claasen et al 2016), will subsequently enhance the students' understanding of food as part of a greater educational ecosystem that promotes innovative learning (Birch et al 1970). It will also contribute to positive school enrolment, attendance, alertness, and learner performance.

The main outcomes of the Nyéléni framework include: Right, Power, Distribution and Space and are analysed according to the main the 3 outcomes of the NSNP programme: School Feeding, Nutrition Education and Sustainable Food Production. This analysis allows us to understand the place of food sovereignty concepts of right power and distribution and how it fits into the current programme implemented into schools.



conditions and performance in schools (Unchs 2000). The DBE acknowledges that effective learning and teaching cannot happen if learners are hungry (DBE 2011).

Right

1. School Feeding:

NSNP, DBE, NRF are all actively attempting to reinforce the implementation of school nutrition programmes and systems throughout South Africa. The promotion of school feeding programmes in quintile 1-4 schools gives students the right to healthy meals daily to ensure nutritional food consumption.

2. Nutrition Education:

The Nelson Mandela institute was launched as a response to the education crisis evident in rural Africa (Mandela 2007) and the NSNP was thus developed to activate for the right of food to prevent hunger.

In schools, subjects such as Home Economics and Business Management are few of the subjects offered by the DBE but not made available to all students at all secondary schools due to a lack of resources or interested numbers. Practical learning as a teaching tool to students is vital as it encourages practical learning and allows students to engage with skills to help them sustain their lives (Carson 2016).

Such Pedagogical methods challenge curriculum reform in the current education model. Which is what is perhaps needed to reinstitute the availability and inclusion of practical learning subjects in all schools to provide equal education opportunities.

3.Sustainable food production:

The South African People's Food Sovereignty act refers to Food Sovereignty as the healthy culturally appropriate food within communities (SAFSC 2018) as well as food sources that are ecologically and sustainably grown. It emphasized the right for people to define their own agricultural and alternative food systems.

The United Nations and food agriculture organization as well as government support this framework and legislation that embraces food sovereignty principles.

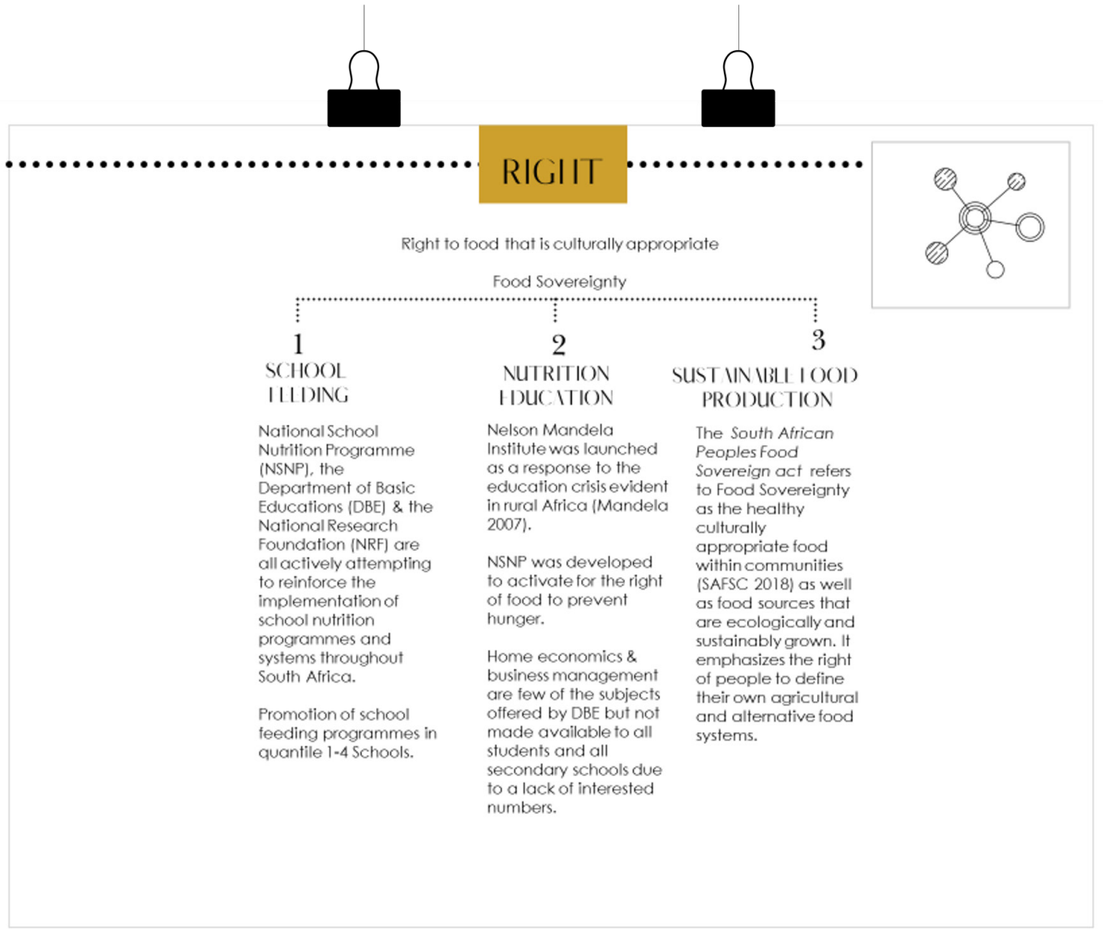


Fig 53: Initial Right framework (Author 2019)

Power

Those who produce, distribute, and consume food are at the heart of the System and its policy.

1. School Feeding:

The aim is to value local food providers and communities in the process of food making from seed to harvest to plate. This approach is more inclusive, economical, and educative to all involved.

It requires creating strategies for schools to have the power to decide on shaping what food students choose to eat and ways of accessing and consuming it.

2. Nutrition Education:

Empowering students to be the masters of their destiny. To equip students with the skills and abilities to empower themselves later in life.
3. Sustainable food production: The Rural Education Policy Emphasized the need to capitalize on the resources currently available within these communities instead of focusing on defaulting and disregarding them. By giving the community the power to contribute to a variety of means it will allow the societal wellbeing economy to flourish and form a sustainable loop of feedback.

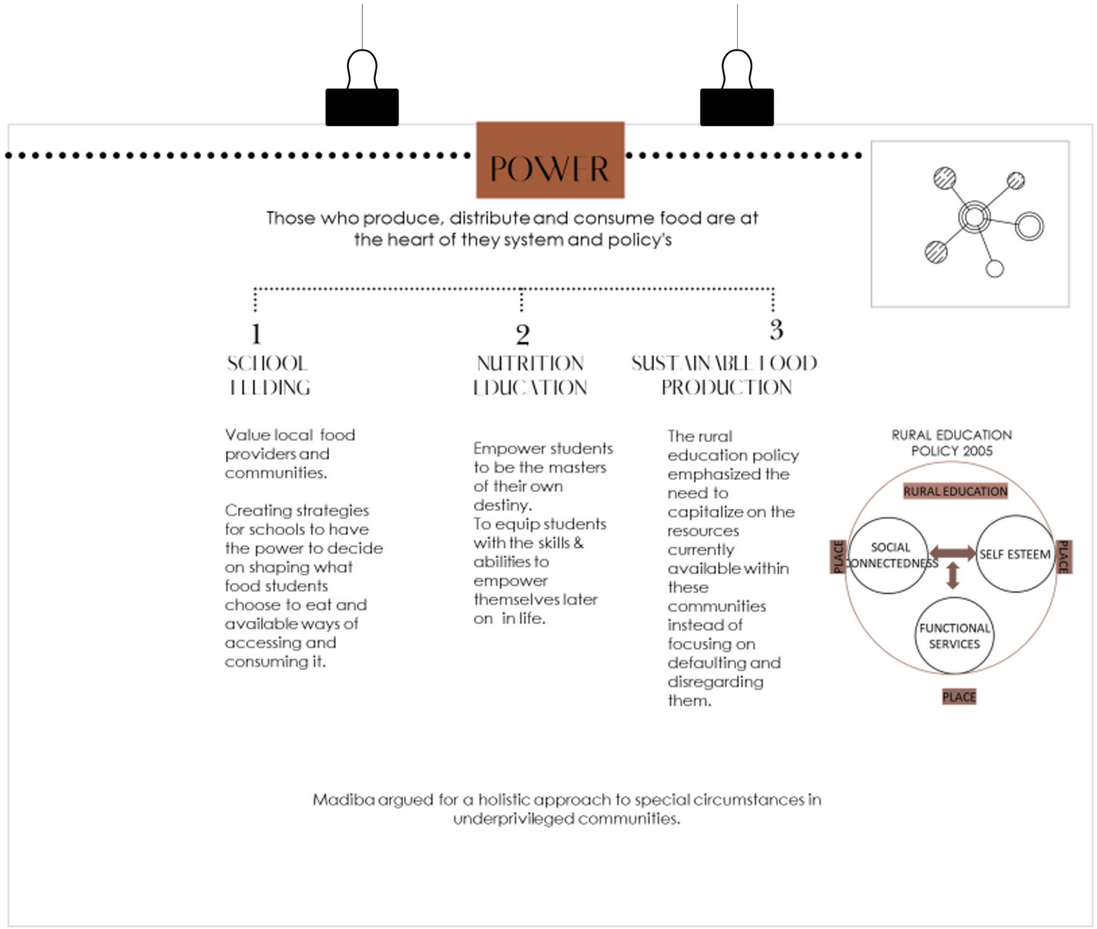


Fig 54: Initial Power framework (Author 2019)

Distribution

1. School Feeding:

Right of the consumer to control their food and nutrition intake. (Glipo et al 2005)

2. Nutrition Education:

Right for students to learn basic production skills and be able to foster these skills throughout the education and to have the opportunity to practise them beyond the school borders and use them as a basis for surviving in the future. Whether learners will continue to a tertiary education or if they find themselves in the working world, it is a crucial life skill to understand the process and importance of preparing, serving, distributing and eating nutritious foods to sustain oneself.

3. Sustainable food production:

Right to use and manage our land, biodiversity and that those elements are in the hands of those who produce (Glipo et al 2005). Schools should have the option to choose whether to insource or outsource their food sources and crops irrespective of whether they are in a specific region or province they fall under.

The local community is prioritized as the main level of decision making. It places the control and access to the means of manufacture in the hands of the local producers (SAFSC 2018), much like the role of authorship in the co-design paradigm, where the user of the space should be empowered through the process.

The developed framework illustrates the connection between architecture and food sovereignty within a secondary school context. It has been established to understand where the gaps and intersections are and woven together in that the result is a framework that leads to a programme for growth, preparation, production, and distribution within a secondary school feeding scheme context.

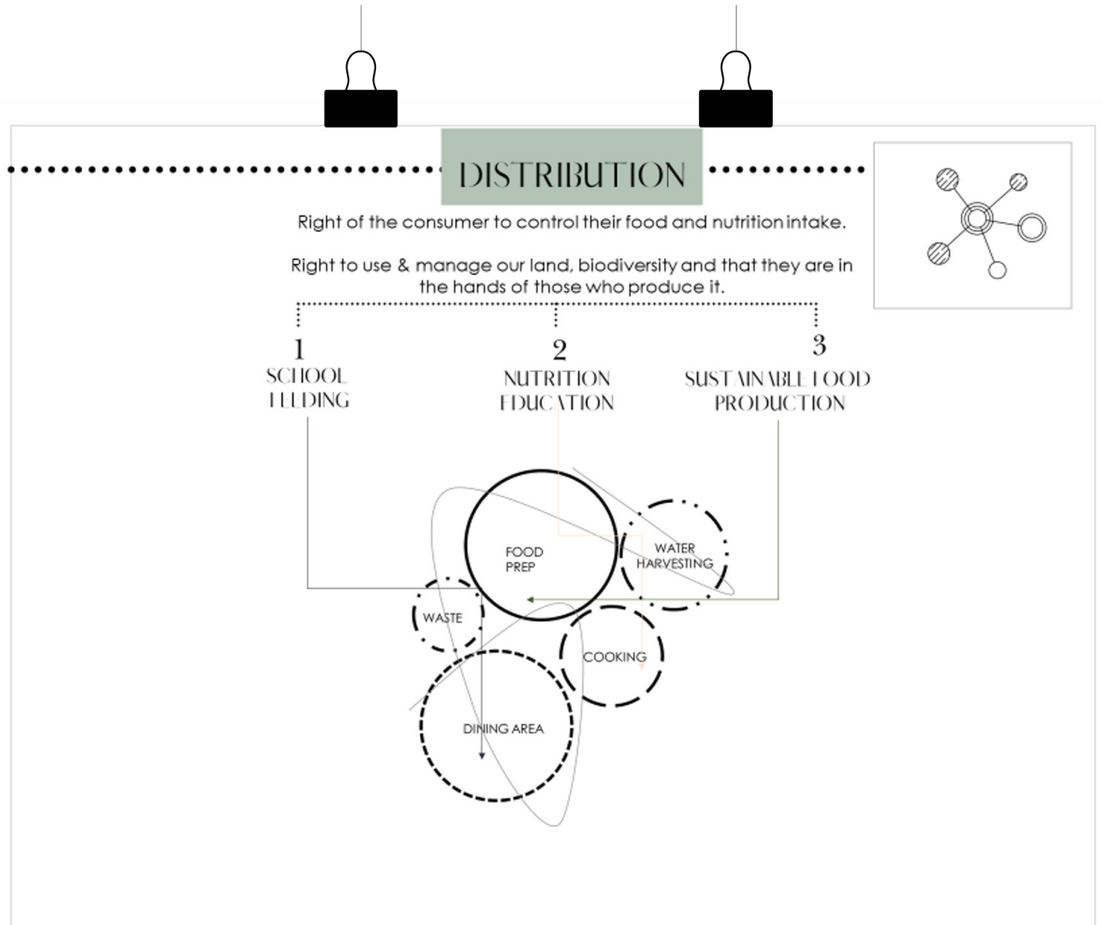


Fig 55: Initial Distribution framework (Author 2019)

Space

For the current NSNP programme to be fully successful in its implementation, it would require the promoting and reinforcing of nutritional education and sustainable food production to carry the same weight as school feeding. This could be possible through interventions in which it would subsequently enhance the success of the NSNPs programme.

The fourth outcome of the Nyéléni Framework is Space. Space can be analysed according to what policy dictates as a requirement for certain programmes. The DBE and NSNP set out the following spatial requirements for food within all secondary schools across the country.

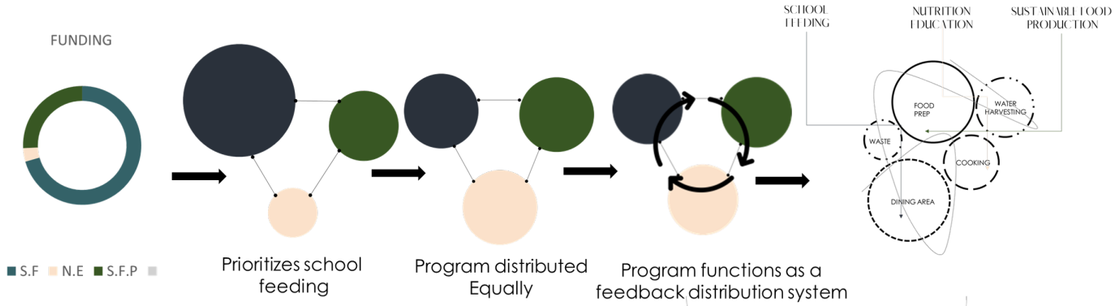


Fig 56: NSNP Funding Distribution (Author 2020)

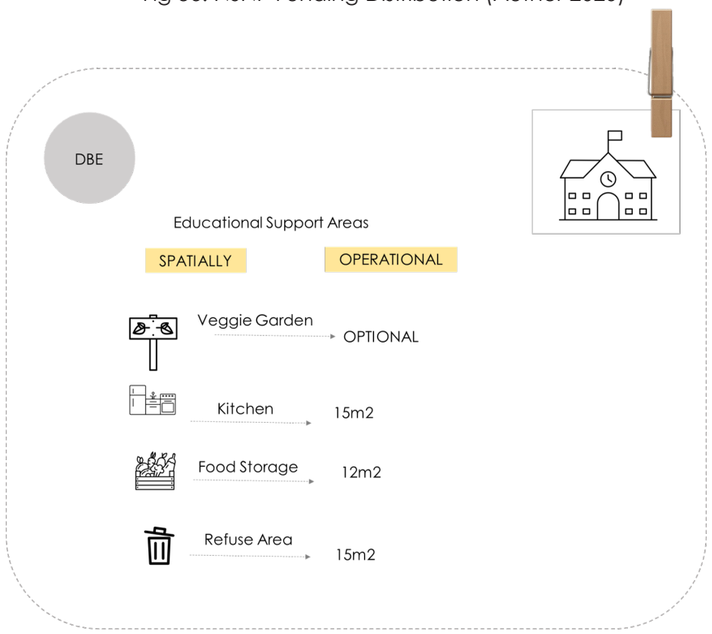


Fig 57: DBE spatial requirements (Author 2020)

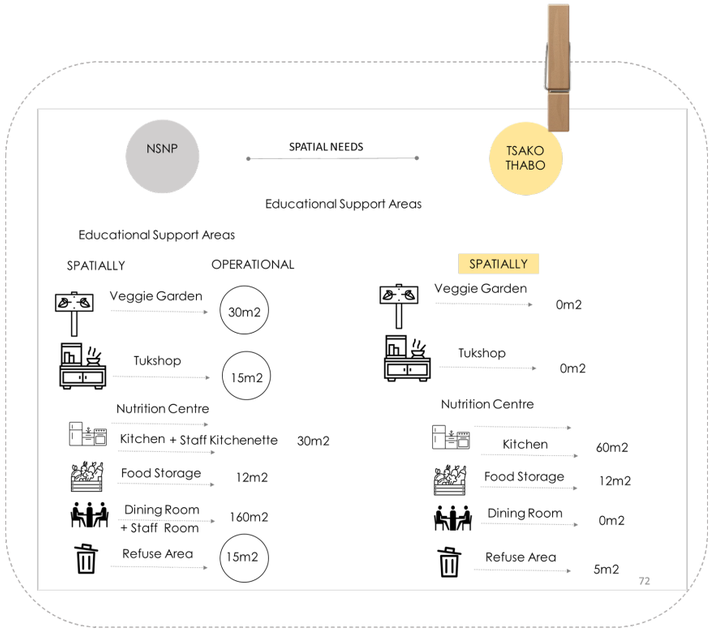


Fig 59: NSNP spatial requirements (Author 2020)

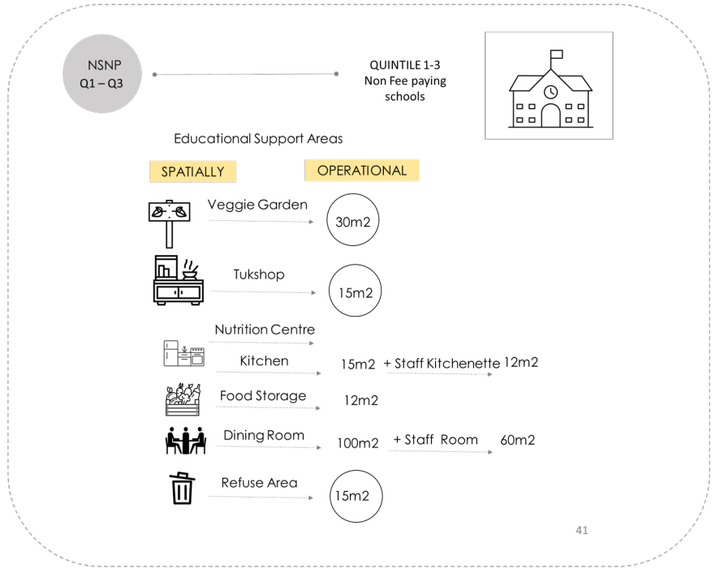


Fig 60: NSNP requirements vs actual implementation of spatial requirements at Tsako Thabo Secondary School (Author 2020)

THE RATIO

of **Food dedicated Spaces** to Other School Areas as per the **DBE**

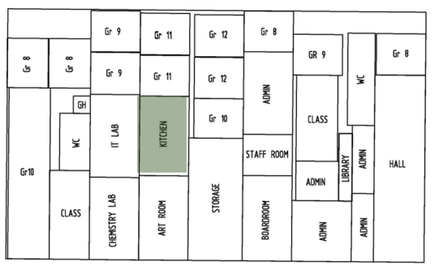


Fig 58: Existing Spatial Ratio (Author 2020)

POTENTIAL RATIO

of **Food dedicated Spaces** to Other School Areas as per project proposal

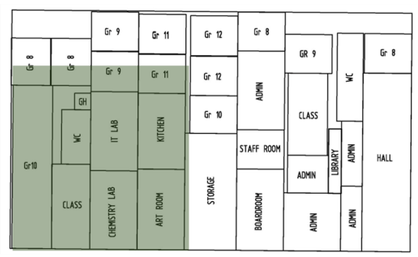


Fig 61: Potential Spatial Ratio (Author 2020)

From the graphics above it is evident that the ideal spatial requirements set out by the DBE and NSNP are not fulfilled on-site at the premises of the case study school, Tsako Thabo.

There is no provision for a vegetable garden, a tuckshop, a dining and staff room and the existing refuse area provided is a 1/3 of the required space.

These crucial spaces that are not evident in the current school align with the issues raised in the workshops done with the students. Students continue to eat inside due to a lack of designated eating spaces and recycling is not implemented due to the lack of facilities and programmes set in place. Students continue to purchase "fast food" from external vendors as there is no controlled tuckshop available to them with other options of food. Students also have no formal educational classes on the importance of nutrition or practical opportunities to foster cooking and practical skills as the school does not offer any additional subjects such as home economics and business management. The art and music programmes have also been cut due to lack of funding and interest and this the opportunity for STEAM (Science, Technology, Engineering, Arts and Mathematics) based subjects to thrive is not possible as it not even an option (Pienaar 2017).

Policy is usually a platform for spatial requirements that ensure successful space for programmes to be fulfilled however in this case the NSNP policy does not align with the DBE policy and so when implementing a programme like school feeding within a school, becomes problematic due to spatial constrictions and conditions.

The process of investigation started in April 2019, during this time statistics dictated that over 9 million school learners from marginalised government schools across South Africa are dependent on daily meals received as their main source of food (World Bank 2020).
In South Africa 1 in 4 children are already malnourished. If only 1 in 5 households has adequate food access. That means that 60-70 % of children would be affected negatively by not having access to those meals provided by schools and Children's food security and nutritional intake would suffer drastically (World Bank 2020).

Fast Forward to March 2020 the start of a global pandemic Covid-19, 60 % of that 9 million (5.4 million) students will painstakingly feel the effect of this global pandemic not as a result of the virus but the consequences of not going to school and receiving substantial food (World Bank 2020).

The world bank states that we are at the stage where the debate is no longer about whether school feeding is important or not but rather how best to design and deliver school feeding during critical situations like these.

The debate thus shifts to how can schools maintain the feeding schemes during holidays and school closure periods and not only during assigned school days and hours.
The role of architectural design as a means to influence behavioural and performance patterns of students through food orientated spaces and education has been investigated.

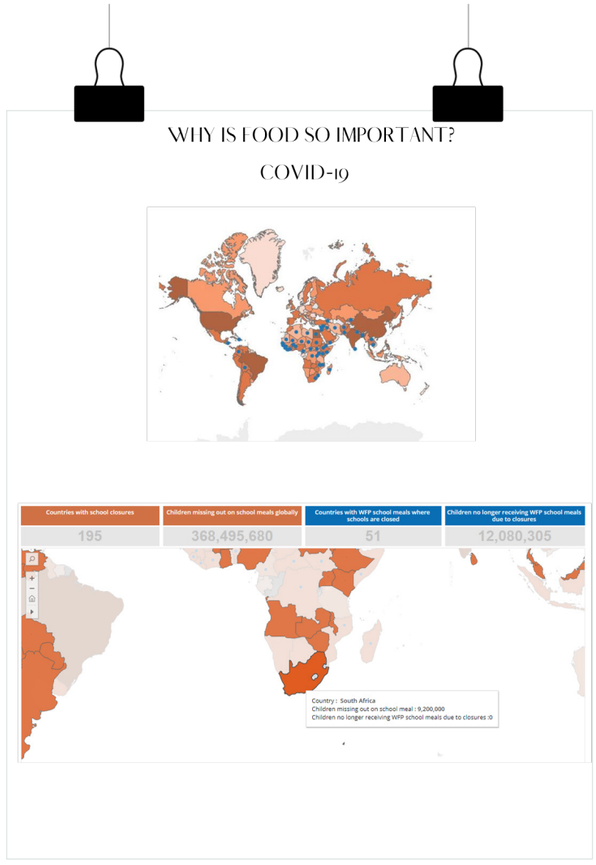


Fig 62: The effect of Covid-19 on schools globally (WHO 2020)

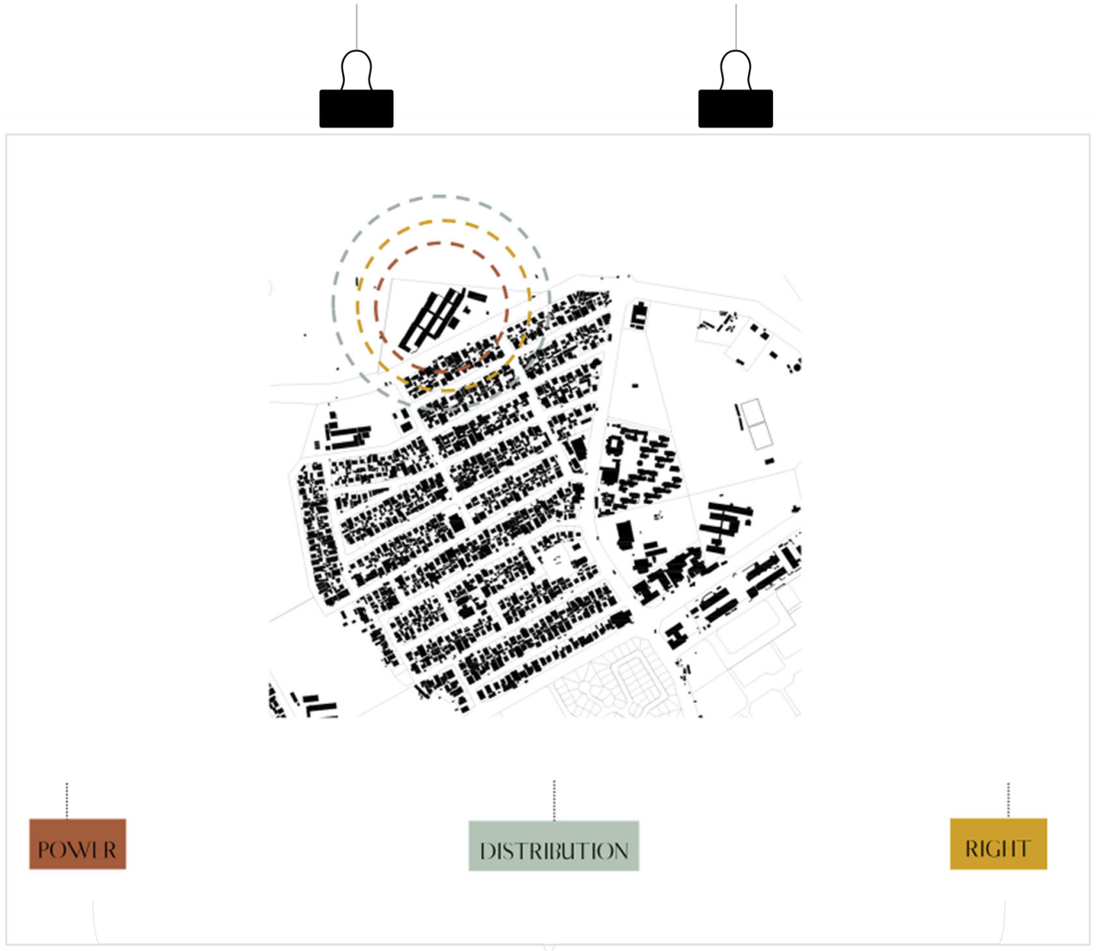


Fig 63: Right Power Distribution conceptual map (Author 2020)

SPACE

The Nyéléni framework outcomes below (SAFSC 2018) provide a possible foundation of values that need to be considered when implementing school feeding within schools with the objective of improving the current feeding programme.

Right: People's right to healthy and culturally appropriate food produced through ecologically sound and sustainable methods.

Power: Putting those who produce, distribute, and consume food at the heart/core of the systems and policies. Advocating for food systems to run as per local producers and not be dependent on the current corporate trade.

Space: Prioritizes local and national markets and empowers marginalized communities that base their businesses on environmental social and economic sustainability.
Distribution: Promotes transparent trade that guarantees just income to all people and the rights of the consumers to control their food and nutrition that the right to manage resources is in the hands of those who produce food.

Distribution: Promotes transparent trade that guarantees just income to all people and the rights of the consumers to control their food and nutrition that the right to manage resources is in the hands of those who produce food.

Framework Part 1

ARCHITECTURE

FOOD SOVEREIGNTY

How spatial design can contribute to

How Food sovereignty can

A way of designing that emphasizes and prioritizes nutrition, wellbeing and health.

A nurturing process that is collaborative

Unpacking the theme through

Theory *Co-Design* *Policy* *Precedents*

&

Through the lens of Nyeleni' Framework

Power *Right* *Space* *Distribution*

Fig 64: Framework Part 1: Architecture intersection with Food Sovereignty diagram (Author 2020)

RESEARCH METHODOLOGY FRAMEWORK

NSNP 3 MAIN STRATEGIES
ALIGN WITH THE DBE 2025 VISION IN PRIORITIZING WELLBEING AMOUNG LEARNERS

FUNDING

S.F N.E S.F.P

1 SCHOOL FEEDING

Contribute to enhanced learning capacity through school learning

- Feeding Schemes
- Nutrition Policy

2 NUTRITION EDUCATION

Strengthen nutrition education in schools & communities

- Curriculum
- Policy
- Educational Ecosystem

3 SUSTAINABLE FOOD PRODUCTION

Facilitating food gardens and other food production projects in schools

- Food Production
- Food System

SPACE

KITCHEN

Reflect on current/existing eating food orientated space

Food hall/kitchen typologies

CLASSROOMS

Practical learning kitchens/classrooms (home economics business management, agricultural studies)

FOOD CENTRES & GARDENS

Dining Halls, food gardens & distribution centres

ROLEPLAYERS

- GOVERMENT
- NSNP
- SCHOOLS
- VOLUNTEERS
- STUDENTS
- DBE

- STUDENTS
- GOVERMENT
- TEACHERS
- AGRICULTURE SCIENCES
- DBE

- COMMUNITY
- STUDENTS
- ARCHITECTS
- TEACHERS
- VOLUNTEERS
- UN
- FOOD SOV. ACT

RIGHT

Right to food for students in Quantile 1-4 as part of school feeding schemes

Right to nutritional and culturally appropriate food

Right to appropriate methods of Food production

POWER

Local Food Control/ Feeding Schemes

Power to choose what and how you eat. To empower students to be the drivers of their future

Power to value local food providers

DISTRIBUTION

Food Culture

Food Ways

Food Systems

REFLECTION

NSNP Possible outcomes/ contributions

1. Household food security
2. Improved education access
3. Learning Outcomes
4. Food Production
5. Local Livelihoods

6 Pillars of Nyeleni Framework Outcome

1. Food People
2. Value Food providers
3. Localised Food providers
4. Local food control
5. Building knowledge & skills
6. Acroecology

SPATIALLY HOW CAN ARCHITECTURE AID IN ACHIEVING THESE OUTCOMES

Fig 65: Research Methodology Framework (Author 2020)

The Wellbeing Economy

The excellence of food security centre believes that malnutrition is the outcome of an economic system that has marginalised households, reduced free clinic-based primary health care and impeded access to sustainable electricity, water, sanitation and solid waste management (Fioramonti 2017).

The growth economy is a vertical structure created at the top of the pyramid and is expected to trickle down the layers (Fioramonti 2017). Instead, the trickle-up effect of self-organised systems produces the biggest changes, Lorenzo Fioramonti author of the Wellbeing economy, also believes that wealth trickles up from the poor to the rich, because of economic growths ability to convert common resources that everyone uses into private goods that can be sold in the market. The circular economy is a model of recycling and systems for upcycling. Co-design workshop 3 confirmed students' knowledge on recycling produce however the school does not provide any amenities to facilitate this practice. An existing recycling centre on the corner of the site, run by community member Ma Sarah, sits alone. By including this existing programme into the school, it will encourage agency among potential learners and past learners of the school. It creates an environment that supports creativity and skill-building in individuals so they can actively engage in crafting the types of lives and communities they wish to live in. These re-embedded spaces offer opportunities for increased citizen participation as it contributes to a larger system within the environment that catalytically affects the school.

The informal economy is a safety net for those excluded by the formal sector, it makes it possible for exchange of goods and services to take place among less privileged people thus weakening marginalisation and social tension (Fioramonti 2017). These informal activities need to take place so that we can build impersonal trust. A wellbeing economy is designed to strengthen social and natural capital while generating human development. The objective is to increase the value which is generated through improving human relations and their connection to nature.

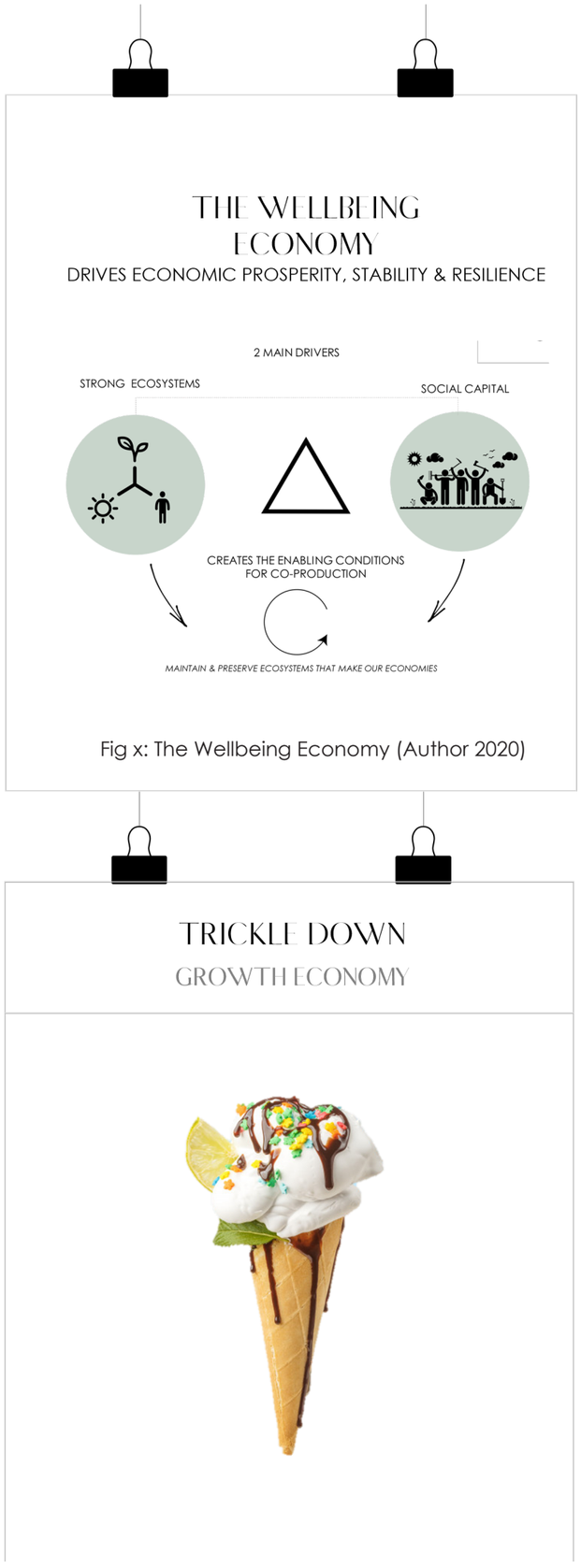


Fig x: The Wellbeing Economy (Author 2020)

Fig 66: The Trickle down effect of the growth economy (Author 2020)



Fig 67: The Trickle up affect of the growth economy (Author 2020)

3.3 Architectural Theory

Adaptive Re-use

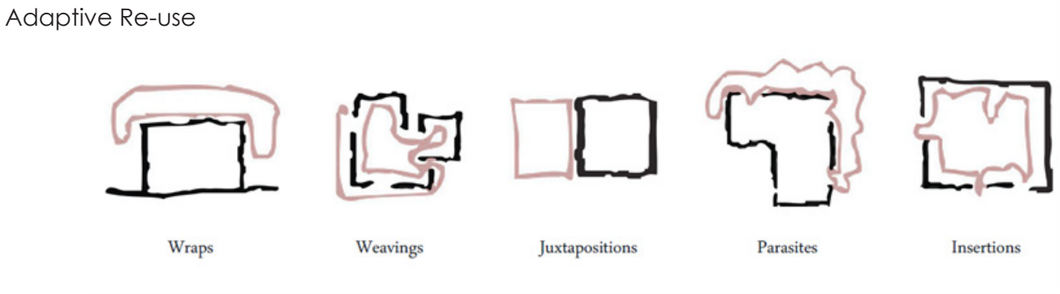


Fig 68: The 5 categories for Adaptive reuse projects (Bollack 2013)

To design for didactic learning requires spatial planning that allows for maximum adaptability and creating spaces that respond not only to the learners but the broader context. The existing school provides the opportunity for adaptation and reuse of space and materials. Françoise Bollack in Old Buildings New Forms (Bollack 2013) describes strategies to apply in adaptive re-use projects. Although the school is not necessarily being preserved for heritage reasons, the design principles are intended to facilitate the joining of old to new and celebrate the integration through a seamless joining. The principles could apply to Tsako Thabo in the following ways :

1.

Wraps are introduced by the portal frame structure added to the existing building as a skin that allows new space to be defined and appropriated.

2.

The weaving of the building is the integration of nutrition into the classrooms. The opening up of the rectangular block.

3.

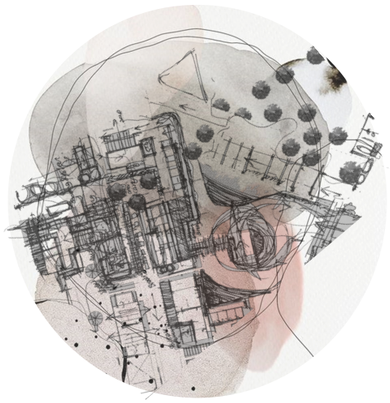
The juxtaposition perhaps already exists in its parallel layout of the school. The conceptual intention of the community centre is juxtaposed from the school.

4.

Parasites in the project development are largely seen as the external additions to the skin of the building including the pergolas and structures that extend into and beyond the classroom.

5.

Insertion again is the addition of layout and moveable walls. Permeable spaces that are redefined in the classrooms. Insertion also exists in the added of the portal frame to the inside of the building.



The design intention remains to design for adaptability and to think beyond pedagogy typologies and the limitations they present. By designing to extend and adapt and not demolish, the concept of resilience and sustainability become evident in the design development.

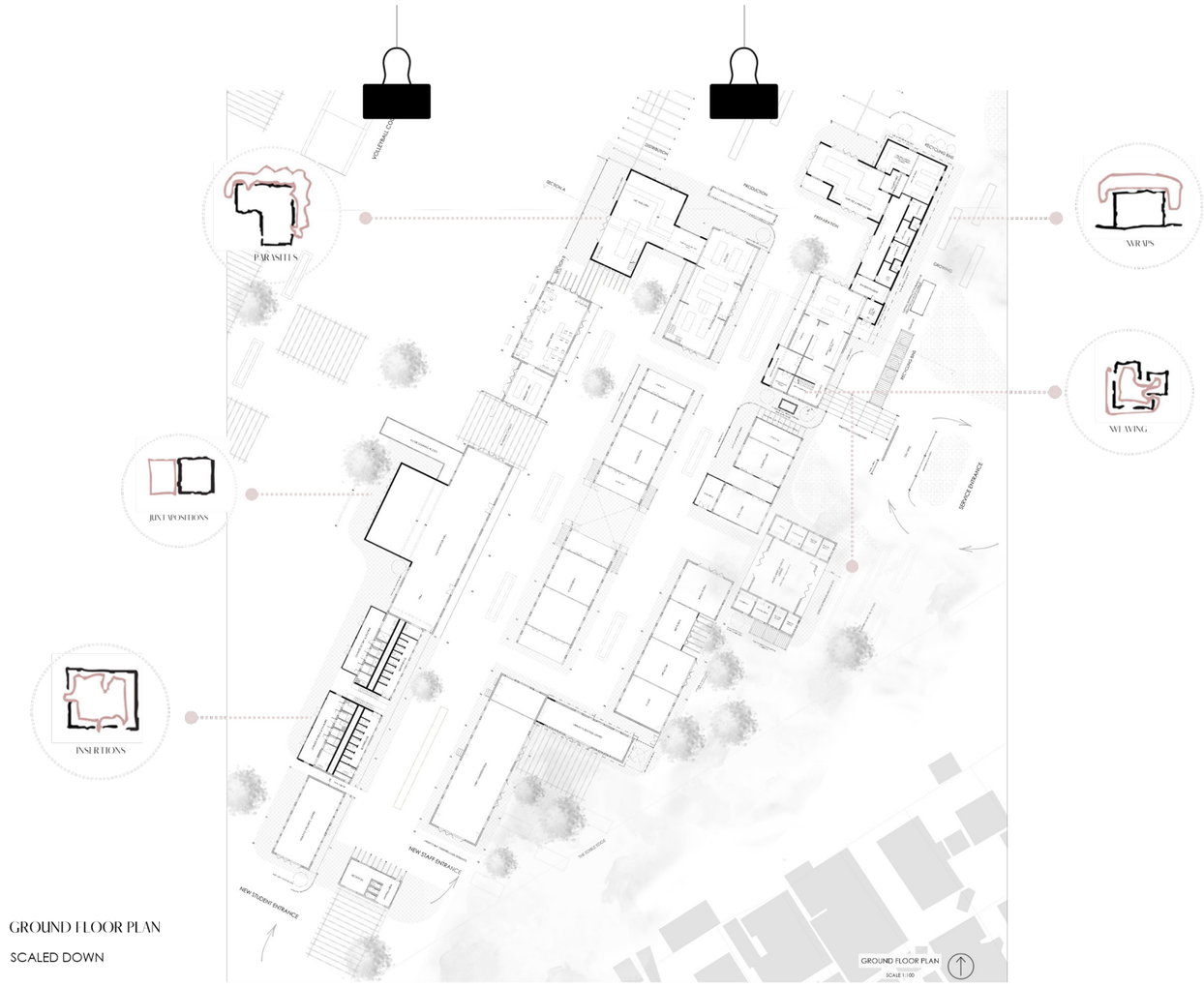


Fig 69: The 5 categories for Adaptive reuse Tsako Thabo (Author 2020)

Liminal Space

Liminal space is defined as the transitional threshold between two states that are usually fixed (Zimmerman 2008). Often in a building or space, there are existing rites of passage, in this context, these are defined as separation, transition and incorporation. These rites form the design basis for transformative space based on how a building is separated in structure, levels, layout and composition.

The project is based on the existing school typology, specifically at Tsako Thabo. With the intention of achieving maximum programmatic success specifically concerning the topic at hand, food, in the transitional spaces within the existing building.

It is noted that the students go through a series of transitions from their daily trip to school and back. That transition from home to the school gates, through the entrance, into the classroom, outside and back. Liminal space indicates that moving through layers of space transfers you from everyday life (Zimmerman 2008). If we look at the daily cycle of a student, they are continuously in and out of realms. The school should consist of transformative thresholds. The habitual norms and rituals of students are greatly informed by the structural limitations and opportunities.

By creating a series of transitional spaces mainly through the adaptation of the existing courtyards and classrooms, unity and production will be able to flow through the school consistently.

By adjusting the existing standardized classrooms, creating height, change in elevation and levels throughout the site, transitional space will aid in heightening awareness of transition and allow the user to be more cognizant of transition.

Liminality influences the approach to architectural design specifically where spaces are influenced by adjacent spaces and thus take on their qualities while remaining independent from them (Zimmerman 2008). The classrooms structures are mostly similar in their layout and form but as new additions are added the classes will start to take on an aesthetic of their own, yet still be influenced by the existing and the new. Each classroom block has the potential to be transformative and change. Scale and proportion both have the ability to transform and create spatial awareness.

By removing unused spaces or repurposing them, scale has a unique threshold condition that provides opportunities for transformative spaces to occur (Zimmerman 2008).

The liminal threshold refers to the between spaces, in the case study school these are defined as the courtyard spaces, the corridors and the spaces between the boundary of the school. Liminal space in this instance creates opportunities for the conversion of permanent elements on-site, the courtyards or the existing building and it allows for the intertwining of programme, space, conversation and people, by taking these elements apart, disassembling and rearranging them and placing them back together to form something new and defined (Zimmerman 2008).

Students associate memory and cognitive behaviour with space (Claasen et al 2016). The space that dictates certain rituals instils in people habits, perhaps values and mannerisms too.

In section, the stepping of the buildings and the in-between zones of growth, preparation, production and distribution allows for the emphasis of threshold and sacred space. The layers of steps and corridors between the different zones emphasize threshold and scared space.

The intention is to further empathize the change in elevation by stepping the buildings along the site and creating a more sloped roof with a more defined pitch.

Blurred space at Tsako Thabo is defined in the fence, the harsh boundary. By removing the fence on the outer boundary of the property and allowing for the spread of programme into the community and landscape, a transition from private, protected space emerges into a collaborative semi-private realm which then further leads to a transition into public space (Zimmerman 2008).

The school feeding programme follows a linear yet intertwined process of growth, preparation, production and distribution. In parallel to this process, the community layer follows the same sequence yet in the other direction, distribution, production, preparation, growth. The Stages of development are also transitional; it is when we define something as a state it has more permeance fixed to it (Zimmerman 2008).

Shearing Layer

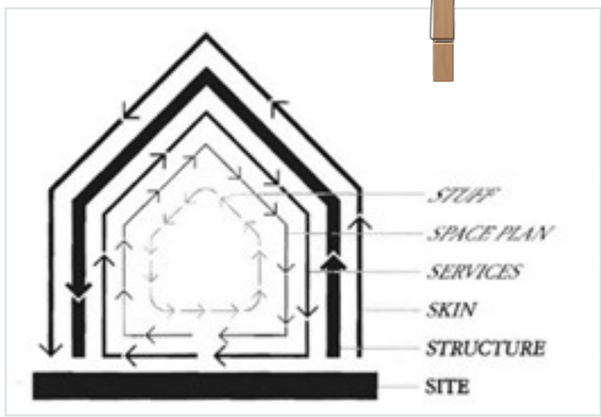


Fig 70: Shearing Layers/ Pace Layering (Brand 1994)

The model of creating and analyzing a building by of dissolving or breaking up a building into segments allows for the existing building to remain in parts that are appropriate to context and programme while allowing the building to adapt to new requirements and infrastructure. Although the shearing layers originally developed by Architect Frank Duffy (Duffy 1992), as four components, the shell, services, scenery and set. Brand later adapted them in his book "How buildings learn: What happens after they are built (Brand 1994).

Brand adapted the structure which is recoined "Pace-Layering". These elements together form the layers of the building and can be seen individually and collectively and can take form at different stages and be layered accordingly.

1. Site: The site refers to the location, contextually and topographically. It forms the geographical setting. Although surrounded by context and buildings, the site itself is seen as "eternal" (Duffy 1992) as its perimeter, boundaries and context will outlast any infrastructure. The site is Fixed.

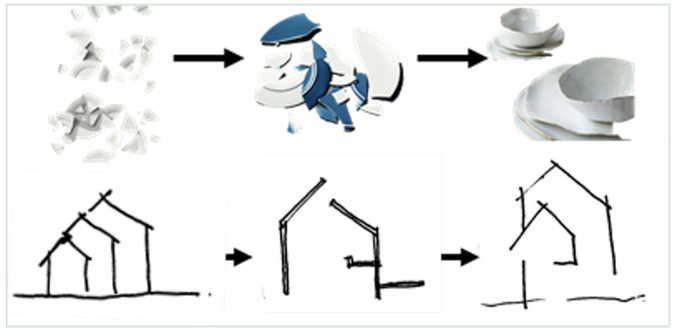
2. Structure: The existing structure, the fixed structural load-bearing elements that during adaptive re-use are often left as is to maintain economic constraints to a project. Often these elements need not be destroyed but rather restored to contribute to the success of the spatial arrangement.

3. Skin: The skin, the most outer part of the building, the façade, often adjusted due to aesthetic and maintenance. The skin contributes to the energy of the building, the ventilation, the insulation, and the circulation.

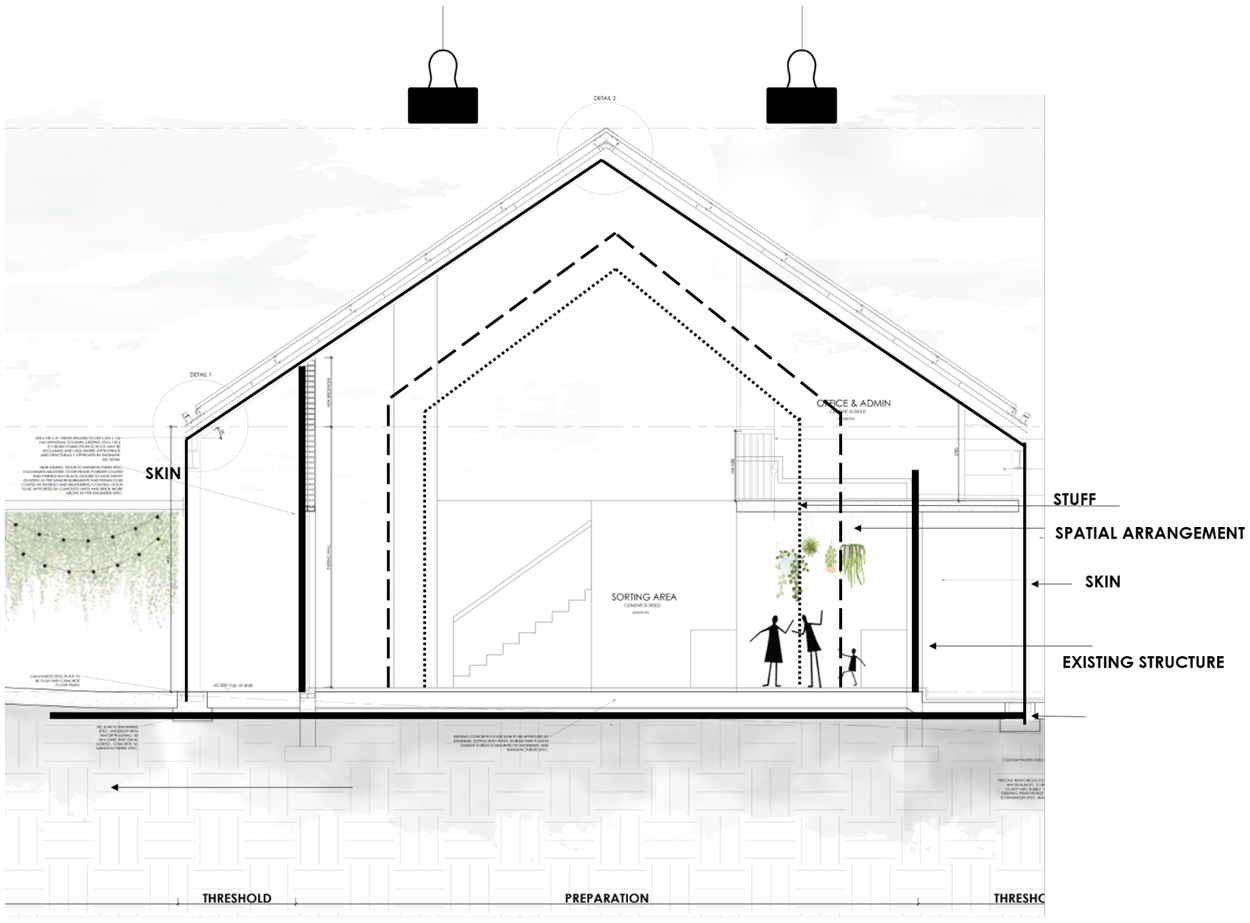
4. Services: The working elements in a building. The life-giving operating systems that provide power, water systems, HVAC. The systems should contribute to the longevity of the building and not further catalyze its decay and operational system.

5. Space plan: The space plan is interpreted by the layout of the building. Its programmatic and functional qualities. Although often two dimensional due to its placement of walls, ceilings, doors and windows, it offers an opportunity for how those elements meet and the consequence in which they meet and how those junctions create space and threshold. Space plans are often changing in order to accommodate programme and intervention. If buildings are designed in a way to accommodate change, then the facilitation of change could be a lot more effective and economical.

6. Stuff
Brand states that the best buildings are made "from low-cost standard designs that people are familiar with and are easy to modify" This allows people to have the freedom to adapt and change their buildings to meet their needs and requirements at any given time. This model of thinking or practice of theory offers space for resilience in architecture, spatially and for the people



If we considered Tsako Thabo according to these layers, what are the **issues**, the **opportunities** and the **resolutions** spatially?



PACE LAYERING ADAPTED

Fig 70.1: Pace Layering Adapted (Author 2020)

FINAL DEVELOPED FRAMEWORK

Research & Architectural Framework

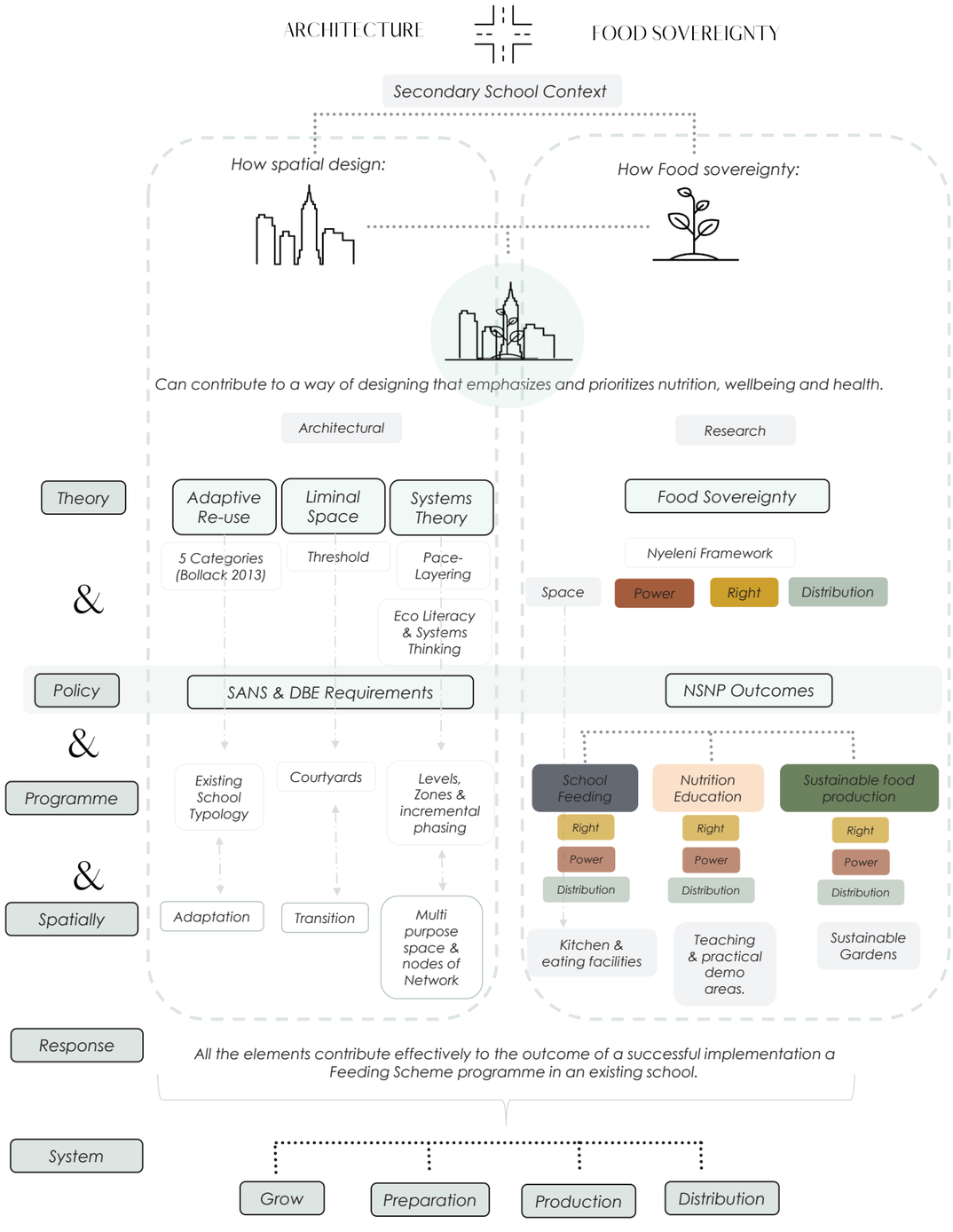


Fig 71: Developed framework (Author 2020)

Reflection

SOCIAL INCLUSION & COLLABORATION

"The global childhood obesity epidemic is more than a wakeup call for designers; it marks a crisis of ethos for us as a community of experts who create the environments in which children live, learn, and play. Children don't decide where to build a home, park, school, or grocery store or if they will have access to an education that includes learning about nutrition and an active, healthy lifestyle" (Dina Miris Sorensen, VMDO architects) (Huang et al 2013).

So, the ethical question we have to ask ourselves as a design community is: what kind of experts are we if we ignore the evidence?

Sorensen notes that It is time for a paradigm shift in practice; where we must work across disciplines, share knowledge, build networks, partner with researchers, and deploy multifaceted design solutions to reverse the trend." (Dina Miris Sorensen, VMDO architects) Act Local – Think Global. (Fioramonti 2017)



Fig 72: South African childhood malnutrition epidemic (Author 2020)



PROGRAMME & USER

4.1 Programme

The informal economy is a safety net for those excluded by the formal sector, it makes it possible for the exchange of goods and services to take place among less privileged people thus weakening marginalisation and social tension (Fioramonti 2017).

The main collaborative strategy towards the improvement of educational school feeding programmes includes the introduction of food halls, teaching kitchens, water systems and sustainable farming (Belasco 2008). These additions are in hope that the students' understanding of food as part of a greater educational ecosystem will promote innovative learning.

PROGRAM

Result of National School Nutrition Program (NSNP)
Implemented by the Department of Basic Education (DBE)Outcomes:

1. SCHOOL FEEDING SCHEME systems
2. NUTRITIONAL EDUCATION facilities
3. SUSTAINABLE FOOD PRODUCTION

Program is *Limited* in that it's main focus is the Functioning of Feeding Scheme as it's priority. Spatial and User Negligence prohibits the success of the potential of the program in the *Case Study School : Tsako Thabo*

Fig 73: NSNP main programme outcomes (Author 2020)







School Feeding

FACILITIES FOR ALL
- Student Eating Halls
- Working Kitchens
- Serving Areas
- Distribution

EATING PROGRAM
- Extends beyond school hours

COMMUNITY & SCHOOL FEEDING SCHEME
- Exist beyond school days & hours
- COVID- 19 (FOOD SECURITY)

Nutrition Education

CHANGE OF CURRICULAR
- Practical learning for Business management
- Home Economics
- Bio & Chem practical's

COOKING CLASSES
- Formal (Nutritional Education)
- Informal Extra curricular food markets/street food vendor opportunity

COMMUNITY – STUDENT INTERACTION IN SHARED LEARNING CENTRE

Sustainable Food Production

HEALTHY FOOD CULTURE

HEALTHY & CULTURALLY APPROPROPRIATE FOOD

FOOD GARDENS
- Edible Education
- Community & Student Garden
- Food distribution centre/system



Fig 74: Programme Integration plan (Author 2020)

KEY

- SCHOOL FEEDING
- NUTRITION EDUCATION
- SUSTAINABLE FOOD PRODUCTION



Fig 75: Programme area implementation plan (Author 2020)

4.2 Programme development

The current program in Tsako Thabo involves a designated classroom where all food is prepared, cooked and served. A small storage area in front of the school is allocated to storing food. Pedagogically, urban farming, nutritional kitchens, food trade stations would be fundamental as teaching tools to students in secondary government schools in South Africa. These programmes would allow students to have a greater understanding of the importance of nutrition as well as equip them with skills and abilities to provide for their families and communities out of school hours. In the secondary school context, there is a conflict in nutritional intake and behavioural performance due to a lack of facilities and spaces to consume food before during and after school. The aim programmatically is to foster the relationship the students have with food and to encourage it to be developed intuitively to create awareness, educate and inform students so that they are cognizant of the process that goes into sustainable food production (Frerichs et al 2015).

Global Issue
Nutrition, food sovereignty and security and health education

Appropriating food in a context that is relevant and understandable to students.

Local Issue
Educational Ecosystem

Creating sustainable design solutions that encourage wellbeing, comradery and entrepreneurship, through practical learning and engaging curriculum.

Urban Issue
Food Culture and production

BUCKINGHAM ELEMENTARY SCHOOL - HEDGS CASE STUDY SCHOOL

CASE STUDY PRECEDENT

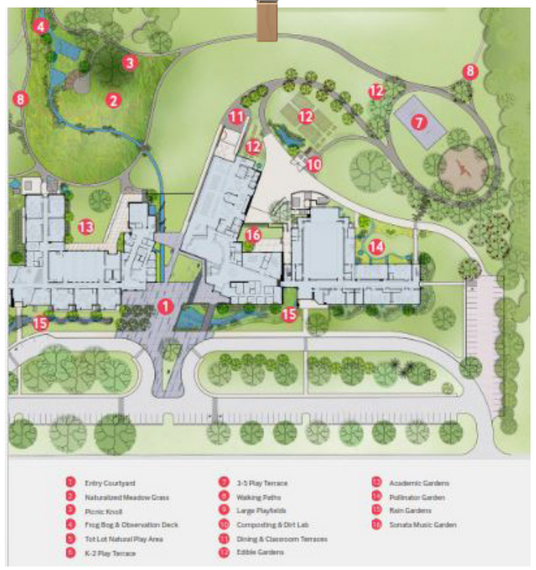












The dining commons collaborative design research involving architects, educators, and public health. Healthy Eating Design Guidelines for Schools (HEDGS)created by Dr Haung, implemented the guidelines at a case study school in the United States (Huang et al 2013).

The framework established four main issues to address part of a larger contribution to healthy eating. Alongside these, they set out five core principles for healthy eating design and ten recommended design strategies within each spatial domain, which influence the current program. This results in a far larger food drive program within the school.

The existing programme should include HEDGS recommendations, resulting in a new programme that should spatially be divided into incremental stages that would be possible for implementation at different financial levels, yet all contribute to a larger vision of healthy eating beyond just the school day.

The dining commons represents a collaborative approach in design research where architects, educators, public health and researchers merge.

Fig 76: Buckingham Elementary school, HEDGS case study school ((VMDO et al 2012)

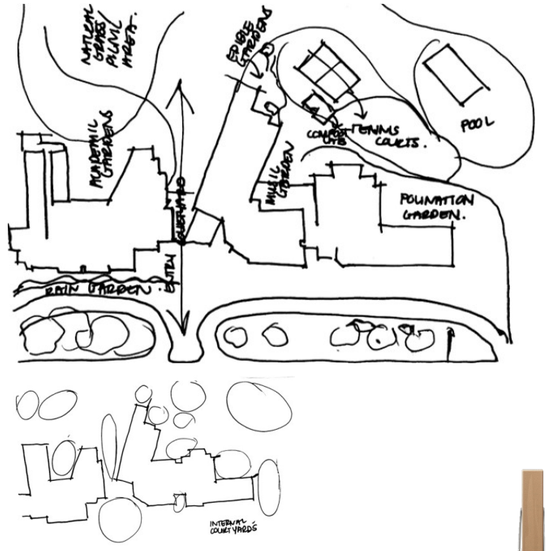
The dining commons represents a collaborative approach in design research where architects, educators, public health and researchers merge. "The design-research partnership marks a powerful moment in the design of learning environments as experts from disparate, yet interrelated disciplines engage with the problem of childhood obesity by seeking to understand the political, social, economic, ecological and infrastructure agendas that make up a school food environment" (VMDO et al 2012).

The dining commons feature design strategies that aim at promoting healthy eating and encourage physical activity. These strategies focus on creating multi-functional teaching spaces that create indoor and outdoor opportunities for eating, teaching and other activities that extend beyond the school.

HEDGS was implemented as a case study school at Buckingham elementary school in the US. Four main issues were established to address part of a larger contribution to healthy eating: Environmental Health, Environmental Psychology, Behavioural Economies & Social Models (Huang et al 2013).

Alongside these, they set out 5 core principles for healthy eating design and then recommended 10 design strategies within each spatial domain (VMDO et al 2012).

Spatially the proposed programme at Tsako Thabo will be divided into incremental stages that would be possible for implementation at different financial levels, yet all contribute to a larger vision of healthy eating beyond just the school day.



HEDGS

10 SPATIAL DOMAINS

1 Commercial kitchen zone
2 Teaching kitchen zone
3 Serving Zone
4 Dining
5 Aesthetics of health food environments
6 Educational signage, way finding & marketing
7 Water access & vending machines
8 On-site food production
9 Integrated healthy food education facilities
10 Integrated healthy food community

HEDGS

1. Provision of equipment and spaces that facilitate the incorporation of fresh and healthy food choices into the school and its community.
2. Provision of facilities to directly engage the school community in food production and preparation.
3. Application of evidence- and theory-based behavioural science principles to "nudge" the school community toward healthy eating behaviours and attitudes.
4. Use of building and landscape features to promote awareness of healthy and sustainable food practices.

5. Conception and articulation of school spaces as community assets to multiply the benefits of school-based healthy food initiatives.

Healthy Eating Design Guidelines for schools (HEDGS)

1. Environmental Health
2. Environmental Psychology
3. Behavioural Economies
4. Social Models

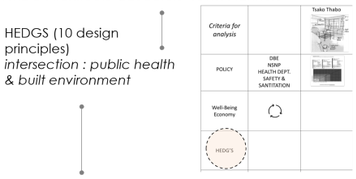
THE RECOMMENDED DESIGN STRATEGIES WITHIN EACH SPATIAL DOMAIN, ADDRESS;
5 CORE PRINCIPLES FOR HEALTHY EATING DESIGN:

INTERNAL COURTYARDS

FORM PART OF THE LARGER PROGRAM/ NETWORKS OF COMMUNITY FOOD SYSTEMS : *promote healthy food culture*

Collaboration & Multidisciplinary approach between : VMDO Architects, Educators, Town Planners

- HEDGS (10 design principles)
- *intersection : public health & built environment*



EXTERNAL PROGRAM
Community Feeding Network

OBJECTIVE : SCHOOLS move towards a CULTURE OF HEALTH

4.4 Programme informants

Adapted from Workshop 1, this analysis helped identify existing food nodes within the school. The following spaces concerning school feeding are recognised as minimum requirements by the DBE.

The NSNP also provides a guideline in which school food programmes have recommended requirements. Within the Tsako Thabo school environment, the following spaces exist and align with policy.

Unpacking food places through mapping and interactive co-design sessions helped identify: Where food is currently distributed & eaten.

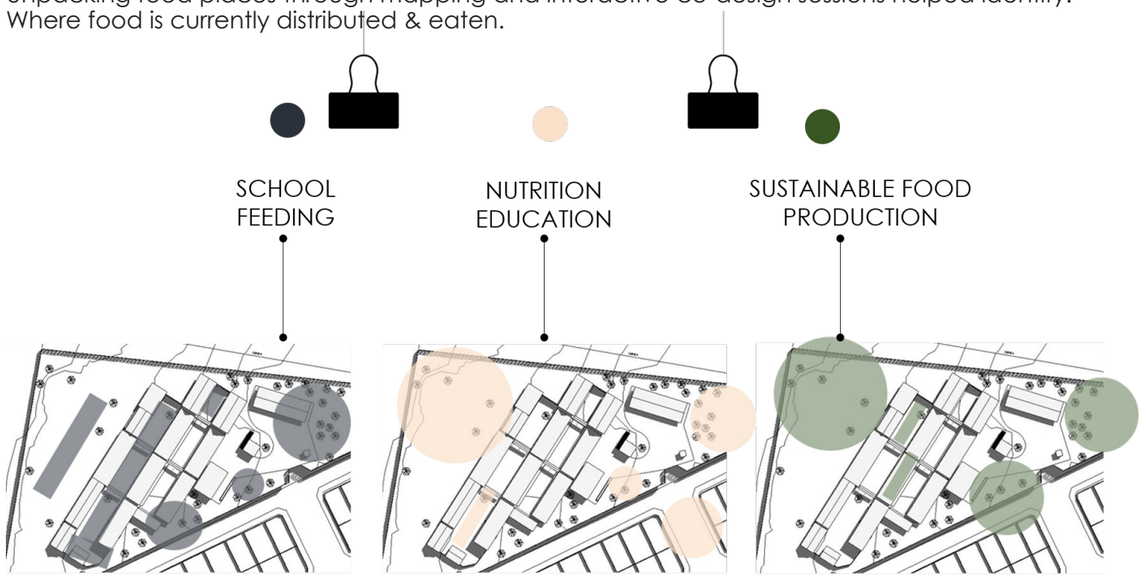


Fig 77: Programme spatial results from workshop (Author 2020)

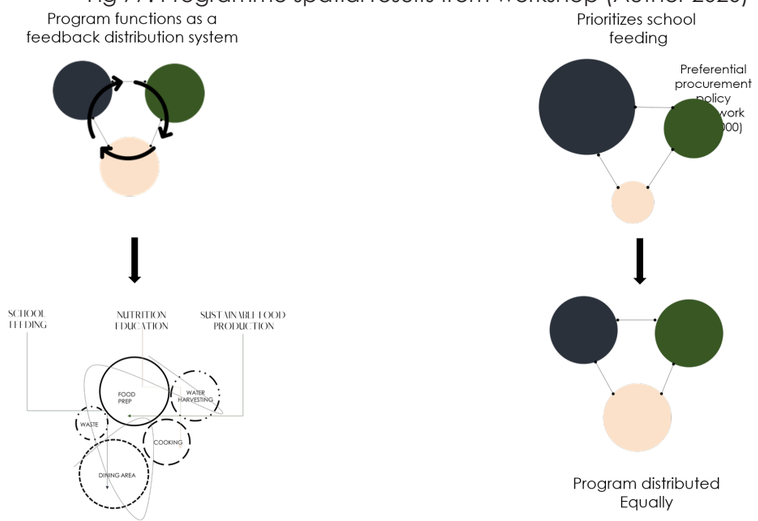
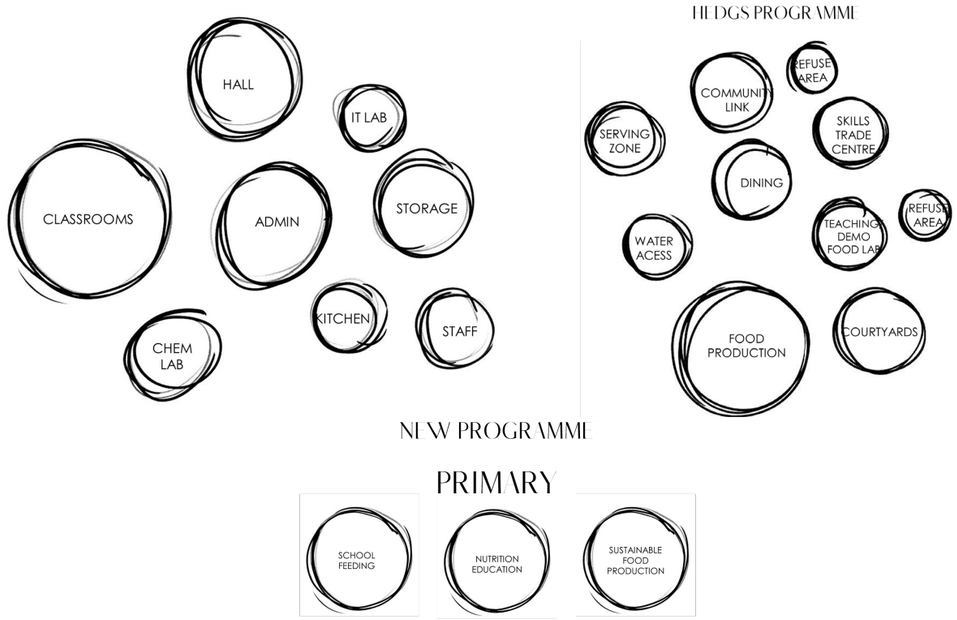


Fig 78: Programme distribution concept (Author 2020)

4.5 Programme Scale

-Primary (School Feeding system within Tsako Thabo)
-Secondary (Community Feeding Systems)
-Tertiary (Feeding systems across schools in SA)



"Growth happens when we generate value that wasn't there before" (Fioramonti 2017), like through the education of children, the improvement of our health and the preparation of exquisite, tasty food. A more educated, healthy and well-nourished person is an example of growth. We should start to see the incremental changes that are made as an increase in human and ecological well-being and it should be reflected in socio-economic performance (Fioramonti 2017).

As defined earlier, the growth economy is established at the top of the pyramid and is expected to trickle down (Fioramonti 2017). Hamdi shows how the trickle-down effect supported by conservatives does not produce the large-scale changes that are predicted and are a neoliberal response to the demands for social justice. Instead, the trickle-up effect of self-organised systems produces the biggest changes (Hamdi 2004).



Phase 1: 0% Budget

Changing Serving layout, Sperate Waste, arrange supervision around school to allow for eating in specific spaces at lunch time. Rely on NGO support for seeds for a food garden.

Phase 2: 25% Budget: Proper Equipped Kitchen

Phase 3: 50& Budget: Food Gardens, Green courtyards

Phase 4: 75% Budget: Dining Hall, Food prep, storage and serving building/area, Equipped demo kitchens for teaching

Phase 5: 100% Budget: All interventions

Fig 79: Future implementation (Scalability of Plan) & Incremental Phases for School Plan (Author 2020)

4.6 Final Programme

Designing healthy food environments for scholars requires consideration of multi-scale spaces (VMDO et al 2012). Rather than separating the production and consumption of the programme that leaves consumers on the receiving end of the growth process, the aim is to keep them together creating a socially inclusive environment for all involved (Darling-Hammond et al 2020). The overall project aims to demonstrate key components that make up the healthy foodscape environment (VMDO et al 2012):

• By Integrating nutrition education opportunities, it reinforces the connection between healthy food and a healthy lifestyle.

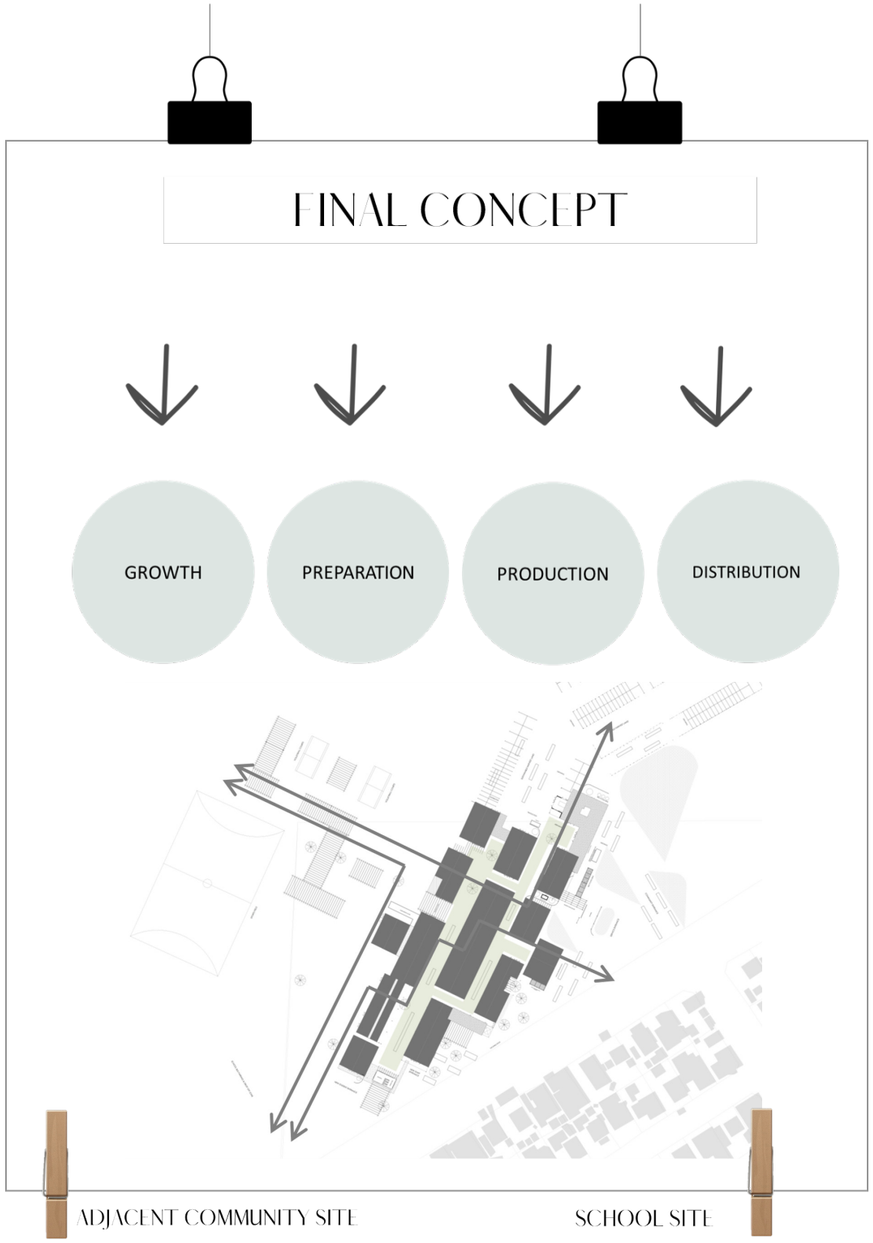
• A variety of diverse outdoor spaces and multiple seating arrangements result in a social atmosphere while providing distinct spaces for various social groups. Outdoor spaces can be used for demos and practical learning and will encourage interdisciplinary learning across grades with social gatherings.

• A teaching kitchen and demo area enables both nutrition education and provides a platform for foodservice staff to pursue the role of educators.

• School & community gardens and break time-spaces throughout the school. Provide opportunities to include physical activity as an extension of the lunch period.

• Efficient systems & flow through the school, natural ventilation and programmatic layout improve the overall aesthetic appeal of the space and connect it to other networks in the community.

The programme and consistent engagement with the learners helped inform the key elements. And when the elements are combined, they will form a foodscape within Tsako Thabo. The iteration process refined the design to equally distribute programmes throughout the site which promotes a healthy educational ecosystem consisting of re-adaptive spaces embedded within the school and open to the community.



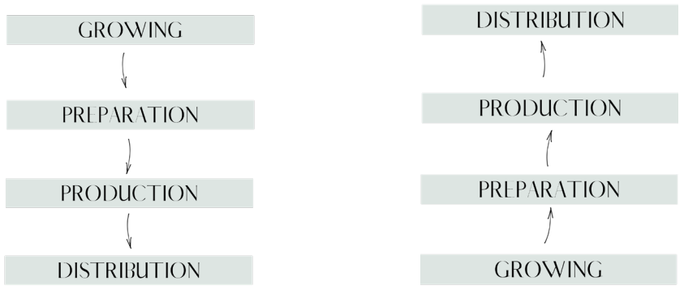
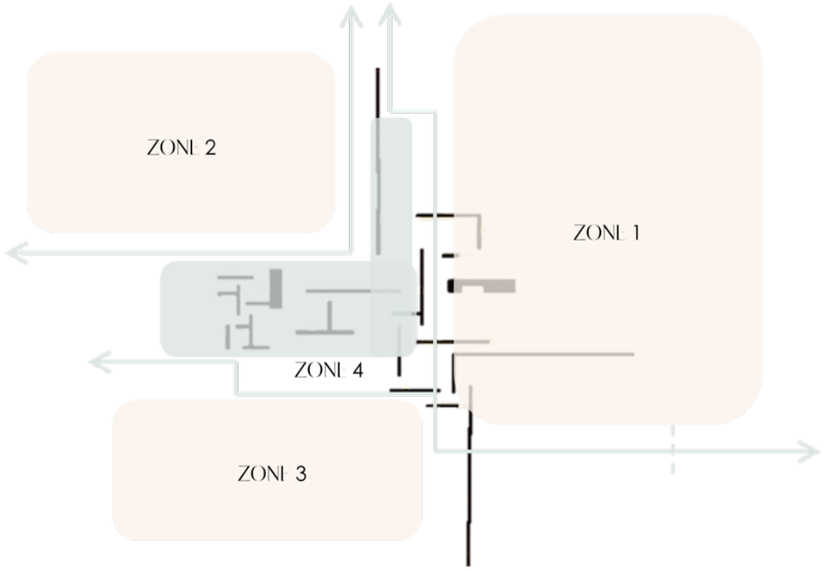
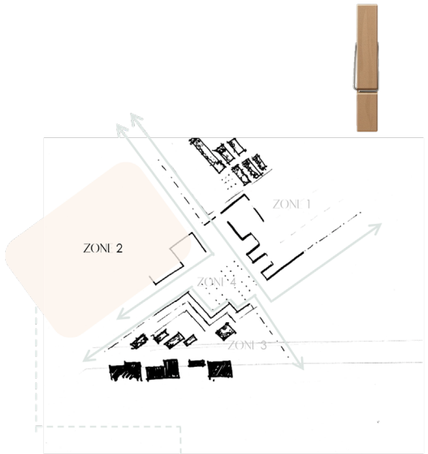
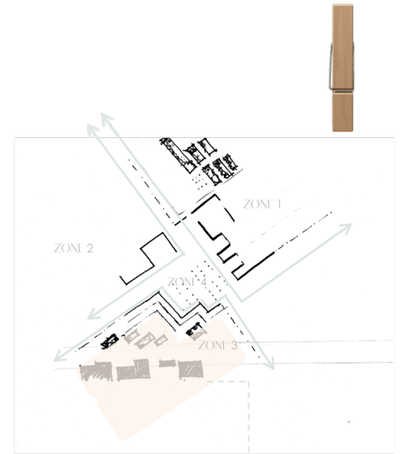


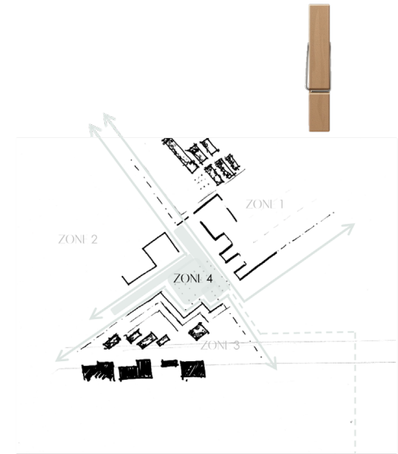
Fig 80: Future implementation of Incremental Phases for School Map (Author 2020)

ZONING









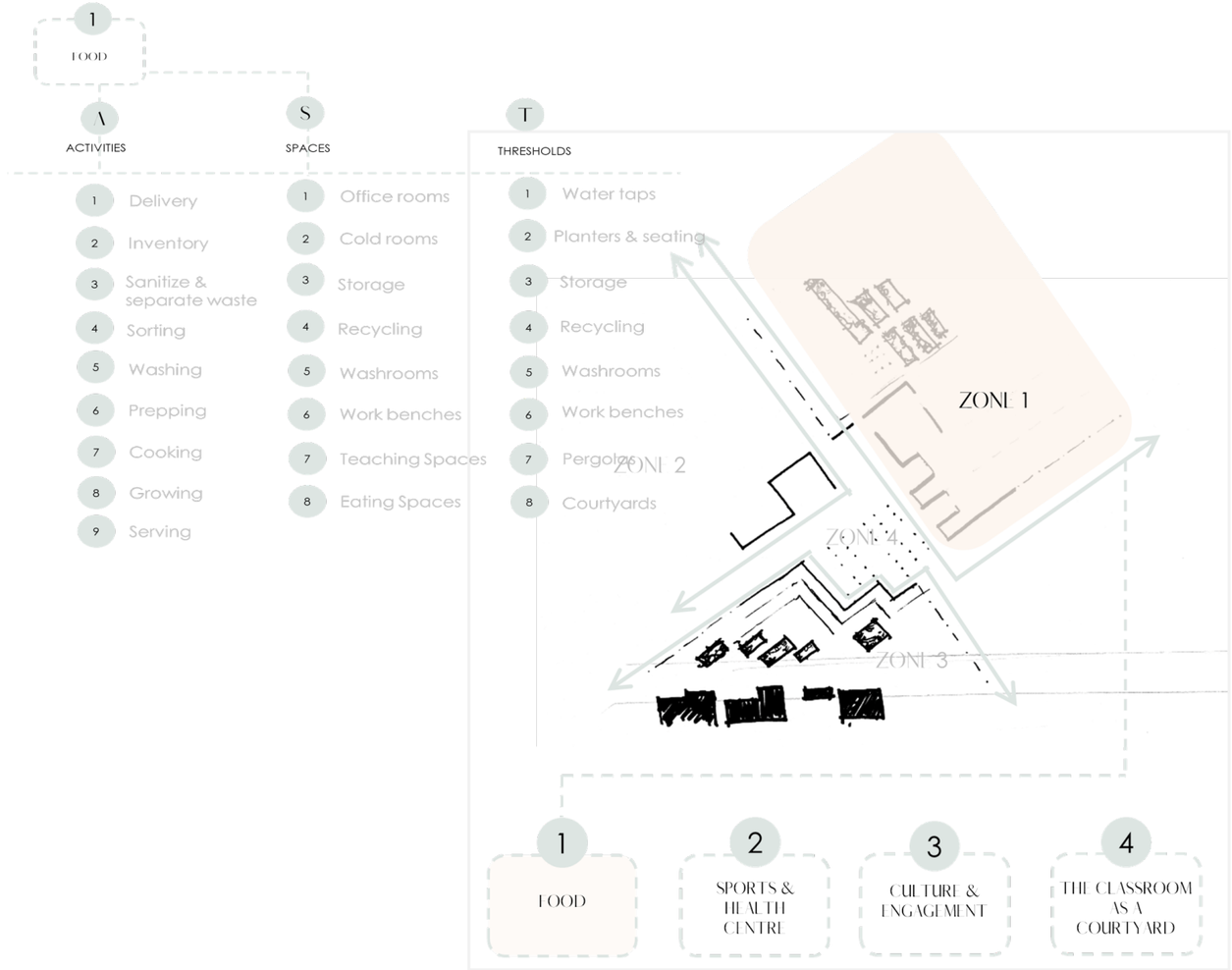


Fig 81: Future implementation of Zoning Phases 1,2,3 & 4 (Author 2020)



Fig 82: A Scene from site (Author 2020)

4.7 Users & Contributors

Client & Stakeholders

Macro client: SA Government, DBE, NSNP
Meso Client: Community, NGO's, NSNP
Micro Client: School, Staff, Students & Community

Authorship

Spatial Agency suggests other ways of doing architecture. It focuses on a collaborative approach in which agents act with and on behalf of, others (Awan et al 2011).

Co-designers

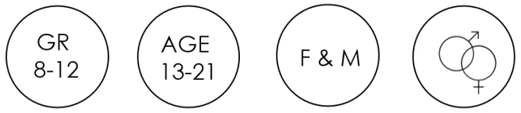
The co-designers consisted of several various students and professionals.

1.The dissertation Volume 1 was co-written by 3 masters students working collectively on different projects on the same site.
2.The engagement with international and fellow collaborators on the ukuDoba methodology, peers and professionals from Chalmers University, Sweden.

3.Co-design sessions and workshops with Honours and Masters students in the Urban Citizenship studio.

Participants

1.Students at Tsako Thabo secondary school



2.Staff members at Tsako Thabo secondary school
3.Community members

Community members

1.Khalambazo community members
2.Uzma from House of Uzma
3.Grace from House of Osizweni

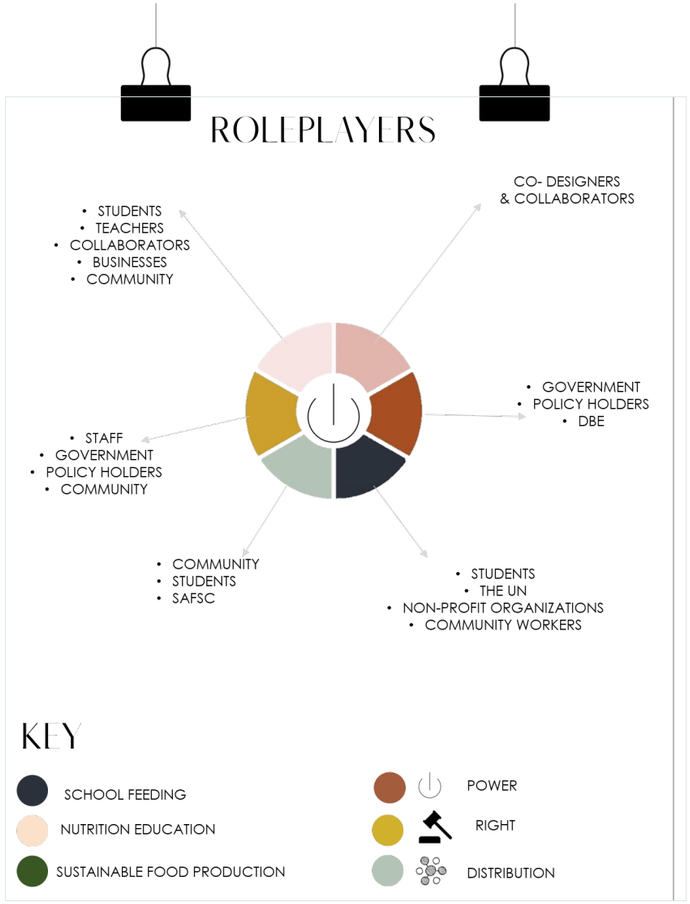
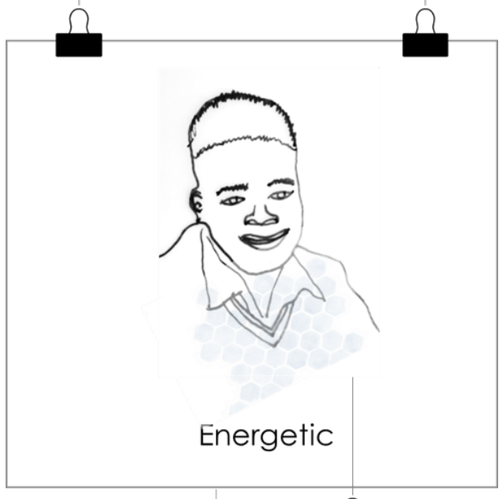
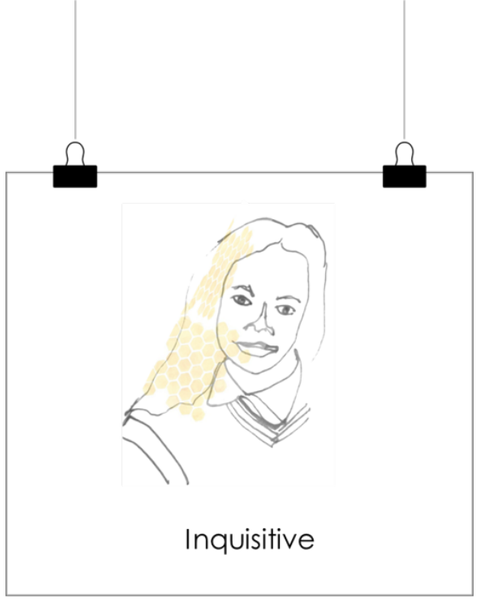


Fig 83: Roleplayers (Author 2020)

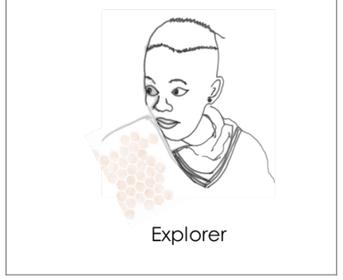
4.8 User Narrative

"Energetic, Elijah a grade 9 learner prefers to eat his meals alongside his classmates in the classroom. He describes the line-up space as overcrowded and a place of social hierarchy that disrupts the notion of social inclusion among learners within the school community. "

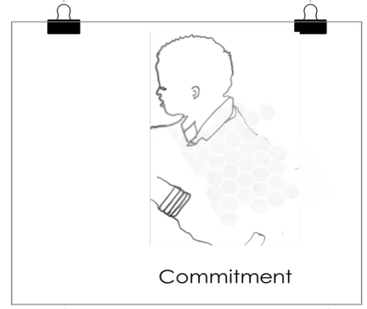




"Naledi is a 2019 matriculant who sells fruit and snacks with her mum on the street sidewalk in Khalambazo. They receive their produce from the Marabastad market in the city. Naledi, although obtained her matric did not receive a bursary to go to University. She now spends her time assisting her mum to help support her two younger sisters."







"Esmeralda and Dora prefer to eat their lunch among friends in either the classroom or concrete courtyards. These spaces are the most private and less occupied, thus avoiding any confrontation from older students and boys."

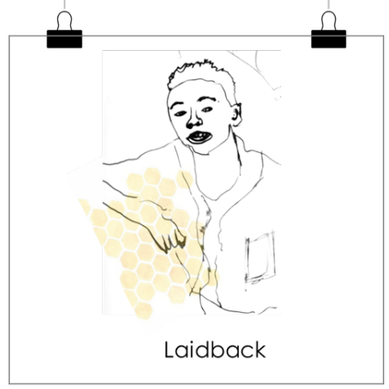
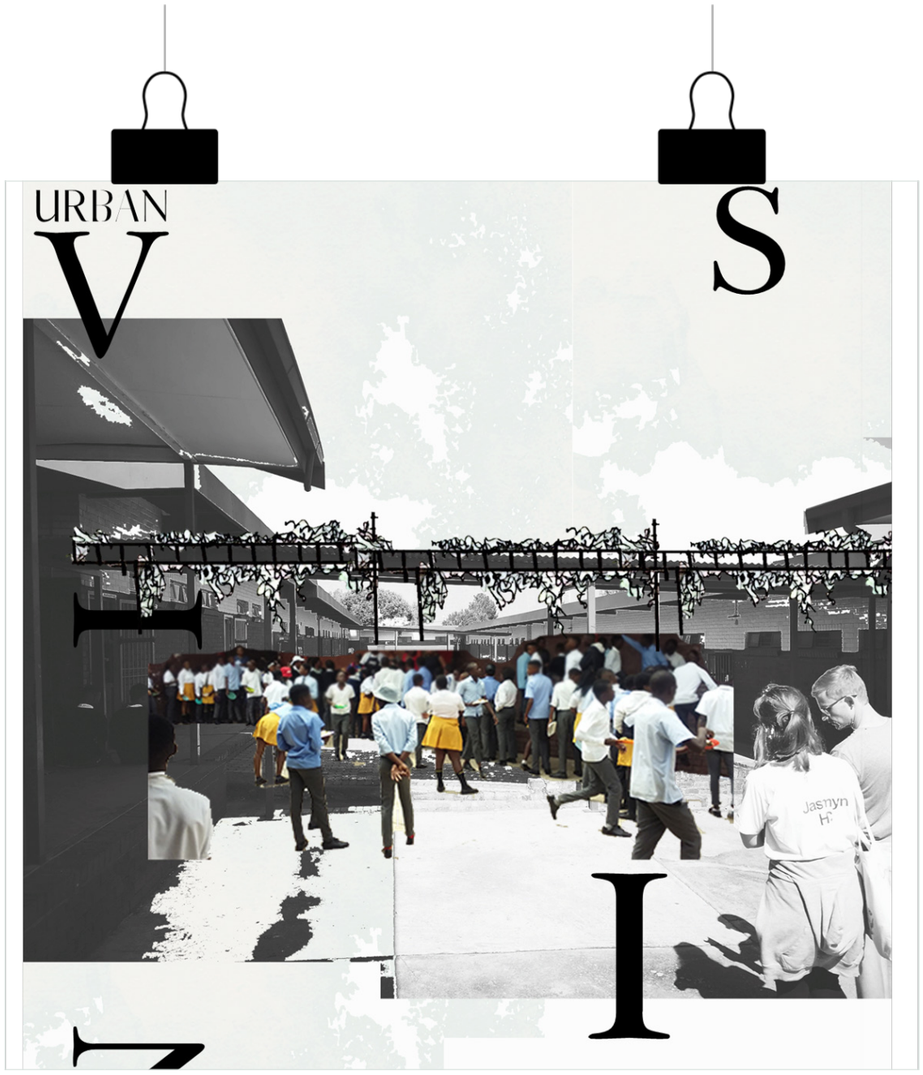


Fig 84: User profile (Author 2020)

Chapter 5



CONCEPT & URBAN VISION

5.1 Project Intention

The overall vision is to create a foodscape that feeds out into the surrounding landscape and is maintained by members of the school and surrounding Khalambazo community. The architectural adaptation and addition of space that prioritizes practical pedagogy and food production should be a physical change that catalytically enhances student wellbeing and promotes practical learning.

During further site investigation in 2020 around Khalambazo area, several small food vendors that exist both within the school and around it were identified as networks of food contributing to the food culture of Tsako Thabo school learners. By continuing to foster the relationship between these nodes of foodservice and the school it supports local economic development.

5.2 Conceptual Approach

The design concept is to re-institute the typical school building typology with the A-frame

gable roof. To adapt the school building to better house and implement health programmes that align to school policies. Theconcept is to readjust the A-frame structure, but to keep the familiar A-frame typology and reappropriate it to the conditions of the surrounding environment and to align to the needs and requirements of the school and spatial experience of the learners.

When looking at the school typologies of schools surrounding Tsako Thabo, it is evident that the typology and spatial arrangement is very similar, perhaps slightly different in arrangement. Based on Tsako Thabo as a case study, the rectangular-shaped classrooms laid out in a parallel manner enclosed by a triangular boundary wall, reveal the spatial and programmatic restrictions the school has.

Safety and security are not to be forgotten in the context of school learners but rather than turn to barricaded walls and electric fences, could the answer not be by removing these barriers and including the community, the school forms part of the landscape, it forms part of the people and programmatically the school feeds beyond its walls. Thus the development of the edible edge.



Fig 85: Urban Vision Concept (Author 2020)



Fig 86: Urban Vision Graphic (Author 2020)

5.3 Urban brief

To create a series of spaces that enhance the habitual notion of eating for school learners. To create indoor and outdoor learning environments that foster nutritional education and encourage practical skills building.

The site should be an extension of the community and through open paths and a community centre, the community should be able to interact with the site at various points and the students should be able to engage with the community at those same nodes.

5.4 Urban Vision

The overall intention is to contribute to the network of food culture that exists within the school. The idea is that collectively the school becomes this foodscape that should something happen in the community, the school network can provide produce, production means and food distribution for the community. By creating a permanent structure that facilitates the feeding scheme programme, the school becomes an important element in the resilience of the community itself. The feeding scheme should be able to function throughout the whole year and not just during school hours and days. This would ensure that students do not have to go without meals or have food insecurity issues during the holiday and recess periods. It also provides the community with security should the country face unforeseen circumstances such a pandemic, water and electricity cuts etc.

Primary (School Feeding system within Tsako Thabo)

To repurpose, adjust and add onto the existing school building in a way that is cost-effective and programmatically beneficial not only to the students in the school but also to the surrounding community. Spatially to use the existing kitchen space, unused classrooms and link these with new intervention to form a foodscape within the school. The existing classrooms will then be adapted, and class allocations will be moved according to programmes.

Secondary (Community Feeding Systems)

The school feeding building will be accessible to the community in a way that maintains the privacy between the school and the community. The community and skills centre will serve to provide a space for community members to take ownership of and build and form in their own way over the years.

Tertiary (Feeding systems across schools in SA)

The project serves as a case study project that could be implemented at other schools throughout the country. The stance taken to subtly adapt the school and provide a realistic and economical opportunity for other schools to be modified was intentional. The project encourages the feeding scheme spatial requirements to apply to all schools who provide this programme offered by the NSNP and encourages food to take a more prominent stance in the daily lives of our youth. The project also advocates for ownership of food sourcing and preparation methods.

HOUT BAY INTERNATONAL SCHOOL

PRECEDENT











The international school of Hout bay by StudioMAS is located in the rural part of Hout bay and the design language is based on the traditional farmstead.

Basic long house forms are positioned to provide courtyards which are enclosed spaces for students to be sheltered from the harsh winds and sun the context is known for.

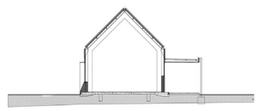
The building form and construction uses the economical industrial steel portal frame construction with white wasted infill brickwork and charcoal steel roofing detailing which creates that seamless blend of traditional form and contemporary detailing.

The school is also created in phases which allows the backbone/ organizational structure to form the foundation of the project and thus be ready for future phases to be implemented as the school grows and the environmental conditions alter (studioMAS Architects 2013.)

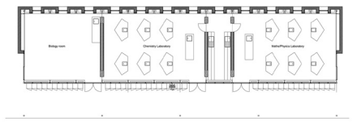
Access is gained directly from the main road. Similarly, in Tsomo Street.
The project is led with the school programme as the main concept however it is cognisant of the approval process, the surrounding farms and its contextual location.
The buildings itself is a continuous engagement with the authorities, the surrounding the community and the school itself.
The farm character of the buildings is reinterpreted as a contemporary approach. They are separate barn-like buildings, have thick masonry walls which double up as storage space on the inside, they have exposed pitched roofs, narrow vertical openings. These are some of the items carried from old to the new.

The separate building blocks create interstice (small intervening space) spaces in the outdoor. Due to the surrounding context, the silhouettes of the mountains are always present, The building courtyards are left open to the sky and the mountains and these views are thus always exposed. Inside the classrooms and labs, there is always a window view to a mountain peak. (studioMAS Architects 2013).

Fig 87: Hout bay Internation School (studioMAS Architects 2018)



Laboratories
SECTION



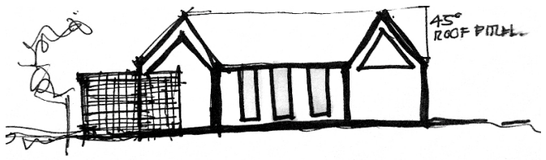
Laboratories
PLAN

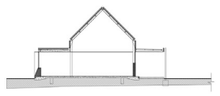






Administration block
PLAN





Administration block
SECTION

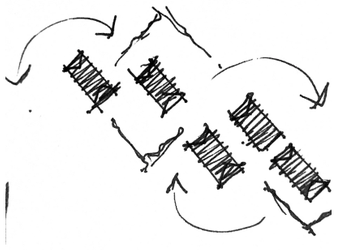






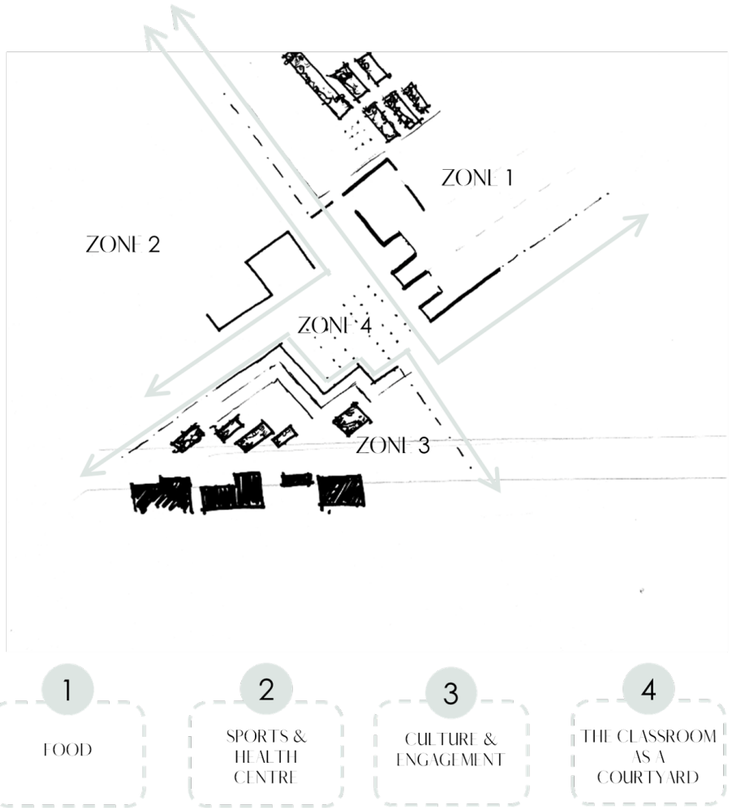
Fig 88: Hout bay International School (studioMAS Architects 2018)

Fig x: 3D incremental Stages (Author 2020)

5.6 Urban Strategy

Graphics illustrating
Dividing of the school into 3 sections
1. Sports, medical centre, hall
2. Music, Art, Library, Admin
3. Food, Dining hall, Preparation and production areas.

The remaining classrooms for the courtyard inside these spaces and are thus able to be closed off from the main three sections during non-school operational periods.



5.7 Urban Vision scale

Hamdi (2004) in his book, Small Change describes the role that informality plays in urban life. It sets out a way of thinking in cities that gives precedence to small-scale, incremental change over large-scale projects. The following represents the incremental stages applicable to the proposed intervention:

Fig 89: Zoning Parti diagram (Author 2020)

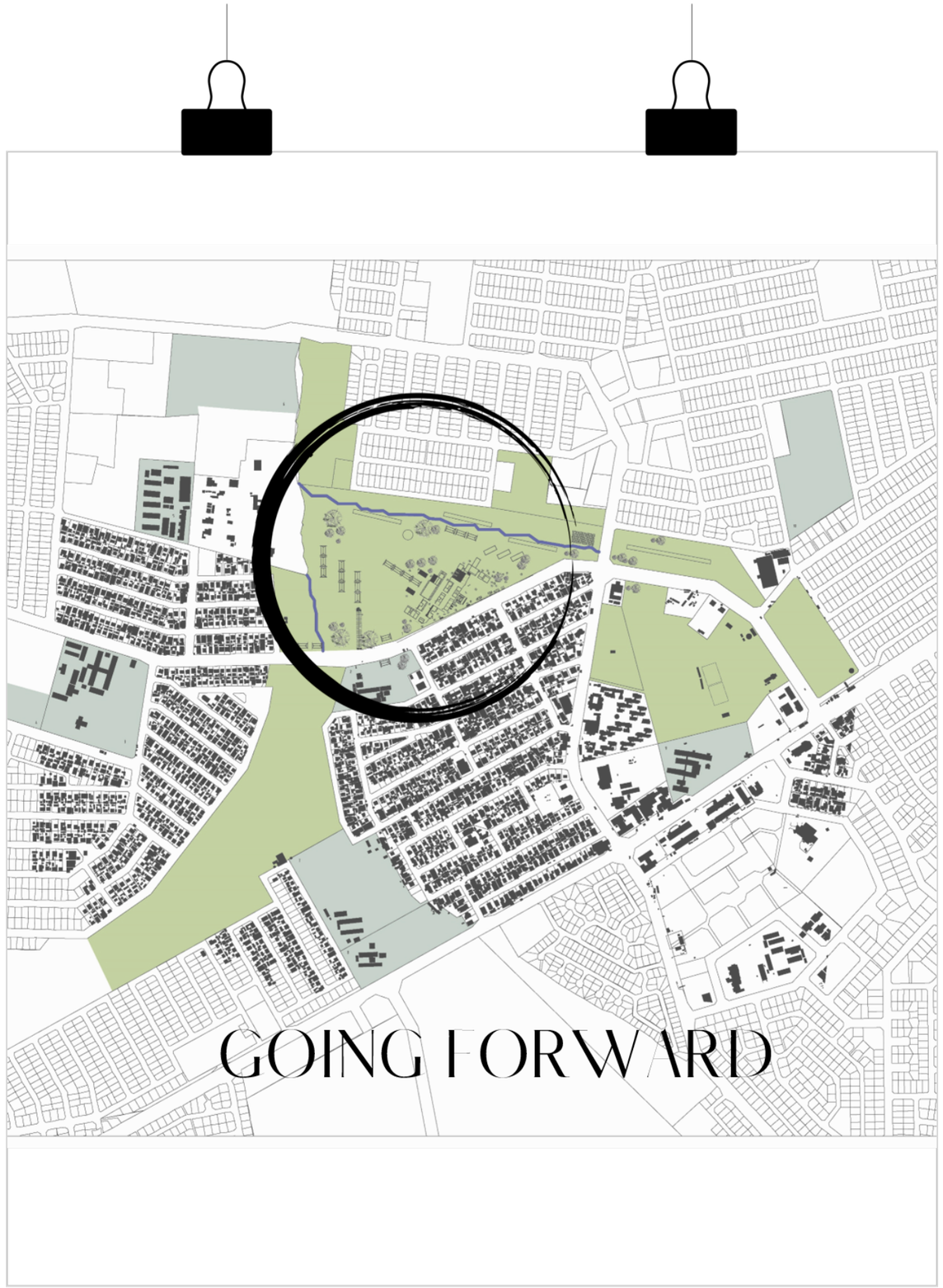




Fig.90 : Urban Vision Site Map 1 Highlighting the green spaces around
(Author 2020)



Fig. 91: Urban Vision Site Map 2 Removing Boundaries (Author 2020)



Fig. 92: Urban Vision Site Map 3 Spilling out into neighbouring sites and green spaces (Author 2020)

5.8 Educational Ecosystem & Didactic architecture

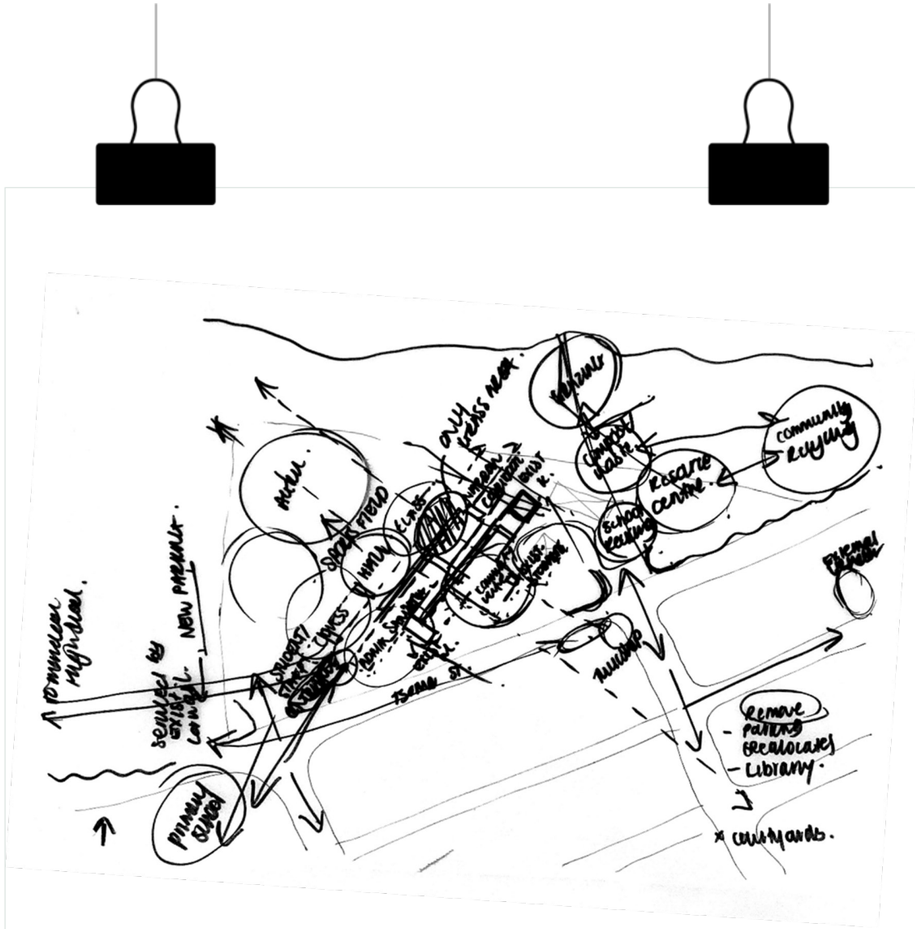
Volume 1 defines the Educational Ecosystem as “a concept through which there is a large focus on the educational sector of a community, identifying and understanding the interrelationships between stakeholders and how these can be enhanced in an effort to uplift the educational quality of the community as a whole” (Mueller & Toutain 2015: 6). Tsako Thabo secondary school is a platform for the MCLC to uplift the educational ecosystem in Mamelodi East. The school acts as a core to connect a system of networks that links people and programme. It fosters a relationship with the principal and students alongside external parties to continuously engage with the school and its community as a means to contribute to extending the schools relationship to community members and stakeholders and to foster the knowledge exchange between the two. By doing so an ecosystem forms and this dissertation investigates the exchange of food and the food system within and around the school and how the existing school can be spatially and programmatically adapted to create a holistic feeding scheme that functions systematically within the school and pours out into the surrounding community to overall create a well-functioning, self-sustaining food programme for all.

As stated in Volume 1, the spatial constructs of the educational ecosystem affect a child's ability to learn, however, the design consideration given to these learning environments is significantly under-developed (Higgins et al 2005).

This dissertation serves to contribute to the educational ecosystem that is being developed within Mamelodi and Tsako Thabo secondary school, respectively. It aims to contribute to the discussion and engage in the impact that space and architecture have on the educational ecosystem particularly in the realm of food the large part it plays and contributes to the learning system and fosters a self-sustaining educational ecosystem of its own within the four developed components of growth, preparation, production and distribution.

Architecturally components that provide facilities for the above are not deemed as minimum requirements within schools and within the NSNP, but rather as suggestions for successful implementation. These suggestions disregard the fact that such facilities are thus dependent on external funding, 3rd party contributions and thus do create an equal playing field for all involved.

Chapter 6



DESIGN DEVELOPMENT

6.1 Architectural Intention

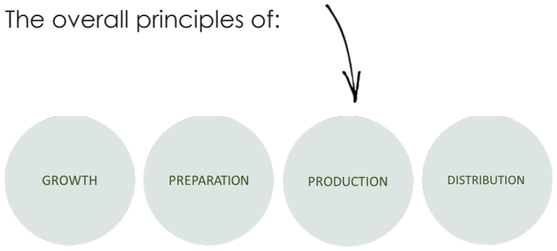
The proposed project is that of the adpative-reuse nature thus it aims to keep the existing school structure in place while modifying and and re-appropriating space and programme.

To use unused classrooms and spaces to accommodate the feeding scheme
And to additionally add on to the school where necessary to incorporate the new programme with the old. The intention is to allow for a school environment that is adaptable for a resilient future. A further community extension will involve less permanent structures which will house facilities for the community to contribute to the food harvesting and distribution.

Once removing the borders of the school and opening the school into the surrounding landscape, the integration of landscape and school terrain become one.

The incremental phasing of the project will create zones which enable dual functionality for the school and the community. It will also enable the school to function beyond the school day and year.

The overall principles of:

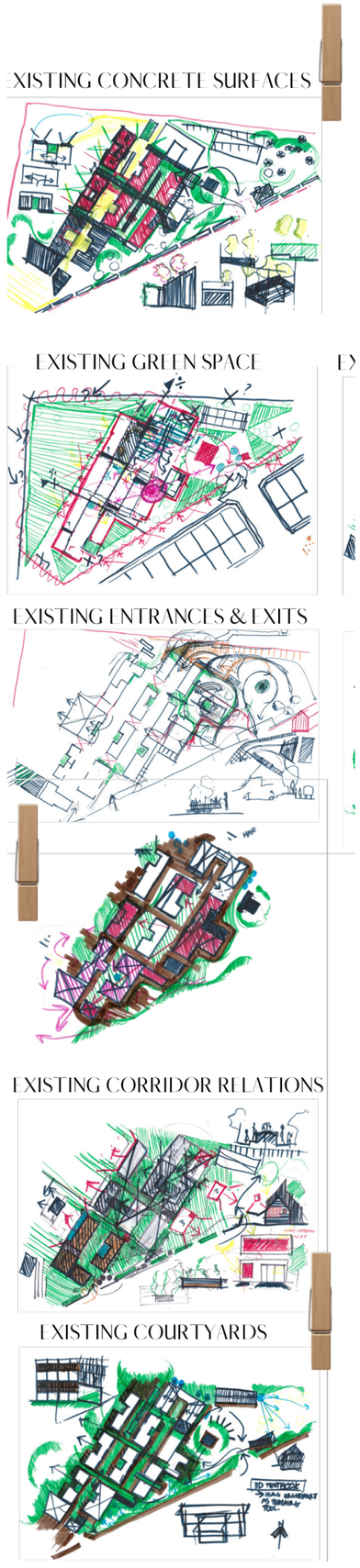


Will be evident in the spatial arrangement of the buildings, the programmatic layout of spaces and the forms in elevation and section.

The layers of the building will contribute to the experiences of the spaces and create a seamless integration into the existing contexts and learning environment.

By creating an adaptable classroom typology , A-frame structure, a more celebrated classroom emerges and a framework for growth is formed. The framework will form part the buildings ability to adapt and will become an opportunity for experimentation in its ability to extend and have a variety of materials added to it.

Fig. 93: Workshop Exploration site drawings (Author 2020)



6.2 Concept & Design development

The Concept is based on theory from the devloped framework as well as key design principles of architecture from adaptive-reuse, liminal space & shear layering. Theoretical and spatial precedents have provided crucial understanding to the form, circulation and systems required in schools.



Fig. 94: Food Sovereignty meets Food security (Author 2020)

ETHEKWINI PRIMARY SCHOOL

PRECEDENT











Fig. 95: Ethekwini Primary School (COF, Fieldworks 2015)

Fieldworks design is a multi-disciplinary architecture firm in Pretoria who value themselves on creating relevant, resilient and sustainable interventions that are capable of positively affecting people's lives in a meaningful way by creating spaces with a strong sense of space but that also align with the company values of innovation, participation and transparency.

Fieldworks architects were commissioned by the Cotton on Foundation to be involved in the eThekwini school renovation, situated in Kwamashu, Durban (COF 2015).

The design is an alteration/addition of the existing school. The architectural team created a spatial education framework based on Uriee Bronfenbrenner's Ecological Systems Theory of development, to guide the layout and design process (Fieldworks 2015). The framework informing the design deals with the effects of social relations and physical environments that inform a child's education.

The project looks at three different elements of education, teaching and engagement that occur in a school environment daily:

1. Individual level
2. Group learning
3. Community

The project addresses sustainability aspects and environmental elements as follows:

Water, Waste, Energy and vegetation

These crucial systems are fundamental to the success and functioning of the proposed food system. They also provide for an educational experience for the learners in their school environment and the elements of sustainability are incorporated into the architecture of the school to allow for this (Fieldworks 2015).

The overall plan aims at reconfiguring existing space to accommodate the programme to make the project as efficient and cost-effective as possible.

The precedent focuses on the formalization of access points, as in my project referred to as zones, as well as movement routes, Controlled entrances and community integration into the site. The project also allows for incremental phasing to take place to enable change over a period.

The project aims at creating a healthy, sustainable and educational environment. This precedent was supported by The Cotton on Foundation as of 2015. The collaboration The Cotton on Foundation initiative with the school was founded in partnership with the Nelson Mandela Foundation(COF 2015). The cotton on foundation recruited Fieldworks architects for the design team.

Initially, the COF foundation donated a library full of books but after that continued its engagement with the school and got involved in the redeveloping of the school by contributing to its existing infrastructure to ensure a quality education for the learners (COF 2016).

The design facilitated by Fieldworks design group, aimed at keeping the original infrastructure while including the students as part of the design process for some inspiration.

They also particularly implemented "Nutrition infrastructure and programs which have successfully been completed by many students. The development of programmes like this is to promote student wellbeing and to "keep students active and involved in school".

Their motivation also focused on providing spaces for teacher support and training to create a better learning environment and quality of education for the students (COF 2016).

"The 'Nutrition Mission KwaMashu" is an educational-based food program and was launched in the community in 2017. It is an 8-day programme that is set out to cover the basics: Nutrition, common health problems, hygiene, kitchen equipment and safety and practical cooking lessons which encourage students to learn basic cooking methods and healthy recipes" (COF 2020).
The Functional kitchen that was added to the primary school in the renovations the school creates a platform for engagement for students and staff and hopes for participation and sharing knowledge through this platform.

"We will assess what the students are eating daily and ensure they are being provided with healthy and nutritious meals that align with the Department of Basic Education's national feeding scheme" (Fieldworks 2015).

My dissertation did exactly that but from a slightly different perspective and it is here that we see the potential of like-minded goals and collaboration.

Through investigating the NSNP initiatives, the meal plans, getting feedback from students on-site about their experience and simply just seeing the food environment in the school. This process has allowed me to make deductions that not only should the food the students eat align with the NSNPs' outcomes and strategy but spatially the issues of where, how and what students eat, needs to be prioritized for all these programmes to successfully work over a prolonged period.

The firm alongside the Cotton on Foundation is currently working to facilitate the nutrition programme at eThekwini Primary in which the aim is that most of the produce will be grown on the school grounds to be used in the school kitchen. The existing vegetable planters at the school will be used for their day-to-day use. The aim at the end is for them to create a syllabus that can aid in instructing community members on how to practice and obtain better nutrition.

From a landscaping perspective, all the trees and shrubs in the planting scheme bear edible fruit for eating. They also Included the "African Orphan crops as part of the planting strategy, specifically for the nutrition mission Garden" (Fieldworks 2015).



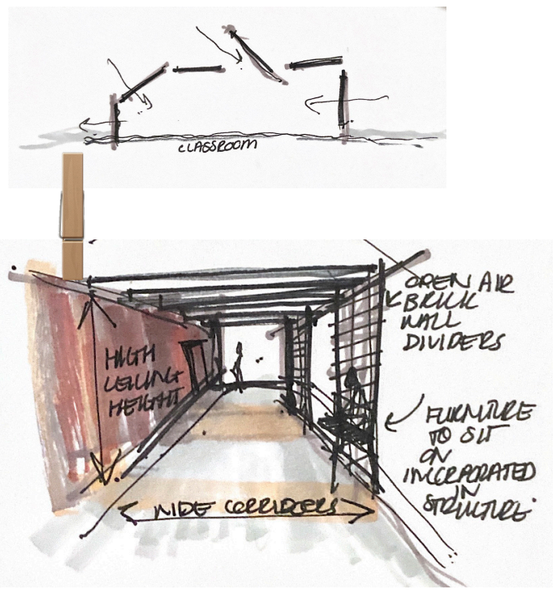


Fig. 96: Principle Sketches (Author 2020)

VELE SECONDARY SCHOOL

PRECEDENT



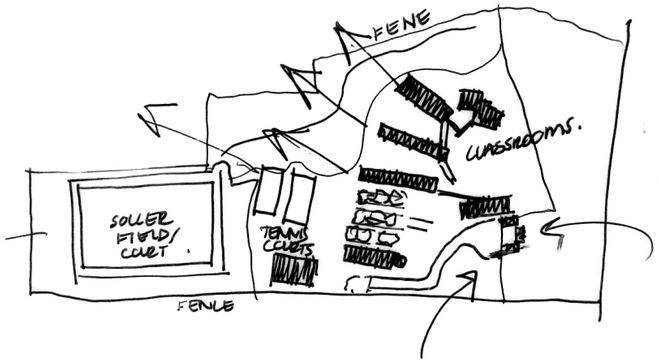








Fig. 97: Vele Secondary School (East Coast Architects 2015)

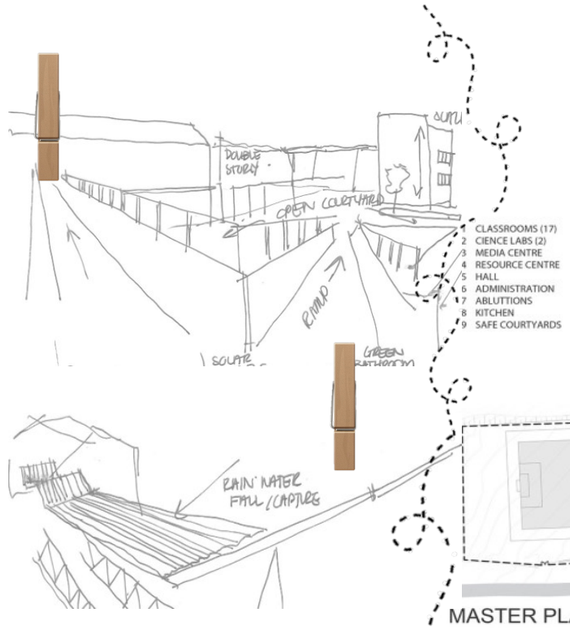


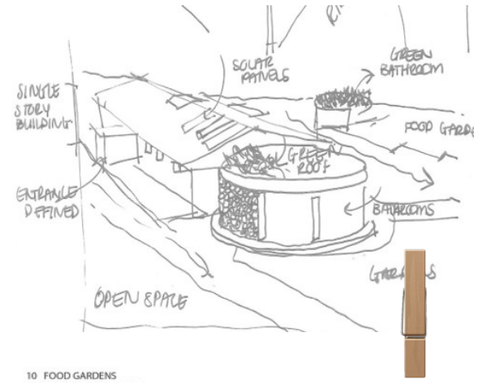
Vele Secondary school is a school integrated with sustainable practice. The school is situated in Limpopo and is part of the Soutpansberg mountain range. It has taken a major transformation from “dilapidated learning facility” to an inventive resource centre that prioritizes learning and teaching in its surrounding environment which pays homage to its cultural heritage (East Coast Architects 2015).

East Coast Architects, early in the process, acknowledged that schools play a critical role in the life of community members (East Coast Architects 2015) predominantly in more remote areas or under-served by government or previously disadvantaged areas with fewer opportunities for socio-economic growth. Their observation is that schools with these backgrounds serve more than just an educational institution but provide many opportunities for the communities surrounding them through the integration of community hubs and places to gather.

In relation to Tsako Thabo, the school has the potential to become the core of the feeding process in the Khalambazo community. The design phase implemented a series of workshops as part of the process to establish a relationship and trust between all stakeholders involved from the architects to community members. Through the mapping, workshops and collaboration, key elements to the project were identified such as the materials, skills and local resources that could be used and thus informed the design and construction development of the project.

The project was built using the same budget that a typical government school would build using the standardized documents to maintain a replicable model for future implementation. It met all of the standard requirements as well as contributed to those by offering the following services (East Coast Architects 2015):





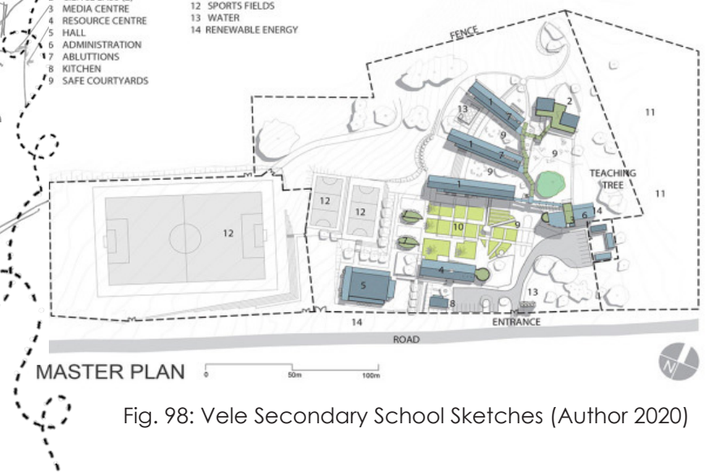
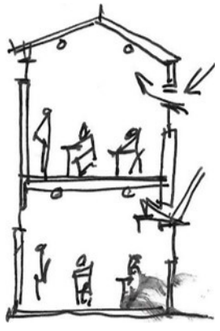


Fig. 98: Vele Secondary School Sketches (Author 2020)



- Rainwater harvesting and storage (200,000 litres)
- Food gardens at the heart of the school campus
- Solar energy for computers and water pumping
- Electricity sub-metering and display for energy management and education
- Green roofs for insulation and celebration of indigenous flora
- Dry composting toilets
- Biogas digestors for cooking
- Passive Low Energy Design for thermal comfort, natural lighting and ventilation
- A campus layout that facilitates the sharing of amenities with the community and surrounding schools.

The project contributed to the matric pass rate as it improved from 38% in 2009 to 93% in 2014 due to the learning environment improvements (East Coast Architects 2015).

6.4 Design informants

Co-design

Wellbeing requires action and thus encourages collaboration through co-design in the process of production. It allows consumers to become producers and transforms the process of engagement into an efficient driver of wellbeing and prosperity.

Theory
Resilience, Adaptive Reuse, Shearing Layers, Liminal Space Theory

Spatial Informants

Workshop outcomes translated into design generators:

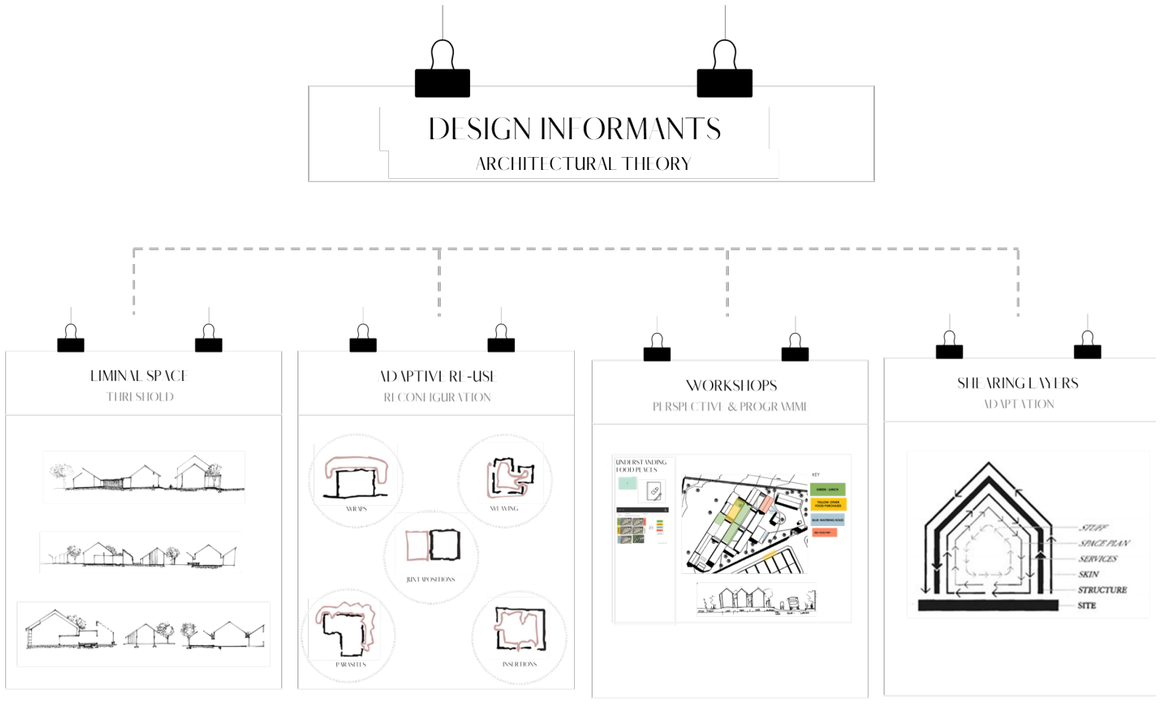


Fig. 99: Four Main Design Informant Principles (Author 2020)

6.4 Design development

The design development of the project is based off of the workshops, theory and exploration. The explorations are linked to specific workshops and are a result of thorough analysis and investigation.



This project aims to modify, re-appropriate & add spaces that aid in practical learning spaces which are essential in secondary schools in South Africa (Kwatubana et al 2018).

The design intention is not to have recreated an entire school to focus on school feeding, the intention was to adapt, subtly, transitionally, and incrementally the inclusion of nutrition and food into the existing school and its programme. The most common addition would be to add a food hall, but the students already used classrooms for that when needed.

The intention is that through the opening of classrooms, extended and creating of green courtyards, introduction of vegetable patches and planters throughout the educational landscape, that nutrition would not be the core of the school in one physical form but would be an important cluster of elements that improve the wellbeing of the students, staff and surrounding communities.

The intention is to investigate the potential role that architectural design has to spatially contribute to critical conditions that exist in school communities.
It aims at responding by creating space making that enables change.
Through the addition of A-Frame structures to the existing classrooms, modified food preparation, production and distribution areas, as well as the sustainable food gardens, are created. These spaces in their new form aim to increase productive learning & provide spaces for skill development and sustainable practise.

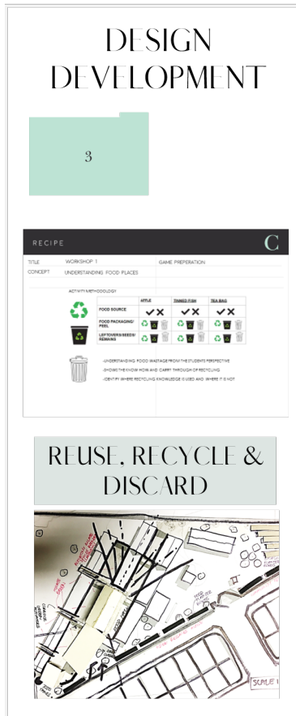


Fig. 100: Understanding Food Places Workshop(Author 2020)

The Classrooms are defined as modular areas, and although they lack character, aesthetic and spatial quality they provide a sense of comfort and safety.

The Library provides quiet Interactive Spaces that are an escape to the chaos around.
The water fountains are overcrowded however during quieter times in the day provides small break moments.

The Green Spaces are re activated and occupied with movement and swells of conversation and exchange.



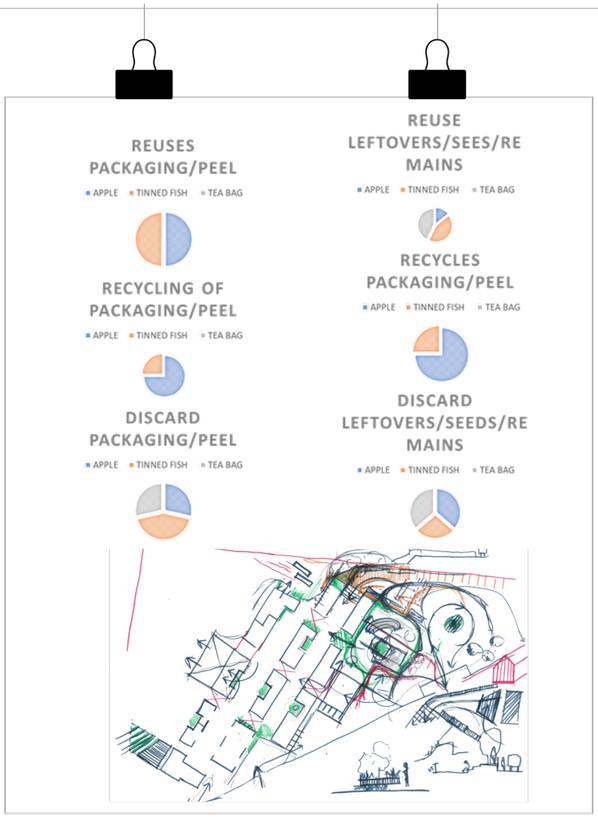


Fig. 101: Design Development Workshop Reuse, Recycle & Discard (Author 2020)

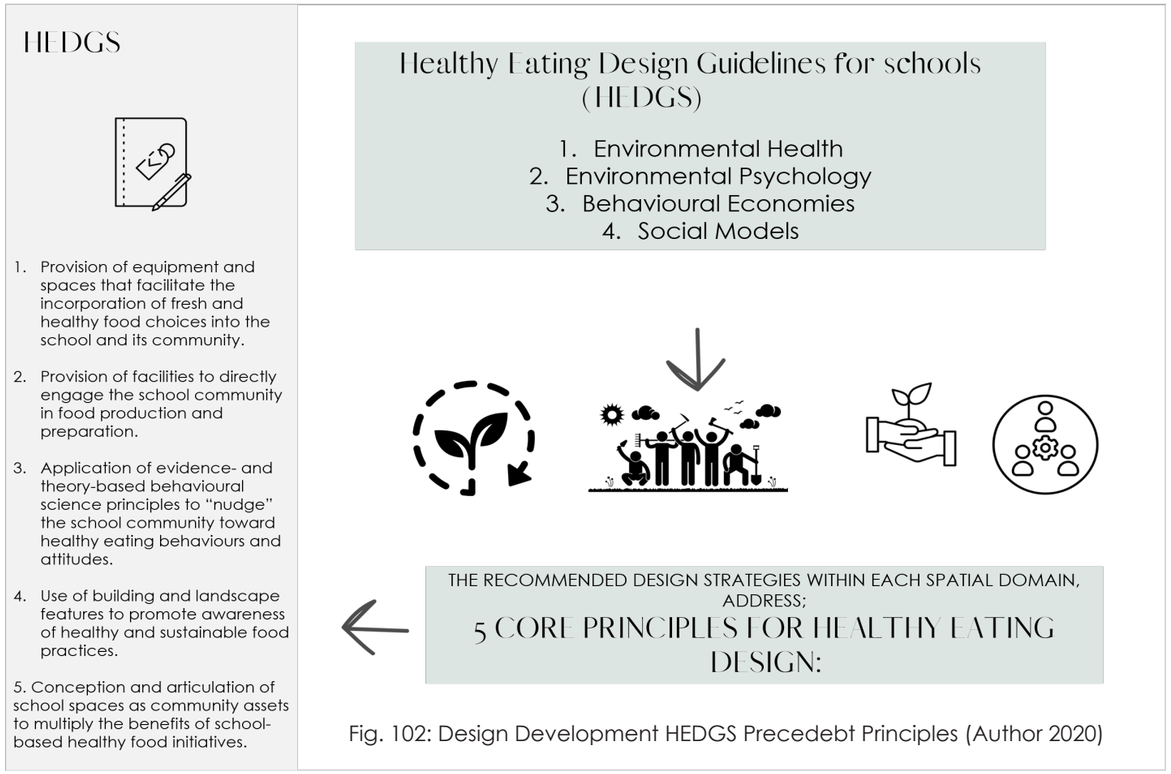


Fig. 102: Design Development HEDGS Precedebt Principles (Author 2020)

DESIGN DEVELOPMENT

3

RECIPE C

TITLE WORKSHOP 1 GAME PREPARATION

CONCEPT UNDERSTANDING FOOD PLACES

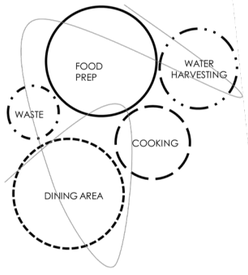
ACTIVITY METHODOLOGY

	ATTLE	TRADES EM	TEA BAG
FOOD SOURCE	✓	✓	✓
FOOD PACKAGING/ PEEL	✓	✓	✓
LEFTOVERS/SEEDS/ REMAINS	✓	✓	✓

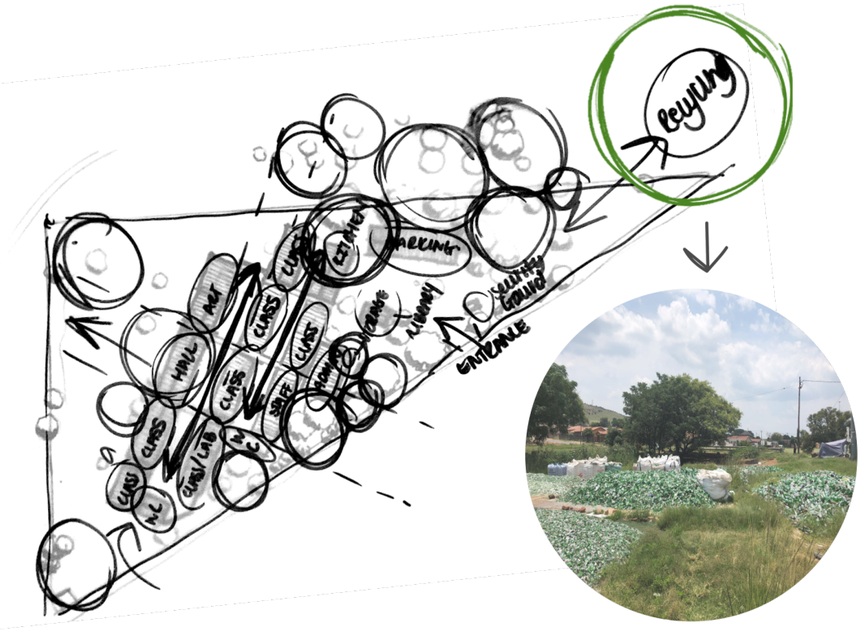
UNDERSTANDING FOOD WASTAGE FROM THE STUDENTS PERSPECTIVE

SHOWS THEM HOW AND CARRY THROUGH OF RECYCLING

IDENTIFY WHERE RECYCLING KNOWLEDGE IS USED AND WHERE IT IS NOT



RECYCLING

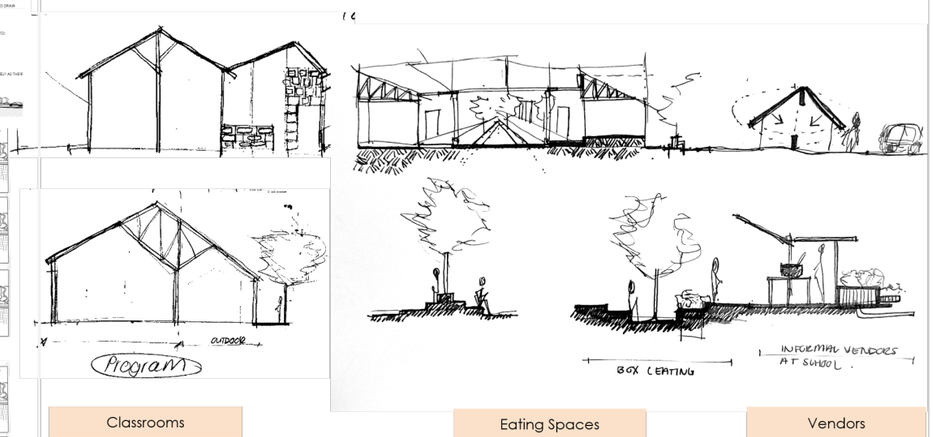

recycling
entrance
compost & buffalo
food production
recycling
recycling
recycling

KEY ELEMENTS

6

RECIPE F

DESIGNING HEALTHY FOOD ENVIRONMENTS



Classrooms | Eating Spaces | Vendors

Fig. 107: Design Development Workshop Healthy Food Environments (Author 2020)

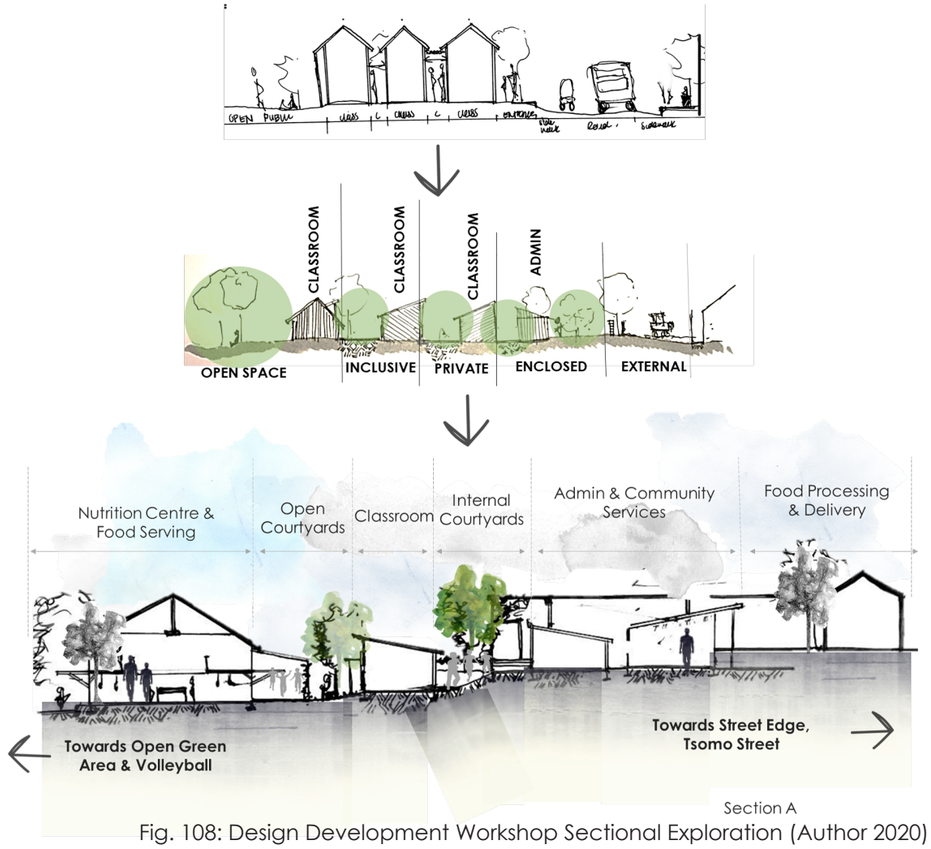


Fig. 108: Design Development Workshop Sectional Exploration (Author 2020)

NUTRITION CENTRE

Enhancing the learner's ability to be more focused and engaged as nutrition influences the psychological development and plays a vital role in a child's engagement and interaction (Birch et al 1970).

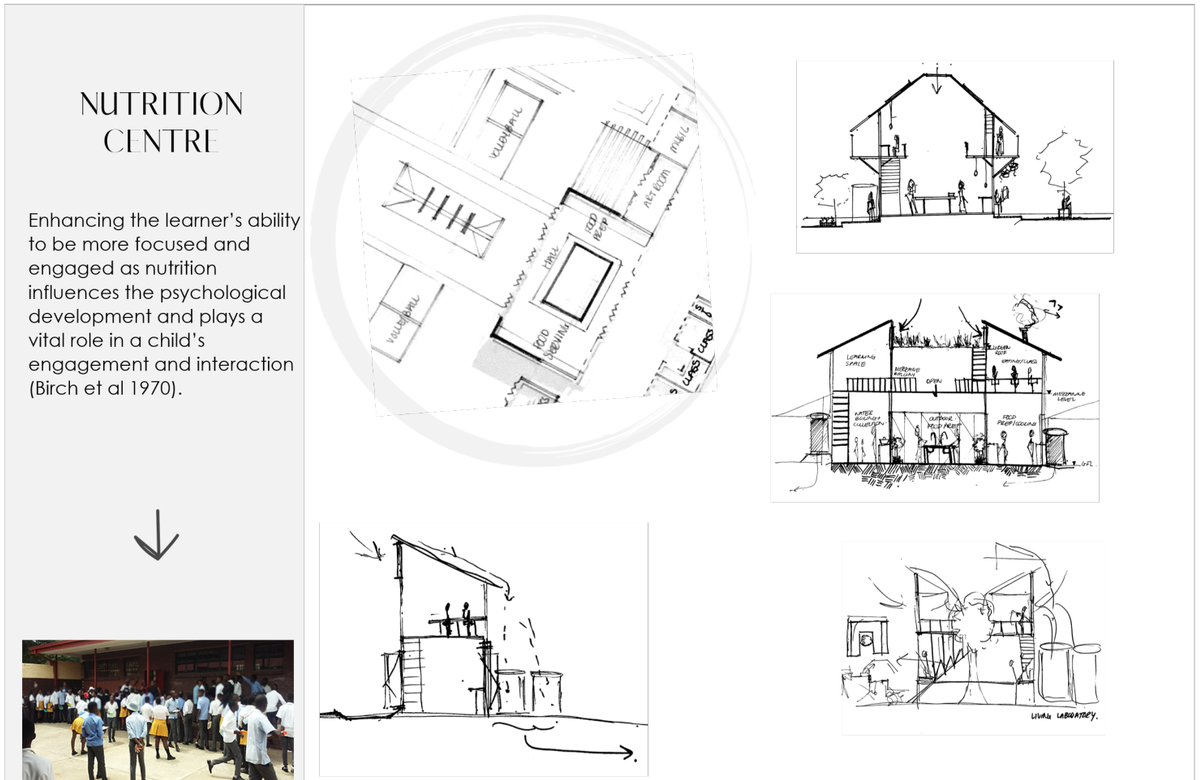


Fig. 109: Design Development Workshop Nutrition Centre (Author 2020)

COMMUNITY & SCHOOL THRESHOLDS

6

RECIPE F

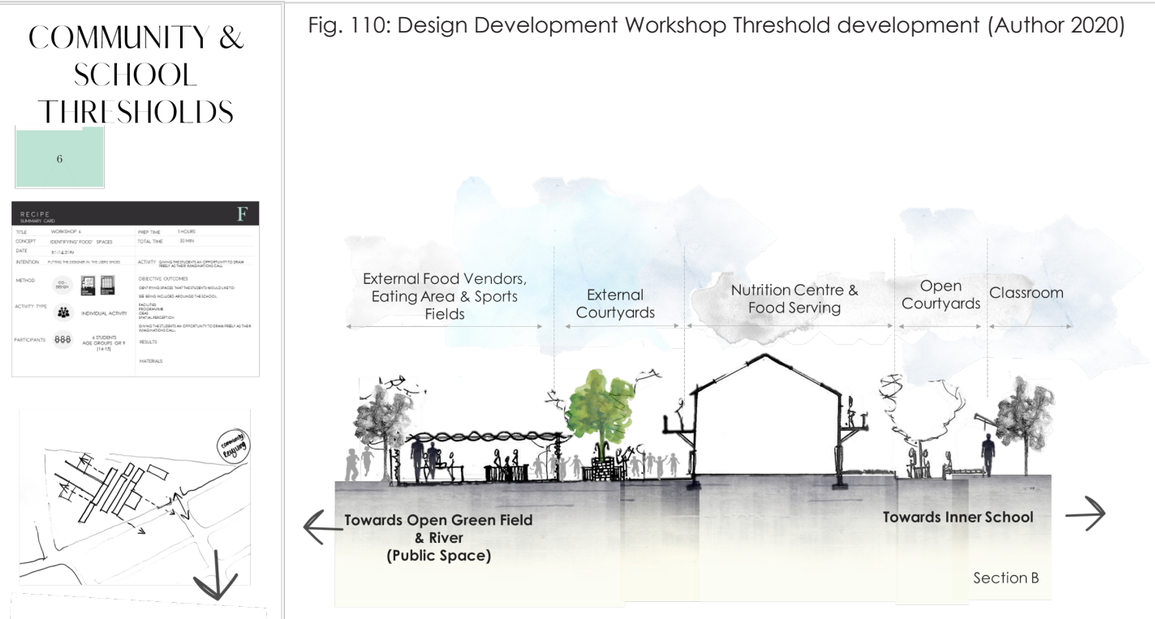


Fig. 110: Design Development Workshop Threshold development (Author 2020)

PROGRAMMATIC FLOW & LAYOUT

5





The unconventional mould demonstrates a lack of individuality and encourages the school system to maximise the potential of all students and acknowledge that Education and learning is part of an organic process.



CONNECTING PROGRAMME TO FEEDER SCHOOL

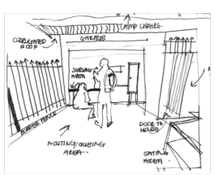
Fig. 111: Design Development Workshop Programme & Layout (Author 2020)

DESIGN DEVELOPMENT

6







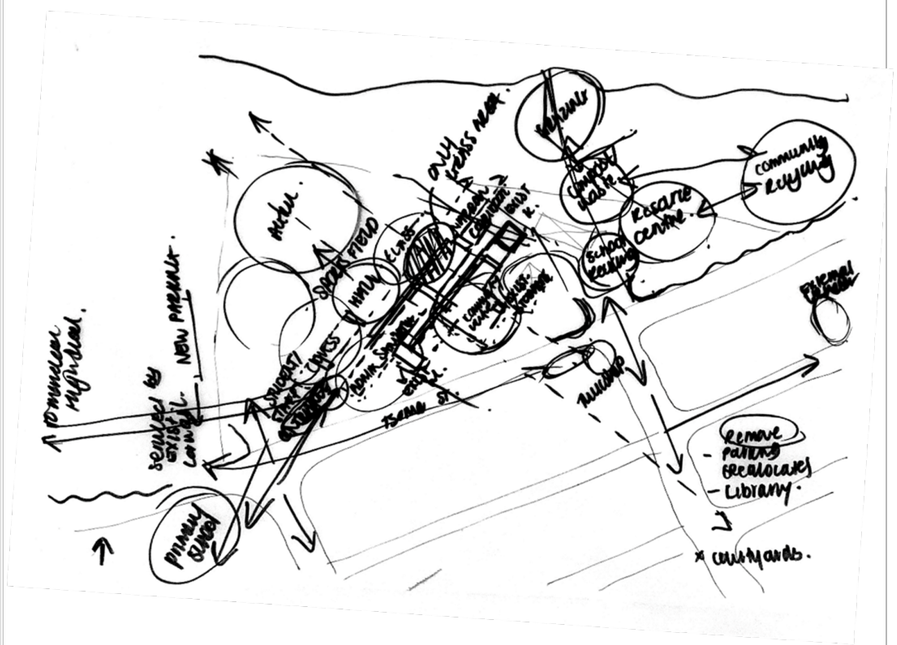


Fig. 112: Design Development Programmatic & Spatial Exploration (Author 2020)

8







Fig. 42 SMITH.K (2019)



Fig. 43 SMITH.K (2019)

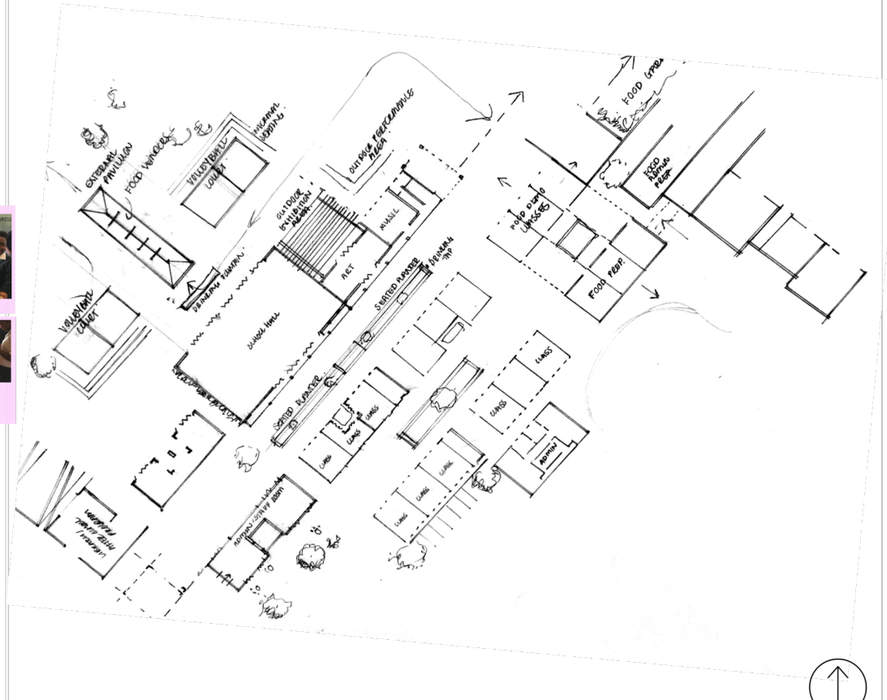
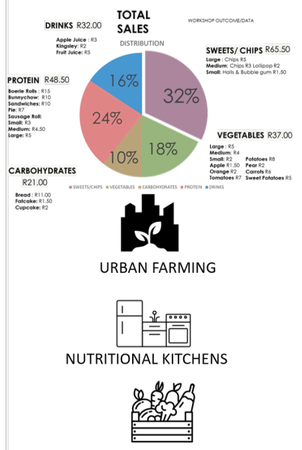


Fig. 113: Design Development Workshop Model Building Spatial Analysis (Author 2020)

INTEGRATING NUTRITIONAL EDUCATION

4





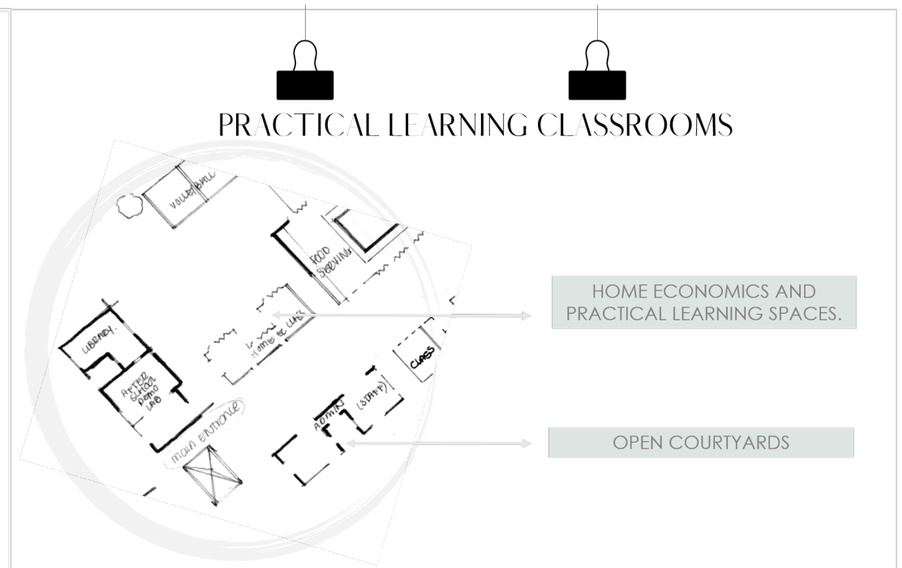
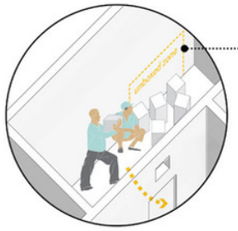




Fig. 114: Design Development Workshop Practical Learning Spaces (Author 2020)

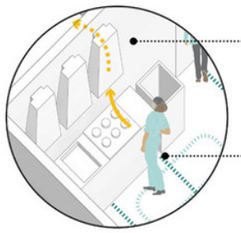
FOOD MOVEMENT

MASS COVID GUIELINES



Clearly designate space in the loading/unloading zone where all shipments are received and unpackaged. Tape on the floor, or other visual cues, will ensure this space is visible and easy to clean.

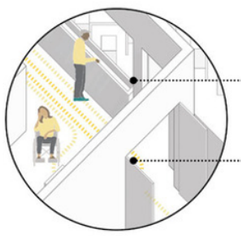
Delivery & Unpacking



Ensure proper airflow, measured by air-changes per hour, to dilute the air and remove contaminants from the kitchen.

Remind all back-of-house staff to don PPE before entering the kitchen, and to circulate into the exchange zone only through designated entry.

Cooking & Exhausting



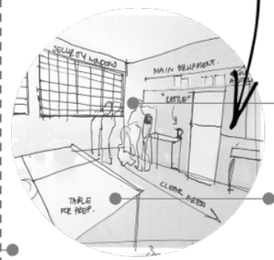
Install a handwashing basin for guests to use upon entering the exchange zone.

Post visible safety standards and protocols for both guests and employees.

Arrival & Sanitation

(MASS 2020)

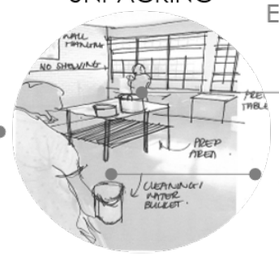
TSAKO THABO



TT Now: 2x2m room 20m away from kitchen . Located at main Entrance of school building. All food deliveries are received and stored there.

TT Intended: Designated space for:
Unloading (Zone)
Unpacking & Sanitizing
Stock Taking
Packing & Storing.
Add: Visual cues to aid in instruction of space. (Eg: tape on floors)

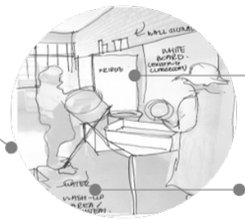
DELIVERY & UNPACKING



TT Now: 2x2m room 20m away from kitchen . Located at main Entrance of school building. All food deliveries are received and stored there.

TT Intended: Install Handwashing basins/stations for all students to use before entering "Exchange" Zone.
Visible Safety & health precaution & instruction posters

ARRIVAL & SANITATION



TT Now: Open plan cooking & food preparation area. Classroom. No specific designated food prep/cooking and serving. Lack of protective/safety ware for staff in kitchen

TT Intended: Ensure Proper Airflow to dilute air & remove contaminants from kitchen.
Changing Area for staff to don PPE & work clothing before and after entering the kitchen area.
Create circulatory movement to and from exchange Zone

COOKING & FOOD PREPERATION



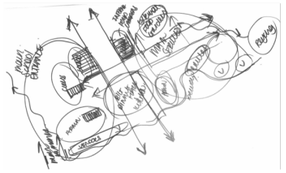
TT Now: Serving takes place along corridors & cues in the courtyard. Consuming takes place in classrooms, corridors and courtyards.

TT Intended: Dedicated 2m apart seating arrangements & encourage outside eating as contamination is limited inside.
Extend existing barriers between furniture to minimize contamination between tables

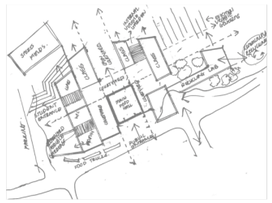
SERVING & SEATING

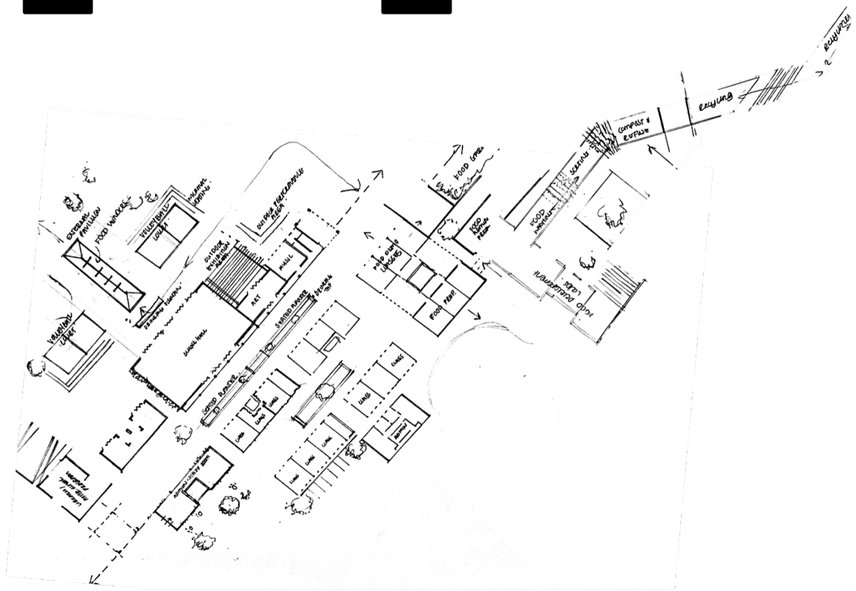
Fig. 115: Mass Architects Spatial Analysis Adapted and Applied at Tsako Thabo School Kitchen (MASS 2020, Author 2020)

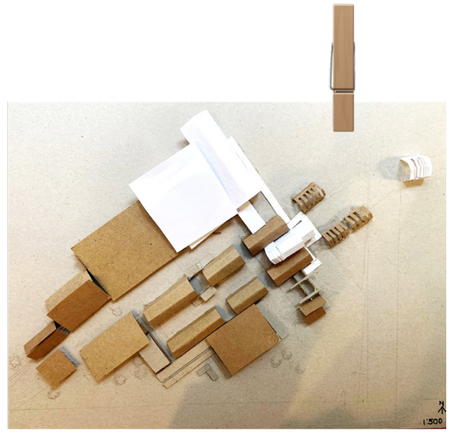
Design Development

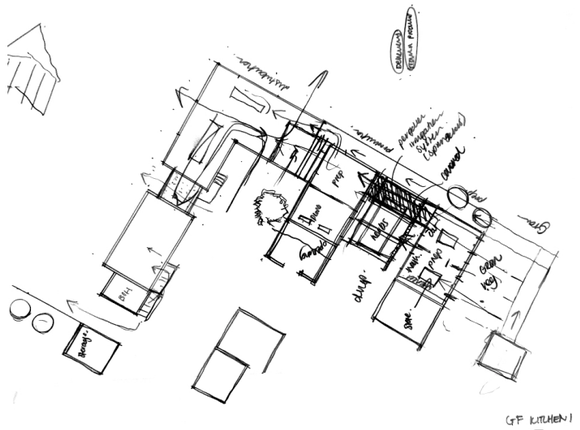






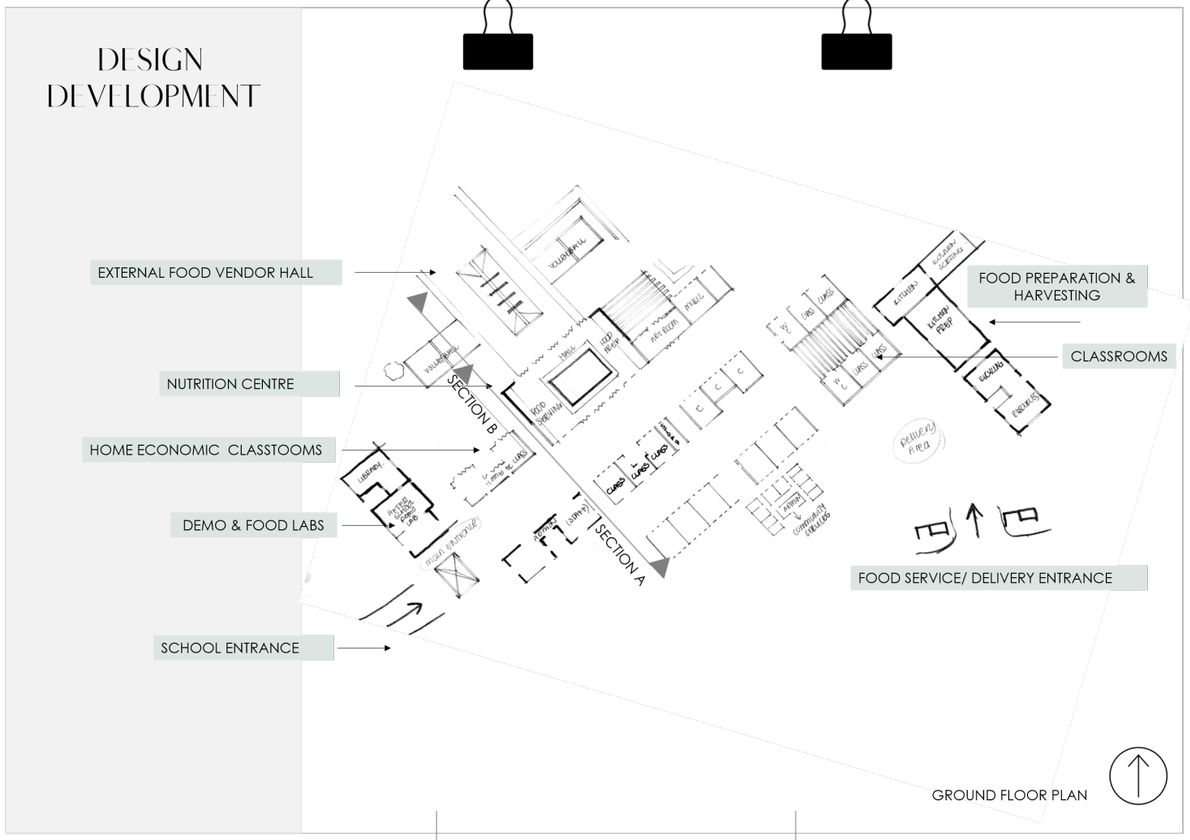






SCALE 1:500

GF KITCHEN 1
1:250



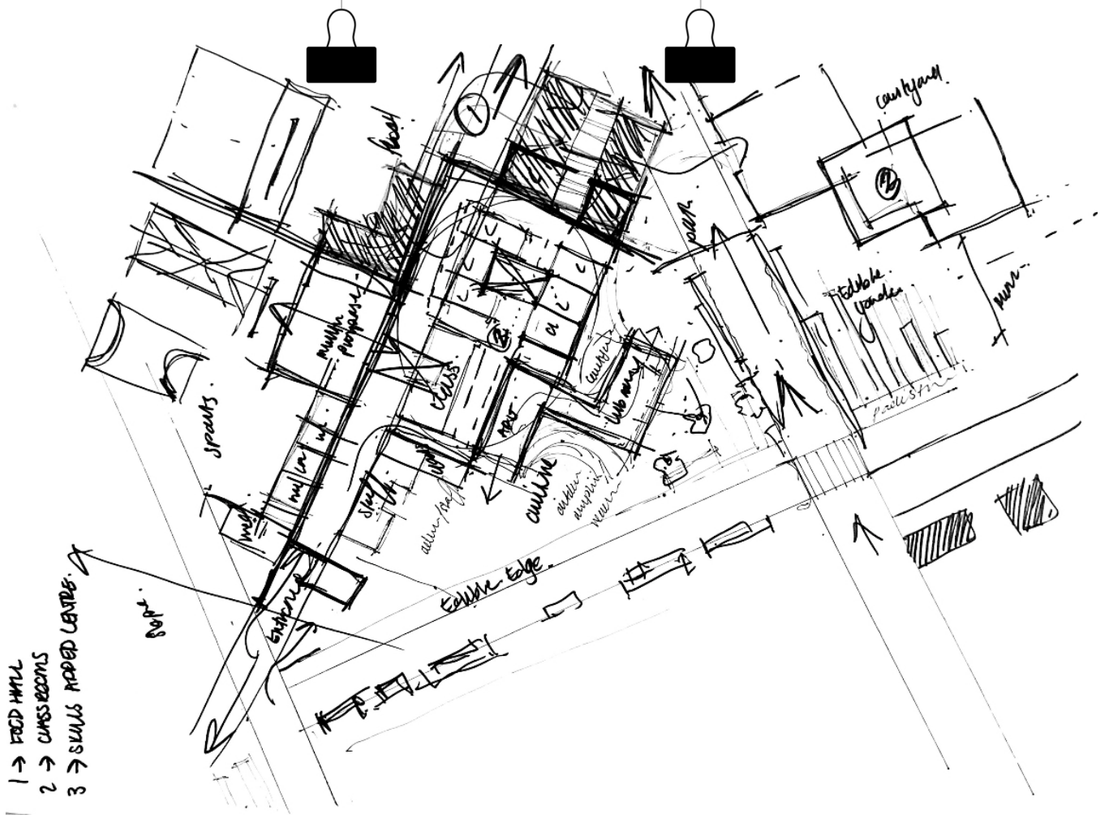
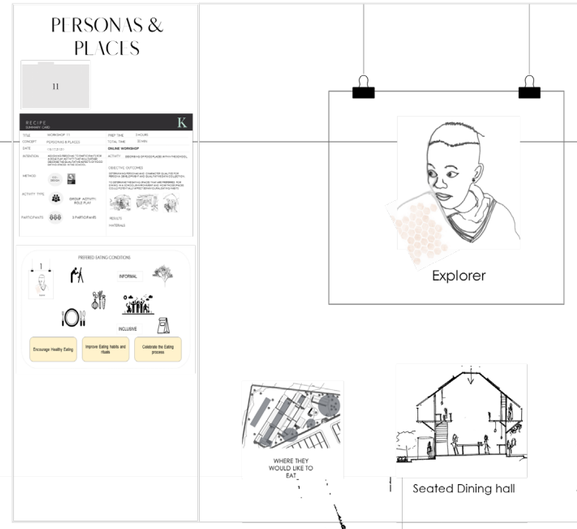


Fig. 116: Design Development Sketches Phase 1 (Author 2020)

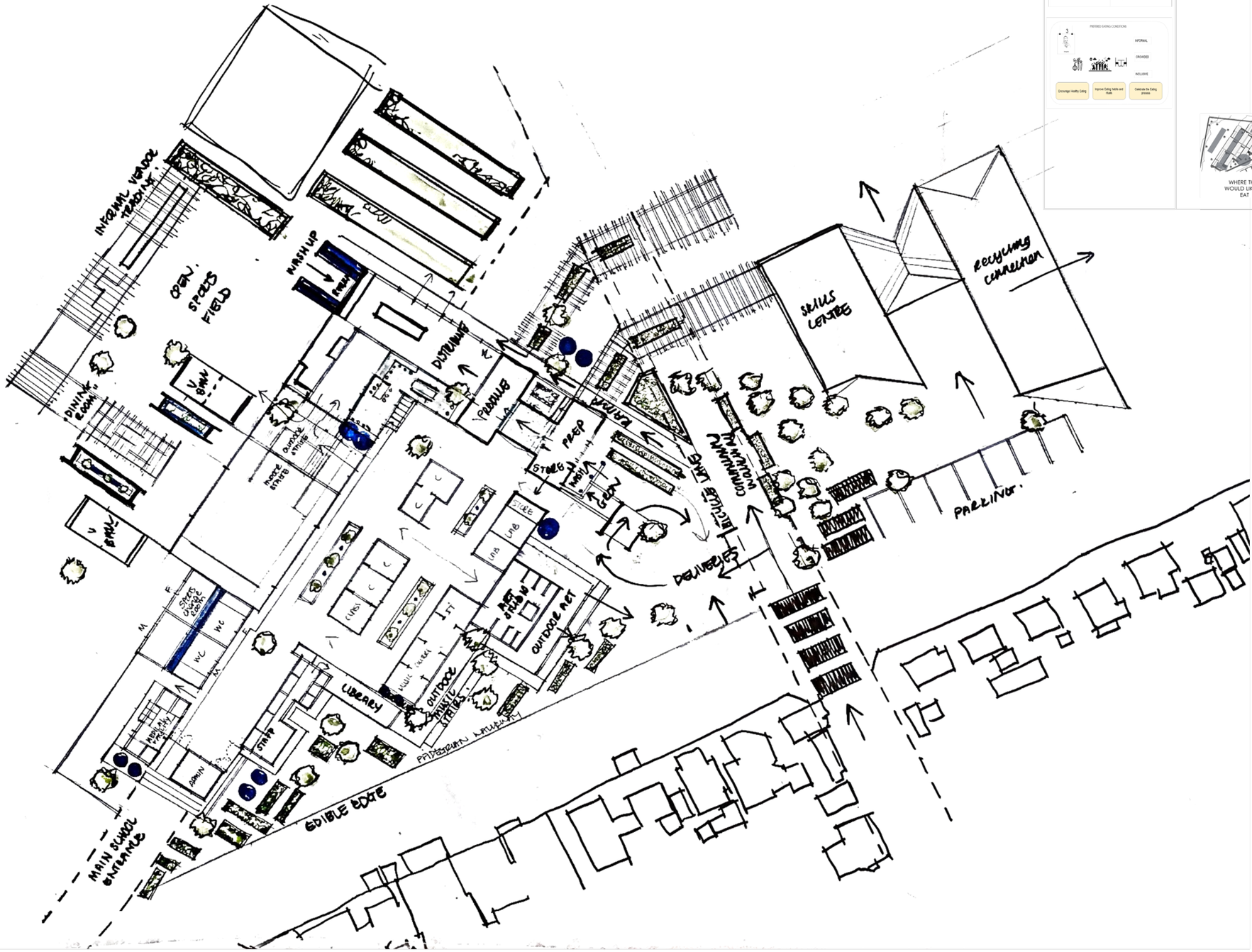




NTS

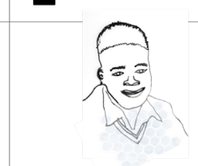
Design Development

Fig. 117: Design Development Sketches Phase 2 (Author 2020)



PERSONAS & PLACES





Energetic

WHERE THEY WOULD LIKE TO EAT



Under a Tree or Shaded Area



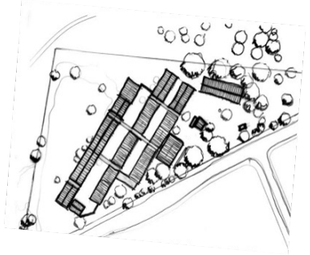
With my friends in Class

NTS

N

Design Development

Fig. 118: Design Development Sketches Phase 3 (Author 2020)



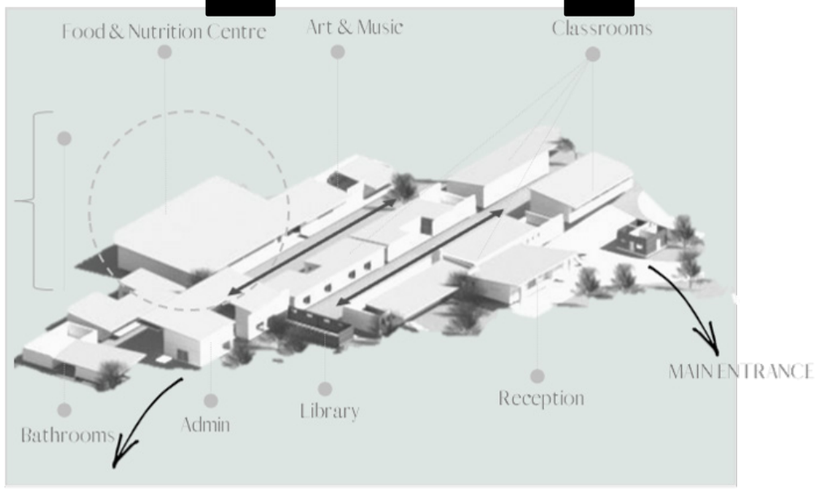
Design Explanation

The design phase started off by attempting to convert the mostly unused Hall into a food hall.

The entrance of the school remained in its original postion and the rest of the school programme did as well.

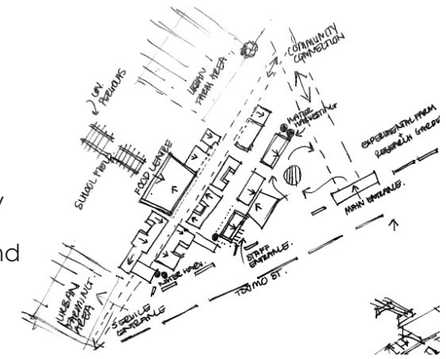
The New Addition to the hall would require its extention onto the green landscape behind the school.

Iteration 1



Plan Exploration

The spatial layout of this design seemed informed by using the largest avaliable classroom that is not mostly used. However, the school hall was far removed from any entrances or exists of the school. This makes it difficult to recieve deliveries, open the facitility to the community and maintain easy access from the communit



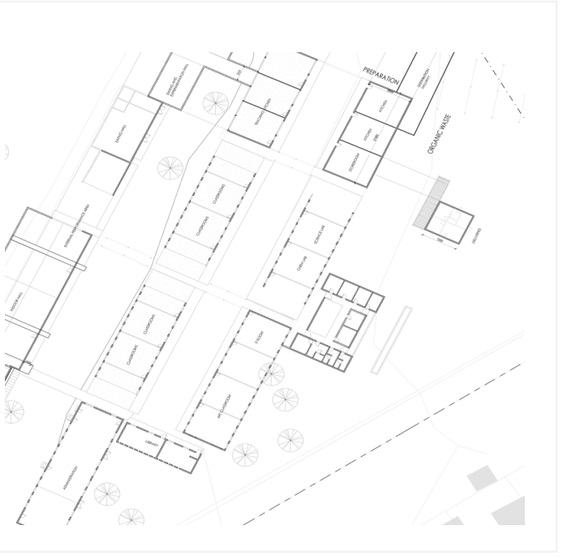
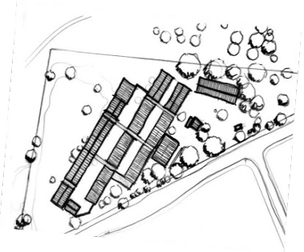
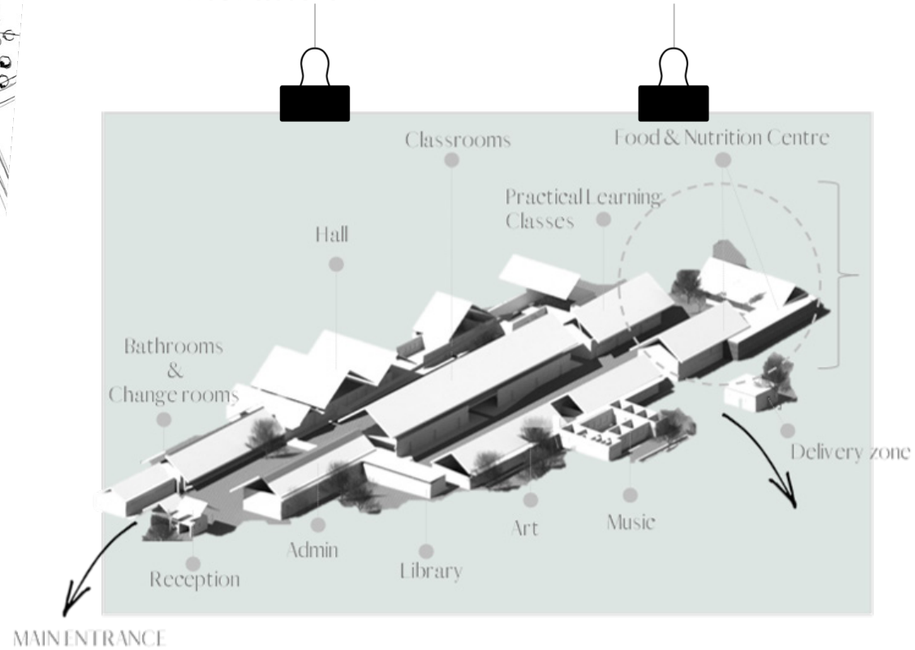




Fig. 119: Design Development Sketches Iteration 1 (Author 2020)



Iteration 2



Design Exploration

The plan extends the nutrition centre beyond the hall and alongside the hall into the unused art classrooms.

It moves the kitchen back to the existing space and rather focuses on using the hall as a recreational centre.

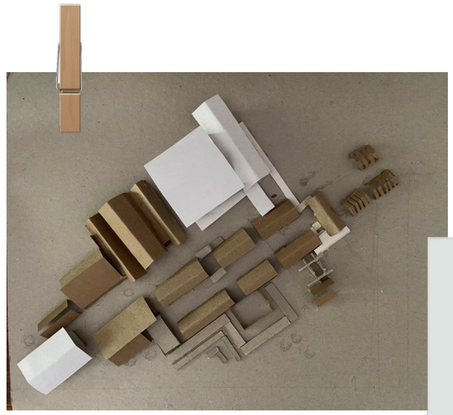
This option allows for nutrition to be accesible to the main street and community members.

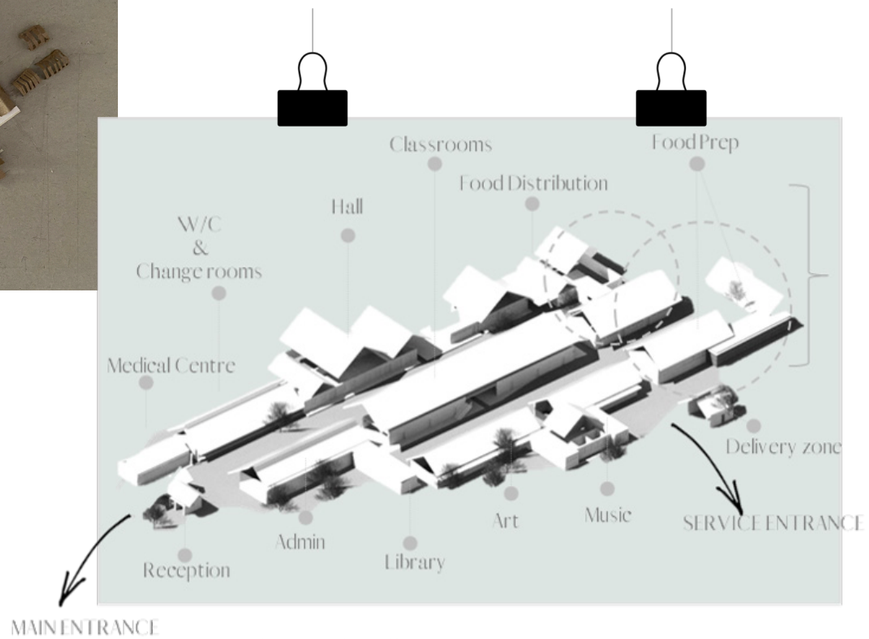




Fig. 120: Design Development Sketches Iteration 2 (Author 2020)

Iteration 3





Design Exploration

The Nutrition Centre now extends itself into the adjacent site. This allows for the community-school connection set out in the design intent. A system of pergolas extend into the open field and allow for places to eat while the students are on break.

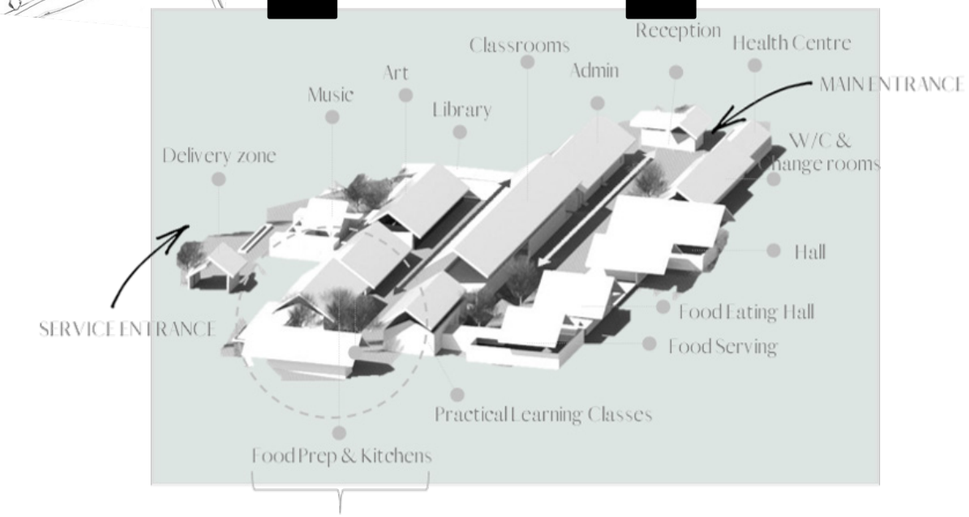
All monopitch roofs have been removed from the existing classrooms and all roofs are now gable ends, experimenting with a steeper roof pitch and a more elevated structure.



Fig. 121: Design Development Sketches Iteration 3 (Author 2020)



Iteration 3.2



Design Exploration

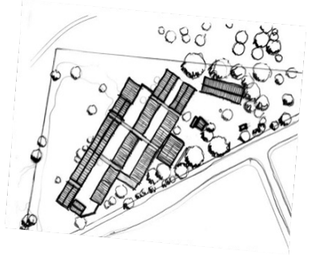
The Nutrition Centre extends beyond the existing classroom. The addition of a food collection area and more teaching kitchens are added to the side of the existing kitchen. The main entrance also moves to the otherside of the site and the old main entrance becomes the service entrance, serving the distribution centre.

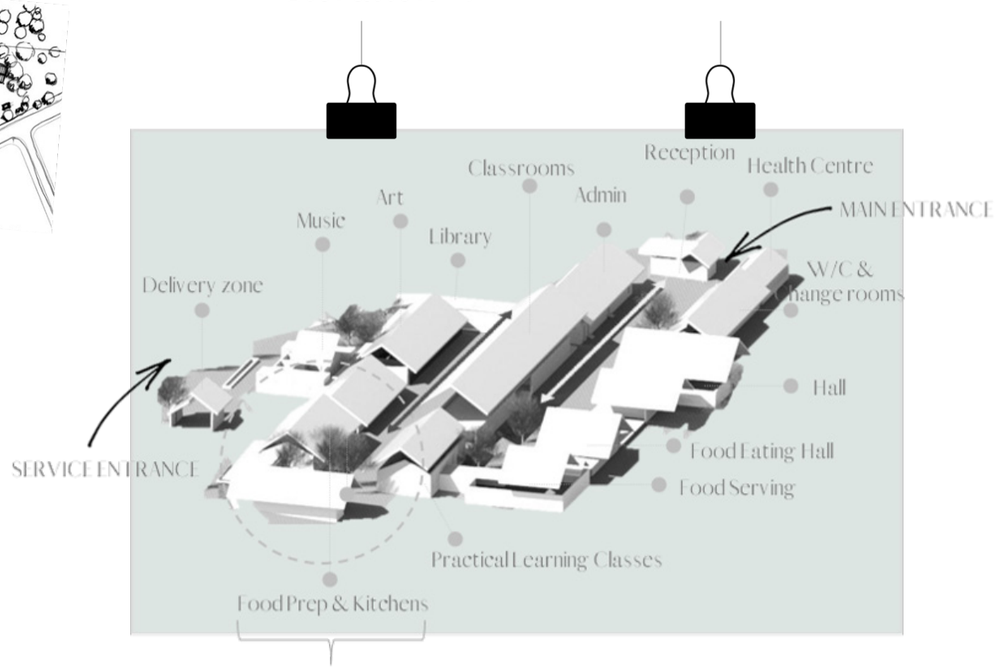
The roofs are all A-frame shaped but are of different widths and run in dfferent directions.

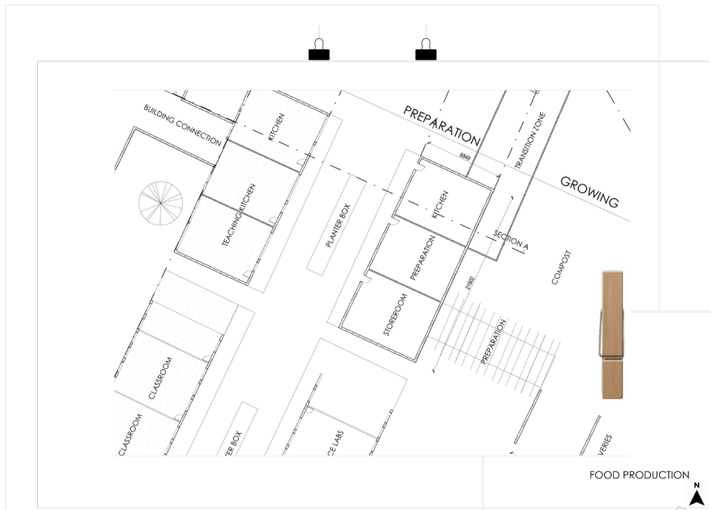


Fig. 122: Design Development Sketches Iteration 3.2 (Author 2020)

Iteration 4







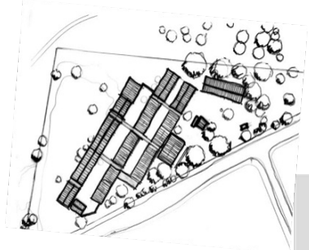


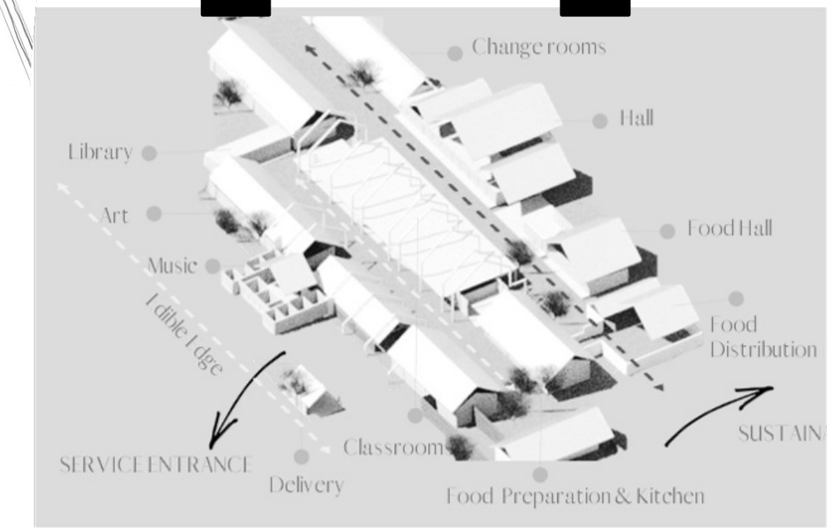
Design Exploration

The Nutrition Centre extends beyond the existing classroom . The addition of a food collection area and more teaching kitchens are added to the side of the existing kitchen. The main entrance also moves to the otherside of the site and the old main entrance becomes the service entrance, serving the distribution centre.

Fig. 123: Design Development Sketches Iteration 4 (Author 2020)

Iteration 5









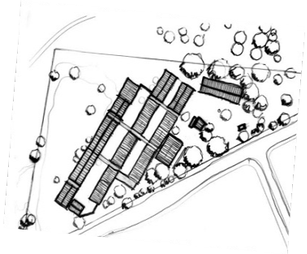
Design Exploration

This iteration is the start of the addition of portal frames to the existing structure in order to start forming the exoskeleton of the building. The Portal frames are moulded to the requirements of each building and its programme. For example, the classrooms will have a wider frame to allow for a wider corridor to accomodate accesibility and circulation.

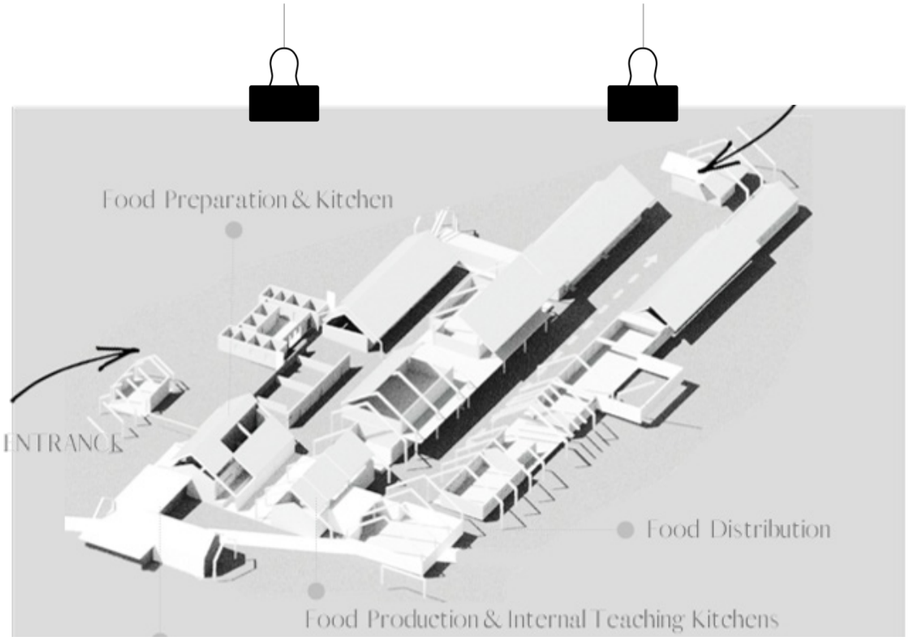
Scale 1: 100

N

Fig. 124: Design Development Sketches Iteration 5 (Author 2020)



Iteration 6



Design Exploration

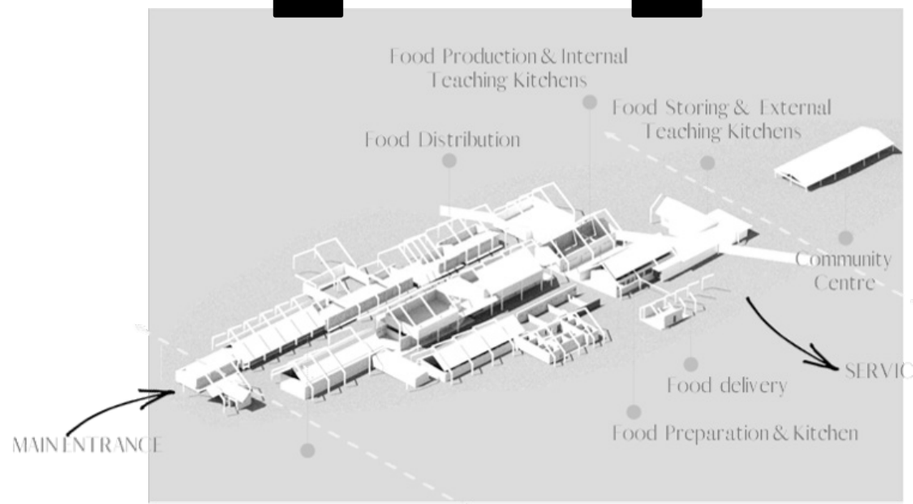
This iteration revises the portal frame dimensions slightly. It combines different widths but the same height for the first storey buildings and a smaller width and different height for the secondary storey building (Main block of classrooms).

The portal frames at the hall area double up to achieve the width necessary. The Kitchen now experiments with the roof placement on the portal frame allowing openings at certain parts in the building. The flexibility the portal frame structure brings is fundamental to the building being able to adapt to programme.



Fig. 125: Design Development Sketches Iteration 6 (Author 2020)

Iteration 7



Design Exploration

This iteration sets the portal frame sizes to be constant in width and adjustable in height. The width is determined by a design decision to make 3m wide walkways and to include that addition of width in the portal frame width. This amendment resulted in very wide portal frames that proportionally were not suitable to all the classrooms.

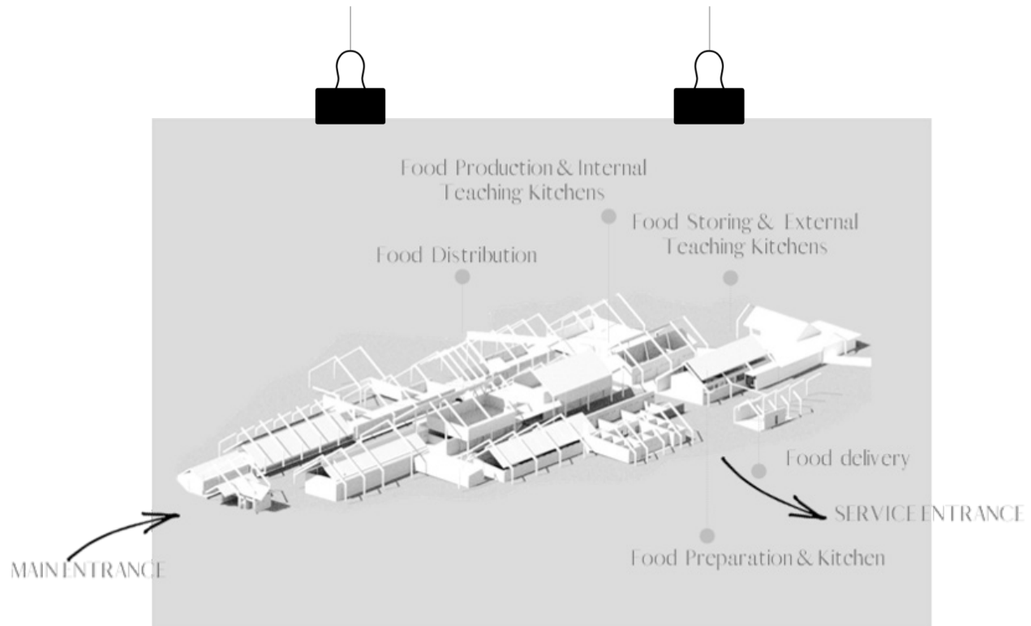
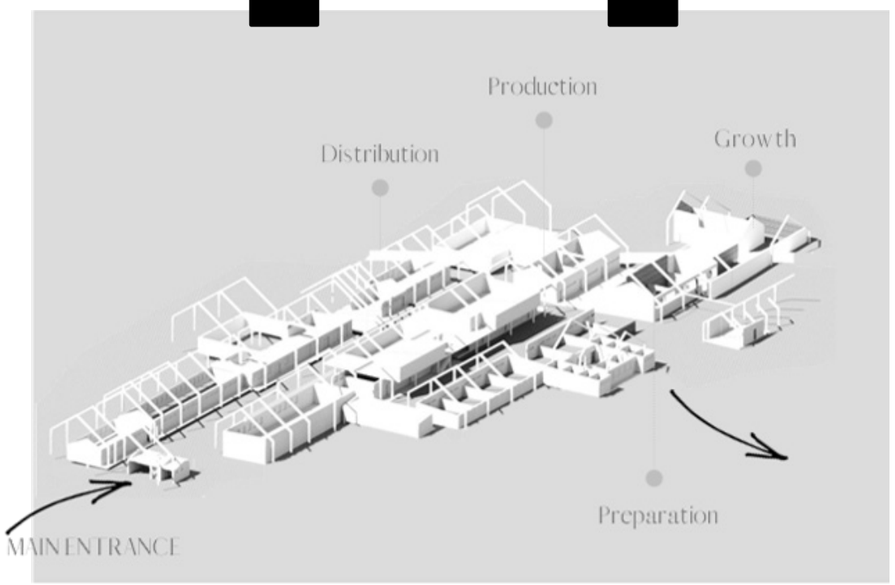


Fig. 126: Design Development Sketches Iteration 7 (Author 2020)

Iteration 8



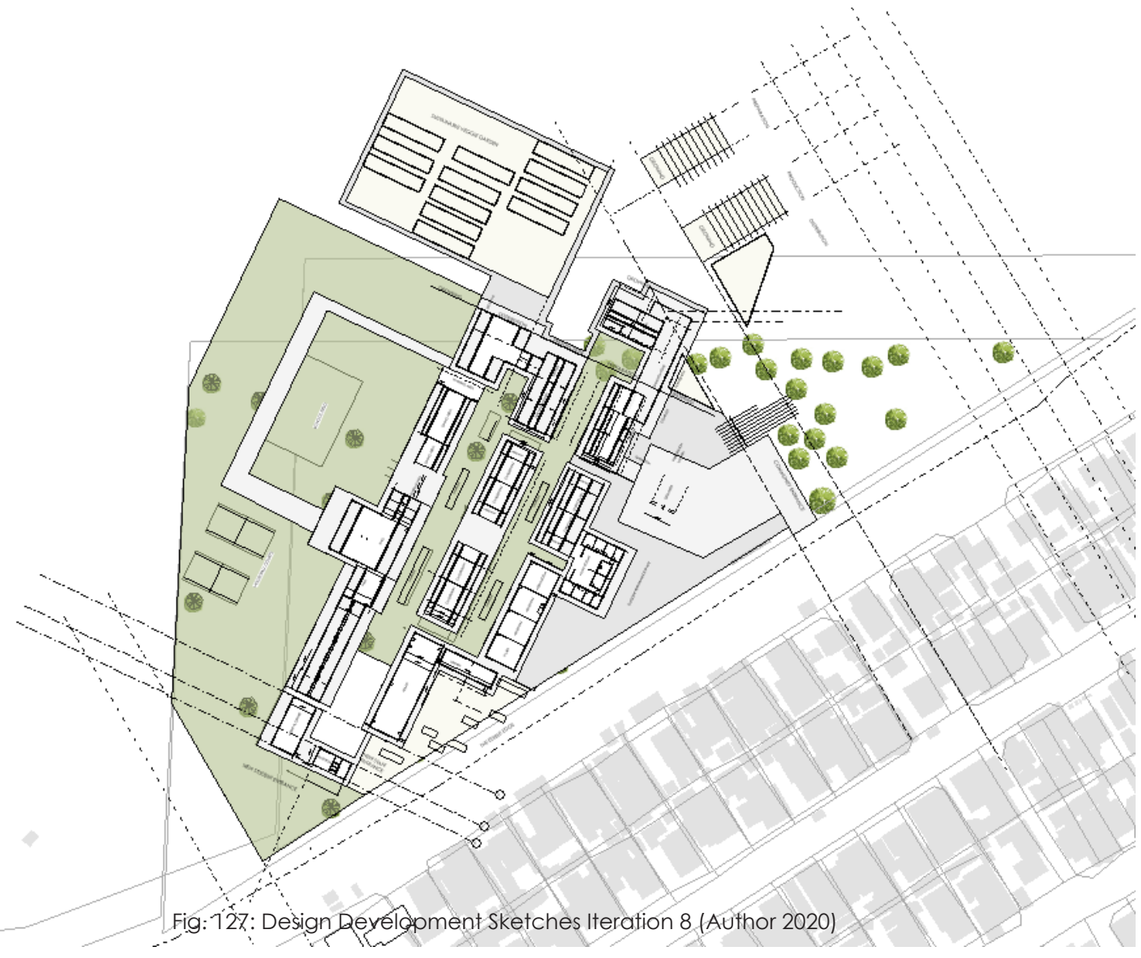
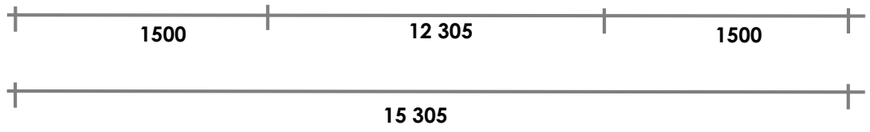


Fig. 127: Design Development Sketches Iteration 8 (Author 2020)

Design Exploration

This last iteration creates a final portal frame structure that takes the most common classroom width 9.305m and adds 1.5 to that on either side, in order to comply with accesibility regulations in SANS. This final width of 12.305m determined the Portal frame width for all structures. This width along with a steeper roof angle, creates enough space for an additional overhand of 1.5m on the roof , thus provided a 3m covered walkway where necessary.

The Portal frames serve to create larger volumes within the classrooms creating space for natural ventilation and daylighting. They orientation of all portal frames now run in the same direction, as to connect them to the adjacent site and follow the axis of integration.



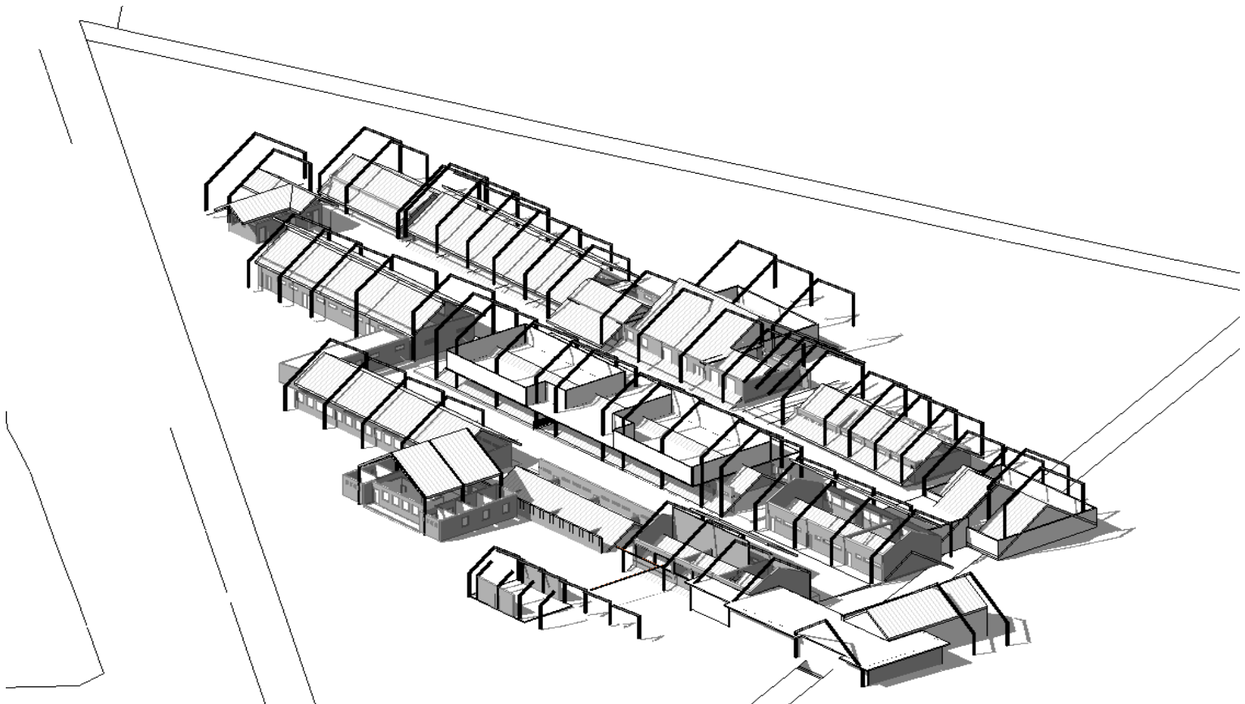
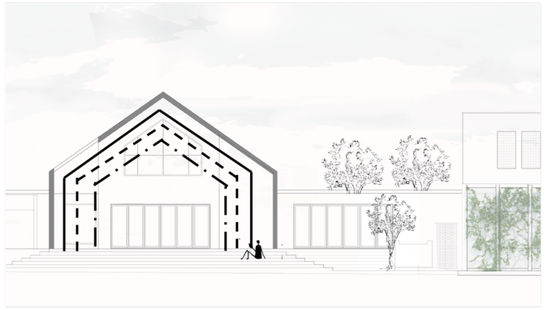


Fig. 128: Design Development 3D Iteration 8 (Author 2020)

The Formation of the PORTAL FRAME



The Portal frame in is essence is just a framework for the extension of a building, that by no means is hardly ever set up in a grid of formality, The Frame adds width for access and comfort. The width is kept constant for affordability on precast structures that could be placed across the school. The height and narrowed pitch extension creates space for circulation, passive energy strategies and volume within the classrooms.

Horizontal extensions

Portal Frames all run across the site in the same direction, including the A Frame timber pergolas on the sustainability farm. This path breaks the existing barrier of the site and invites the programme to move beyond the school.

Vertical Extensions

The heights of the Portal Frames are varied across the site according to classroom use/ need. The facades of the building increase in volume which alllows for systems of natural ventilation and light to incorporated in order to improve comfort levels in these spaces.

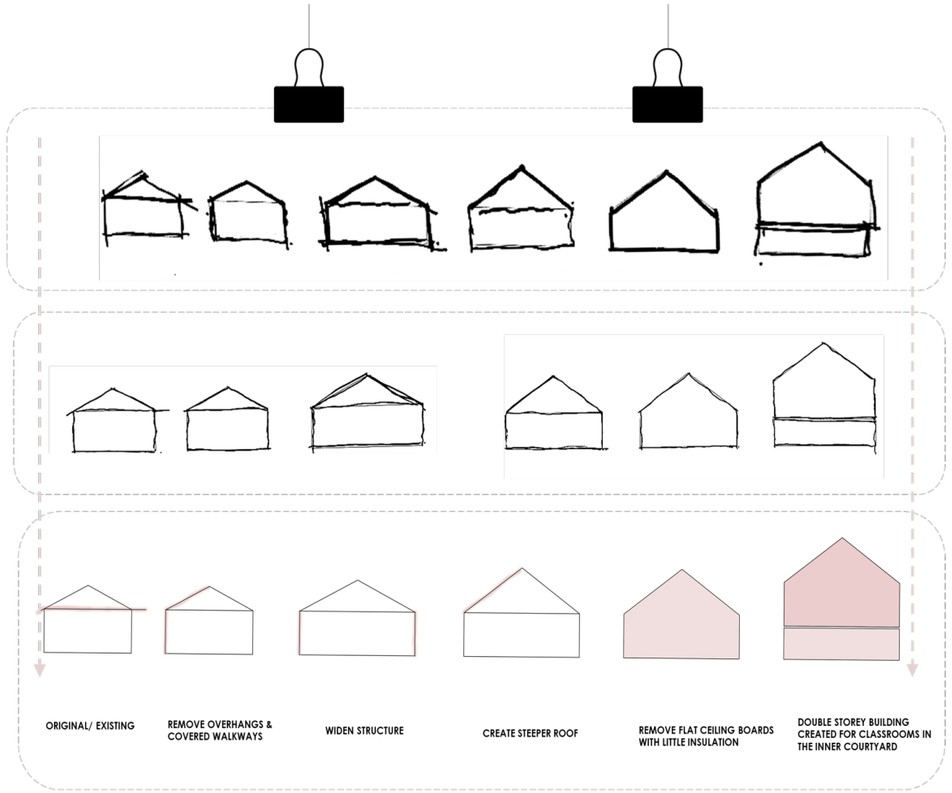


Fig. 129: Portal Frame Formation (Smith 2020)

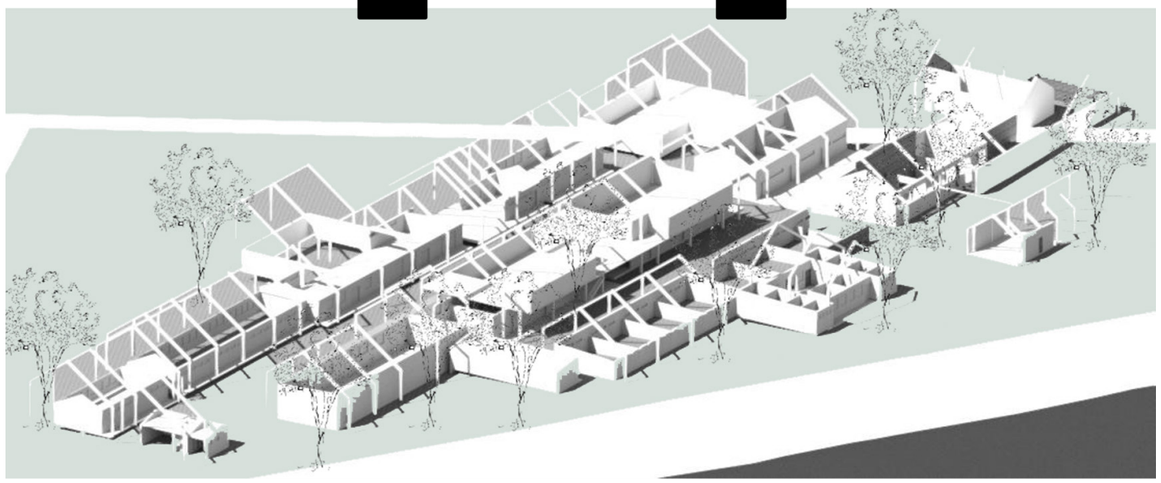


Fig. 130: Final Spatial Exploration (Smith 2020)

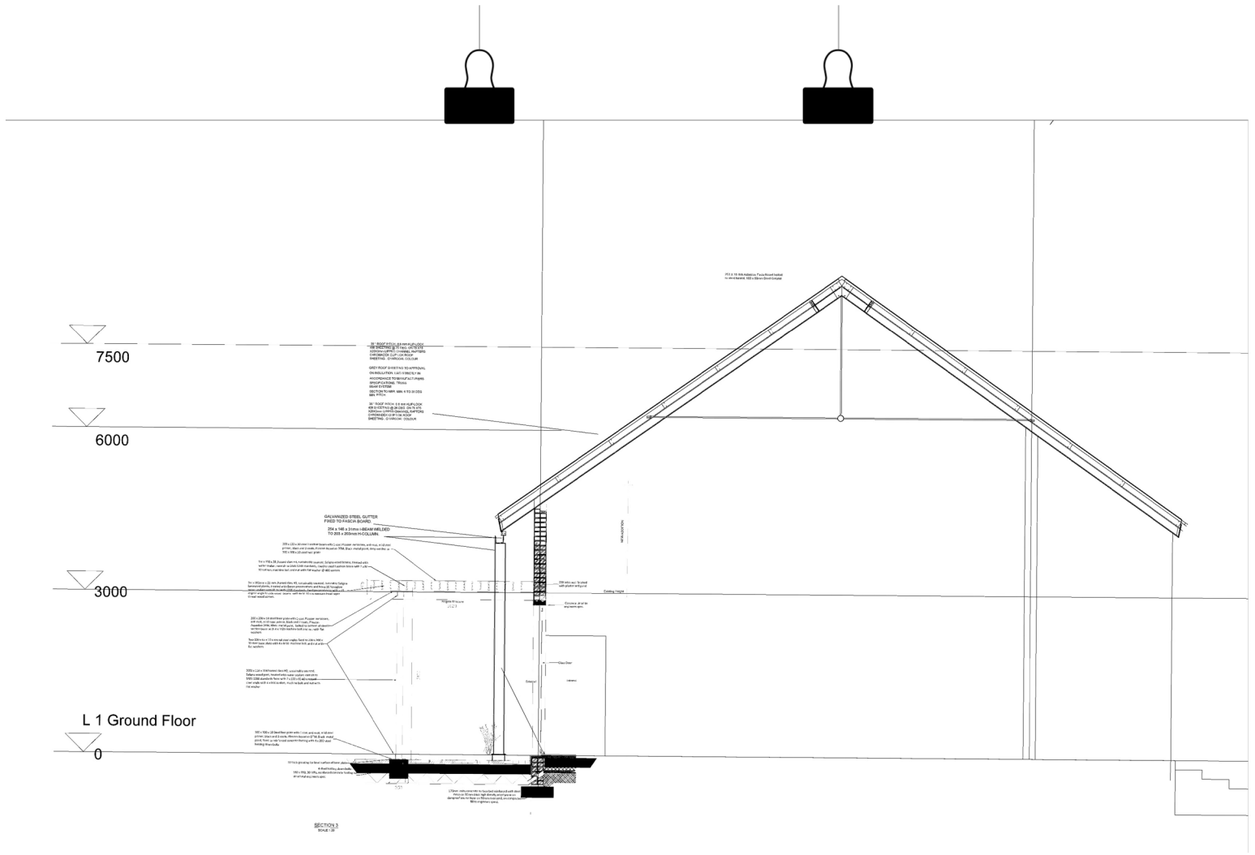


Fig. 131: Spatial connection development to portal frame (Smith 2020)

Reflection

Designing for resilience: Covid-19



Dr Nic Spaull, Education economist at the University of Stellenbosch. says with schools closed food has stopped being distributed daily. In the Western Cape, the Peninsula Feeding Association raises funds for daily meals for 4200 students. NGOs are something of a saving grace as they deliver food parcels to impoverished school communities throughout SA (Spaull 2020).

With many households facing reduced outcomes, they will have to forfeit meals that would've been provided as a result of school feeding schemes. Children's food security and nutritional intake will suffer drastically. 1 in 5 households has adequate food access. 60-70 % of children will be affected negatively by not having those meals.

Now is the most important time to make sure you are healthy and able to sustain yourself. A pandemic is an opportunity to highlight the importance of having healthier buildings in which people are safe, natural daylight is abundant and good clean ventilation is a guarantee (Dietz et al 2020).

As architects, we understand how people use space and thus can use that ability as a design informant to prevent and reduce the spreading of a virus and overall promote healthy eating amongst our youth and less privileged communities.

As a student during the lockdown period, inclined to be involved with the community and craving that social interaction and need to do something was something so unfamiliar. To watch the news everyday and having done the research on the importance of school feeding and not being able to do anything "physically" about the issue in a time of strict lockdown regulations was one of the most challenging yet motivating moments during my Masters year.

Where there is a will , there is a way. Permits in hand and a non profit food drive planned, there was no stopping two eager UCS students in getting involved. The photographs are taken at a food drive run for the community members in the informal setltlement ofPlastic view.



 Fig. 132: Food Parcel Drive (Smith & Mulder 2020)











Fig. 133: Composition of Sphatlo (Smith 2020)

TECHNE'

7.1 Overview

The technical chapter will investigate the structural intentions of the design from the materiality,structural elements, building technlogies, environmental systems and the construction and functioning of all of these elements.

The Technical concept is based off of design opporttunities presented in the development phase and are intended to synthesize the design into a functioning programme as intended.

7.2 Technical Intention

The technical intention is to reintegrate school feeding within the existing school context by transforming existing spaces into multi-functinal learning spaces. To create an adaptable form that is able to be reapplied in similar contexts. The existing school should remain as intact as possble with any and all additions contributing to the learning environment.

The exoskeleton structure is intended to act as the glue between the new and the old. It provides a structure that fits over the new, while allowing space to extended vertically and horizontally.

7.3 Contextual Condition

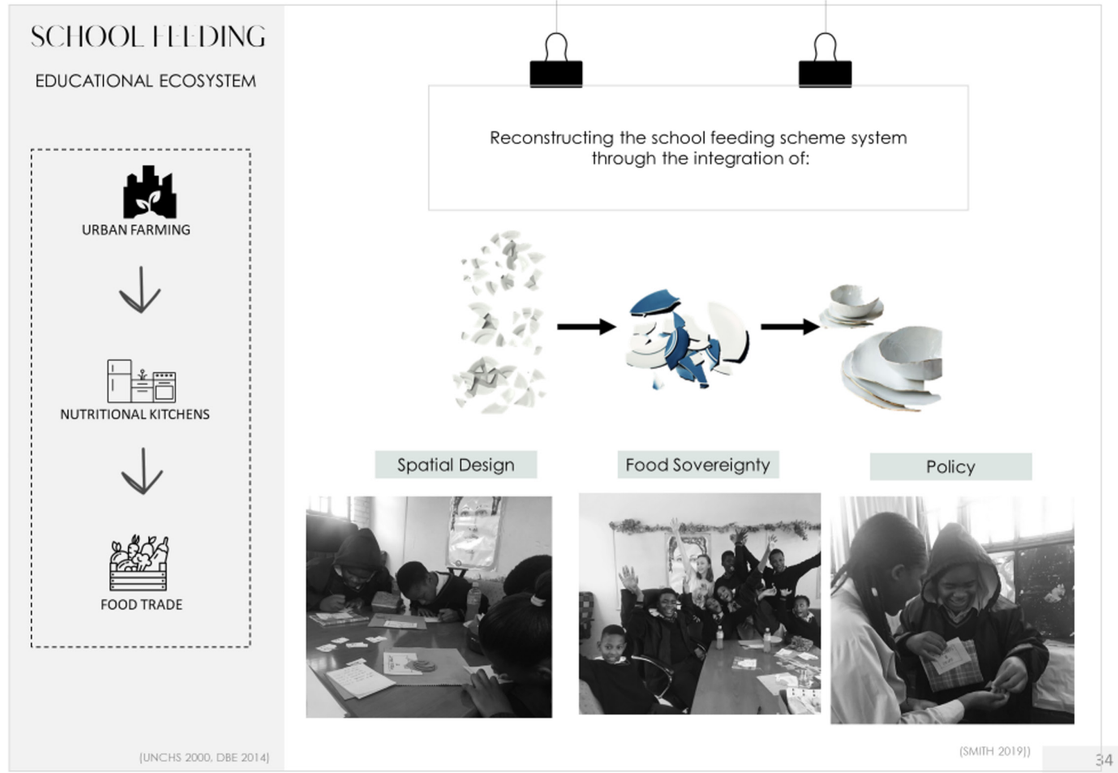
The contextual condition as described in the previous chapters, explores the design flaws of the existing school typolgy. The narrow corridoors, uneven pathways,lack of natural ventilation, diminished insulations, little to no green spaces and landscaping,orientation and daylighting disadvantages all provide necessary issues that require solutions. The technical chapter aims at demonstrating the investigation to those solutions and probable outcomes to be implemented. The Techne' of the building should be an extension of the design in its language, form and function and should aid in enabling productivity of the programme.

7.4 Technical Concept

To create an efficient school environment that promotes school feeding schemes to function successfully through the adaptive reuse of the existing school structure, system exposure, local and sustainable food production facilities and landscapes. To enable a growing learning environment through adaptable spaces and energy efficient systems.



Fig. 134: Technical Concept Visualizations (Smith 2020)



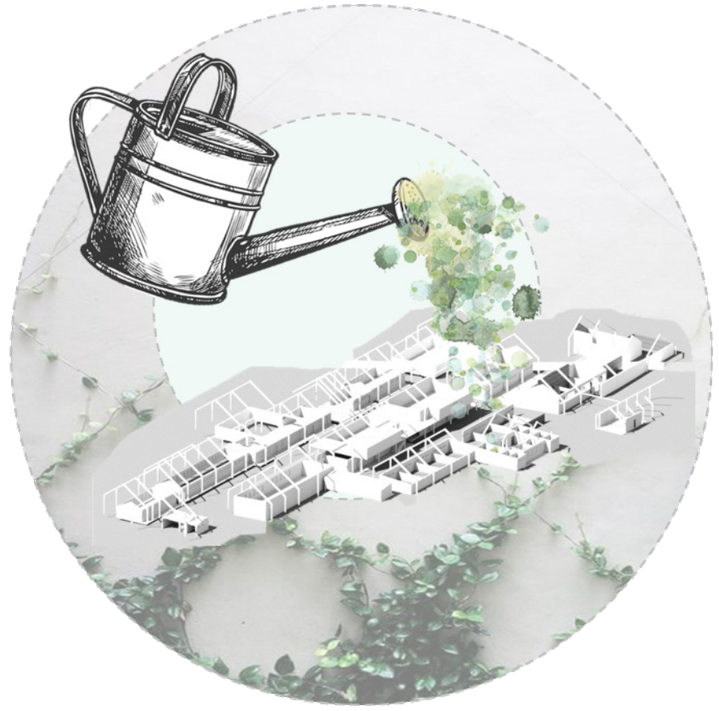


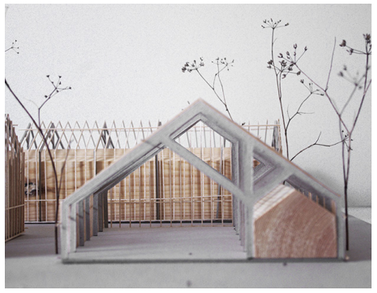
Fig. 135: Technical Concept Visualizations 2 ((Smith 2020)

ROAD SERVICE CENTRE

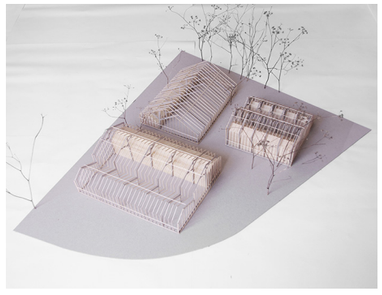
7.5 TECHNICAL PRECEDENT











The road service centre in Genthod by TEd'A arquitectes in 2015 is constructed of prefabricated concrete portal frames that are set up over the main three buildings on site. Cognizant of the existing envrionment, the existing trees are kept in place.

The portal frames that extend over the building are further divided by a timber substructure which thus supports the exterior envelope of the portal frame and allows for other strucutres such as transparent corrugated polycarbonate oofing to be placed over it.

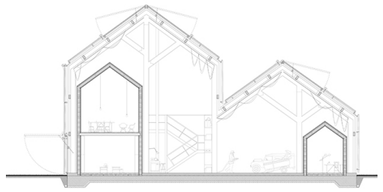
The height and volume now created with the polycarbonate material allows for natural lighting to encompass the whole building.

This greenhouse that is conceptuall formed is a basis for the passive energy strategy of the building which pays homage to the essence of production as the project is situated in a extensive farming typolgy context.

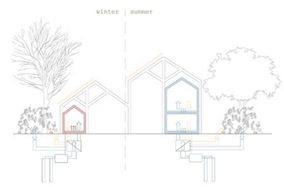
Although a complexity lies in the buildings systems, the strucutre is simple and is divided into three separate buildings which house 3 separate programmes.

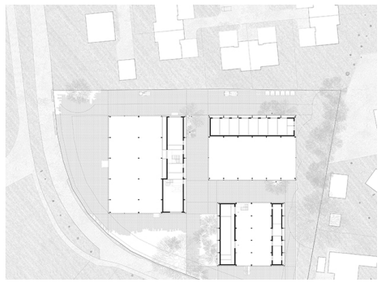












The construction of the building is based on 4 main elements:

MODULATION	→	REPETITION
SYSTEMIZATION	→	PREFABRICATION

The intent behind this is to minimize energy required in the construction phase, to optimize time and costs associated with the build.

The substructures and layers of skins that make up the building used as a means to create a variety of spaces that allow for maximum solar energy to be used.

The first layer of polycarbonate sheeting, in its lightweight and translucent form allows for solar radiation to move through which ultimately creates the greenhouse effect within the building.The heat is absorbed by materials with "high thermal intertia" (TEd'A arquitectes 2015). The second skin creates a space for cars to be washed and supporting space for the programme.

The envelope layer of the building consists of roll up wooden blinds,protective from the sun, as well as opening in the facade' and roof of the structure allow for natural ventilation through the convenction strategy which keeps the air inside the building cool and refreshed.

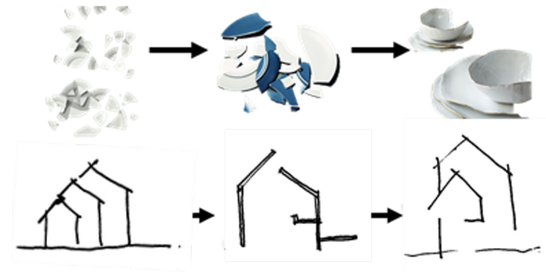


Fig. 136: Road Service Centre in Genthod (TEd'A arquitectes 2015)

7.6 Related SANS Requirements

The technical chapter will investigate the structural intentions of the design including the technical development, materials applied, structural components and systems required.

7.7 Materiality & Assembly

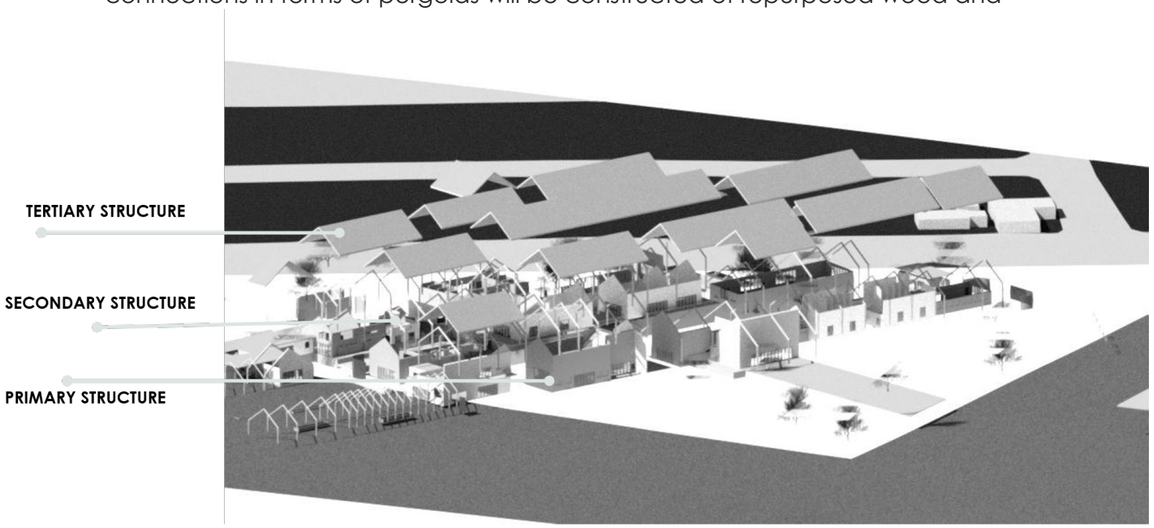
The technical chapter will investigate the structural intentions of the design.



Fig. 137: Materiality Development (Author 2020)

The existing masonary classrooms will stay as is, parts of the exterior will be painted and some left exposed to their natural state.

The new portal frames will be constructed of steel powder coated. The additional building connections in forms of pergolas will be constructed of repurposed wood and



7.8 Building Technologies

Tectonic & Structural Intention

The overall additions are intended to provide multi-functional spaces that contribute to the wellbeing and growth of the school in the long run. The structure is continuously exposed to the existing stereotomic elements that interact with lightweight tectonic elements like glass and timber which aid in appropriating the spaces for practical learning and engaged indoor-outdoor learning.

Primary: Existing masonry structure of the classrooms that form the shape and outline for classroom adaptation and courtyard insertion.

Secondary: The liminal spaces that exist within and around the school. Layered corridors, thresholds and landscaped courtyards.

Tertiary: The lightweight A-frame structure that sits above, around and in between the existing school and is seen as additional structures that encourage growth and productivity for the school typology to have a resilient future.

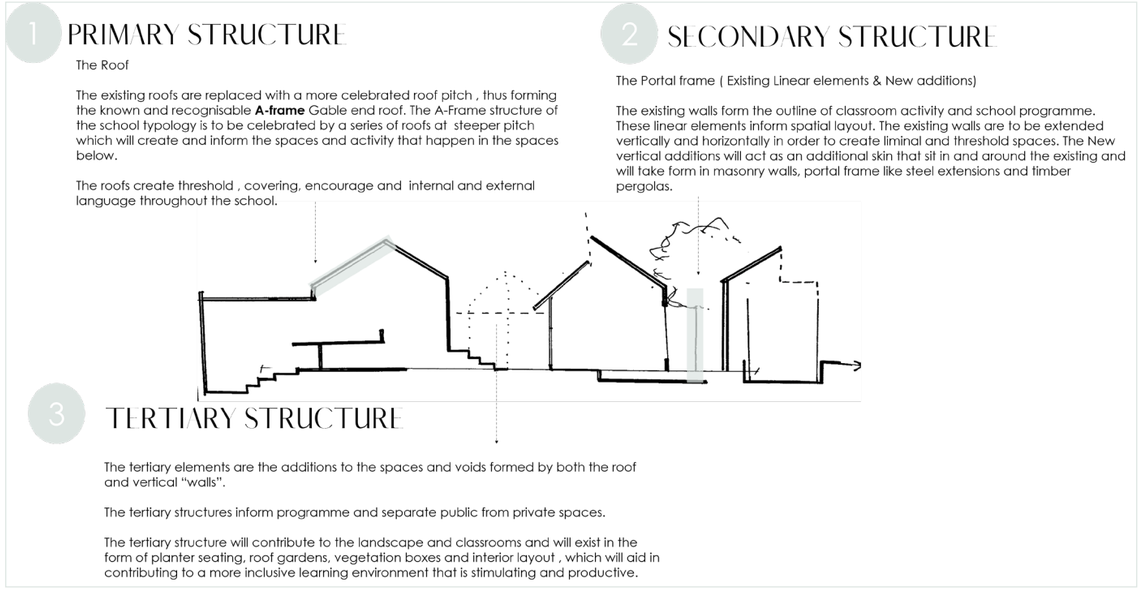


Fig. x: Technical Concept Rev 1 (Author 2020)

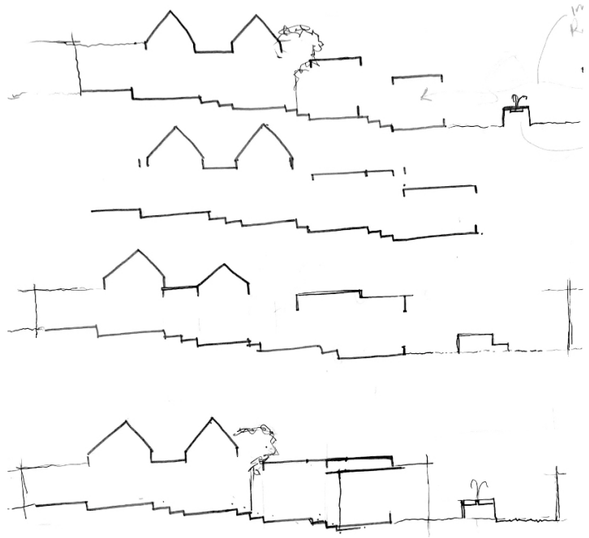


Fig. 138: Technical Development (Author 2020)

SECTIONAL PARTI DEVELOPMENT

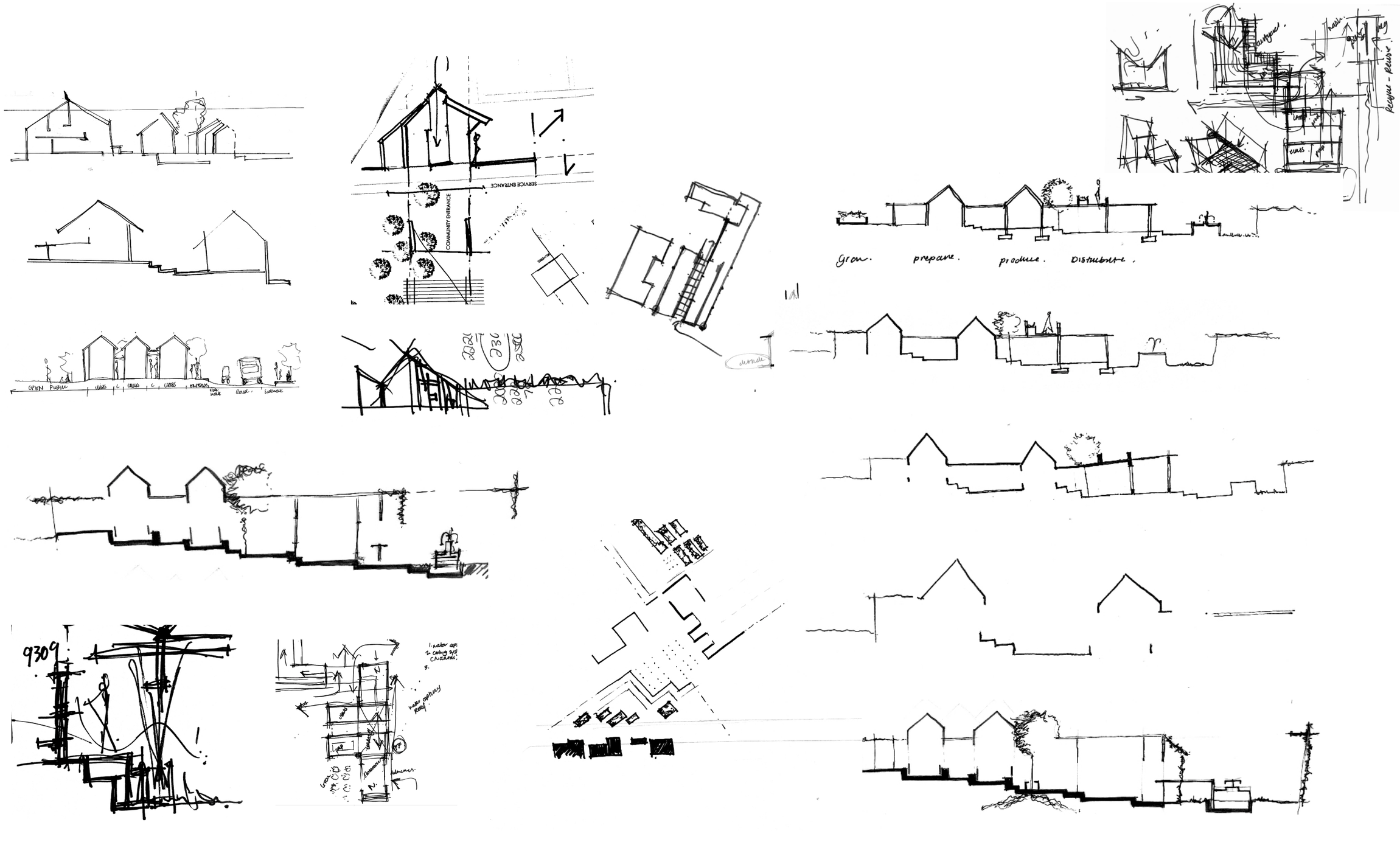
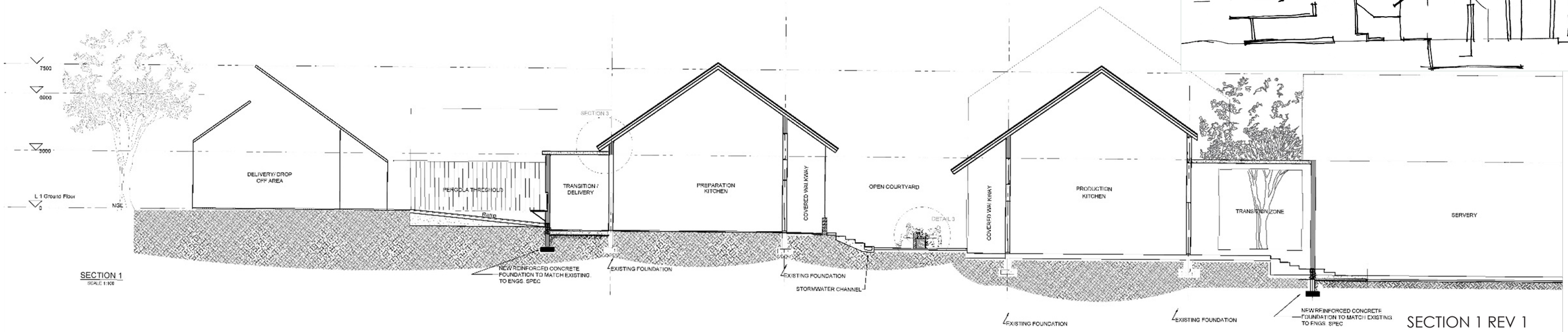


Fig. 139: Technical Development Sketches (Author 2020)

SECTIONAL DEVELOPMENT



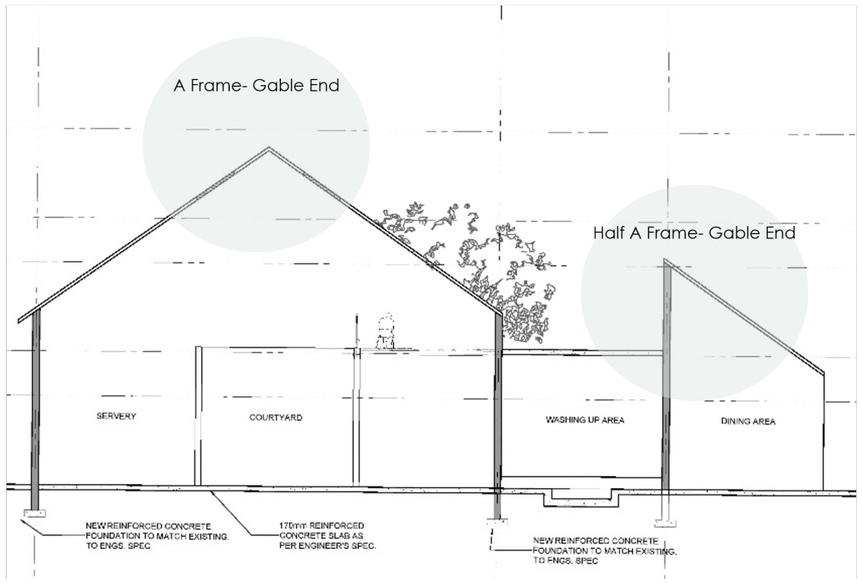
SECTION 1
SCALE 1:100

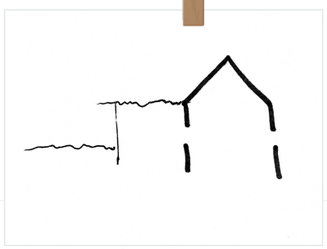
SECTION 1 REV 1

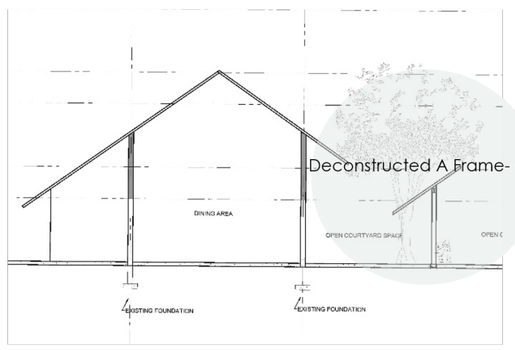


SECTION 2
SCALE 1:100

SECTION 2 REV 1







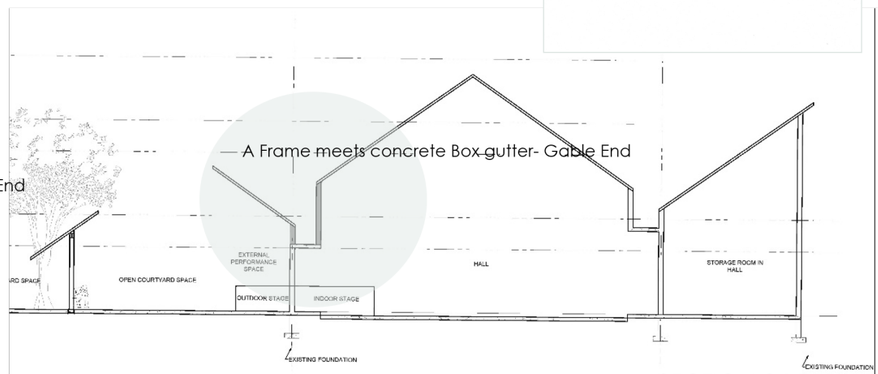
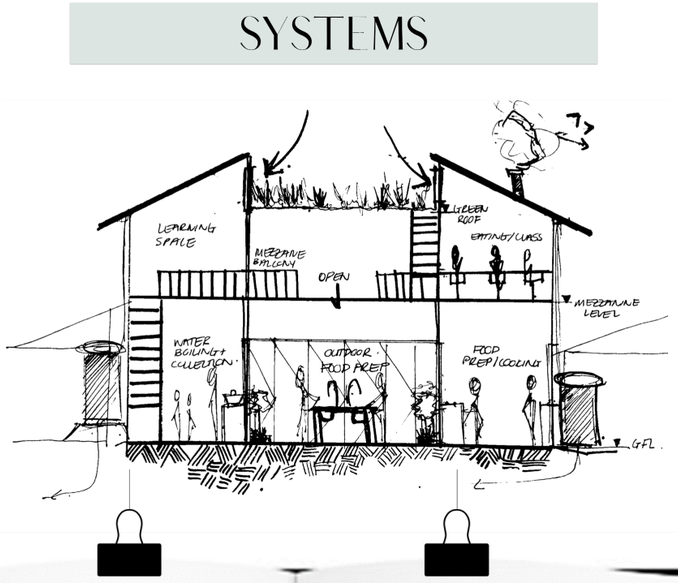


Fig. 140: Technical Section Development Sketches (Author 2020)

7.10 Services

To allow for functional and productive circulation throughout the school, movement is encouraged by sets of internal and external courtyards, indoor and outdoor learning spaces as well as public, semi-public and private spaces. The services of the school feeding programme are exposed to contribute to the nature of nutritional pedagogy to both the school and surrounding.

7.11 Systems & Environmental Response Strategies



The main systems of the building include:

Natural Ventilation and Lighting, exposed water harvesting systems, Re-use of material waste on-site for adaptation & addition to school & sustainable vegetable gardens.

System 1 (Natural Ventilation)
Climate condition
Daylighting

System 2 (Alternative heating and cooling systems)

System 3 (Landscape & Vegetation)

System 4 (Water Harvesting/Strategy)

Green building strategy & rating

Systems Menu

Implementable Systems

Starters

Vegetation & Landscaping

Served as systems diagram, planting palette and landscaping plan

Cleanser

Recycling & Waste

Served as systems diagram and programme

Light Meals

Natural Ventilation & alternative cooling & heating systems

Served as systems diagram, sketch diagrams and a systems section illustration

Drinks

Water harvesting

Served as systems diagram, sketch diagrams and a rain water collection roof plan

Fig. 141: Systems Menu (Author 2020)



Fig. 142: Technology Systems Implemented (Author 2020)

System 3: Landscape & Vegetation



Fig. 143: Co-designing session with Prof Lise Korsten, Co-Director of the DST-NRF Centre of Excellence in Food Security (Korsten 2020)

Prof Korstens invaluble expertise on food security and sovereignty has been crucial in the development of my project from the development of the theoretical framework, specifically the inclusion of the Nyéléni framework, right through to the inclusion of the specific plant species, vegetation and produce types and processes.

The constant collaboration and insight proves the need for interdisciplinary research among research fields in various departments.



Fig. 144: Implementing Food Gardens (Author 2020)

Services

The services aim to allow for functional and productive circulation throughout the school. Movement is encouraged by sets of internal and external courtyards, indoor and outdoor learning spaces as well as public, semi -public and private spaces. The services of the school feeding programme are exposed in order to contribute to the nature of nutritional pedagogy to both the school and surrounding community.

Systems

Natural Ventilation and Lighting, Exposed Water harvesting systems, Sustainable food gardens & Re-use of material waste on site for adaptation & addition of the building.

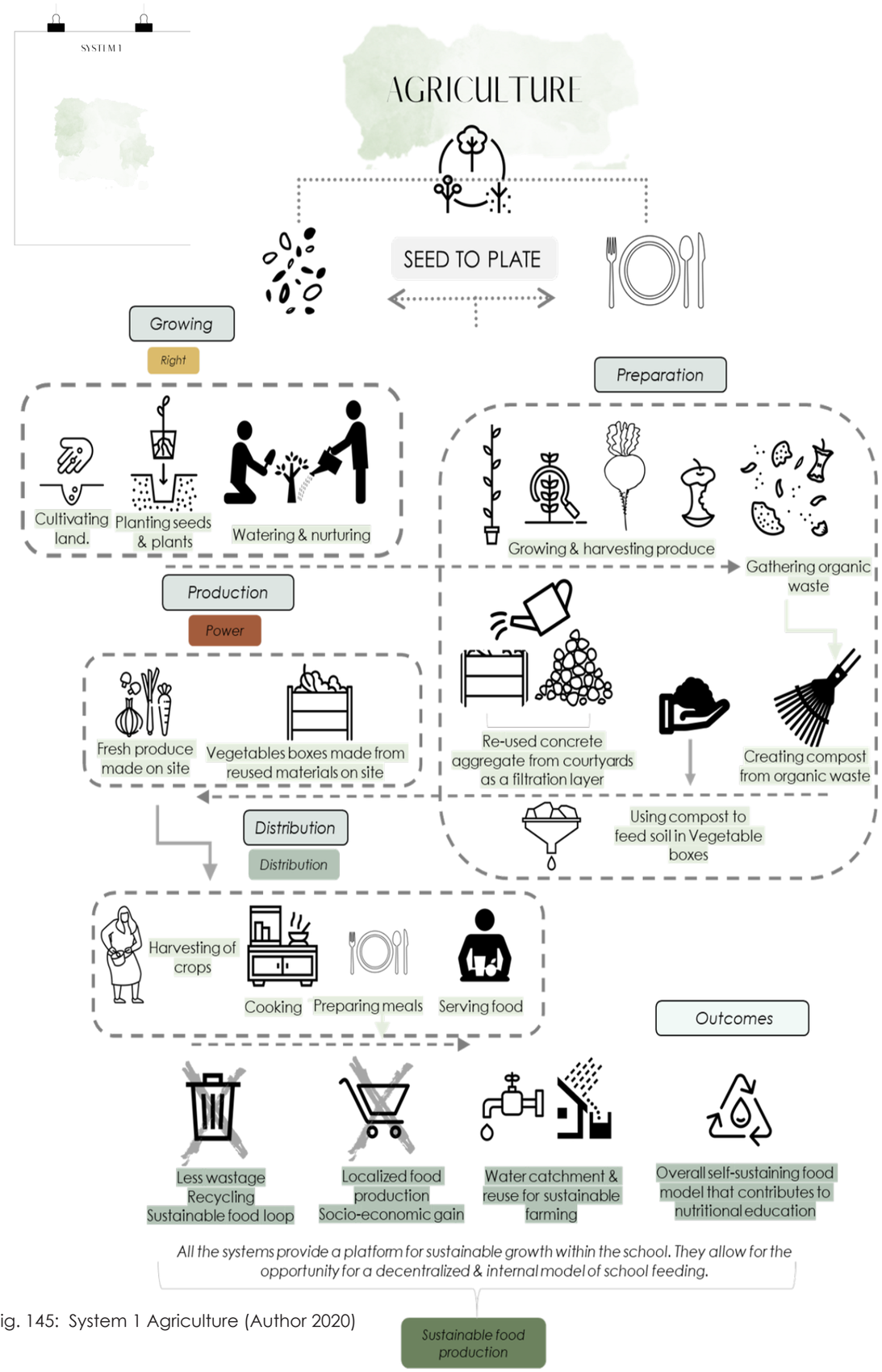
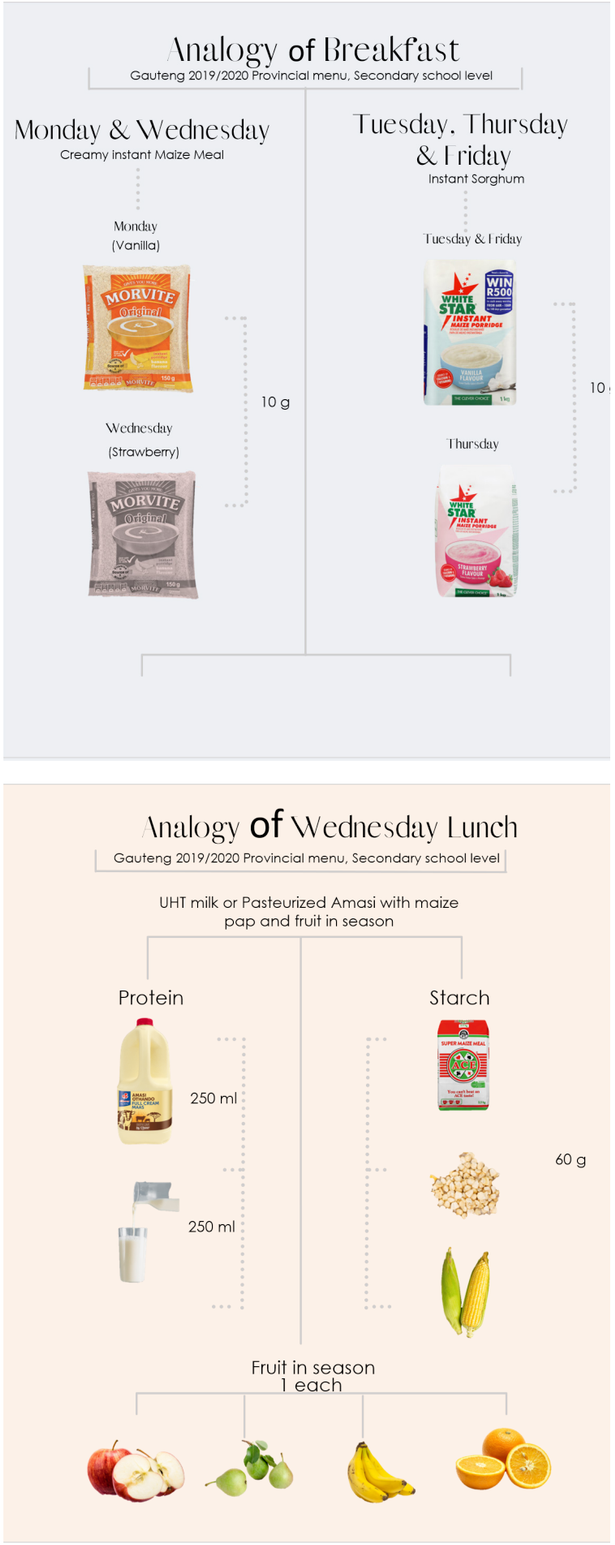
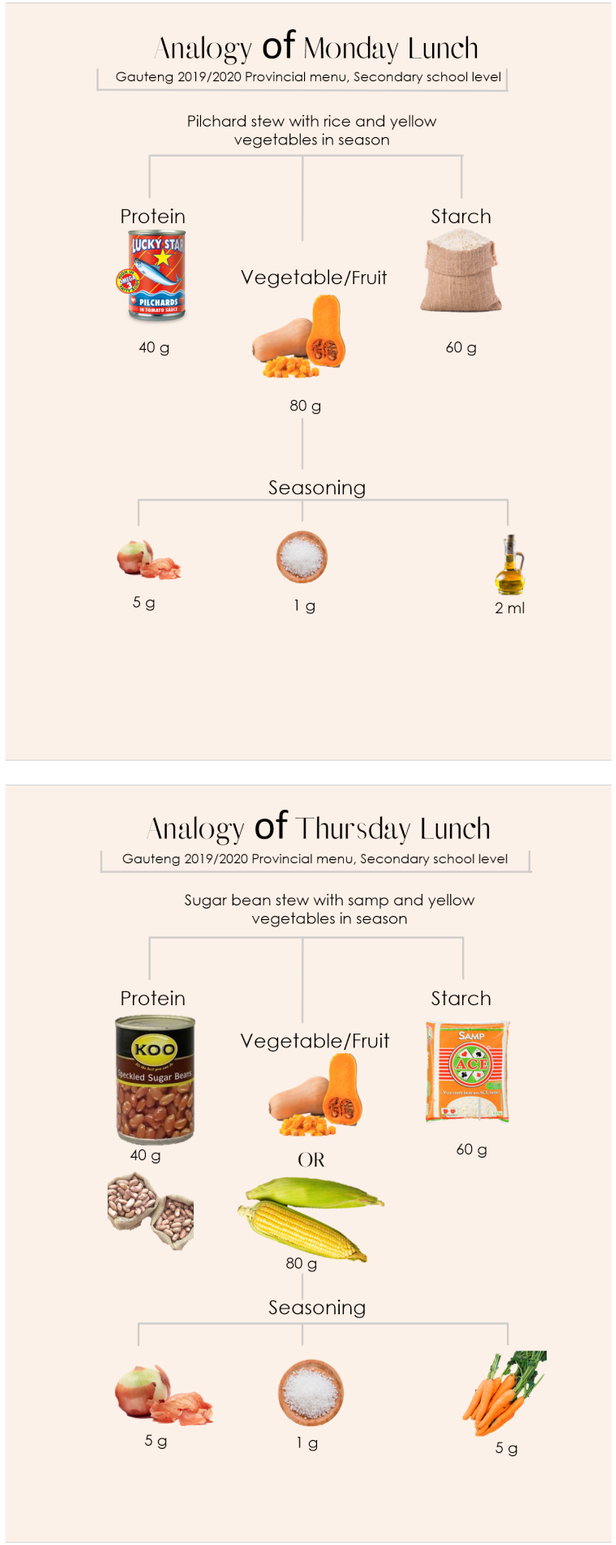


Fig. 145: System 1 Agriculture (Author 2020)





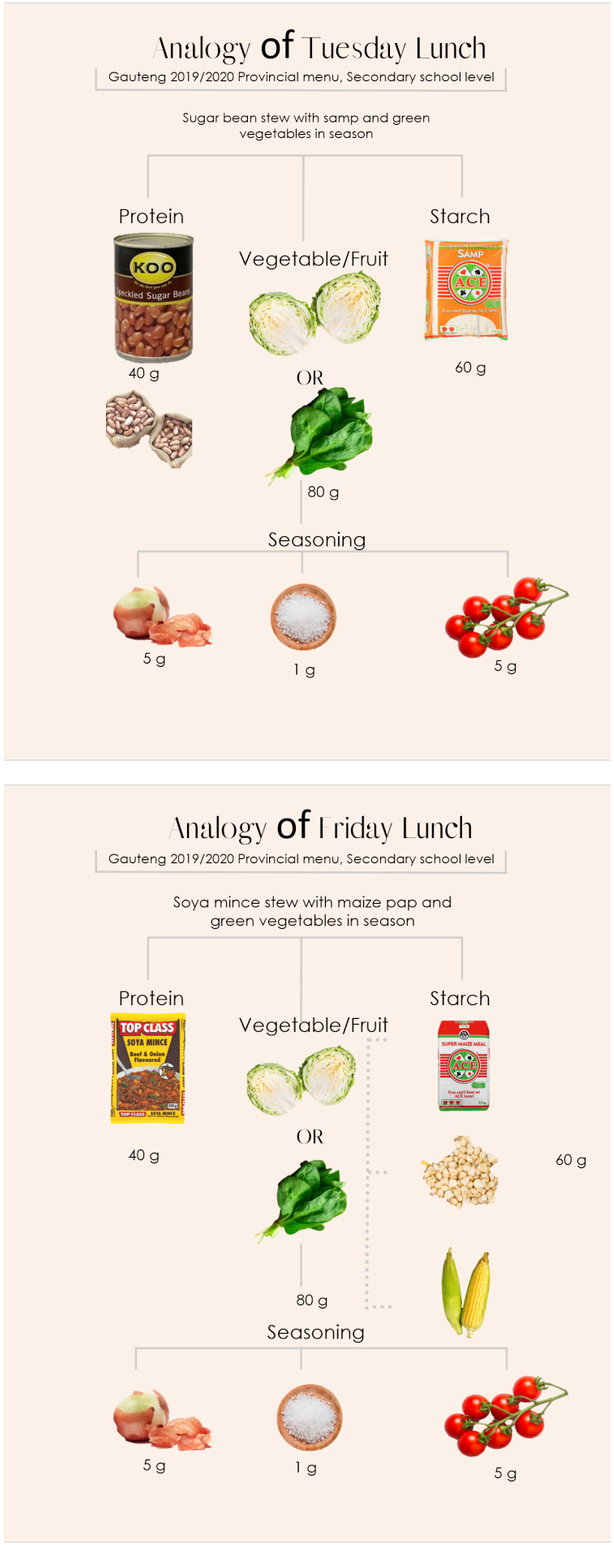


Fig. 146: Graphics showing existing menu for possible plant pallete (Author 2020)

Plant Palette

Productive Garden



Broccoli - Brassica oleracea var. italica



Brussels sprouts - Brassica oleracea var. gemmifera



Cabbage - Brassica oleracea var. capitata



Carrot - Daucus carota subsp. sativus



Cauliflower - Brassica oleracea var. botrytis



Celery - Apium graveolens



Garlic - Allium sativum



Lettuce - Lactuca sativa



Onion - Allium cepa



Spinach - Spinacia oleracea



Radish - Raphanus sativus



Eggplant - Solanum melongena



Bell Pepper - Capsicum annuum



Tomato - Solanum lycopersicum



Cucumber - Cucumis sativus



Pumpkin, Winter squash - Cucurbita moschata



Zucchini squash - Cucurbita pepo



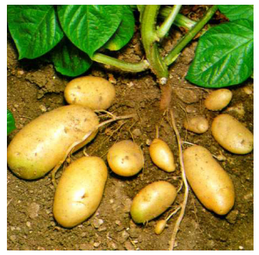
Sweet melon - Cucumis melo var. cantalupensis



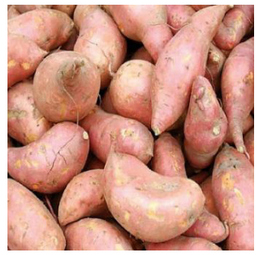
Watermelon - Citrullus lanatus



Table Beet - Beta vulgaris



Potato - Solanum tuberosum



Sweet potato - Ipomoea batatas



Green bean - Phaseolus vulgaris

Fig. 147: Productive Garden Plant Pallete (Author & Venter 2020)

Herb Garden



Basil - Ocimum basilicum



Chives - Allium schoenoprasum



Cilantro - Coriandrum sativum



Parsley - Petroselinum crispum



Rosemary - Salvia rosmarinus



Sage - Salvia officinalis



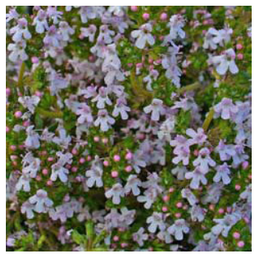
Lemongrass - Cymbopogon



Mint - Mentha



Oregano - Origanum vulgare



Thyme - Thymus vulgaris



Turmeric - Curcuma longa



Cumin - Cuminum cyminum

Fig. 148: Herb Garden Garden Plant Pallete (Author & Venter 2020)

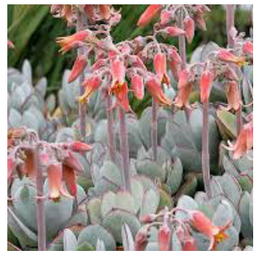
Green Roof



Aptenia cordifolia



Bulbine frutescens



Cotyledon orbiculata



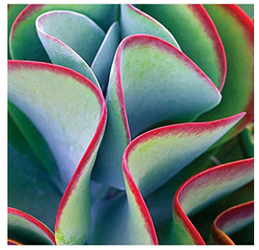
Cotyledon orbiculata var. oblonga



Eucomis autumnalis



Helichrysum petiolare



Kalanchoe thyrsiflora



Senecio serpens



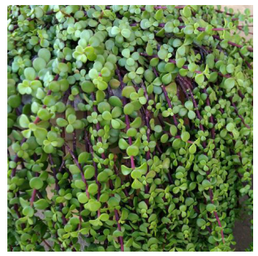
Stapelia leendertziae



Othonna capensis



Rhipsalis baccifera



Portulacaria afra

Fig. 149: Green Roof Garden Plant Pallete (Author & Venter 2020)

Climbers



Clematis brachiata



Combretum microphyllum



Rhoicissus digitate



Rhoicissus tridentate



Aristida congesta Subp. Congesta

Fig. 150: Climbers Plant Pallete (Author & Venter 2020)

Productive trees



Macadamia - Macadamia integrifolia



Lemon - Citrus limon



Pecan - Carya illinoinensis

Fig. 151: Productive Trees Plant Pallete (Author & Venter 2020)

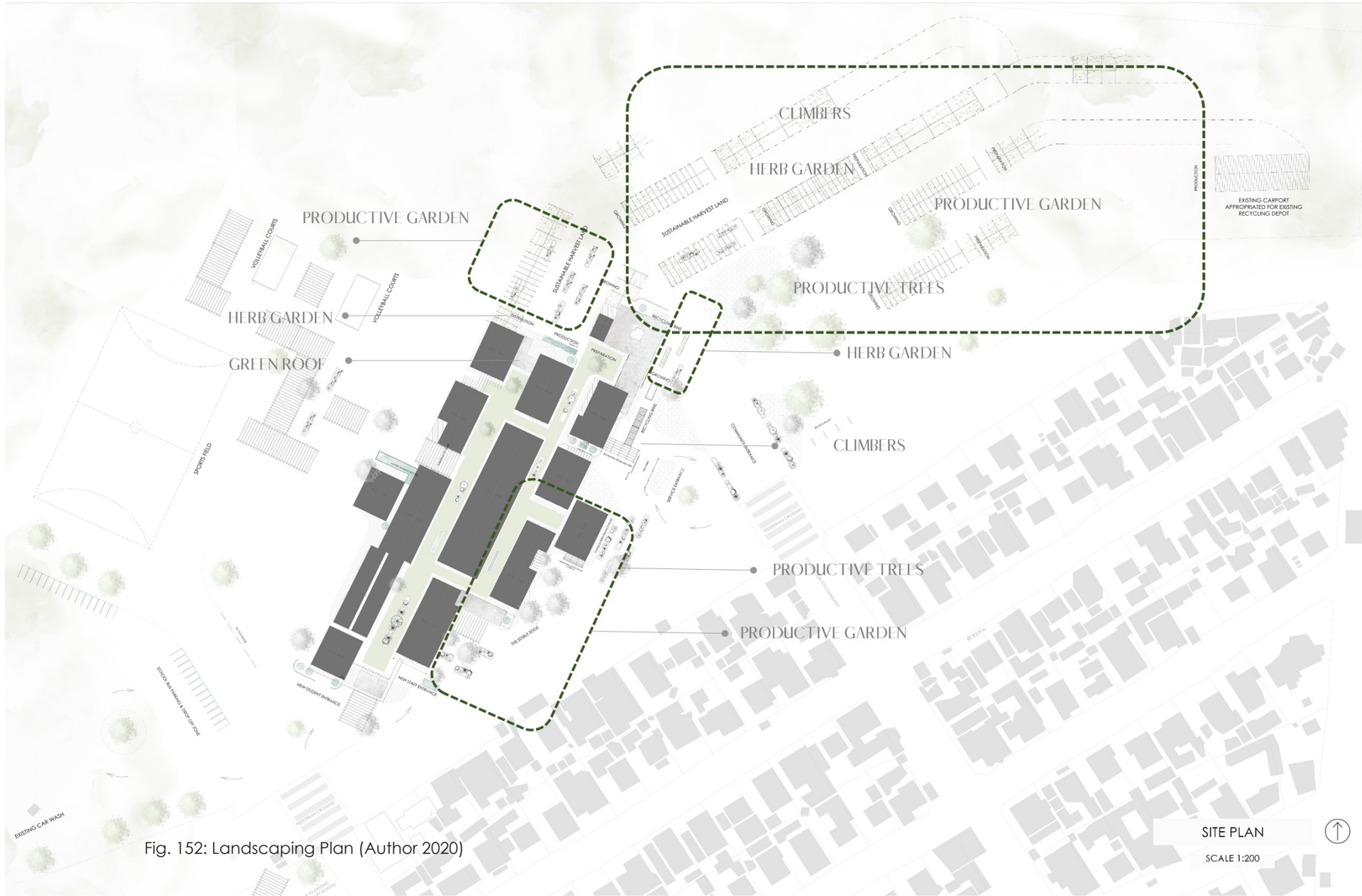
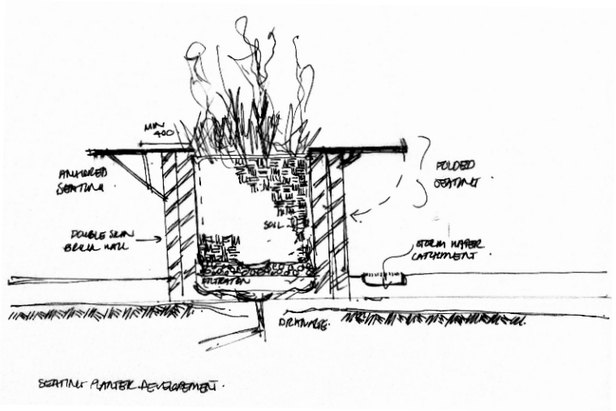
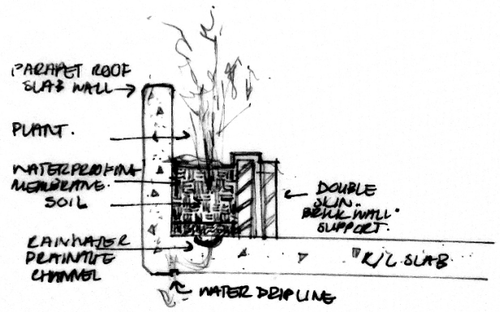


Fig. 152: Landscaping Plan (Author 2020)



Fig. 153: Young Child (Nelson Makamo)





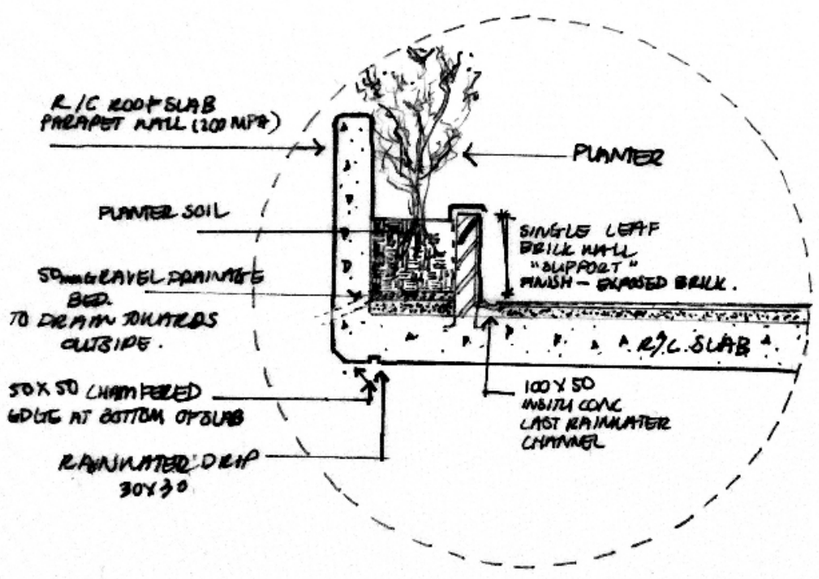
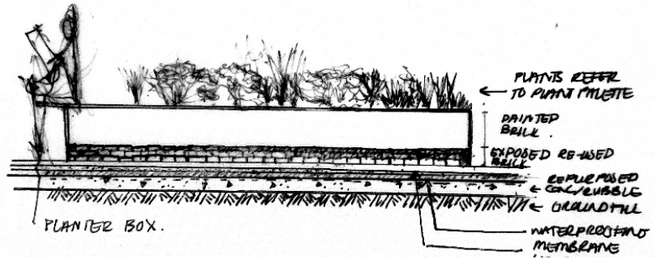
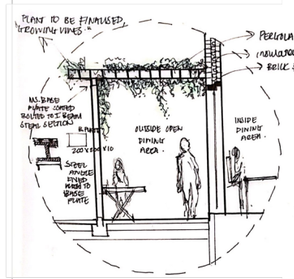
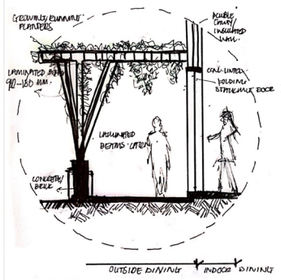
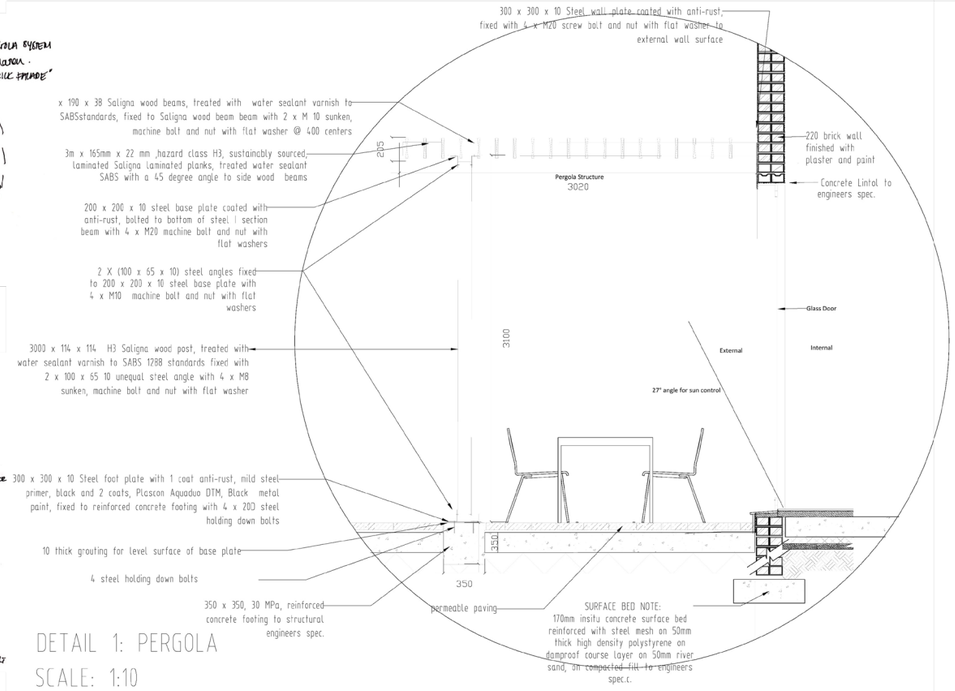


Fig. 154: Detail Development Sketches (Author 2020)



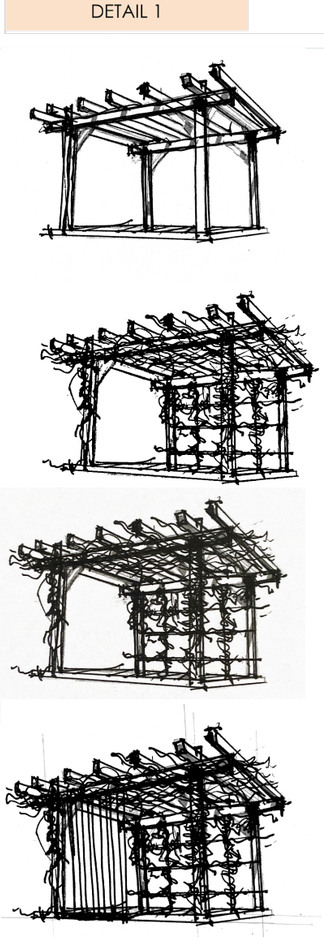






Pergola

DETAIL 1



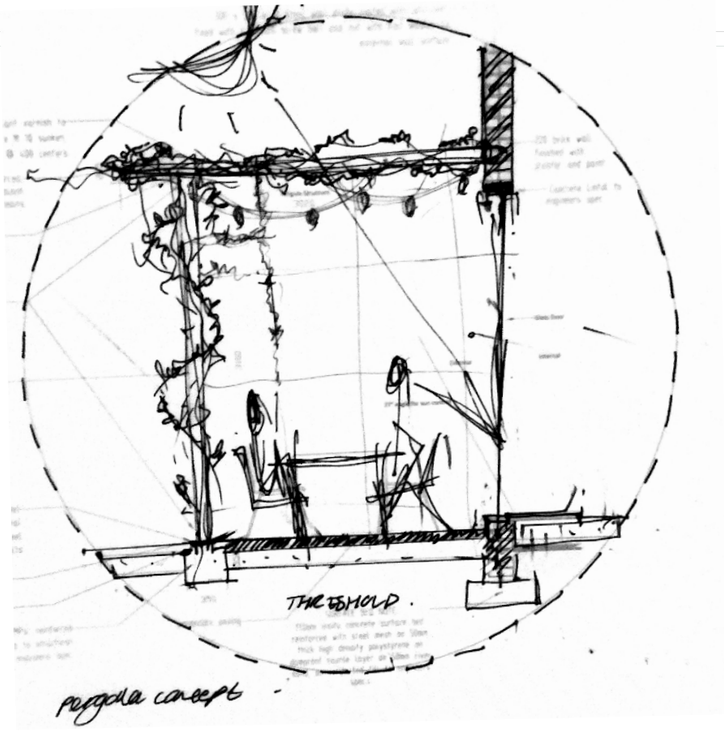


Fig. 155: Pergola Detail development (Author 2020)

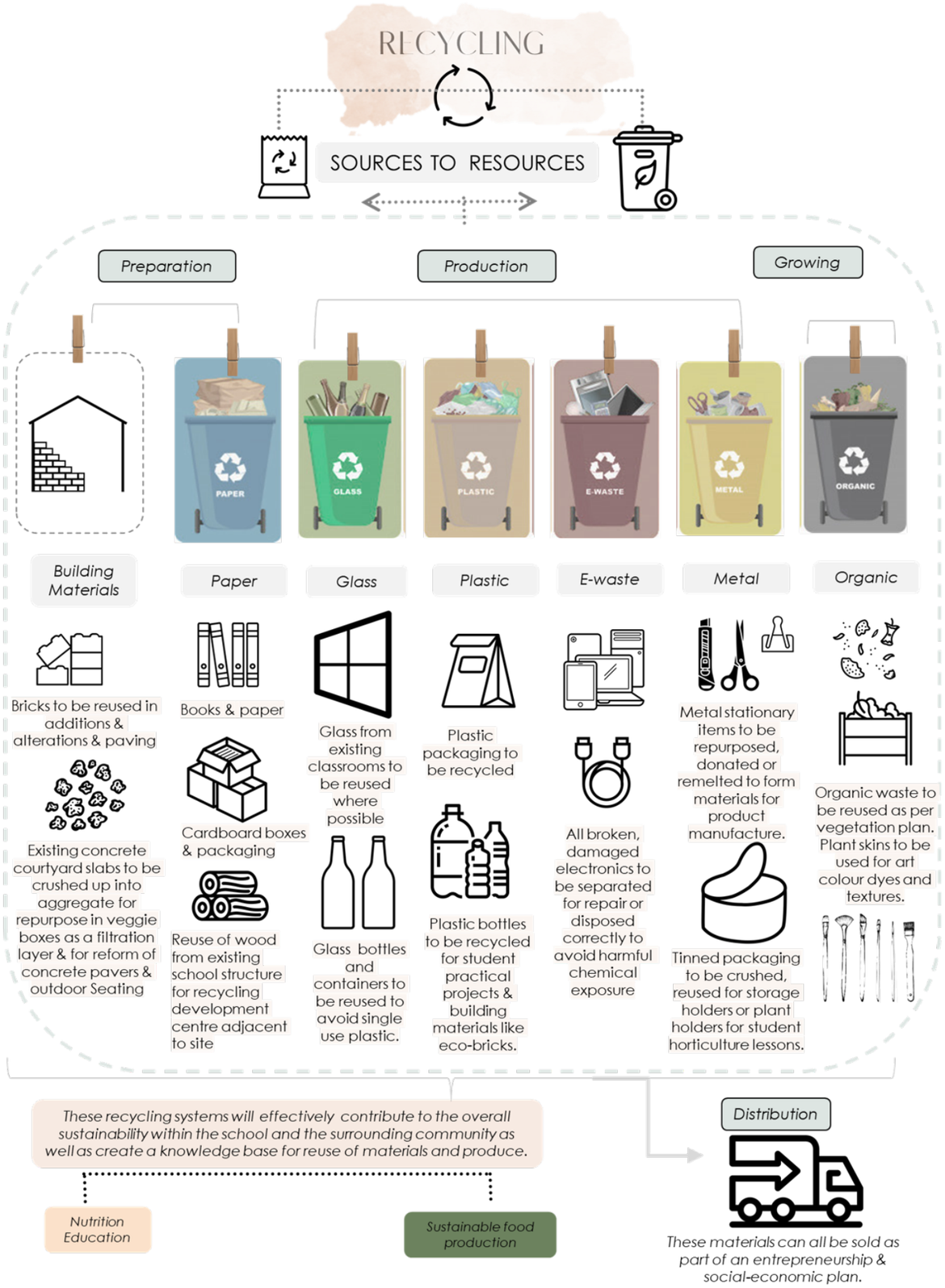


Fig. 156: System 2 Recycling (Author 2020)

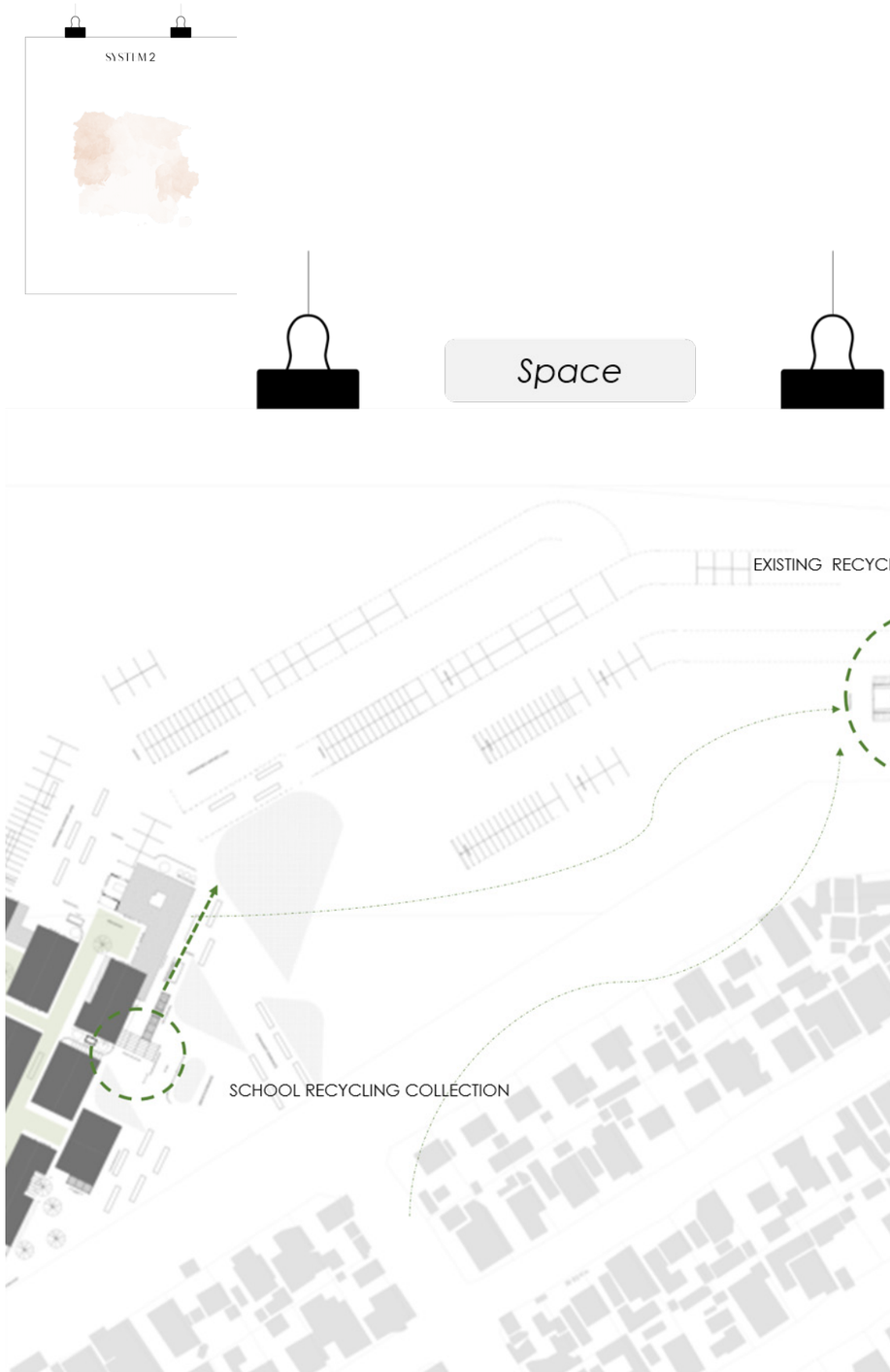
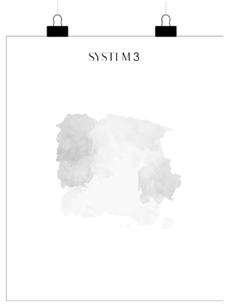
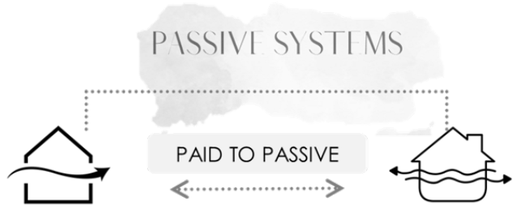


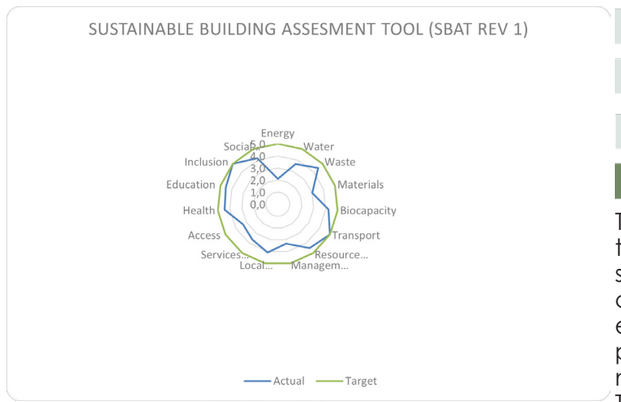
Fig. 157: Recycling Plan (Author 2020)



System 1: Natural Ventilation



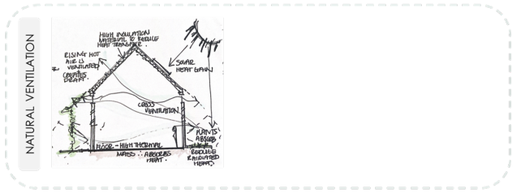
Green Building Strategy & Rating



SOCIAL	3,6
ECONOMIC	4,8
ENVIRONMENTAL	3,5
OVERALL SBAT RATING	4,0

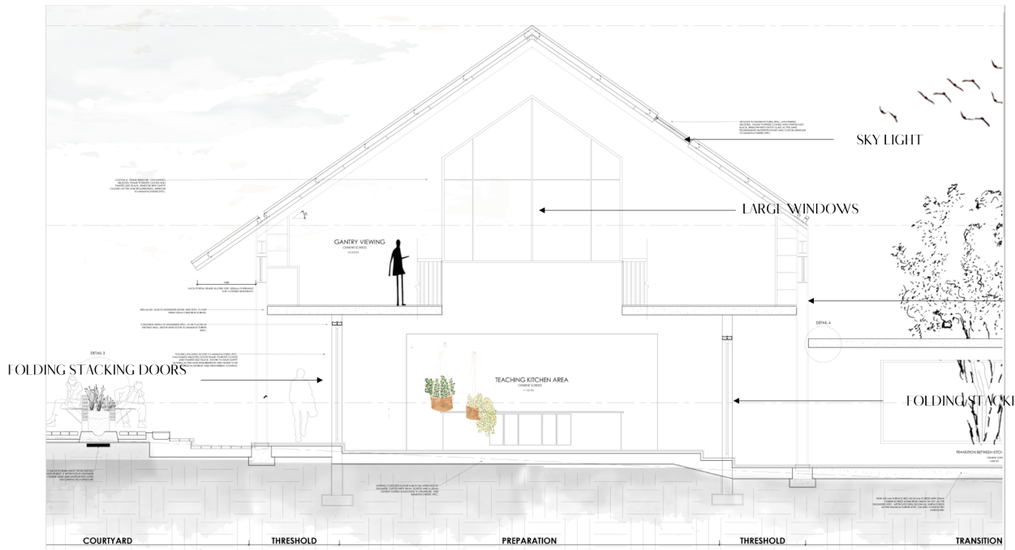
The overall SBAT rating resulted in a school that is overall more postively inclined towards sustainability and resilience. The school and its close proximity to services and the community encourages a network of sharing, the productive gardens contribute to the food network within the school and its surrounding. The use of recycling as a system and recycling of building materials results in adaptation that requires less energy and thus leaves a lower carbon footprint.

Fig. 158: SBAT Rating of New Building (Author 2020)



NATURAL LIGHTING

Fig. 159: Natural Lighting Section (Author 2020)



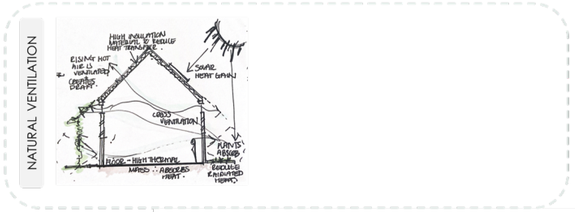
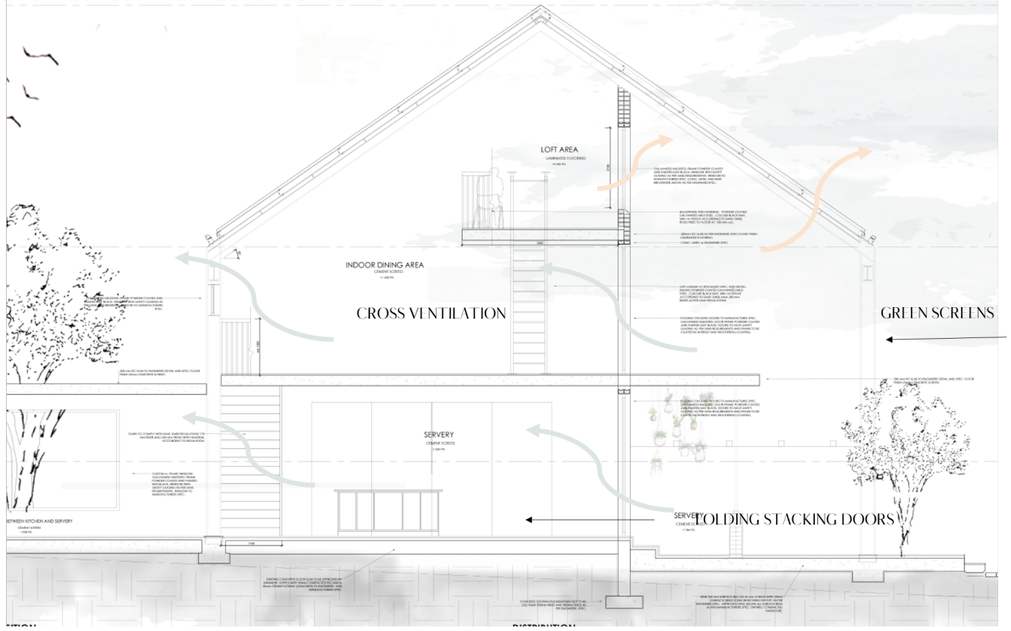
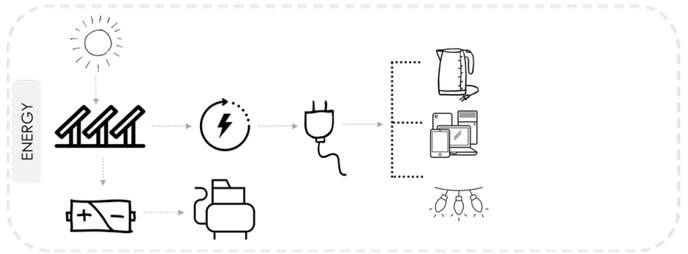


Fig. 160: Natural Ventilation Section (Author 2020)





System 2: Alternative Heating & Cooling Systems



Fig. 161: Alternative Cooling Systems (Author 2020)

System 4: Water Harvesting



Fig. 162: Water harvesting Sketch development (Author 2020)

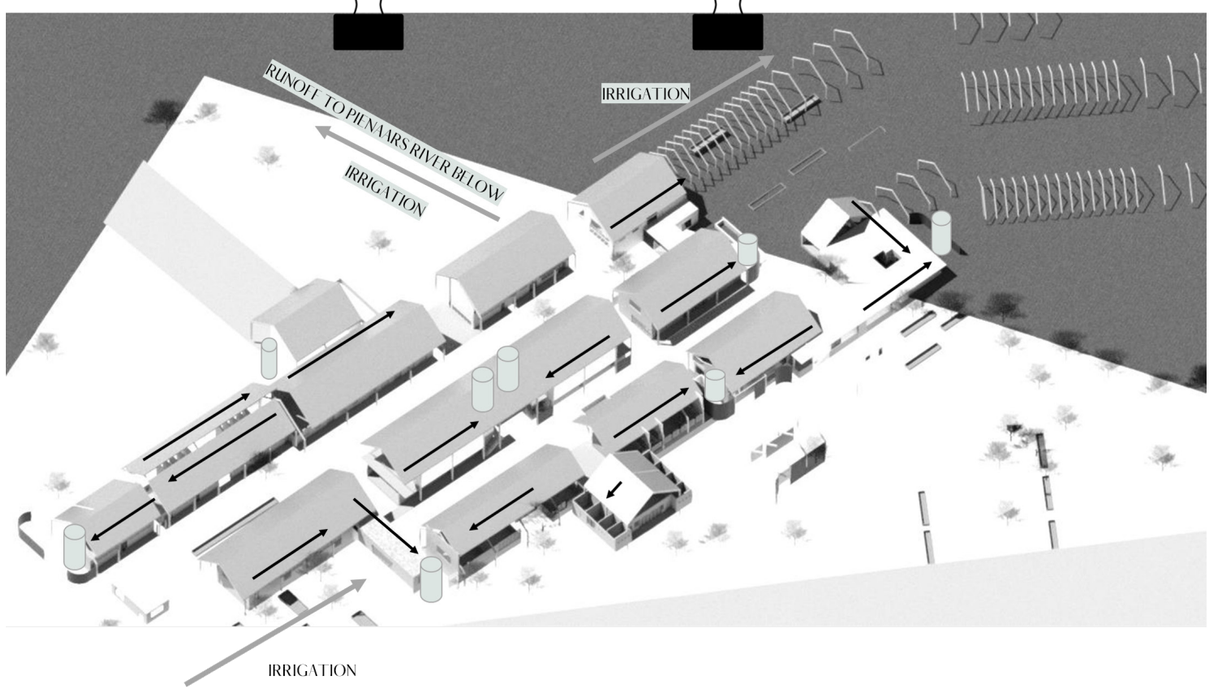


Fig. 163: Final Rainwater Harvesting Visualization (Author 2020)

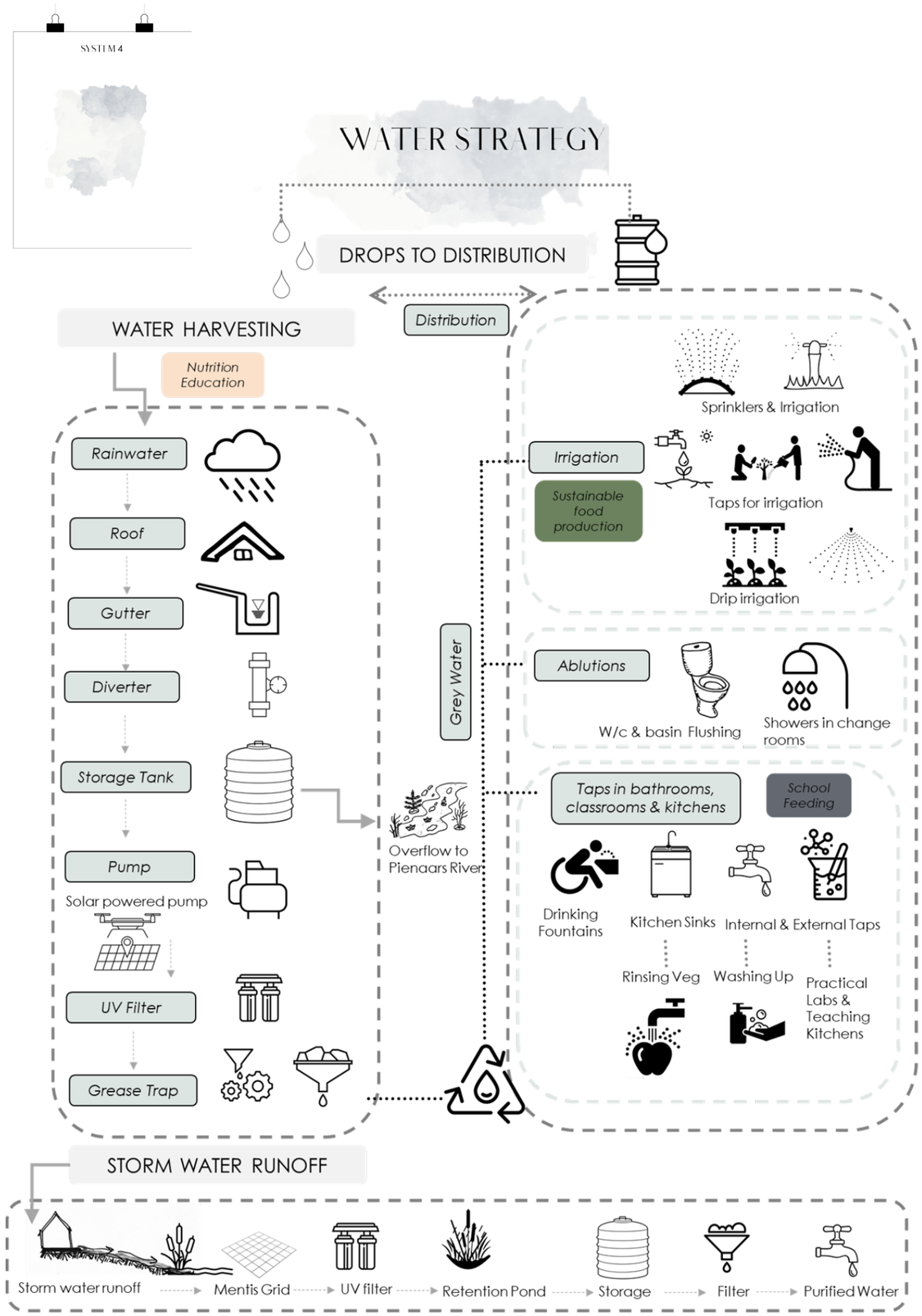


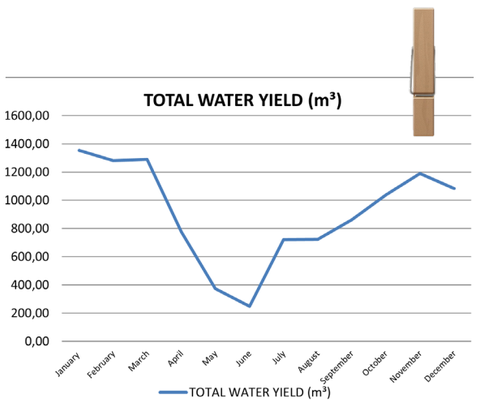
Fig. 164: System 4 Water Harvesting (Author 2020)

Water management model

Water resource information
Note: for the calculation of the water budget the Water management model of Fourie Pieterse 2014 is used.

Water yield

The water yield calculation of the site will primarily consist of rain water harvesting as the primary source and with recycled water from grey water harvesting initiatives as a supplement alternative source. Although there is a water source nearby, the Pienaars River, it is of the opinion of the author that this water source would entail many complication on a social and economic sphere as to be utilised for the first phase of the project.



RECYCLED / ALTERNATIVE WATER SOURCE

MONTH	SOURCE 1 WEEKLY YIELD (m³)	SOURCE 1 MONTHLY YIELD (m³)	SOURCE 2 WEEKLY YIELD (m³)	SOURCE 2 MONTHLY YIELD (m³)	TOTAL / MONTH (m³)
January	39,54	158,19	0	0,00	158,19
February	21,81	87,23	0	0,00	87,23
March	23,85	95,38	0	0,00	95,38
April	14,83	59,32	0	0,00	59,32
May	3,78	15,12	0	0,00	15,12
June	2	8,14	0	0,00	8,14
July	0,87	3,48	0	0,00	3,48
August	1,74	6,97	0	0,00	6,97
September	6,4	25,59	0	0,00	25,59
October	20,64	82,58	0	0,00	82,58
November	28,5	113,99	0	0,00	113,99
December	32	127,95	0	0,00	127,95
ANNUAL AVE.		783,94		0,00	783,94

(m³)	
158,19	1353,08
87,23	1282,12
95,38	1290,27
59,32	776,25
15,12	373,59
8,14	247,12
3,48	720,41
6,97	723,90
25,59	862,01
82,58	1038,49
113,99	1189,39
127,95	1083,86
783,94	**10940,51**

Fig. 165: Water Yield (Author 2020)

The amount of rainwater that can be harvested from the site was determined by multiplying the m2 areas of the site with set runoff coefficients determined by the materials permeability. The following results were found as indicated on the table:



- Paving A (consists of general paving types)
- Paving B (consisting of some permeable grass blocks to assist in some rainwater permeability on site for landscaping)
- Vegetation (Non-productive or agricultural purposes)



As deduced from the data the site will have an annual average of 850mm water per month that can accumulate to a total of 10940.51 m3 of water for the whole year. The site will receive its highest water yield during the month of January where it will remain stable until the end of March. Thereafter the water yield will gradually decline, reaching its lowest point in June during the height of winter. There after the water yield will gradually increase till mid-summer again.

Water demand
The water demand for the site was dived into three types of vegetation: This includes the Lawn area of 9395,7 m2 , the general planting areas of 3627,1 m2 and the allowance for 2000m2 of agricultural land for food production. This calculation is specific to agriculture watering demand. Extra rainwater storage tanks and systems are provided on site to collect and distribute rainwater as a means for human consumption and washing and cleaning.

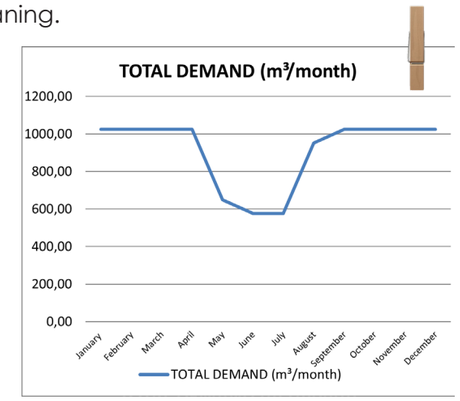
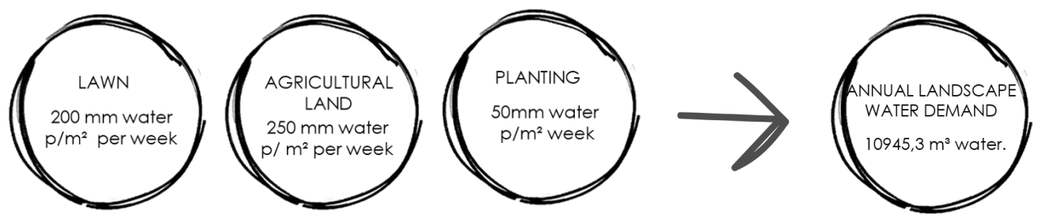


Fig. 166: Water Demand (Author 2020)

The landscape demand is calibrated to suit the demands of the specific vegetation type expressed in a standard mm of water per m2 of land. This is as follow:



As deduced from the data the site will have a demand of 1024,2 m3 of water every month with a decrease in demand during the winter months of May – August reaching a low of 575,8m3. This amounts to an annual landscape water demand of 10945,3 m3 water.

Water budget

For the water budget calculation an initiation phase is suggested. This entails an initial water amount to be pumped into the intended water reservoir from a municipal source to serve as the initial water source for the first year. There after the intended water reservoir will be sustained through the water harvesting methods as discussed in the chapter.

WATER BUDGET

RESERVOIR CAPACITY (m³):	125
MIN VOLUME (m³):	0

WATER BUDGET — INNITIATION PHASE

MONTH	YIELD (m³/month)	DEMAND (m³/month)	MONTHLY BALANCE	POTENTIAL VOLUME (m³)	VOLUME IN TANK (m³)
September	862,0	1024,2	-162,2	**0,0**	**0,0**
October	1038,5	1024,2	14,3	**14,3**	**14,3**
November	1189,4	1024,2	165,2	**179,5**	**125,0**
December	1083,9	1024,2	59,7	**239,2**	**125,0**
	4173,8	4096,8	77,0		

WATER BUDGET — YEAR 1

MONTH	YIELD (m³/month)	DEMAND (m³/month)	MONTHLY BALANCE	POTENTIAL VOLUME (m³)	VOLUME IN TANK (m³)
January	824,7	171,2	653,5	**95,4**	**95,4**
February	753,8	168,8	585,0	**94,2**	**94,2**
March	761,9	171,2	590,7	**111,7**	**111,7**
April	459,2	170,4	288,8	**109,9**	**109,9**
May	215,1	154,2	60,9	**81,0**	**81,0**
June	141,4	138,3	3,2	**47,5**	**47,5**
July	403,4	139,1	264,3	**9,7**	**9,7**
August	406,9	156,2	250,7	**-32,9**	**-32,9**
September	492,2	170,4	321,8	**-67,9**	**-67,9**
October	615,8	171,2	444,6	**0,0**	**0,0**
November	713,9	170,4	543,5	**17,6**	**17,6**
December	661,2	171,2	489,9	**45,0**	**45,0**
ANNUAL AVE.	6449,6	1952,7	4496,9		

Fig. 167: Water Budget (Author 2020)

As deduced from the data the maximum amount of water to be collected and stored in the water tank based on the area of the site would amount to 111.7 m3 of water during the month of March. This amount of water in the reservoir will gradually decline from March as the amount of rainwater harvested declines and the demand still remains. The reservoir will reach a negative value during the month of August and September as the demand for water exceeds the stored and received water amounts. It is estimated that the water reservoir will run dry during October as all water in the tank will be used up. From November the reservoir will begin to gradually fill again as the rainfall season starts and the amount of water received exceeds the demand.
As the maximum amount of water to be collected and stored from site during the year is calculated as 111.7 m3 with an allowance of an extra 10% for rare 1 in 50 year rainstorm events a 125m3 submerged water reservoir is suggested for the site. This water reservoir is rather divided into 8 x 20 000 litre JoJo or similar water harvesting tanks throughout the school. Some of the tanks will be sumerged below ground in order to store water and collect storm water runoff.

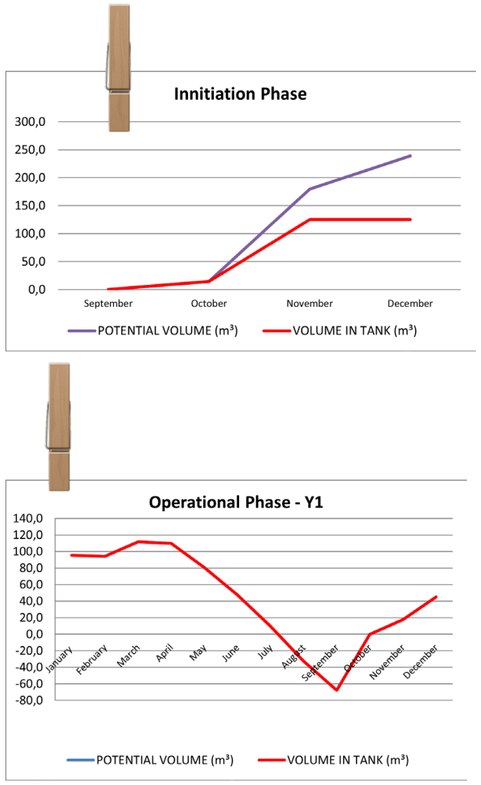
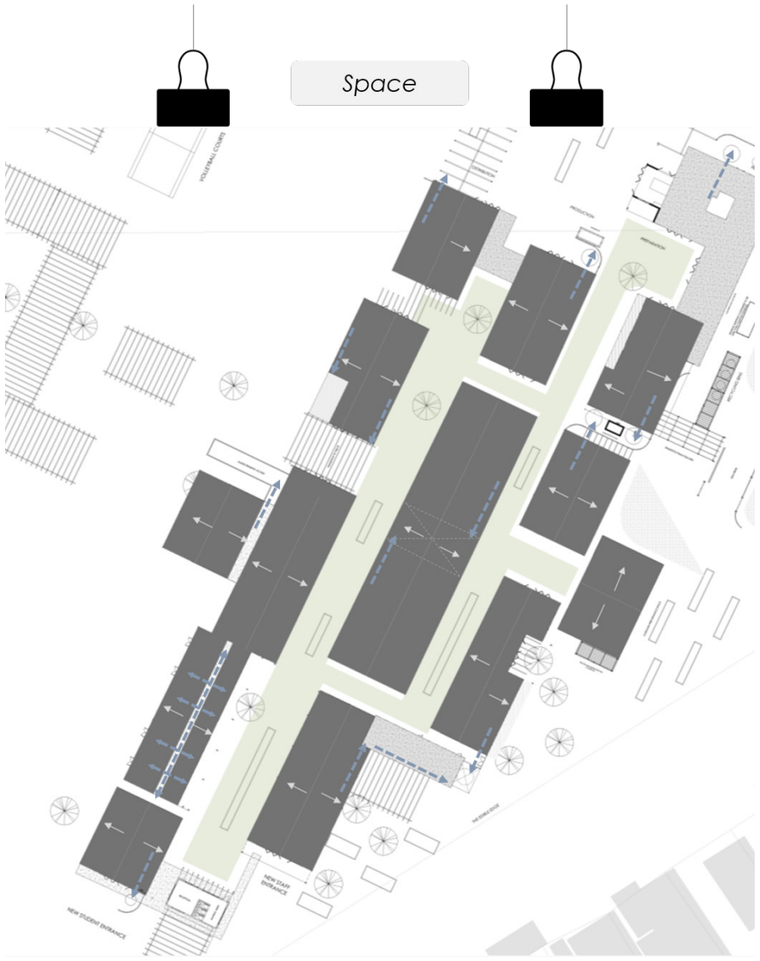


Fig. 168: Water Tank Volume (Author 2020)



ROOF WATER COLLECTION

Fig. 169: Roof Water Collection (Author 2020)

Water harvesting Plan



WATER DISTRIBUTION FOR IRRIGATION

Fig. 170: Water Distribution For Irrigation (Author 2020)

WHY IS ARCHITECTURE SO IMPORTANT?

COVID-19

A pandemic is an opportunity to highlight the importance of having healthier buildings in which people are safe , natural daylight is abundant and good clean ventilation is a guarantee.

Article : Rethinking the built environment to limit Coronavirus transmission (Dietz et al 2020)

Social distancing : staying away from places we usually gather This paper highlights how design could potentially help reduce the SARS-COV-2 transmission.

THE BUILT ENVIRONMENT HAS THE POTENTIAL TO REDUCE TRANSMISSION THROUGH:

1. Promoting natural daylight in a building . Sunlight is known to kill microbes on surfaces , thus contaminated surfaces are seen as catalysts for transmission as viruses can potentially settle on surfaces.

2. Enhancing airflow and ventilation into buildings can reduces the disease. Improve natural ventilation: most people spend a lot of time indoors and rely on mechanical ventilation, these systems can allow us to come into contact with pathogens through airflow.

3. The built form controls how people interact with each other to a certain degree . It defines spaces , controls quantities of people and suggests program while also allowing freedom.

4. Maintain high humidity within buildings as dry air conditions are conducive to virus growth.

5. Office layout changes - allow spaces to be adaptable to changes that prevent large gatherings or encourage social distancing and a normal practice.

As architects we understand how people use space and thus can use that ability as a design informant to prevent and reduce the spreading of a virus.

Fig. 171: COVID-19 Built Environment Strategies (Dietz et al & Author 2020)



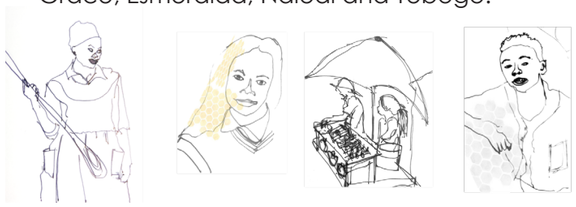
CONCLUSION

The overall prospect of an improved, more focused food appropriated programme allows for the possibility of the program starting to spill out into the existing surrounding green areas around the periphery of the school and the community. By extending the food system there is a potential to reconnect people with natural and human systems that keep them and their communities alive, healthy and thriving. (Cowen et al 2016)

Once this is n place we can start to build resilience into communities to cope with the shock that compromises critical life-sustaining systems.

With the addition of a skills centre on the edge of the school, it encourages agency among potential learners and past learners of the school. It creates an environment that supports creativity and skill-building in individuals so that they can actively engage in crafting the types of lives and communities they wish to live in. The wellbeing Economy endorses a Holistic approach which is fundamental to a learning environment embedded in a community full of knowledge and culture waiting to be shared. The power of food sovereignty is controlled by those most involved and affected by its production, distribution and consumption. So when we decide to change the position of power from that of the hands of policy and governance and we place it so lightly in the hands of the seed planter, the feeder and the eater, we start to empower;

"Grace, Esmeralda, Naledi and Tebogo."



When reflecting on the circumstances and context of this project, from a personal point of view, I think about the things like my peanut allergy, having options to avoid the consumption of that. Options that don't exist in most public schools in previously disadvantaged areas. The only alternative option is no food then.

Many things don't fall under the responsibility of the Department of Education itself, but the right to food, to nutrition, to health and knowledge about all of those things should be a basic right. The right for youth to have access to food regardless of their circumstance is imperative.

In such unprecedented times, we find ourselves queuing at pharmacies, stockpiling on food. Our health should not be based on our ability to afford such things to build up our immune systems, at the least, we should be able to build up our youths' immune systems, fuel their minds and build them up to be resilient to withstand situations like a global pandemic. "Well-nourished children are better able to grow and learn, to participate in and contribute to their communities, and to be resilient in the face of disease, disasters, and other global crises" (Unicef).

The dissertation holds the possibility to contribute to future school developments within the secondary school context in South Africa. It advocates for spatial requirements and prioritizes learning environments from a perspective of those on the receiving end. It forms part of research engaged at trying to be socially inclusive of community engagement in schools, of practical learning and encouraging school curricular that is creative, engaged and skill-building. To many students, school is not just a place they go to learn about math's, science and biology, it is to many, a ground for growth in other aspects of life, it is the place that fosters education beyond the classroom, eating beyond the plate and studying beyond a textbook. To many it is home, a place of safety, security and refuge.



Fig. 172: Food Parcel Drive Lockdown 2020 (Mulder 2020)

In conclusion, it is evident that spatial design can aid in the promotion of food sovereignty through the integration of nutritional pedagogy, feeding schemes and sustainable food production at a secondary school level in order to enhance student learning capacity and wellbeing.

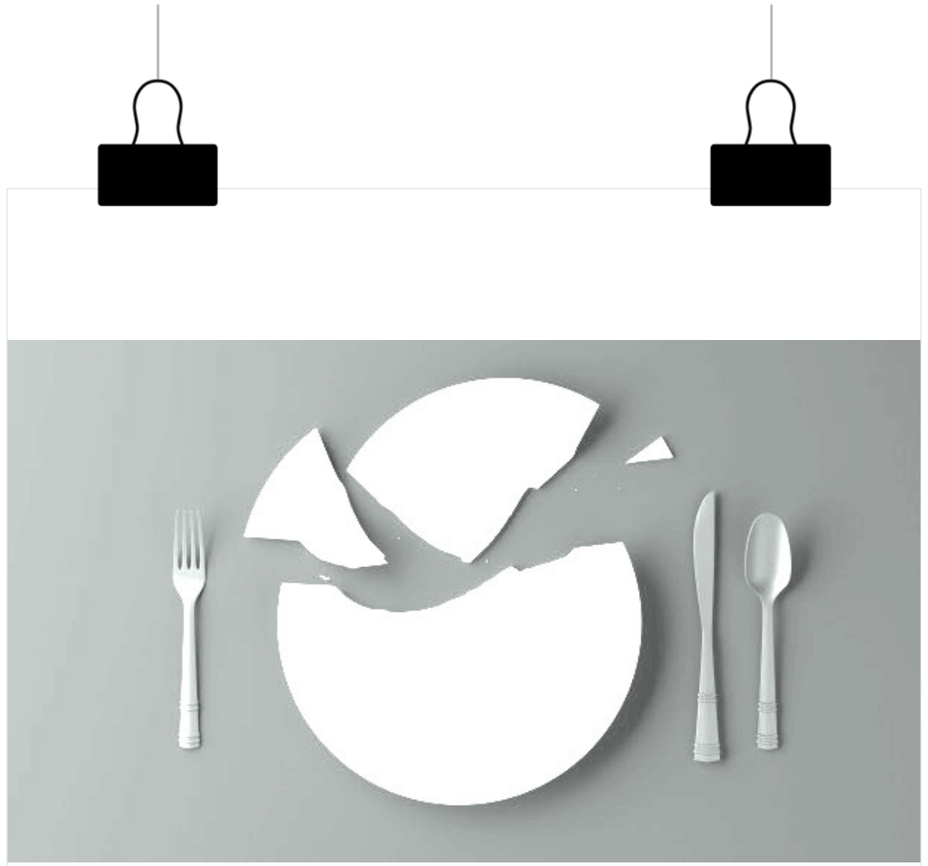
The relationship between architecture and food sovereignty is evident in architectures ability to provide designated spaces for food to be grown, prepared, produced and distributed so that students and members of the community have a right to locally made produce that is culturally appropriate from seed to plate.

The impact of nutritional pedagogy and feeding schemes at a secondary school level is extremely fundamental in the sustaining of students lives as growing beings. By nurturing student's knowledge of health, wellbeing and nutritional education, you are essentially equipping them with skills and knowledge to sustain themselves when the need arises. The global pandemic has affected so many learners access not only to healthy food but food in general, so education in this realm could help learners on how to grow their own food and keep themselves healthy not only in a crisis but when they have to support themselves.



Fig. 173: Where it all Began, the Kettle (Smith 2020)

Chapter 9



FINAL DELIVERABLES



SITE PLAN

SCALE 1:200

Final Site Plan (Smith 2020)
NTS



286 Final Ground Floor Plan (Smith 2020)
NTS



288

Final First Floor Plan (Smith 2020)
NTS

289



NORTH EAST ELEVATION: FOOD PREPARATION, PRODUCTION & DISTRIBUTION AREA

SCALE 1:100



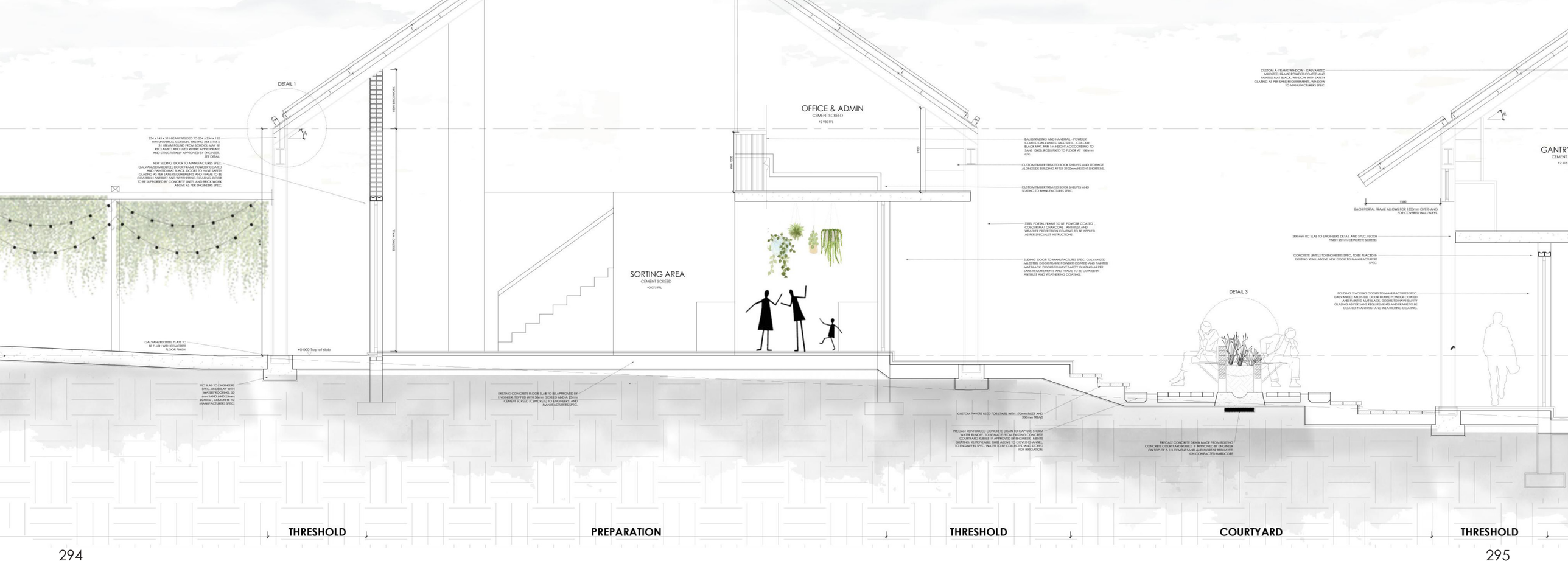
SECTION A: FOOD PREPARATION, PRODUCTION & DISTRIBUTION AREA
SCALE 1:20

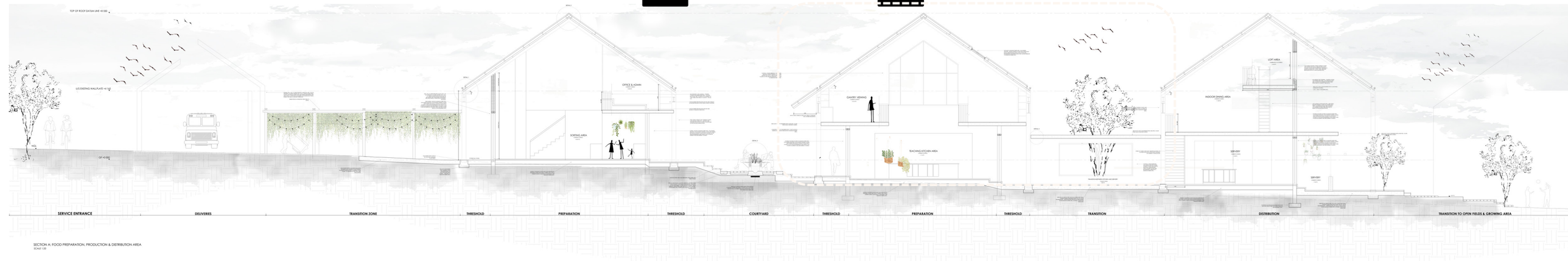
Final Section A (Smith 2020)
NTS



SECTION A: FOOD PREPARATION, PRODUCTION & DISTRIBUTION AREA
SCALE 1:50

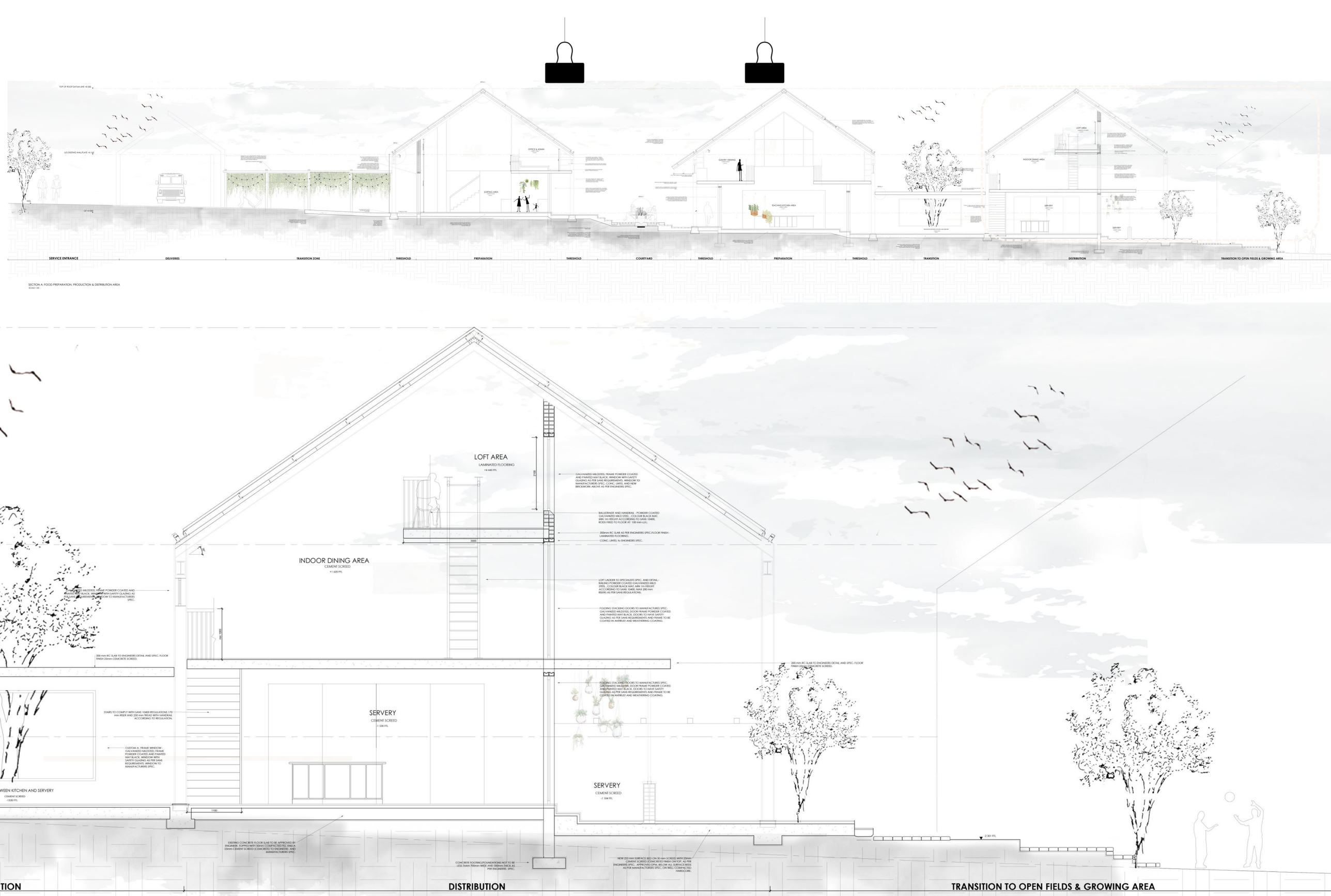
DETAIL 2





SECTION A: FOOD PREPARATION, PRODUCTION & DISTRIBUTION AREA
SCALE 1:100





SECTION A: FOOD PREPARATION, PRODUCTION & DISTRIBUTION AREA
SCALE 1:50



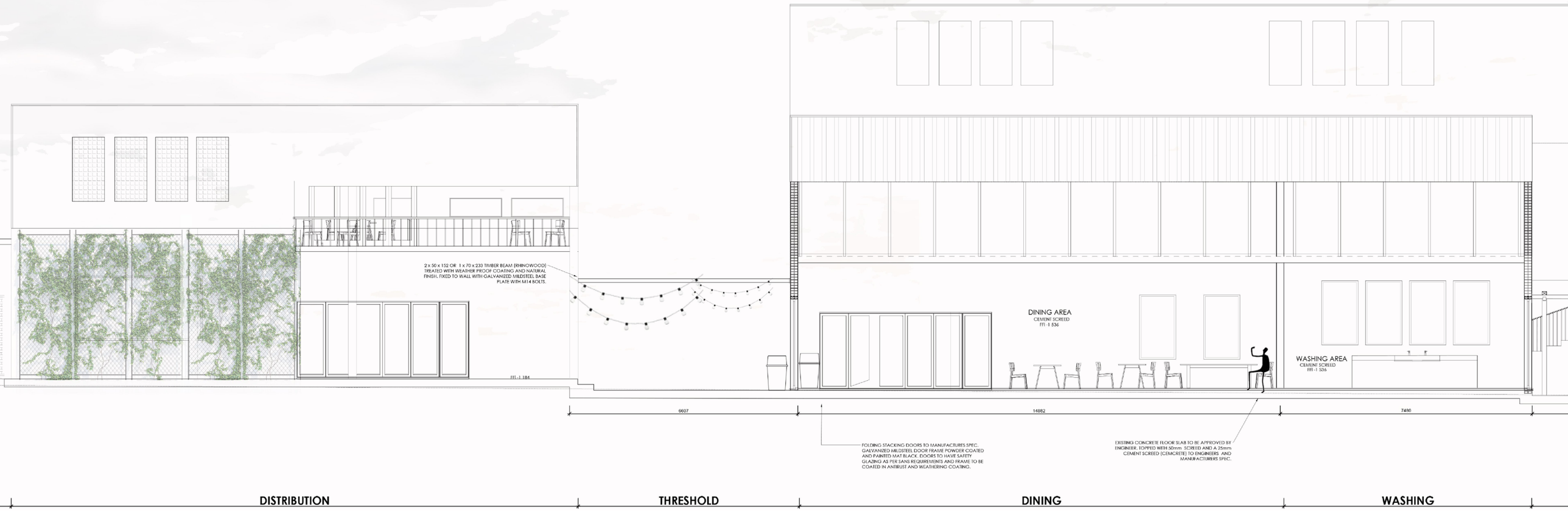
SECTION B: FOOD DISTRIBUTION TO DINING & NORTHERN ELEVATION

SCALE 1:200

GROWING | **PREPARATION** | **TRANSITION**



SECTION B: FOOD DISTRIBUTION TO DINING & NORTHERN ELEVATION
SCALE 1:200



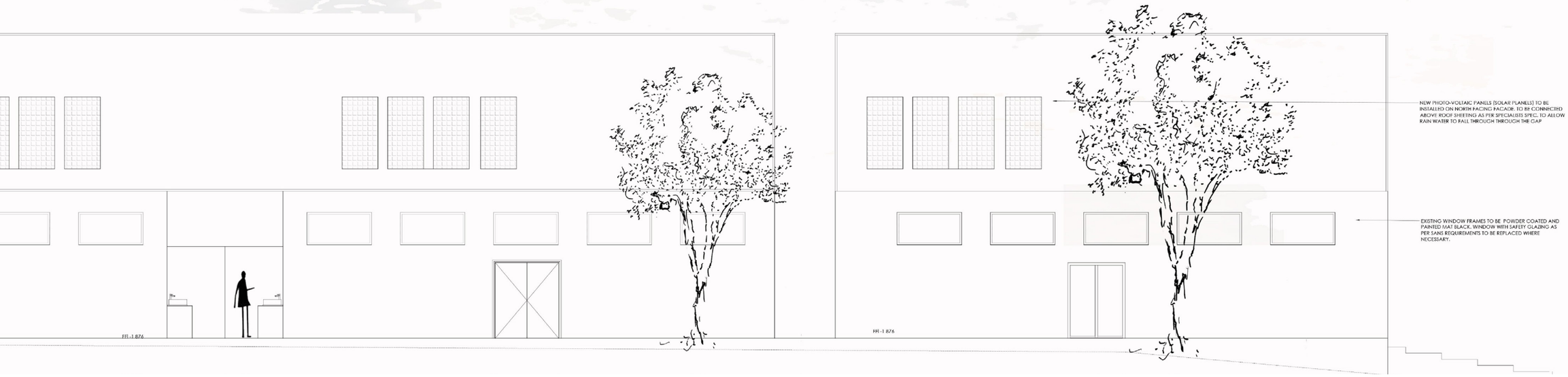


SECTION B: FOOD DISTRIBUTION TO DINING & NORTHERN ELEVATION
SCALE 1:200

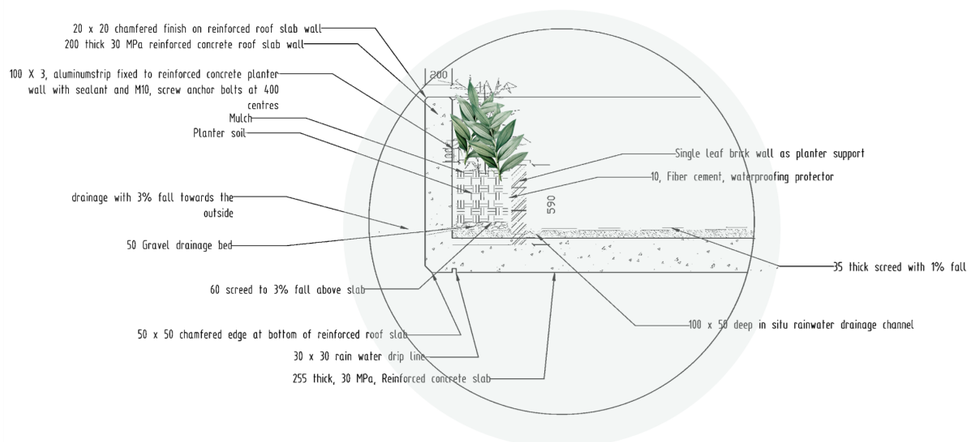




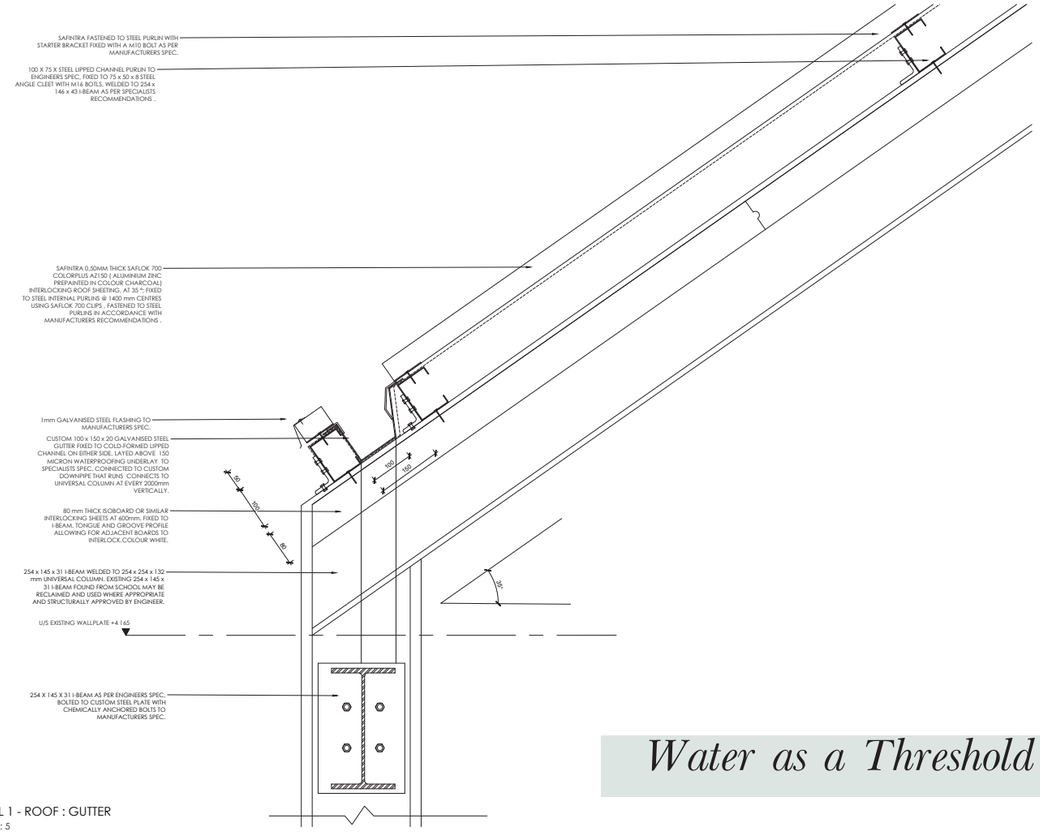
SECTION B: FOOD DISTRIBUTION TO DINING & NORTHERN ELEVATION
SCALE 1:200



The existing conventional extended gutter widened the Frame of the original school building. The new detail facilitates the rainwater transition from roof to storage. It sits within the roof façade, a small cut out as if to flow with the facacde, it cascades subtly into the downpipe fixed to the Steel column, in which its appearance again aims to be seamless.



Water Transfer through Vegetation

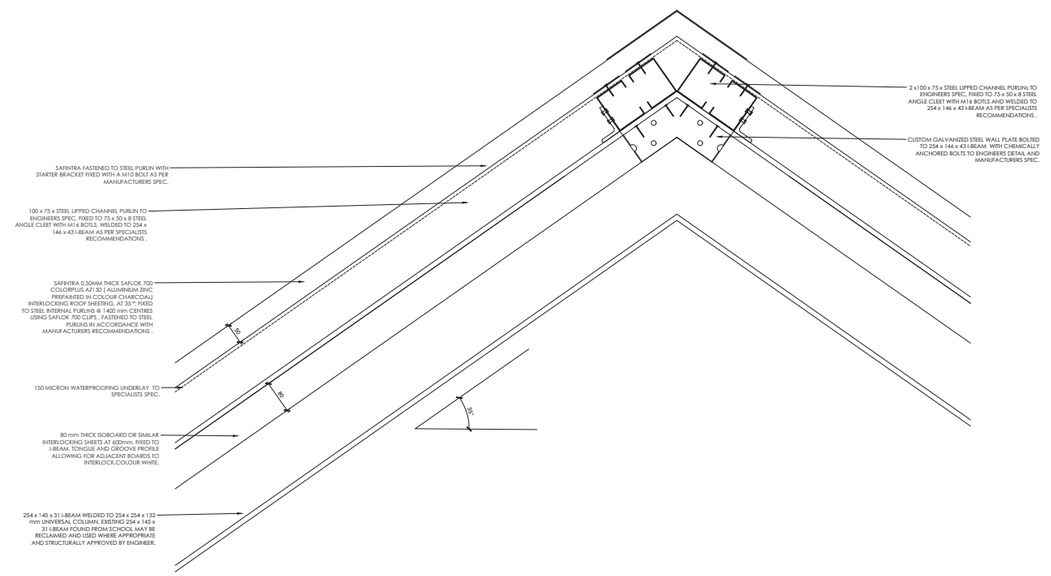


DETAIL 1 - ROOF : GUTTER
SCALE 1: 5

Final Detail 1 (Smith 2020)
NTS

Water as a Threshold

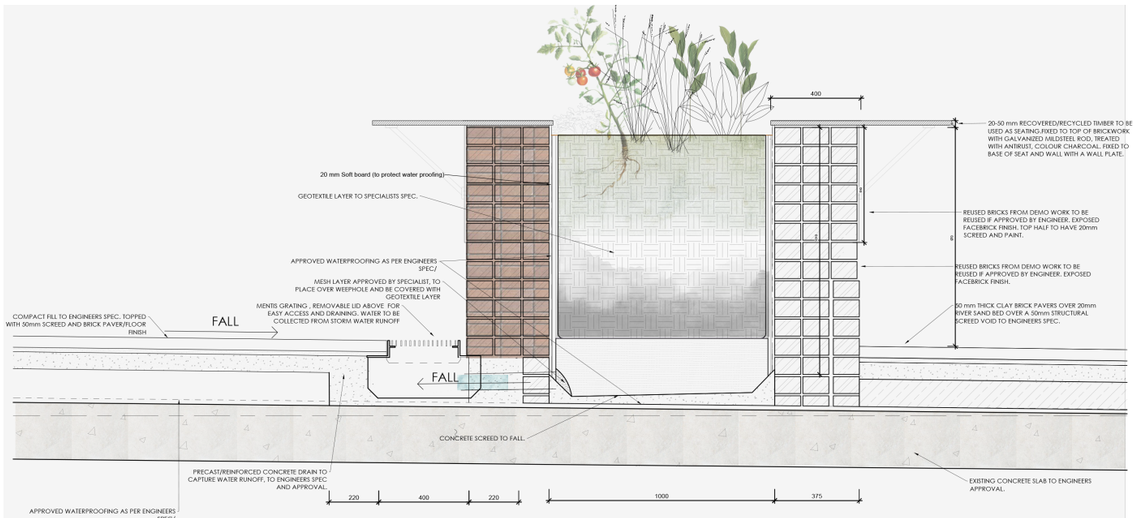
Roof as liminal space contributer



DETAIL 2 - ROOF : CONNECTION
SCALE 1: 5

Final Detail 2 (Smith 2020)
NTS

Planter as a Transitional Stop



DETAIL 3 - PLANTER BOX & SEATING
SCALE 1: 10

Final Detail 3 (Smith 2020)
NTS

WALLS

GREEN SCREEN
GROUND FLOOR PLAN

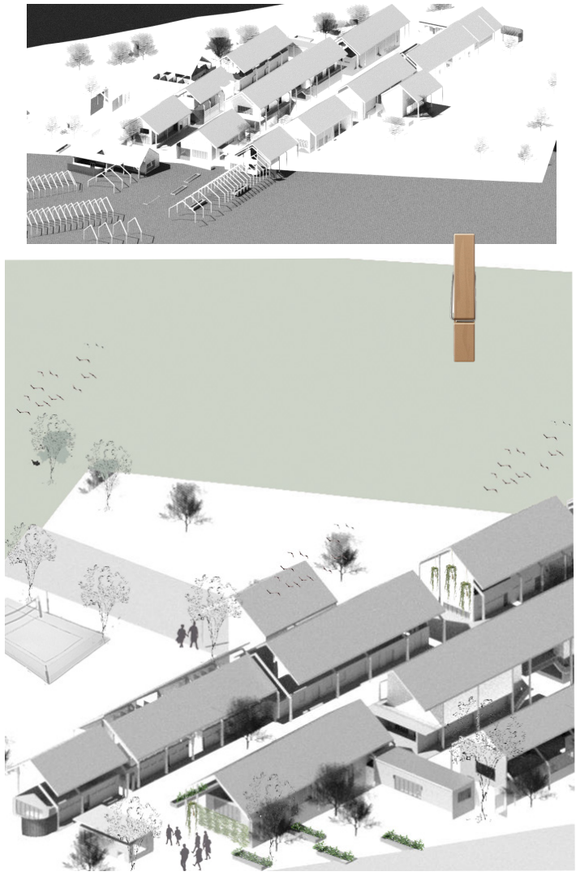
CHARCOAL COATED HIGH TENSILE STEEL
GROUND FLOOR PLAN



TIMBER
GROUND FLOOR PLAN

WHITE PAINTED BRICK
GROUND FLOOR PLAN

EXISTING BRICK
GROUND FLOOR PLAN

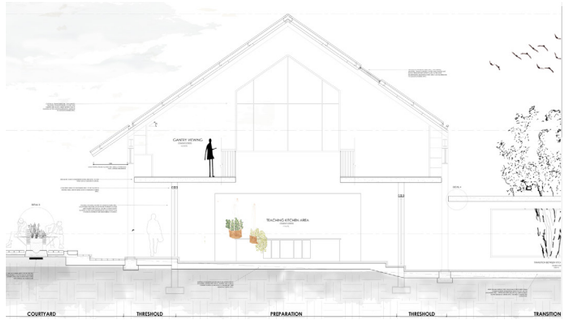


FLOORS

HERRINGBONE EXISTING BRICK
GROUND FLOOR PLAN

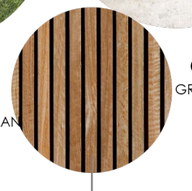


GROUND FLOOR PLAN



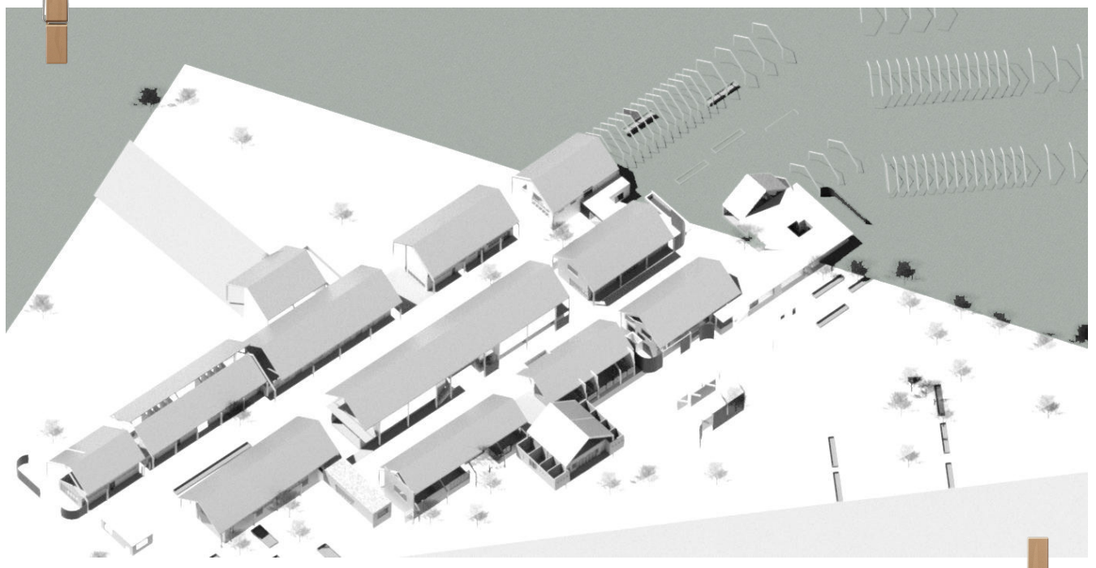
CONCRETE LIGHT WEIGHT
GROUND FLOOR PLAN

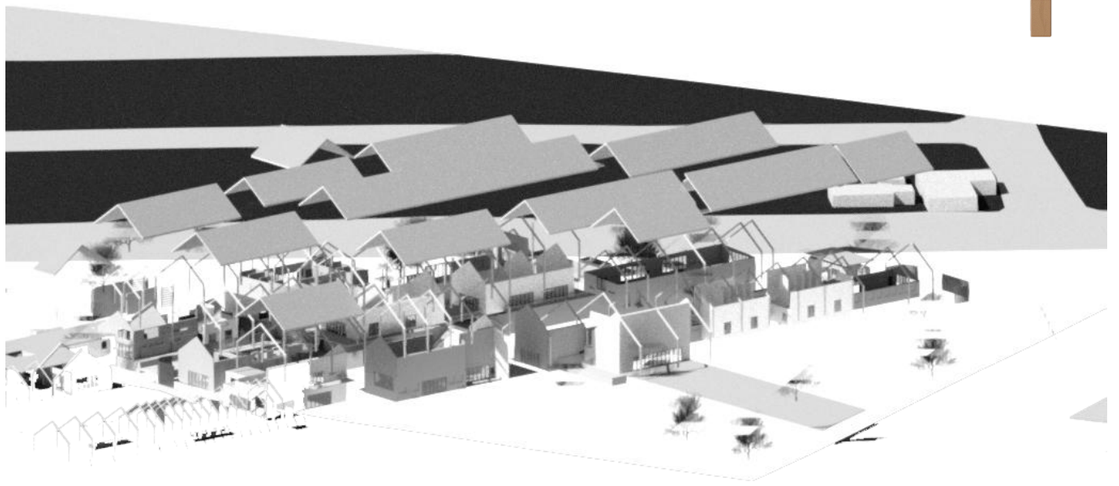
GROUND FLOOR PLAN



TIMBER PANELLING
GROUND FLOOR PLAN







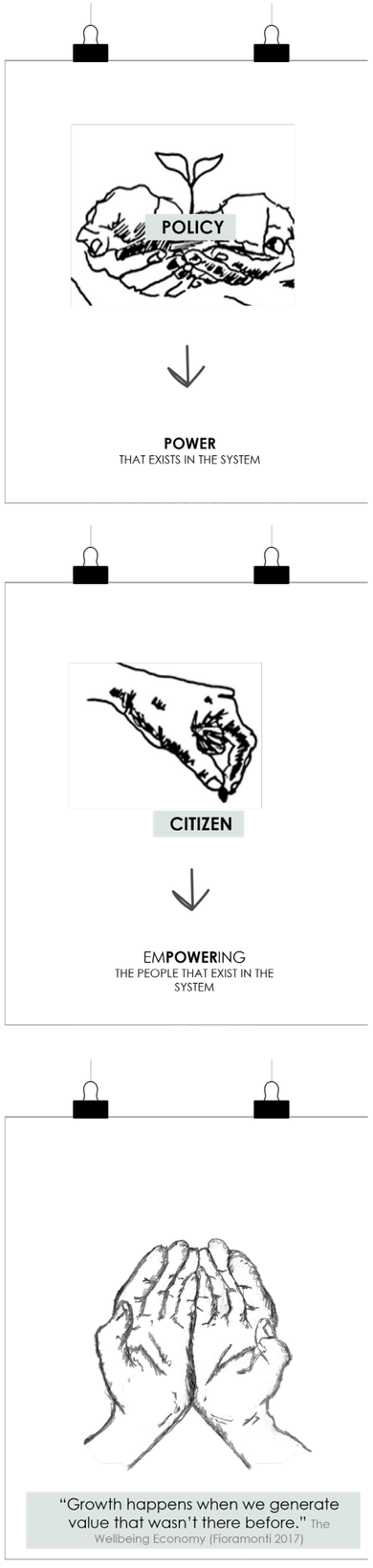


Fig. 174: Changing Hands of Power (Author 2020)

Final Reflection

"I am not interested in picking up crumbs of compassion thrown from the table of someone who considers himself my master. I want the full menu of rights." Desmond Tutu

The dissertation places itself in the context of a secondary school in Mamelodi East. Contexts as such are often faced with negative connotations or stereotypes that most would rather not confront or dedicate their time to.

This project, its active engagement and research process embedded itself in the mere act of investing in the future of our beloved country, its children. The educational ecosystem provides the basis for the formation of bright minds and change-makers. The dissertation and its investment of time and research into the improvement of malnutrition and nutrition education was an eye-opener to the injustice we as a country are still facing 26 years later.

The project has allowed me to reflect on the unequal rights in South Africa. To understand where opportunities lie within the school regulations and where there are still places to contribute to developing school standards. It has emphasized the importance and the power of spatial solutions and their contribution to creating functioning educational environments.



Fig. 175: Co-design Workshop 2019 (Mulder 2019)



Fig. 176: School Children (Nelson Makamo)

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Appendix

Appendix A

ukuDoba Timeline

Appendix B

ukuDoba Methodological Framework version 1

Using KoBo Toolbox

ukuDoba Methodological Framework version 2

Using Maptionnaire

Appendix A

ukuDoba Timeline



Lauren Konstantinou



Purll Naidoo



Kelsey Smith

THE UNIT FOR URBAN CITIZENSHIP STUDIO_MAMELODI
GROUP INTRODUCTION

Involvement in NRF Research Project "Stitching the City"

Lauren Konstantinou, Purll Naidoo and Kelsey Smith are personally involved in an ongoing NRF Research Project, titled 'Stitching the City"

The research project involves a collaboration between the architecture departments of Chalmers University of Technology, in Sweden, and University of Pretoria, in South Africa.

The intention of the project is to develop a data collection methodology that results in efficient storage of collected information in an online data warehouse. This data warehouse allows for layers of information to be accumulated each year and easily accessed.

As part of our dissertation outcome, we have contributed to the creation of the ukuDoba Method, which we have applied to our individual dissertations as a research methodology

THE DEVELOPMENT OF THE UKUDOBA FRAMEWORK

A COLLABORATIVE RESEARCH PROJECT (STITCHING THE CITY) BETWEEN CHALMERS UNIVERSITY OF TECHNOLOGY, SWEDEN, AND THE UNIVERSITY OF PRETORIA, SOUTH AFRICA

INVOLVED COLLABORATIONS

UNIVERSITY OF PRETORIA

BOUKUNDE: DEPT. OF ARCHITECTURE

BArch HONOURS

STAKEHOLDERS

Tsako Thabo Secondary school, Mamelodi

CURRENT METHODS OF DATA COLLECTION

FIELD WORK
ANALOGUE MAPPING
SITE MAPPING (DESKTOP & TRANSECT SITE WALKS
INTRODUCTION TO EPICOLLECT (DIGITAL DATA CAPTURING)

MAPPING & CAP (Community Action Planning)

Q1

Q2

CO-DESIGN

- SITE ANALYSIS
- WORKSHOPS
- GAME DESIGN
- INTERACTIVE PARTICIPATION
- SOCIAL INCLUSION

DESIGN GAMES

ROLE PLAY

EPICOLLECT

METHODOLOGY

POSSIBLE SOLUTION

NRF – STINT PROJECT "STITCHING THE CITY"

1 *Project aim : To establish a transdisciplinary collaboration between the Chalmers University of Technology in Gothenburg, Sweden and the University of Pretoria, South Africa.*

2 *To develop a methodological framework and digital platform for the collection & sharing of non-traditional types of spatial economic data at a street- and precinct level.*

To be developed and adapted to local Global South and Global North conditions.

3 *To create home-grown strategies for economic survival, based on co-operative networks that over years have disparate and unsynchronised research processes.*

In hope that this collaboration will serve to capture types of micro-data in order to share it among researchers from different disciplines to inform responsive economic transformation policies.

PROBLEMS WITH ANALOGUE DATA:

4
- Re-done every year (No collaboration)
- Data sits stagnant on an a shelf or gets thrown away
- Emphasis on recapturing data rather than comparing and compiling data
- Not tangible
- Inaccessible data for interdisciplinary work
- Limited tools available and training required for epicollect

5

NRF – STINT APPLICATION PROCESS

3 CHOSEN CANDIDATES

UP & Chalmers University

2019

WHAT

COLLABORATIVE PROJECT TO TEST THE EFFECTIVENESS OF DIGITAL TOOLS TO CAPTURE LIVED CIRCUMSTANCES OF USERS FROM A HANDS-ON AND REAL-WORLD PERSPECTIVE

21 SEP

EXCHANGE TO GOTHENBURG

CHALMERS UNIVERSITY OF TECHNOLOGY AND UNIVERSITY OF PRETORIA

GOTHENBURG, SWEDEN

WHY SWEDEN?

HAMMARKULLEN, GOTHENBURG

MAMELODI, PRETORIA

IMMIGRANTS, ECONOMIC CLASS

RACIAL & ECONOMIC DIVIDE

SOCIAL INCLUSION STUDIO

UNIT FOR URBAN CITIZENSHIP

WHY US?

- INTEREST IN **PARTICIPATORY DESIGN**
- **EXPOSURE** IN HONOURS 2019
- **CONTINUATION** IN MASTERS 2020

NOW

LATER

TESTING EXISTING METHODOLOGIES

ANALOGUE DATA COLLECTION

- HANDS-ON
- REAL WORLD PERSPECTIVE
- LIVED EXPERIENCES FROM USERS OF SPACE
- INFORMATION THAT MATTERS

DIGITAL DATA COLLECTION

- REMOVED POINT OF VIEW
- EASILY OUTDATED IN THESE SOCIAL CONTEXTS
- SHAREABLE & COMPARABLE

CAN IT BE DONE?

CAN DIGITAL COLLECTION METHODS BE USED EFFECTIVELY TO CAPTURE ANALOGUE DATA IN ORDER FOR A REAL-WORLD PERSPECTIVE TO BE ACHIEVED?

29 SEP

THE TRIP'S OUTCOME

MULTIPLE DISCIPLINES = HOLISTIC CONTEXTUAL UNDERSTANDING

DATA WAREHOUSE = EASY ACCESS & BUILDING ON INFO EACH YEAR

GEONODE

DATA COLLECTION BY ANYONE - ESPECIALLY COMMUNITY MEMBERS

2020

HOW

HOW DO WE GO ABOUT COLLECTING DATA USING DIGITAL TOOLS TO BE ABLE TO STORE THE INFORMATION IN AN ONLINE DATABASE

27 JAN

EXCHANGE IN SOUTH AFRICA

CHALMERS UNIVERSITY OF TECHNOLOGY AND UNIVERSITY OF PRETORIA

CONTINUATION OF THE RESEARCH PROJECT

RESEARCHERS

3 X STUDENTS FROM EACH UNIVERSITY

DEVELOPMENT OF THE FRAMEWORK

OUTLINING THE PROCESS

COLLECT DATA

CONVERT DATA

STORE DATA

DATA COLLECTION PLATFORM

TESTING MULTIPLE DIGITAL DATA COLLECTION PLATFORMS

KEY CATEGORIES

USABILITY

ACCESSIBILITY

CAN THE ONLINE PLATFORM PERFORM THE SAME TASK AS ANALOGUE METHODS

KOBO TOOLBOX

TESTING EACH TOOL OF THE CHOSEN DATA COLLECTION PLATFORM ON SITE

REFLECTING ON USE OF EACH TOOL THROUGH DISCUSSION

UKUDOBA FRAMEWORK DRAFT 1.0

STEP-BY-STEP CHAPTERS

1. COLLECT DATA **KOBO TOOLBOX**
2. CONVERT DATA **QGIS**
3. STORE DATA **GEONODE**

08 FEB

APPLICATION OF FRAMEWORK TO PROJECTS

USE OF THE FRAMEWORK WITHIN 3X MASTERS STUDENTS PROJECTS AT THE UNIVERSITY OF PRETORIA

UKUDOBA WORKSHOPS

PRESENTING THE FRAMEWORK TO UNIVERSITY OF PRETORIA HONOURS AND MASTERS STUDENTS

ONGOING DEVELOPMENT OF FRAMEWORK BASED ON THEIR FEEDBACK

KELSEY SMITH, LAUREN KONSTANTINOU, PURELL NAIDOO

Volume 1

Appendix B
ukuDoba Booklet

ukuDoba Methodological Framework version 1

Using KoBo Toolbox

ukuDoba Methodology

A Methodological Framework for Effective Data Collection and storage

Version 1.0

Preface

The ukuDoba handbook is the outcome of the Swedish-South African project “Stitching the City” that integrates education and research. The project aims at developing a method and digital library of geolocated data for knowledge facilitation to support data re-use in architectural courses. It also aims at establishing a collaboration between the University of Pretoria, South Africa, and the Chalmers University of Technology in Gothenburg, Sweden.

“Stitching the City” has been hosted by the course Planning and Design for Social Inclusion in Gothenburg (2019 and 2020) and the Urban Citizen studio in Pretoria (2020). Many thanks Emilio and Carin!

ukuDoba has been tested in field studies by students in two areas: Mamelodi-East in the City of Tshwane and Hammarkullen in Gothenburg and the handbook has been developed by the six master students in an iterative process. Thank you, Robin, Lauren, Purll, Mumtaheena, Kelsey and Markus for your invaluable work! Without you, no handbook.

A special thank you goes also to Cameron and Victoria for development of the GeoNode structure to store and share our data. Finally, thank you Marco, Monica, Serena for your support and constructive input.

Liane & Chrisna
October 2020

Preface

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STINT
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NRF National Research Foundation

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The ukuDoba methodology was created from a collaboration between three Master of Architecture students from Chalmers University of Technology, Sweden and three Master of Architecture students from the University of Pretoria, South Africa. All authors are actively involved in the ‘Stitching the City” research project and have a background in participatory design, social inclusion and urban citizenship within architecture. This background influenced their interest in the creation of the ukuDoba Method.

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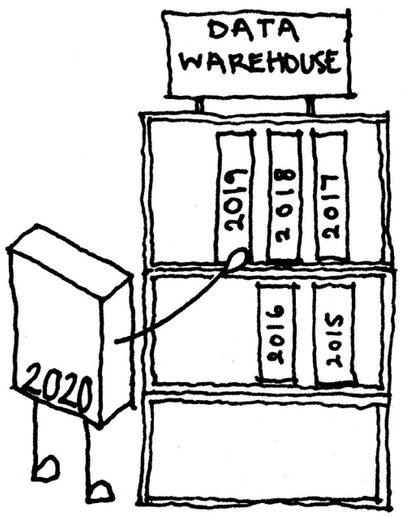
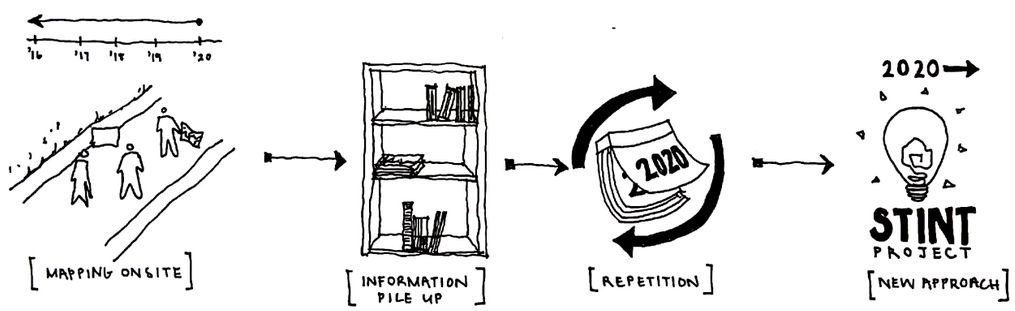
ukuDoba

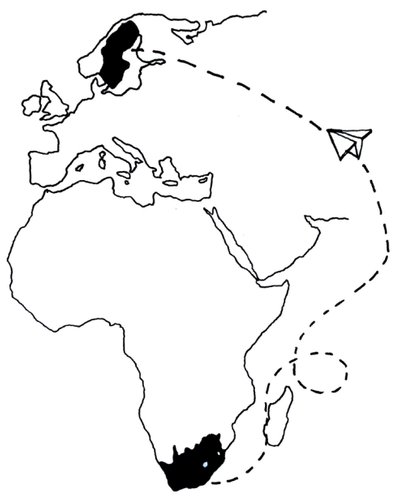
Over time, physical maps and folders are being stacked in bookshelves. This format of data collection is difficult to access and build upon. Year, after year, these research processes are repeated, by both universities, leaving layers of rich data disjointed.

ukuDoba - the methodological framework, has been developed for the collection and sharing of non-traditional types of spatial economic data at a street and precinct level in an online platform. These cross-disciplinary micro-data can be layered and easily accessed by researchers from different disciplines as well as students and community members.





ukuDoba

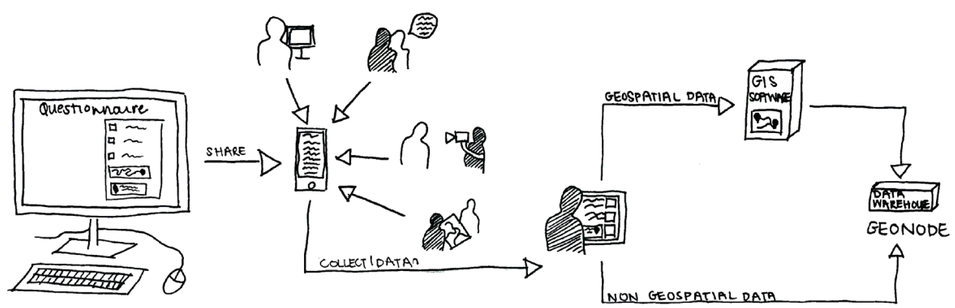


The methodological framework, ukuDoba, and online platform, Geonode, are currently being tested in two study areas: Mamelodi East in Tshwane, South Africa and Hammarkullen in Gothenburg, Sweden.

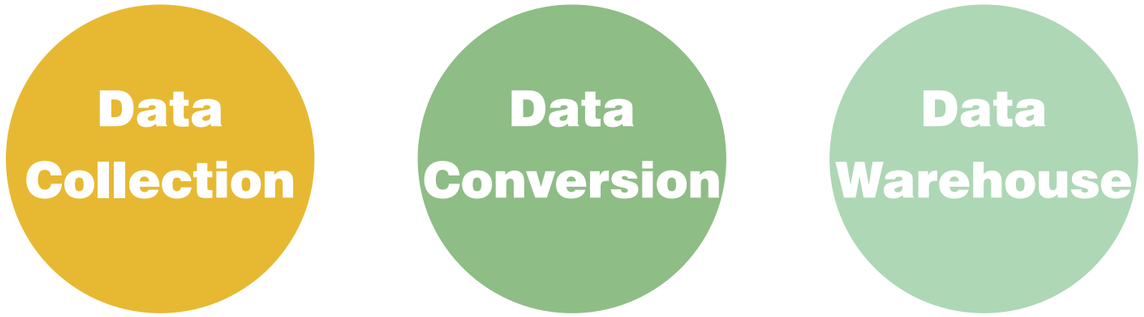
Here, we present a step by step guide to follow the ukuDoba methodology of how to effectively digitally collect, convert and store data in an online platform, GeoNode.



In Zulu the word ukuDoba means ‘fishing’. With this booklet, we hope to help users ‘fish’ for the data they need for their project.



The ukuDoba Methodology



KoBo Toolbox

QGIS

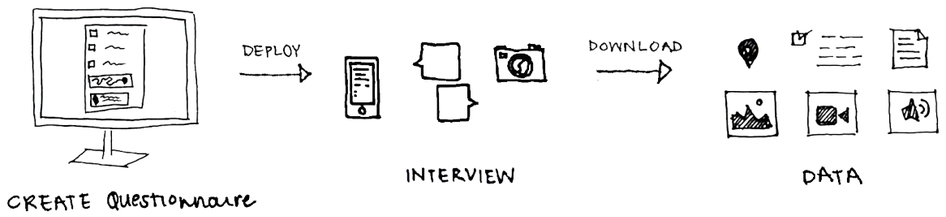
Geonode

1

Data Collection

Data Collection

KoBoToolbox



What?

- Kobo Toolbox is an open access Digital data collection tool that allows you to create a questionnaire that can be downloaded to your mobile device, filled in on the ground, offline, and geo-referenced on site. You can take photographs, record video and voice clips, or write text.
- After fieldwork, you can then upload the data to the internet over WiFi and access the data via your computer. This data can then be shared with others and they can then use it or edit it.
- Other tools used for similar data collection are: Maptionnaire, FieldPapers, EpiCollect5 etc.

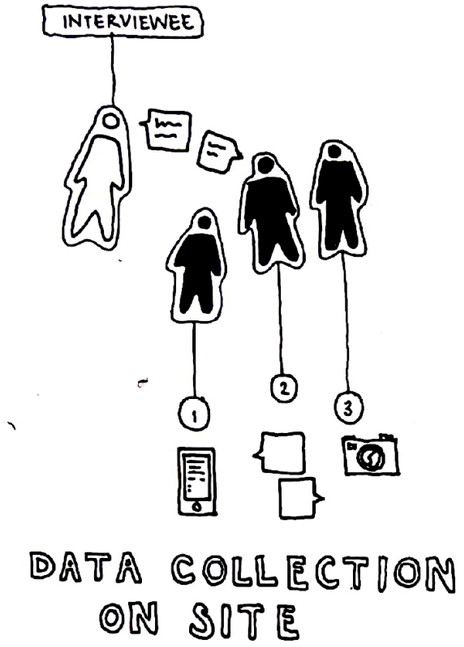
Why?

- Communities to share their knowledge.
- To digitally store data in a Digital platform (easier to access and use).
- To geolocate collected data

Data Collection

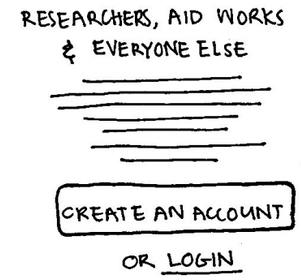
How?

- Always collect data in groups of three people.
- The first person is in charge of taking notes and should focus on gathering data using the data collections tool.
- The second person is in charge of leading the interview and can have the questions open on their phone as a guide.
- The third person is in charge of documentation of the process and takes pictures, video and audio records.



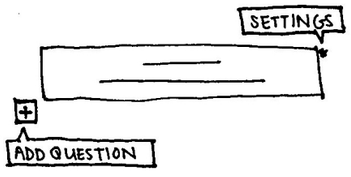
Getting started

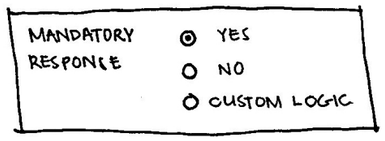
1. Use your computer to start. You will only use your phone when filling out the form on site.
2. https://www.kobotoolbox.org/ > Scroll down > **Researchers, Aid Workers and Everyone Else** > Create an Account > Verify in email



Creating a questionnaire

1. Open KoBo Toolbox on your computer browser > **New** > Build from Scratch > Fill in
2. Project Name > Use a set format (e.g. **2020_ Location_Project Name**) > **Create Project**
3. "**+**" > types of questions (see glossary for types of questions)
   - Question 1: select **Acknowledge** question (digital consent for interview). See example below:
   - Question 2: select **Point** question (current location of interview).
   - Question **Settings** > Mandatory Response > **Yes** (Question 1 and Question 2)





4. Layout and Settings > Select Start Time and End Time
5. Save & Preview
6. Return to List (top left corner)



I hereby voluntarily grant permission for participation in this project, as explained to me by the researcher. I am aware that the results of the investigation may be used for the purposes of publication. I will remain anonymous: my comments may be used without giving any geographic or personal references (name, address, ID, occupation, age, income etc) that may accidentally imply my identity.

Glossary: question types & examples

Point: tracks your current location*

Acknowledge: gives consent to the interview*

Text: add in between questions for additional notes

Quantitative Tools examples:
How many children do you have?
Which ones are applicable to you?

Qualitative Tools examples:
How would you rate this park?
When did the music festival happen?

Media: captures images, sounds and videos

Line and Area: highlights a route or area

* Make these questions mandatory to fill in.

Note: Some tools present challenges in application due to internet access and device compatibility.

Calculate tool example:

"How many girls?" > Settings > Data column name > "girls"

"How many boys?" > Settings > Data column name > "boys"

${girls} + ${boys} > Settings > Data column name > "total_ children"

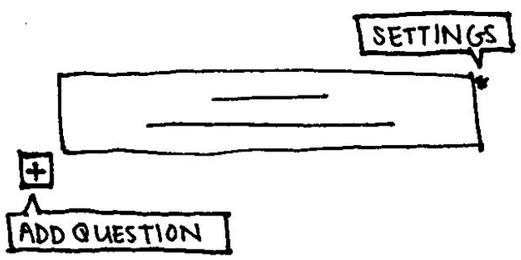
"There are ${total_children} in this room."

Carry-on question example

"Which colour is your favourite?"

- Blue
- Red
- Yellow
- Other

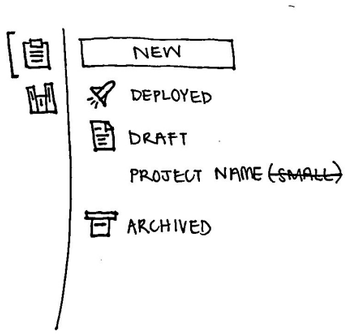
"If other, explain."



Settings of question > **Skip Logic** > **Add a Condition** > **Select a Question** > "Which colour is your favourite?" > "Other"
Now the text box question will only pop up if "other" is selected.

To use your questionnaire

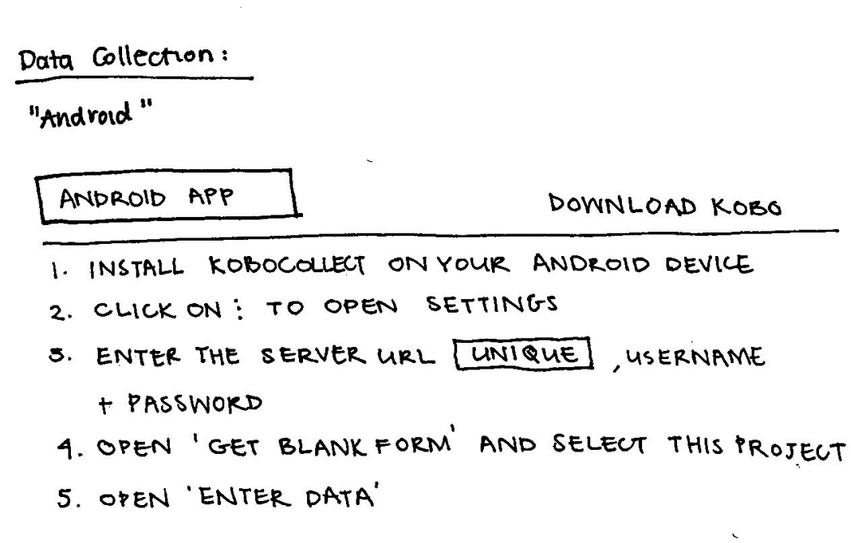
1. Menu > **Draft** > Your Project > **Deploy**
2. To share with others: Hover over project name > ***share icon*** (right hand side)



Data collection

There are two ways to collect data. Follow the relevant steps:
Collect Data > dropdown options

Android Users: "Android Application"
Download KoboCollect > Follow instructions on KoBo Toolbox to open form (enter given unique URL) > To fill in form on your phone: **Fill in blank form**



iOS Users: "Online-Offline (multiple submission)"
Click **Open** > copy **URL of form** > Open https://www.the-qrcode-generator.com/ in a new tab > select URL > paste URL of form > Save > scan QR Code on phone to open form

1. Internet access needed to open form on phone
2. No internet access needed when using form in field

Note: Save form as **Draft** if editing needs to be done after the interview.

After collection

1. Edit data **before** uploading forms.
2. **Android Users:**

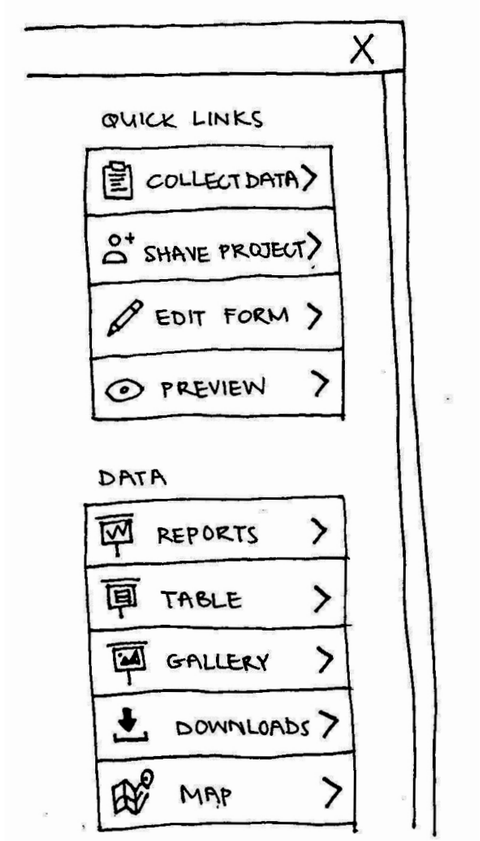
   To Edit = **Edit Saved Form**

   To Upload = **Send Finalized Form** > Select All > Send Selected

   iOS Users:

   To Edit = Save form as **draft** > Select form in side menu > edit it

   To Upload = Open side menu > Select Forms > **Upload** (iPhone will automatically upload forms when connected to internet if not saved as draft)
3. Desktop PC > Kobo website > Deployed > Your Project
4. Summary of data collected > Data > **Reports**
5. Downloads > Export Type > **CSV (Legacy)** > New Export > Pending > **Click to Refresh** > click the file link to download

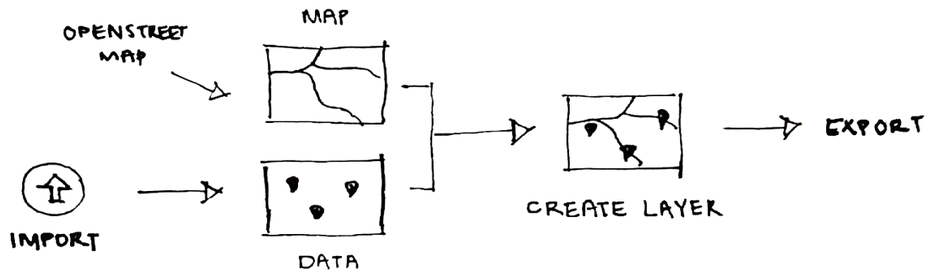


Step 1 Complete

2 Data Conversion

Data Conversion

QGIS



What?

A geographic information system (GIS) is a framework which provides a platform for users to engage with spatial data, through analysis and editing. There are alternative platforms that can perform this function, however we will use QGIS as it is a free service, making it more accessible to a wider range of people.

Why?

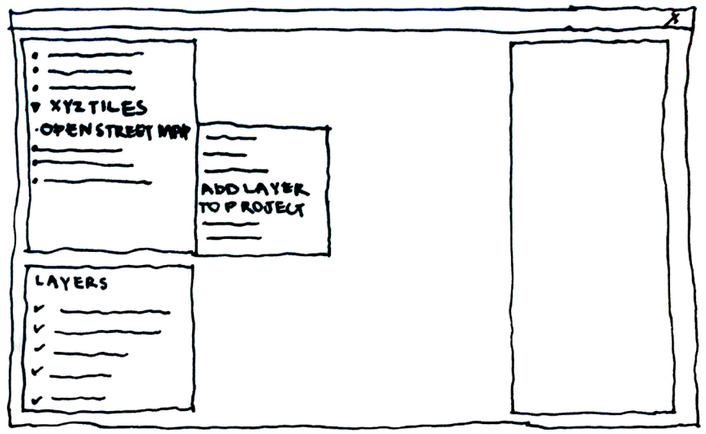
For the purpose of this framework, QGIS will be used to convert the data into a usable file type that can be imported and stored in the data warehouse GEONODE.

Getting started

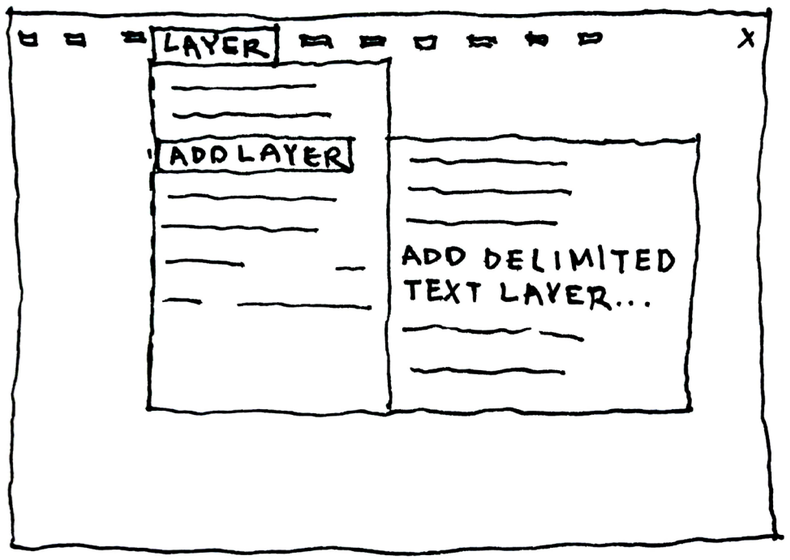
Download QGIS Standalone Installer Version 3.10 (64 bit) > Install QGIS > Run QGIS

Importing CSV Legacy files

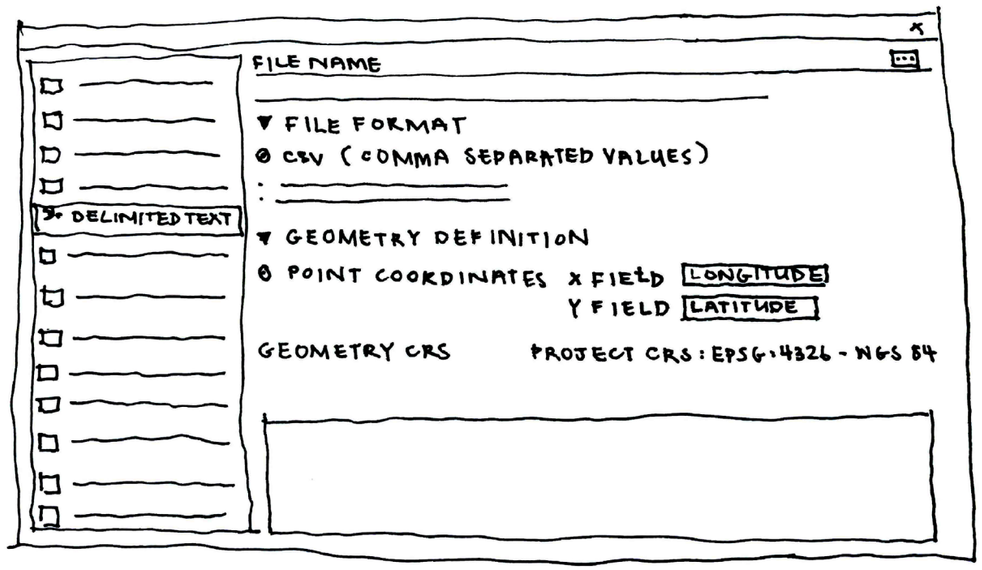
1. Open QGIS application on your computer > Project tab > New
2. Side Browser Menu > Drop down tab **XYZ Tiles** > Right click on **Openstreetmap** > **Add Layer to project**



3. Main menu > **Layer tab** > **Add Layer** > **Add Delimited Text layer**



4. File name > Click (...) to browse > Select your **CSV (Legacy) File** > **Ope**n

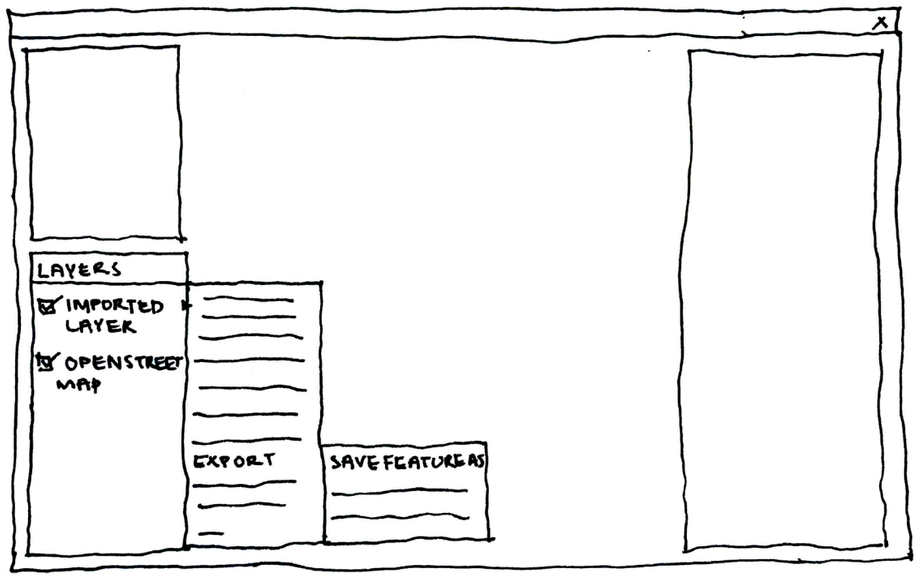


5. Drop down tab > **File Format** > select **CSV (comma separated values)**
6. Drop Down tab > **Geometry definition** > Select **Geometry CRS = Project CRS: EPSG:4326-WGS 84** > Select **X field = Longitude** and **Y field = Latitude** > **Add** > Close window

Note:
Once editing the X and Y fields, if the points appear on a blue screen then delete your imported CSV (legacy) layer, re-import it and let X field= Latitude and Y field = Longitude.
If you do not use a CSV legacy file, you will not have the option to select the x and y fields.

Exporting ESRI shape files

1. Layers Menu > Insure Openstreetmap layer is below your Layer
2. Right click on your layer > **Export** > **Save feature as**
3. Create a new folder on your computer with your project name to export your shapefiles to
4. Drop down tab **Format** > Select **ESRI Shapefile** > **File Name** > Click (...) to browse > Write your file name > Drop down tab **CRS** > Select **Project CRS: EPSG:4326 - WGS 84** > **Ok**
   (There should be 6 shapefiles exported)



Notes

There is no need to save QGIS files as the only files that are required are the ESRI Shapefiles that you export.

Tips

To learn more check the Youtube tutorial:
https://www.youtube.com/watch?v=sQ2z-D8TN2E

Step 2 Complete

3

Data Warehouse

Data Warehouse

What?

GeoNode is a web-based application and platform that facilitates the creation, sharing and collaborative use of geospatial and non-geospatial data.

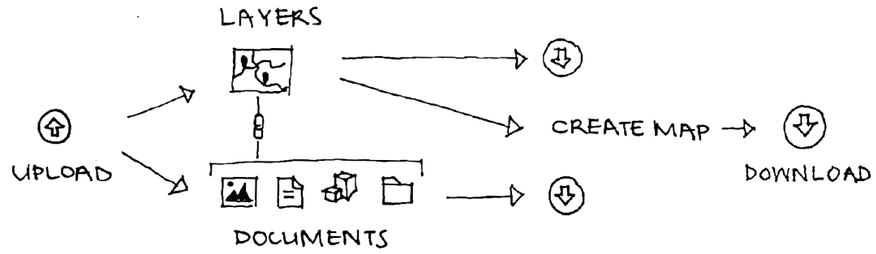
The Geospatial data can be stored as Layers, formats that GeoNode supports:
Shapefiles & its associated files (.cpg, .dbf, .prj, .qpj, .shp, .shx)
GeoTiffs (.tiff, .tif)
American Standard Code for Information Interchange (ASCII)
The Non-geospatial data can be stored as Documents, formats that GeoNode supports:
Microsoft Word (.doc & .docx), Powerpoint (.ppt & .pptx), Excel (.xls & .xlsx)
Image Formats (.gif, .jpg, .jpeg, .png, .tiff, .tif)
OpenDocument File Formats (.ods, .odt,. odp)
Portable Document Format (.pdf)
Compressed Files (.rar, .zip, .gz)
Markup Languages (.sld, .xml, .qml)
Text documents (.txt)

Both of these could be linked with each other. Also documents that are non-spatial in nature can still be uploaded to GeoNode and then linked to a spatial file afterwards.

You are able to take all other files that are not individually supported and create a .zip file in order to upload them.
(Cheat file : .zip file)

Data Warehouse

GeoNode



Why?

To store and share the data we collectected with geolocation in an open source platform.
To manage and catalogue geospatial data and keep track of metadata. Each dataset in the system can be shared publicly or restricted to allow access to only specific users.
To manage and share data if the project is occurring over several years such as a longitudinal study so that the data can be used for numerous years after the date of collection as long as it is labelled and managed correctly.

Getting started

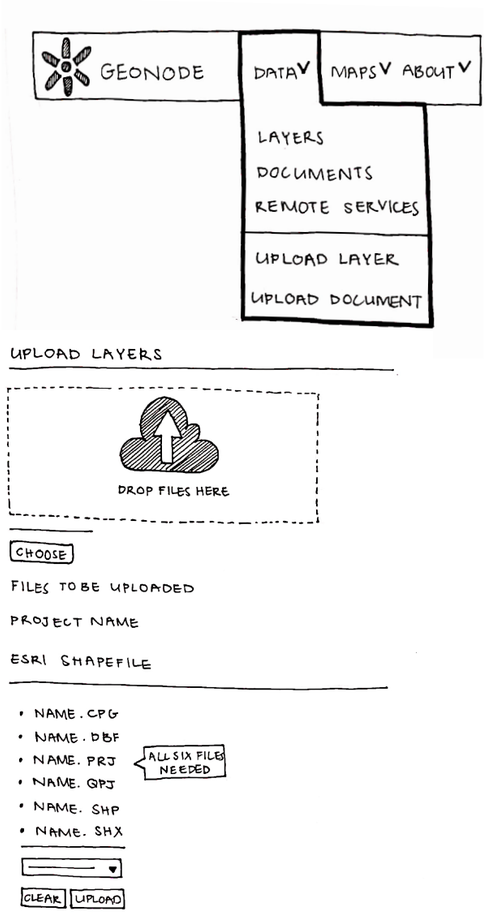
Please refer to **The Stitching the City GeoNode** link and not the GeoNode demo when the document refers to geonode.

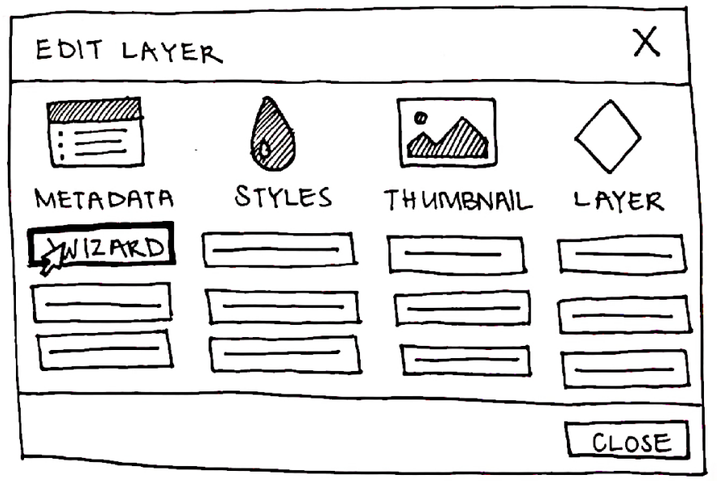
Open **GeoNode** (https://geocatalogue.co.za/)
Register > Wait for approval > **Sign In**
Main Menu > **About** > **People** > Find other users and yourself
(Edit your profile to include your contact information)

(Stitching the City QR Code)

Uploading layers

1. Main Menu > **Data** > **Upload Layer**
2. Drag the shapefiles and its associated files in **Drop files here**.
   (Exported from previous tool, eg: QGIS/Kobo, make sure all six file types are there - .cpg, .dbf, .prj, qpj, shp, shx. and avoid duplicates.)
3. Permission > Select **Users** and **Groups** in all tabs > **Upload Files**
   (To control who you want to share the collected data with.)
4. **Inspect Data** > **Next**
   (Recheck the list of data uploaded and edit if needed. Leave **Advanced tabs** on default.)
5. Layer uploaded.
   (Find the preview window, **Infos, Attributes**. You can **Share, Rate, Comment or make it Favourite**)
6. Editing tools > **Styles** > **Edit** > Edit if needed





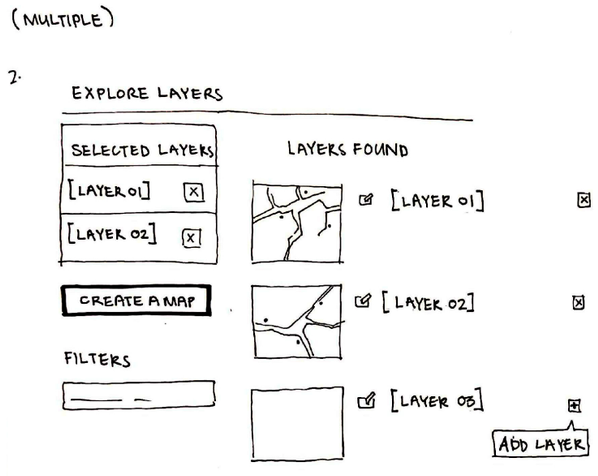
7. Editing tool > **Metadata** > **Wizard**
8. Edit > Fill in **Basic Metadata** > Fill in **Location and Licences** > Fill in **Optional Metadata** > Fill in **Dataset attributes**
   (Make sure you go through all the mandatory boxes as everything you input here is important for documentation accuracy and for other users who will be looking for data.)
9. Preview > Check.
10. Settings > Edit if needed, or leave it default.
11. Update > **Return to Layer**

Uploading documents

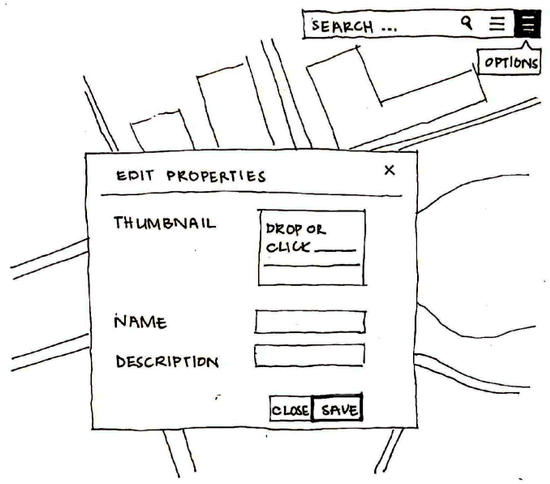
1. Main menu > **Data** > **Upload Document.**
2. Create a **Title** > Browse the File > Add **URL**, if needed.
3. Permission > Select **Users** and **Groups** in all tabs
   (To control who you want to share the collected data with.)
4. Link to > Choose Layer/ Map > **Upload**.
5. Edit **Metadata** (Follow the same steps as **Layer**.)
6. Document uploaded.
   (Find the **Infos**. You can **Share, Rate, Comment** or make it **Favourite**)

Creating map

1. (Single layer) Go to your **Layer** > **Create a Map**
   Or, (Multiple layers) Main menu > **Data** > **Layers** > Click **(+)** and select the Layers > **Create a Map**

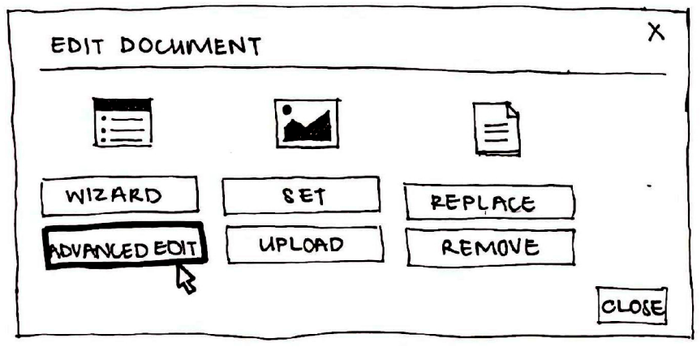


2. Layers > Edit if needed
3. Options > **Save as** > **Edit Properties** > Fill in > **Save**
4. Map added



Linking documents to layer/map

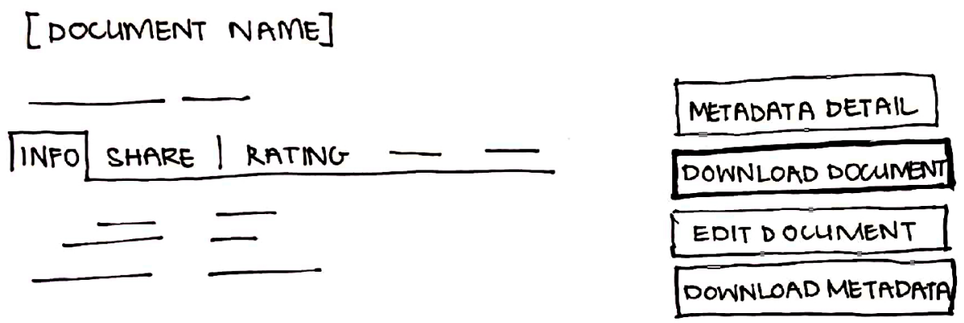
1. Go to your **Document** > **Edit Document** > **Metadata** > **Advanced Edit** (You can use the **Wizard**)



2. Link to > Choose Layer/ Map > **Update**
3. Document Linked.
   (Check in your Layer page if the document is there)

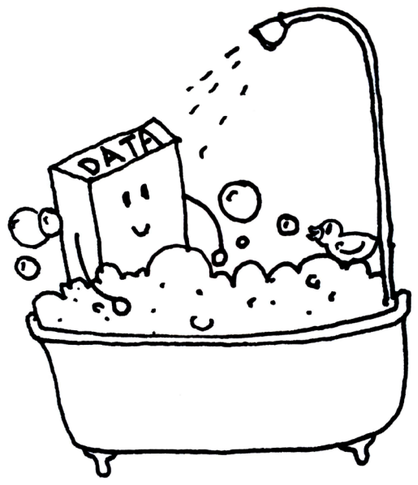
Downloading layer/ documents

1. (Layer) Go to your **Layer** > **Download Layer** > Select File type/ format.
2. Or, (Document) Go to your **Document** > **Download Document.**



Tips

- Select appropriate file names when renaming Layers, Maps and Documents to ensure that data is kept clean.
- Fill out the metadata as best as you can, be as descriptive as possible as that will help identify files later. If you are unsure of anything you can fix it later.
- Set permissions for each layer, this is important for data security. The default is set to ‘Anyone’, meaning that anyone who can log in can edit the data.
- Use all the tagging and legend options to make the data filter process convenient for users.
- For linking multiple files as Documents to one Layer or Map, upload them as a zip folder rather than uploading separate files.



To learn more visit the ‘CDL wiki’ page. (https://github.com/CamGreen/NRF-STINT_Wiki/blob/master/README.md)

Step 3 Complete



ukuDoba Methodological Framework version 2

Using Maptionnaire

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Markus Zorn
Purll Naidoo

September 2020

ukuDoba Methodology

A Methodological Framework for Effective Data Collection and storage

Version 2.0

Preface

The ukuDoba handbook is the outcome of the Swedish-South African project “Stitching the City” that integrates education and research. The project aims at developing a method and digital library of geolocated data for knowledge facilitation to support data re-use in architectural courses. It also aims at establishing a collaboration between the University of Pretoria, South Africa, and the Chalmers University of Technology in Gothenburg, Sweden.

“Stitching the City” has been hosted by the course Planning and Design for Social Inclusion in Gothenburg (2019 and 2020) and the Urban Citizen studio in Pretoria (2020). Many thanks Emilio and Carin!

ukuDoba has been tested in field studies by students in two areas: Mamelodi-East in the City of Tshwane and Hammarkullen in Gothenburg and the handbook has been developed by the six master students in an iterative process. Thank you, Robin, Lauren, Purll, Mumtaheena, Kelsey and Markus for your invaluable work! Without you, no handbook.

A special thank you goes also to Cameron and Victoria for development of the GeoNode structure to store and share our data. Finally, thank you Marco, Monica, Serena for your support and constructive input.

Liane & Chrisna
October 2020

Preface

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The ukuDoba methodology was created from a collaboration between three Master of Architecture students from Chalmers University of Technology, Sweden and three Master of Architecture students from the University of Pretoria, South Africa. All authors are actively involved in the 'Stitching the City" research project and have a background in participatory design, social inclusion and urban citizenship within architecture. This background influenced their interest in the creation of the ukuDoba Method.

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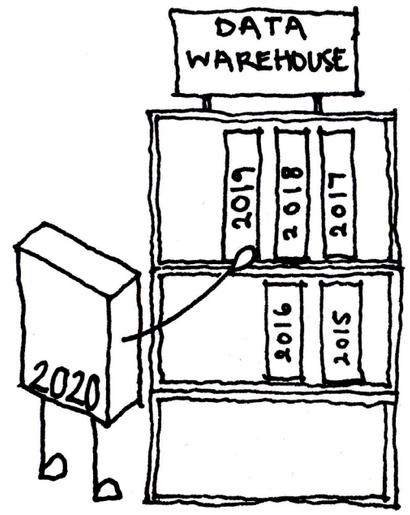
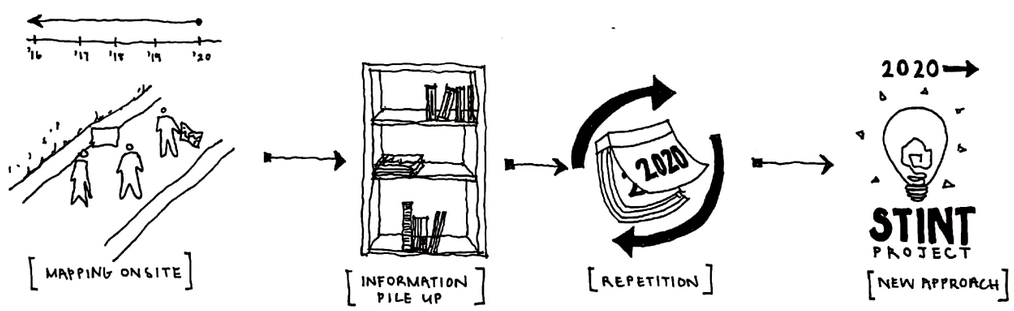
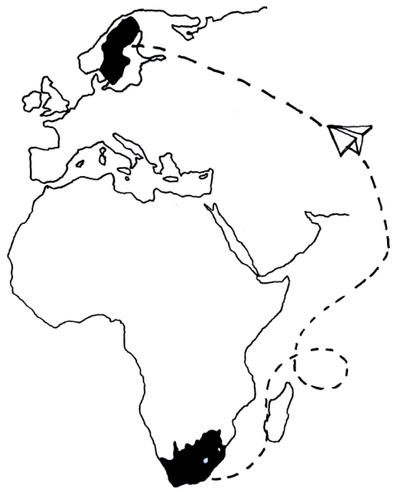
ukuDoba

Over time, physical maps and folders are being stacked in bookshelves. This format of data collection is difficult to access and build upon. Year, after year, these research processes are repeated, by both universities, leaving layers of rich data disjointed.



ukuDoba - the methodological framework, has been developed for the collection and sharing of non-traditional types of spatial economic data at a street and precinct level in an online platform. These cross-disciplinary micro-data can be layered and easily accessed by researchers from different disciplines as well as students and community members.



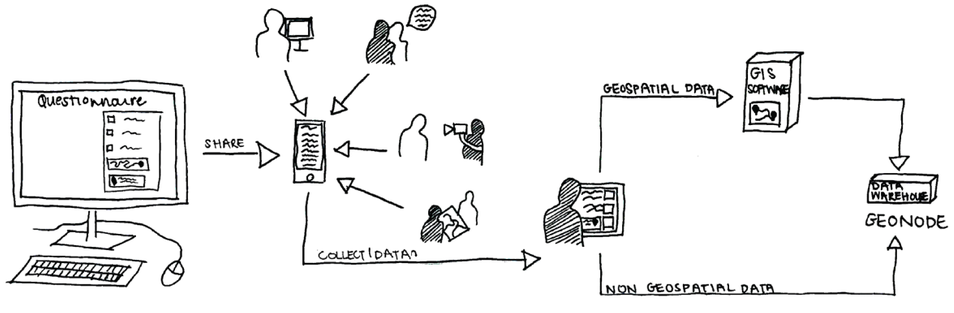


The methodological framework, ukuDoba, and online platform, Geonode, are currently being tested in two study areas: Mamelodi East in Tshwane, South Africa and Hammarkullen in Gothenburg, Sweden.

Here, we present a step by step guide to follow the ukuDoba methodology of how to effectively digitally collect, convert and store data in an online platform, GeoNode.



In Zulu the word ukuDoba means ‘fishing’. With this booklet, we hope to help users ‘fish’ for the data they need for their project.



The ukuDoba Methodology

Data Collection

Maptionnaire

Data Conversion

QGIS

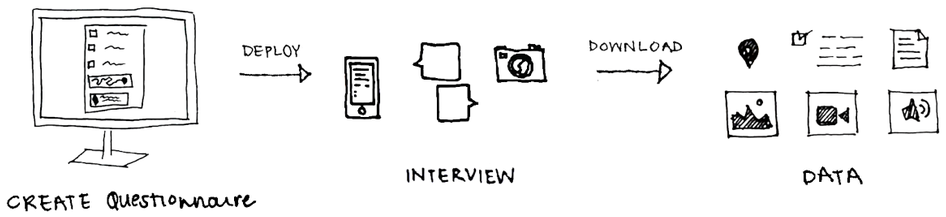
Data Warehouse

Geonode

1

Data Collection

maptionnaire



What?

- Maptionnaire is a paid subscription based service that allows you to create questionnaires that can be sent out to participants or be filled in out on the field by yourselves. It is georeferenced and supports multiple types of media.
- After fieldwork, you can access the data via your computer. This data can then be shared with others and they can use it or edit it.
- Other tools used for similar data collection are: Kobo Toolbox, FieldPapers, EpiCollect5 etc.

Why?

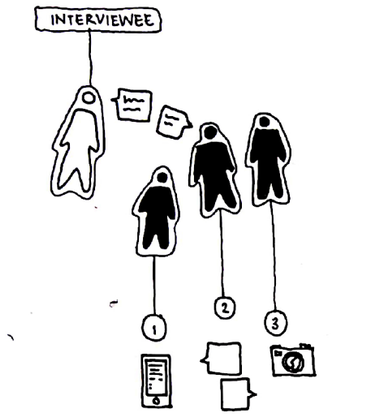
- Let communities to share their knowledge
- To digitally store data in a Digital platform (easier to access and use)
- To geolocate collected data

Data Collection

How?

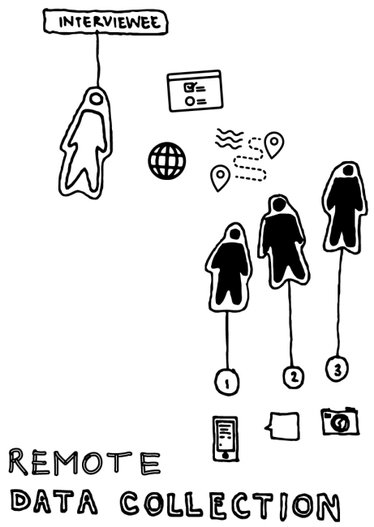
On-site collection

- Always collect data in groups of three people.
- The first person is in charge of taking notes and should focus on gathering data using the data collections tool.
- The second person is in charge of leading the interview and can have the questions open on their phone as a guide.
- The third person is in charge of documentation of the process and takes pictures, video and audio recordings.



Remote collection

- It is important to have a dialogue between the interviewer and interviewee.
- This could be ensured by sending the questionnaire link online for people to fill up and discussing / having dialogue over the phone or internet with audio calls.
- Filling up the questionnaire together and discussing / having dialogue with video calls, sharing screens options can help.
- If multiple participants need to fill out the same form in the same browser, they have to use incognito mode



Getting started



- Use your computer to start. You can only use your smartphone or tablet for collecting data
- Visit the link below to log in
  https://app.maptionnaire.com/en/login/

Creating a questionnaire



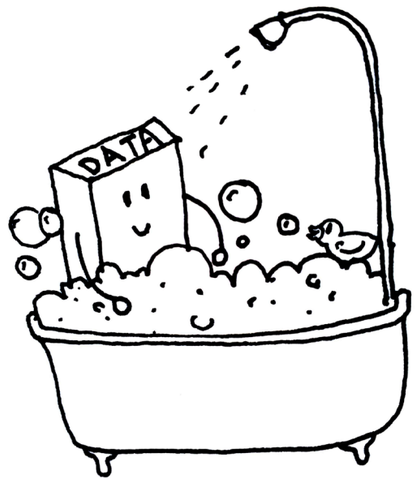
1. **Questionnaire** > **Create new**
2. **Edit** > Fill in **Name and Description**
   (This is the first page people would see, so introduction, background and purpose should be included in the description)
3. **Pages** > **(+)** > Create at least 3 pages
4. Write **Page name**s for all pages
   (Suggested as ‘Consent’, ‘Name of Survey’, ‘Thanks for Participating’)
5. First page > **(+)** > **Multiple choice question** > **Question** > **Choose one** > Type in your consensual agreement in the question box and create two options “**Yes**” and “**No**”
6. Next page > **(+)** > Select the types of questions (see glossary for types of questions) > Click the **Question** to edit
7. Last page > **(+)** > **Paragraph of Text** > Type in a note of thanks with the contact info of your team for further inquiries > **Page settings** > Check **“This is an exit page** (Additional questions could be added such as, asking for reasons if answered no to the consent)

Maptionnaire

Carry-on
Creating a questionnaire

8. **Branching rules** at the top > **Triggering question** > Select your triggering question > **Triggering answers** > Choose **Yes** > **Choose target page** > Choose *"Name of survey"* > **Save** > Go back to **Edit** (Using branching rules are not recommended to use with individual questions, only pages)
9. **Location at the beginning** under the pages> Set your site area (This is the default background of your questionnaire pages, could be changed for each page in the settings tab)
10. **Maps** > Select the type of map
11. **General Settings** > Edit as per your preferences > Find the link for the questionnaire > Set a **Questionnaire Password** if you want limited access > Go back to **Edit**
12. **Data and Privacy settings** > Edit as per your preferences
13. **Style settings** > Edit the style of your questionnaire
14. **Language settings** > Select the additional language, if needed> Click **Translate** to add all the questions in selected language > **Save**
15. **View** > Check the questionnaire

Note:
Make sure to keep your form clean of unnecessary datapoints before deploying the questionnaire. This will ensure effective collection of data, save you time during analysis, and keep the participants engaged.



Glossary: question types & examples



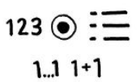
Drawbutton: mark out points, highlight a route or area, upload a media file



Multiple choice: choose one, choose many, dropdown, priority assessment



Open question: big answer field, small answer field



Number questions: integer numbers, string of digits, decimal numbers, range of numbers



Video & document: link a video from youtube or upload your own to show inbetween questions



Paragraph or text: add in between questions for additional information to participants

Setting up background maps for forms

1. **Location at the beginning** > zoom in to set the viewport > **save**
2. Under **Maps** you tick the boxes you want your participants to be able to toggle between

- If you wish to set a different map for only one of your pages: **Click the page** > Click **settings** > follow the steps above

I hereby voluntarily grant permission for participation in this project, as explained to me by the researcher. I am aware that the results of the investigation may be used for the purposes of publication. I will remain anonymous: my comments may be used without giving any geographic or personal references (name, address, ID, occupation, age, income etc) that may accidentally imply my identity.

Branching questions

Using skip logic in your survey is a great way of controlling the navigation in the form depending on what the answers are.

The most important thing to consider is that the target answer is a page and that it is only compatible with multiple choice questions. Be careful with using the branching as it can lead to undesireable outcomes in the collected data.

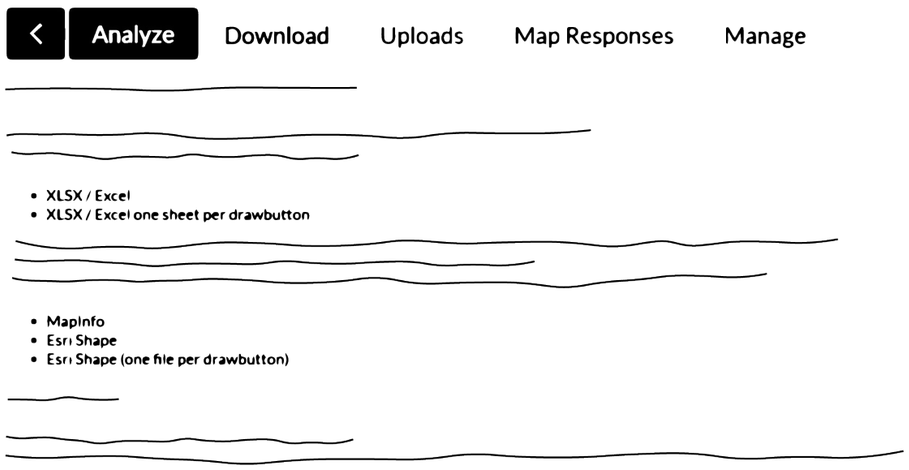
To use your questionnaire

Simply distribute the link to the web-based questionnaire to allow participants to fill it in and start collecting your data!

After collection

1. Find your questionnaire > **Response Data** > **Analyze** > Check and edit if needed
2. Find your questionnaire > **Response Data** > **Download** > Download ESRI Shape file



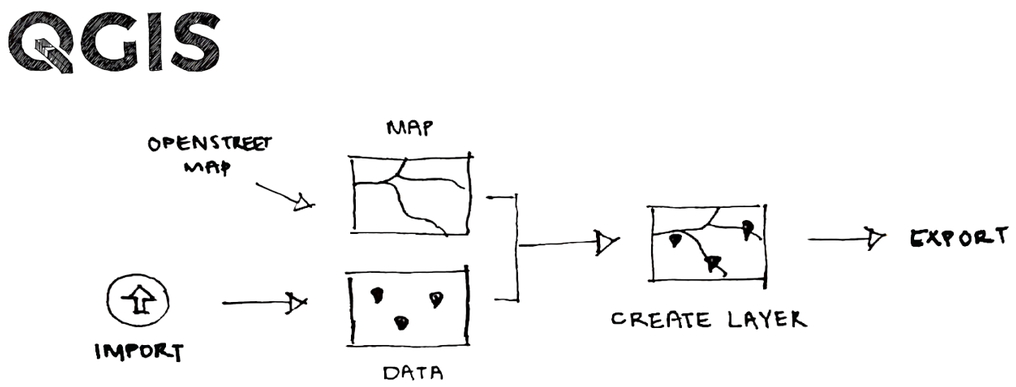


Step 1 Complete

2

Data Conversion

If your chosen data collection tool does not provide a shapefile or if you for some other reason have a csv file that needs to be geolocated, follow this portion of the handbook. Maptionnaire provides shapefiles in the file-format .shp



What?

A geographic information system (GIS) is a framework which provides a platform for users to engage with spatial data, through analysis and editing. There are alternative platforms that can perform this function, however we will use QGIS as it is a free service, making it more accessible to a wider range of people.

Why?

For the purpose of this framework, QGIS will be used to convert the data into a usable file type that can be imported and stored in the data warehouse GEONODE.

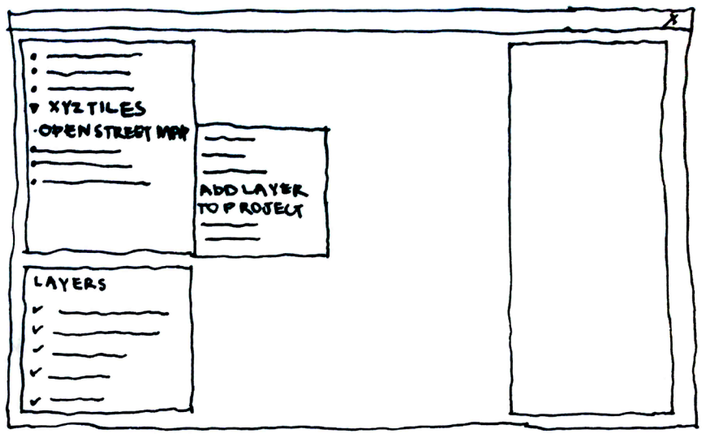
QGIS

Getting started

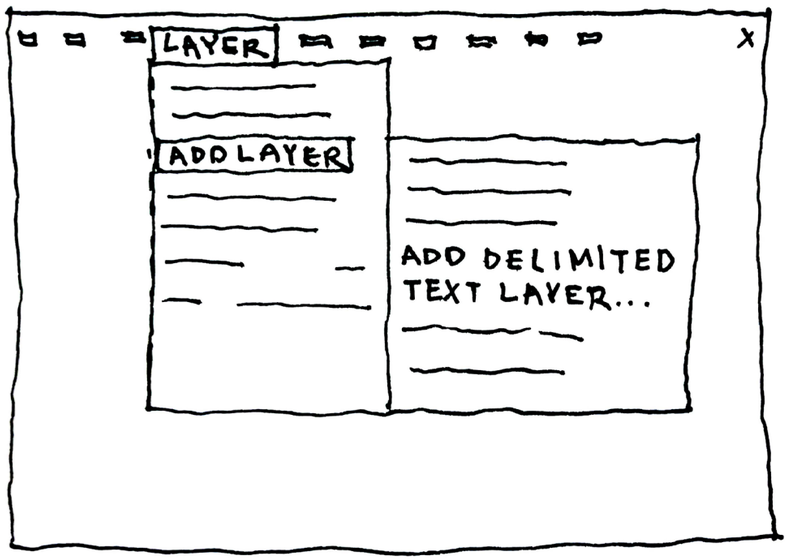
Download QGIS Standalone Installer Version 3.10 (64 bit) > Install QGIS > Run QGIS

Importing CSV Legacy files

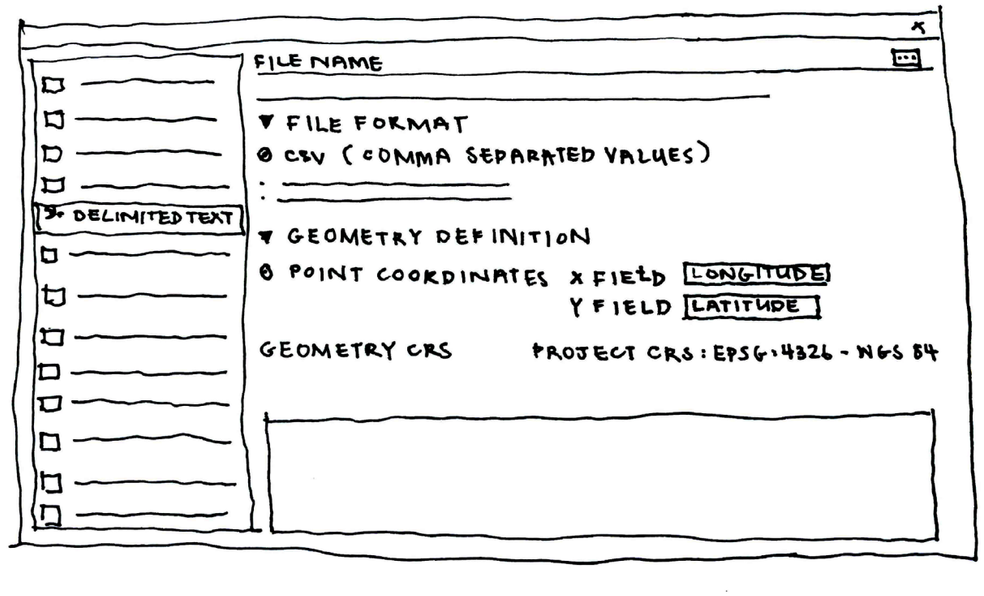
1. Open QGIS application on your computer > Project tab > New
2. Side Browser Menu > Drop down tab **XYZ Tiles** > Right click on **Openstreetmap** > **Add Layer to project**



3. Main menu > **Layer tab** > **Add Layer** > **Add Delimited Text layer**



4. File name > Click (...) to browse > Select your **CSV (Legacy) File** > **Ope**n

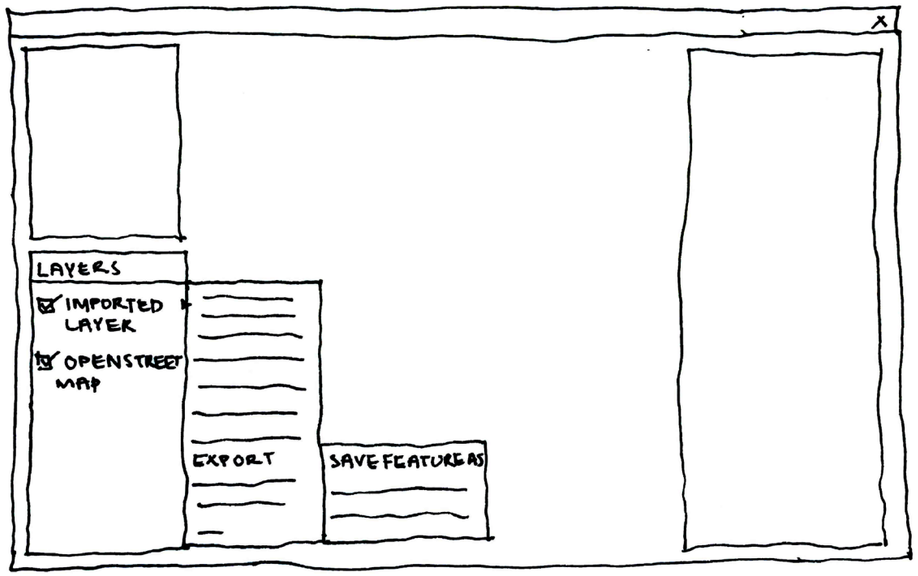


5. Drop down tab > **File Format** > select **CSV (comma separated values)**
6. Drop Down tab > **Geometry definition** > Select **Geometry CRS = Project CRS: EPSG:4326-WGS 84** > Select **X field = Longitude** and **Y field = Latitude** > **Add** > Close window

Note:
Once editing the X and Y fields, if the points appear on a blue screen then delete your imported CSV (legacy) layer, re-import it and let X field= Latitude and Y field = Longitude.
If you do not use a CSV legacy file, you will not have the option to select the x and y fields.

Exporting ESRI shape files

1. Layers Menu > Insure Openstreetmap layer is below your Layer
2. Right click on your layer > **Export** > **Save feature as**
3. Create a new folder on your computer with your project name to export your shapefiles to
4. Drop down tab **Format** > Select **ESRI Shapefile** > **File Name** > Click (...) to browse > Write your file name > Drop down tab **CRS** > Select **Project CRS: EPSG:4326 - WGS 84** > **Ok**
   (There should be 6 shapefiles exported)



Notes

There is no need to save QGIS files as the only files that are required are the ESRI Shapefiles that you export.

Tips

To learn more check the Youtube tutorial:
https://www.youtube.com/watch?v=sQ2z-D8TN2E

Step 2 Complete

3

Data Warehouse

What?

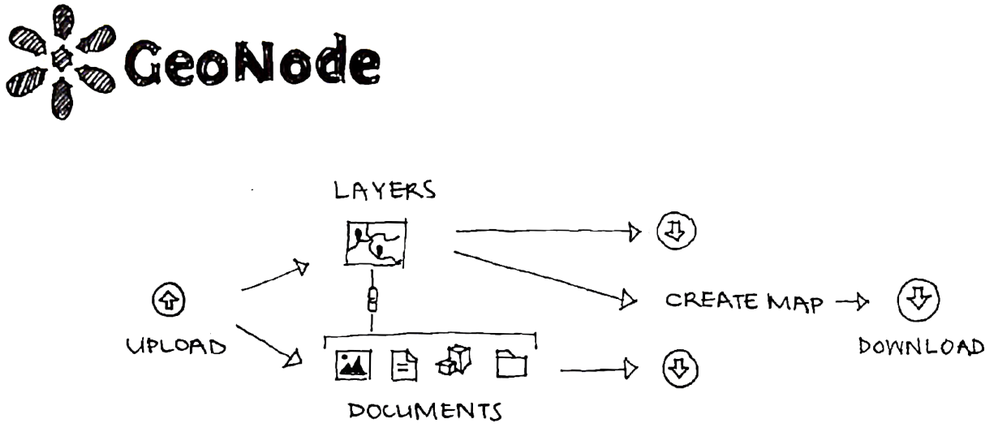
GeoNode is a web-based application and platform that facilitates the creation, sharing and collaborative use of geospatial and non-geospatial data.

The Geospatial data can be stored as Layers, formats that GeoNode supports:
Shapefiles & its associated files (.cpg, .dbf, .prj, .qpj, .shp, .shx)
GeoTiffs (.tiff, .tif)
American Standard Code for Information Interchange (ASCII)
The Non-geospatial data can be stored as Documents, formats that GeoNode supports:
Microsoft Word (.doc & .docx), Powerpoint (.ppt & .pptx), Excel (.xls & .xlsx)
Image Formats (.gif, .jpg, .jpeg, .png, .tiff, .tif)
OpenDocument File Formats (.ods, .odt,. odp)
Portable Document Format (.pdf)
Compressed Files (.rar, .zip, .gz)
Markup Languages (.sld, .xml, .qml)
Text documents (.txt)

Both of these could be linked with each other. Also documents that are non-spatial in nature can still be uploaded to GeoNode and then linked to a spatial file afterwards.

You are able to take all other files that are not individually supported and create a .zip file in order to upload them.
(Cheat file : .zip file)

Data Warehouse



Why?

To store and share the data we collectected with geolocation in an open source platform.
To manage and catalogue geospatial data and keep track of metadata. Each dataset in the system can be shared publicly or restricted to allow access to only specific users.
To manage and share data if the project is occurring over several years such as a longitudinal study so that the data can be used for numerous years after the date of collection as long as it is labelled and managed correctly.

Getting started

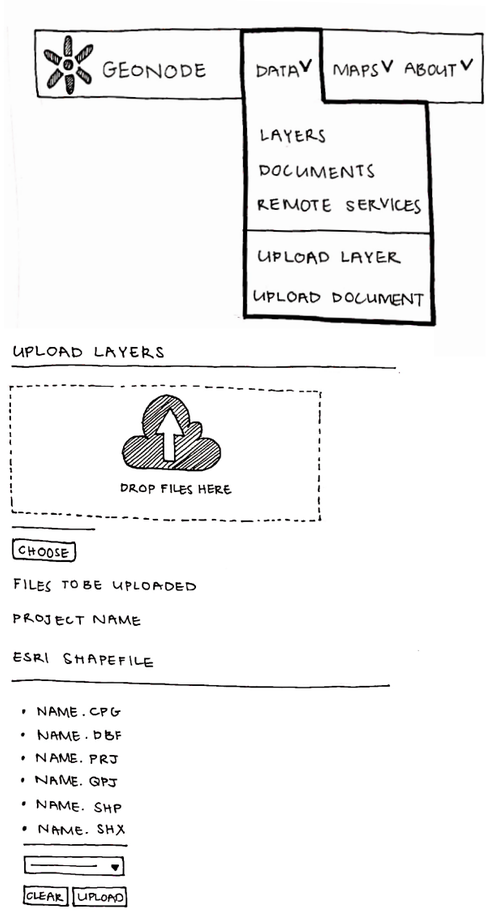
Please refer to **The Stitching the City GeoNode** link and not the GeoNode demo when the document refers to geonode.

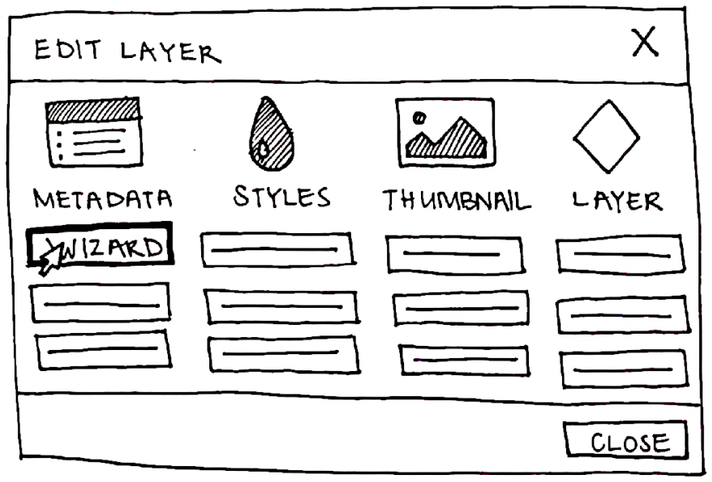
Open **GeoNode** (https://geocatalogue.co.za/)
Register > Wait for approval > **Sign In**
Main Menu > **About** > **People** > Find other users and yourself
(Edit your profile to include your contact information)

(Stitching the City QR Code)

Uploading layers

1. Main Menu > **Data** > **Upload Layer**
2. Drag the shapefiles and its associated files in **Drop files here**.
   (Exported from previous tool, eg: QGIS/Kobo/ Maptionnaire, .cpg, .dbf, .prj, qpj, shp, shx. and avoid duplicates.)
3. Permission > Select **Users** and **Groups** in all tabs > **Upload Files**
   (To control who you want to share the collected data with.)
4. **Inspect Data** > **Next**
   (Recheck the list of data uploaded and edit if needed. Leave **Advanced tabs** on default.)
5. Layer uploaded.
   (Find the preview window, **Infos, Attributes**. You can **Share, Rate, Comment or make it Favourite**)
6. Editing tools > **Styles** > **Edit** > Edit if needed





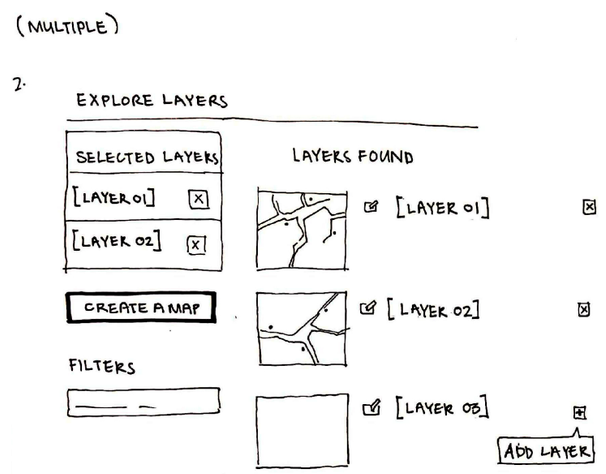
7. Editing tool > **Metadata** > **Wizard**
8. Edit > Fill in **Basic Metadata** > Fill in **Location and Licences** > Fill in **Optional Metadata** > Fill in **Dataset attributes**
   (Make sure you go through all the mandatory boxes as everything you input here is important for documentation accuracy and for other users who will be looking for data.)
9. Preview > Check.
10. Settings > Edit if needed, or leave it default.
11. Update > **Return to Layer**

Uploading documents

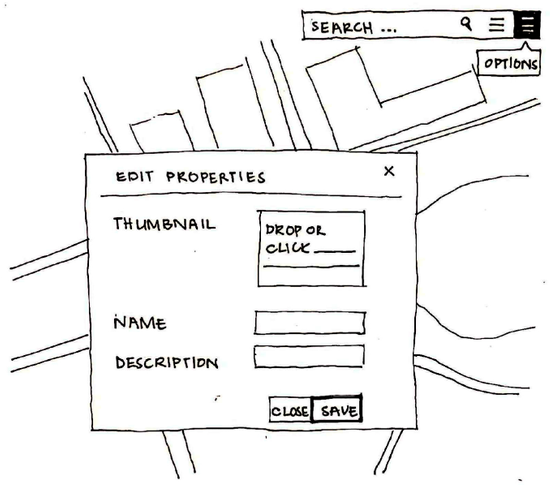
1. Main menu > **Data** > **Upload Document.**
2. Create a **Title** > Browse the File > Add **URL**, if needed.
3. Permission > Select **Users** and **Groups** in all tabs
   (To control who you want to share the collected data with.)
4. Link to > Choose Layer/ Map > **Upload**.
5. Edit **Metadata** (Follow the same steps as **Layer**.)
6. Document uploaded.
   (Find the **Infos**. You can **Share, Rate, Comment** or make it **Favourite**)

Creating map

1. (Single layer) Go to your **Layer** > **Create a Map**
   Or, (Multiple layers) Main menu > **Data** > **Layers** > Click **(+)** and select the Layers > **Create a Map**

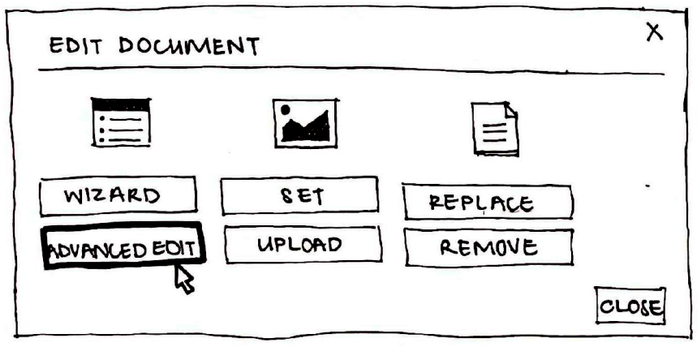


2. Layers > Edit if needed
3. Options > **Save as** > **Edit Properties** > Fill in > **Save**
4. Map added



Linking documents to layer/map

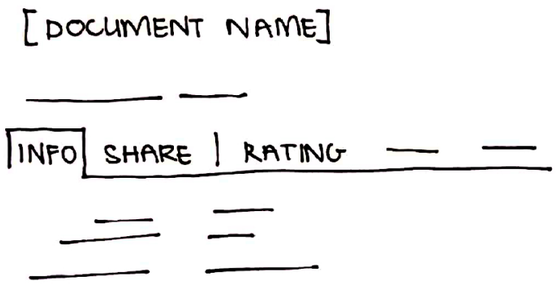
1. Go to your **Document** > **Edit Document** > **Metadata** > **Advanced Edit** (You can use the **Wizard**)

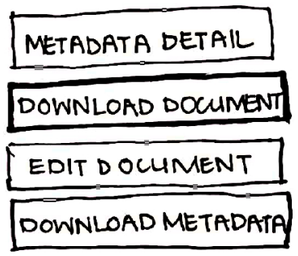


2. Link to > Choose Layer/ Map > **Update**
3. Document Linked.
   (Check in your Layer page if the document is there)

Downloading layer/ documents

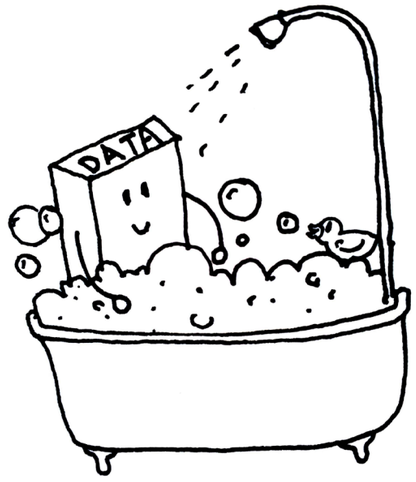
1. (Layer) Go to your **Layer** > **Download Layer** > Select File type/ format.
2. Or, (Document) Go to your **Document** > **Download Document.**





Tips

- Select appropriate file names when renaming Layers, Maps and Documents to ensure that data is kept clean.
- Fill out the metadata as best as you can, be as descriptive as possible as that will help identify files later. If you are unsure of anything you can fix it later.
- Set permissions for each layer, this is important for data security. The default is set to ‘Anyone’, meaning that anyone who can log in can edit the data.
- Use all the tagging and legend options to make the data filter process convenient for users.
- For linking multiple files as Documents to one Layer or Map, upload them as a zip folder rather than uploading separate files.



To learn more visit the ‘CDL wiki’ page.
(https://github.com/CamGreen/NRF-STINT_Wiki/blob/master/README.md)

Step 3 Complete



Authors

Robin Eskilsson
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Mumtaheena Rifat
Kelsey Smith
Markus Zorn
Purll Naidoo

September 2020

Appendix

Appendix C
Ethical Clearance

Appendix D
Recipe Cards

Appendix C

Ethical Clearance

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Engineering, Built Environment and Information Technology

Fakulteit Ingenieurswese, Bou-omgewing en Inligtingtegnologie / Lefapha la Boetšenere, Tikologo ya Kago le Theknolotši ya Tshedimošo

Reference number: EBIT/118/2020

Miss K Smith
Department: Architecture
University of Pretoria
Pretoria
0083

Dear Miss K Smith

FACULTY COMMITTEE FOR RESEARCH ETHICS AND INTEGRITY

Your recent application to the EBIT Research Ethics Committee refers.

Approval is granted for the application with reference number that appears above.

1. This means that the research project entitled "The role of architecture in rehabilitating food sovereignty and nutritional education within secondary schools through collaborative participation" has been approved as submitted. It is important to note what approval implies. This is expanded on in the points that follow.

2. This approval does not imply that the researcher, student or lecturer is relieved of any accountability in terms of the Code of Ethics for Scholarly Activities of the University of Pretoria, or the Policy and Procedures for Responsible Research of the University of Pretoria. These documents are available on the website of the EBIT Research Ethics Committee.

3. If action is taken beyond the approved application, approval is withdrawn automatically.

4. According to the regulations, any relevant problem arising from the study or research methodology as well as any amendments or changes, must be brought to the attention of the EBIT Research Ethics Office.

5. The Committee must be notified on completion of the project.

The Committee wishes you every success with the research project.

Prof K.-Y. Chan
Chair: Faculty Committee for Research Ethics and Integrity
FACULTY OF ENGINEERING, BUILT ENVIRONMENT AND INFORMATION TECHNOLOGY

100 1908 - 2008
UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

10/03/2020

EBIT FACULTY COMMITTEE FOR RESEARCH ETHICS AND INTEGRITY
Dear Prof Chan,

ETHICS RENEWAL 2020

In terms of document reference number: EBIT/9/2018

HONOURS STUDENTS, DEPARTMENT OF ARCHITECTURE: "STITCHING THE CITY: FROM MICRO-DATA TO MACRO-VIEWS"

In terms of the conditions of approval granted for research to be undertaken as part of the RFS and RFP modules in the Honours programme, I would like to notify the committee that the research will be ongoing for the 2020 academic year. I understand that all the conditions and responsibilities as stipulated in the approval will remain applicable to the project.

Kindly note that the method of investigation will apply to two distinct geographic areas, namely Mamelodi (specifically centred around the Tsako Thabo Secondary School) and Moreleta East (specifically centred around the informal settlements of Plastic View and Cemetery View). Students will be engaging with ad-hoc members of the affected community as informants rather than subjects.

I would like to declare that the following MArch(Prof) students will be involved with the project as a continuation of their Honours work undertaken during 2019 and will make use of the data for their mini-dissertations:

Student number	Surname	Name
15042482	**du Bois**	Morné
15203329	**Khoswe**	Vitukumbe
15001700	**Konstantinou**	Lauren
12148131	**Matena**	Dipuo
15032371	**Mulder**	Idelette
15362282	**Naidoo**	Purll
15209106	**Simeon**	Aimee
13070330	**Smith**	Kelsey

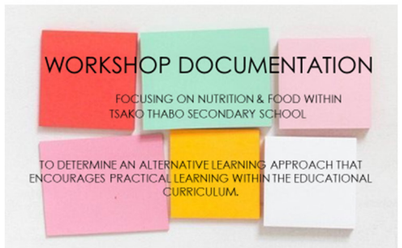
Yours sincerely,



Dr C Combrinck
Senior Lecturer: Department of Architecture
University of Pretoria
Tel +27 (0)12 420 6536
Email carin.combrinck@up.ac.za

Appendix D

Recipe Cards



TSAKO THABO VISION STATEMENT

" To produce well rounded learners who can participate fully in the economic development of South Africa"

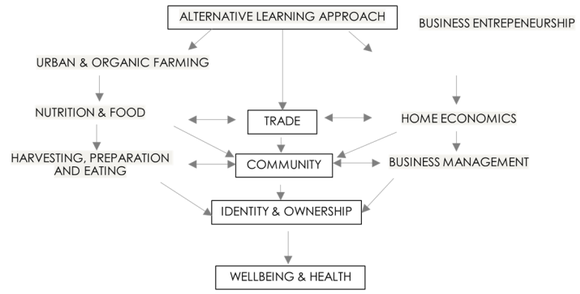


Fig.1 SMITH.K (2019)

FOOD SOVEREIGNTY IN TSAKO THABO

FOCUS LENSE

Nutrition within the school environment and Urban Farming as a design element within the learning ecosystem.



A

RECIPE 1
SUMMARY CARD

TITLE	WORKSHOP 1	PREP TIME	1 HOURS
CONCEPT	UNDERSTANDING FOOD PLACES	TOTAL TIME	30 MIN
DATE	24.04.2019		
INTENTION	TO PHYSICALLY PLACE DIFFERENT COLOUR PINS ASSOCIATED WITH DIFFERENT FOOD AREAS AS PER KEY.	ACTIVITY	MAPPING OF EXISTING FOOD SPACES WITHIN THE SCHOOL
METHOD	CO - DESIGN	Objective OUTCOMES	WHERE FOOD IS PREPARED WHERE THEY EAT (BREAKFAST & LUNCH) WHERE THEY PURCHASE FOOD WITH THEIR OWN MONEY WHERE THEY DRINK WATER
Activity type	GROUP ACTIVITY	RESULTS	
participants	6 STUDENTS AGE GROUPS GR 8-10	MATERIALS	

RECIPE 1

TITLE	WORKSHOP 1	GAME PREPaRATION
CONCEPT	UNDERSTANDING FOOD PLACES	

MAPPING:

PHYSICAL
-Map current eating places (Breakfast, Lunch and Snacking)
-Map Watering holes
-Food Preparation : Delivery → Prep → Serving → Eating → Clean up → Waste & Recycling

CONTEXTUAL
-Educational institutes within Mamelodi East Township area (Khalambazo)
-High school
-CAFCA

RECIPE 1

TITLE	WORKSHOP 1	THEORY: CO-design	
CONCEPT	UNDERSTANDING FOOD PLACES	Education: curriculum	

CO - DESIGN

Alternative learning approach that encourages practical learning within the educational curriculum. Focusing on Nutrition and Food within the school. Using Urban Farming and harvesting as a tool to teach and enhance the students understanding of food. Linking to trade in core subjects like business management and home economics as subjects within the curriculum.

PSYCHOLOGICAL DEVELOPMENT

Human Sociology for the Health Sciences

- Nutrition within the Age Group 13-21
- The impact of food on learning development
- Food influencing behaviour , concentration and performance
- Nutritional Content
- Urban Farming processes
- Team and practical Learning

EDUCATION: EXTRA CURRICULUM

- After school Entrepreneurship
- Market opportunity
- Home Economics
- Urban Farm involving the community
- Community service
- Learning Landscape
- Maintenance Plan
- Up-cycling

RECIPE 1

TITLE	WORKSHOP 1	MATERIALS & tOOLS
CONCEPT	UNDERSTANDING FOOD PLACES	



- SITE MODEL
- CARDBOARD
- GLUE
- MAP
- GREYBOARD
- RULER
- DIFFERENT COLOUR PINS

RECIPE 1

TITLE WORKSHOP 1

CONCEPT UNDERSTANDING FOOD PLACES

OUTCOMES : Photographs



COMMUNICATION & DISCUSSION



AWARENESS & ENGAGEMENT

RECIPE 1

TITLE WORKSHOP 1

CONCEPT UNDERSTANDING FOOD PLACES

OUTCOMES : Photographs



KEY ALLOCATION OF FAMILIAR
& UTILIZED SCHOOL AREAS

RECIPE 1

TITLE WORKSHOP 1

CONCEPT UNDERSTANDING FOOD PLACES

Results 1

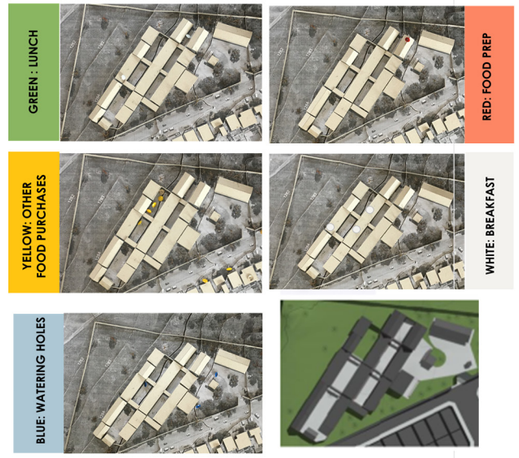


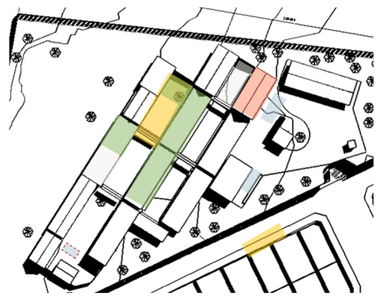
Fig. 8-12 SMIITH,K (2019)

RECIPE 1

TITLE WORKSHOP 1

CONCEPT UNDERSTANDING FOOD PLACES

Results 2

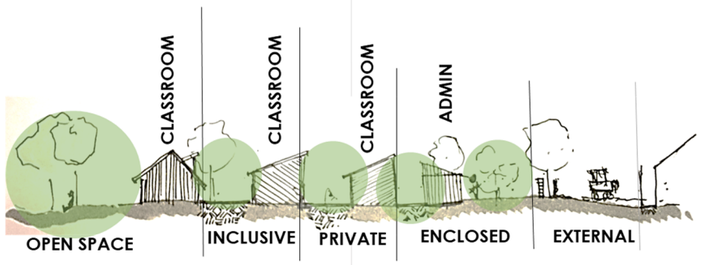


IDENTIFIED AREAS



RECIPE 1

TITLE	WORKSHOP 1	ANALYSIS : DESIGN RESPONSE
CONCEPT	UNDERSTANDING FOOD PLACES	



RECIPE 1

TITLE	WORKSHOP 1	ANALYSIS : DESIGN RESPONSE
CONCEPT	UNDERSTANDING FOOD PLACES	

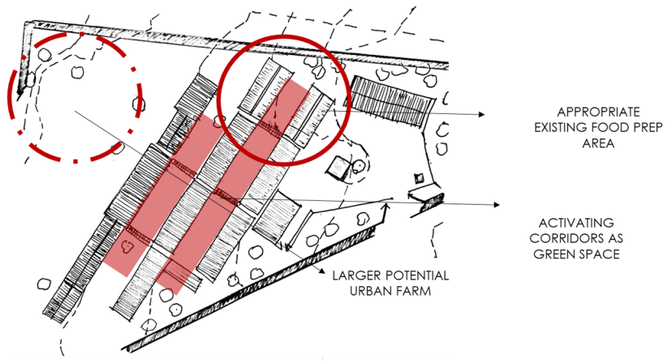


Fig. 14 SMIITH,K (2019)

RECIPE 2
SUMMARY CARD

TITLE	WORKSHOP 2	PREP TIME	4 HOURS
CONCEPT	MAPPING OF FOOD TYPES & QUANTITIES	TOTAL TIME	40 MIN
DATE	24.04.2019		
INTENTION	TO PHYSICALLY PLACE DIFFERENT COLOUR SHAPES ASSOCIATED WITH DIFFERENT FOOD GROUPS, AS PER KEY, PROPORTIONALLY ON A PAPER PLATE.	ACTIVITY	STUDENTS ARE TO PLACE SHAPES ACCORDING TO FOOD GROUPS THAT THEY CONSUME. THE SHAPE COLOURS REPRESENT FOOD GROUPS AND THE SIZES QUANTITIES.
METHOD	CO - DESIGN	Objective OUTCOMES	TO MAP THE STUDENTS NUTRITIONAL INTAKE AT CERTAIN INTERVALS DURING THE DAY
Activity type	INDIVIDUAL ACTIVITY	RESULTS	
participants	6 STUDENTS AGE GROUPS GR 8-10		

Styslinger, M. 2011. Food gardens at Cape Town area schools grow food and teach farming skills; [Online] Nourishing the planet. Available at:

RECIPE 2

TITLE	WORKSHOP 2	THEORY: Idaho plate
CONCEPT	MAPPING OF FOOD TYPES & QUANTITIES	

CO - DESIGN

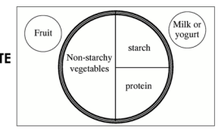
methodology DESIGN GAMES

The Idaho plate method is an indication of the proportion size of the main food groups in ones diet.

The method is used as a teaching philosophy to teach students how to plan meals, the roles of nutrition , quantity and proportions as well as the importance of health and wellbeing

Raidl, Martha & Spain, Kristina & Lanting, Rhea & Lockard, MS & Johnson, Shelly & RD, Marnie & Sant, Laura & Welch, Julia & Liddil, Audrey & CDE, Mimi. (2007). The Healthy Diabetes Plate. Preventing chronic disease. 4. A12.

IDAHO PLATE METHOD



IDAHO PLATE METHOD



PLATE THEORY

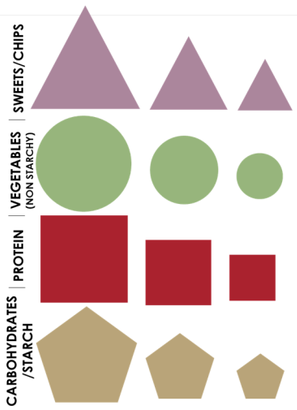


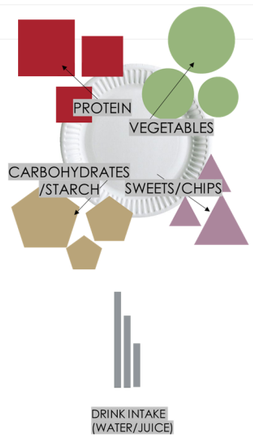
RECIPE 2

TITLE WORKSHOP 2

CONCEPT MAPPING OF FOOD TYPES & QUANTITIES

GAME PREPaRATION





RECIPE 2

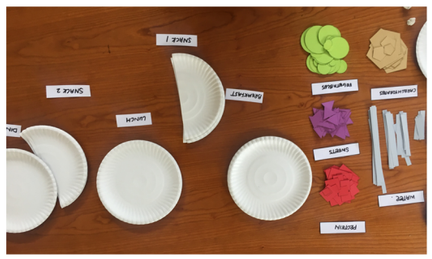
TITLE WORKSHOP 2

CONCEPT MAPPING OF FOOD TYPES & QUANTITIES

MATERIALS & tOOLS

PAPER PLATES & COLOURED SHAPES





- WHITE PAPER PLATES
- COLOURED CARDBOARD
- EACH COLOUR TO REPRESENT A FOOD GROUP
- LABELS
- PRESTICK

RECIPE 2

TITLE WORKSHOP 2

CONCEPT MAPPING OF FOOD TYPES & QUANTITIES

OUTCOMES : Photographs





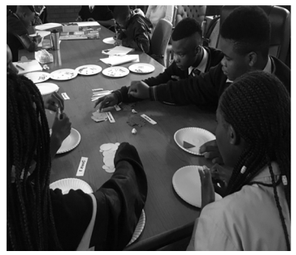


Fig. 20,21 & 22 SMIITH,K (2019)

RECIPE 2

TITLE WORKSHOP 2

CONCEPT MAPPING OF FOOD TYPES & QUANTITIES

Results 1









- UNDERSTANDING IMPORTANCE OF FOOD AMOUNG STUDENTS

- OBSERVING FOOD TYPES CONSUMED ALONGSIDE PORTION SIZES

- SEEING FOOD INTAKE FROM THE STUDENTS PERSPECTIVE

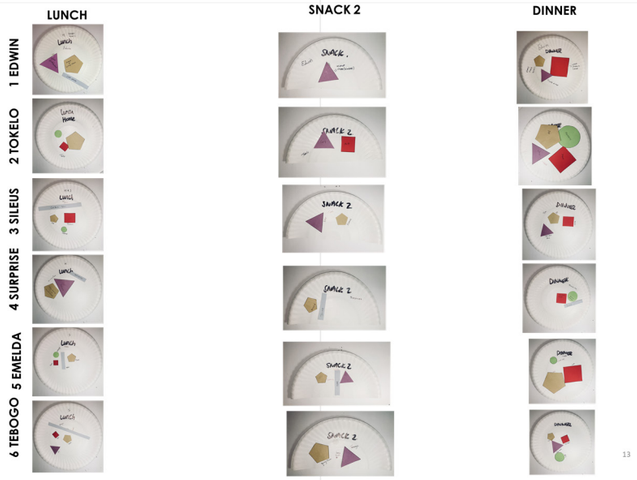
- GAINING ACCESS TO HOW FOOD EFFECTS ENERGY LEVELS THROUGHOUT THE DAY

RECIPE 2

TITLE WORKSHOP 2

CONCEPT MAPPING OF FOOD TYPES & QUANTITIES

Results 1



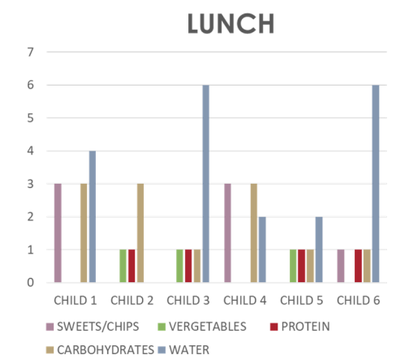
13

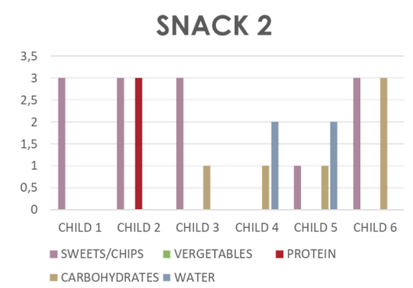
RECIPE 2

TITLE WORKSHOP 2

CONCEPT MAPPING OF FOOD TYPES & QUANTITIES

Results 2



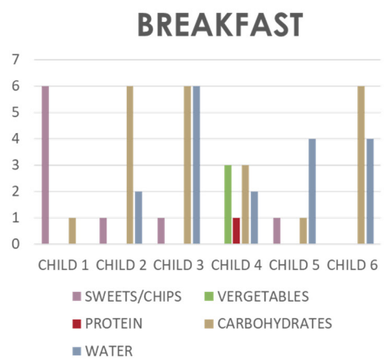


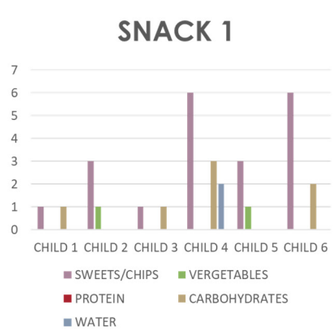
RECIPE 2

TITLE WORKSHOP 2

CONCEPT MAPPING OF FOOD TYPES & QUANTITIES

Results 2



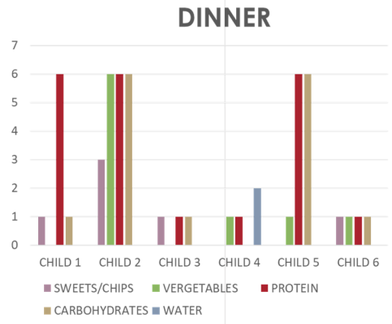


RECIPE 2

TITLE WORKSHOP 2

CONCEPT MAPPING OF FOOD TYPES & QUANTITIES

Results 2



B

RECIPE 3

TITLE	WORKSHOP 3	THEORY:
CONCEPT	Reuse recycle & throw away	

CO - DESIGN

tool MOTIVATION MATRIX

Rural Education Policy 2005

Nelson Mandela Foundation argued for a holistic approach to special circumstances in rural communities.

To CAPITALIZE on resources available in communities instead of focusing on the deficits facing them

RECIPE SUMMARY CARD 3

TITLE	WORKSHOP 3	PREP TIME	1 HOURS
CONCEPT	Reuse recycle & throw away	TOTAL TIME	30 MIN
DATE	26.04.2019		
INTENTION	TO UNDERSTAND FOOD WASTE & RECYCLING	ACTIVITY	EACH STUDENT IS TO INDICATE AS PER THE CHECKBOX IF THEY REUSE, RECYCLE OR DISCARD THE 3 FOOD ITEMS.
METHOD	CO - DESIGN; tool MOTIVATION MATRIX	Objective OUTCOMES	WHAT FOOD IS RE-USED WHAT FOOD IS RE-CYCLED INTERPRETING WHAT WASTAGE & ORGANIC WASTE IS.
Activity type	INDIVIDUAL ACTIVITY	RESULTS	
participants	AGE GROUPS (13-16 GR 8-10)	MATERIALS	

RECIPE 3

TITLE	WORKSHOP 3		GAME PREPaRATION
CONCEPT	Reuse recycle & throw away		

ACTIVITY METHODOLOGY

	APPLE	TINNED FISH	TEA BAG
FOOD SOURCE	✓ ✗	✓ ✗	✓ ✗
FOOD PACKAGING/ PEEL	♻ 🗑 🗑	♻ 🗑 🗑	♻ 🗑 🗑
LEFTOVERS/SEEDS/ REMAINS	♻ 🗑 🗑	♻ 🗑 🗑	♻ 🗑 🗑

-UNDERSTANDING FOOD WASTAGE FROM THE STUDENTS PERSPECTIVE

-SHOWS THE KNOW HOW AND CARRY THROUGH OF RECYCLING

-IDENTIFY WHERE RECYCLING KNOWLEDGE IS USED AND WHERE IT IS NOT

RECIPE 3

TITLE WORKSHOP 3

CONCEPT Reuse recycle & throw away

MATERIALS & tOOLS







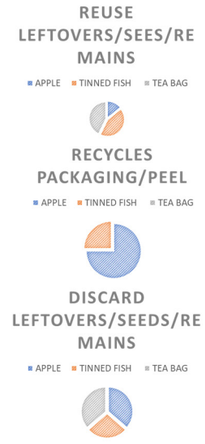
RECIPE 3

TITLE WORKSHOP 3

CONCEPT Reuse recycle & throw away

Results 2





RECIPE 3

TITLE WORKSHOP 3

CONCEPT Reuse recycle & throw away

Results 1

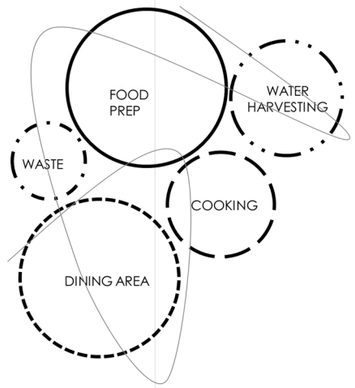


RECIPE 3

TITLE WORKSHOP 3

CONCEPT Reuse recycle & throw away

ANALYSIS : DESIGN RESPONSE



RECIPE 3

TITLE WORKSHOP 3

CONCEPT Reuse recycle & throw away

ANALYSIS : lessons

POSSIBLE FOOD SOURCES TO BE PRODUCED

DAILY INTAKE

PROTEIN
VEGETABLE/ FRUIT
STARCH
SEASONING



GROWABLE FOOD TYPES

VEGETABLES/FRUIT:

YELLOW VEGETABLES
ONIONS
GREEN VEGETABLES
TOMATOES
FRUIT (SEASONAL)
CARROTS
SOY

CROPS:

RICE
SUGAR BEANS
SAMP
MAIZE
SOY (MINCE)

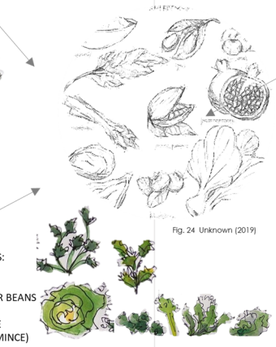


Fig. 24 Unknown (2019)

ACTIVITY 2
DESIGN CONTRIBUTION



CONSUMABLES NEEDED

COOKING OIL
IODISED SALT
MILK (UHT)
PASTEURISED AMASI



RECIPE 4
SUMMARY CARD

TITLE WORKSHOP 4

CONCEPT BUSINESS & ENTREPENEURSHIP

DATE 26.04.2019

INTENTION TO ENGAGE IN CURRICULUM IN A FUN AND PRACTICAL MANNER AND TO ENCOURAGE SOCIAL PRACTICAL LEARNING.

METHOD

CO - DESIGN





Activity type



GROUP ACTIVITY

participants



6 STUDENTS
AGE GROUPS GR 9
(14-15)

PREP TIME 3 HOURS

TOTAL TIME 30 MIN

ACTIVITY IDENTIFYING AN INTEREST IN BUSINESS MANAGEMENT & HOME ECONOMICS

Objective OUTCOMES

Role play: different vendors per food source. they are selling the items categorized by food type and size, s m l respectively.

The items are being sold at prices chosen by the vendor. Prices they are conscious and aware of, realistically.

RESULTS

MATERIALS

RECIPE 4

TITLE WORKSHOP 4

CONCEPT BUSINESS & ENTREPENEURSHIP

THEORY: CO-design

CO - DESIGN





"Education is the most powerful weapon you can use to change the world" – Nelson Mandela

Madiba said to equip children with the engine of development is to equip them with knowledge and practical learning by doing this we are engraving the way for sustainable life.

STEM curriculum focuses on Sciences, Technology, Engineering and mathematics. The intention of this workshop was to emphasise the value that practical activities bring to the school curriculum and how engaging subject like business management can equip students with life skills.

RECIPE 4

TITLE WORKSHOP 4

CONCEPT BUSINESS & ENTREPENEURSHIP

GAME PREPaRATION

VENDORS : TO SEE WHO IS ABLE TO SELL THE MOST FOOD. THUS MAKING THE MOST PROFIT AFTER EXPENSES.

BUYERS: WHO IS ABLE TO PURCHASE THE MOST WITH THE STANDARD AMOUNT OF R15,00 GIVEN.

RECIPE 4

TITLE	WORKSHOP 4
CONCEPT	BUSINESS & ENTREPENEURSHIP



MATERIALS & tOOLS

- PAPER
- MATERIAL PIECES
- DIFFERENT COLOURS REPRESENTING DIFFERENT FOOD ITEMS
- FAKE MONEY/CURRENCY

RECIPE 4

TITLE	WORKSHOP 4
CONCEPT	BUSINESS & ENTREPENEURSHIP

OUTCOMES : Photographs





WORKSHOP PROGRESS









Fig. 29-34 SMITH.K (2019)

RECIPE 4

TITLE	WORKSHOP 4
CONCEPT	BUSINESS & ENTREPENEURSHIP

OUTCOMES : Photographs



COMMUNICATION & DISCUSSION



AWARENESS & ENGAGEMENT

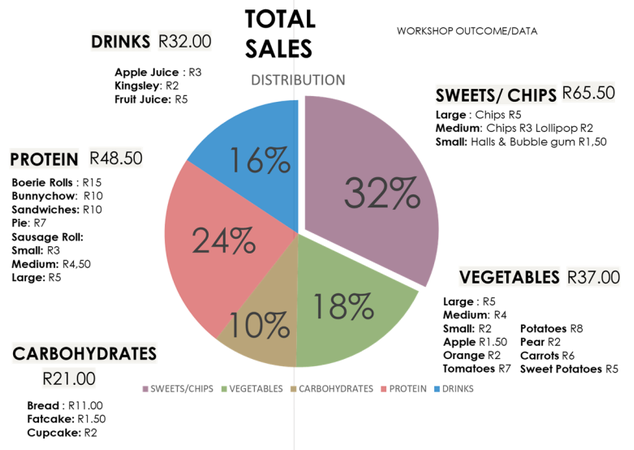


KEY ALLOCATION OF FAMILIAR & UTILIZED SCHOOL AREAS

RECIPE 4

TITLE	WORKSHOP 4
CONCEPT	BUSINESS & ENTREPENEURSHIP

Results 1



RECIPE 4

TITLE	WORKSHOP 4	ANALYSIS : lessons
CONCEPT	BUSINESS & ENTREPENEURSHIP	

-AN UNDERSTANDING OF ENTREPRENEURSHIP AMOUNGST STUDENTS
-LEARNING THE IMPORTANCE OF MONEY DISTRIBUTION (HOW FAR IT CAN/WILL GO)

-DEMONSTRATES THE ABILITY TO NEGOTIATE & INTELLIGENTLY/ SAVE MONEY

C

RECIPE SUMMARY CARD 5

TITLE	WORKSHOP 5	PREP TIME	1 HOURS
CONCEPT	THE COOKIE CUTTER Approach	TOTAL TIME	30 MIN
DATE	30.04.2019		
INTENTION	BREAKING THE MOULD - IN THE EDUCATION SYSTEM - THE IDEA OF "PERFECT" - THE CURRICULUM	ACTIVITY	CONVENTIONAL VS UNCONVENTIONAL
METHOD	CO - DESIGN GROUP SKETCHING		1. TO DRAW A TYPICAL COOKIE CUTTER SHAPE 2. TO DRAW ANY TYPE/SPECIAL COOKIE CUTTER SHAPE YOU IMAGINE POSSIBLE.
Activity type	INDIVIDUAL ACTIVITY	Objective OUTCOMES	TO SEE THAT STUDENTS UNDERSTAND STANDARD NORMS VS VARIABILITY. TO SEE IF THERE IS A DIFFERENCE BETWEEN CONVENTIONAL AND UNCONVENTIONAL VIA SHAPE EXERCISE. TO UNDERSTAND THE STUDENTS CHOICE OF SHAPE WHEN TOLD TO DO AS THEY PLEASE. THE NEED TO DEVELOP CONFIDENT LEARNERS WHO THRIVE IN THEIR PERSONAL STRENGTHS AND NOT OTHERS/ STATUS QUO.
participants	6 STUDENTS AGE GROUPS GR 9 (14-15)	RESULTS	
		MATERIALS	

RECIPE 5

TITLE	WORKSHOP 5	THEORY:	CO-design
CONCEPT	THE COOKIE CUTTER Approach		

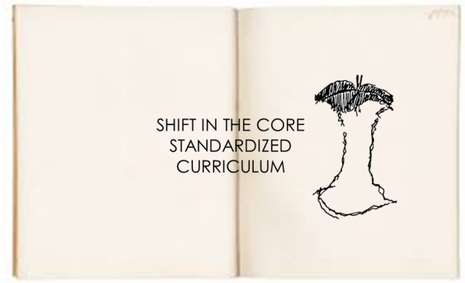
CO - DESIGN



Fig. 38 UNKNOWN (2019)



Fig. 39 UNKNOWN (2019)



RECIPE 5

TITLE	WORKSHOP 5	GAME PREPaRATION
CONCEPT	THE COOKIE CUTTER Approach	

Cookie cutter theory :

Education and learning is part of on organic process

The unconventional/broken mould demonstrates how perfect moulds & cookie cutters lack individuality and that school system should maximise the protentional of all students

RECIPE 5

TITLE	WORKSHOP 5	MATERIALS & tOOLS
CONCEPT	THE COOKIE CUTTER Approach	

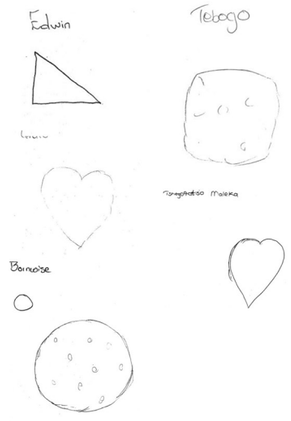


- PAPER
- COLOURED PENS
- SOME CONVENTIAL COOKIE CUTTERS/SHAPES

RECIPE 5

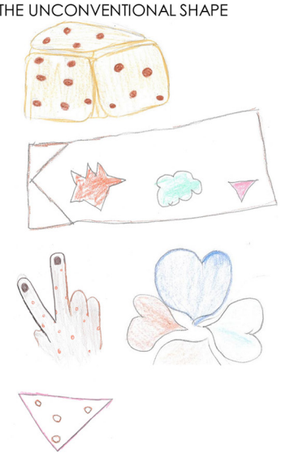
TITLE	WORKSHOP 5	Results 1
CONCEPT	IDENTIFYING FAVOURABLE SPACES	

THE KNOWN SHAPE



WORKSHOP OUTCOME

THE UNCONVENTIONAL SHAPE



RECIPE 6
SUMMARY CARD

TITLE	WORKSHOP 6	PREP TIME	1 HOURS
CONCEPT	IDENTIFYING"FOOD" SPACES	TOTAL TIME	30 MIN
DATE	30.04.2019		
INTENTION	PUTTING THE DESIGNER IN THE USERS SHOES.	ACTIVITY	GIVING THE STUDENTS AN OPPORTUNITY TO DRAW FREELY AS THEIR IMAGINATIONS CALL

METHOD: CO - DESIGN — GROUP SKETCHING — MOTIVATION MATRIX

Activity type: INDIVIDUAL ACTIVITY

participants: 6 STUDENTS
AGE GROUPS GR 9
(14-15)

Objective OUTCOMES

IDENTIFYING SPACES THAT THE STUDENTS WOULD LIKE TO:

SEE BEING INCLUDED AROUNGD THE SCHOOL

FACILITIES
PROGRAMME
IDEAS
SPATIAL PERCEPTION

GIVING THE STUDENTS AN OPPORTUNITY TO DRAW FREELY AS THEIR IMAGINATIONS CALL.

RESULTS

MATERIALS

RECIPE 6

TITLE WORKSHOP 6

CONCEPT IDENTIFYING"FOOD" SPACES

THEORY: CO-design

SEED ORGANIZATION , SOUTH AFRICA, CAPE TOWN

CO - DESIGN



Fig. 41 UNKNOWN (2019)

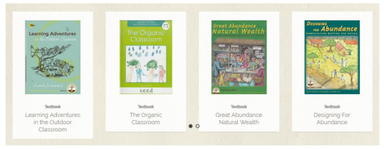


Fig. 40 UNKNOWN (2019)

Mandela, N. 2007. Building Sustainable rural educations. [Online] Available at: http://www.mandelainstitute.org.za/mandela-and-education.php [Accessed 17 March. 2019].

RECIPE 6

TITLE WORKSHOP 6

CONCEPT IDENTIFYING"FOOD" SPACES

GAME PREPaRATION

Mandela, N. 2007. Building Sustainable rural educations. [Online] Available at: http://www.mandelainstitute.org.za/mandela-and-education.php [Accessed 17 March. 2019].

RECIPE 6

TITLE WORKSHOP 6

CONCEPT IDENTIFYING"FOOD" SPACES

MATERIALS & tOOLS



-PRINTED OUT SECTIONS OF THE SCHOOL
- COLOURED PENS
- PENCILS
- PAPER

RECIPE 6

TITLE WORKSHOP 6

CONCEPT IDENTIFYING "FOOD" SPACES

Results 1

SPACES STUDENTS IDENTIFIED

CLASSROOMS – MODULARITY

LIBRARY – QUIET INTERACTIVE SPACES

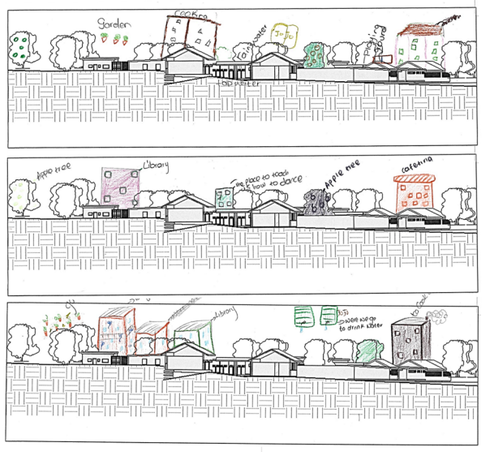
WATER FOUNTAINS – SMALL BREAK MOMENTS

GREEN SPACES BEING ACTIVATED



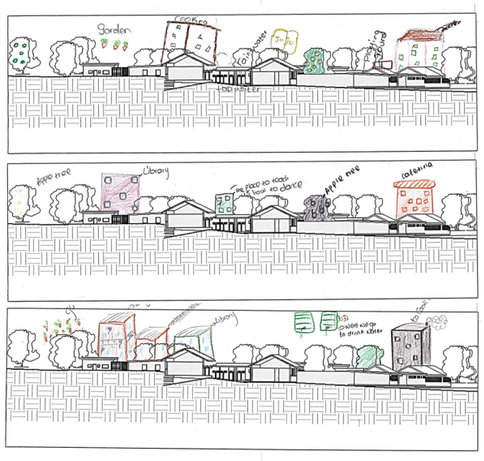
RECIPE 6

TITLE	WORKSHOP 6	Results 1
CONCEPT	IDENTIFYING “FOOD” SPACES	



RECIPE 6

TITLE	WORKSHOP 6	Results 2
CONCEPT	IDENTIFYING ”FOOD” SPACES	



D

RECIPE
SUMMARY CARD 7

TITLE	WORKSHOP 7	PREP TIME	1 HOURS
CONCEPT	IDENTIFYING”FOOD” SPACES PART 2	TOTAL TIME	60 MIN
DATE	13.05.2019		
INTENTION		ACTIVITY	IDENTIFYING SPACES THAT THE STUDENTS WOULD LIKE TO:

METHOD: CO - DESIGN; food GROUP SKETCHING; food MOTIVATION MATRIX

Activity type: INDIVIDUAL ACTIVITY

participants: 6 STUDENTS
AGE GROUPS GR 9
(14-15)

Objective OUTCOMES

1,EAT
FORMALLY
INFORMALLY

2. PLAY AND EAT

MULTI PURPOSE SPACES USED TO DO RECREATIONAL ACTIVITIES
CHILL SPACES
EATING AND PLAYING AT THE SAME TIME

3. FOOD FARM

IMPLEMENTATION OF A URBAN FARM
STUDENTS TO TAKE PART IN THE MAINTENANCE AND SELLING

RESULTS

MATERIALS

RECIPE 7

TITLE WORKSHOP 7

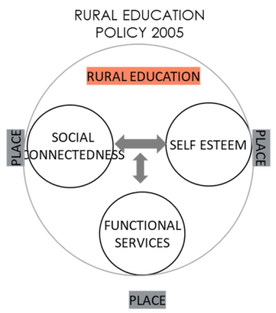
CONCEPT IDENTIFYING"FOOD" SPACES

THEORY: CO-design

CO - DESIGN

Carson, Ronald. 2016. The International Journal of Sustainability Education. Quantifying Sustainability in System Design Education 12, Issue 3, 29-43.

- **Self -esteem:** Children's and teachers' valuing of themselves, an identity and sense of pride in oneself and the place where one lives, learns and works.
- **Social Connectedness:** Being connected to meaningful others and belonging to a group, i.e. school communities using partnerships to function as educational units of wellbeing, learning and teaching.
- **Functional Services:** Learners and teachers must have access to basic development services that includes but not limited to the following: health, social development, and libraries.



RECIPE 7

TITLE WORKSHOP 7

CONCEPT IDENTIFYING"FOOD" SPACES

GAME PREPARATION



IDENTIFYING POSSIBLE LOCATIONS FOR FOOD PREP,EATING AND STORING.

CONVERSATIONS AND ENGAGEMENT WITH THE STUDENTS IS KEY

RECIPE 7

TITLE WORKSHOP 7

CONCEPT IDENTIFYING"FOOD" SPACES

MATERIALS & tOOLS



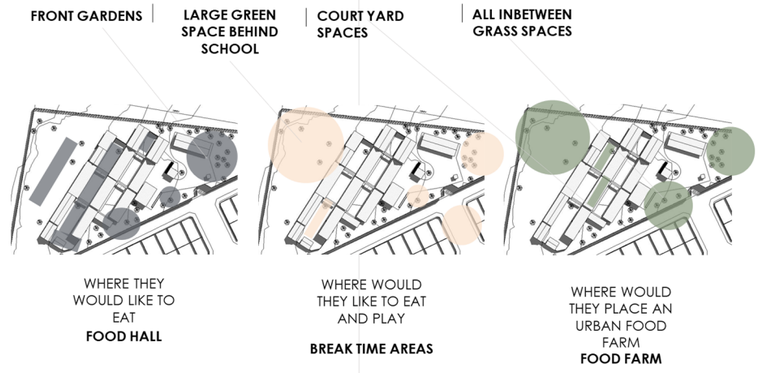
- SITE MODEL
- CARDBOARD
- GLUE
- MAP
- GREYBOARD
- RULER
- DIFFERENT COLOUR PINS

RECIPE 7

TITLE WORKSHOP 7

CONCEPT IDENTIFYING"FOOD" SPACES

Results 1



POSSIBLE SITE AREAS

RECIPE 8
SUMMARY CARD

TITLE	WORKSHOP 8
CONCEPT	BUILDING FOOD PLACES
DATE	13.05.2019
INTENTION	TO ALLOW THE LEARNERS TO IMAGINE THE SPACE THEMSELVES.
METHOD	CO - DESIGN ROUGH PROTOTYPING
Activity type	GROUP ACTIVITY
participants	6 STUDENTS AGE GROUPS GR 9 (14-15)

PREP TIME	1 HOURS
TOTAL TIME	60 MIN

ACTIVITY TO TAKE INTO CONSIDERATION THE TYPE OF SPACE AND ENVIRONMENT THEY RELATE TO AND WOULD WANT

IN SMALL GROUPS BUILD A MODEL THAT WOULD BE YOUR IDEAL FOOD HALL.

INCLUDE SPACES THAT ONE CAN COOK , EAT AND TEACH.

EACH MEMBER WAS GIVEN A ROLE TO PLAY AS FOLLOWS:

1, CHEF/COOK
2, STUDENT
3, TEACHER

Objective OUTCOMES

SEE THAT STUDENTS UNDERSTANDS THE REQUIREMENTS NEEDED FOR A FUNCTIONING FOOD HALL.

THERE IS A CREATIVE, INCLUSIVE APPROACH.

EXCITEMENT ON THE CONCEPT OF A ALL IN ONE TEACHING EATING SPACE.

RESULTS

MATERIALS

RECIPE 8

TITLE	WORKSHOP 8
CONCEPT	BUILDING FOOD PLACES



MATERIALS & tOOLS

-MODEL BUIDLING MATERIALS
-GLUE
-BOARD
-STICKS

RECIPE 8

TITLE	WORKSHOP 8
CONCEPT	BUILDING FOOD PLACES

THEORY

SPATIAL AGENCY

UNDERSTANDING THE POWER IN THE TRANSFER OF KNOWLEDGE : EXPOSING THE USER BY IMPOWERING THEM TO ACTIVELY PARTAKE IN THE DESIGN PHASE

Awan, Nishat & Schneider, Tatjana & Till, Jeremy. (2011). Spatial Agency. Other Ways of Doing Architecture. 10.4324/9781315881249.

RECIPE 8

TITLE	WORKSHOP 8
CONCEPT	BUILDING FOOD PLACES

OUTCOMES : Photographs



Fig. 44-49 SMITH.K (2019)

RECIPE 8

TITLE	WORKSHOP 8
CONCEPT	BUILDING FOOD PLACES

Results 1

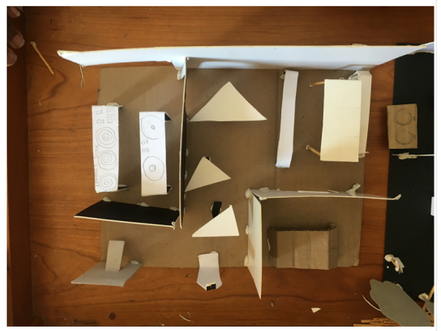


Fig. 42 SMIITH,K (2019)



Fig. 43 SMIITH,K (2019)

E

RECIPE 9
SUMMARY CARD

TITLE	WORKSHOP 9
CONCEPT	DISCOVERING FOOD CULTURE IN MAMELODI
DATE	27.01.2020
INTENTION	TO GET A TASTE OF THE FOOD CULTURE IN MAMELODI
METHOD	UKUDOBA
Activity type	GROUP ACTIVITY
participants	COMMUNITY MEMBERS ALL AGES

PREP TIME	1 HOURS
TOTAL TIME	2 HOURS

ACTIVITY

SITE VISIT : WITH SWEDISH EXCHANGE STUDENTS

Objective OUTCOMES:

TESTING UKUDOBA TECHNOLOGY

RESULTS

MATERIALS

RECIPE 9
SUMMARY CARD

TITLE	WORKSHOP 9
CONCEPT	DISCOVERING FOOD CULTURE IN MAMELODI
DATE	27.01.2020

OUTCOMES : TESTING UKUDOBA TECHNOLOGY

SITE VISIT : WITH SWEDISH EXCHANGE STUDENTS





F

RECIPE
SUMMARY CARD

10

TITLE	WORKSHOP 10	PREP TIME	2 HOUR
CONCEPT	FOOD CULTURE IN MAMELODI	TOTAL TIME	4 HOURS
DATE	17.03.2020		
INTENTION	TO GET A TASTE OF THE FOOD CULTURE IN MAMELODI	ACTIVITY	DISCOVERING FOOD CULTURE IN MAMELODI

METHOD: UKUDOBA

Activity type: GROUP ACTIVITY

participants: COMMUNITY MEMBERS ALL AGES

SITE VISIT : WITH 2020 URBAN CITIZEN STUDIO HONOURS STUDENTS.

Objective OUTCOMES:

TESTING UKUDOBA TECHNOLOGY & INTRODUCING THE CONTEXT.

RESULTS

MATERIALS

RECIPE
SUMMARY CARD

10

TITLE	WORKSHOP 10	PREP TIME	2 HOUR
CONCEPT	FOOD CULTURE IN MAMELODI	TOTAL TIME	4 HOURS
DATE	17.03.2020		

SITE VISIT & UKUDOBA TESTING WITH HONOURS STUDENTS





G

RECIPE
SUMMARY CARD

11

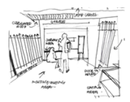
TITLE	WORKSHOP 11
CONCEPT	Personas & Places
DATE	03.07.2020
INTENTION	ASSIGNING PERSONAS TO PARTICIPANTS FOR A ROLE PLAY ACTIVITY THAT WILL FURTHER DESCRIBE THE QUALITATIVE ASPECTS OF FOOD EATING SPACES IN THE SCHOOL
METHOD	CO - DESIGN
Activity type	GROUP ACTIVITY: ROLE PLAY
participants	3 PARTICIPANTS

PREP TIME	3 HOURS
TOTAL TIME	30 MIN
ONLINE WORKSHOP	
ACTIVITY	DESCRIBING OF FOOD PLACES WITHIN THE SCHOOL.

Objective OUTCOMES

DETERMINING PERSONAS AND CHARACTER QUALITIES FOR PERSONA DEVELOPMENT AND QUALITATIVE DATA COLLECTION.

TO DETERMINE THE EATING SPACES THAT ARE PREFERRED FOR DINING IN A SCHOOL ENVIRONMENT AND HOW THOSE SPACES COULD POTENTIALLY AFFECT BEHAVIOURAL EATING HABITS


RESULTS

MATERIALS

RECIPE
11

TITLE	WORKSHOP 11
CONCEPT	Personas & Places

MATERIALS & tOOLS

	Personality	Eating Habits	Extra Curricular	Morning Ritual	Food Preferences
1	Outgoing	Likes to snack a lot & consume large portions	Plays Volleyball & Enjoys Running	Walks to school & buys local scone on the way	Vegetarian
2	Shy & very focused	Buys Lunch almost everyday	Choir	Does homework in the morning and misses school breakfast	Doesn't like Vegetables
3	Free spirit	Often Eats off of friends food	Not bothered or interested in extra activities	Gets to school early to get breakfast before friends see	Doesn't really like the school food and tries to avoid it. Picky Eater
4	Class Clown	Hates queing for food at school but relies on the meals for food	Volunteers / helps parents business after school hours	Arrives to school 5 min before school starts and snacks on fruit brought along the way	Eats everything and anything
5	Politically minded & Popular	Doesn't really eat at school	Art	Journey to school is 1 hour long, student sleeps during the first class	Sweet tooth

RECIPE
11

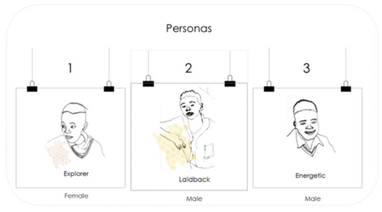
TITLE	WORKSHOP 11
CONCEPT	Personas & Places

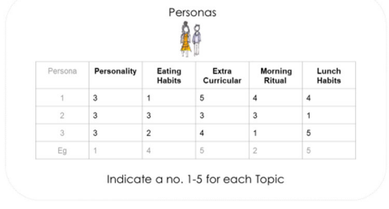
MATERIALS & tOOLS

ONLINE WORKSHOP









RECIPE
11

TITLE	WORKSHOP 11
CONCEPT	Personas & Places

OUTCOMES :



RECIPE 11

TITLE	WORKSHOP 11	objectives
CONCEPT	Personas & Places	

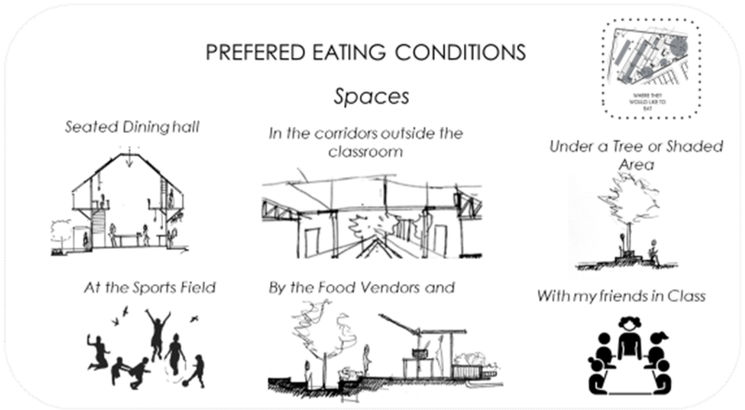


Fig. 8-12 SMIITH,K (2019)

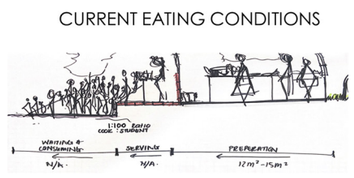
RECIPE 11

TITLE	WORKSHOP 11	OUTCOMES :
CONCEPT	Personas & Places	









RECIPE 11

TITLE	WORKSHOP 11	Results 1
CONCEPT	Personas & Places	

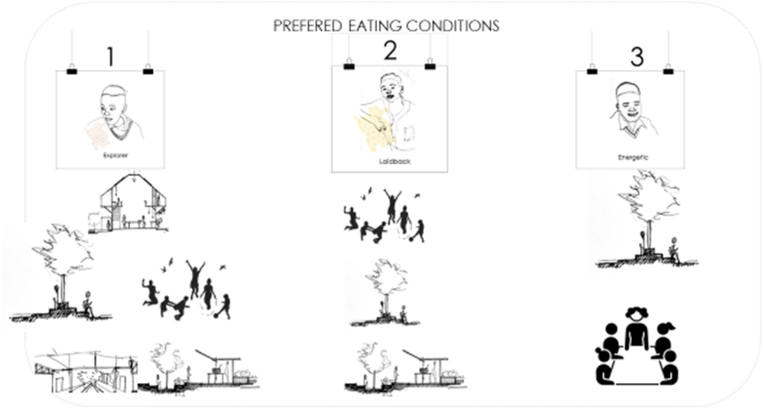


Fig. 8-12 SMIITH,K (2019)

RECIPE 11

TITLE	WORKSHOP 11	Game preparation
CONCEPT	Personas & Places	



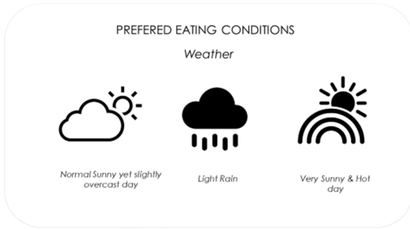


Fig. 8-12 SMIITH,K (2019)

RECIPE 11

TITLE	WORKSHOP 11	Results 2
CONCEPT	Personas & Places	

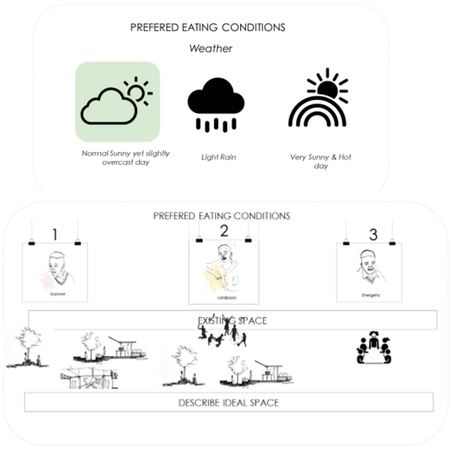


Fig. 8-12 SMIITH,K (2019)

RECIPE 11

TITLE	WORKSHOP 11	Results 2
CONCEPT	Personas & Places	

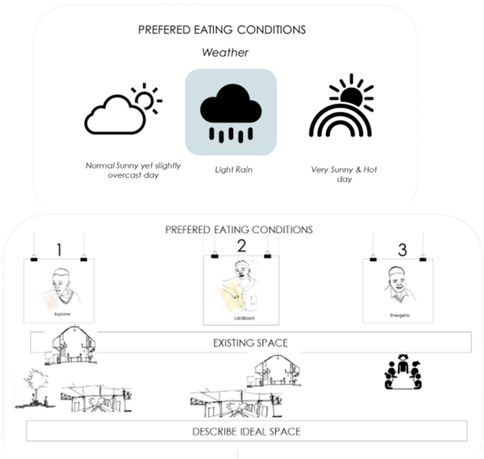


Fig. 8-12 SMIITH,K (2019)

RECIPE 11

TITLE	WORKSHOP 11	Results 2
CONCEPT	Personas & Places	

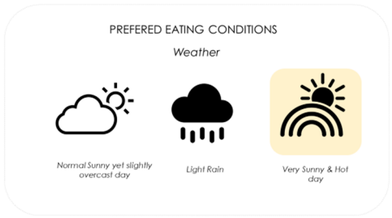
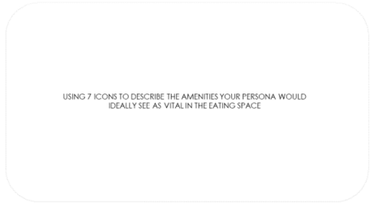


Fig. 8-12 SMIITH,K (2019)

RECIPE 11

TITLE	WORKSHOP 11	objective
CONCEPT	Personas & Places	





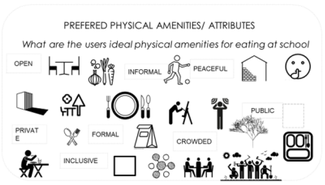


Fig. 8-12 SMIITH,K (2019)

RECIPE 11

TITLE	WORKSHOP 11	Results 2
CONCEPT	Personas & Places	

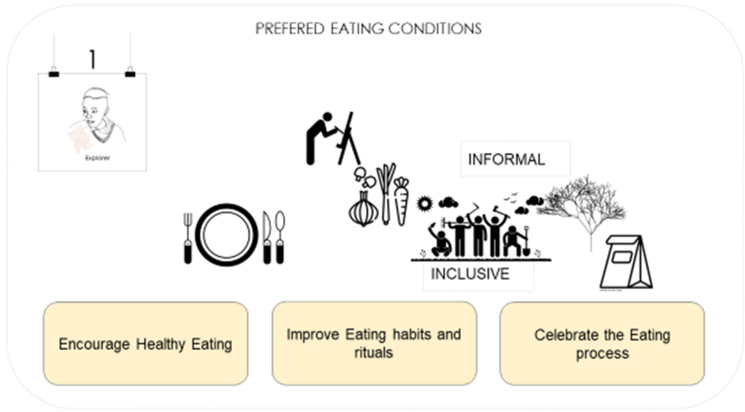


Fig. 8-12 SMIITH,K (2019)

RECIPE 11

TITLE	WORKSHOP 11	Results 2
CONCEPT	Personas & Places	

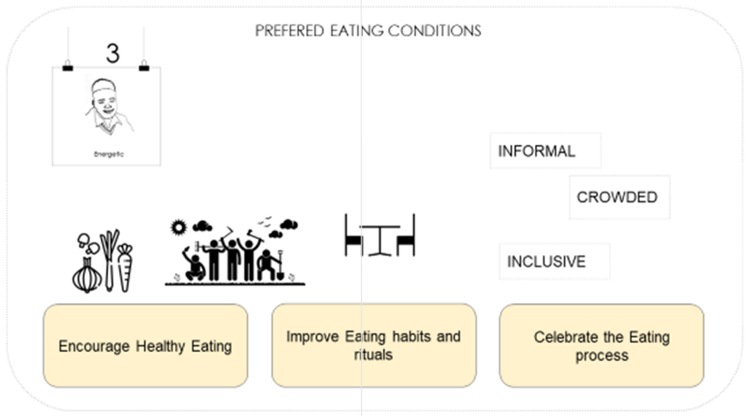


Fig. 8-12 SMIITH,K (2019)

RECIPE 11

TITLE	WORKSHOP 11	Results 2
CONCEPT	Personas & Places	

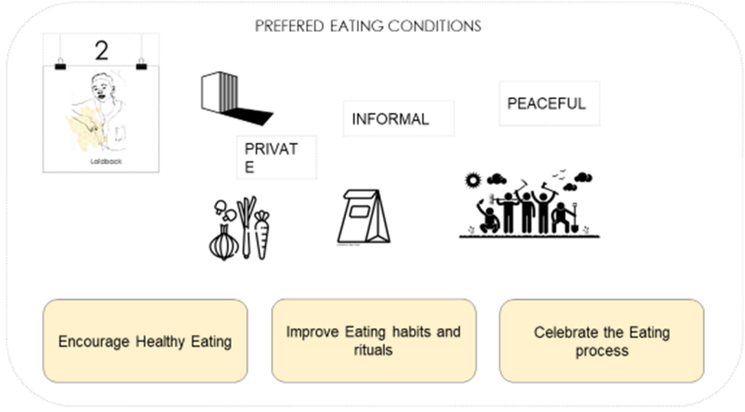


Fig. 8-12 SMIITH,K (2019)

END

Masters 2020

"it is what it is..."