ARIFA

A NATURE CENTRIC LEARNING EXPERIENCE

SUST
748

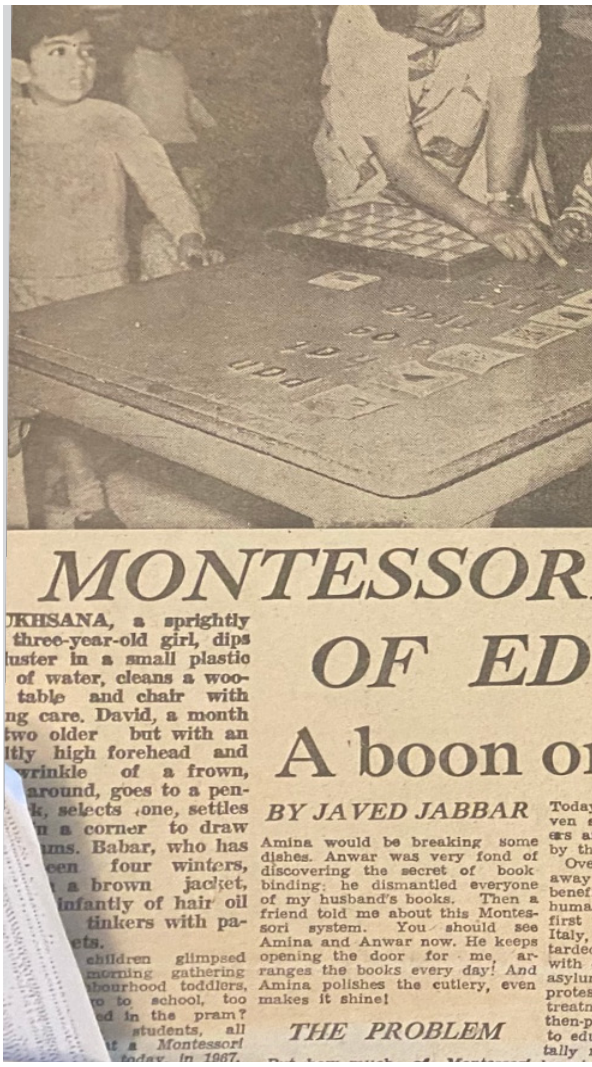
SAMIHA KHAN

THE PROCESS BOOK

CONTENTS

1

THE PATH TO EDUCATION



MONTESSOR

OF ED

A boon o

BY JAVED JABBAR

Amina would be breaking some dishes. Anwar was very fond of discovering the secret of book binding; he dismantled everyone of my husband's books. Then a friend told me about this Montessori system. You should see Amina and Anwar now. He keeps opening the door for me, arranges the books every day! And Amina polishes the cutlery, even makes it shine!

THE PROBLEM

Throughout my journey at Scad, as myprojects progressed I found myself always being rooted back to education. The decision to follow on the path of education, came not only from the trend I found myself falling into with my projects, but also from a place close to my heart.

My very own grandma, Arifa Saifie. At the age of 24, In 1963, she traveled to the united states and trained at the washington institute of montessori, after which she taught at Ashdun Hall in Atlanta, where she and friend of hers started a school funded by a couple that was very intrigued and interested in Montessori. Following this venture she decided to come back to Karachi and open her own school The Montessori Children's

I SYSTEM
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r bane?

, in Karachi, there are se-
chools with qualified teach-
nd equipment, all recognised
e Montessori Association.
r 4,000 miles and 97 years
lies the origin of this bold,
icial approach to the infant
n. Dr Montessori, one of the
women medical doctors of
found in 1870 mentally re-
l children herded together
dangerously insane adults in
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ted and demanded better
nent for them. Using the
revalent Froebel's approach
ucation, she found even men
retarded kids capable of

ously opening her own school.

This institution has a comfortable aura of house-and-home hovering over its present 43 pupils as they gambol on the patch of lawn, drift pass the fluttering curtains, work and toddle in the cosyish rooms, and listen each morning to the record player humming out 'Twinkle, twinkle little star".

An adorably-fresh voiced chorus of 43 sweet sounds fills the school each day as the Montessori musicians learn to pronounce the words, and get that "Twinkle" right.

A successful participant of the local teacher's training course, young Miss Afza Syeda runs a bustling, busy Children's Academy, off Nazimabad's second Chowrangi. Starting in July, 1966 with an optimistic first enrolment of 125 students, Miss Syeda found that her limited school premists could allow only 60 toddlers.

Now whittled down to convenience, her experiment is a manageable affair. The Academy takes its tots out regularly for excursions to places of interest and will soon be launching a Parents' Familiarisation Course which will introduce parents to the de-

tails of the Montessori system and show them how a Montessori child is, and can be, righter than other kids.

Other kids bring to mind the 'other' education. And the trouble of transition. Fr before Montessori can be given the passport to a place in traditional education, the new Stem must show how a Montessori-bred infant can safely re-adjust himself to the difference of e teacher-dominated class room

Presently, to quote e puzzled mother: "My child's changed. Somehow he isn't so brig Takes longer to do his lessons So different from his ways wh he was

Photographs by Hasan Bozai and Abdul Hadi

of the Montessori system. But that, if Montessori provides for the flowering of the human as an infant, it must also provide schools and methods for his blossoming as an adolescent. In this respect, traditional education, arranged by governmental and private educational agencies, needs, to re-examine its relationship with the Montessori system and seek ways and means to improve the process of re-adjustment.

A CRISIS

As things stand now, the child begins to walk, talk and exercise his intelligence with extraordinary efficiency until he is four or five years old, but as soon as he enters the teacher-ridden class room he falters in step and faces a crisis of fresh perspectives.

The trouble then would seem to

little on the teacher's permanence. Clearly, some sort of sitting down, seeing in and setting out is needed right away.

Right away because we must not forget that even as we read this, Rukhsana, the three-year-old table cleaner; David, the dream-drawer, and Babar, the alphabet-artist are all growing up very differently from the children they will meet later in the desk-filled class rooms of primary and secondary schools. We must not allow such a confrontation of incomprehensives—one child totally assured of himself in thought and action, the other completely robbed of initiative, always waiting upon the teacher's every word to learn and decide.

The suburban safari by Niaz Mir on p. 26

house. This led to 3 generations of family members following in her footsteps and becoming montessorians. My grandmother believed that everything a child learnt in school was taken home and further developed.

These values taught at an early stage of preschool are the basis of the framework that transforms a child into the future of humanity.

With my grandmother and my own mother being Montessorians, I grew up in this climate of awareness since I was a child. And, through my final project I would like to make my contribution to the family legacy, not as a montessorian but, as myself, a designer with sustainability at its forefront.

2

PAKISTAN'S CURRENT EDUCATION SYSTEM

Since Pakistan's creation in 1947, as a new country that was once part of India at the time of heavy british colonialism (1757 - 1947, british colonial rule in India); Pakistan had only a few good quality schools in the big cities specifically where british army officers were deployed. However, in the rest of the country the education system was less effective and predominantly Islamic-oriented in nature, and access to secular and modern education was out of reach for the common people (Whitehead, 2005).

According to the education policy of the British colonial era, Urdu was the medium of instruction for the children of the general public and English was the medium for the students of the privileged class (Coleman, 2010). Which set the precedent for "classism" within the nation. A growing need to be from a privileged family to have access to basic resources like a quality education.

The educational system set at the time of creation of the country remained mostly unchanged for public schools. It has spent the last almost 80 years running on the same education system set at the time and now more than ever, the people have identified that the didactic colonial system of education does not provide the emerging needs for the future of Pakistan in the 21st century.

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Education is considered to be closely related to the economic and social development of a country. Without substantial investment in human resources, no country can achieve sustainable economic development.

According to UNICEF, Pakistan, Presently, has the world's second-highest number of out-of-school children (OOSC) with an estimated 22.8 million children aged 5-16 not attending school, which is representing 44 per cent of the total population in this age group and in the 5-9 years age group with 5 million children that are not enrolled in schools..

Even though efforts have been made to provide free education through NGOs such as the citizen's foundation who have built 1800 schools across Pakistan's rural areas. As of 2021, Pakistan's overall literacy rate is still at just 48%for females and 70% for males. (UNESCO, Pakistan) making it one of the countries with the lowest rates of literacy in the Asia pacific region.

Image from a public school in Pakistan in 1947 depicts barely a very minimal difference from the picture of a school in Zarbaig village, a rural area in KPK, Pakistan.

Image from a school in Zarbaig village, a rural area in KPK, Pakistan.

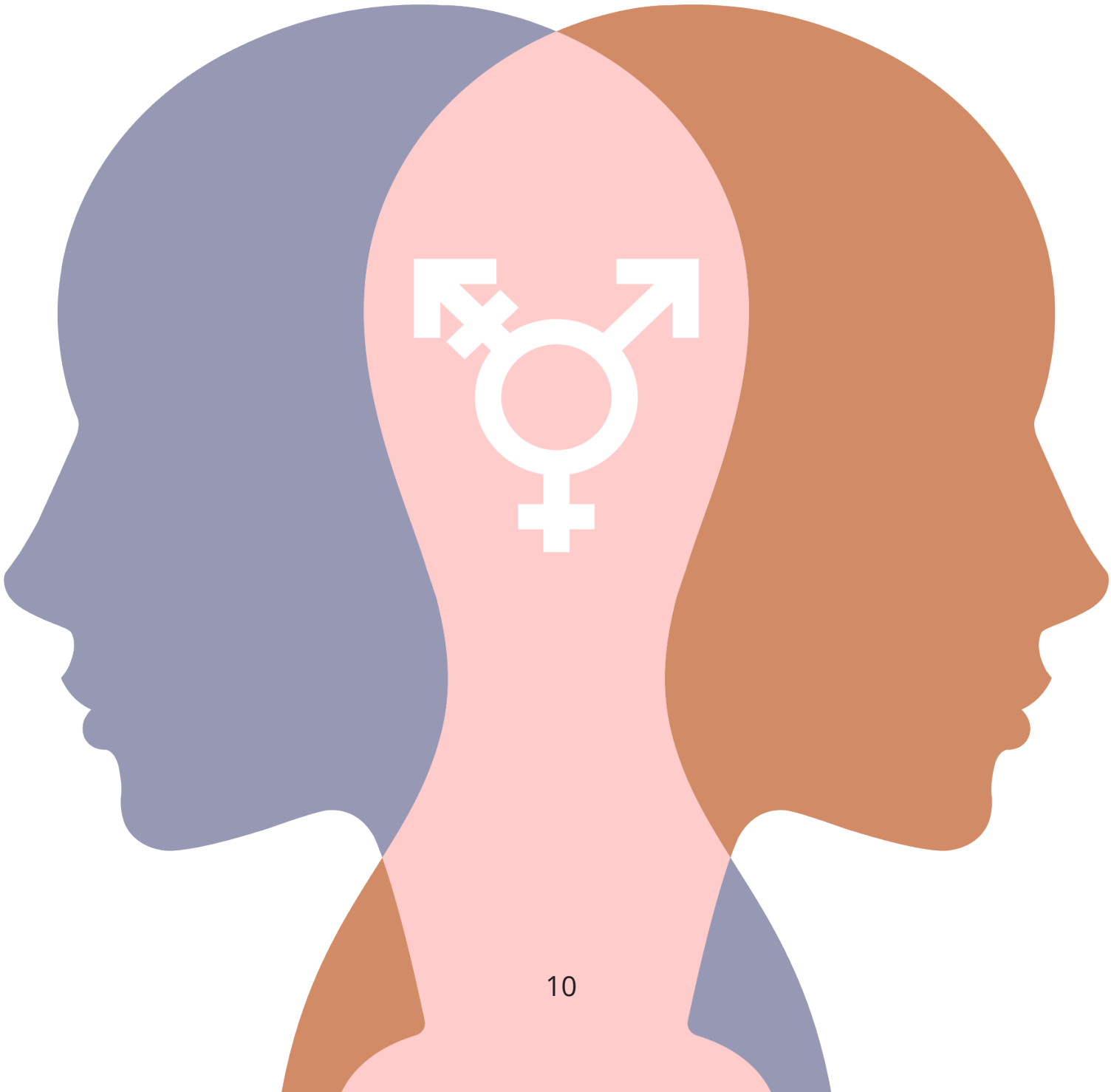
"the people have identified that the didactic colonial system of education does not provide the emerging needs for the future of Pakistan in the 21st century."

Pre-primary education:

Primary education is seen as one of the main means of promoting economic growth and improving living standards in developing countries (Suryadarma et al. 2006) Providing access to primary school is a widely accepted priority in the fight against poverty. It is the first stage of compulsory education, which lays the foundation for students' academic studies and is the basic right of all mankind. Education for all is a key resource towards a more sustainable future for the next generations to come. It is important for children to be given holistic development from a young age with the areas of social, ethical, cultural, intellectual, emotional and physical well-being, and certain key academic skills, that are not currently covered in pre primary educational practice in Pakistan. The didactic teaching method situates the teacher as a dominant figure in the classroom. However, for children to learn at the holistic level it's important to deviate from this method of learning towards one that gives children a more central role in their learning to ensure that every child has the opportunity to develop to their full potential. (The status of early childhood education in Pakistan: Inside stories)


Sensorial

3 PREDOMINANT GENDER INEQUALITY



As stated in the project drawdown, educating girls also builds resilience and equips girls and women to face the impacts of climate change. They can be more effective stewards of food, soil, trees, and water, even as nature's cycles change. They have greater capacity to cope with shocks from natural disasters and extreme weather events. **Today, there are economic, cultural, and safety-related barriers that impede 62 million girls around the world from realizing their right to education.**

The current framework of the education system in Pakistan has not only accounted for the lack of equal socio economic opportunities within the overall society but it also accounts for the increase in gender inequalities within the educational arena, specifically within underprivileged communities.And while the underfunded education crisis has affected millions of children, both boys and girls, about two-thirds are female, accounting for 56% of girls in Pakistan that do not go to school.

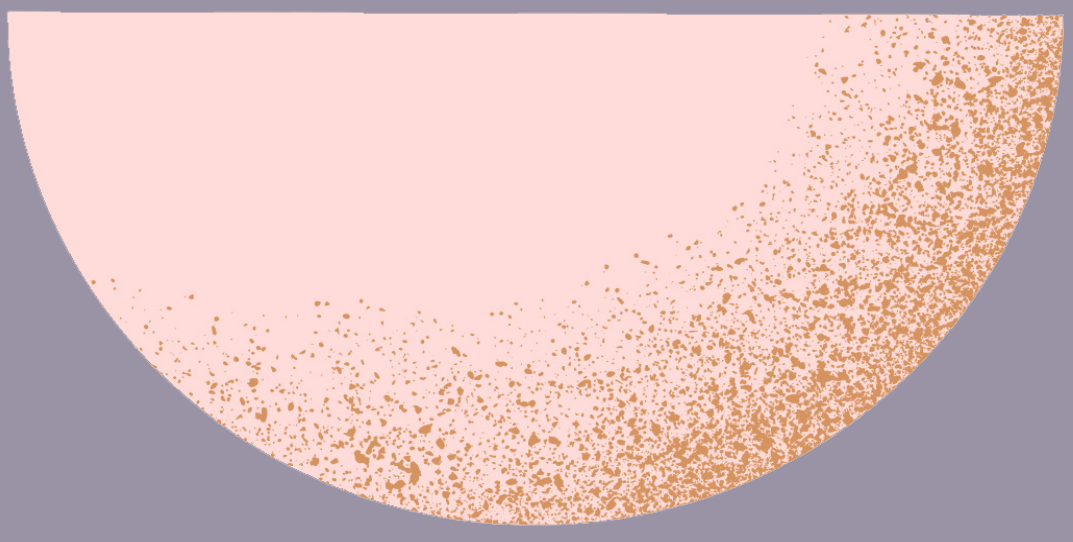
Girls' education in Pakistan is extremely valuable but sadly undervalued. Girls are denied the right to education due to families with conservative mindsets set through religious extremism, and misconstrued concepts of a woman's role and capability in society. They are seen as merely homemakers and in extreme cases, are given into marriage at extremely young ages.

In Pakistan, gender imbalances are strongly seen amongst eunuchs (biologically intersex individuals, also known as transgenders) as well, that have been classified at the bottom of the society. With the perceived misfortune of being biologically born between two genders, eunuchs have been abandoned at birth, being denied the right not only to education, but to basic needs, such as food and shelter and of course acceptance into society. This growing issue has led them to earn livelihoods through begging on the streets or resorting to prostituition.

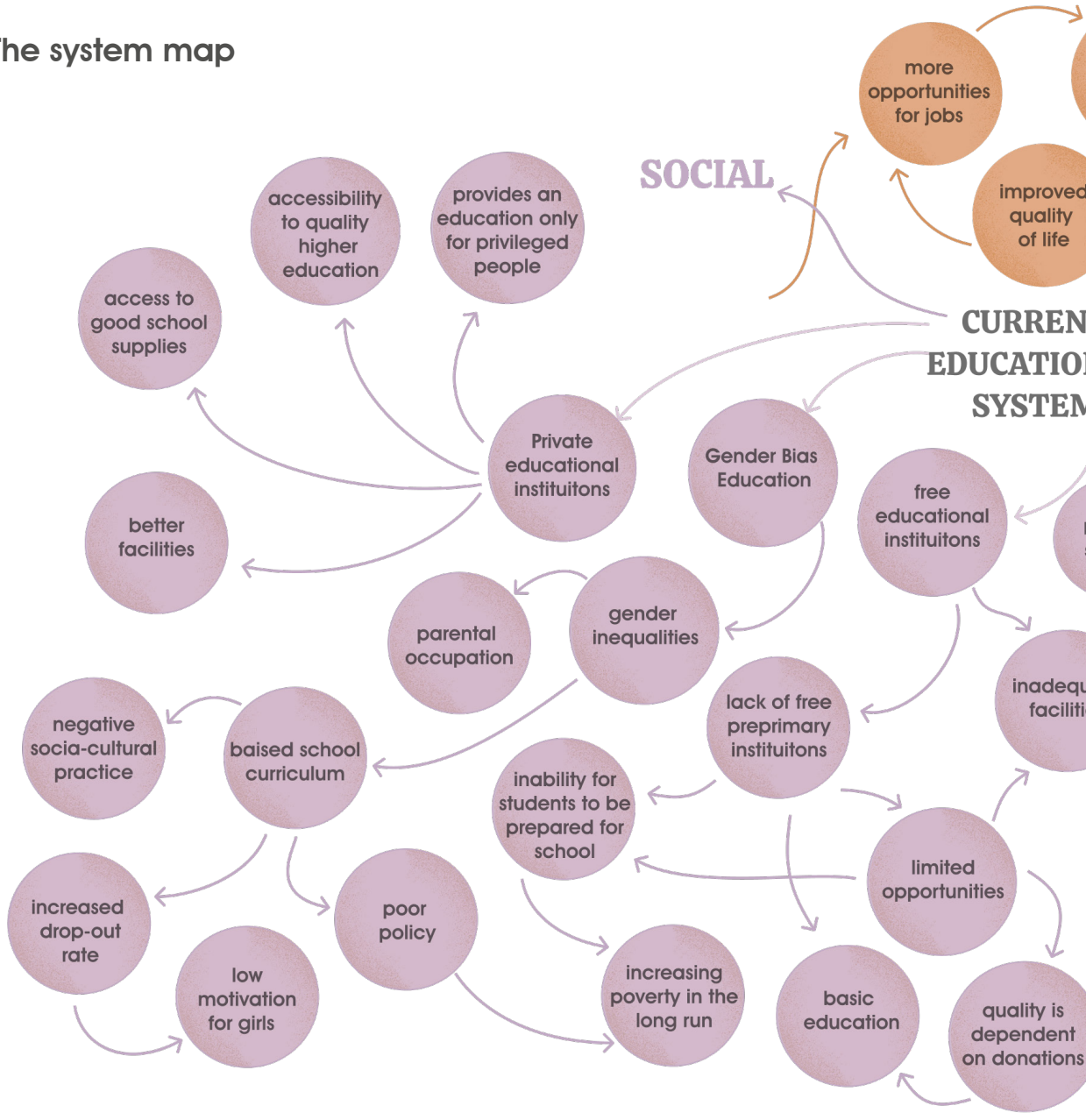
As of 2012, The Supreme Court ruled that according to the constitution trans-genders had equal rights as all citizens of Pakistan. The apex court ordered that equal rights should be given to the eunuchs in all fields of life including education and employment in a dignified manner. However, little has been done since to shift the social stigma amongst society about viewing a eunuch as any other human being.

"Eunuchs are seen as social outcasts by Pakistan's largely conservative society."

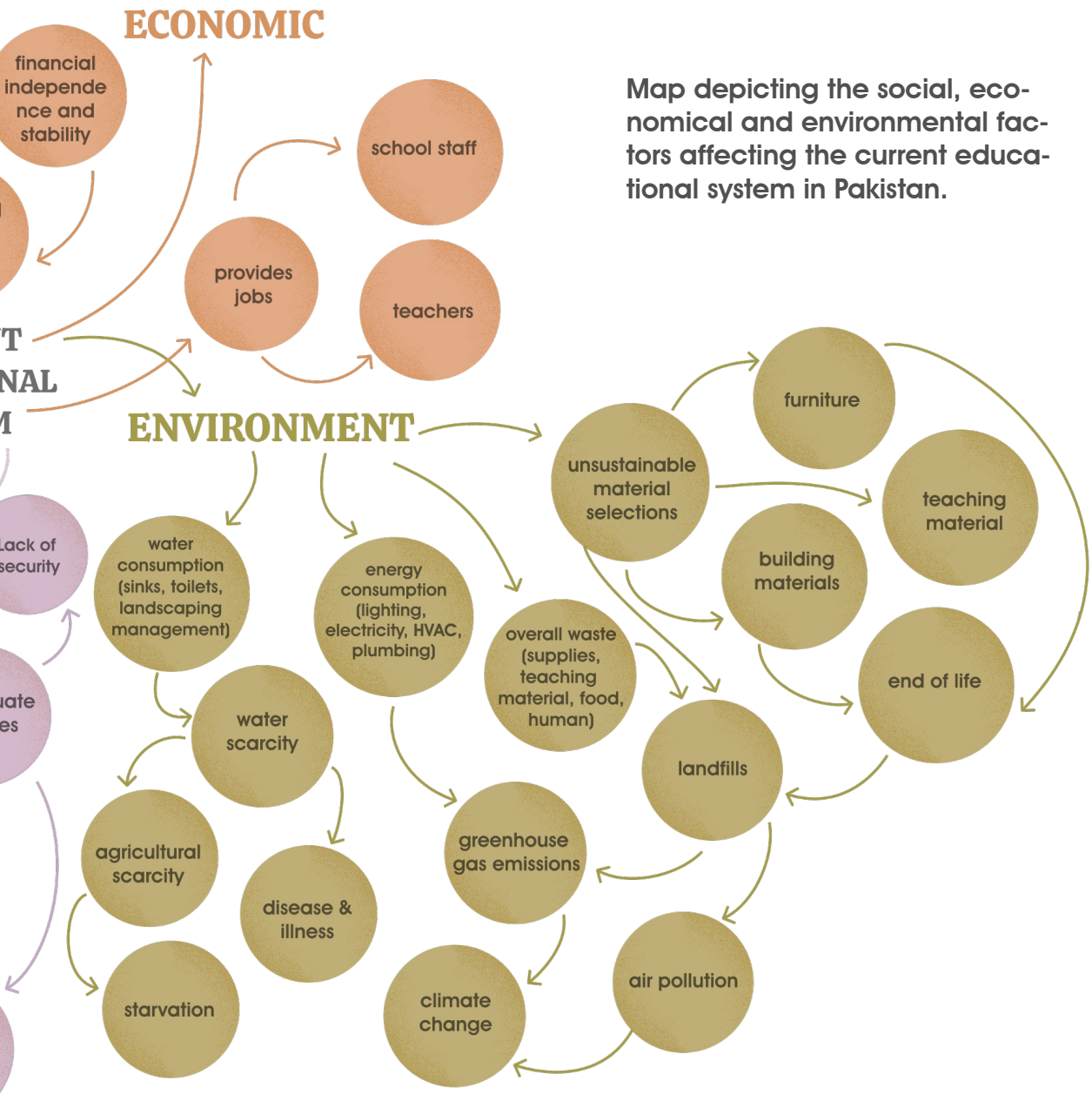
4 THE OPPORTUNITY FOR DESIGN



The system map



The Systems map provides a holistic view of the current system at hand and all the vast interconnected parts and systems that make up the system as a whole.



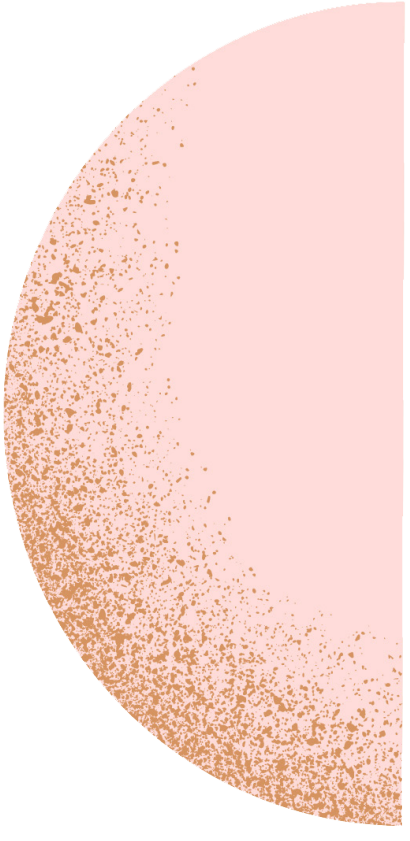
Map depicting the social, economical and environmental factors affecting the current educational system in Pakistan.

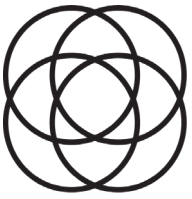
Based on my research I was able to construct a map that depicts the different social, economic and environmental factors that would come into play when designing for the current educational system of Pakistan. I classified the social element into private and free educational systems and then mapped out each one internally. For the environmental element, I looked at water consumption, energy consumption, overall waste, and materials and how this leads to overall climate change. For the economic aspect I touched on how the current system provides jobs for teachers and all staff involved and how there are more opportunities for jobs leading to financial independence and stability amongst the society. Like any system map, there definitely is room for further growth and detailed orientation of each part; it gives a brief overview and glimpse into the interconnected relationships within the system from my perspective.

The Earth Charter influence

To truly support and identify a key solution space to the ongoing issue of social classism and inequality within the field of education in Pakistan I turned to The Earth Charter. The Earth Charter relates strongly with the current necessity of bringing in sustainable practice into communities. Rooted from human conscience, It sets the precedence for growth within communities on a global scale to achieve "**global interdependence and shared responsibility for the well-being of the whole human family, the greater community of life, and future generations."**

While the importance of all 16 principles strongly resonate with me, I found the following principles being top of mind within my targeted solution space.





Interdependence of all life

1. Respect Earth and life in all its diversity.

a. Recognize that all beings are interdependent and every form of life has value regardless of its worth to human beings.

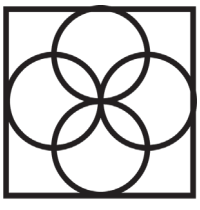
b. Affirm faith in the inherent dignity of all human beings and in the intellectual, artistic, ethical, and spiritual

Love and responsibility

2. Care for the community of life with understanding, compassion, and love.

a. Accept that with the right to own, manage, and use natural resources comes the duty to prevent environmental harm and to protect the rights of people.

b. Affirm that with increased freedom, knowledge, and power comes increased responsibility to promote the common good.



Democracy and freedom

3. Care for the community of life with understanding, compassion, and love.

a. Accept that with the right to own, manage, and use natural resources comes the duty to prevent environmental harm and to protect the rights of people.

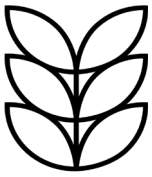
b. Affirm that with increased freedom, knowledge, and power comes increased responsibility to promote the common good.

Justice across generations

4 Secure Earth's bounty and beauty for present and future generations.

a. Recognize that the freedom of action of each generation is qualified by the needs of future generations.

b. Transmit to future generations values, traditions, and institutions that support the long-term flourishing of Earth's human and ecological communities.

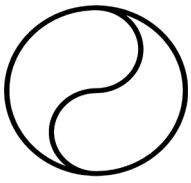


Prevent
ecological harm

6 Prevent harm as the best method of environmental protection and, when knowledge is limited, apply a precautionary approach.

a. Take action to avoid the possibility of serious or irreversible environmental harm even when scientific knowledge is incomplete or inconclusive.

b. Prevent pollution of any part of the environment and allow no build-up of radioactive, toxic, or other hazardous substances.



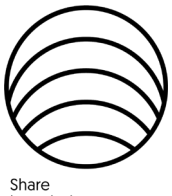
Sustainable
lifestyles

7 Adopt patterns of production, consumption, and reproduction that safeguard Earth's regenerative capacities, human rights, and community well-being.

a. Reduce, reuse, and recycle the materials used in production and consumption systems, and ensure that residual waste can be assimilated by ecological systems.

b. Act with restraint and efficiency when using energy, and rely increasingly on renewable energy sources such as solar and wind.

c. Promote the development, adoption, and equitable transfer of environmentally sound technologies.

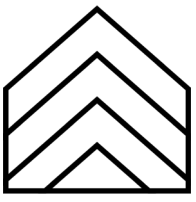


Share
knowledge

8 Advance the study of ecological sustainability and promote the open exchange and wide application of the knowledge acquired.

a. Support international scientific and technical cooperation on sustainability, with special attention to the needs of developing nations.

b. Recognize and preserve the traditional knowledge and spiritual wisdom in all cultures that contribute to environmental protection and human well-being.

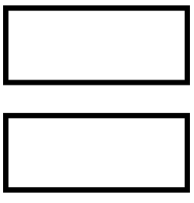


Erradicate
poverty

9 Eradicate poverty as an ethical, social, and environmental imperative.

a. Empower every human being with the education and resources to secure a sustainable livelihood, and provide social security and safety nets for those who are unable to support themselves.

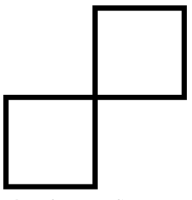
b. Recognize the ignored, protect the vulnerable, serve those who suffer, and enable them to develop their capacities and to pursue their aspirations.



Equitable human
development

10. Ensure that economic activities and institutions at all levels promote human development in an equitable and sustainable manner.

a. Promote the equitable distribution of wealth within nations and among nations.



Gender equality
and equity

11 Affirm gender equality and equity as prerequisites to sustainable development and ensure universal access to education, health care, and economic opportunity.
a. Secure the human rights of women and girls and end all violence against them.

b. Promote the active participation of women in all aspects of economic, political, civil, social, and cultural life as full and equal partners, decision makers, leaders, and beneficiaries.

c. Strengthen families and ensure the safety and loving nurture of all family members.

Dignity, inclusion
and well-being

12 Uphold the right of all, without discrimination, to a natural and social environment supportive of human dignity, bodily health, and spiritual well-being, with special attention to the rights of indigenous peoples and minorities.

a. Eliminate discrimination in all its forms, such as that based on race, color, sex, sexual orientation, religion, language, and national, ethnic or social origin.

b. Honor and support the young people of our communities, enabling them to fulfill their essential role in creating sustainable societies.

Integrate values into education

14.Integrate into formal education and life-long learning the knowledge, values, and skills needed for a sustainable way of life.

a. Provide all, especially children and youth, with educational opportunities that empower them to contribute actively to sustainable development.

b. Promote the contribution of the arts and humanities as well as the sciences in sustainability education.

c. Enhance the role of the mass media in raising awareness of ecological and social challenges.

d. Recognize the importance of moral and spiritual education for sustainable living.

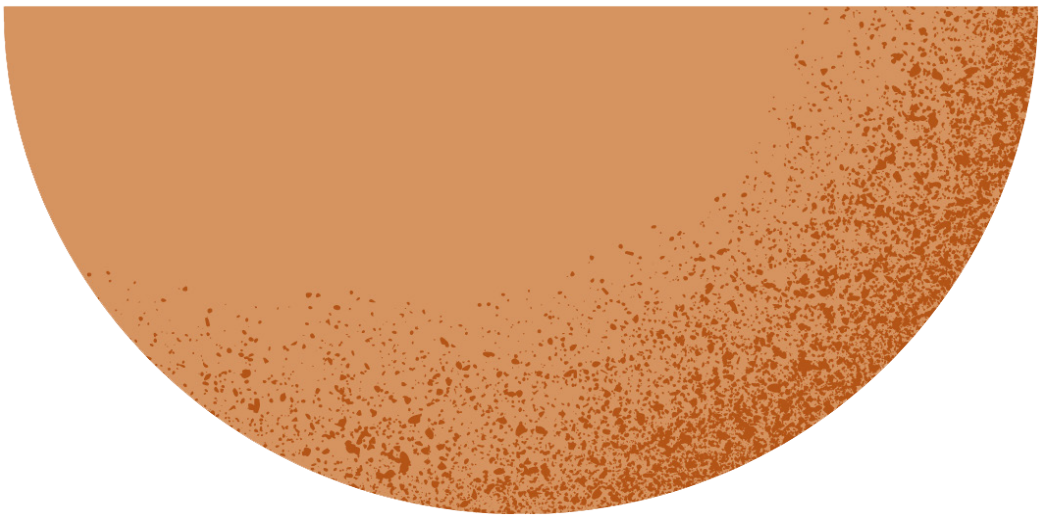
Nonviolence and peace

16 Promote a culture of tolerance, nonviolence, and peace.

a. Encourage and support mutual understanding, solidarity, and cooperation among all peoples and within and among nations.

b. Recognize that peace is the wholeness created by right relationships with oneself, other persons, other cultures, other life, Earth, and the larger whole of which all are a part.

The Earth charter's principles set the stage for further development towards achieving sustainable development goals. I found them directly relatable to everything i want to instil throughout the project and paving the path towards a perfect opportunity space.

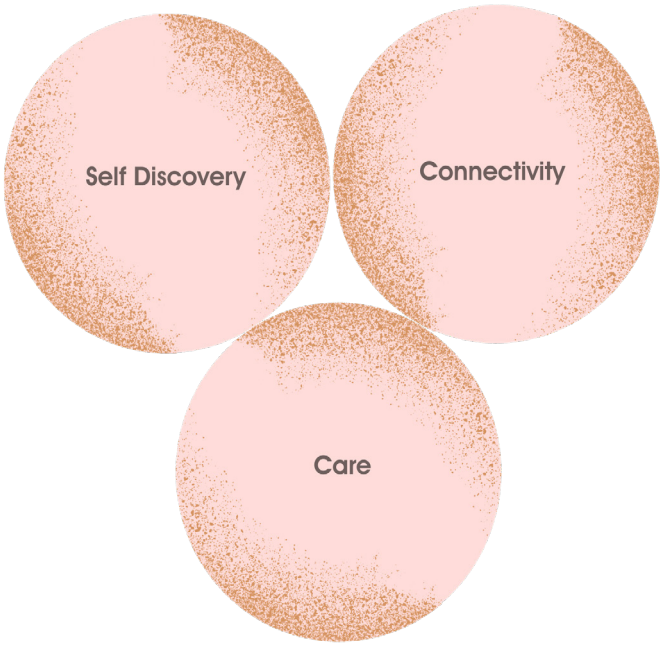


How might we challenge design to develop the sense of respect, care, equality, and stability for a developing nation such as Pakistan?

The Montessori Curriculum

Montessori is a method of education that is based on self-directed activity, hands-on learning and collaborative play. Children work in groups and individually to discover and explore knowledge of the world and to develop their maximum potential. Children are given the opportunity to learn through their own experience and at their own pace. It emphasizes independence and it views children as naturally eager for knowledge and capable of initiating learning in a sufficiently supportive and well-prepared learning environment. ("Theories of Learning: 3 Theories | Psychology".)

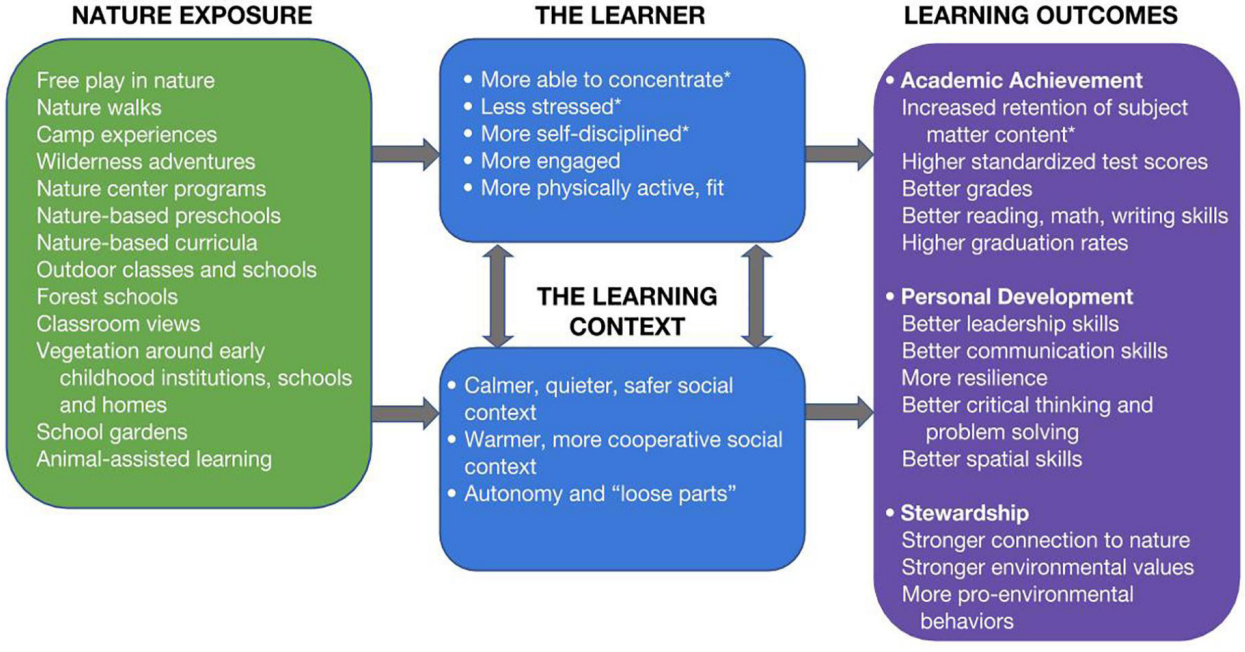
The essence of Montessori is to be as natural as possible. All materials are wooden and made from natural materials in addition to the fact that the basis of the philosophy is repetition. The material is reused by the child at several times and mostly always in a different way, as the child reaches a new stage of cognitive development his perspective of the material's manipulation changes. Hence he gains a new insight each time. The same materials help the child to reach progress at new levels.



Nature centric learning

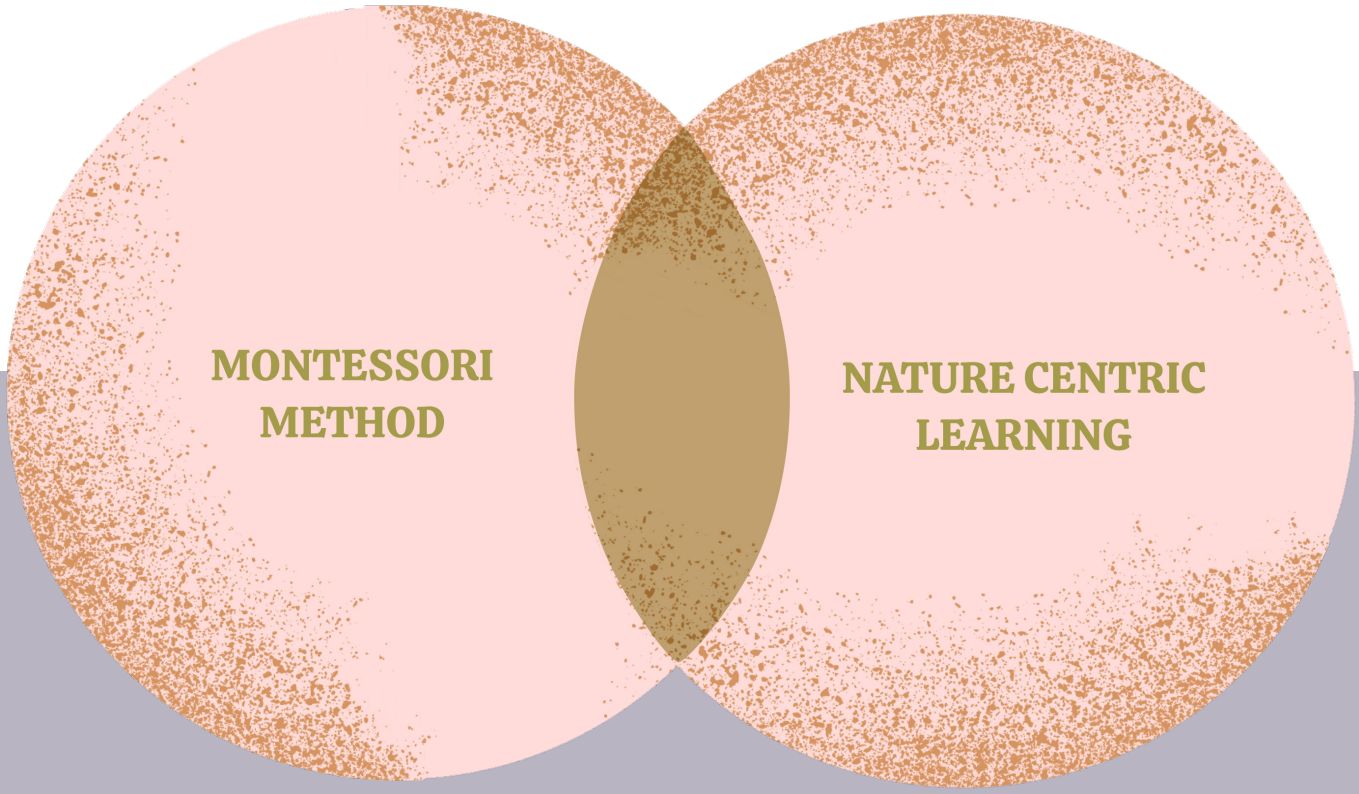
Nature-centric learning promotes self-discovery in children, improving their motor skills and cognitive abilities, while also helping them to connect with and care for the environment and respond at any moment to the natural curiosities that exist in all of us. The figure below made by researchers from Frontiers in psychology maps out the ways in which nature based learning can promote a child's growth into a person and an "environmental steward".

Frontiers in psychology



After learning about both methods of teaching I realized that the montessori teaching practice and nature centric learning very consciously complement each other.

This area of opportunity brought me towards the idea of designing an early years learning environment that allows an easy integration of both methods of learning.



With Pakistan being the 5th largest population in the world of over 220 million people, and the 2nd highest rate of children out of school.

There lies an opportunity space in Pakistan to design a school, which can act as a bridge between privatized early years education and free early years education to build a solid foundation for life-long learning.

SWOT Analysis

I then conducted a SWOT analysis identifying the strengths, weaknesses, opportunities and threats of successfully building a nature centric learning environment in the city of Karachi, based on the current state of the city. I found that there really is a strong need for it, however the potential threats identified seem to be ones that would just be out of one's control when it comes to

5 EXPERT ADVICE AND CONVERSATIONS

Shehla Khan
Montessorian
Director of Orange Seeds Preschool chain

Mariam Al Kassab
Owner of KidzVenture Preschools & Edutainment centers
President of Give to learn to grow foundation

Sandra Cason
Farm to School Coordinator

Maliha Ahad
Owner of AIM Consulting and training, Training center for teachers in the Middle East, Africa, India & Pakistan.

Arif Saifie
Father of 2 children in private preschools in Karachi, Pakistan
Financial Controller & Head of investments, UBL, Pakistan

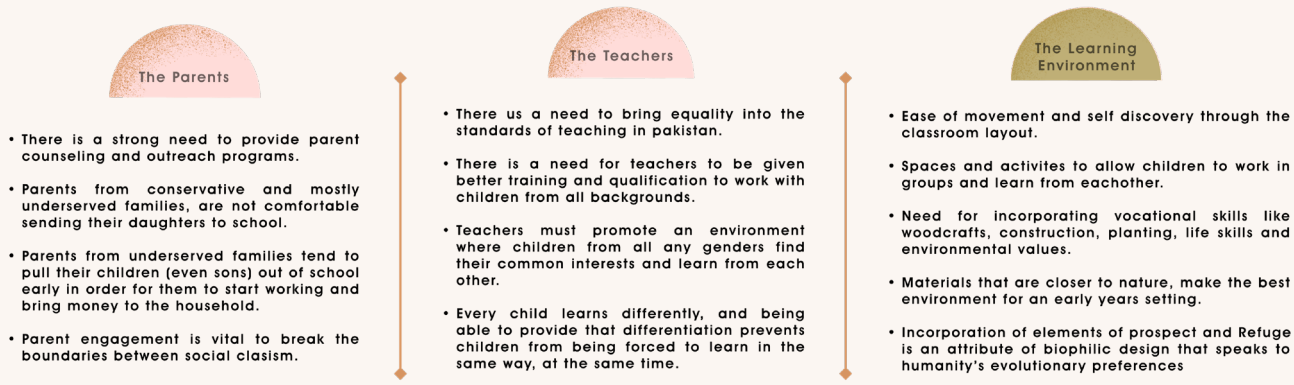
Sarah Kathryn Clark
Interior Designer
Biophilic Design Specialist

Overview

I had the opportunity to speak to a variety of educational professionals, a parent from the target demographic, and a biophilic design expert. The conversations helped me shape and pinpoint key factors to consider when designing the school. One particular statement that emerged from my conversations was the idea that Parents are a child's 1st teacher, their 2nd teacher Is the teacher itself and 3rd teacher is the learning environment.

I used this idea to further classify my research into 3 areas; the Parents, the teachers and the learning environment.

Key insights



The Parents

There is a significant need to provide parent counseling and outreach programs for underserved families in order to ensure they keep their children in school. This will help to make them understand how important education is for girls as well. It is important to have engaging social events allowing parents to socialize with each other to destigmatize the social standard.

The Teachers

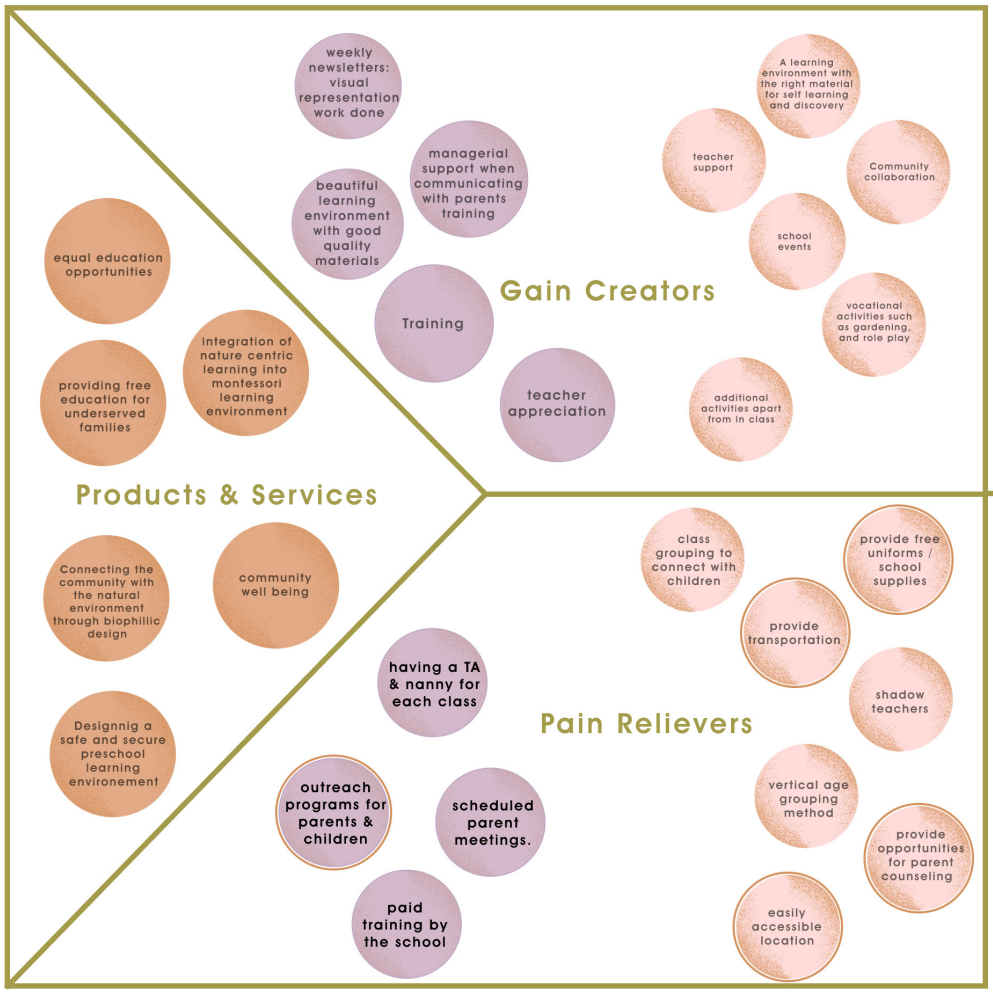
It is necessary to make sure teachers are properly trained and if not, for them to be provided with intensive and proper training as every child learns differently, and being able to provide that differentiation prevents children from being forced to learn in the same way, at the same time.

The Learning Environmnent

With both montessori and the nature centric learning method it is important to have ease of movement throughout the classroom layouts to make sure children are able to explore freely. There is a need to give children hands-on experiences from the start through vocational activities. Adding natural elements into the space through green spaces, natural light, indoor outdoor spaces, design, materials and finishes helps instill a closer connection with the environment.

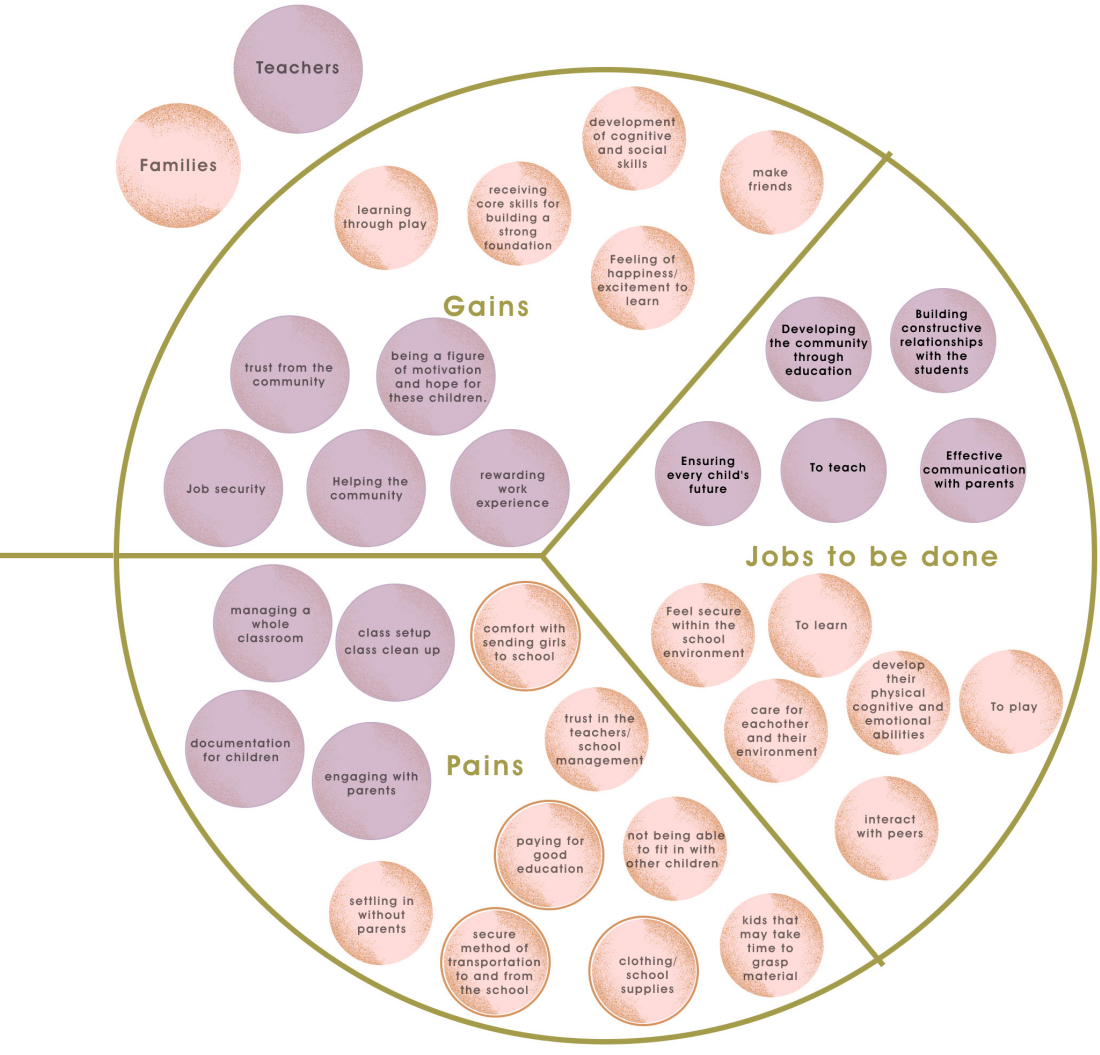
"Parents are a child's 1st teacher, their 2nd teacher Is the teacher it-self and 3rd teacher is the learning environment."

6 THE FINE TUNING



Value Proposition Canvas

Through my insights from my interviews I then used a value proposition canvas to identify what the challenges and benefits would be for my actors, which I classified as families and teachers. I identified some of the major pains specifically for underserved families as comfort with sending girls to school, paying for good education, clothing/school supplies, and a secure method of transportation to and from the school . I classified the correlating pain relievers as providing opportunities for parent counseling, providing free uniforms & school supplies, providing transportation, and an easily accessible location.

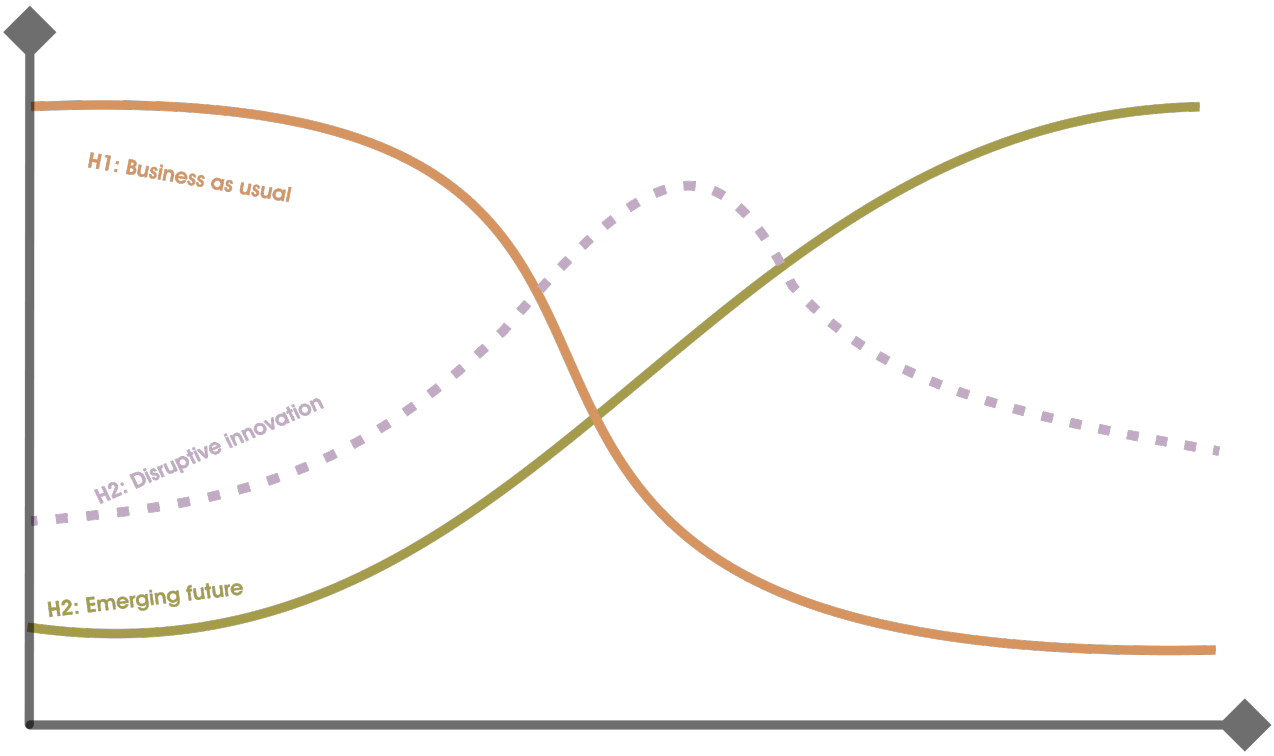


Value Proposition Statement

For the youth of the emerging future of Pakistan, my project will be a nature centric learning environment that shapes and provides the tools to build a solid foundation for lifelong learning.

3 Horizons Models

Based on the 3 horizons model, I identified what the H1 is, what the transitional opportunity on H2 is right now with the ducational Pakistan and what the desired outcome would be



H1

- High amount of out of school children leading to immense poverty and low literacy rate.
- Economic instability, high rates of polution, high rates of inequality within society, inefficient use of natural resources.
- The country is not developing at a pace that it can be leading to an unstable, unsafe and disastrous state of the country at all levels.

H2

- Increasing awareness around the capabilities of investment in quality education for all, providing equal opportunities for people
- Better use of natural resources, switching to renewable energy sources and methods of using resources more efficiently, incorporating more environmentally friendly practices amongst society (recycling, composting, limiting use of wasteful and toxic materials)
- Securing a better future for the people of the country economically, socially and environmentally.

H3

- No poverty
- A country with equal opportunities for everyone.
- A country running on efficient use of natural resources.
- Preservation of the country's natural environment with a low level of pollution.
- A society that feels safe and secure

Primary Goals

- Provide equal education opportunities for all.
- Instill the sense of care and awareness of their natural environment right from the start.
- Designing a Biophilic environment
  To address the issue of gender inequality amongst the current society.
- Acceptance of diversity within society.
- Achieve living building challenge imperatives.
- Better use of natural resources, using renewable energy sources and methods of using resources more efficiently within the built environment
- Incorporating more environmentally friendly practices amongst society like limiting use of wasteful and toxic materials)

The 5 Overarching Goals

- **Eliminate classism.**
- **Eliminate gender inequality**
- **Improve the quality of life for underserved societies.**
- **Enable awareness and care for the environment through design.**
- **Highlight the opportunity for sustainable design within the built environment.**

Starting with the bustling city of Karachi, this school will act as a pioneer to creating a sustainable learning experience right from the start, which would make early years education an accessible option to all, no matter what gender a child is or "financial" background a person is from. This school will also act as a model to defy the existing socio economic and gender imbalances by becoming a female led and run institution at all levels.

7 DESIGN IMPLEMENTATION

Design Statement:

The design of the school will act as a safe physical space that will not only be a top notch education facility but will also help bring society together and address the larger systemic social issues of classism, poverty and gender inequality.

The vision for the physical design of the school is to implement biophilic design by inviting connectivity to the natural environment through the use of direct nature, indirect nature, space and place.

Case Study 1: Bali Green School

An award winning school right from like the architecture, to sustainable initiatives, curriculum focused around nature centric learning The origins of were from Bali, they then become a global movement in education, with schools opening in New Zealand, South Africa, and Tulum. Their 'living' curriculum educates for sustainability through community-integrated, entrepreneurial learning, in a natural environment.

Some of the main features I'd like to particularly highlight about it are

1. Solar energy is an important and material component of Green School's renewable energy and carbon emissions reduction strategy. They have a solar PV and microgrid energy management system, contributing a considerable amount of green school's renewable energy portfolio, adding to their mix towards bringing them to their goal of becoming a carbon positive community member.

2. They also have a micro hydro vortex which also contributes towards their renewable energy portfolio.

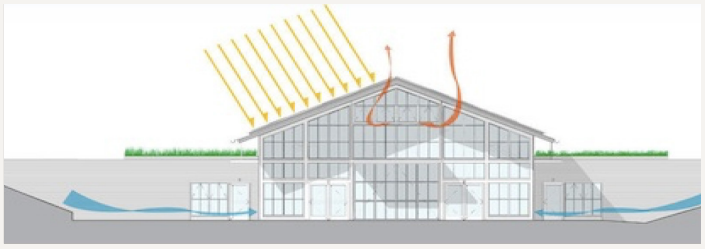
3. Their water filtration system installed is a Reverse Osmosis (RO) water filtration system. The source of their facility's potable water is a 60 meter deep well. Although the well water is drinkable, they decided to install a Reverse Osmosis Biofiltration System to ensure the purity and safety of the drinking water for their community.

4. Green School uses composting as one of its solid waste management strategies. They have a dedicated Compost Station on campus where biomass, kitchen waste and cow manure is collected and composed to create an organic material that is used as nutrient rich fertilizer for the permaculture gardens dispersed throughout the school grounds that supply our kitchen.

5. They are running an aquaponics center on campus as well.

6. Bio Bus is a social enterprise, initiated by Green School students, that strives to provide sustainable transport services to Green School students and community members. The project sponsors setup a cooking oil collection system in the local community. Once cooking oil is collected, it is sent to a processing facility to create the biofuel that is then used by the Bio Bus vehicles to transport students and community members.

Case Study 2: Branson school



Designed as an experiment in sustainability and a model for future programs, this LEED Platinum school commons in California has no solid walls. The facility is located in north San Francisco in the center of Branson School's campus and has a terrace and garden where students enjoy nature-centered outdoor learning.

1. The entire building is flanked by green-roofed supports that manage rainwater runoff and provide insulation, and benefit from its sunny southern exposure.

2. Without doors to cut off air flow or sunlight, which is only possible because of the region's mild climate, the students commons is both naturally lit and ventilated, which slashes its overall energy load.

3. Rooftop photovoltaic panels capture solar energy and recycled concrete aggregate reinforces the school for concrete beams.

4. A large and interactive LUCID screen documents the energy savings and other data resulting from this incredible project, and the information is being used in environmental science classes.

Case Study 3: Tipu Sultan School

Roswag Seiler, German architecture firm developed a school building with eight classrooms as an extension for a campus in the village Jar Maulwi in the west of Pakistan accommodating two kindergarten-groups, five primary-school classes and five secondary-school classes for girls.

In addition, agricultural initiatives are supported and teachers were educated within the project. The ground floor consists of two separate heavy earthen cubes, constructed with the weller technique. The upper level is designed as a light bamboo construction.

The design continues in the local building-tradition while further developing and enhancing technical construction methods with the aim of becoming a prototype for a new locally rooted building typology using natural materials.

The sustainability of the construction was increased by inserting a foundation resistant to humidity, a horizontal barrier and protection against pests. The building was constructed to be both earthquake and flood resistant. Local architects and craftsmen could learn about the enhanced construction techniques, while being part of the realization of the project, ensuring that the knowledge created can be further distributed in the community.

Case Study4: Super Adobe



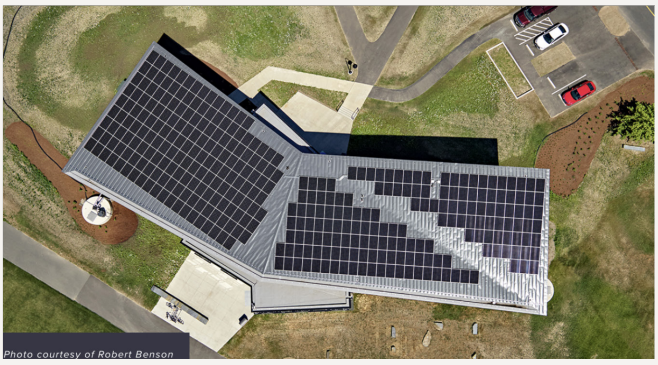

SuperAdobe is a form of earth bag architecture developed by architect and CalEarth founder Nader Khalili. Using long sandbags ("SuperAdobe Bags"), barbed wire, on-site earth and a few tools, Khalili devised a revolutionary building system that integrates traditional earth architecture with contemporary global safety requirements, and passes severe earthquake code tests in California.It is Inspired by traditional earth architecture in the deserts of Iran and adapted for modern usage. Simplified so that anyone can build.

Long or short sandbags are filled with moistened earth and arranged in layers or long coils. Strands of barbed wire are placed between each layer of sandbag to act as both mortar and reinforcement. Stabilizers such as cement, lime, or asphalt emulsion may be added. Similar to how a potter stacks coils of clay to make a vessel, builders stack coils of earth for make a structure.

SuperAdobe is extremely well-suited for building arches, domes and vaults, and SuperAdobe domes are extremely strong structures.

They have passed California earthquake code tests, and withstood a 7.6 magnitude earthquake in Nepal. The same method can build silos, landscaping elements, or infrastructure like dams, cisterns, roads, bridges, and for stabilizing shorelines and watercourses.

Case Study 5: R.W Kern Center



The R.W Kern Center is located on a previously developed master-planned college campus surrounded by campus development. Originally, the site had some level of contaminated soil due to pesticide use in the 1960s and 70s. The land is not considered a sensitive ecological habitat. It has achieved several living building challenge imperatives from each petal (place, water, energy, health & happiness, materials, equity and beauty)

Water petal:

The Kern Center employs a net-positive water system, capturing, treating, and disposing of all its own water on site. Rainwater is collected from the roof and stored in two 5,000-gallon reservoirs adjacent to the building; from there it is UV treated, stored in a potable water tank, and pumped to sinks and drinking fountains. The storage reservoir includes an overflow; when the reservoir is full, water is discharged and treated as site stormwater. Kern's composting toilets use no water, reducing the overall water consumption to just 150 gallons per day.

Ecological water flow imperative:
Greywater is collected and filtered through indoor planters in the building's central common space, and through an on-site constructed wetland of native plantings.

Energy petal:

Kern's sustainable design begins with strategies appropriate for a cold climate: passive solar orientation, robust insulation, an air-tight envelope, exterior shades, and triple glazed windows help mitigate against large swings in temperature and humidity typical of the New England climate. The Kern Center's envelope maximizes thermal efficiency, incorporating both low-carbon and LBC-compliant materials.

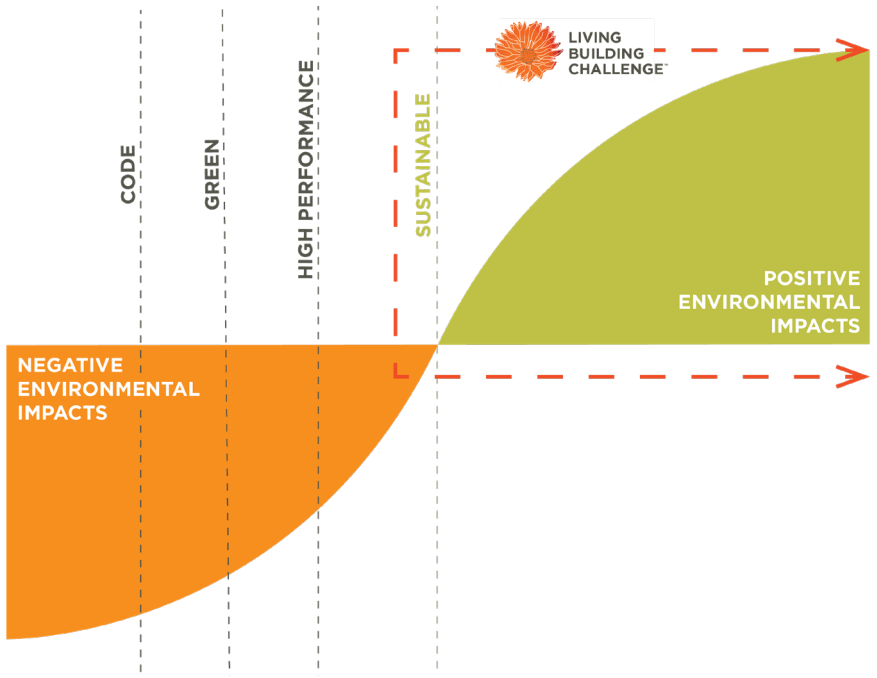
Health & Happiness petal:

Health air imperative: The design team sought to ensure that the building maintained healthy air quality while minimizing the amount of energy expended. This strategy began with a two-part track-off system to keep dirt and particulates out of the building, which helps maintain healthy air and reduce maintenance needs. External metal grates provide the first level of dirt capture, backed up by secondary grates in each vestibule. Ventilation in the building is provided by an Energy Recovery Ventilation system, which operates independently of temperature control and is activated according to CO2 sensors in each space.

The Living Building Challenge

LIVING BUILDING CHALLENGE℠

The living building challenge by the living future institute is a philosophy, certification and a dvocacy tool for projects globally to cross the bridge from being "less bad" for the environment to becoming truly regenerative.



The living building challenge is has 20 imperatives to achieve which are classified into 7 petals.

PLACE

01. Ecology of Place
02. Urban Agriculture
03. Habitat Exchange
04. Human-Scaled Living

WATER

05. Responsible Water Use
06. Net Positive Water

ENERGY

07. Energy + Carbon Reduction
08. Net Positive Carbon

HEALTH & HAPPINESS

09. Healthy Interior Environment
10. Healthy Interior Performance
11. Access to Nature

MATERIALS

12. Responsible Materials
13. Red List
14. Responsible Sourcing
15. Living Economy Sourcing
16. Net Positive Waste

EQUITY

17. Universal Access
18. Inclusion

BEAUTY

19. Beauty + Biophilia
20. Inspiration + Education

PLACE

The intent of the Place Petal is to realign how people understand and relate to the natural environment that sustains us. The built environment must reconnect with the ecology of place and the unique characteristics found in every community so that the story can be honored, protected and enhanced.

For my location I chose a vicinity called sea view which is by Clifton beach, which connects into the Arabian sea. Public wisdom has divided Clifton Beach into two categories: "Ghareebon ka Sahil [the shore for the poor]" and "Ameeron ka Sahil [the shore for the rich]." They believe areas toward the west side are for low-income communities and areas towards the east side are 'reserved' for the rich. Which led me to choose my location between both.

Seaview, Clifton beach, Karachi, Pakistan

Imperative number 1 (Ecology of place) can be achieved by encouraging ecological regeneration through the use of planting trees, and foliage throughout the area and demonstrating a positive contribution to the ecology of the place. As well as encouraging the use of no petrochemical fertilizers or pesticides to be used for the operation and maintenance of the on-site landscape, including urban agriculture.

Imperative number 2 (Urban Agriculture) can be achieved by integrating opportunities for connecting the community to locally grown fresh food. A part of the school's outdoor area will be dedicated to a planting section to grow produce that can be provided to underserved families bringing their children to the school.

I**mperative number 3 (Habitat exchange**) can be achieved by planting trees and green spaces, there lies the potential to achieve as it will allow for the land to remain protected, and serve as a home and regenerative space for other species and animals.

WATER

The intent of the Water Petal is to realign how people value water; to address the energy and chemicals involved in transporting, purifying and pumping water; and to redefine "wastewater" as a precious nutrient and resource.

Imperative number 5 (responsible water use) will both be accounted for by designing the building in a way to allow for rainwater collection, via a pipe system, sending the collected rainwater through a rain chain and down into the water system of the site.

Imperative 6 (net positive water) The water system of the site will be designed as a closed loop system to achieve net positive water via the living machine system. The Living Machine System operates partially underground and partially above ground. It is made up of several components to mimic the process of natural coastal wetlands. The patented tidal-flow technology pumps wastewater into 'tidal-flow' wetland cells (gravel filled planters) which are flooded and drained to oxygenate the wastewater. The beautiful part of the living machine system is that the visible parts of the system are planted with vegetation that not only aids the system, but creates an attractive garden for the space.

ENERGY

Imperative 7 (energy + carbon reduction) and imperative number 8 (net positive carbon) will be achieved by installing a solar power system that allows the entire space to be run on 100% solar energy.

Net positive energy is to be achieved through solar panels installed as part of the roofing of at least one of the buildings and it will also be incorporated as parking shades, and playground shades. To understand the true capabilities of running on purely solar energy I consulted with an architectural engineer specializing in solar panels.

A facility running on solar power will require a battery. The solar grid will provide energy during the day time via the battery and also produce excess energy which will be stored in the batteries for night time use. A solar battery comes in an electrical cabinet which is 4m x 0.8m x 5m (L x W x H) and can be placed in the electrical room of the building.

Once the connected load is identified, the size of the system in kWp is dependent on the total connected load and the loads the electric system is powering. Sufficient solar capacity will be necessary to ensure day loads are covered using solar, and the excess energy produced by the installed solar capacity is stored in the battery for night use.

By designing for and installing a solar grid system with a battery, net positive energy is 100% achievable running solely on solar power. Additionally, using materials that are more energy efficient for the structure of the building limiting the waste of energy are also key elements that will allow the ability to reach net positive carbon.

The solar grid and battery system will be installed by a local company as well called PakSolar.

HEALTH & HAPPINESS

The health & happiness petal is made with the intent for all species to thrive by connecting people to nature and ensuring that our indoor spaces have healthy air and natural daylight. The element of connection with the natural environment allowing for the connection of indoor and outdoor spaces is the basis of my design concept.

I**mperative 9 (healthy interior environment) & Imperative 10 (Healthy interior performance**) will potentially be achieved through the structure of the building, by incorporating architectural elements of the building with natural air circulation within the space. By designing circular buildings with enclosed courtyards in between, the design will have passive cooling within the structure as well.

Each classroom will feature Bigassfans Essence fan, which is a purpose built energy-efficient fan that provides quiet air movement, but designed for massive air circulation. The building will also be designed with large windows bringing in natural daylight and views of the outside. The framework of the school will also have to incorporate safe and regular cleaning and hygiene practice to ensure a healthy interior environment.

Although the school is situated in a rather urban environment, it will still have access to the outdoors by incorporating a multi sensory outdoor play area to allow children to play and be outdoors. The indoor outdoor layout of the school exhibits the feeling of being almost outdoors, yet still being in a secure environment.

MATERIALS

Imperative 12 (responsible materials) and imperative 14 (resppnsible sourcing) are achieved with the 4 primary materials used for the structure are Glass fibre reinforced concrete, aluminum composite material, saif cool energy saving glass and local FSC recycled Deodar cedar wood.

Glass Fiber Reinforced Concrete:

For coastal cities like Karachi, using concrete is beneficial and almost a necessity to withstand exposure to high winds with sand and salts that cause steel corrosion and concrete spalling. Glass fibre reinforced concrete is currently a good solution that is locally produced and used in construction in Karachi. A company called T-rod international are local manufacturers of this type of concrete, some of the benefits are below. Some of the major benefits of using glass fibre reinforced concrete are that it is lightweight, it's stronger than steel, non-conductive to heat and electricity making it more energy efficient, high fatigue endurance and impact resistance, non-corrosive, rust free, it's cost effective, it's got a lower carbon footprint, non toxic, less energy intensive with cutting and machine work and it's easier and quicker to install.

Aluminum composite Panel:

Alucobond is a type of aluminum composite panel. The aluminum that's used in manufacturing alucobond contains 85% recycled materials on average and earns LEED certifications as well with materials and resources (recycled content and regional materials) and innovation and design process. 99.9 percent of all fugitive volatile organic compounds are captured and excess paint is recovered and used to cover the non-visible side of Alucobond. Also, Alucobond is fully recoverable and the polyethylene found in its core is an incredibly energy efficient material to recycle and reuse indefinitely. Alucobond offers long-term color consistency, weather resistance, excellent flatness, rigidity and formability, and ease of maintenance.

Alucobond has also been chosen as the sustainable metal panel chosen for many outstanding LEED accredited projects. Alucobond is being sourced by a local company in Karachi called Pakistan Safety Glass, this company happens to be situated very close to the site location as well. Making it an ideal material to be used for any metal features for the project.

Energy saving glass:

Saif cool glass is a type of glass being supplied and manufactured by a local company called pakistan safety glass, it is a double glazed glass which allows heat insulation, uv resilience and energy efficiency. With Karachi being a coastal city prone to humidity and heat, it's vital to ensure proper insulation throughout the building. Although we'd like to allow natural sunlight into the building, saif cool glass allows the heat insulation to remain comfortable on the inside, as well as uv protection from harmful rays.

FSC Recycled Deodar Cedar wood:

Deodar cedar wood is a natural from the northern areas of pakistan. It is very widely used for construction and architecture in Pakistan as the preferred local wood due to its strength and durability. The SGS group of Pakistan, is a company that supplies certified FSC recycled deodar cedar wood.

EQUITY

Imperative 17 (Universal access)
The space will be designed to ensure easy access and movement for individuals with physical disabilities, by being designed at one level. The Montessori curriculum is based on self paced and directed activity which allows for inclusion of children with special needs as well through its vertical age grouping method, and the availability of a shadow in the class for children that may need the extra support. Imperative 17 will also be achieved by ensuring no obstruction to the natural sea view and to intrude the ways of accessibility for neighboring communities and neighborhoods.

Imperative 18 (Inclusion)
will be achieved by designing a safe educational environment accessible to all. The framework and structure of the school has been designed as a conscious framework for defying the existing socio economic stigmas amongst society, allowing for social inclusion and equal opportunities to students from all financial backgrounds and all genders. The school is also being designed with the idea of being female led and managed on all levels. Additionally design and construction materials and resources will be locally procured and supplied, to ensure the inclusion and skillmanship of local companies.

BEAUTY

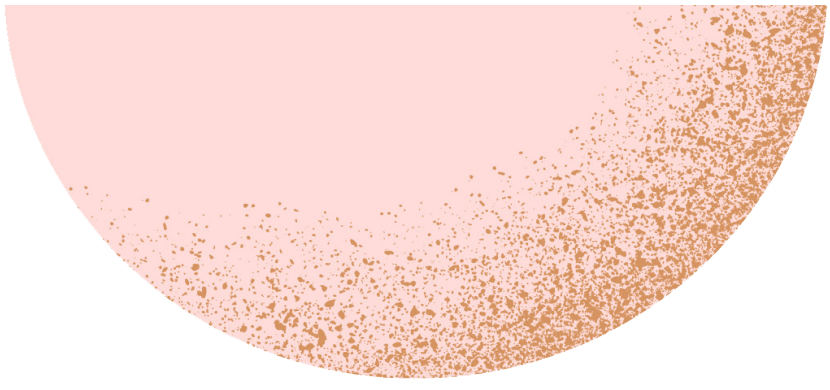
Imperative 19 (beauty + biophilia)
The physical structure of the school has been designed based on the natural environment it is situated in, Sea view. The curved layout mimics the freeform aesthetic of natural waves. The pathways are designed with the concept of wave currents and the way currents lead us. Based on keller's framework for biophilia, the direct experience of nature is perceived through natural air ventilation, natural sunlight within the space, large windows that look on to the view of the sea and by planting local trees and plants throughout the environment, and designing an organically shaped water feature within the space to instill calmness and serenity.

The indirect experience of nature is perceived through the use of natural materials, such as local dedar cedar wood, natural concrete wall texture, the use of geometric circular shapes to design each area, designing a multisensory outdoor play area using natural wood materials for children to engage with the outdoor environment within a safe space.

The experience of space and place has been included by designing with the concept of prospect and refuge in mind. Prospect focuses on experiencing long distances which are incorporated using high ceilings and large windows to instill the feeling of openness. and refuge emphasizes enclosed spaces that facilitate feelings of intimacy and security, which is depicted in the way each classroom has been designed as an enclosed space.

Biophilia also incorporates embracing the culture and history of a space, which I have exhibited through the architectural structure of the building, the aesthetic is a modern derivative of traditional Pakistani architecture. I have incorporated locally made natural marble stone tiles for the connecting corridors, and accents of a heritage sindhi tile laid in the common areas of each circle. The school can also portray local art done by local artists and children from the oncology unit at Indus hospital.

Imperative 20 (Education and Inspiration)
Imperative 20 is achieved by the foundation of the school itself, providing an equal opportunity towards early years education for all. By designing the school using sustainably conscious materials, closed loop systems and renewable energy sources, the structure on it's own is a medium of awareness and education to other companies. It shows the potential of designing with key sustainable ideologies in mind.

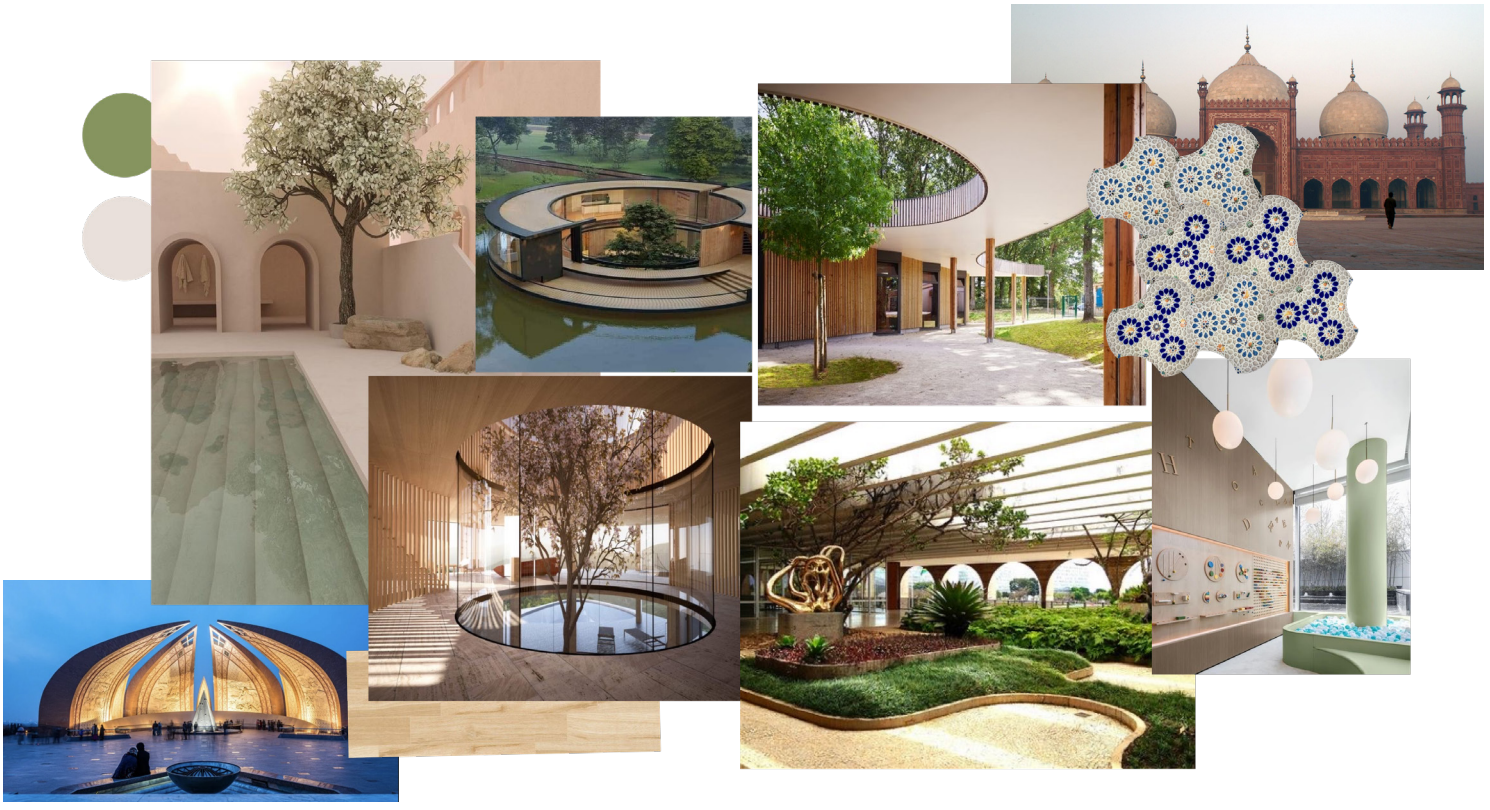


INSPIRATION

By taking inspiration from my case studies, and using the living building challenge imperatives as a foundation to design the different elements of the school i was able to curate a visual representation of what a model school could look with the social and environmental elements being the framework of it's foundation.

MOODBOARD

The moodboard was created to depict the architectural aesthetic and flow I was trying to achieve through the built strucuture. It also depicts the potential materials and the local architecture inspiration for the building as well.

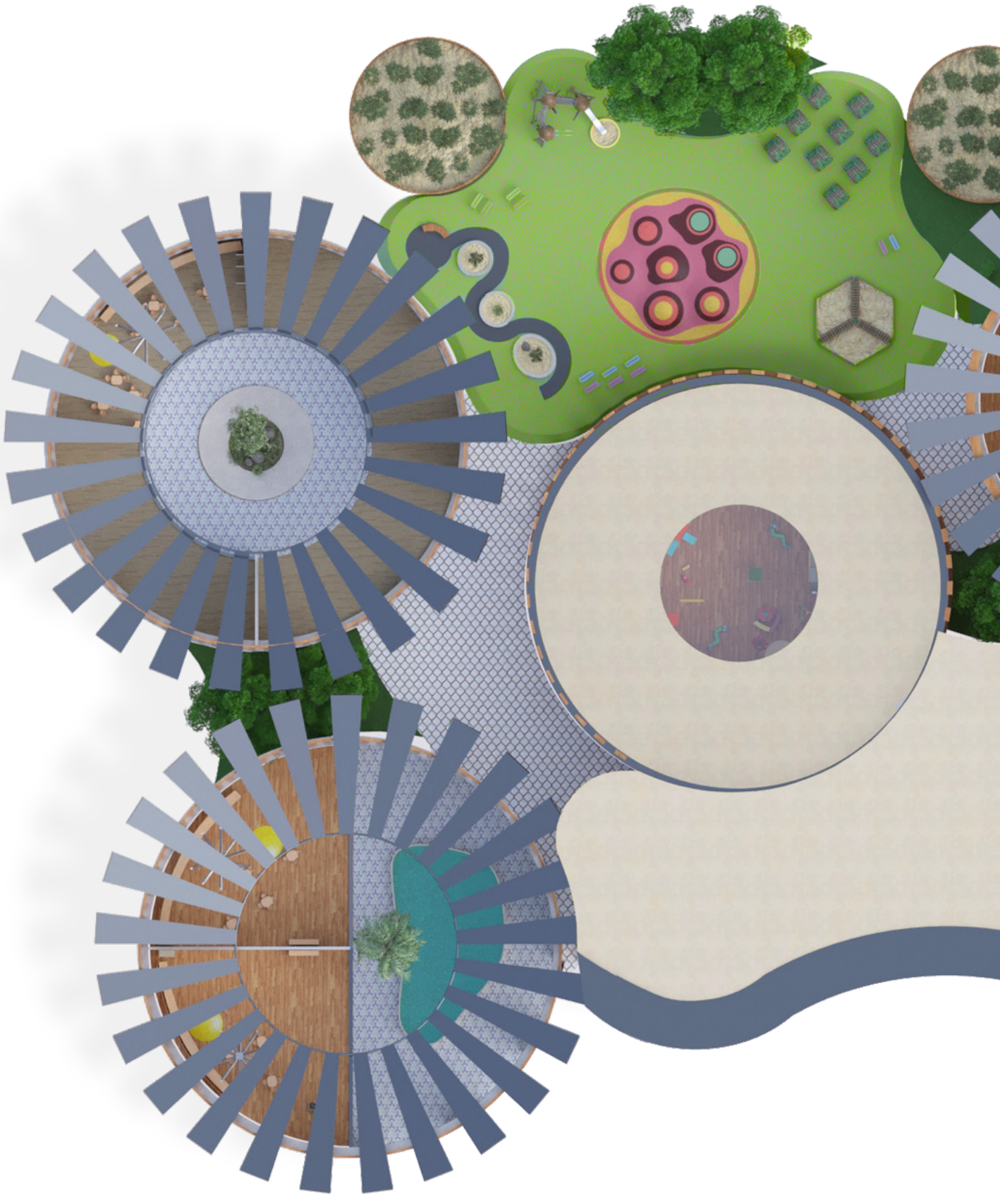


8 THE FINAL DESIGN

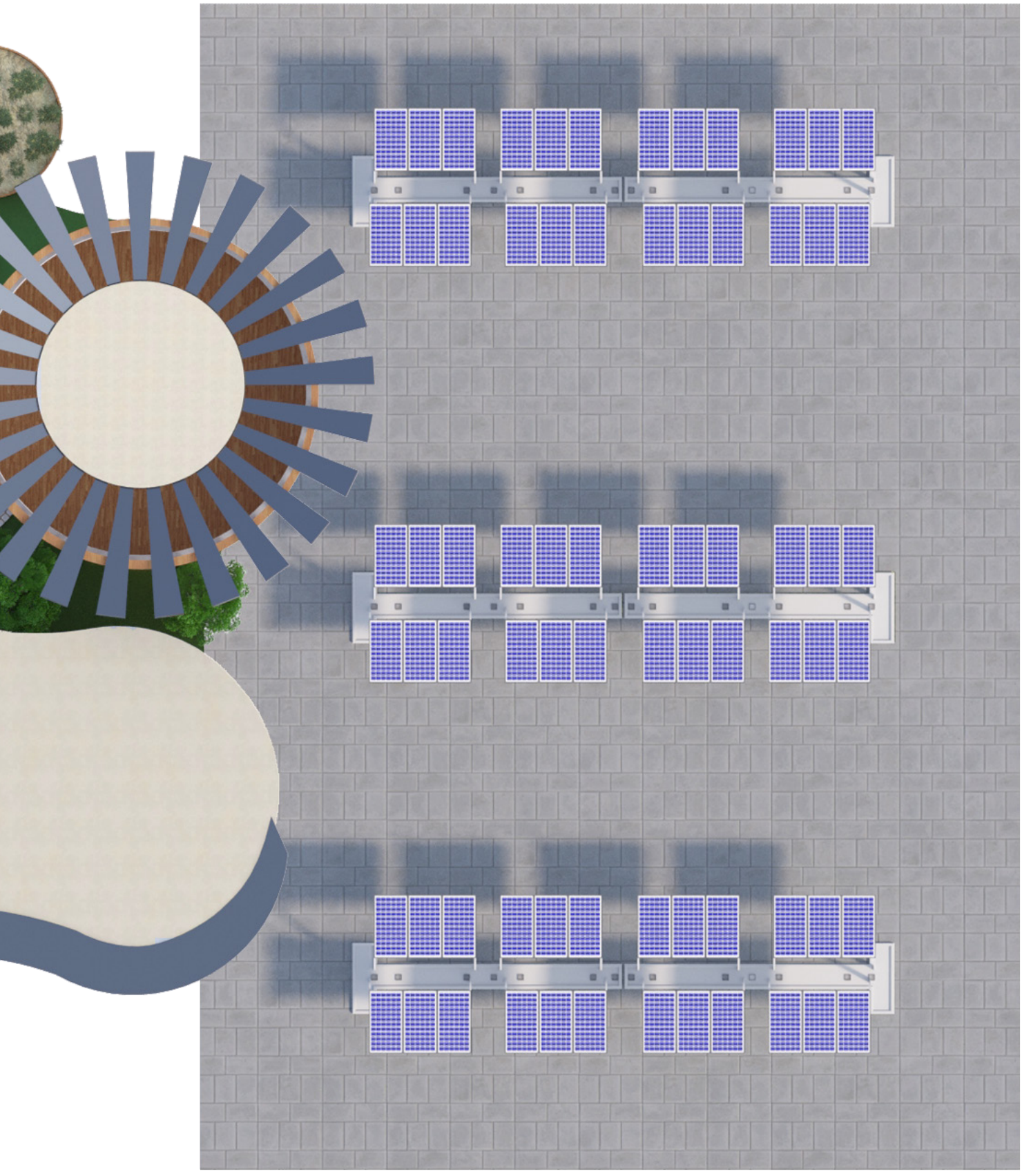
Arifa is designed as a model to defy the existing socio economic inequalities and gender imbalances by becoming a female led and run institution at all levels that accepts children from all genders and backgrounds.

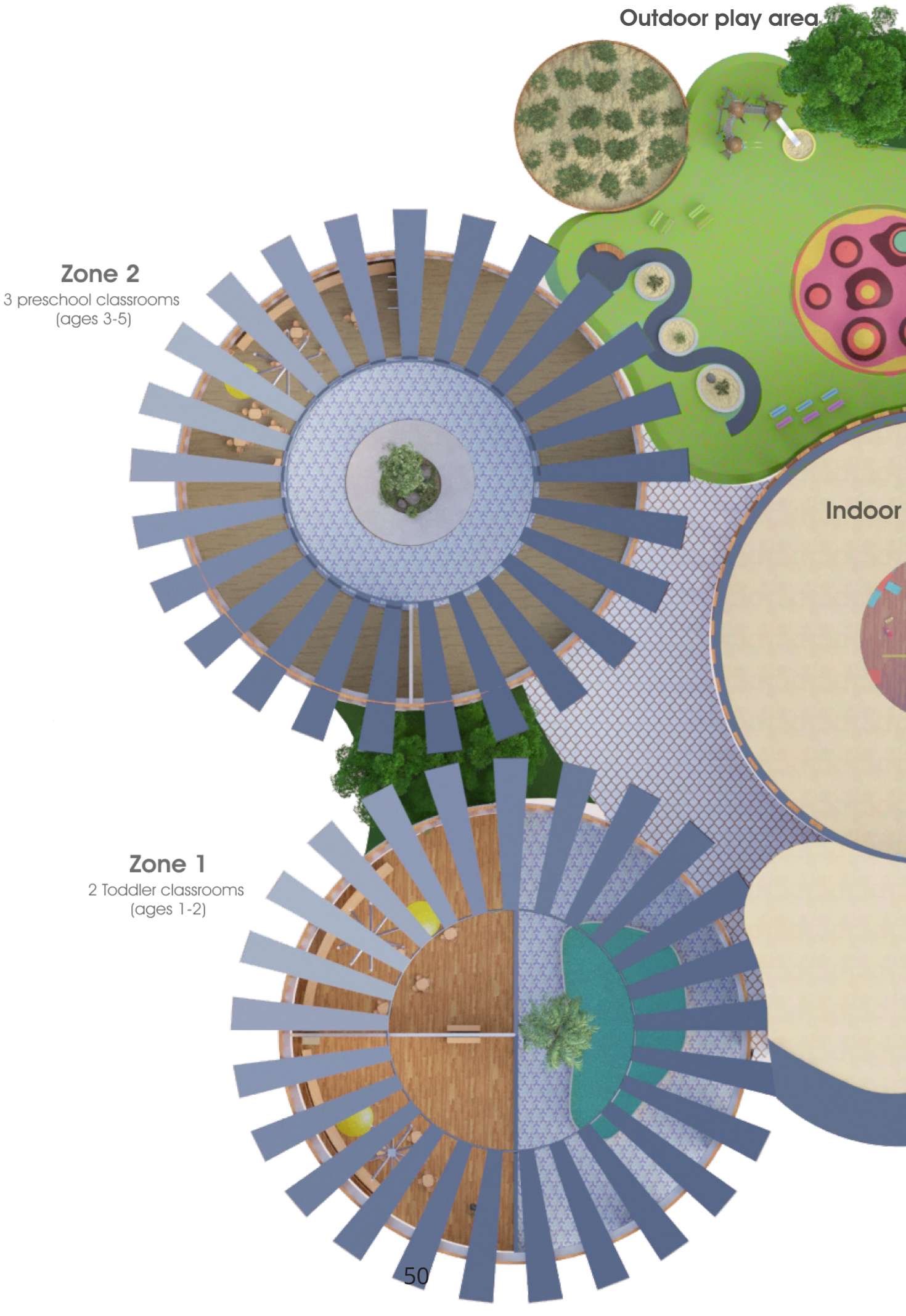
This is a word filled with meaning and intention. Not only is it grandmother's name, it is also derived from an Arabic word meaning Intelligent; well-educated; the one who is knowledgeable, making the name a perfect fit for the institution.

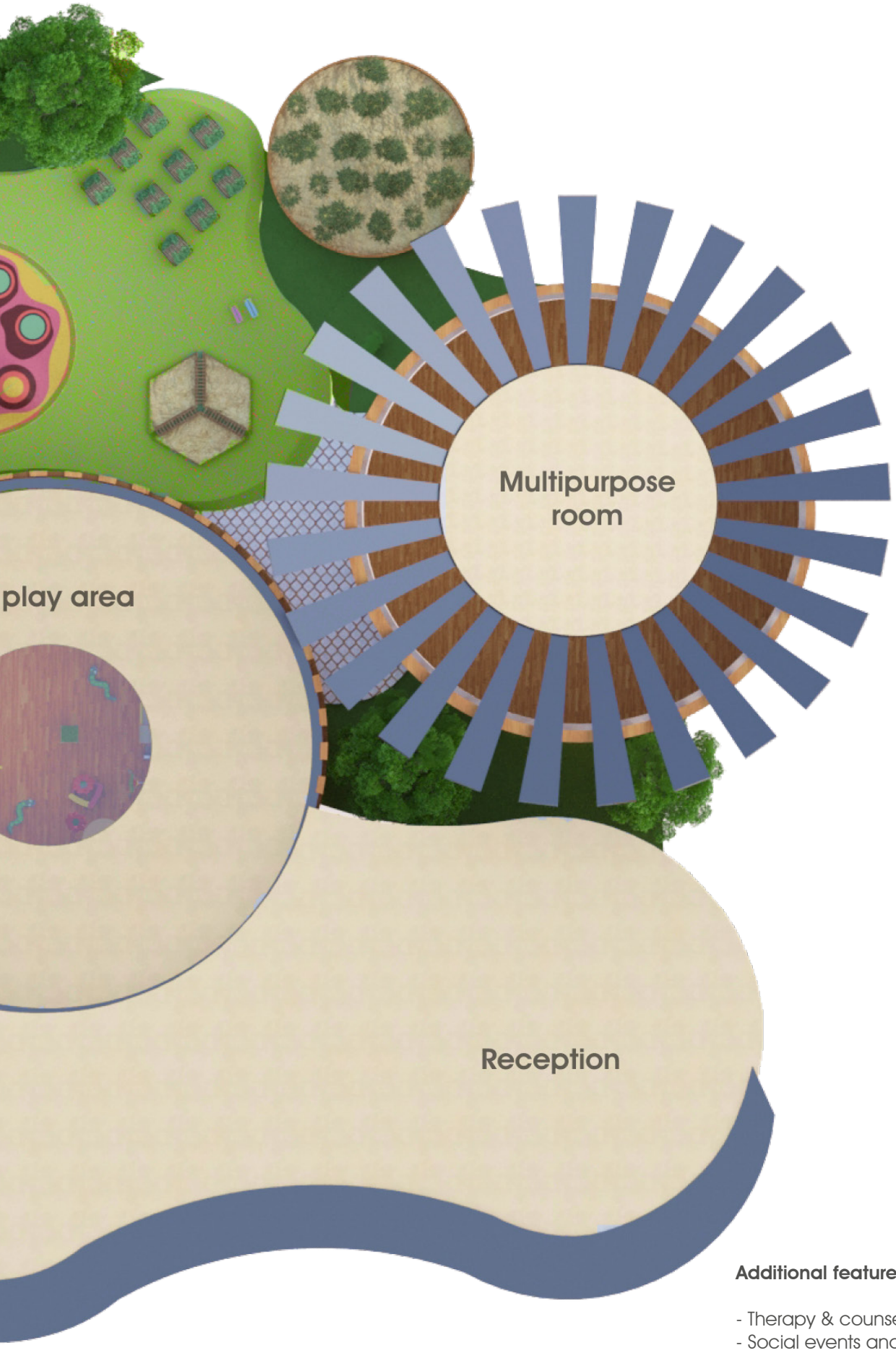
The national language of pakistan is urdu which is made of arabic as well. So the idea was to keep a name that could be easily pronounced and relatable to the general society as well. The logo's design was made with the calligraphic scripture of the word Arifa along the unique curved shape of the school's layout.



Top view of entire school area




Outdoor play area
Zone 2
3 preschool classrooms
(ages 3-5)
Indoor
Zone 1
2 Toddler classrooms
(ages 1-2)

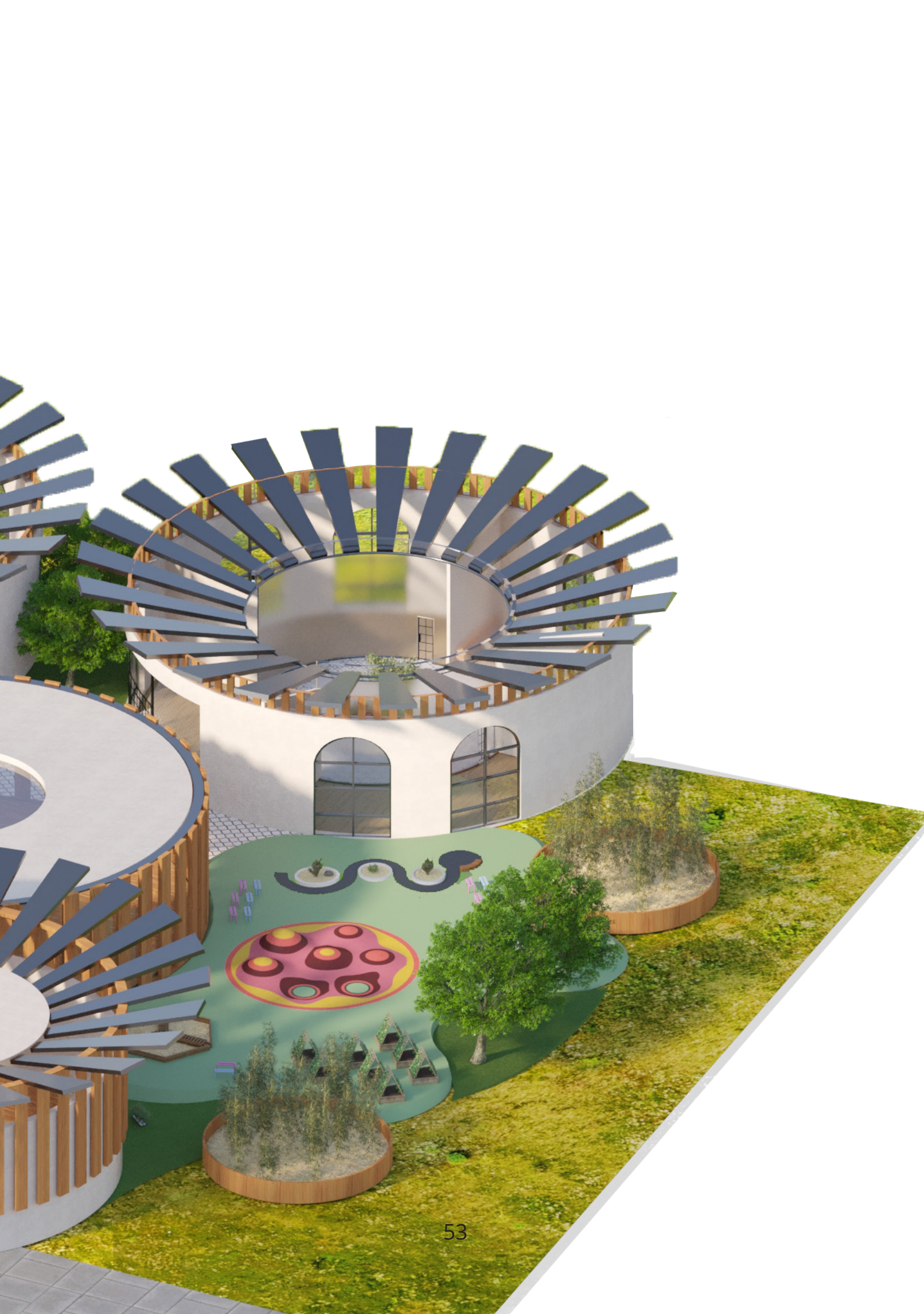


Additional features:

- Therapy & counseling room
- Social events and activites at the multipurpose room
- Role play town & soft play area in indoor play zone.

Concave roofing with aluminum composite panels. Concave roofing allows for the redirection of the wind, to ensure nature air circulation within the natural courtyard area. The extended roofing acts as an awning to provide shade from the sun.

Extended awning

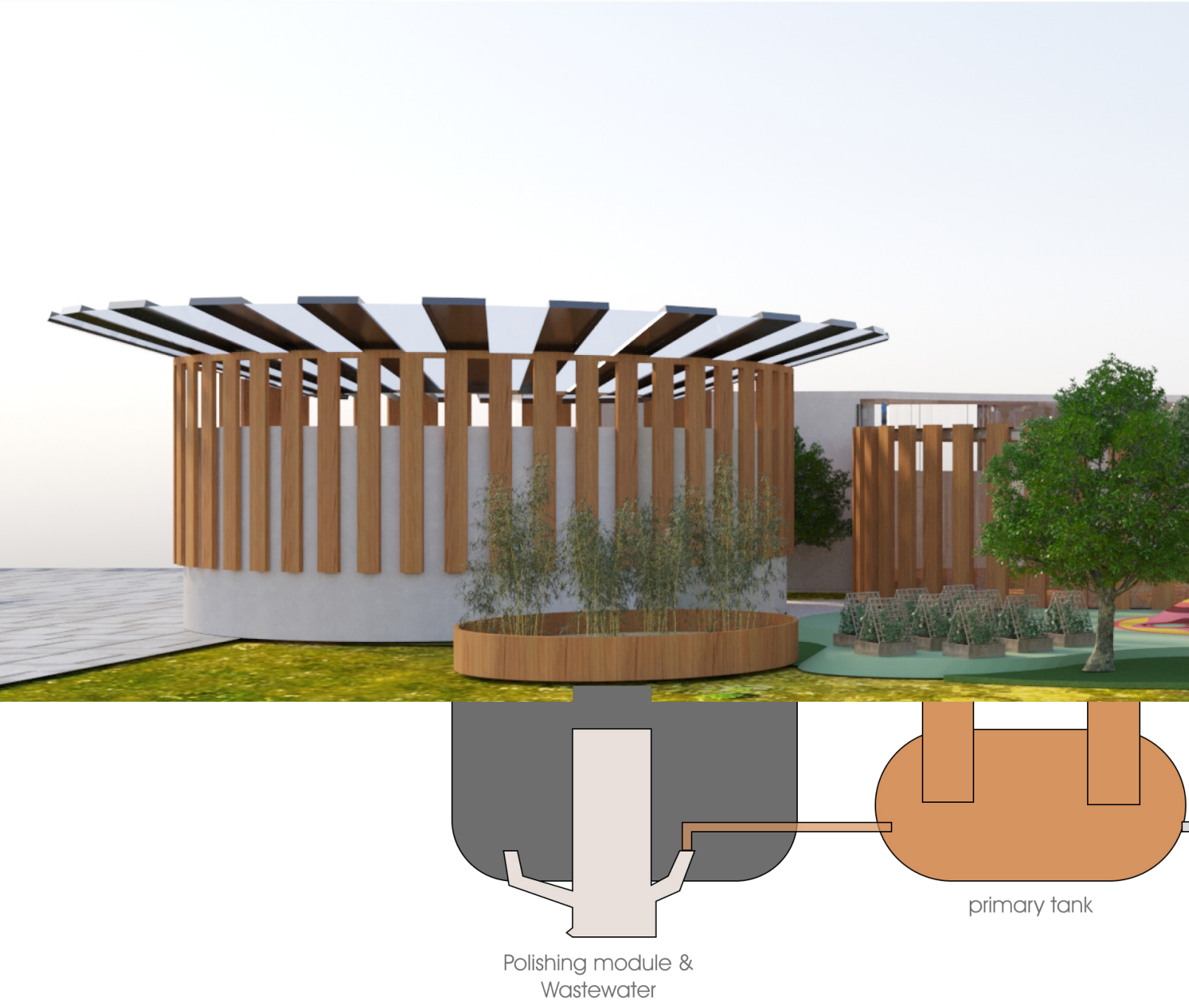


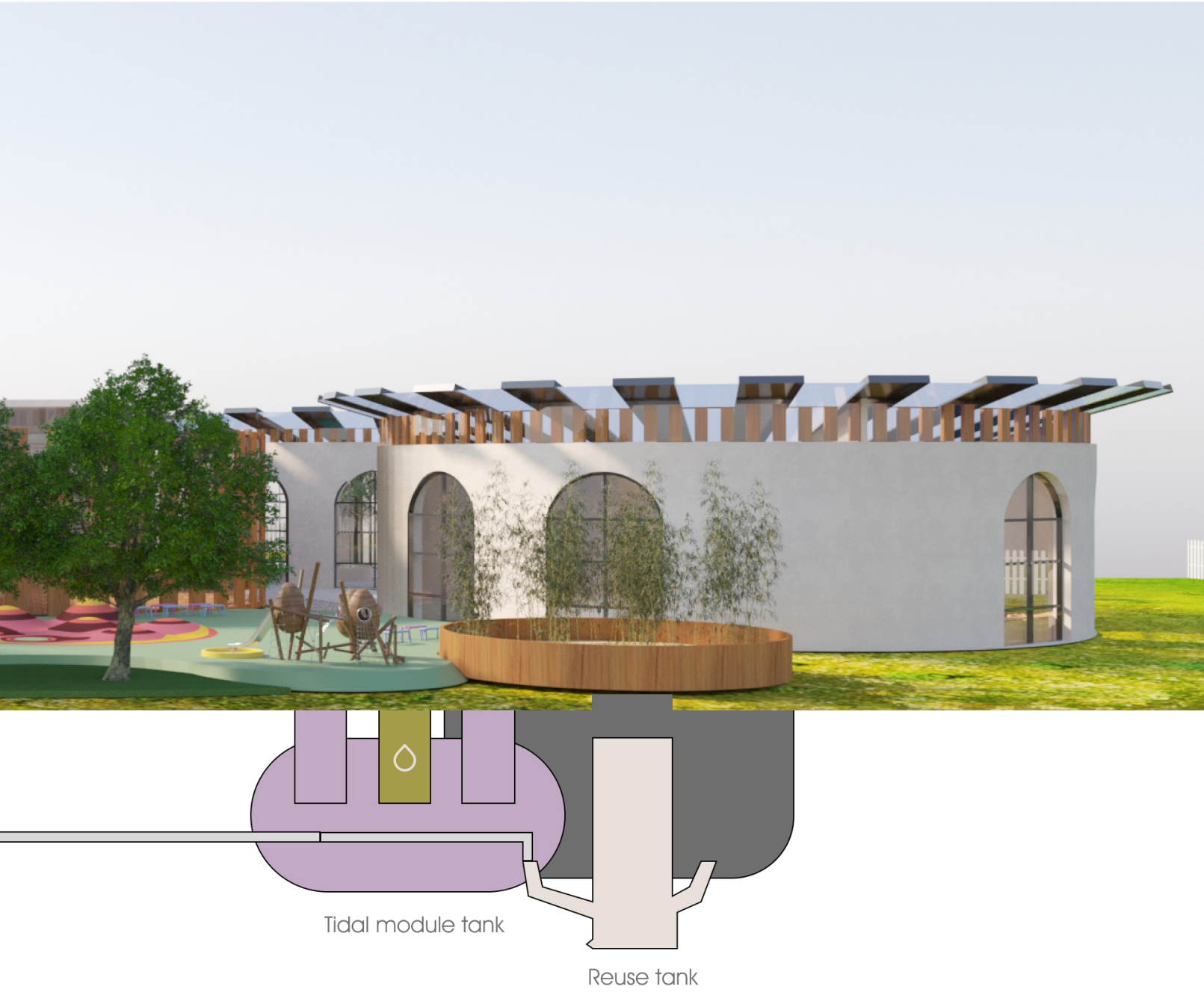
Front Elevation:

Showing the arched windows, glassfiber concrete structure,FSC recycled wood paneling, and saif cool glass


FSC Recycled Cedar
Deodar Wood
Saif cool glass

Back Elevation:
Showing how the living machine system will be incorporated.



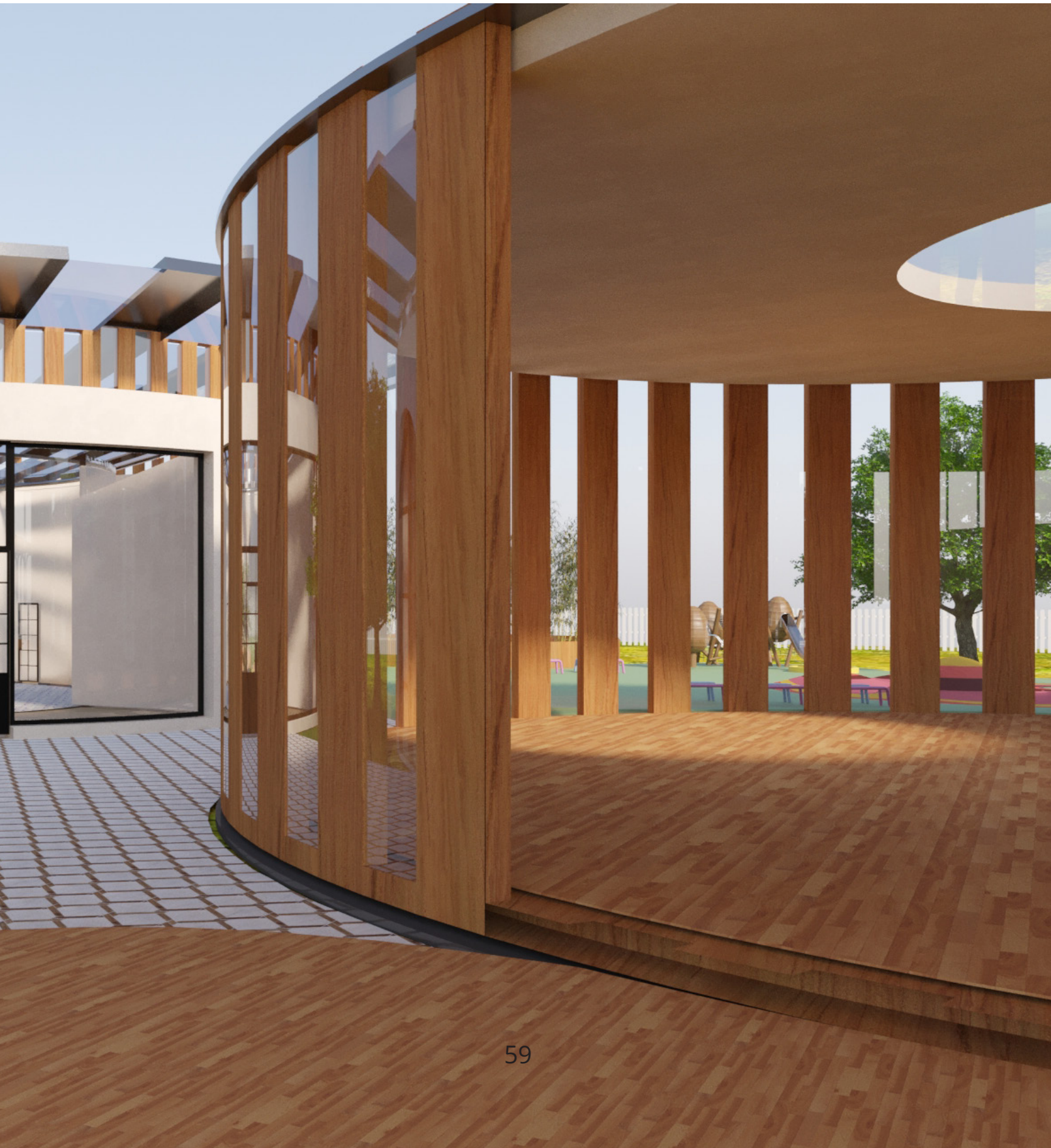


Tidal module tank
Reuse tank

Connecting pathways:

The pathways are designed with the concept of wave currents and the way currents lead us acting as connecting elements between the different areas.

The flooring used here is local marble tile made by a company called Paktile that works with scrap marble. Marble flooring maintains a calm and cooling effect throughout the space. The wood specified for this project is FSC recycled local Cedar Deodar wood, found in northern parts of pakistan, and being certified adn refurbished by a local company as well.




Rainchain
Rainwater
collection piping

Zone 2 has 3 preschool classrooms for ages 3-5 years. Zone 2 is designed as a more circular courtyard, with a tree feature. Both zones, have walkways paved with local Sindhi mosaic tiles. The Rain water collection system through the rain chains is present here too, however the rain chain's direct the water strsight down into the water system.

Zone 1 has 2 toddler classrooms fro ages 1-2, Zone 1's courtyard features a water feature to instill a sense of tranquility within the space, a key feature to highlight here is the rain chains, being directed straight into the water feature, The rain chains allow for the collection of rainwater coming down the concave roofing into collection piping and then transferred down the rain chain and into the water system.

Toddler Classroom

Preschool Classroom

Classrooms:

All classrooms in both zones are designed to have large windows allowing natural light and the views of the sea, they are planned to have an unobstructive floor plan to allow free movement, and for teachers to have the liberty of setting up their classroom the way they would need to.

Each Toddler classroom will have a sleeping area, and soft play corner as well.

Zone 2's classrooms are designed for vertical age grouping. So, each classroom has a toilet and changing area for the children.

Both classrooms in Zone 1 and 2 Feature the Essence fan by bigassfans which are designed for energy efficiency and maximum air circulation.

The classrooms are designed keeping room for space bubbles if needed, and segregation for parents that may be conservative, and not want genders interacting with each other. Larger classrooms allow for the possibility for teachers to create separate areas within the same class environment.

Both classrooms have a space for circle time, and are currently designed to start with a capacity of 16 children but can go up, once the amount of students grow.

The montessori curriculum is paperless, and uses only natural materials in the class. Most montessori teaching material is made of natural wood.

Age 1.5 years

Age 3.5 years

Age 3 years old

Children of various ages using montessoir material in a montessori learning environment in their own way

Outdoor Play area:

The outdoor play area is designed as a multisensory play area, with a cycling track, an outdoor play structure, bouncy hills, a sandp and water play are and a planting & gardening area, to grow local herbs and vegetables which can eventually be distributed and given to underserved families with children in the school. The play area provides the children with a safe space to experience being in the natural environment. The flooring of the outdoor play area is Nike Grind Flooring which is made of broken down sports shoes and supplied to manufacturers who then make it into sports flooring.

UN SDG's

Keeping the UN SDG's in mind, at the end of the project I re evaluated which one's were specifically being addressed. With the sustainable development goals being a global starting point achieving. Not only will The physical space of The school be a sanctuary that provides security and a quality education to students, but it will also help address quite alot of the UN SDG'S starting with the systemic social issues of classism, poverty and gender inequality.

NO POVERTY

1.1, 1.4, 1.4.1, 1.5

1.1: By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day

1.4: By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance

1.4.1: Proportion of population living in households with access to basic services

1.5: By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters. Building resilience through education the provides future opportunities for individuals to be more stable through economic and social turbulence.

QUALITY EDUCATION

4.1, 4.2, 4.5, 4.A, 4.C

4.1: By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes

4.2: By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education

4.5: By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations

4.a: Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all

4.c: By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing States

GENDER EQUALITY

5.1, 5.5, 5.5.2, 5.C, 5.C.1

5.1: End all forms of discrimination against all women and girls everywhere

5.5: Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life

5.5.2: Proportion of women in managerial positions

5.c: Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels

5.c.1: Proportion of countries with systems to track and make public allocations for gender equality and women's empowerment

6.3, 6.4,
6.5, 6.A

Ensure availability and sustainable management of water and sanitation for all

6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally

6.4: By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity

6.5: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate

6.a: By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies

7.2, 7.2.1,
7.A, 7.B, 7.B.1

7.2: By 2030, increase substantially the share of renewable energy in the global energy mix

7.2.1: Renewable energy share in the total final energy consumption

7.a: By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology

7.b: By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support

7.b.1: Installed renewable energy-generating capacity in developing countries (in watts per capital)

8.2, 8.3,
8.5, 8.6

8.2: Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors

8.3: Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services

8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value

8.6: By 2020, substantially reduce the proportion of youth not in employment, education or training

INDUSTRY, INNOVATION AND INFRASTRUCTURE

9.2, 9.4, 9.A, 9.B

9.2: Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries

9.2.1:Manufacturing value added as a proportion of GDP and per capita

9.2.2:Manufacturing employment as a proportion of total employment

9.4: By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities

9.a: Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States

9.b: Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities.

9.b.1: Proportion of medium and high-tech industry value added in total value added

REDUCED INEQUALITIES

10.1, 10.2, 10.3, 10.4

10.1: By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average

10.1.1:Growth rates of household expenditure or income per capita among the bottom 40 per cent of the population and the total population

10.2: By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status
10.2.1:Proportion of people living below 50 per cent of median income, by age, sex and persons with disabilities

10.3: Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard

10.3.1: Proportion of the population reporting having personally felt discriminated against or harassed within the previous 12 months on the basis of a ground of discrimination prohibited under international human rights law

10.4: Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality

12.8, 12.8.1,
12.A, 12.A.1

12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse

12.8: By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature
12.8.1:Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment

12.a: Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production
12.a.1: Installed renewable energy-generating capacity in developing countries (in watts per capita)

13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
13.3.1:Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment

15.3.15.9

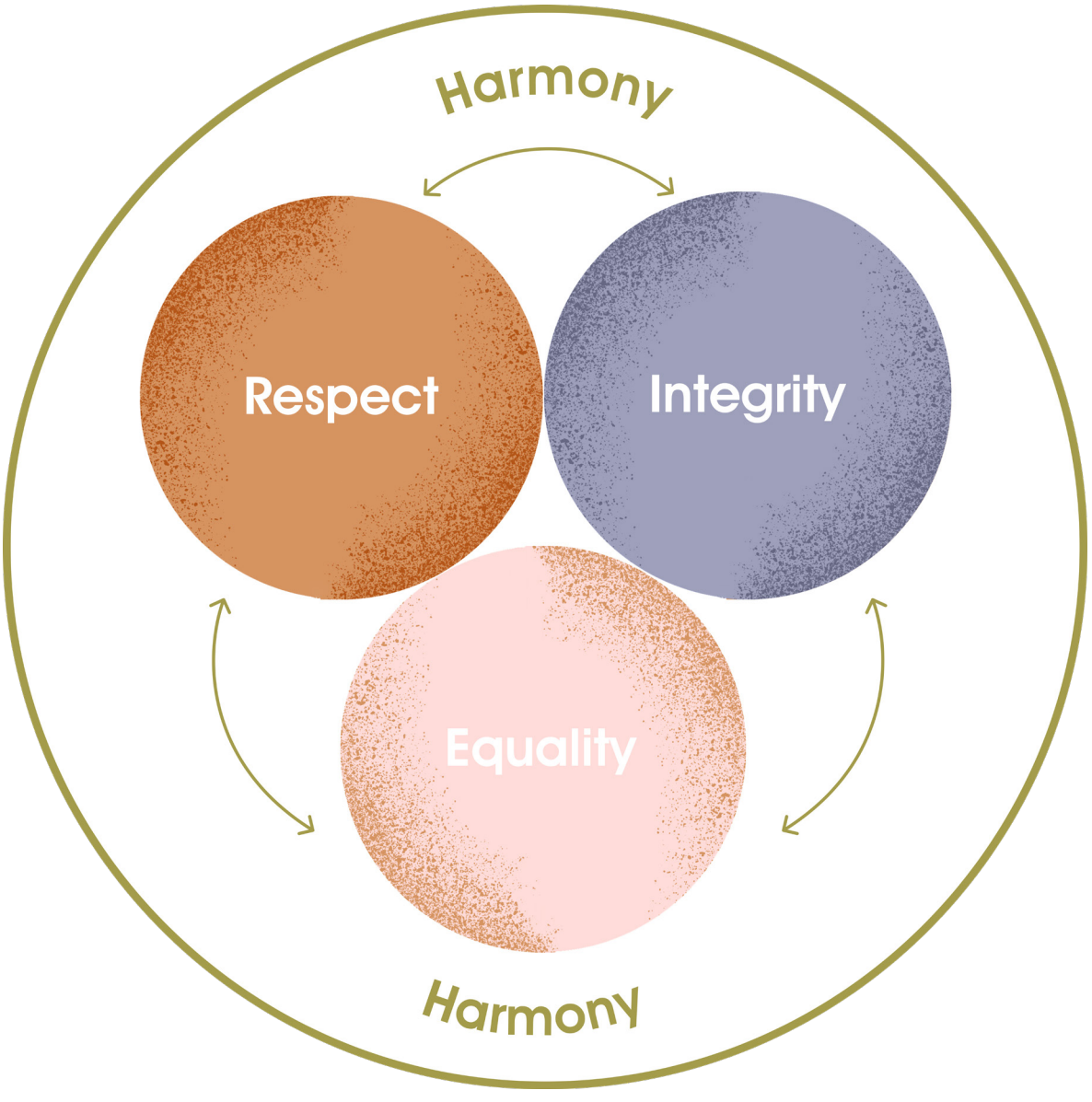
15.3: By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world
15.9: By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts

9 CONCLUSION

As designers we don't challenge design by simply creating additional spaces that are visually aesthetic or the embarking on an innovative design process by utilizing safer materials and renewable energy as sources for our structures.. However as designers for sustainability we challenge design by instilling change through fundamental awareness of systemic structure and space.

Through understanding the research and curating the concepts I learnt from my conversations with various industry professionals in the field of education led me to creating this design framework. Arifa is a visual representation of a model school that has been designed based on this framework of respect, integrity, equality and harmony.

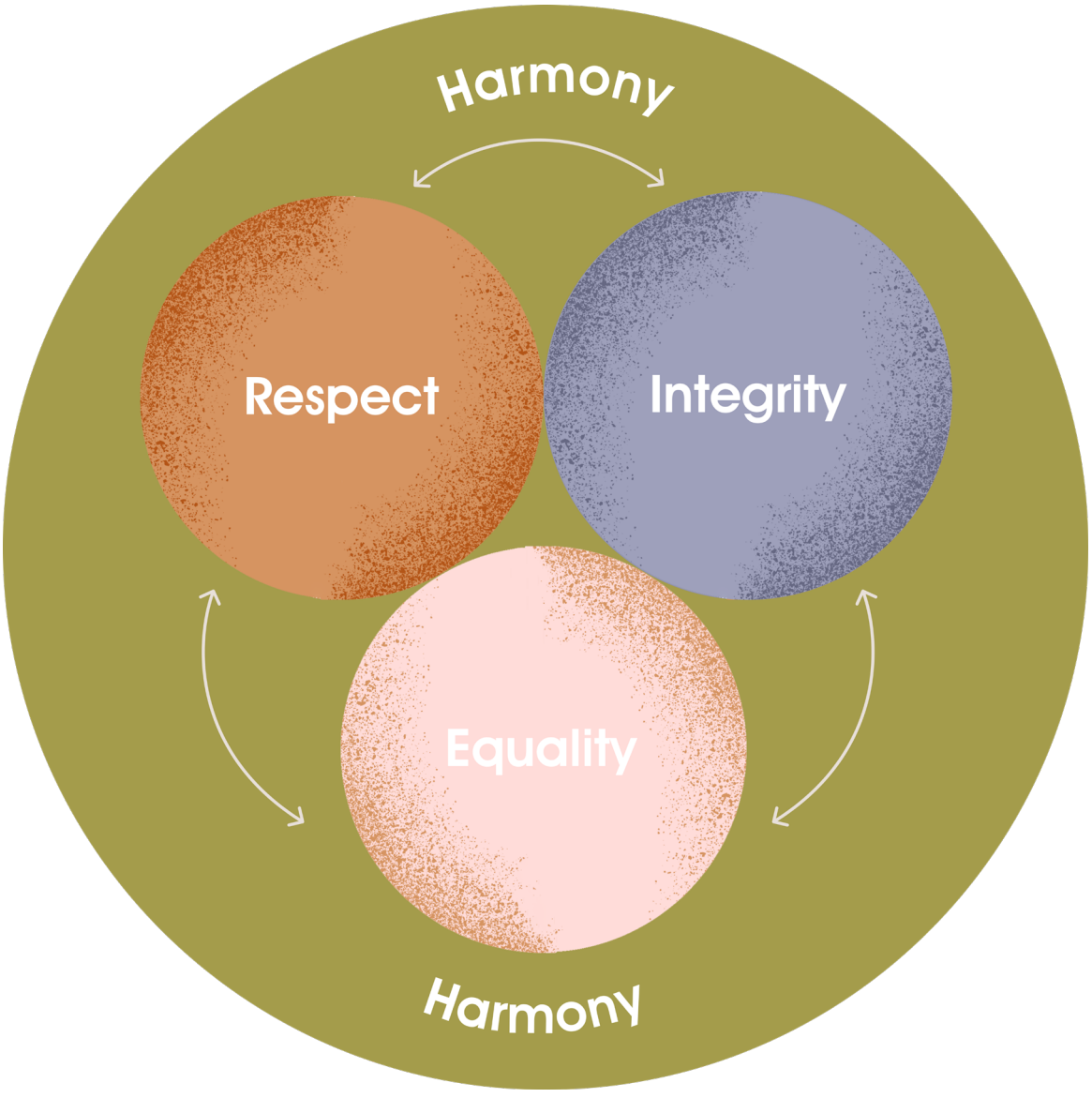
THE DESIGN FRAMEWORK



Respect will be achieved, amongst society, by creating an inclusive environment that breaks the barriers of social classism and exclusion within society. Through forming relationships with each other socially, we are enabling students to understand one another and in turn respect each other no matter their socio-economic background.

Integrity relates to being honest, showing a consistent and uncompromising adherence to strong moral and ethical principles and values with regards to transparency with parents, teachers, and employees. Maintaining a medium of honesty within the space is crucial to our foundation.

Equality ties in the reality of creating an environment that is inclusive within its space, values and opportunities. To create a space that allows for all genders to learn and feel empowered from the level of students to upper management. Our goal is to create an environment where all employees, teachers and students are given fair opportunities and resources to perform to their maximum abilities.



And then we have Harmony. Harmony may be achieved through space by building a relationship with the natural surrounding environment. Giving a sense of belonging and care for the environment within each student, teacher and user. By maintaining respect, integrity and equality we can achieve harmony through energies that are transmitted within the spaces created. Children from various backgrounds will be entering this environment and taking back what they absorb at home, whether a child is coming from a troubled home, lavish home, a home in shambles, a negative home environment, or even a home full of love and happiness. Once they enter this learning environment, they should feel nothing but tranquility, security, love and harmony.

From educating the current industry, with the introduction of safe building standards and environmental friendly practices, to educating parents on the importance of securing their child's future. We are building a future for the youth of Pakistan to become leaders, creators, scientists, doctors, artists, designers and so on of this planet we all call home. Arifa is a model that truly depicts how education can pave the path towards the emerging future of a developing nation like Pakistan.

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