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STEAM Machine
A Regional Platform for Science, Technology, Engineering Arts & Maths in Tanzania

MASTER'S THESIS

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Supervisor

Univ. Prof. Dipl.-Arch. Petra Petersson

Institute of Construction and Design Principles

Graz, March 2018

AFFIDAVIT

I declare that I have authored this thesis independently, that I have not used other than the declared sources/resources, and that I have explicitly indicated all material which has been quoted either literally or by content from the sources used. The text document uploaded to TUGRAZonline is identical to the present master‘s thesis dissertation.

Date	Signature

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Abstract:

STEAM Machine
SCIENCE, TECHNOLOGY, ENGINEERING, ART, MATH
Learning-Machine

Tanzania, a member state of the East African Community, has aspirations to transform its economy into a semi industrial, middle-income economy by the year 2025. As outlined in its manifesto “Vision 2025’, education is a fundamental priority for harnessing its natural resources, stimulating competitiveness and fostering innovation amongst its rapidly increasing young population; one of the fastest growing in the world.

The present state of educational infrastructure is nowhere near the necessary capacity to provide for the competitiveness and challenges of the 21st century. This Thesis is an examination of the potential for a Regional platform for education, exhibition and experimentation in the STEAM fields as an instrumental device in harnessing indigenous knowledge and augmenting the educational curriculum in Tanzania.

The progress of the work is embodied in 3 stages: 1) Context – Circumstances and Problem Analysis 2) Concept – Synthesis and Solution 3) Communicate – The dissemination of an Idea

The outcome of the thesis is a conceptual proposal and a strategy for disseminating architectural ideas through social media as a holistic attempt to address the problem by: engaging a participatory audience, encouraging feedback and lobbying support for a solution to Tanzania’s most pertinent problem: Poor Education.

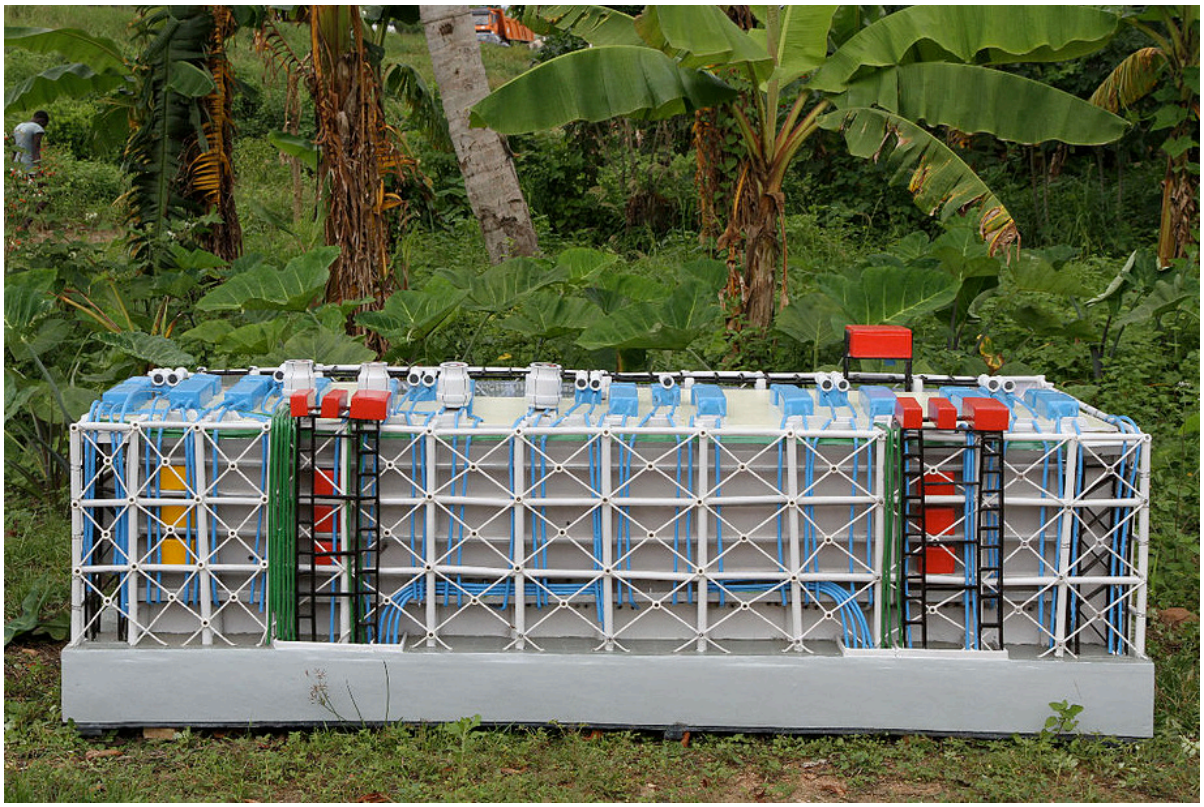

FIG. 1 This coffin, built by Kudjoe Affutu, was the main part of Saâdane Afif's exhibition "Anthologie de l'humour noir" in the Centre Pompidou in Paris
Regula Tschumi

INTRO

This thesis will be examined through chapters that explore the main capacities of the architect: To contextualise the brief, conceptualise an idea and to communicate.

Given the established goals for the thesis, to design an architecture that provides potential rather than imposing limits, the curation of space, programme and function will be an embedded concept intrinsic of an architecture that can be user-appropriated .

In the context phase, a photo essay is curated from an archive of images to illustrate a personal, visual response to a diverse and challenging context. My professional experience working in the science education sector in Tanzania will be illustrated through a social media campaign that I initiated in order to raise awareness of the work young scientists are doing in Tanzania. The aim if these presentations are twofold: A) to provide a background narrative to the circumstances which led to the inception of this project. B) to overcome the misconceived image of a poverty striken developing society with a positive, progressive and more realistic image of the innovation, development and diversity.

Written essays, supported by graphic illustration, serve as alternative tools for informing perspective on issues that concern the architect in any given context, mobility, materiality and community. Given the absence of architectural precedent and the rapid pace of infrastructural economic transformation in the region, a typical analysis of the immediate context of the site would not serve justice to the potential of the project.. These essays aim to support a more and progressive image of the cultural and economic context of Tanzania.

Other select criteria, mentioned below, have been identified as imperative to the concept phase of the proposal.

Climatic conditions are represented through illustrated graphics since there is no debate about the socio-cultural influence on their circumstances.

The geographic location of Kagera is a shift in perception from a peripheral location to a central one by identifying its position in relation to the state but neighbouring countries….

The essay, Worth its Weight in Gold, elevates the debate about

materiality and locality in respect of contextual architectural design. Here the Irony of western architectural agencies preaching the virtues of local materials, local workers and local design aesthetics exposed. Projects such as this thesis are often misconstrued as “humanitarian” and “Local” , instead this essay intends to justify the STEAM Machine a project taking place in Global world.

“..and I will walk 500 more” touches on the perception of community in respect of a national Tanzanian community that has overcome tribal conflicts to adapt Swahili as a national language and a school system that serves as a geopolitical instrument in fostering national identity. It challenges typical western perception of ‘Local Community’ in the Tanzanian Context.

Past experiences with architectural projects in Tanzania are explored through the Article “another Brick in The Wall”. The conceptual framework for an approach to design that celebrates potential rather than imposing limits is illustrated with reference to designs.

Overall the strategy behind the contextual investigation is to depart from the status quo in “design for Humanity” field of projects. Rather than conform to the perceived requirements for architecture in Africa to be local, symbolic and humble, this project aims to be Global, Robust and Ambitious.

The concept stage explores the visual curating of architectural precedents as design exercise in itself, synthesising complex architectural works and presenting them for their respective spatial, programmatic, structural or artistic qualities.

A conceptual prototype for an educational environment that is capable of accommodating change and appropriation is developed schematically and is ullustrated accordingly.

In the final chapter of this book, links are provided along with sample material of the online social media platforms that are used to disseminate content, spread ideas and receive feedback. This phase adapts curating of content to serve the purpose of encouraging engagement with a target audience, meanwhile lobbying support for a transformational idea that could launch Tanzania’s STEAM education into the next generation.

CONTEXT

Understanding Context.

Where does one depart and what are the existing and emerging circumstances to pull into focus. Is it a search for cultural understanding, empirical understanding, phenomenological or social understanding?

This chapter explores the areas that help establish the context for a 21st century Steam Machine in Tanzania. It is not a critical engagement with the material study of existing precedents and architectural form but rather a snapshot of the immense phase of transition of a developing country transforming into a contemporary 21st century middle class society.

CONTEXT

"Price was firmly against the notion of the architect or planner as the provider of 'visually recognizable symbols of identity, place and activity,' and for him the effects produced by architecture had nothing to do with any aesthetic sensibility. Architectural effects evolved in time and were the outcome of use, weather, and other largely uncontrollable conditions" [1]

Architecture considered for its semantic materialisation of place, identity and function could be considered as a direct translation of the circumstances of context.
A more abstract undertaking of the architectural discipline reveals an understanding of context as the social, economical and political circumstances in which we evolve and exist. This examination of context became prolific in the 60's and 70's through the works of archigram "instant city" and Cedric Price "Fun Palace".[2] The genesis of these projects was a reaction to social & political context of the time, rather than any topics of historical precedent, form, proportion, tradition and tectonics. [3]

It is evident that existing scholarship of architectural projects in an East African Context provide little evidence of any attempt to extend the examination of context beyond the circumstances of poverty, materiality, vernacular-form and meaning. It can be acknowledged that the concern for form and its relation to Meaning, Materiality, Craft and Tradition are legitimate concerns of the architect; However, this examination posits that it should be possible to establish an alternative point of departure for conceiving of architecture in the EAC as part of globally connected world.

Any investigation of context shouldn't immediately indicate that architecture is an artefact of localised "meaning" but rather a robust response to a particular challenge in a specific environment.

Context theory itself may relate to various fields of architectural design methodology i.e. the idea that architecture is a response to the "genius loci",[4] the spirit of place. From the inception of this project, the actor takes a more critical view of regionalism and

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1 Mary Lou Lobsinger, Cedric Price. An Architecture of Performance http://www.academia.edu/1442541/_Cedric_Price._An_Architecture_of_Performance_
2 Mark Wigley, "Exhibition: Cedric Price – The Fun Palace," Curatorial Statement, Columbia University: Arthur Ross Architecture Gallery, Buell Hall, 19 September 2005,
3 Sadler, Simon, Archigram: Architecture Without Architecture, MIT Press, 2005
4 Norberg-Schulz, Christian: Genius Loci: Towards a Phenomenology of Architecture 1991

particularly the ability for nomadic architectural practitioners to harness meaning from any ‘sense of place’ in a global world .

Context is examined beyond the contextual analysis of, vernacular form, materiality and craft. Instead context is emphasised as the climatic, geo-political, socio-demographic, technological, cultural and industrial parameters within which the project exists.

Research within these parameters is presented in the form of essays, graphics, diagrams and a photo essay. All with the purpose of establishing a point of departure for design concept that overcomes the constraints of picturesque context theory and potentially invalid presumptions over identity, regionalism, materiality and meaning.

Tanzania

One can travel by plane from one end of the country to the next, witnessing dramatic shifts in the landscape, from the highest mountain in Africa, Mount Kilimanjaro, lake victoria, the largest African lake. As Far as the Horizon there is open savannah, lush rainforests and the tropical coastline of the Indian ocean.
Take the journey by bus and you will be rewarded as you struggle along rugged roads through vast game reserves teeming with wildcats, rhino, elephants and wildebeests. Where the journey by plane presents the diversity of the landscape, climate and geography, the bus ride is a face-to-face encounter with the diversity of its people, stopping of along the long journeys to collect people from various tribes and packing them all in to a cramped bus for the onward journey.

Tanzania itself is undergoing a journey to transformitself into an industrialised, middle income society by the year 2025. An ambitious transformation for a country in 151st place out off 188 countries in the Human Development Index

Since it's independence from British Colonial Rule in 1963, Tanzania is one of the few Sub-Saharan to have been "spared the internal strife that has blighted many African states[1]. The country has maintained peaceful political stability and, for the most part, peaceful coexistence between the 120 plus tribes that share its the countries borders. The unfortunate reality is that this stability has done little to elevate the economic prosperity for many Tanzanians.

Although economic growth is relatively healthy and the poverty rate is continuing to decline, the actual number of people suffering the conditions of poverty remain the same due to the countries high growth rate. [2] A rapidly growing population of 52 million cover a land area of almost a Million sq/KM. According to the United Nations, it is one of the fastest growing young populations in the world.

With this comes immense challenges. Tanzania is developing at a rapid pace; Technology, media and internet are sweeping across the country with immediate impact, yet education, environmental concern and health infrastructure are slugging slowly behind.

1 http://www.bbc.com/news/world-africa-14095776
2 http://www.worldbank.org/en/country/tanzania/overview

Given the pace of transformation there is serious demand for thinking forward and addressing head-on the uncertainties of a rapidly changing global context, the insecurity of declining natural resources and the adversities of Climate change

by providing the people with the skills, resilience and creativity to adresss the challenges posed by a future characterized by the uncertainties of rapid development, climate change, accelerated innovation and declining resources.

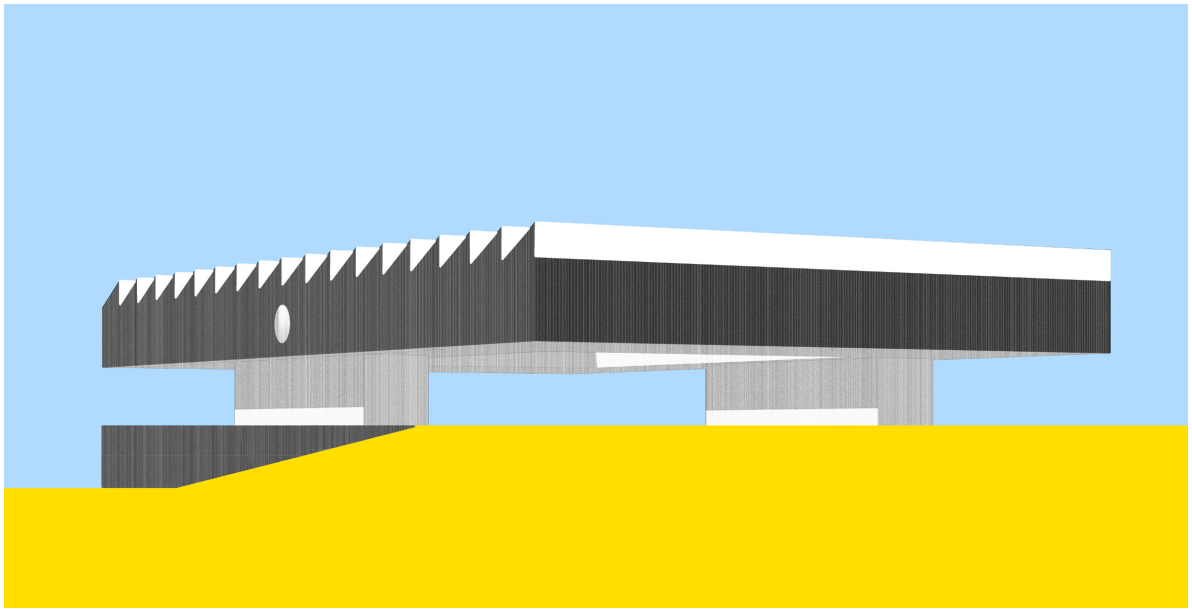
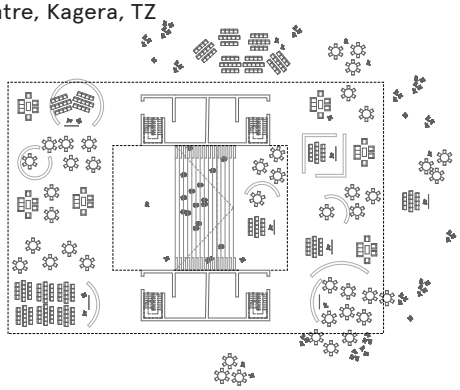


FIG. 2 Initial Sketch for Science Centre, Kagera, TZ



Another Brick in the wall:

The current paradigm of western architectural tourism in Tanzania

"The proliferation of the Western quest for exotic adventures has led to a new form of educational colonialism, where it is extremely hard to see how the important material means employed by foreign agents contributes to redress growing global inequality, or at the very least improve local capacities and skill" [1]

As an architect, there is a ferocious appetite for the whisper of a chance to design and build ones own concepts. The chance to execute an idea, to materialise it , sometimes even with your own hands!
In a country like Tanzania, there is not just demand, but an urgent necessity for new ideas on how to build with scarce resources and how to conceptualise spatial projects in the built environment. Universities and aid organisations have recognised this demand, but also the marketing potential of the iconic aesthetic of a type of " architecture for humanity".

But in fact, it is often the realisation of projects that are intended to be charitable which can be considered as "luxury projects". Projects initiated by university '*Design-Build Studios*' who benefit from the luxury of experimenting

1 Tomà Berlanda, Architectural Review, Feb, 2015

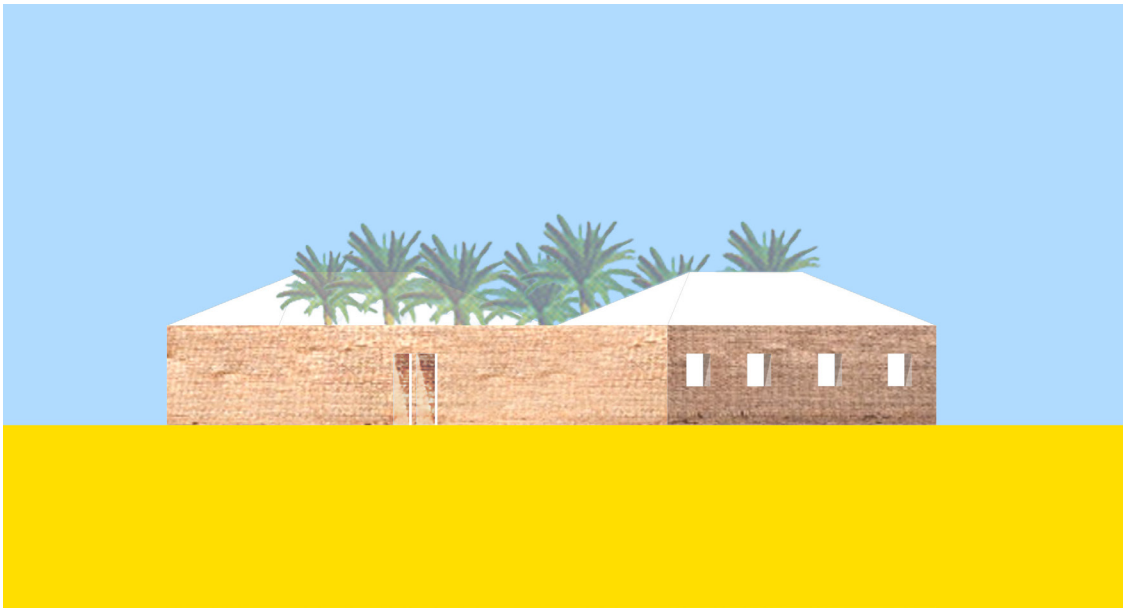
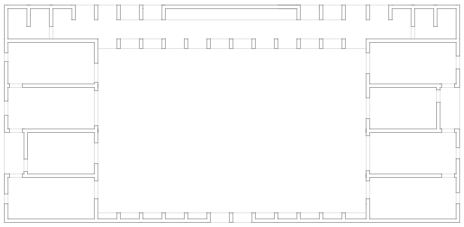


FIG. 3 House for 2 families, Dar, TZ



on architecture in regions where there is no accountability for flawed design or workmanship, where there are no prohibitive safety standards, where local labour is actually the workforce of the world that survive on less than a Dollar a day, where the local labour is insufficiently trained in safety standards or labour skills, where materials are cheap and most often, substandard.
These are not charitable projects, these are projects that are materialised from the luxury of being able to exploit the crippling conditions of poverty.

Although design-build projects can be valid forums for experimenting in materialising architectural design, the conditions in which they occur reflect an attitude that equates ‘context’, the site, to that of an architectural lab-rat. There’s a type of “Alaba, how do you do syndrome’ affecting the current discourse in humanitarian architecture. It’s a contrived yet well intentioned effort, but in the end it manifests itself in a display of grave social incompetence, discrimination and a condescending attitude. The danger of applying this dialogue to architecture is the promotion of a language of design that attempts to communicate its ability to save humanity, when in fact, all it does is burden the end users with a misunderstood artefact of western educational tourism.

In the context of a region with a scarcity of contemporary architectural precedents, design can be seen as something indulgent and elaborate. There is an obvious urgency for planning functional, pragmatic architecture, but architecture only happens when design isn't at the expense of functionality and also vice versa. In the Tanzanian context, a definitive approach to design is essential so that a concept can be robust and simple enough to withstand the many inevitable obstacles that will be uncovered in the execution phases

The two projects presented here both employ the simplest architectural element, the wall, as the genesis for the design. projects make use of totally opposing attitudes to the wall, The home for(fig.3), the wall becomes an intervention that embraces the two existing dwellings and defines the space in between as a shared courtyard, meanwhile, it provides all the domestic utilities for both families to share. This wall defines security and comfort. On the other hand, in Kagera, The Regional Innovation & Science Centre (the RISC) (fig.2)employs a structural solution that eliminates the wall in order to provide an open and flexible platform for students to perform independent learning outside of the classroom. At the same time the structural solution isolates the laboratories at upper level from the foundation below in order to resist eccentric forces from potential earthquakes.

In both concepts, the client's authorship of the project is promoted to encourage some element of post-build appropriation. Architecture is in most cases a very rigid and inflexible artefact. It's not something that can usually be appropriated without significant costs or skills. Providing the opportunity for local appropriation is another strategy that should be useful in ensuring that projects garner a sense of identity from the end users. In the home for two families, the wall envelope was designed as an enclosure in which future expansion of the house could happen according to the clients wishes, all at low-cost and with minimal physical intervention to the existing structure. At the RISC the open learning platform is left undefined with the intention to facilitate the end users to curate the space according to desired functions and appropriate space use as the institute and programme develops.

In the end these concepts appear incredibly simple. But they are the result of an intense dialogue with local stakeholders and partners. They appear so simple and yet the circumstances surrounding them are so complex and challenging. There was always a conscious effort to try and design an architecture that didn't scream its humanitarian impact. There was always an intention to avoid the indulgent language of design that the Tanzanians felt was so unnecessary. There was a very deliberate attempt to resist the exploitation of cheap and poor construction methods, to avoid being just another brick in the wall, a barrier to good architecture and sustainable development. But even after all these considerations, the designs appeared so simple. So simple that when revealed to the Tanzanian clients, the ones who perceived design as something extraneous and indulgent, they start to tell me… "Great idea, now we can add some designs"!

"Hey! [Architects], leave those kids alone"

PINK FLOYD

African Architecture, In the Media.

Architectural photography, the depiction of an architectural work, a space and a complete creation is devoid of human. The simple reason is that we are naturally hard wired to focus on human faces[1]

With 90% of African projects containing some degree of life photography, FIG. 4 **there are some questions raised as to why Architects feel the need to depict their work by obscuring it with Portrait Photography? The results are clear from a sample study of 50 african projects compared against 50 European projects through Divisare search query. A mere 6% include portrait photography in the european sample!**

Why do they do this? I will let Phines Harper answer by cross reading passages from his scathing Attack on the architectural medias' Profiling of architecture that is executed in the context of poverty.

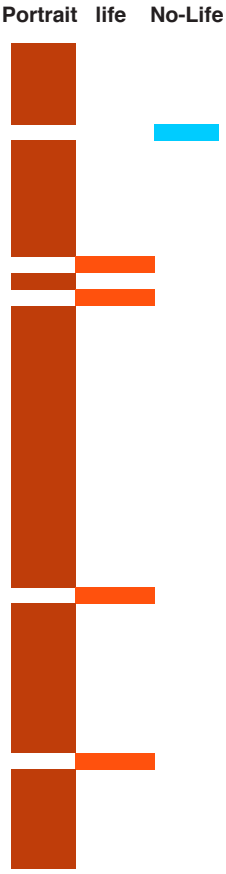
1 https://www.fastcodesign.com/3062926/why-do-we-love-images-of-empty-spaces-neuroscientists-and-artists-explain

> *"This practice is given credence by the media who, in rushing to publish the pictures, are complicit in uncritically reproducing the objectifying imagery. It highlights a broader problem in architectural criticism in which humanitarian work is rarely treated seriously, neither celebrated nor critiqued with sincerity."*[1]

https://www.dezeen.com/2017/01/26/phineas-harper-opinion-slum-porn-poverty-not-instagram-filter-selgascano-school-iwan-baan/ 1

#vernacular #Africa

DIVISARE PROJECT_Africa	Architect	Country
WHY NOT ACADEMY MATHARE - 2014-2015	LIVEINSLUMS, GAETANO BERNI, IVAN COSENTINO, GIULIA CELENTANO	Kenya
NUOVE AULE PER LA SCUOLA HOLYFAMILY DI SIONGIROI	CATTANEO GIORGIA	Kenya
THE MAKOKO FLOATING SCHOOL	NLÉ, KUNLÉ ADEYEMI	Nigeria
SURGICAL CLINIC AND HEALTH CENTER	KÉRÉ ARCHITECTURE	Burkina Faso
GANDO SCHOOL EXTENSION	KÉRÉ ARCHITECTURE	Burkina Faso
INFIRMARY IN LAONGO	KÉRÉ ARCHITECTURE	Burkina Faso
PARTNERS IN HEALTH HOUSING	SHARON DAVIS DESIGN	Rwanda
AU DORMITORY	TERRAIN ARCHITECTS	Uganda
HABITAT INITIATIVE CABO DELGADO	ZIEGERT | ROSWAG | SEILER ARCHITEKTEN INGENIEURE	Mozambique
SOS CHILDREN'S VILLAGE IN DJIBOUTI	URKO SANCHEZ ARCHITECTS	Djibouti
CULTIVATING COMMUNITIES	ASA STUDIO	Rwanda
MUGOMBWA REFUGEE CAMP PRE-PRIMARY	ASA STUDIO	Rwanda
ECCD CENTRES	ASA STUDIO	Rwanda
BUSENGO MATERNITY	ASA STUDIO, STUDIO TAMASSOCIATI	Rwanda
BUTARO HOSPITAL	MASS DESIGN GROUP	Rwanda
EDUCATION CENTER NYANZA	DOMINIKUS STARK ARCHITEKTEN	Rwanda
THREAD ARTIST RESIDENCY AND CULTURAL CENTER	TOSHIKO MORI	Senegal
SCUOLA ELEMENTARE A KOBÀ	CARAVATTI_CARAVATTI ARCHITETTI	Mali
SCUOLA COMUNITARIA A FANSIRÀ CORÒ	CARAVATTI_CARAVATTI ARCHITETTI	Mali
CASE PER MAESTRI VILLAGGIO DI N'TYEANÌ	CARAVATTI_CARAVATTI ARCHITETTI	Mali
SCUOLA COMUNITARIA A DJININDJEBOUGOU	CARAVATTI_CARAVATTI ARCHITETTI	Mali
DISPENSARIO MEDICO DI N'GOLOFALÀ	CARAVATTI_CARAVATTI ARCHITETTI	Mali
SCUOLA COMUNITARIA A N'TYEANI	CARAVATTI_CARAVATTI ARCHITETTI	Mali
MAGAZZINO PER CONSERVAZIONE DI PRODOTTI AGRICOLI	CHIARA GUGLIOTTA, MATTEO CARAVATTI	Mali
CENTRO DI SALUTE COMUNITARIA (CSCOM)	CHIARA GUGLIOTTA, MATTEO CARAVATTI	Mali
KIMISAGARA COMMUNITY CENTRE	ARCHITECTURAL [FIELD] OFFICE	Rwanda
WOMEN'S OPPORTUNITY CENTER	SHARON DAVIS DESIGN	Rwanda
TEACHERS' HOUSING	KÉRÉ ARCHITECTURE	Burkina Faso
GANDO LIBRARY	KÉRÉ ARCHITECTURE	Burkina Faso
KYAMBURA GORGE LODGE	REGIONAL ASSOCIATES	Uganda
ECD&F CENTRES	ASA STUDIO	Rwanda
ORPHELINAT FALATOW JIGIYASO	F8 ARCHITECTURE	Mali
THE LIBRARY OF MUYINGA	BC ARCHITECTS & STUDIES	Burundi
PARC NATIONAL DU MALI, BAMAKO	KÉRÉ ARCHITECTURE	Mali
A community centre Ouagadougou	FARESTUDIO	Burkina Faso
PELIP HOUSING	NOERO WOLFF ARCHITECTS	South Africa
LIVING TEBOGO	BASEHABITAT	South Africa
ITHUBA IPHIKO	BASEHABITAT	South Africa
BIBLIOTECA DI QUARTIERE A KATI COKÒ	CARAVATTI_CARAVATTI ARCHITETTI	Mali
MAPUNGUBWE INTERPRETATION CENTRE	PETER RICH ARCHITECTS	South Africa
CENTRO SOCIALE A KUINIMA KURA, BOBODIOULASSO	CARAVATTI_CARAVATTI ARCHITETTI	Burkina Faso
DANO HIGH SCHOOL	KÉRÉ ARCHITECTURE	Burkina Faso
INSIDEOUT SCHOOL	ANDREA TABOCCHINI, FRANCESCA VITTORINI	Ghana
KAPALANGA SCHOOL	PAULO MOREIRA ARCHITECTURES	Angola
H2OS	STUDIO TAMASSOCIATI	Senegal
WHITE CUBE	OMA	DRC
NIAMEY 2000 - URBAN HOUSING	UNITED4DESIGN	Niger
SWAWOU	ORKIDSTUDIO	Sierra Leone
NKU	ORKIDSTUDIO	Kenya
SOTTO LE VELE	SCEG	Madagacar



#vernacular #Europe

Divisare Project EU		
MANIFESTO FOR APARTMENT LIVING.	BENIAMINO SERVINO	Italy
HOUSE IN ALCOBAÇA	AIRES MATEUS	Portugal
HAY BARN CONVERSION	JOÃO MENDES RIBEIRO	Portugal
CAN MANUEL D'EN CORDA	MARIÀ CASTELLÓ MARTÍNEZ	Spain
CASA DOS CASEIROS	SARA ANTUNES MÁRIO FERREIRA ARQUITECTOS	Portugal
HOTEL IN THE DOURO VINEYARDS	RICARDO CARVALHO + JOANA VILHENA ARQUITECTOS	Portugal
UMBAU HAUS LENDENMANN	L3P ARCHITEKTEN	Switzerland
VINEYARD HOUSE	BLAANC	Portugal
CA NA MARIA	LAURA TORRES ROA, ALFONSO MIGUEL CABALLERO	Spain
SHADOW HOUSE	JONATHAN TUCKEY DESIGN	UK
ROMAN VILLA "LA OLMEDA". PALENCIA, SPAIN	PAREDES PEDROSA ARQUITECTOS	Spain
CRYSTAL HOUSES	MVRDV	Netherlands
PRIVATE RESIDENCE IN PIROGOVO_RUSSIA	ZDA UMBERTO ZANETTI	Russia
BORRERAIG HOUSE. GLENDALE	DUALCHAS ARCHITECTS	UK
BARROCA MUSEUM	DC.AD - DUARTE CALDAS	Portugal
SCHOOL AND NURSERY IN AFERS	PEDEVILLA ARCHITEKTEN	Italy
SUMMER HOUSE IN ANDROS	KATERINA TSIGARIDA ARCHITECTS	Greece
BE HOUSE	SPACEWORKERS®	Portugal
HOUSE WITH FOUR HOUSES	PROD	Portugal
HOUSE ALM	ESTUDIO ODS	Portugal
MAISON L1	PRAX ARCHITECTES	France
NORTH VAT	RODIĆ DAVIDSON ARCHITECTS	UK
HOUSING REHABILITATION IN LA CERDANYA	DOM ARQUITECTURA	Spain
BALANCING BARN	MVRDV, MOLE ARCHITECTS	UK
VILLAGE HALL IN HUNSPACH.	HEINTZ-KEHR ARCHITECTS	France
GREENHOUSE	D.A	France
VALENTINO ROME FLAGSHIP STORE	DAVID CHIPPERFIELD ARCHITECTS	Italy
FUNERAL PARLOR IN MURTAS	ALEJANDRO MUÑOZ MIRANDA	Spain
EAST ROAD	LIFSCHUTZ DAVIDSON SANDILANDS	UK
ALFRISTON SCHOOL	DUGGAN MORRIS ARCHITECTS	UK
HOUSE IN RATO	CHP ARQUITECTOS	Portugal
CASA V	DOSIS DE ARQUITECTURA	Spain
LA MANZANERA	RICARDO BOFILL TALLER DE ARQUITECTURA	Spain
RESTORATION AND EXTENSION OF THE VILLA GARBALD	MILLER & MARANTA	Switzerland
CONTEMPORARY ALPINE HOUSE	RALPH GERMANN	Switzerland
FOUNDRY MEWS	PROJECT ORANGE	UK
REANIMATE	KOIS ASSOCIATED ARCHITECTS	Greece
HOUSE ÅKERUDDEN	MNY ARKITEKTER	Finland
STABLE ACRE	DAVID KOHN ARCHITECTS	UK
CHANCA HOUSE	MANUEL CACHÃO TOJAL	Portugal
HOUSE IN SOBRAL DA LAGOA	RICARDO BAK GORDON	Portugal
MOTTISFONT VISITOR CENTRE	BURD HAWARD ARCHITECTS	UK
L286	NUNO GRAÇA MOURA	Portugal
VILLA MÖRTNÄS	FOURFOURSIXSIX	Sweden
HOUSE IN PALMELA	PEDRO SEGURADO QUINTINO ROGADO, CATARINA ALMADA NEGEIROS	Portugal
KID UNIVERSITY IN GANDÍA	PAREDES PEDROSA ARQUITECTOS	Spain
CONTEMPORARY VERNACULAR	WY-TO	France
LUGO AUDITORIUM	PAREDES PEDROSA ARQUITECTOS	Spain
IRIBARREN HOUSE	IÑIGUEZ & USTARROZ	Spain
LANDESTHEATER SCHWABEN	TRINT + KREUDER D.N.A.	Germany
ANTIPAROS KATIKIA 1	VOIS ARCHITECTS	Greece

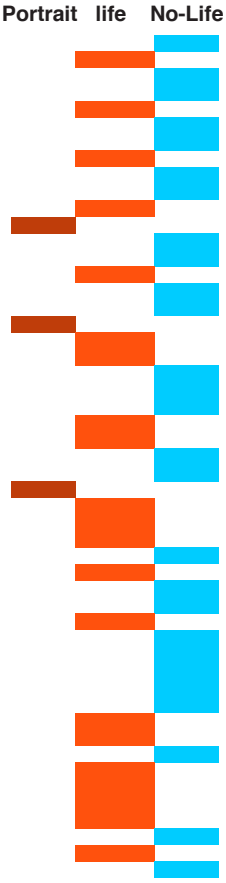


FIG. 4 Data on portrait photography from Divisare.com

FIG. 5

Humanitarian firms seek to both confront, but simultaneously rely on, postcolonial power imbalances

Western fixation with the architecture of extreme deprivation is not intrinsically negative, but there are prominent examples of a shallow gawping engagement which are nauseating and even exploitative.

FIG. 6

FIG. 7

FIG. 8

FIG. 9

FIG. 10

This is not a game-changing piece of design, yet it is presented with missionarylike piety

All quotes by Phineas harperhttps://www.dezeen.com/2017/01/26/phineas-harper-opinion-slum-porn-poverty-not-instagram-filter-selgascano-school-iwan-baan/ <?>

FIG. 11

Poverty should never be an Instagram filter.[x]

“This mismatch between realised quality and critical reception is symptomatic of post-colonial attitudes, which consistently reward whites beyond their achievements. You can’t shake the feeling that, were this a [Tanzanian]-grown project, instigated by unknown black architects rather than white westerners, it would have gone unremarked on.”[1]

1 Phineas Harper

© Laia García

FIG. 12

Center for Women in Masai Village
C-re-aid
Appeared on **ARCHDAILY**,
"***The worlds most visited architectural website"***

At this point it is important that I clarify: This is not a determined battle to combat humanitarian design practice and to name, shame and blame those guilty of discriminatory and exploitive architectural practice. NO, this is simply an informed point of departure from engaging in such malpractice.

This is a determined effort to respect that no matter the existing set of circumstances, architecture now occurs in a global context where culture, identity, language and community should be acknowledged and celebrated rather than arrogantly and poorly appropriated.

Nyerere supported the presence of foreign cultures in Tanzania saying, "a nation which refuses to learn from foreign cultures is nothing but a nation of idiots and lunatics…[but] to learn from other cultures does not mean we should abandon our own."[1]

1 Lemelle, Sidney J. "'Ni wapi Tunakwenda': Hip Hop Culture and the Children of Arusha." In The Vinyl Ain't Final: Hip Hop and the Globalization of Black Popular Culture, ed. by Dipannita Basu and Sidney J. Lemelle, 230–54. London; Ann Arbor, MI: Pluto Press.

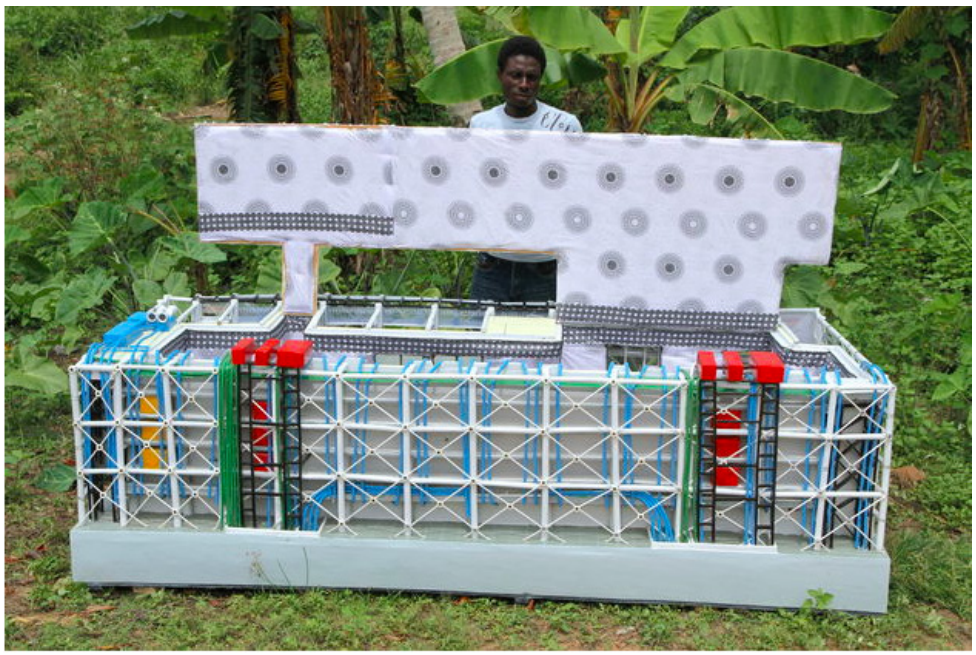


FIG. 13 This coffin, built by Kudjoe Affutu, was the main part of Saâdane Afif's exhibition "Anthologie de l'humour noir" in the Centre Pompidou in Paris
Regula Tschumi

NEED THE BIGGER PICTURE?

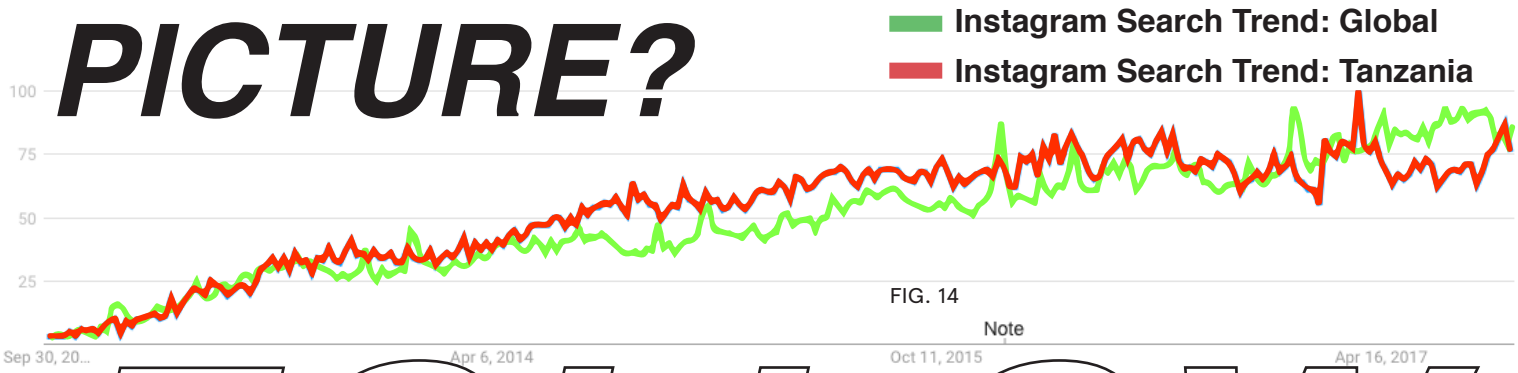


FIG. 14

FOLLOW ME! DIA

“Unfairness and inequality in the way you cover stories is very much a reflection of the inequalities and injustices in the societies we live in and of the political, social and economic landscapes we work in”[1]

With rapid uptake and trend graphs running parallel with that of the most developed countries in the world,[2] See FIG.1. Instagram has proliferated even the most marginal of Tanzanian communities. This presents an immense amount of visual material to piece together an Image of Tanzania. Instagram proves to be a valuable tool for finding educational, development and design organisations that otherwise wouldn’t have online exposure by traditional web search results.

FOLLOW MEdia! is a desktop research exercise that allows even the reader to engage with live accounts in tanzania and witness the diversity of visual profiles of organisations and individuals participating in Education, design, development and innovation in Tanzania. The following profiles illustrate the growing appetite for innovation and design in Tanzania and it serves as an indication for the rapid pace of development and industrialisation in the country..

1 Ms Valarie Msoka, Former Executive Director of TAMWA (Tanzania Women’s Media Association) http://www.newtimes.co.rw/section/read/223875/

2 Google Trends Data: Instagram Downlowd Graphs




Instagram

ystanzania ···

Follow

Young Scientists Tanzania YST:A Science Outreach Programme leading to an annual National Exhibition for secondary schools. #sciencefordevelopment
www.youngscientists.co.tz

38 posts | 346 followers | 501 following

Instagram

schoolofstjude ···

Follow

The School Of St Jude Offering a free high-quality education to over 1,800 of the poorest & brightest students in Arusha! Fight Poverty Through Education! www.schoolofstjude.org

588 posts | 2,066 followers | 339 following

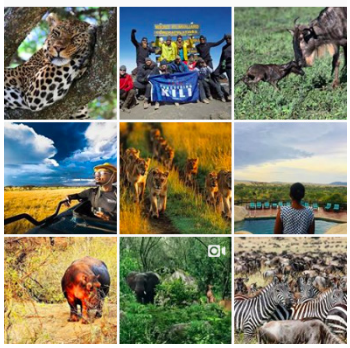
Instagram

tanzaniaparks ···

Following

Tanzania National Parks Tanzania National Parks is a parastatal organisation that has the mandate to manage the 16 national Parks in Tanzania.
www.tanzaniaparks.com

795 posts | 10k followers | 112 following



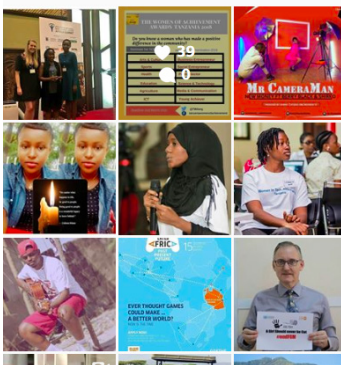
Instagram

rahmasuleiman ···

Following

Rahma suleiman
Scientist|Developer|Pioneer|RestlessDevYoungLead...

313 posts | 787 followers | 1,731 following



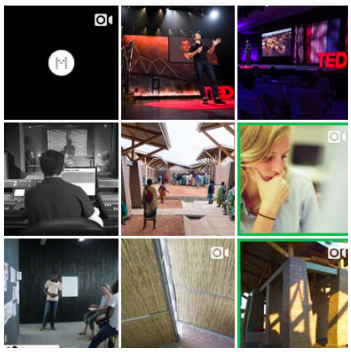
Instagram

massdesigngroup ···

Following

MASS Design Group Our mission is to research, build, and advocate for architecture that promotes justice and human dignity.
www.designthatheals.com

180 posts | 6,406 followers | 100 following



Instagram

great_minds_tz ···

Following

Great Minds Tz Tanzania Awakening Group ⬇️
Target 👉🏻 Youths Life Style 🔵 Youth For Change 🔥
~ VOI ~
greatmindstz.wordpress.com

50 posts | 1,535 followers | 1,142 following

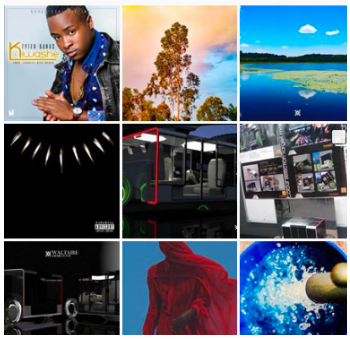
Instagram

waltaire_design ···

Following

Waltaire Design Co. Tanzania Industrial Designer Tanzania All round Artist Product design Building design Interior design Environ. design Photography
+255788151886
be.net/waltermrobert

239 posts | 661 followers | 468 following



Instagram

twendeinnovates ···

Following

Twende Social Innovation Empowering people to design and make technologies to improve life in Tanzania
www.twende-tanzania.org

61 posts | 221 followers | 109 following

Instagram

ieftz ···

Following

IEFTZ The Indigenous Education Foundation of Tanzania is a community-collaborative organization that provides quality and affordable education in Tanzania.
www.ieftz.org/donate

517 posts | 871 followers | 330 following

Instagram

bunihub ···

Following

Buni Innovation Hub BUNI is an open space for Tanzania's tech community to foster innovation, entrepreneurship and the culture of co-creation. FB:bunihub Twitter:bunihub
www.buni.or.tz

84 posts | 988 followers | 167 following

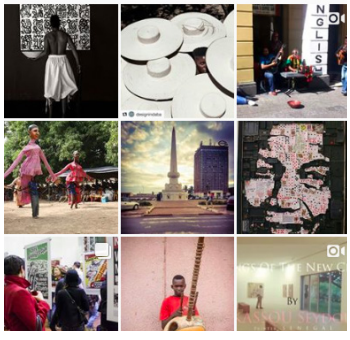
Instagram

africacreativecities ···

Following

AFRICA CREATIVE CITIES Project reviewing the creativity in African cities, giving the world a contemporary,more positive image of Africa. Use #africacreativecities
www.africacreativecities.com

382 posts | 56k followers | 4,837 following



Instagram

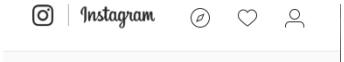
africandesigncentre ···

Following

African Design Centre The ADC develops Africa's most creative minds and operates as a hub for innovation, research and policy surrounding the built environment.
www.ted.com/talks/christian_benimana_the_ne...

104 posts | 738 followers | 142 following



Tanzania's Young Scientists

FIG. 15

FIG. 16

During my time as media-specialist in Tanzania, I have been directly involved with an organisation promoting science, innovation and technology amongst secondary school students across the country. This experience was pivotal in providing the basis for the thinking behind this thesis investigation.

Tasked with documenting the progress of scientific innovation amongst young students in TZ, key to this was raising the profile of young individuals participating in science research and innovation.

FIG. 17

FIG. 18

Traveling around the country, to some of the remotest regions in Tanzania, I was able to get a clear picture of the existing circumstances of science education in the country.

It was evident that media would also have a role to play in cultivating that same type of public awareness of architecture in this context.

I present these images from my work with young Scientists Tanzania for 3 reasons.
1: To illustrate that the demand for sophisticated educational infrastructure extends beyond the simple and often archaic structures being presented in western architectural media.
2: that Social media has a potentially significant role to play in changing attitude, raising awareness and disseminating ideas.

3: To Profile the new generation of aspirational young people who intend to be changemakers in their societies.

It is about time that Architecture can leap frog into the 21st century and embrace digital media as a way of encouraging discourse, participation and assessing attitude towards architectural projects in Tanzania.
It would be an effective device in encouraging young students to understand architectural projects and the ability to interact, appropriate them and to consider them as safe spaces for their innovation, creativity curiosity, expression and experimentation.

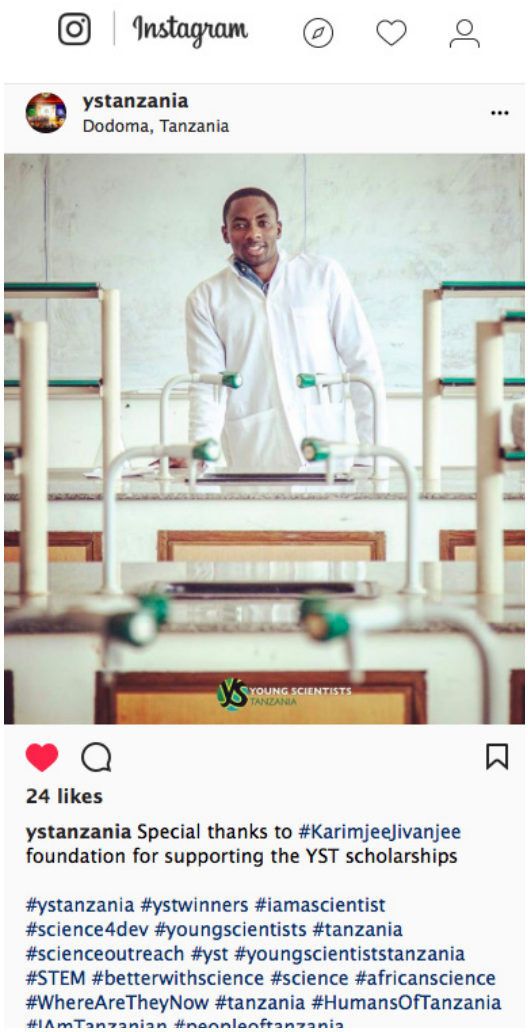


FIG. 19

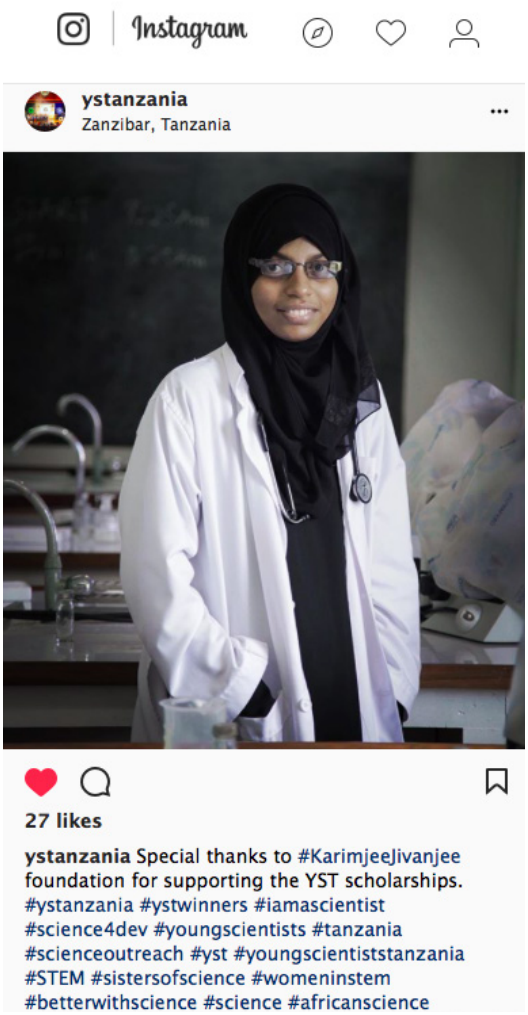


FIG. 20

It is time the media accept and communicate the reality that Women in Africa are “proven agents of change, leaders, innovators responsible for a lot of the positive developments on the continent.”[1]

1 http://www.newtimes.co.rw/section/read/223875/

FIG. 21

FIG. 22


Instagram
ystanzania
Dar es Salaam, Tanzania
Using Science and Technology to Transform Tanzania
60 likes
ystanzania Young scientists Tanzania is a platform for encouraging young people to use #Science #technology & #innovation to transform their environment positively.
#bff #skyisthelimit #throwback #ystanzania #ystwinners #iamascientist #youngscientists #tanzania #scienceoutreach #yst #youngscientiststanzania #STEM #womeninstem

FIG. 23

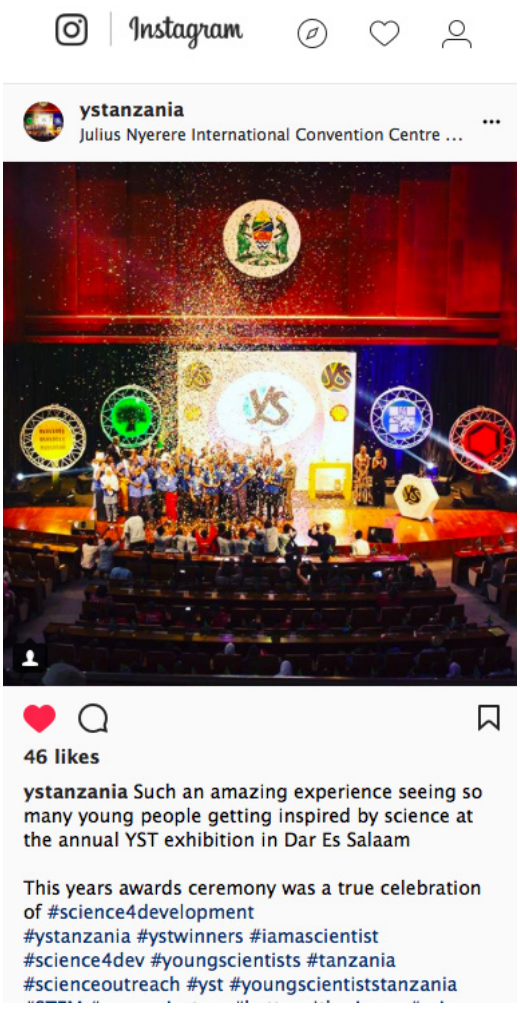

Instagram
ystanzania
Julius Nyerere International Convention Centre ...
46 likes
ystanzania Such an amazing experience seeing so many young people getting inspired by science at the annual YST exhibition in Dar Es Salaam
This years awards ceremony was a true celebration of #science4development
#ystanzania #ystwinners #iamascientist #science4dev #youngscientists #tanzania #scienceoutreach #yst #youngscientiststanzania

FIG. 24


Instagram
ystanzania
Dar es Salaam, Tanzania
58 likes
ystanzania 'Effectiveness of the Maru hotpot in maintaining heat in food'
•
Excellent research by this years runners up at the YST2017 exhibition! •
Mawata Matukuta & Annagrace Malamsha from Kilakala girls secondary school in Morogoro .
•
#womeninstem #empoweringwomen #girls #science #sdg #IAmAScientist #humansoftanzania #throwback #yst #yst17 #ystwinners #womeninscience #girlpower #betterwithscience #itstartshere #tanzania
annysilver10 😊😍😊 project of a kind 😊😍😊
gracesamwel4303 They deserved it ...please
make a correction on the name Mawatu Matukuta ..it

FIG. 25


Instagram
ystanzania
Dar es Salaam, Tanzania
73 likes
ystanzania #solarpower and #girlpower and #yeswecan
Naima Mohamed is a young #inventor from Vinguguti and she is the recipient of the Special Education Award this year at the YST exhibition Her project investigates the potential for solar powered agricultural equipment to increase productivity for the development of the country.
Young scientists Tanzania is a platform for encouraging young people to use #Science #technology & #innovation to transform their environment positively.
#ItStartsHere

FIG. 26

A Passage

“This was my first glimpse of Dar es Salaam...a vast rippling blue-black lagoon and all around the rim of the lagoon there were pale-yellow sandy beaches, almost white, and breakers were running up on to the sand, and coconut palms with their little green leafy hats were growing on the beaches, and there were casuarina trees, immensely tall and breathtakingly beautiful... And then behind the casuarinas was what seemed to me like a jungle, a great tangle of tremendous dark-green trees that were full of shadows and almost certainly teeming... with rhinos and lions and all manner of vicious beasts. Over to one side lay the tiny town of Dar es Salaam, the houses white and yellow and pink, and among the houses I could see a narrow church steeple and a domed mosque and along the waterfront there was a line of acacia trees splashed with scarlet flowers...”[1]

1 Roald Dahl – Going Solo

A Picture

FIG. 27

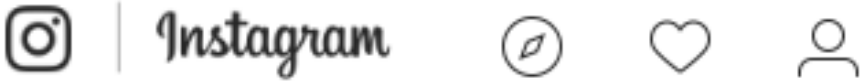
A Film

Within one short passage from an irresistibly exciting account of the authors life, one could be mesmerized by the description. An image of an exotic enclave, where swahili street stands fill the gaps between temples, churches and mosques. A city as an interface where global cultures thrive and the threshold between wilderness and civilisation exposes the landscape where the lions still reign above all.

Text and film referring to Roald Dahls Passage from Going Solo. A moment that describes a first encounter with this great city, Dar Es Salaam. See P. 40.

A Place

FIG. 28



THE_MISSING_PICHA

Photo Essay

The curation of captured photographs is employed a design task. It is the challenge of examining the volume of photographic material recorded over a 5 year period visiting Tanzania; then, selecting, editing and curating the material to illustrate a visual narrative. Although the outcome of the task results in the production of a visual catalogue, there is purpose in the act of curation as a design task in itself.

Photography is a system of visual editing. At bottom, it is a matter of surrounding with a frame a portion of one's cone of vision,while standing in the right place at the right time. Like chess, or writing, it is a matter of choosing from among given possibilities, but in the case of photography the number of possibilities is not finite but infinite.
—John Szarkowski

This task finds itself in the phase of the design process "context". The purpose being to explore, without prejudice• what are the circumstances in the field and then to communicate them.

Two diametrically opposing narratives become apparent during an online search for 'Tanzania' through web search engines. 1) The sensationalisation of the struggles of poverty, serving mostly the

purpose of fundraising interests. 2) The sensationalizing of Folk, Flora & Fauna; primarily serving commercial tourism interests.

It is understood that it is impossible not to view the Tanzanian context through the lens of poverty. The dangers of romanticizing the adversities of poverty as humbling are tragic but there should also be no complacency when face to face with such inequality. Meanwhile, it would also be stubborn and contrived not to celebrate the beauty of Tanzania's assets of cultural & natural heritage.

The dilemma begins with the quest to communicate a 'truth' through photographic essay. The concept of exploring any one truth over another for the purpose of illustrating the circumstances of present-day Tanzania is not within aspirations of this exercise. Instead, the photo essay details a personal perspective on experience in Tanzania.

The images cover the breadth of vision from Ultra-wide angle lenses to magnified, narrow cones of vision. Images are paired together to draw visual and meaningful relationships. Altogether, it is a compilation of fragments that depict one of the most pronounced feelings experienced during experiences in the county over that past 5 year period - The Feeling of expectation, the feeling of great expectations of things that have yet to pass.

Evidently, this results in sober portrayal of temporality. it is intended to portray, of course, like roald dahls passage, the fantasy and spectacle of place, but without establishing any overpowering image, the contrast is blurred the saturation is missing, the action is hidden, the narrative is lost. For the purpose of this exercise, it is an honest representation of a feeling that.. despite the picturesque, the people and the poverty, something is missing and something is to be expected..

The photo essay in 18 spreads.

Not simply an image of a context, celebrated less for what it really says but more about what is missing. The result itself is not the final outcome. It is the exercise of taking, editing and curating that becomes a process of engagement with the context.

Content curation finds itself in the gallery. Visual Curation finds itself in Branding, magazines, image-search algorithms, social media platforms and image bookmarking sites.

Where content curation promotes a narrative, visual curation allows for serendipity, drawing visual relationships that juxtapose and establish new content.

A purely visual essay, this method allows for the opportunity to explore the melancholy of an immense phase of transition in Tanzania. Feel Free to swipe through or to pause and reflect.

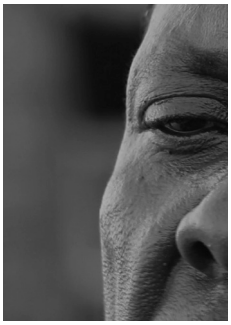
"As I progressed further with my project, it became obvious that it was really unimportant where I chose to photograph. The particular place simply provided an excuse to produce work…. you can only see what you are ready to see—what mirrors your mind at that particular time." George Tice

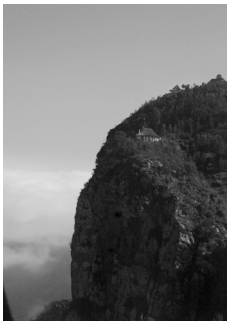




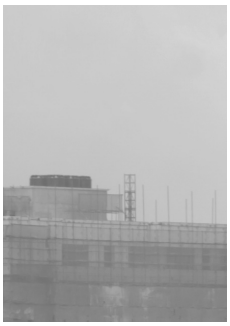
FAST FOOD

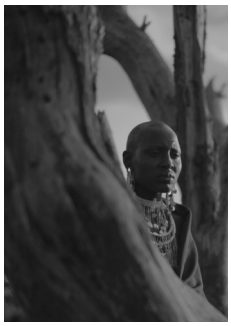


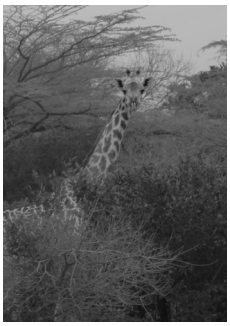



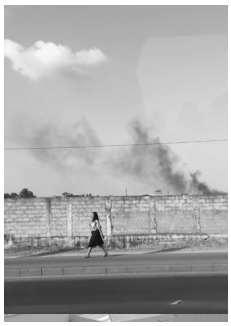


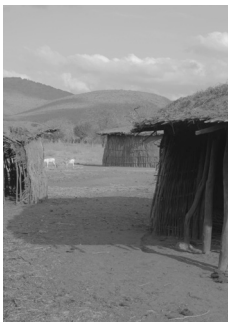
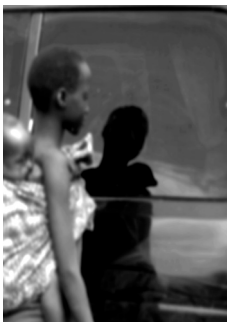


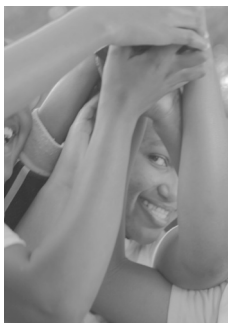



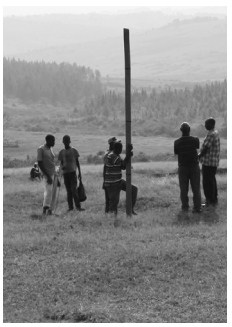


JCB

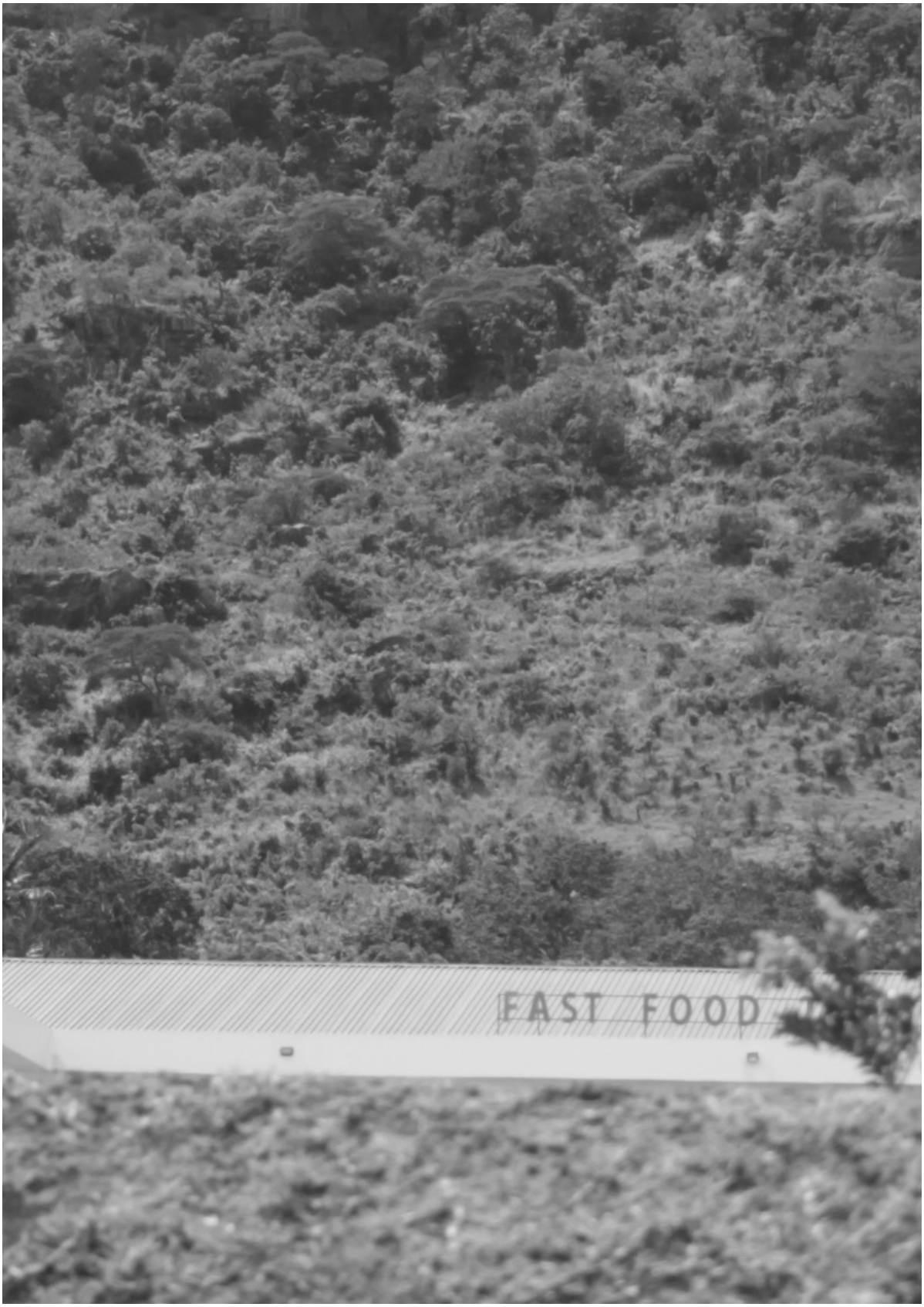


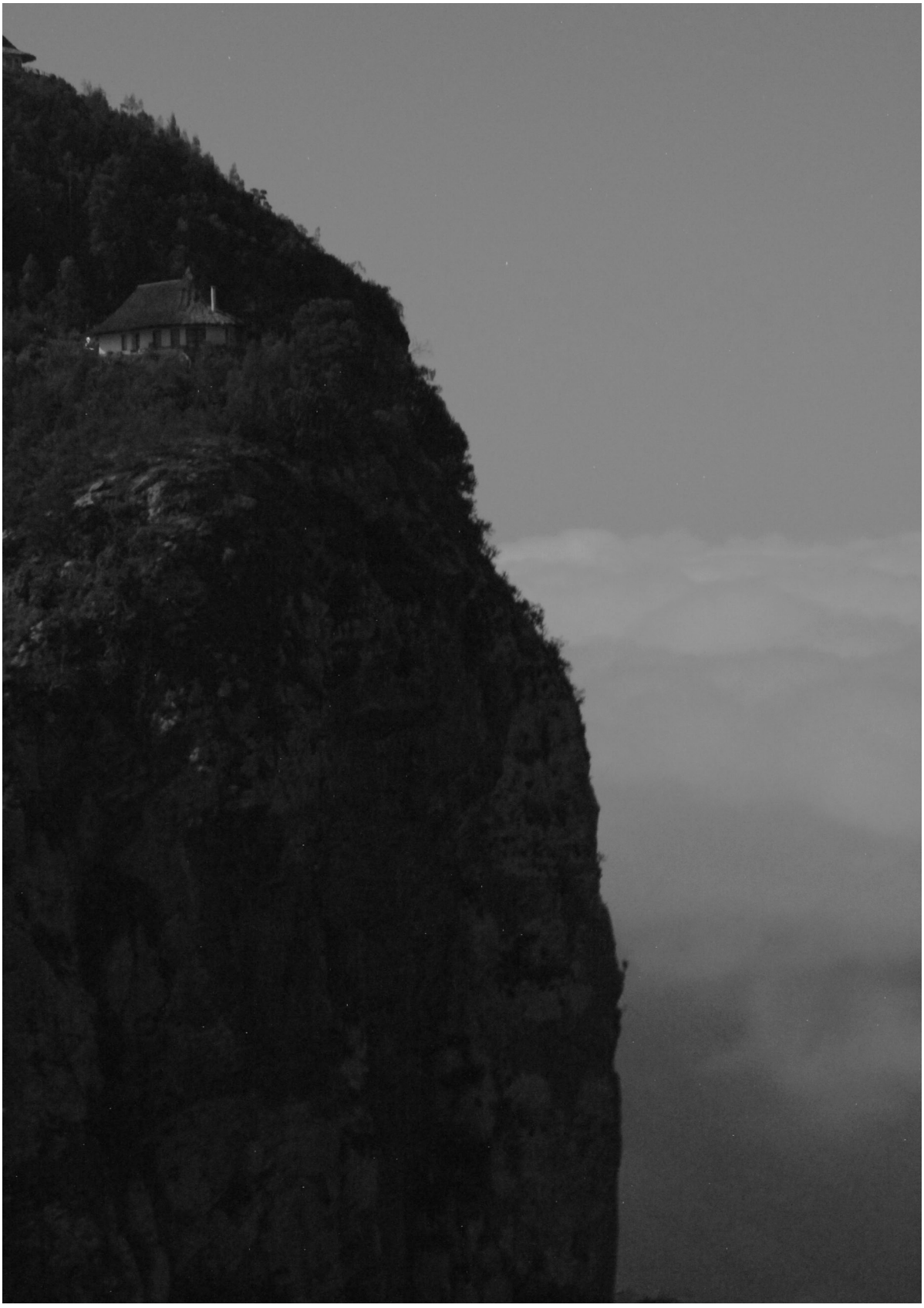



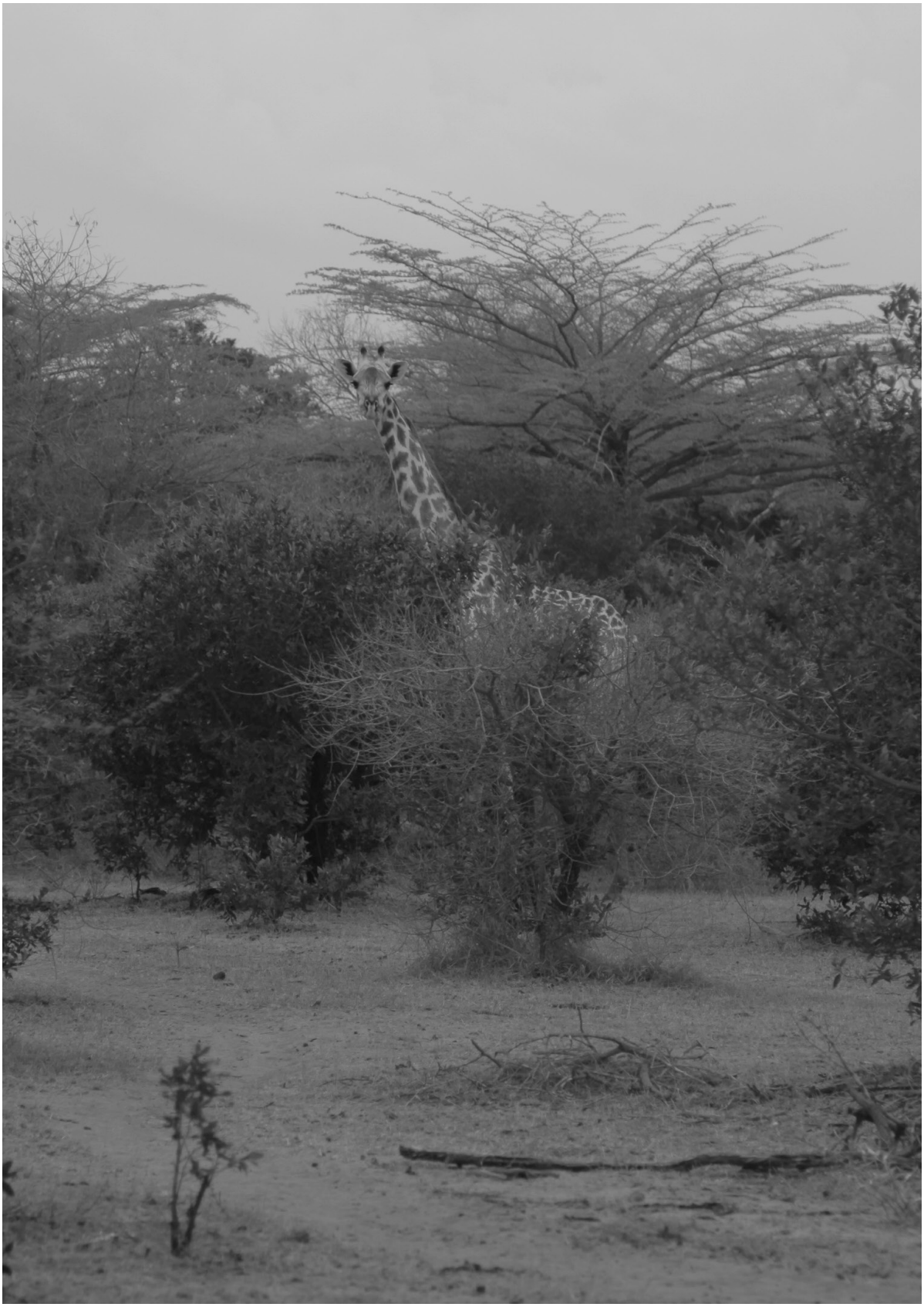






FAST FOOD






vodacom


MTT
JCB

‘I Will Walk 500 hundred miles’

School: an incubator for national Identity
language and mobility: a unified tanzania

“Africa will write its own history, and it will be, to the north and to the south of the Sahara, a history of glory and dignity.” So wrote Patrice Lumumba, the Democratic Republic of the Congo’s first prime minister, in 1960. Though his leadership was unconnected to Swahili particularly, the words spoke to a new, proud pan-Africanism to which Swahili was inextricably linked’.[1]

Swahili language is one of the most important catalysts for fostering Tanzanian identity in a pan African context of postcolonial states. Following independence, the father of the nation, Nyrere was instrumental in gathering momentum behind the Swahili language movement. For reason of independence and the belief of a pan African united folk.

Pivotal to the original success of Swahili was the secondary level education programme in Tanzania. This is where the true unification of the country occurred, schools became melting pots for Tanzania’s youth, regardless of race religion, tribe and Swahili was the language they shared.[2]

Tanzania is a massive country stretching upto 1400km from one end to the other. In spite of the immense infrastructural and economic challenges aassociated with sending students from one region of Tanzania to the next, the programme has been transformational in fostering a population of young Tanzanians that recognize their national identity above their tribal ties.

This is a context where the barriers of distance and infrastructure are overcome for the ambition of educational and national prosperity. It must be recognised that this is now part of the collective identity of young Tanzanians.

The potential for an educational facility, even in the remotest of regions of Tanzania is a promising prospect because of this national educational programme. Logistically, the present infrastructure of any developed country would be a barrier to the strategic location of centralized regional facilities in remote rural areas, but in Tanzania, it is in spite of the barriers, that distance is fundamental to unity and identity.

However, The inconvenience of poor infrastructure doesn’t end here, the prospect of a not too distant future with automated vehicles, hyper-speed transport systems and drone vehicles should ensure that remote rural

1 http://harvardpolitics.com/books-arts/swahili-language-influence/
2 https://thefutureofafrica.wordpress.com/2009/10/16/ethnic-diversity-in-east-africa-the-tanzania-case/

areas should never be left behind in terms of its connectivity to with wider world. Already, Tanzania and Rwanda are set to be world leaders in Drone Delivery Infrastructure

This understanding of the educational institution as an effective device for not only edifying and enlightening students but for effectively thawing inter-tribal becomes an exciting point for consideration.

"This further weakened tribal, ethnic and regional feelings on the one hand, and strengthened the feelings that they were all Tanzanians. Thus overcoming the obstacles of localism and ruralism. In the long run that paved the way toward intermarriage between couples from different ethnic groups and religious background."[3]

The European Union's ERASMUS programme can be considered an example of how a union of states with turbulent and traumatic histories encourages and supports educational institutes as places of inter cultural exchange, European-identity fostering and development of soft-power relations. [4] The Tanzanian Secondary Education Programme has been doing the same thing since the 60's and the results have yet to be fully acknowledged and documented.

It is worth noting the location of Kagera, the most isolated region in Tanzania, yet it is the most central region at the heart of the East African Union as having enormous potential in this regard. Given its proximity to RWANDA, BURUNDI UGANDA CONGO, all areas that suffer and have suffered from internal conflicts and instability. It wouldn't be so far fetched to imagine the region as a strategic focal point for East African Union cultural and educational exchange.

Tanzania is now one of the only Sub Saharan African countries to embrace an African language, Swahili, as the official language of instruction. [5] This reform occurred in 2016 with Tanzania's new president Dr. John Magafuli, a massive step in embracing its Tanzania's african identity and unburdening school students with the challenge of learning through a non-native language. This is a massive step in Post-Colonial identity. But it has been the immense effort to overcome the inconvenience of distance and regional ties that has been so effective in establishing Swahili in the collective Identity of Tanzanians all across the country.

3 https://thefutureofafrica.wordpress.com/2009/10/16/ethnic-diversity-in-east-africa-the-tanzania-case/
4 http://www.france24.com/en/20171218-talking-europe-eu-commissioner-tibor-navracsics-soft-power-european-identity-erasmus-brexit
5 https://qz.com/355444/tanzania-dumps-english-as-its-official-language-in-schools-opts-for-kiswahili/

“living together, working together, and sharing equitably the fruits of their work as well as the means of production. Their culture encouraged them to think of themselves

primarily as members of a large group, a community, and thus the needs of each as an individual tended to be superseded by his needs as a member of society."[1]

1 Mwalimu: The Influence of Nyerere
edited by Colin Legum, G. R. V. Mmari. Page 36 James Currey Publishers, Oxford

WORTH ITS WEIGHT IN GOLD

An Education.

> *"…Education should be treated as a strategic agent for mindset transformation and for the creation of a well educated nation, sufficiently equipped with the knowledge needed to competently and competitively solve the development challenges which face the nation. In this light, the education system should be restructured and transformed qualitatively with a focus on promoting creativity and problem solving."* [1]

Bearing the burden of decades of corruption and Capitalist Colonialism, Tanzania has witnessed some of the world's most precious natural resources harnessed from its lands. [2]Precious stones, minerals and metals, oil, gas and Endangered Species.

The purpose of this text does not intend to investigate and shed light on the morality/legality of the material extraction of these resources, but it does intend to expose the discrepancies between its value of resources and quality of education. Logic prevails that a country with such a wealth of natural resources should in theory have a superior education system.

---

1 The United Republic of Tanzania –esdp Education Sector Development Programme (2008-2017)

2 https://troubleandsqueak.com/2014/01/15/capitalist-colonialism-the-exploitation-of-tanzania/#more-173

FIG. 29

GOLD MINE EXTRACTION
Dillon MArch
West Rand Goldfield
2007

Despite Tanzania's wealth of natural resources, standards of education have done little to progress.[3] The demand for a new thinkers to deal with the advantages and challenges that come with becoming a 21st century, global, industrial economy is imminent. Tanzania has one of fastest growing young populations in the world and at the current rate there are approximately 800,000 young people entering the work force every year.[4] The present situation paints a drastic picture, one that is disproportionate to the value of its natural resources – 1.5 million unemployed adolescents.[5]

The country's land is fertile with abundant resources and climatic conditions for agriculture are optimal. Without a fundamental level in scientific education, it is not possible to harness the benefits of local resources and favourable conditions for agricultural and industrial production, a contributing factor to Tanzania's 30% poverty rate. [6]

The current state of education in Tanzania, particularly in the fields of Science Technology Engineering and Maths, is by any standards, very low. The total budget contribution to education is approx.. 17%, this is comparable to some of the world leading pioneers in education, for example Finland.

Finland's expenditure on education as a total percentage of government expenditure is12.3% (2014) Compare this with Tanzania's expenditure at 17.3% (2014)[7] and there is a significant discrepancy in expenditure and educational ratings. Finland's Pisa ratings are constantly recognised as one of the best schooling systems on the world. While Tanzania scores amongst the worst despite spending 41% more on education.

Interestingly, Finland is not as generously endowed with natural resources or climatic conditions as Tanzania, yet it has a very successful export economy . Finland's most valuable natural resource by measure of total export value is timber and its processed by-products. But for a country that recognised its disadvantage and invested heavily in education, its timber export value is worth its weight in gold!

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3 http://www.thecitizen.co.tz/News/Why-Mtwara-schools-dominated-the-bottom-list-in-Form-4-exams/1840340-3819094-9mu3fez/index.html

4 (http://www.worldbank.org/en/country/tanzania/overview)

5 (https://www.hrw.org/news/2017/02/14/tanzania-15-million-adolescents-not-school)

6 (https://www.oecd.org/countries/tanzania/41302291.pdf)

7 (https://data.worldbank.org/indicator/SE.XPD.TOTL.GB.ZS?locations=FI-TZ)

Although it is a topic of great interest, the finer details of Finland's strategic investment in education will be eclipsed, also, we will also avoid the murky circumstances of Tanzania's investment in its underperforming education system.The essay is an attempt at simply drawing an obvious but striking statement of Tanzania current circumstances

TZ: rich (in resources) but education is poor
V
FI: poor (in resources) but education is rich

Now at this point these comparisons can draw one into obvious conclusion that there has been (a possible) severe mismanagement of resources, corruption and material exploitation.

Nevertheless, another the picture is also clear, that the educational infrastructure is clearly not there to capitalise on its industrial production from its natural resources and harness its climatic conditions for agricultural development.

Another aspect that can be identified in school design… Finland, an extreme environment where its predominant natural resource is timber, in fact often makes use of state of the art building materials and technologies to realise state of the art school environments for creative, innovative learners

Tanzania, on the other hand is a country whose most valuable export, and it needs to be emphasized, ***gold***, often falls victim to a western pseudo-intellectual dogma that because Tanzania is a poor country, its schools should be built using poor materials, poor techniques and an untrained workforce that constitute the poorest %50 of the world who earn less than a dollar a day .

It should simply be acknowledged that any country where the primary export happens to be the most valuable material on the planet, then the discourse in the suitability and appropriateness of materiality and skilled labour can extend beyond the misinformed obsession for "local" materials. These issues are commonly associated with the context of poverty and constrain conceptual and intellectual progress, especially in a context where the need for progressive thinking to deal with complex issues is more pertinent.

This article serves the purposes of providing some perspective and illustrating that “Locally Sourced” cannot be the bottom line in a global economy where the rest of the world can benefit from Tanzania’s precious materials, meanwhile local projescts must suffer the substandard materials, equipment and techniques that are often imposed upon it by western agencies who paid for their long-haul ticket to preach the virtues of pseudo ‘localisms’.

The graphics illustrating Tanzania’s import trade categories paints a clear picture and interesting point of departure for the material consideration of a design project in the country. Despite the existing circumstances of a well established Global North - Global South wealth disparity, I conclude:

Any country where Gold constitutes 21% of its total export value unquestionably deserves to import the optimum materials required for the development of its educational infrastructure.*

*This is not intended as a provocation, nor is it an attempt to liberate the challenges of any project with a type of irrational artistic license. Instead it is certainly intended to liberate from the pervasive perception that ALL architecture in Tanzania, when carried out by western agencies, should be an opportunity to return to archaic materiality and local aesthetics.

Finland's most valuable *natural* resource

by measure of total export value

TIMBER

FIG. 30

Tanzania's most valuable *natural* resource

by measure of total export value

GOLD

FIG. 31

Location, Location Location..

An Isolated region in the Centre of an East African Community

Kagera is one of the most isolated and remote regions in tanzania.

The immediate reaction has been to question why such an investment of interest should ever be made to a region so isolated and disconnected from the rest of the country.

Kagera might be perceived as poor Agricultural areas on the periphery of Tanzania. Much like Dodoma was perceived as a dry barren desert landscape, literally in the middle of the country, disadvantaged by being equally far away from anything of cultural or economic significance as any other region. However, it is now the centre of the country and it is the political Capital of Tanzania.

Kagera is can, despite its remote location, also be considered a Centre, the only region amongst all the East African Unions country that shares border with so many of its member states; it has the potential of become a nerve center for the entire union, fostering stability, mobility, trade,knowledge and cultural exchange.

Key to this is an educational facility that can accommodate and inspire the youth to engage with the fields of STEAM to address the complex and ever evolving demands of expanding economies of the EAC Union and the industrialisation of their economies.

Kagera is situated ideally as central hub for a union that aspires to free movement of its people in pursuit of peace and prosperity. Fundamental to any nations peace and prosperity is a community of science. Kagera for the purpose of this thesis will not be seen for its handicap as a remote Tanzanian region, but rather for its future potential as a central hub for the East African Community. fostering exchange, peace, development and security

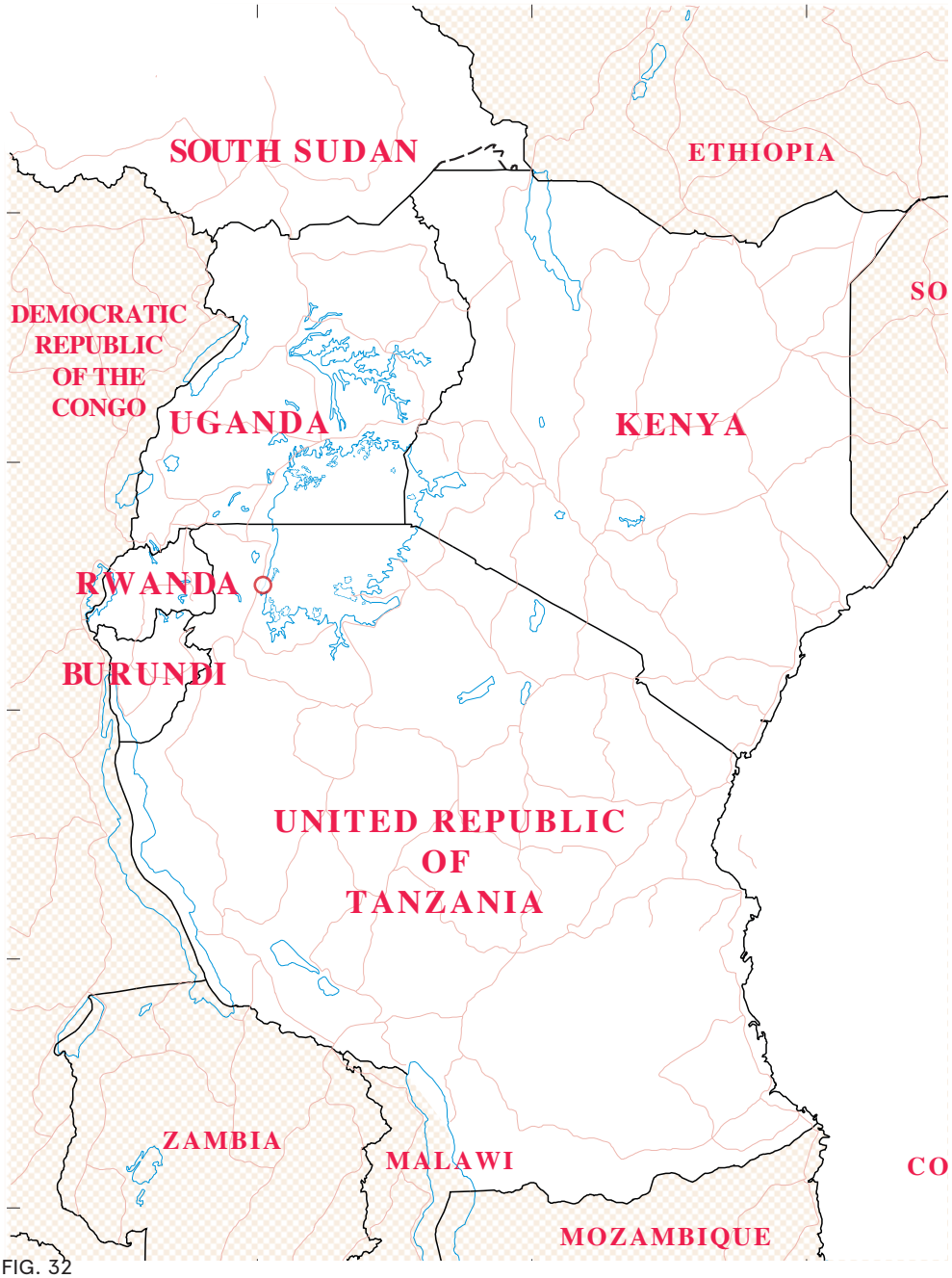


FIG. 32

East African Community

The East African Community (EAC) is the regional intergovernmental organisation of the Republics of Kenya, Uganda, the United Republic of Tanzania, Republic of Burundi and Republic of Rwanda with its headquarters in Arusha, Tanzania.
The EAC aims at widening and deepening co-operation among the partner states and other regional economic communities in, among others, political, economic and social fields for their mutual benefit. [1]

1 https://au.int/en/recs/eac

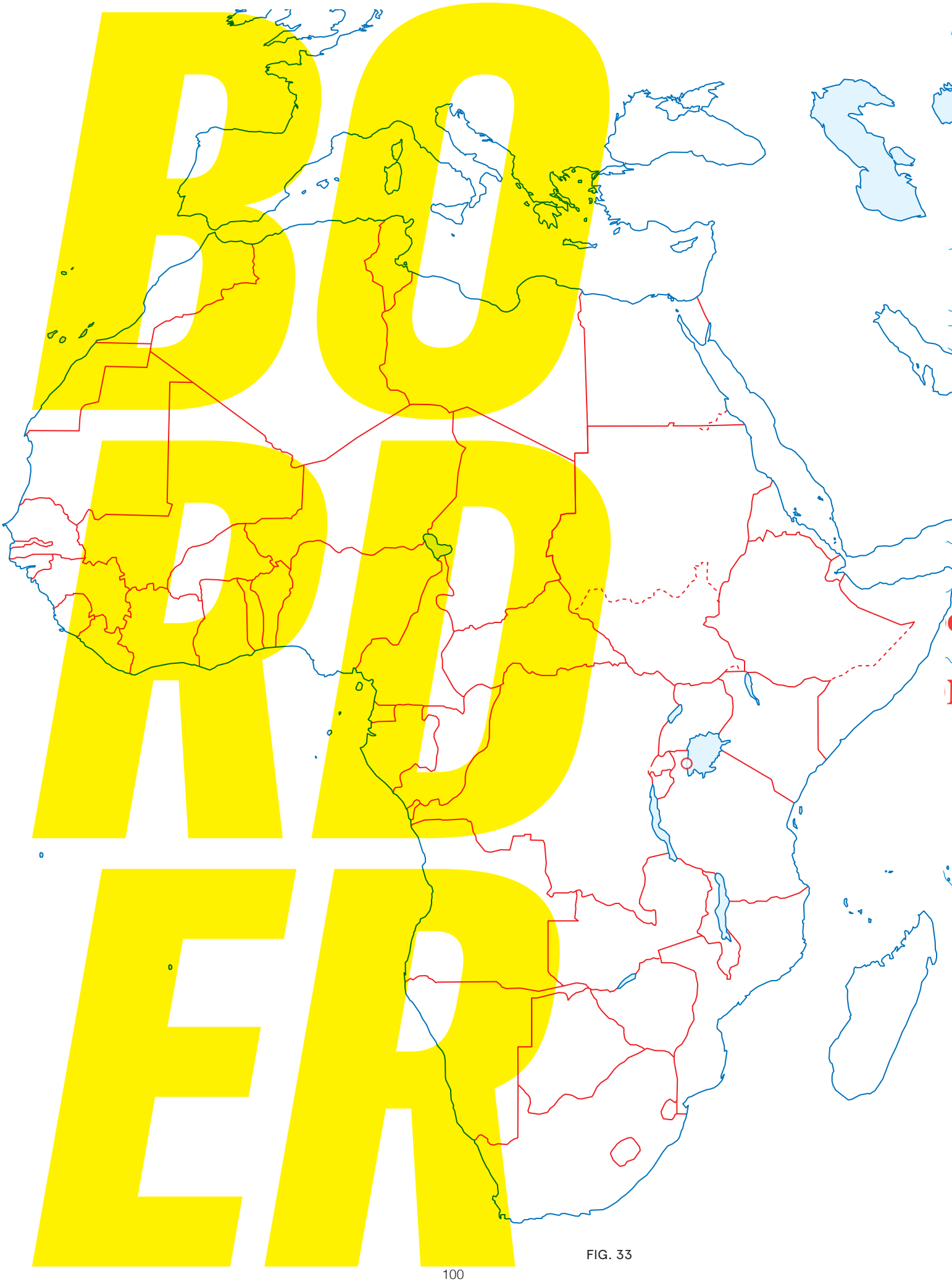
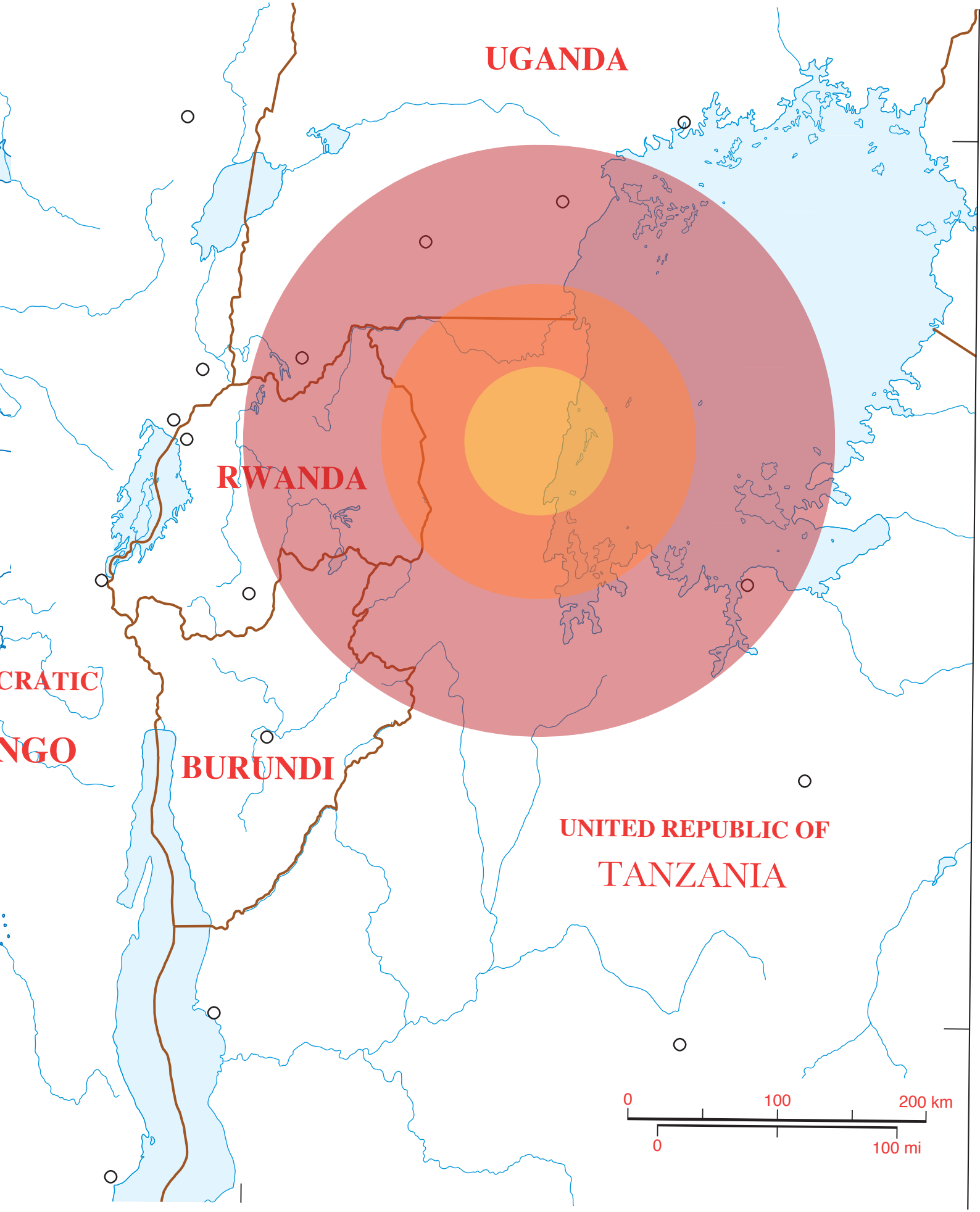


FIG. 33



Bound by the nile and lake victoria
Sandwiched between Rwanda, Burundi, Uganda and Kenya

this is potenitally the most important location in all of east arica!

FIG. 34

DataShots

Shifting climate condition, rapid emergence of transport and logistics technologies, border disputes and the formation of political and economic unions; These DataShots present a screen-shot of the current context but offer an opportunity to reflect on the temporary nature of the circumstances. From the onset of this study, it has been acknowledged that transformation in a developing country like Tanzania can be rapid. Immense change and shifting circumstances can bring positive advantages but also have detrimental impacts. These DataShots are a graphic glimpse at climate, water resources, infrastructure, and offer an opportunity to consider the role STEAM education has to play in impacting positively in these areas in the immediate future.

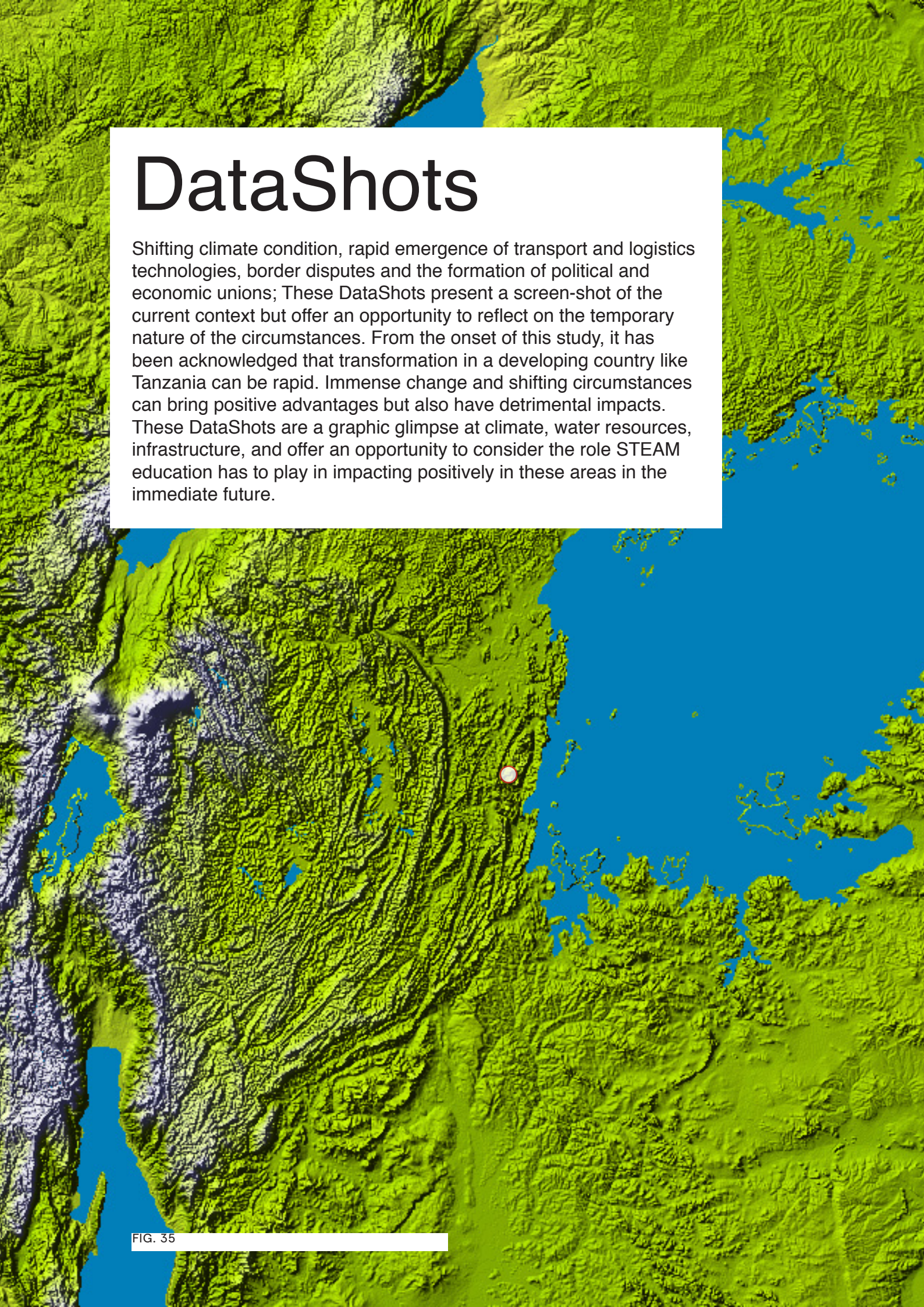
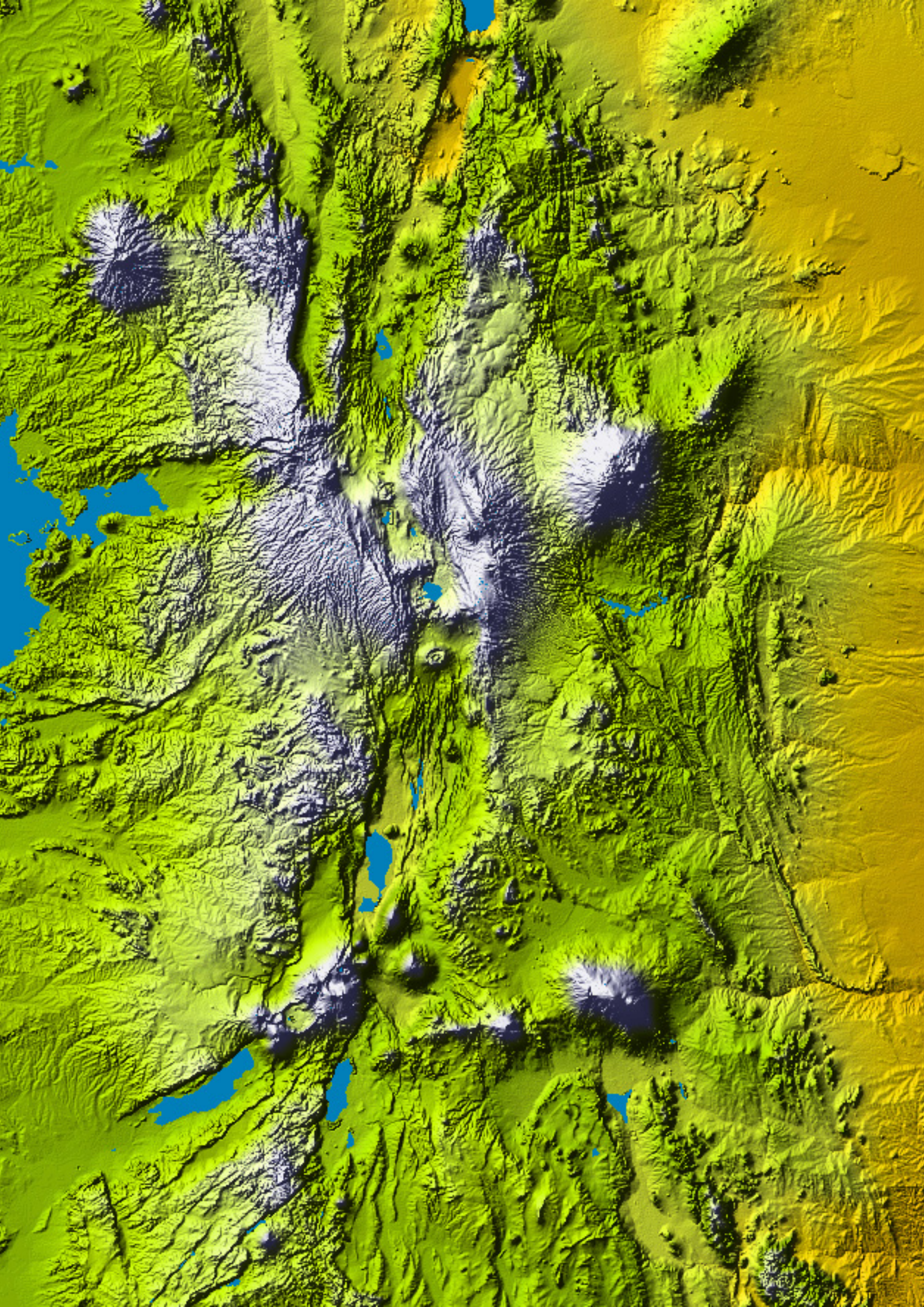


FIG. 35



KAGERA

Kagera:The Center of a Union
Kagera:The periphery of a state

FIG. 36

Tanzania in the East african Community, an intergovernamental organisation aiming to foster conomics proseprtiy, unity language, culture, peace and stability. Headquarters in Tanzania

Kagera, outlined in red is the most peripheral region in Tanzania, yet the most central region in the EAC

KAGERA

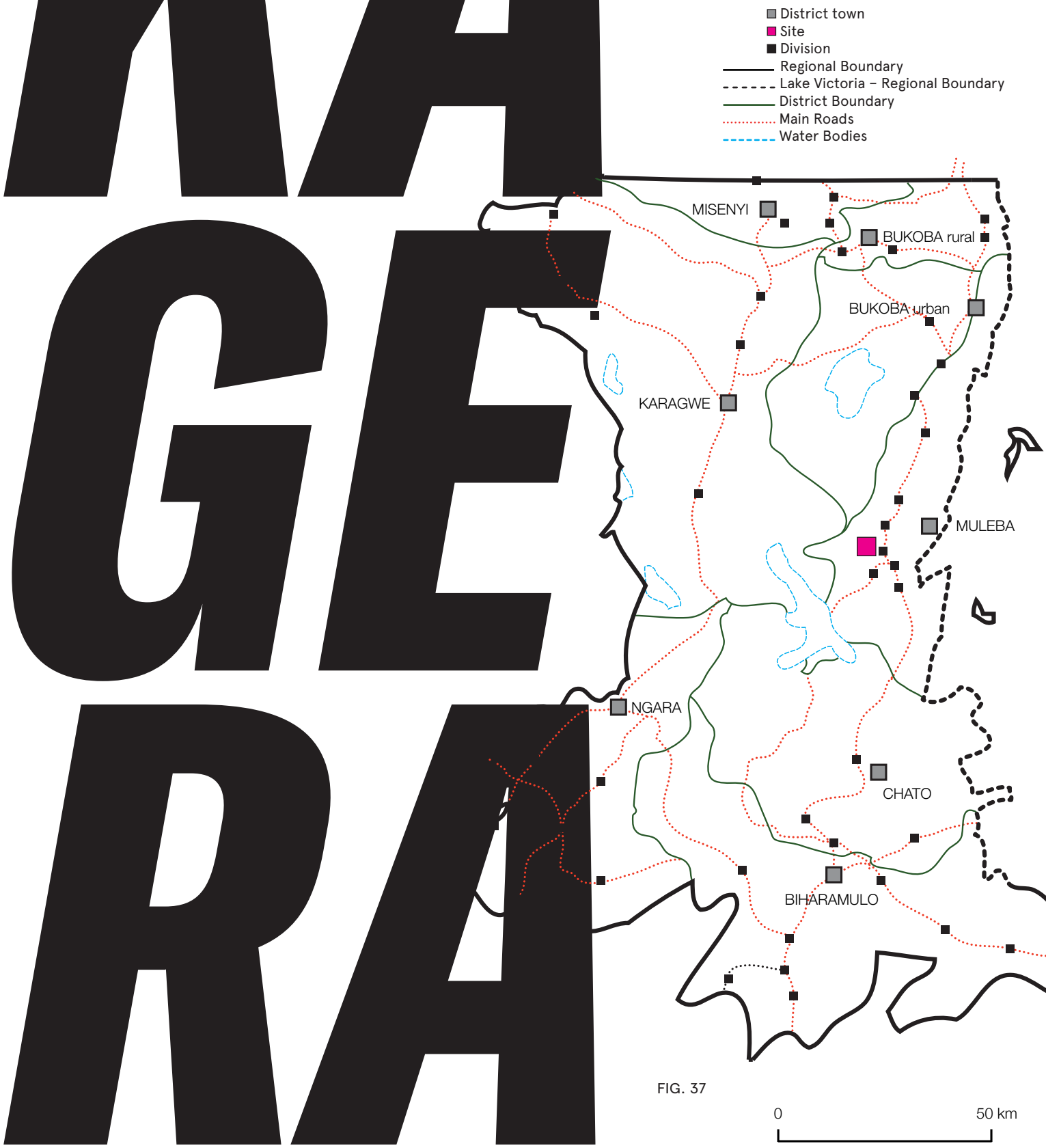
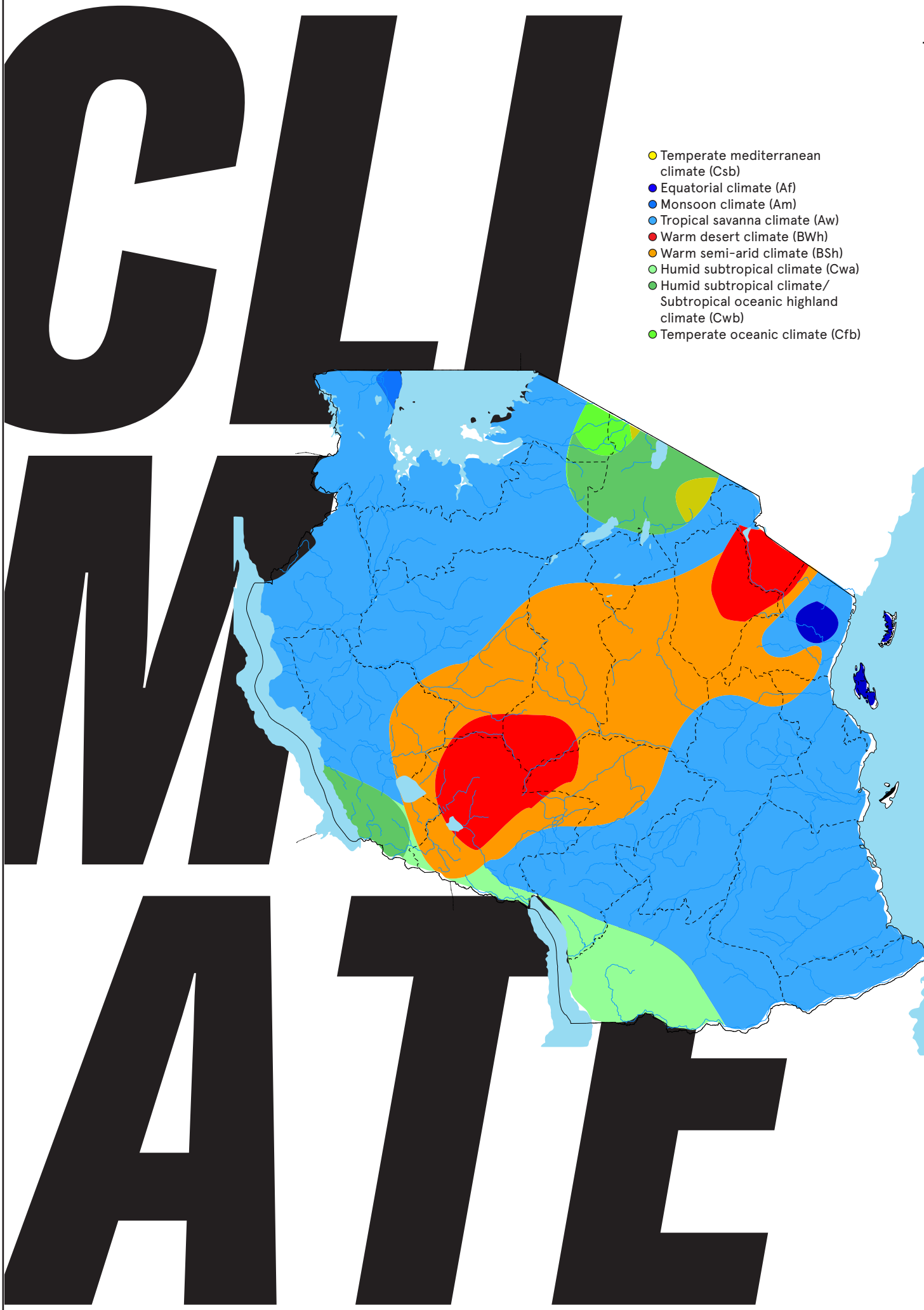


FIG. 37

FIG. 38

CLIMATE



Climatic Conditions are optimum for agricultural production, STEAM education will provide the necessary skills to harness this potential, but it will also to encourage the creative problem solving skills that re most necessary in the fight to solve one of the most significant challenge facing our global society, Climate change.

No matter what, water is the most important resource on the planet. STEAM education will promote the necessary innovation to harness, and treat water. Preservation and conservation Climate change. poses a siginifcant threat to many regions in the world, drought and famine lead to instability and migration. Action needs to happen to mitigate the adverse affect climate change can have on rainfall and therfore, the stability and peace of a global society

RAIN
ING

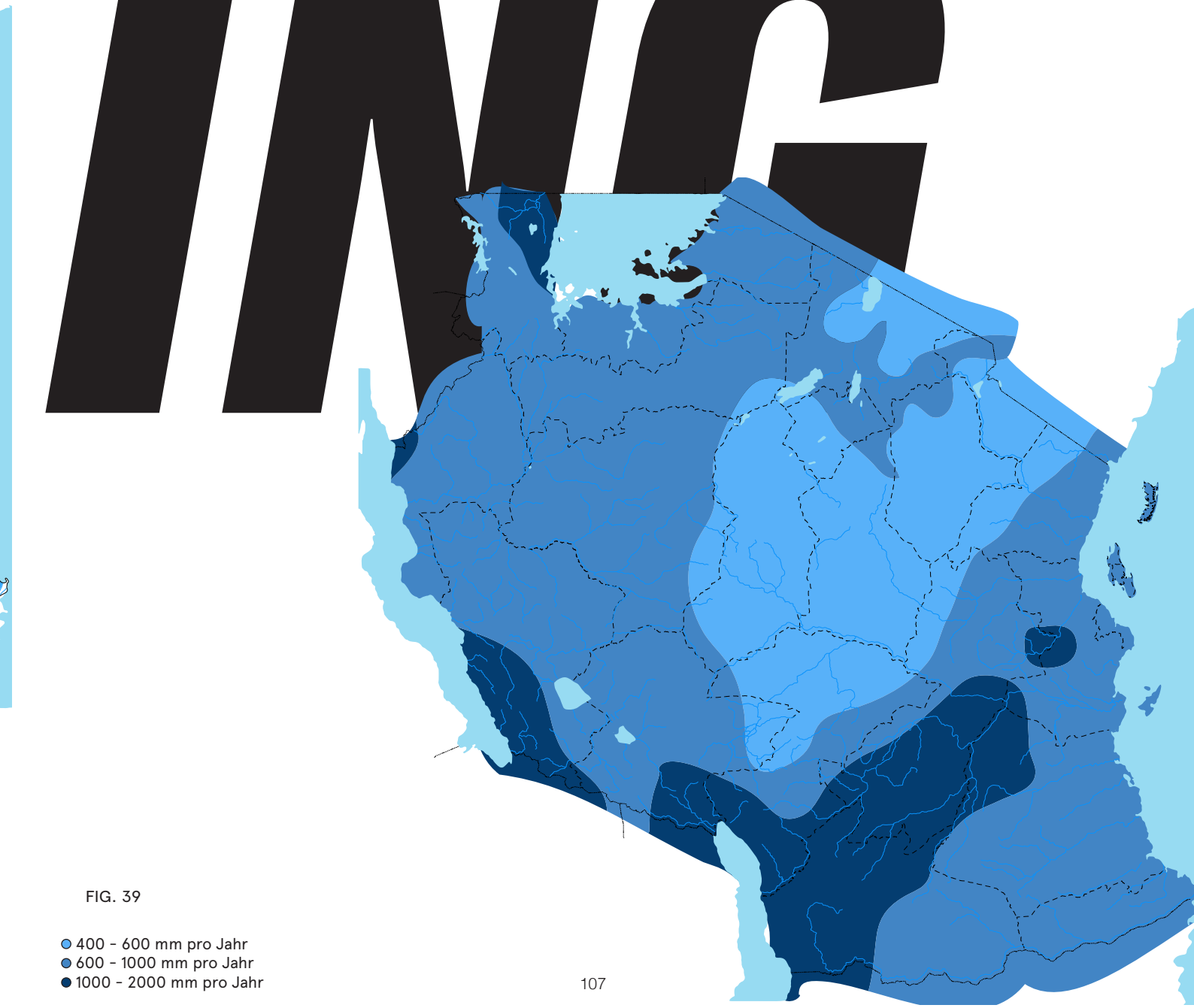


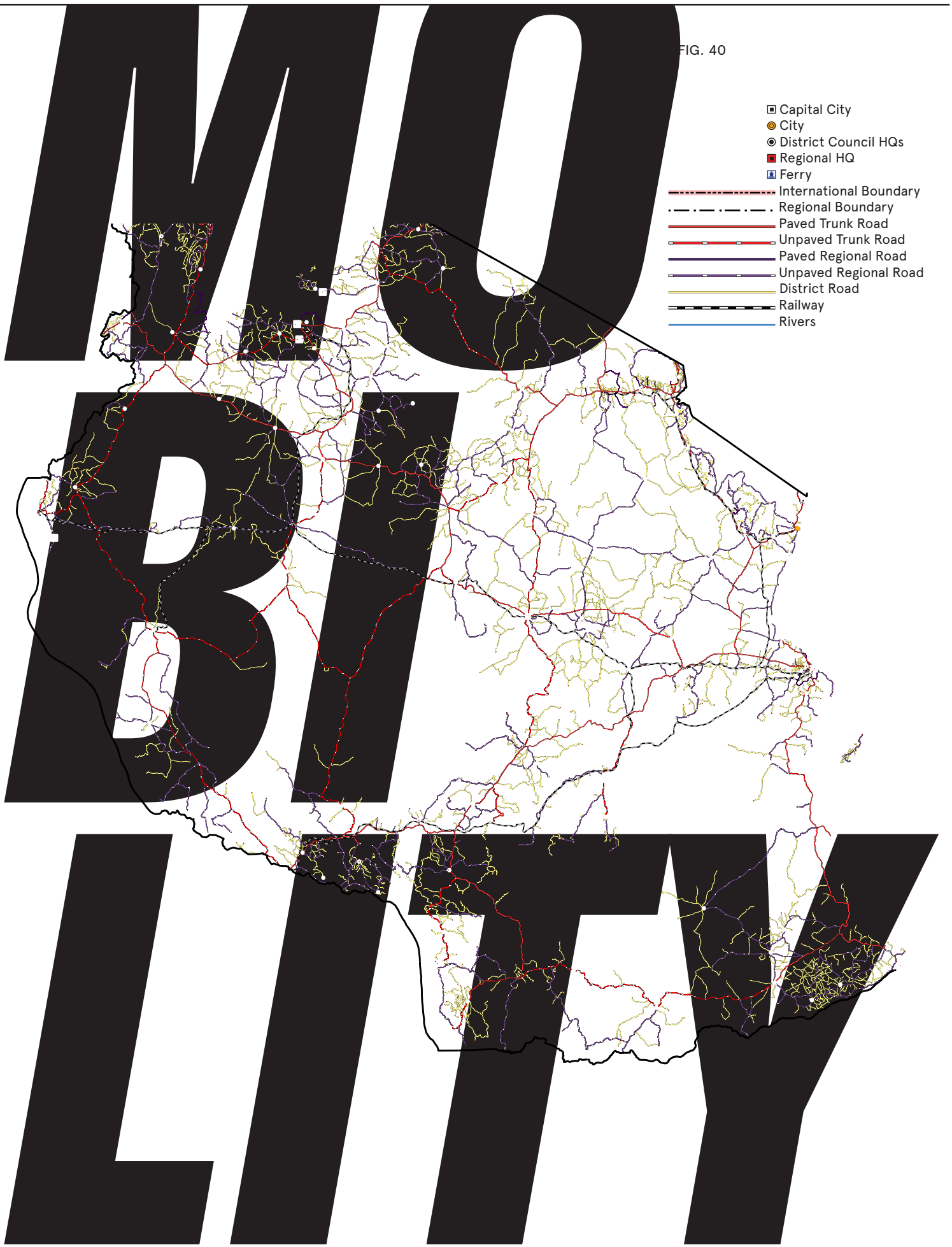
FIG. 39

- 400 - 600 mm pro Jahr
- 600 - 1000 mm pro Jahr
- 1000 - 2000 mm pro Jahr

The roadmap illustrates a landscape of fractured transport infrastructure. with the new generation of logistics and transport technologies, its is inevitable that this will have an impact on the morphology of this network. Tanzania is already leading the way with it's drone delivery programme and with the potential for autonomous vehicles, Technology will literally take infrastructure off the map! STEAM education is part of the roadmap for the development of Tanzania's infrastructure network.

MOBILITY

FIG. 40



WATER

FIG. 41

No matter what, water is the most important resource on the planet. STEAM education will promote the necessary innovation to harness, and treat water. Preservation and conservation **Climate change**. poses a siginifcant threat to many regions in the world, drought and famine lead to instability and migration. Action needs to happen to mitigate the adverse affect climate change can have on rainfall and therfore, the stability and peace of a global society

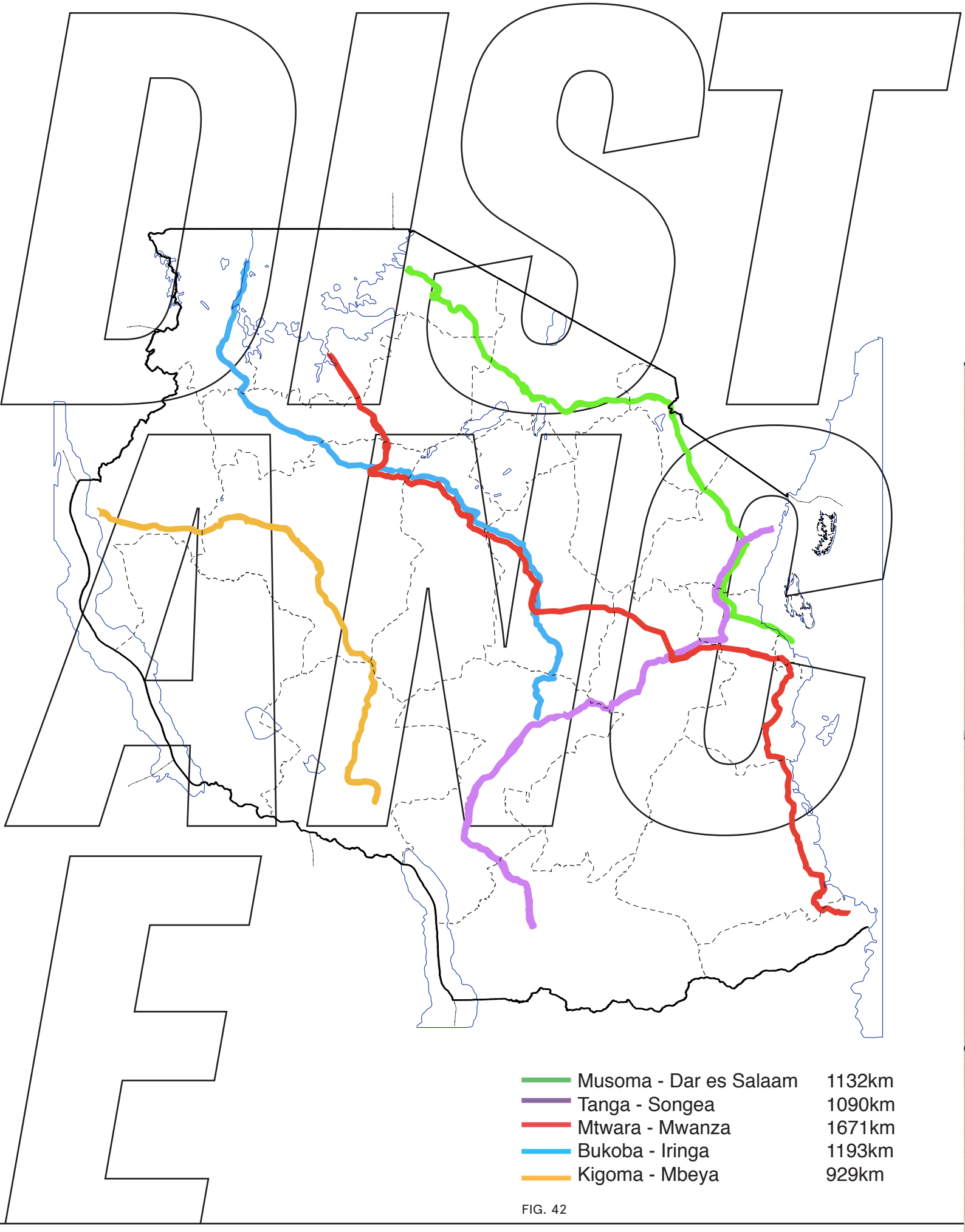


FIG. 42

The distance between home and school can be as siginficant as a 3 day journey by bus. Students from Mwanza studying in Mtwara, this mobility at such a young age and in spite of the barrier of disatance is all part of the rich social fabric of Tanzania

A tale of 2 capital cities, one by population, the other by politics.
Dar es salaam, the swahili town turned choking metropolis is no longer the political capital of Tanzania. Dodoma, lying in the Arid center of the country, has become the the new home of political power under the leader ship of Tanzanian president John Magafuli.

CAPITALS

FIG. 43

Climatic Conditions are optimum for agricultural production, STEAM education will provide the necessary skills to harness this potential, but it will also to encourage the creative problem solving skills that re most necessary in the fight to solve one of the most significant challenge facing our global society, Climate change.

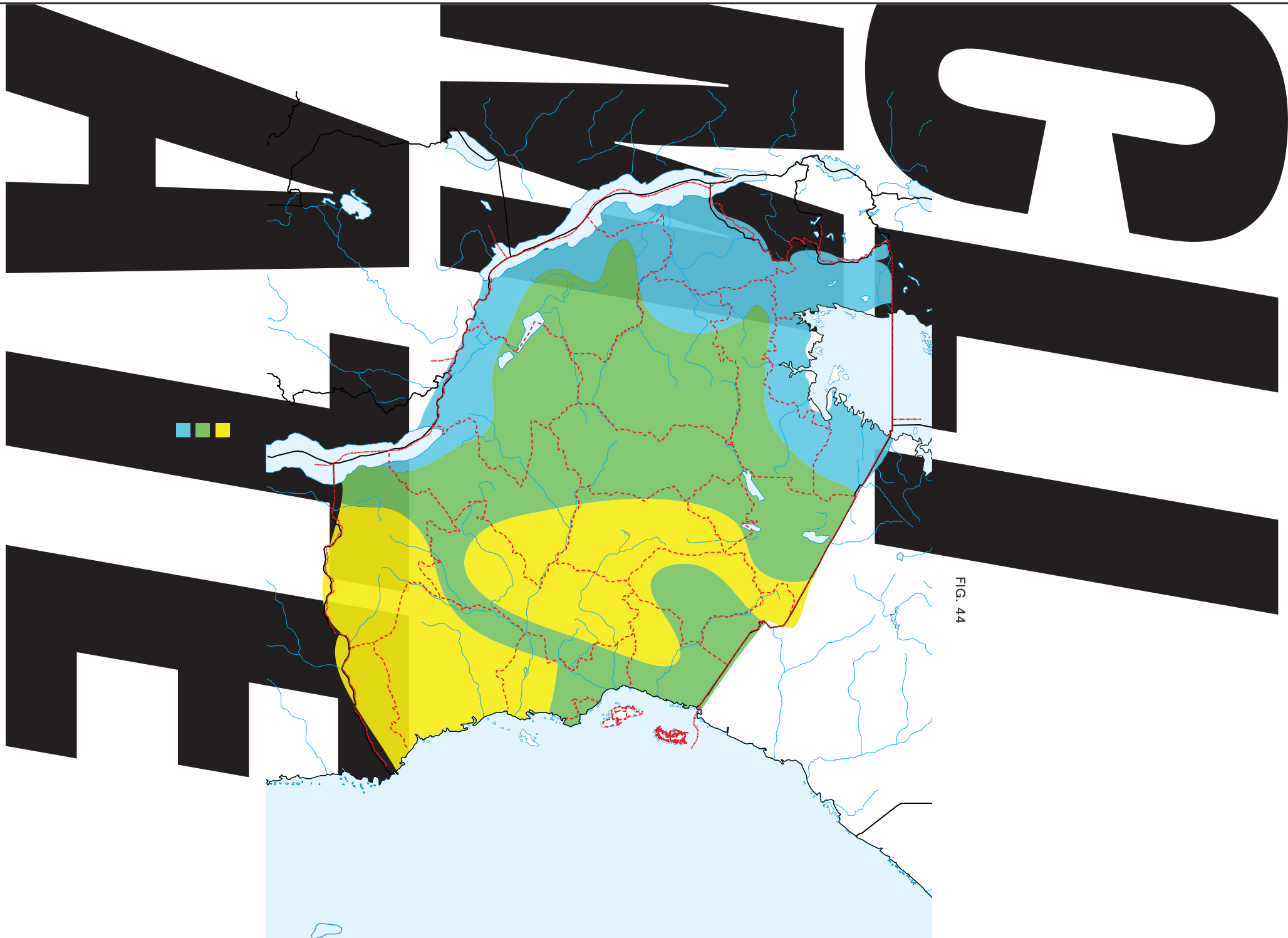
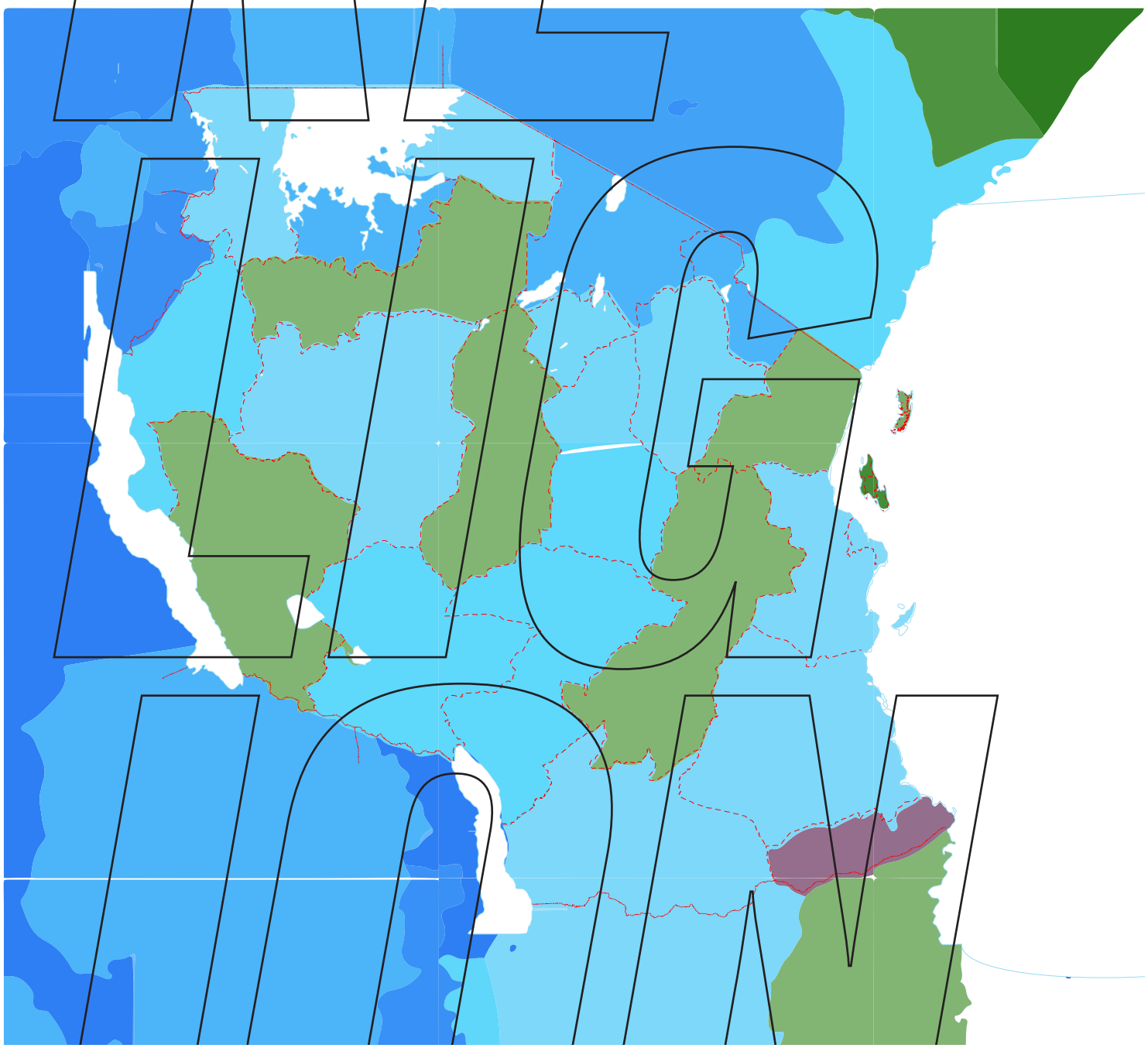


FIG. 44

FIG. 45



Tanzania's religious diversity is reflected in the patchwork landscape of the map in compraison to the larger surface area reflecting religious majorities in neighbouring countries.
Current statistics on religion in Tanzania are unavailable because religious surveys have been eliminated from government census reports since 1967. Religious leaders and sociologists estimate that Muslim and Christian communities are approximately equal in size, each accounting for 30 to 40 percent of the population, with the remainder consisting of practitioners of other world faiths, practitioners of indigenous religions, and people of no religion.[1]

1 https://en.wikipedia.org/wiki/Religion_in_Tanzania

Need for STEAM.. now!

An education devoid of arts…is an empty, half-brain kind of education." [1]

STEAM is an acronym that denotes the fields of Science, Technology, Engineering Art and Math education. The initiative to include Art within the STEM agenda was originally championed by the Rhode Island School of Design and has now expanded to include educators from across the globe through the STEMtoSTEAM network.[2]

The delivery of STEAM fields is underpinned by new teaching methodologies where learning is conceived as, both, an independent and collaborative investigation. Expert teachers that facilitate the students in their creative inquiry guide this educational experience.

At present, the economic impact of poor performance in STEM is driving the demand for a strategic shift in Education Policy to improve the STEM fields in Tanzania, it is vital that while STEM subjects are being prioritized, Arts Subjects are also encouraged so as not to be diminish the importance of indigenous artistic creativity and expression, but also not to stigmatize those with natural artistic capacities. Furthermore, The advocacy for Art to be included as a priority subject alongside Scientific and Technical subjects is clear; creativity, curiosity and expression are integral attributes of innovative learners capable solving problems collaboratively and independently.

Art + Design are poised to transform our economy in the 21st century just as science and technology did in the last century.[3]

Despite a number of previous educational reforms, little has been achieved that improves the circumstances for learners
In developing countries such as Tanzania, educational change means providing a quality of education that better addresses the needs of ever-expanding technologies in information systems, communications, medicine and engineering. The current Tanzanian educational system, which was meant to serve an agriculturally-based society, will not allow teachers and students to adapt to meet the economic and social demands that such global transformation

1 Professor Howard Gardner
2 STEMtoSTEAM
3 STEMtoSTEAM

is bringing.[4] As a result, there is a wide discrepancy between the knowledge, skills and competencies that school graduates have and the needs of society.

As Tanzania projects itself into the 21st century with its Vision 2025 as an industrial ecnomy, it will need to harness the ingenuity, creativity and

Integrating ARTS into the STEM fields. The Steam fields are considered as essential to the development of a creative generation of 21st century thinkers, not only for 21st century innovations and progress, but also to harness the capacity for these fields to provide solutions to issues that hinder development in 21st century Tanzania.

4 http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/sc_A_Needs_Assessment_Study_of_Tanzania_Science_Education.pdf

FIG. 46 STEMtoSTEAM initiatives Globally

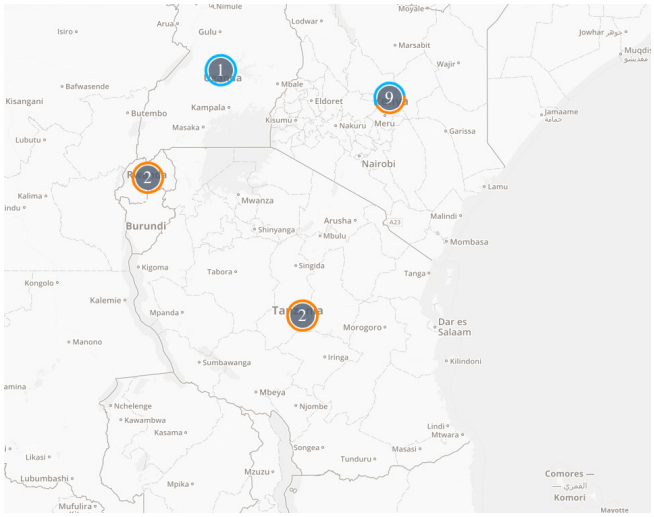
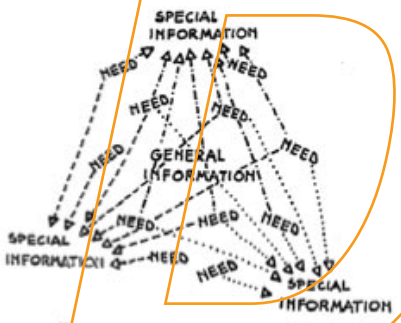


FIG. 47 STEMtoSTEAM initiatives in the EAC


CONCEPT

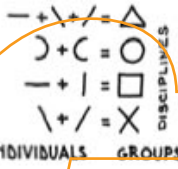

ОСО
СNС
РЕР
Т

1. THE IDEA OF UNIVERSITY: THE NEED FOR AND EXCHANGE OF GENERAL AND SPECIAL INFORMATION.

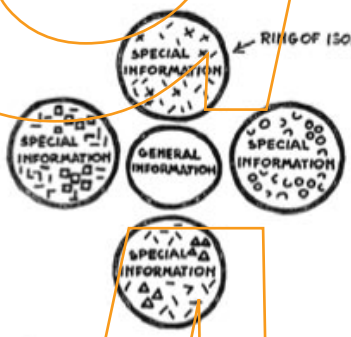


IDEA OF UNIVERSITY

2. THE UNIVERSITY IS COMPOSED OF INDIVIDUALS AND GROUPS, WORKING ALONE OR TOGETHER, IN DIFFERENT DISCIPLINES. WHEN INDIVIDUALS WORK TOGETHER THEY TAKE ON NEW CHARACTERISTICS AND DEVELOP NEW NEEDS.



3. THE UNIVERSITY AS IT SEEMS TO BE: BUILDINGS CONTRIBUTE TO THE ISOLATION OF SPECIFIC DISCIPLINES.



ATOMIZATION OF THE IDEA OF UNIVERSITY

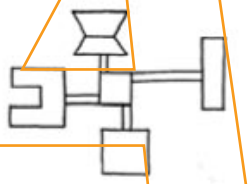
4. BUT THE REMOVAL OF BUILT BARRIERS AND THE MIXING OF DISCIPLINES IS NOT ENOUGH. THE GROUP IS MEANINGLESS WHEN THERE IS NO PLACE FOR THE INDIVIDUAL.

GROUP IS EVERYWHERE

5. THE RELATIONSHIP OF GROUP AND INDIVIDUAL MUST ALSO BE CONSIDERED. AREAS OF ACTIVITY AND AREAS OF TRANQUILITY MUST BE PROVIDED. IF THE GROUP IS EVERYWHERE, THERE IS NO GROUP BECAUSE THERE IS NO INDIVIDUAL.

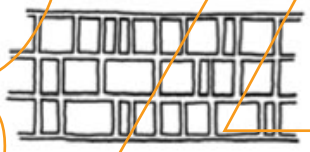
PLACES FOR INDIVIDUAL · PLACES FOR GROUP
TRANQUILITY AND ACTIVITY
ISOLATION AND EXCHANGE

6. THE EXTERNAL EXPRESSION OF DIFFERENCES IN FUNCTION (ARE THESE AS IMPORTANT AS THE SIMILARITIES?) AND NOSTALGIA FOR REPRESENTATIVE FORM ALSO TEND TO SEGREGATE THE UNIVERSITY INTO SPECIALIZED DISCIPLINES ONLY.



DISSOCIATION

7. WE SEEK RATHER A SYSTEM GIVING THE MINIMUM ORGANIZATION NECESSARY TO AN ASSOCIATION OF DISCIPLINES. THE SPECIFIC NATURES OF DIFFERENT FUNCTIONS ARE ACCOMODATED WITHIN A GENERAL FRAMEWORK WHICH EXPRESSES UNIVERSITY.



ASSOCIATION

8. IN SKYSCRAPER TYPE BUILDINGS DISCIPLINES TEND TO BE SEGREGATED. THE RELATIONSHIP FROM ONE FLOOR TO ANOTHER IS TENUOUS, ALMOST FORTUITOUS, PASSING THROUGH THE SPACE-MACHINE-LIFT.

9. IN A GROUND SCRAPER ORGANIZATION GREATER POSSIBILITIES OF COMMUNITY AND EXCHANGE ARE PRESENT WITHOUT NECESSARILY SACRIFICING ANY TRANQUILITY.

10. TENTATIVE USE OF A MINIMUM STUCTURING SYSTEM WHERE INDIVIDUAL AND GROUP MAY DETERMINE DESIRABLE RELATIONSHIPS.

FIG. 48

Where context examined the existing circumstances, concept examines the articulation of architectural ideas, whether they are a direct manifestation of existing conditions or a result of referencing previous ideas.

The Concept for a regional centre for excellence was developed through talks with the Directors of the Bukoba, Muleba Secondary School and Members of the Young Scientists Tanzania organisation.

Key Aspects of the design solution should consider

Flexibility is essential to provide for an evolving contemporary teaching curriculum.

Rooms offering functions other than just as classrooms

Access and inclusion to provide for equal opportunities and to accommodate special needs and disabled students

Safety and security, creating the feeling of an organised, safe environment important for well-being, health and self esteem.

Design quality including functionality, fitness for purpose, maximising site opportunities and aesthetic values

Good working and learning environment including aspects such as air and lighting quality, noise attenuation, responsive services etc.

Environmental performance and sustainability, limiting environmental impacts and optimising the use of renewable resources

Community involvement making the school a focal point for life long learning

Key Aspects informing a design

Provide a solution that accommodates potential for flexibility and a variety of alternative functions

Provide a solution that ensures the optimum environment for teaching and learning of science

Provide a solution that embraces the environmental, topographic limits of the location and the site

Provide a solution that clearly distinguishes between the public and private functions of the centre

Provide a solution that encourages innovative, creative and independent learners to engage with science and to embrace the challenges in their environment.

Atlas of reference

the Curation of an idea

ATLAS of reference
Research: An Atlas of reference:

The atlas of reference is a collection of architectural precedents that cover cultural and educational institutions. The works have been compiled to provide a visual catalogue of the architectural projects that are determined have supported the conceptual basis of the thesis.

Individually the projects are not presented for their direct influences but rather as a catalogues that is greater than the sum of its parts. The projects are diverse in their handling of materiality, structure and form but this catalogue is held together by the intrinsic attempt of each architect to liberate architecture of the rigidity of the structural element, the wall.

Unlike Architectural projects that establish spatial boundaries to form 'rooms' as sculptured spaces to be experienced through movement (Kahn, Zumthor, Märkli..), these projects instead employ structure and 'planes' to define 'A Space'. These buildings are spaces in themselves as opposed to a sequence of spaces.

The articulation of tectonics and detail are of disparate concerns in each of the projects, but the essential attempt to liberate space is discernible throughout. Capacity, potential and indeterminacy are the values extracted from these precedents and they serve the basis of the conceptual framework of this thesis project.

Catalogue of Architectural Liberation

Liberation of space is the underlying concern for all of these architectural artefacts . In the modernist masterpieces of Mies van der rohe we observe liberation of the floorplan in rigid institutions like galleries and universities. Later projects like Lina Bo Bardi's MASP liberated the section by contributing a civic space below its gallery. The optimisation of space is examined in the section at Alejandro de la Sota' school where the roof structure itself is the space that accommodates the learning environment. Even the most rigid of institutions, the bank, embraced Richard Roger innovative thinking by liberating the building of all infrastructure and embracing the exposed power aesthetic as an architectural language. Conceptual projects like Prices fun palace were an exercise in liberation of architecture as a building, to free it from the constraints of its inherent inflexibility and to embrace user appropriation as a Design methodology. Architects like Lacaton Vassal and Bruther, who have, like Mies, embraced the materiality of industrial production, employ standard elements and simple construction details, but unlike Mies, it is not to celebrate material for its tectonic qualities, the purpose is to liberate the architecture of its inflexibility and complex detailing, providing end-users with the capacity to appropriate and optimise the architecture with ease.

I	Maison de la Recherche et de l'Imagination (MRI), Caen,Bruther 2015	2500 m^2
II	Nantes School of Architecture, Nantes Lacaton Vassal, 2009	15150 m^2
III	IIT Crown Hall, Chicago, Mies van der Rohe, 1955	2400 m^2
IV	Sciences de la vie Building . lausanne,Bruther/ Baukunst, 2017 Neue	16000 m^2
V	~~Nationalgalerie, Berlin, Mies van der Rohe, 1968~~	~~2683 m^2~~
VI	Kanagawa Institute of Technology Workshop, Tokyo, Junya Ishigami, 2010	1989 m^2
VII	Maravillas Gymnasium, Madrid, Alejandro de la Sota, 1962	10000 m^2
VIII	Lloyds Building,London, London Richard Rogers, 1986	55000 m^2
IX	Fun Palace, Cedric Price,	N/A -
X	São Paulo Museum of Art (MASP), Sao Paulo, Lino Bo Bardi, 1968	10000 m^2

"Architecture is what remains when you get rid of the superfluous." Bruther

"It is important to make buildings in which users find freedom." Anne Lacaton

"Architecture is the will of the age conceived in spatial terms." Mies van der Rohe

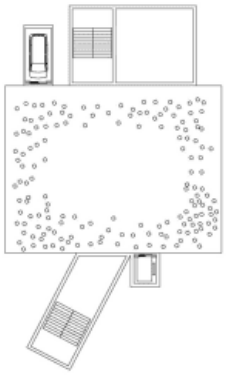
"[Architecture] must create new appetites, new hungers-not solve problems, architecture is too slow to solve problems." Cedric Price

"Architecture is about public space held by buildings." Richard Rogers

" I [am] interested in finding a way to design space somehow free of geometry or any rules. I imagined this could lead to a new universality in space." Junya Ishigami

"the building does not really have any Architecture at al.l" Alejandro de la Sota

"I am an architect, I break walls!" Lina Bo Bardi



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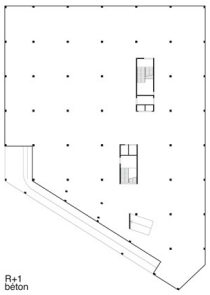

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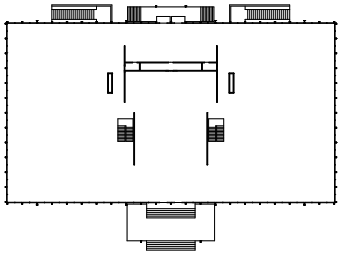

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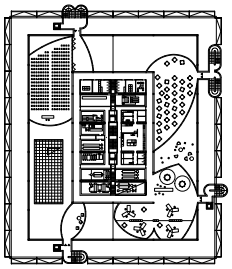

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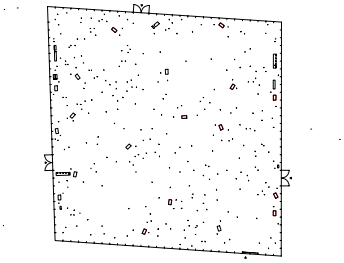

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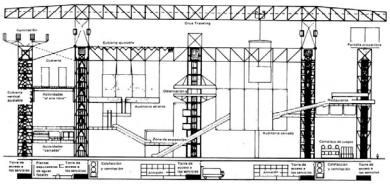

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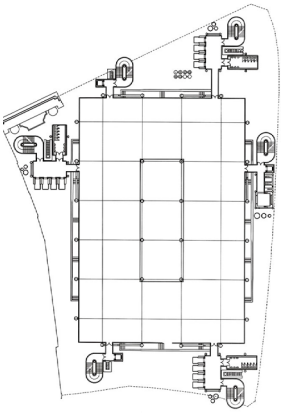

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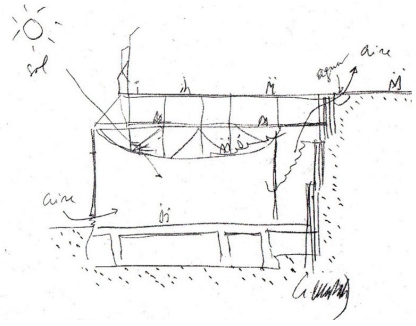

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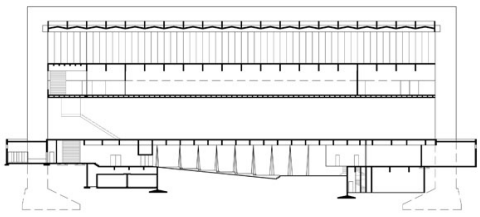


X

Atlas of reference

the source of ideas

Architecture as an optimum artefact of organic essentialism, nothing more and nothing less than what is needed Stripped of the unnecessary, [1]Architecture remains as THE pure result of the sum of its components, elements and properties. Rather than an architecture of diminished significance in its articulation and aesthetic gestures, the essence of such a statement is to embrace a way of thinking about design that is precise and coherent. Since it is suggested that architecture is what 'Remains' it is an indication that architecture is a process of reduction. The process of eliminating the gratuitous gestures of a contemporary architectural environment saturated with ideas, meanings, symbols. To 'Get Rid' is an indication that architecture has become burdened with redundant ideas. Such a concept provides solace from the confusing world of tired architectural clichés, where they have now entered the realm of social media and presented as gospel. Even

'Architecture is what remains when you get rid of the superfluous' [2]

1 Ross Lovegrove, https://www.domusweb.it/en/design/2008/01/03/organic-essentialism.html

2 Bruther, https://www.architectural-review.com/buildings/vertical-hangar-bruthers-fab-lab-in-caen/10008071.article

in an egalitarian society such an approach to design can be misconstrued amongst laypeople as lazy, reductionist and functional. But somewhere like Tanzania, where good architecture is expected to serve the purpose of communicating the ascent from the conditions of poverty, extravagance and extraneous articulation are often perceived to be of higher value than concept. Architectural projects executed by western agencies are perceived as ambitious artefacts, symbolic of prosperity, progress and status. Here lies the dilemma of implementing an architecture that embraces the rationale of providing minimum constraints yet maximum potential in a context where the appetite for extravagance and luxury are intrinsic to the aspirations of economic and social prosperity. Meanwhile it is also the dilemma that imbuing design with articulated extravagance also leaves the end users with an inflexible building, unable to accommodate change.

‘Less is more’
‘Less is a bore’
‘I’m a whore’
‘Yes is more’
....

[Not] Just another brick in the wall

An architecture of Potential.

This educational Centre would serve the purpose of establishing a regional hub for Workshops, Outreach, Exhibitions and Demonstrations in the Science, Technology, Engineering, Art and Math.

Rather than attempting to address the lack of resources in individual schools, this center would provide a community shared-space for any institution in the region that wants to participate in STEAM fields.

Free from the constraints of complicated details and elaborate schematics, the concept for the Kagera Steam Machine translates a pedagogical philosophy into the schematic organisation of the architecture. A learning environment where knowledge and expertise supports the foundation for students to pursue creative inquiry in the STEAM fields.

This is an environment that should combine practical educational infrastructure along with open, non-programmed spaces where students can be guided individually or in groups by education experts. Its is a combination of Bottom up and open school educ

Meanwhile, clear boundaries should be established so as not to contaminate private zones for educational experimentation with zones for public exhibition.

Material decisions about the execution of the building should ensure that the building can be easily appropriated, modified and optimised as the role of the STEAM machine evolves in the shaping of STEAM Education the Region.

FIG. 50

NETWORK

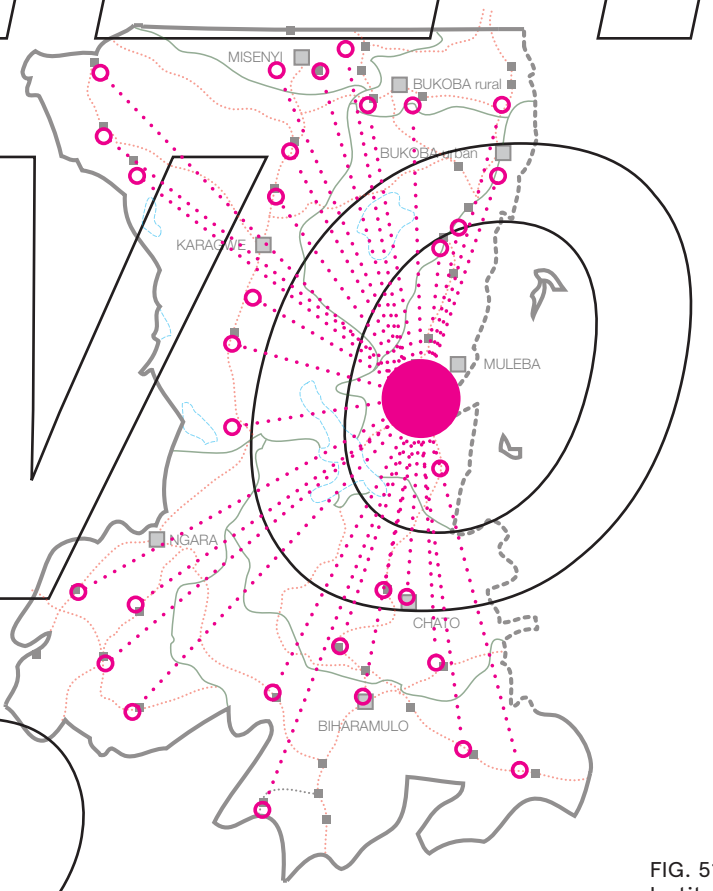


FIG. 51 Kagera Regional Institute for STEAM as a Shared-Space by all schools in the region

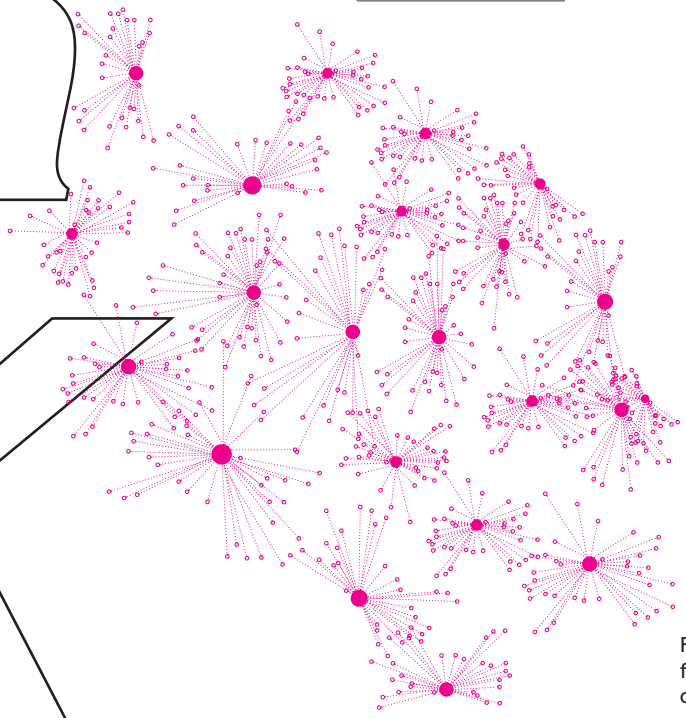


FIG. 52 Potenital strategy for implenting regional centres Nationwide

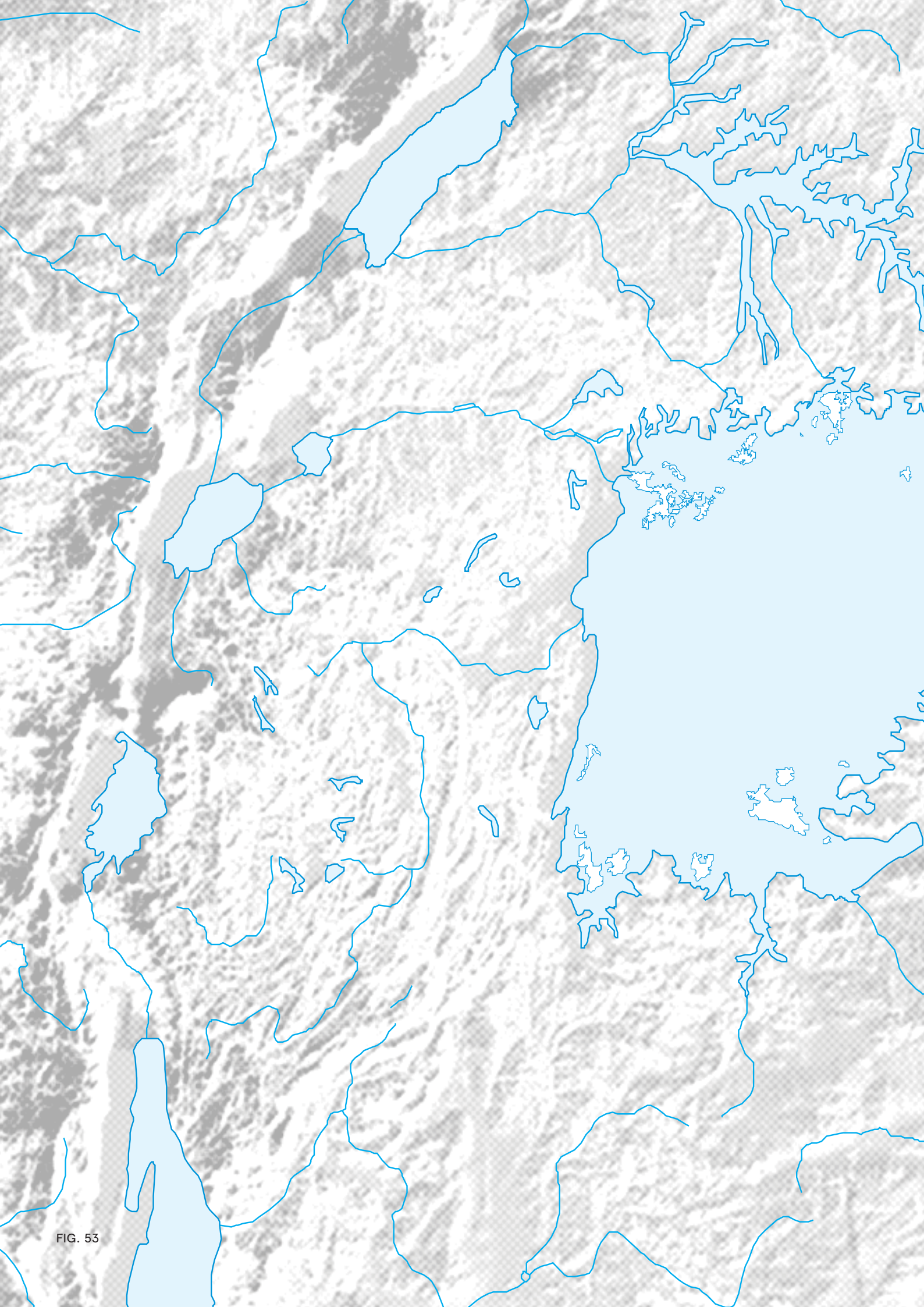
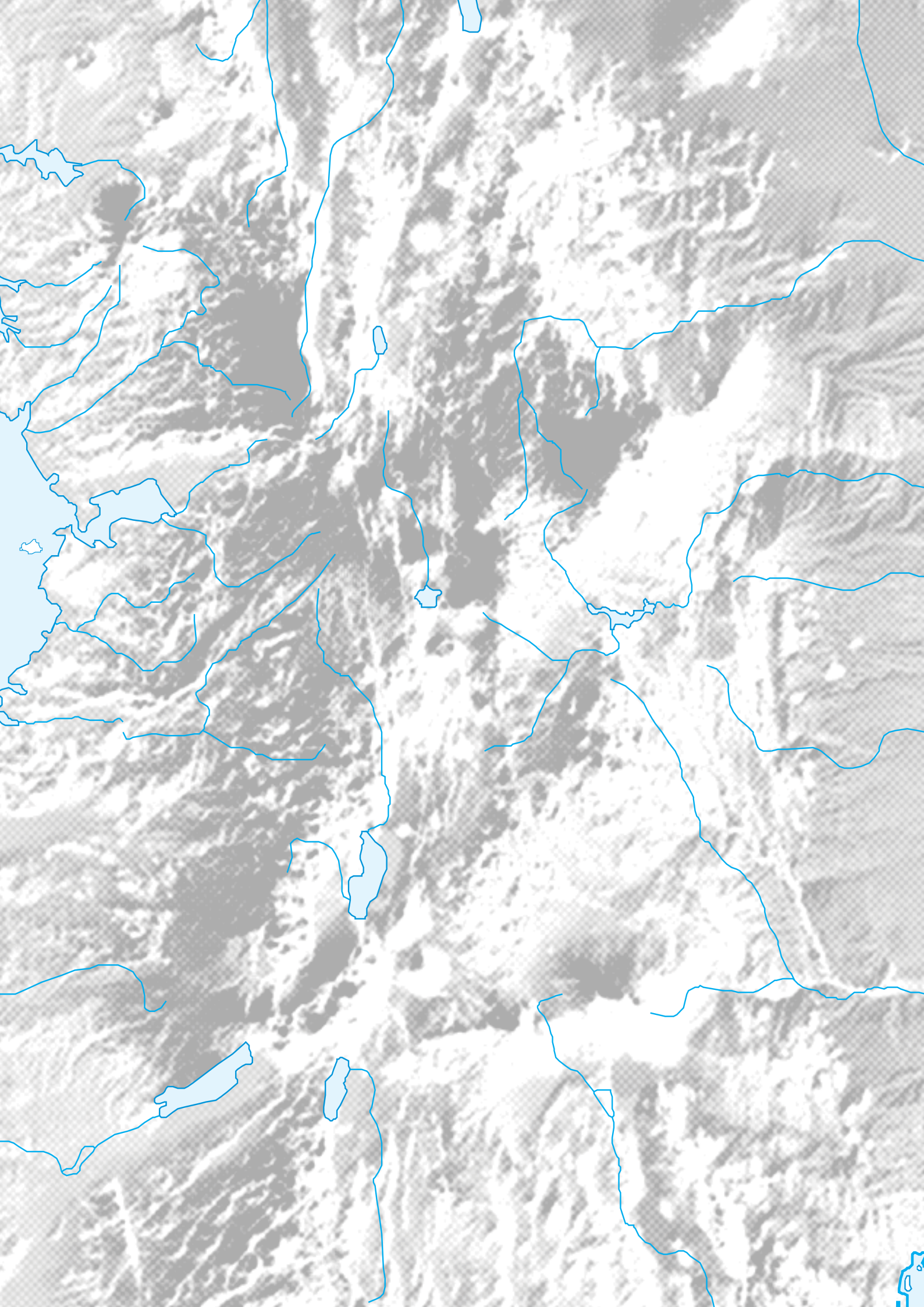


FIG. 53



Together with the Organisation, Young Scientists Tanzania and the Muleba Secondary School in Kagera, The initial steps to consider a Regional Centre for Excellence in Science began with locating an appropriate site. Ijumbi, a new town along the Bukoba - Biharamulo Roadwas considered an ideal location because of its proximity to Infrastructure, Natural water resources, Health Care and Residential Facilities. With Muleba Secondary School providing the land for development, the Facility would benefit form using resources of the Nearby Secondary School and Seminary While Independent organisation like Young Scientists Tanzania would operate the Facility

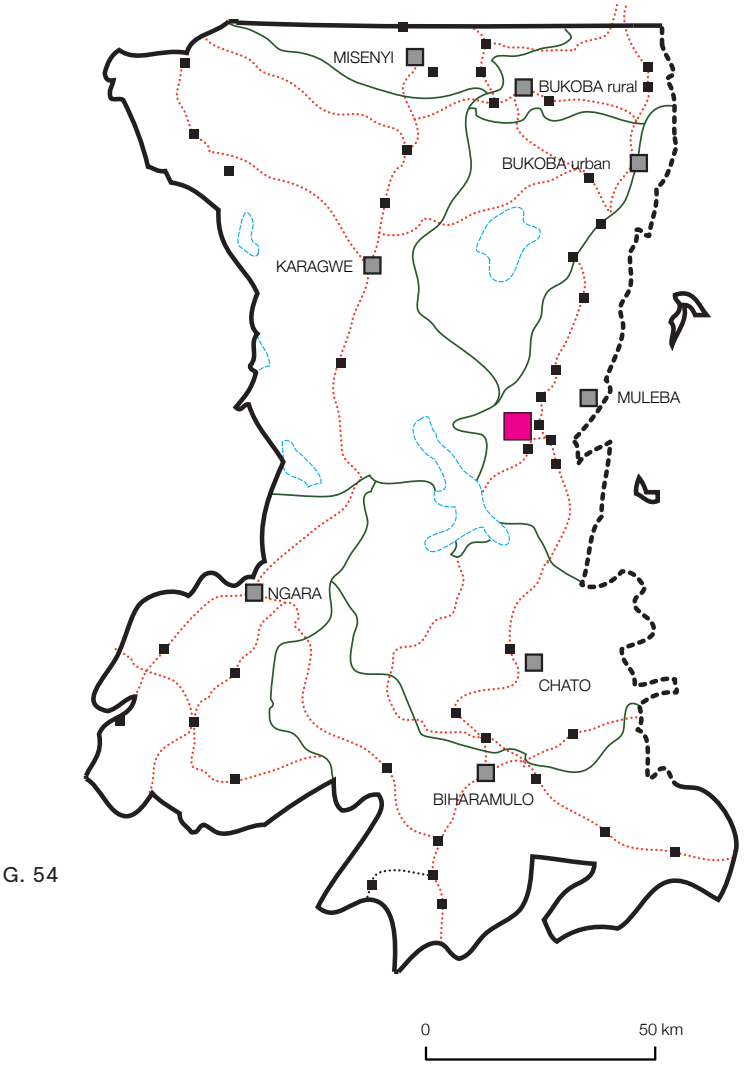
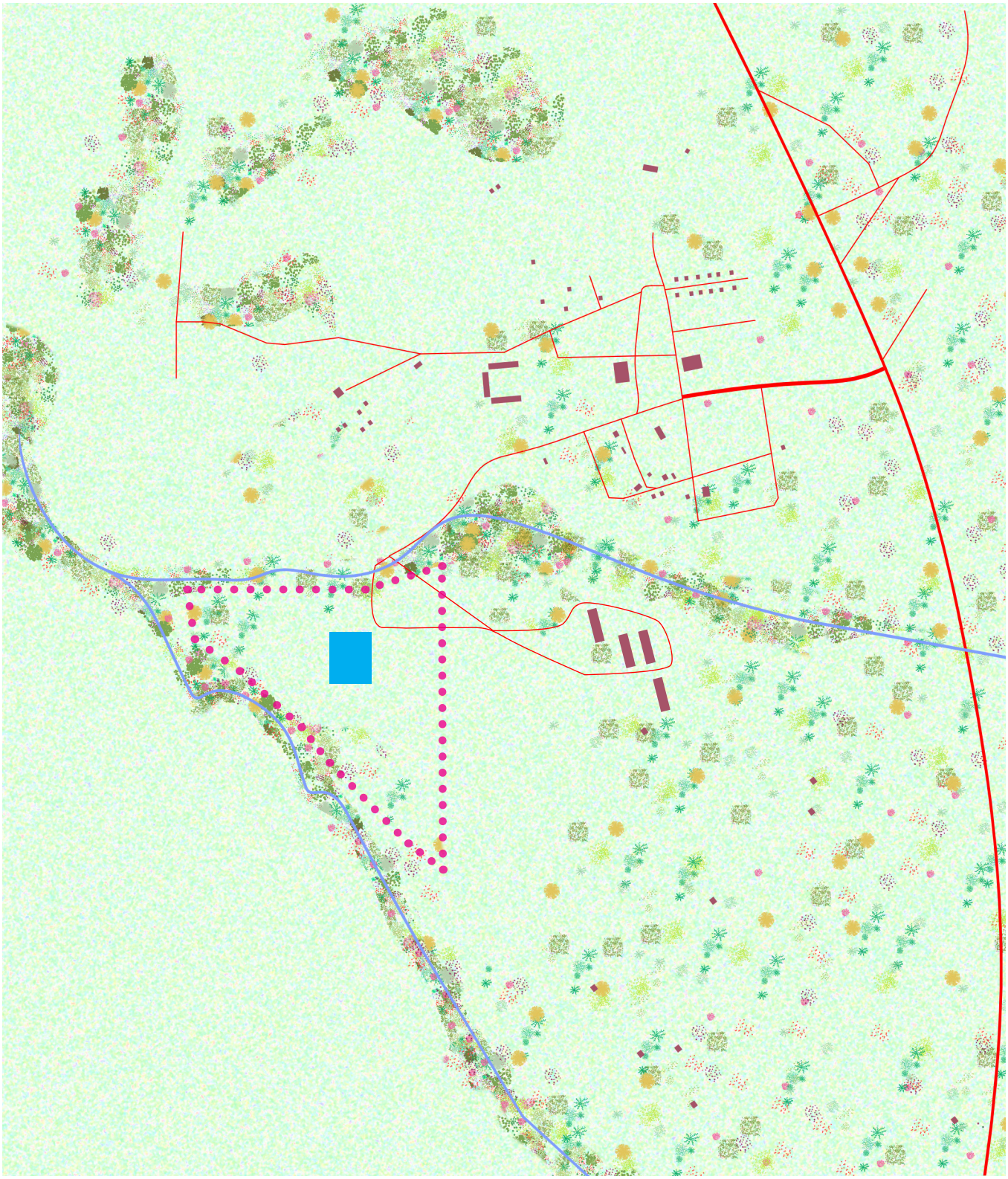


FIG. 54



A Brief

Multi purpose STEAM teaching platform, Provision of informal learning environment with capacity for exhibiton eventes, sheltered open learning, Student appropriates extra curricular space. The driver behind shaping this environment is one where students feel empowered to work beyond the boundaries of the classroom to resolve their task and challenges.

Multi purpose open plan laboratory environment for 400 students in total.

Laboratory facility storage and ancillary room

Stage areas for demonstrations, announcement and ceremonies

Flexible teaching space, with appropriate acoustic and visual partition strategies*

Administration and Teaching Areas.

Teachers workshops and visitors roome

Directors office

Library area

Reception

All other services accommodation, dining and traditional classroom environment will be catered for by the Muleba Secondary School.

*5m2/pupil for open learning environment and practical training laboratories

Learning in a school environment

10 what they read
20 what they here
30 what they see
50 what they here and see
70 what they say themselves
90 what they say and do themselves through their own actions.

A framework for appropriation

The design solution is essentially a response to the initial challenge of the thesis " to provide an architecture that is celebrated for the potential it provides rather than the limit that it imposes
It is a machine. The architecture serves its purpose not as an awkward inanimate object, but rather a machine that can be modified, fine tuned and adapted to suit expanding and ever changing needs and circumstances.

Through its form and materiality,It should communicate its ability to produce, to be industrious and creative. It is an educational machine that generates the community of steam graduates who can use their skills to deal with the challenges of their 21st century environment.

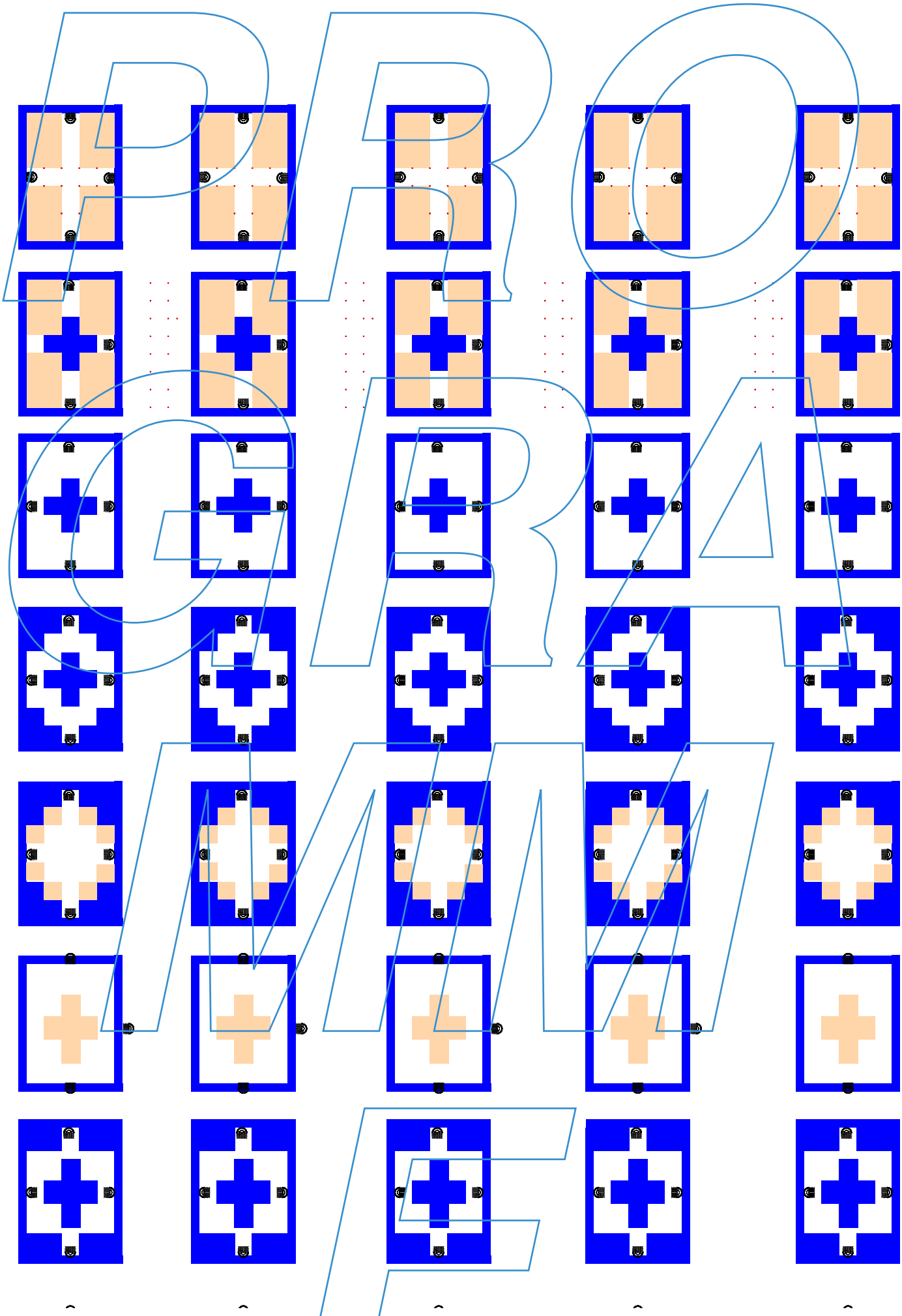
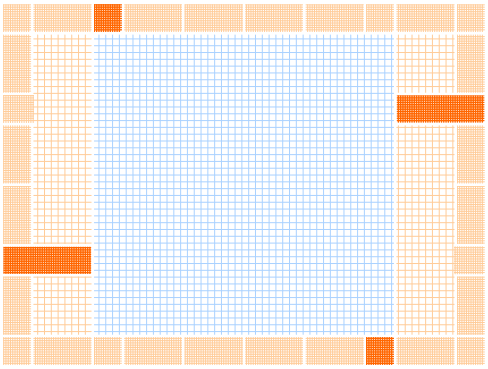
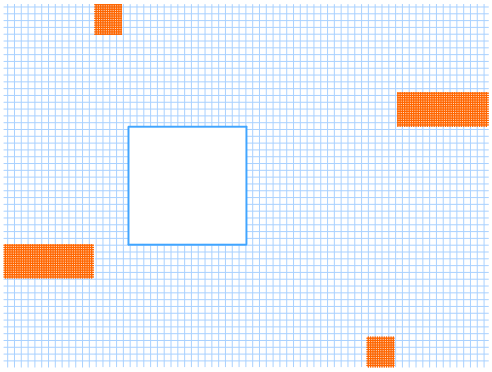
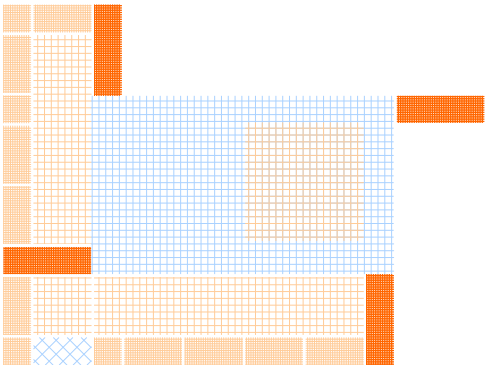


FIG. 55





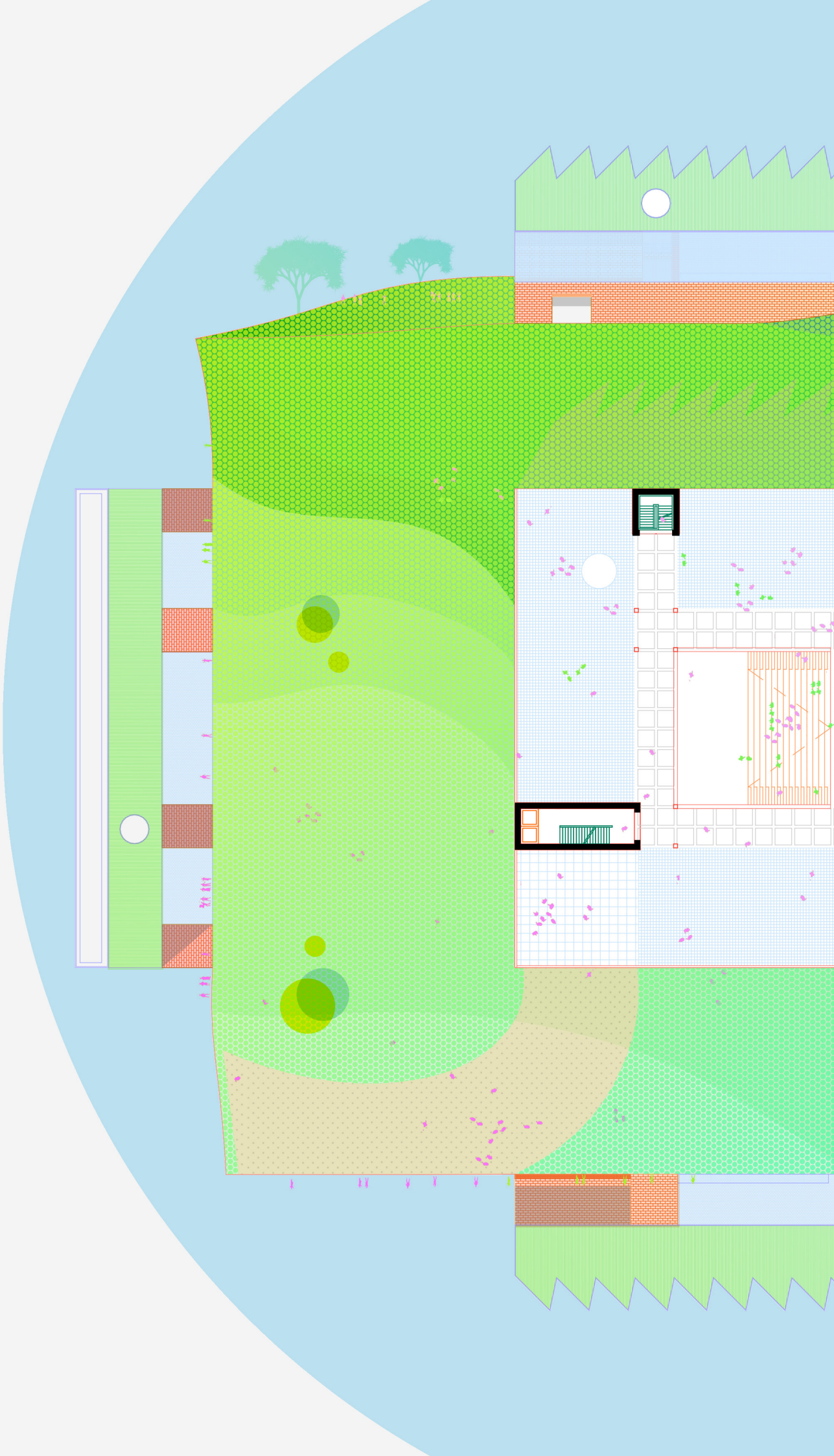


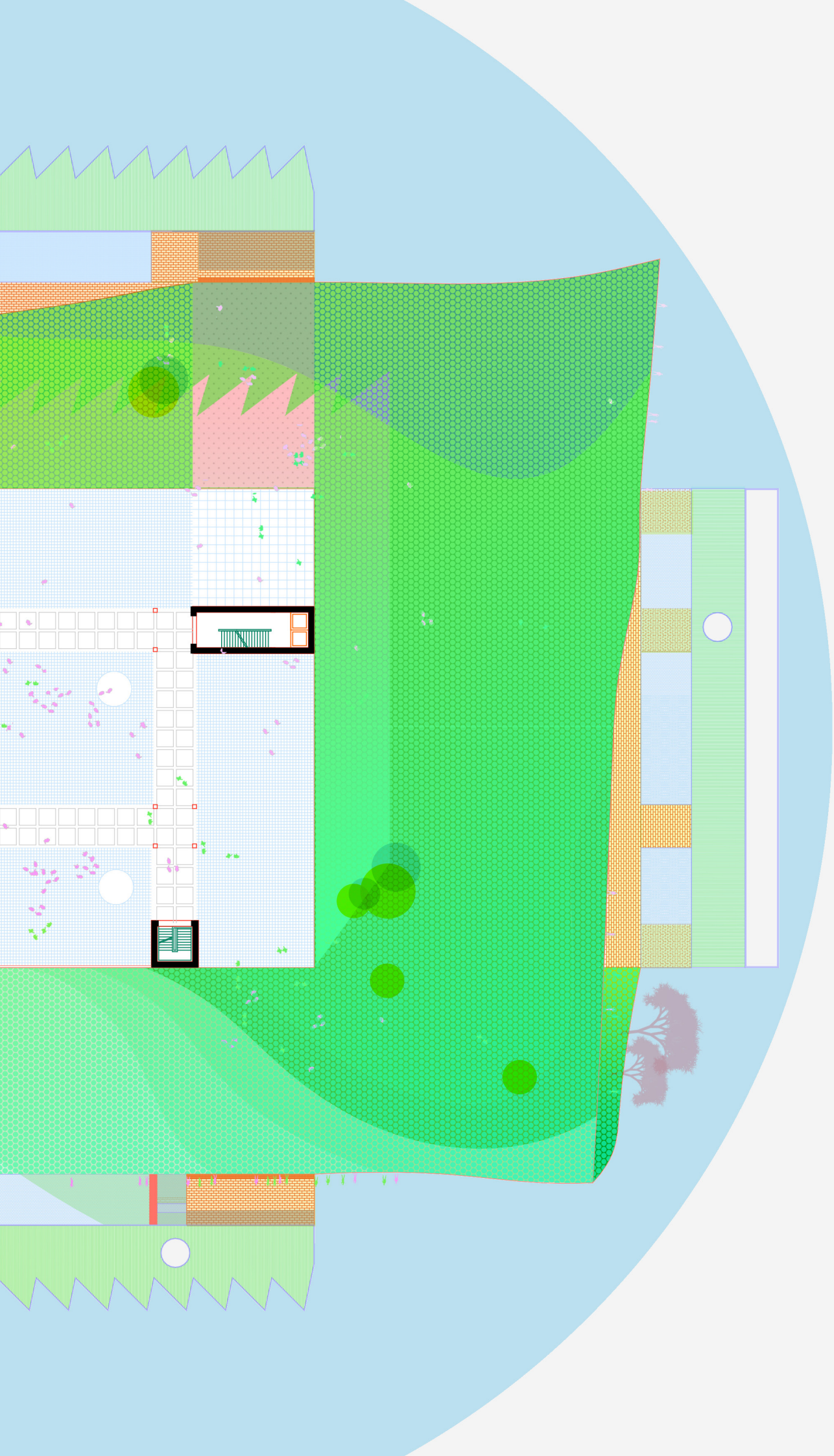
A Concept

FACTORY of Ideas
Sheltering the learning platform is the Factory of ideas. This is the “thick roof” component of the building and it comprises a series of flexible spaces that accommodate Physics, Chemistry and Biology laboratories. Special arrangements will be made to accommodate Domestic Science labs, language labs, ICT learning and spaces for workshops and presentation of practical experiments.
The spaces of the factory of ideas can be adapted to open up onto each other to form a larger exhibition space, meanwhile providing areas for teacher-guidance workshops.
This is the space where teachers and students come together to practically engage in the experimentation of ideas.
Since the centre will host public exhibitions and workshops for teachers from all over the region, it is important to separate these spaces from the rest of the center in order to clearly distinguish between spaces for public use and spaces for the private control of the institution.

THE STEAM PLATFORM
The learning platform is an intermediate, informal space whereby students and teachers can appropriate open areas to accommodate independent or group learning. It is a platform for students to investigate ideas and exhibit their innovations to the public and the media. This learning platform is curated by expert teachers who guide the students in their independent and collaborative inquiry, meanwhile the open space promotes a ‘thinking outside the classroom’ approach to learning. While most of the schools facilities have been integrated into the “thick roof” and “thick foundation” components, the learning platform is liberated from walls and most of the programmatic limits that would hinder the flexibility of this multi-functional space. The platform benefits from using the slope of the site to create a natural central auditorium for presentation, workshops and lectures.

THE KNOWLEDGE FOUNDATION
The concept originates from the idea that the institutional role of the teachers is to provide a platform for scientific inquiry based on a solid foundation of knowledge. The design positions teacher and administration facilities within an exaggerated foundation as a feature that provide an open platform for the necessary inquiry and openness needed to foster creative and innovative learners for the 21st century in Tanzania. More than a symbolic gesture, the integration of administration and teacher facilities into the foundation component of the building provides the infrastructural basis for an open learning educational platform above





-1 Admin Level

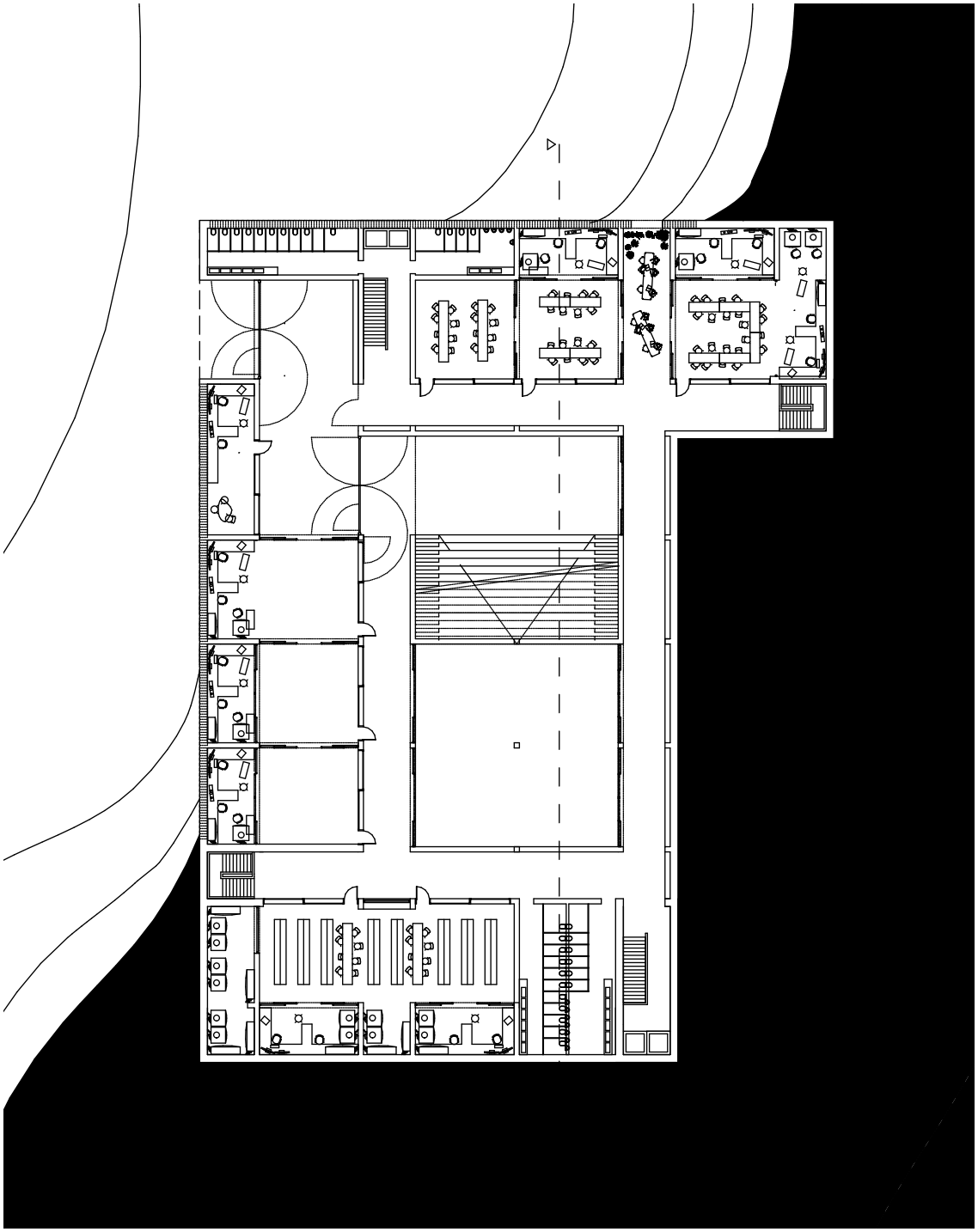
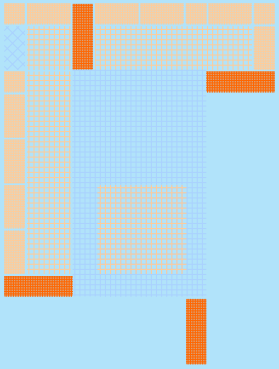


FIG. 7



Knowledge Foundation

Solid knowledge and sound theory are reflected in the monumentality of the plinth, unlke the free-plan space for investigation and the lofty Laboratory above where ideas are tested and experimented upon, The Knowledge foundation provideds the very basis for all education in the facility.

It contains all the teacher, administration, storage and archival facilities, Meanwhile it Contains the reception area and Space for an open stage.

Although Submerged into the landscape, natural light filters in through the glass block ceilings and through perforated opening in the apparently monumental walls

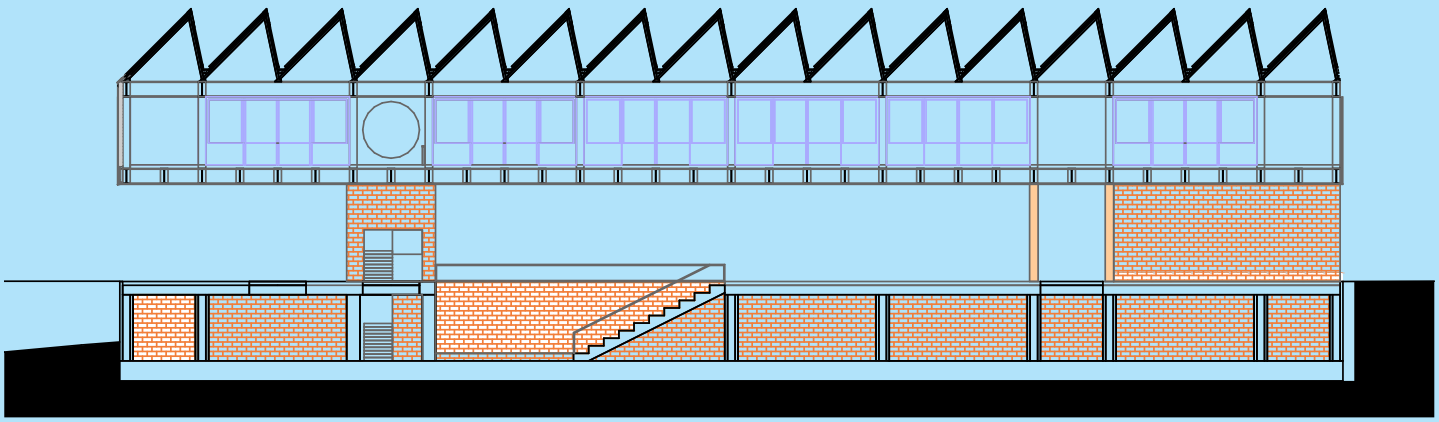
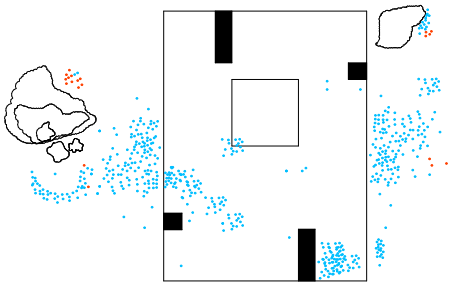
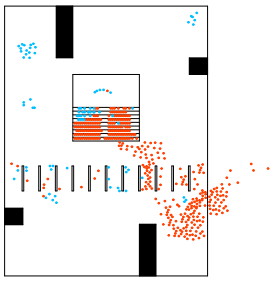
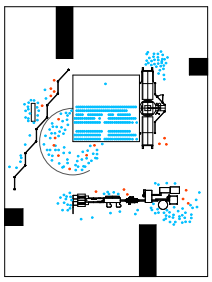
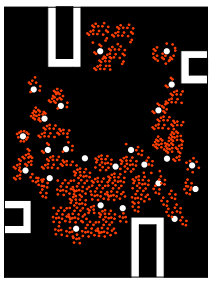
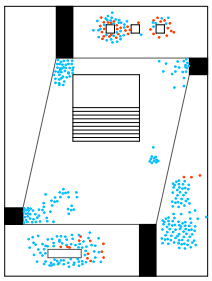
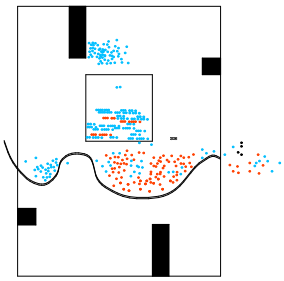
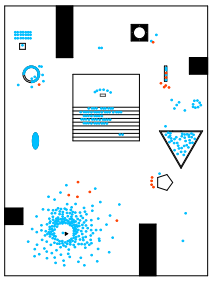
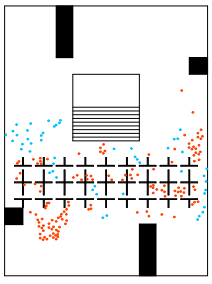
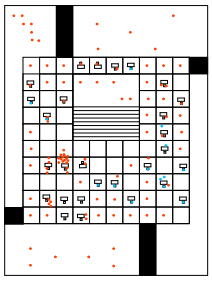
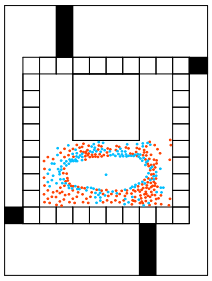


FIG. 7

Discipline	Mode A	Mode B
Science		
Technology		
Engineering		
Art		
Maths		

STEAM Platform

The STEAM platform, an interstitial space bounded by the thick roof and the elaborated foundation below becomes a space of potential.

Its openness is a gesture to the wider environment, it is an invitation to students, teachers and individuals from all over the region to gather in this shared space. On the other hand it is a gesture to promote the students to engage with their environment, their context and their communities.

There are two distinct modes of use and each mode caters for a mix of independent student learners, group collaborators or invited spectators to occupy the platform.

Mode A

Initiate, Investigate, Collaborate

In this mode the educational specialists guide and facilitate independent investigation and group-work exercises in an open learning environment. Depending on the field of study, the platform can be a space tailored by the individual students themselves or by working groups instructed by teachers. The investigation of their topics can occur on the platform or outside in the wider environment. Depending on the field of study the space can appropriated accordingly.

Mode B

Exhibit, Demonstrate, Disseminate

Mode B is the phase of space use that accommodates events, exhibitions and demonstrations. The phase provides a platform for the students to showcase their research, innovations and creations to the wider public and to other students throughout the region.

The illustrations serve as an indication to the variety of appropriations of the learning platform according to, subject field and mode of use.

learner

Specatator

00 STEAM Platform

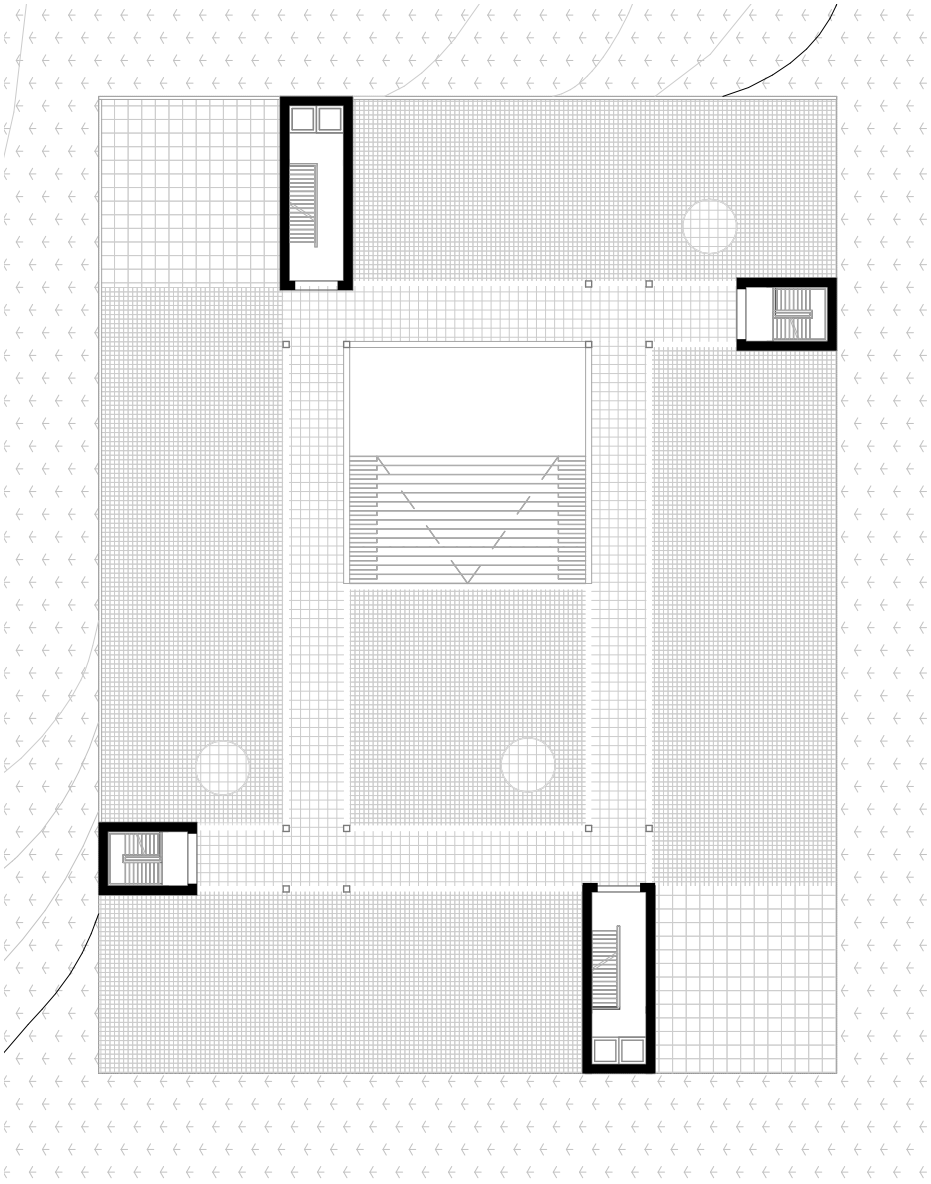


FIG. 7

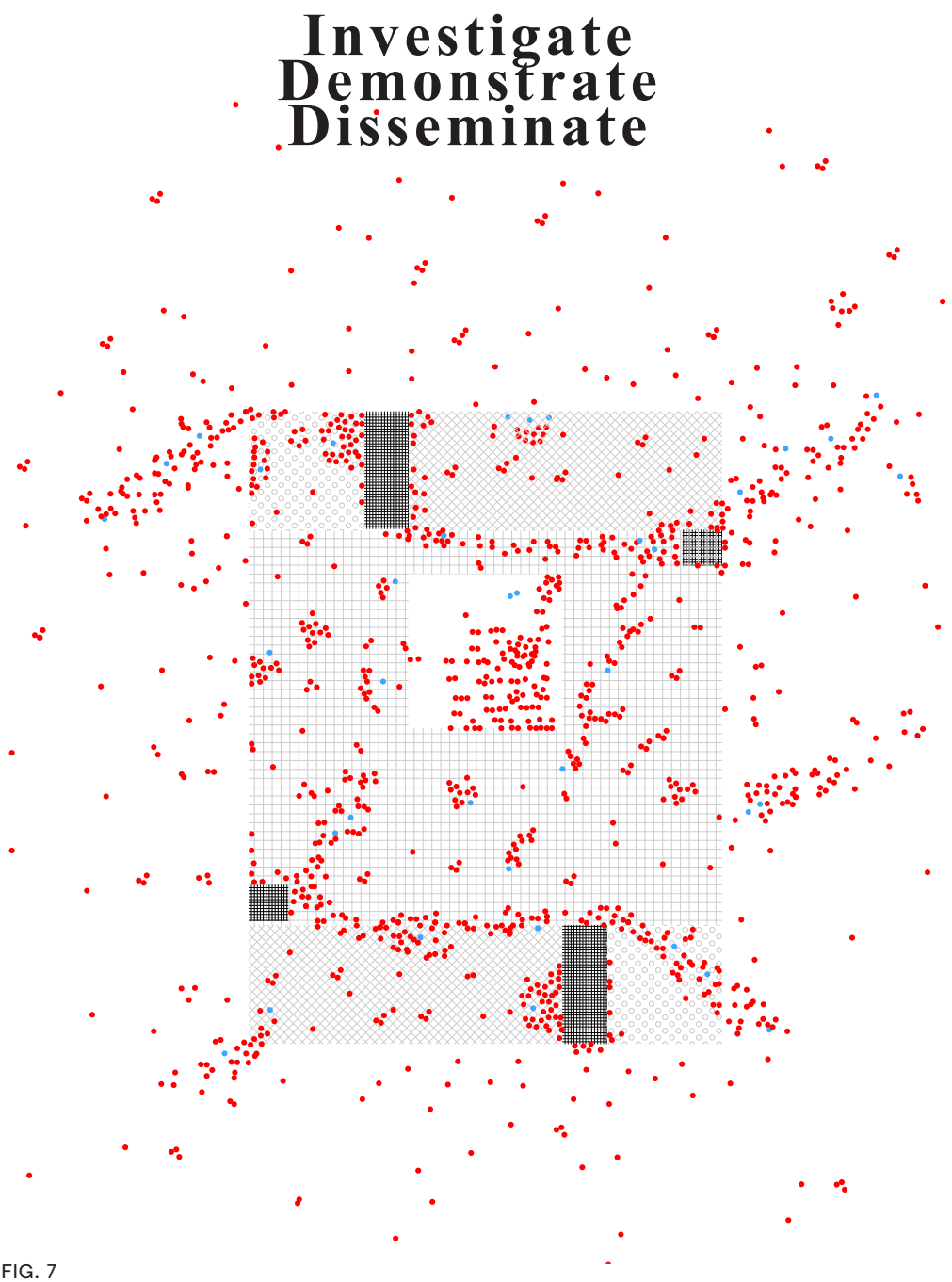


FIG. 7

A platform for investigation demonstration and dissemination of knowledge and creativity. The learning platform encourages an s social open learning environment, e

GROUP IS EVERYWHERE

FIG. 56

Collaborate
Innovate
Educate

STEAM

Science -Technology-Engineering-Art-Math

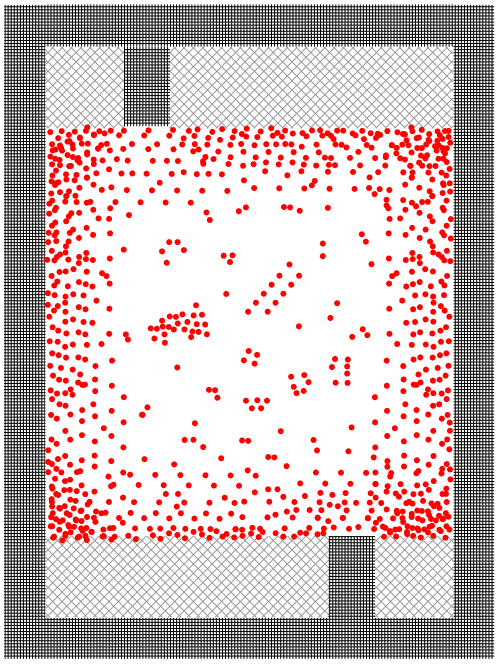


FIG. 7 Tentative Use of Minimum Structuring

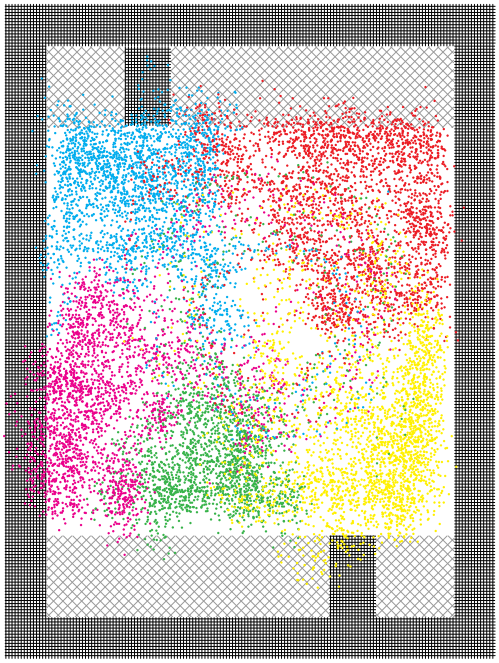
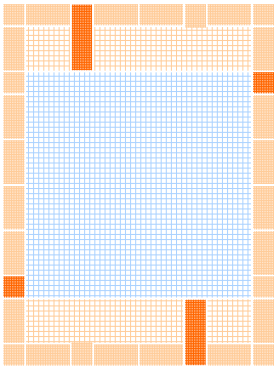


FIG. 7 Cross Fertilisation of STEAM disciplines

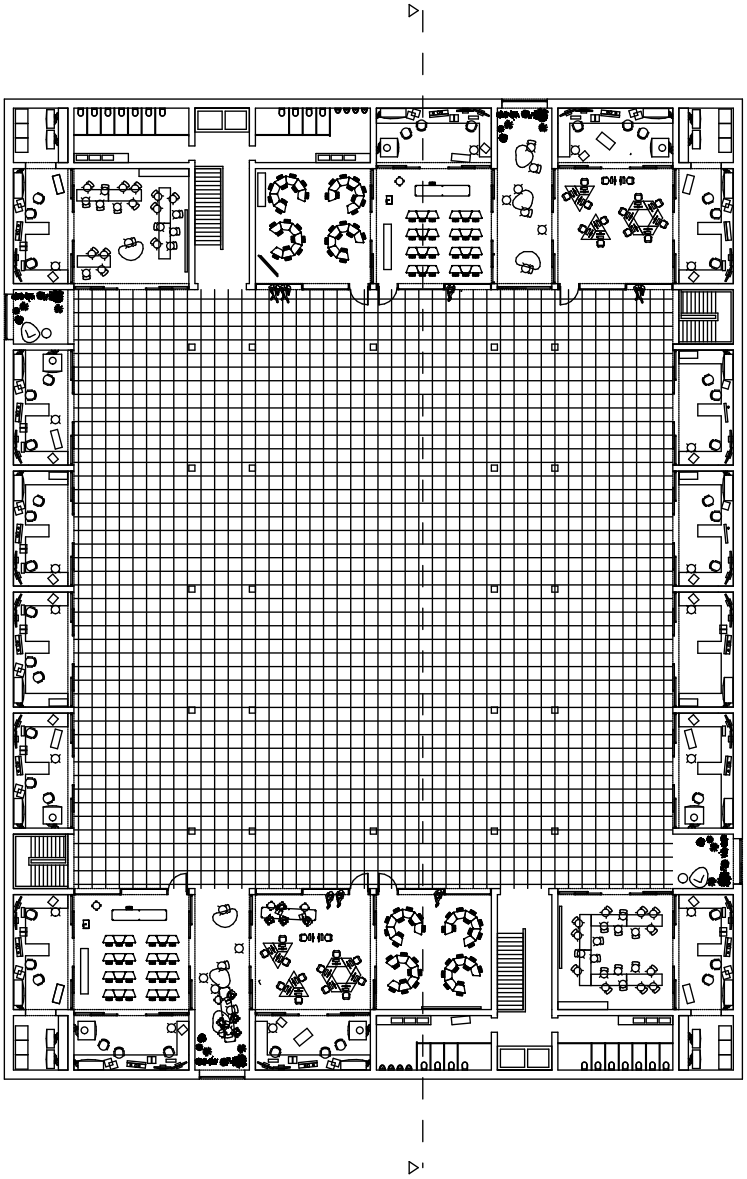
With all technical resources integrated within the perimeter of the floor plan the scheme adopts the principle of a 'Tentative use of Minimum Structuring' as a strategy for accommodating potential variants to the free plan but also to encourage the cross-disciplinary fertilisation of ideas and innovation.

The factory of ideas becomes a production space that can be appropriated and developed incrementally according to the more specific demands and technical spatial requirements for the appropriate teaching in Each of the STEAM fields.

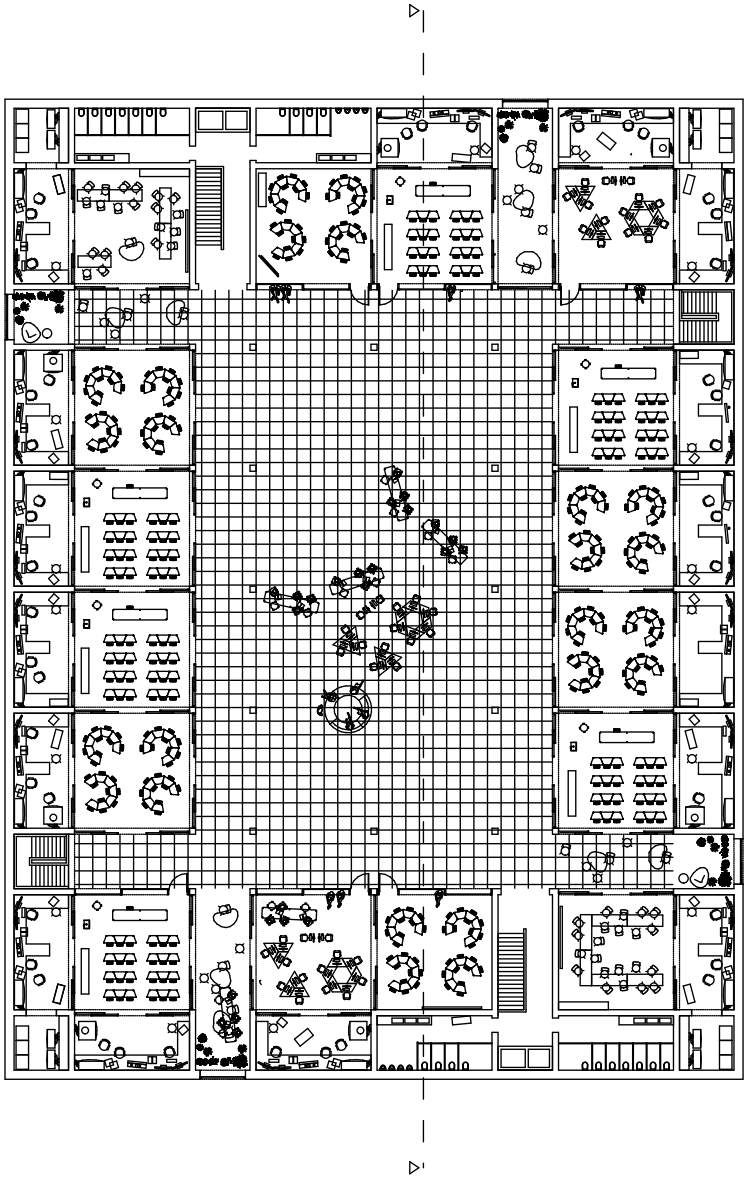
FIG. 57 TENTATIVE USE OF MINIMUM STRUCTURING



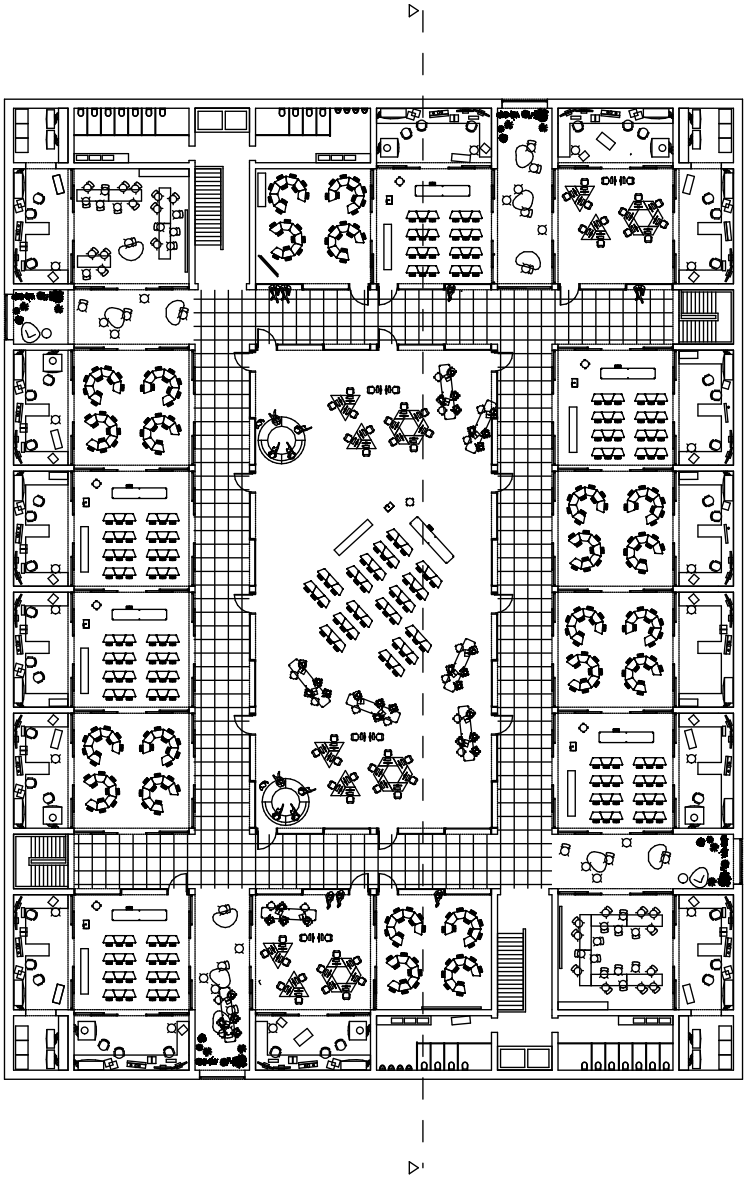
01. Laboratories



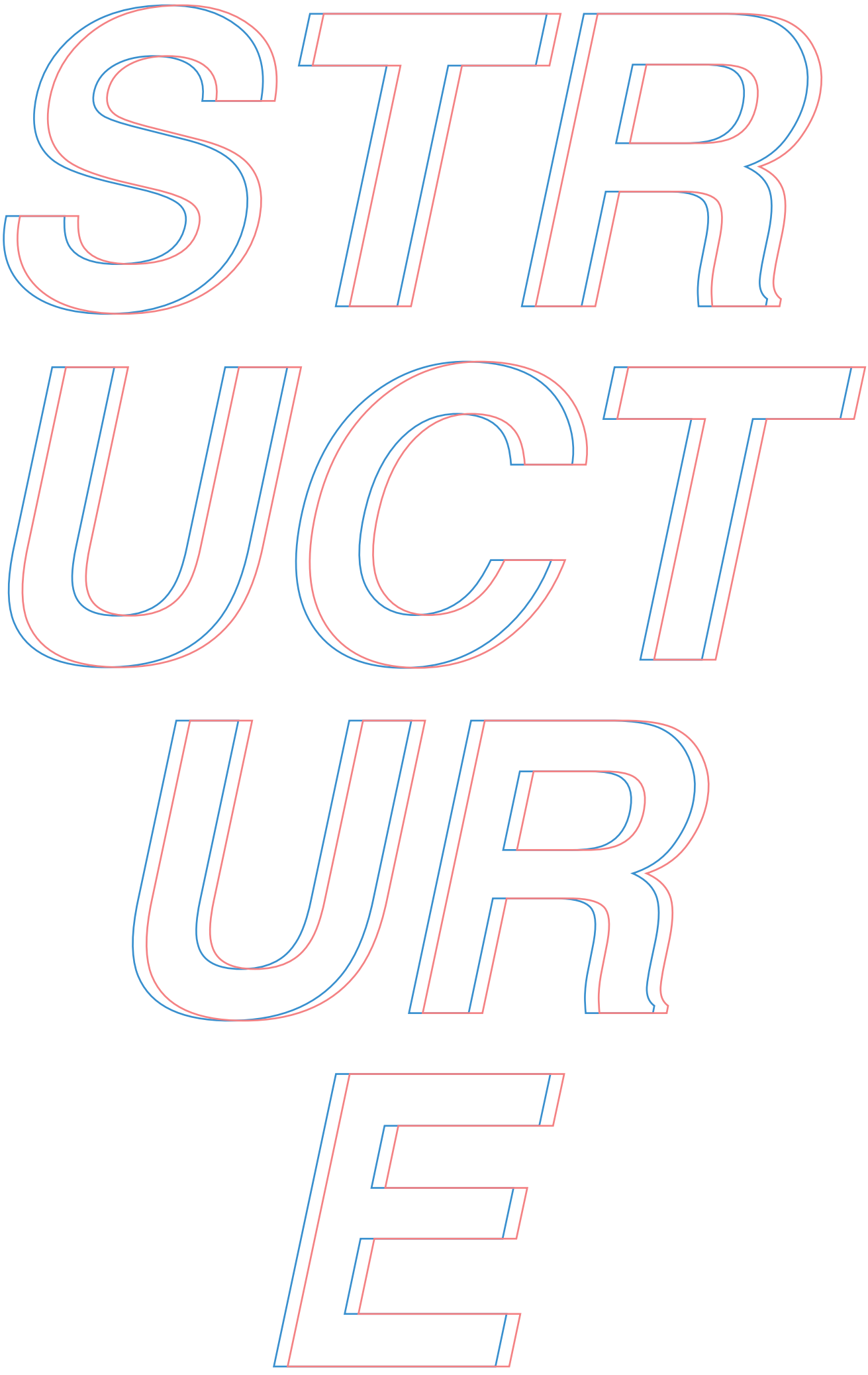
Potential Arrangement of Laboratory infrastructure, Workshops, Studios and Free-plan



Potential Arrangement of Laboratory infrastructure, Workshops, Studios and Free-plan



Potential Arrangement of Laboratory infrastructure, Workshops, Studios and Event Space/Seminar Room.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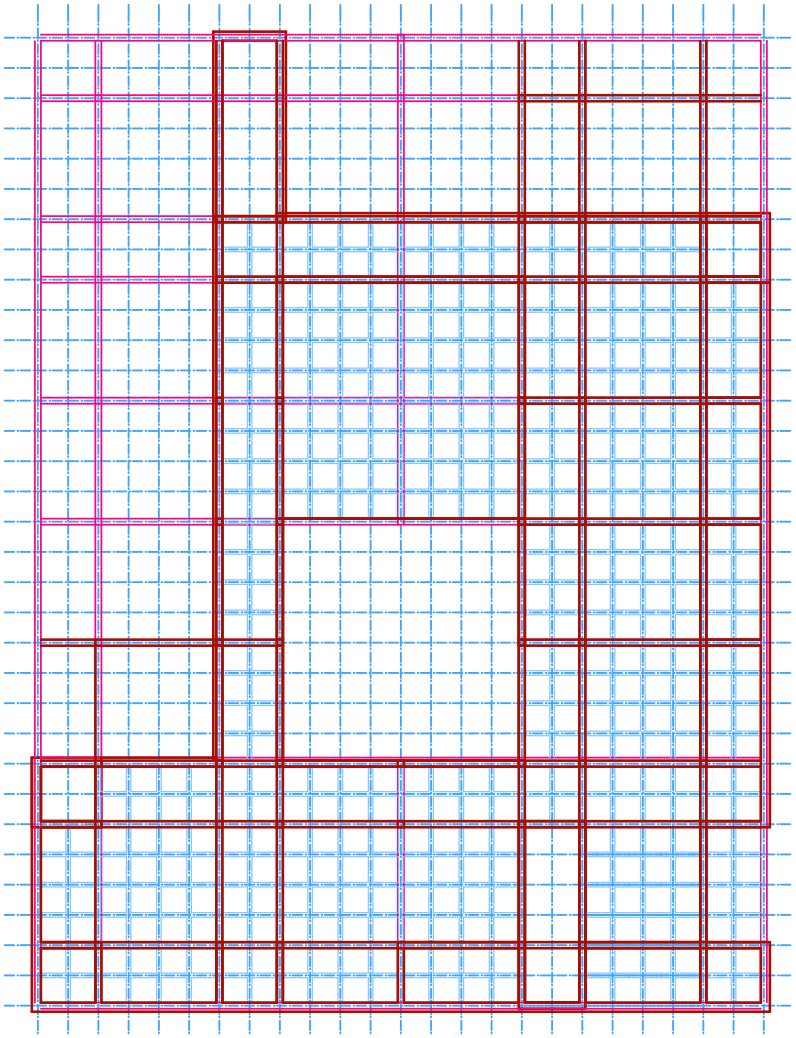
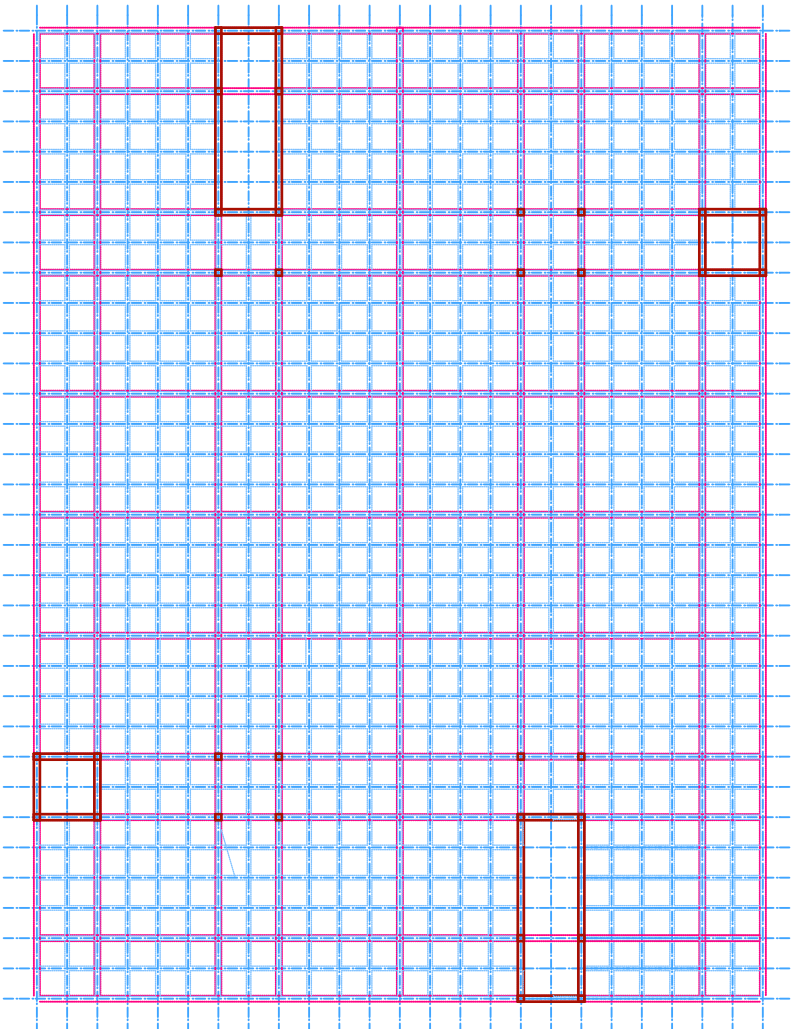


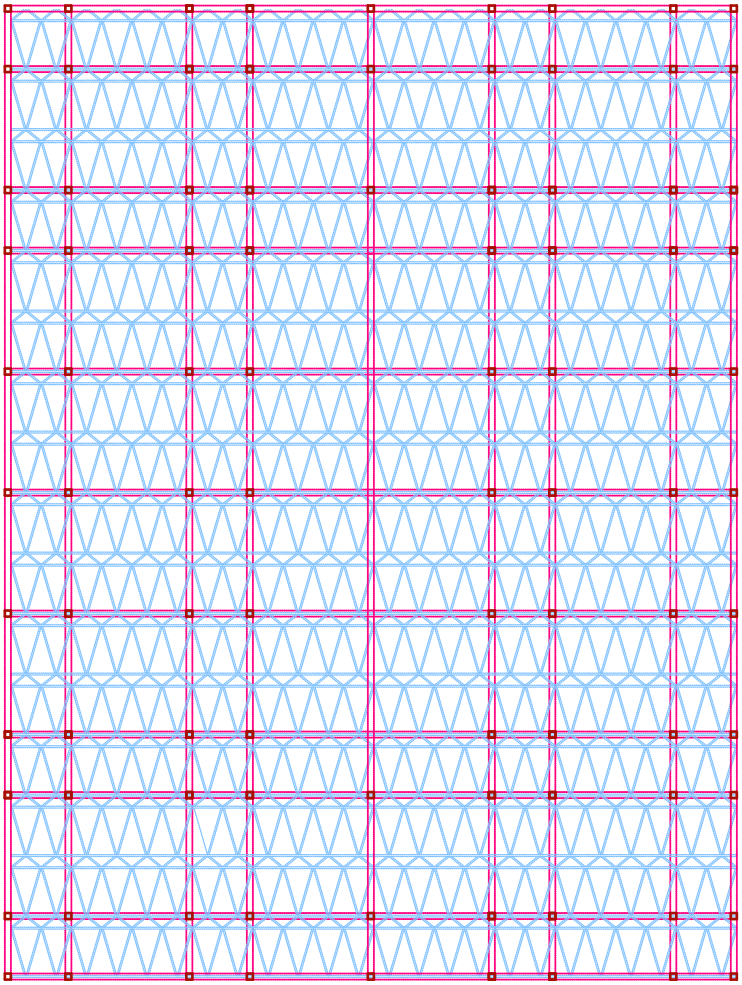
Thick Foundation

This sub-level is on principle and elaborate foundation.
The primary structure is conceived of a reinforced concrete structure that uses local burnt clay bricks as a permanent formwork to conceal and protect all columns and shear walls. In combination with a reinforced concrete slab the entire floor works as a 3-dimensional diaphragm providing rigidity and resistance to any eccentric loads imposed on the rising structural cores supporting the laboratory floor above

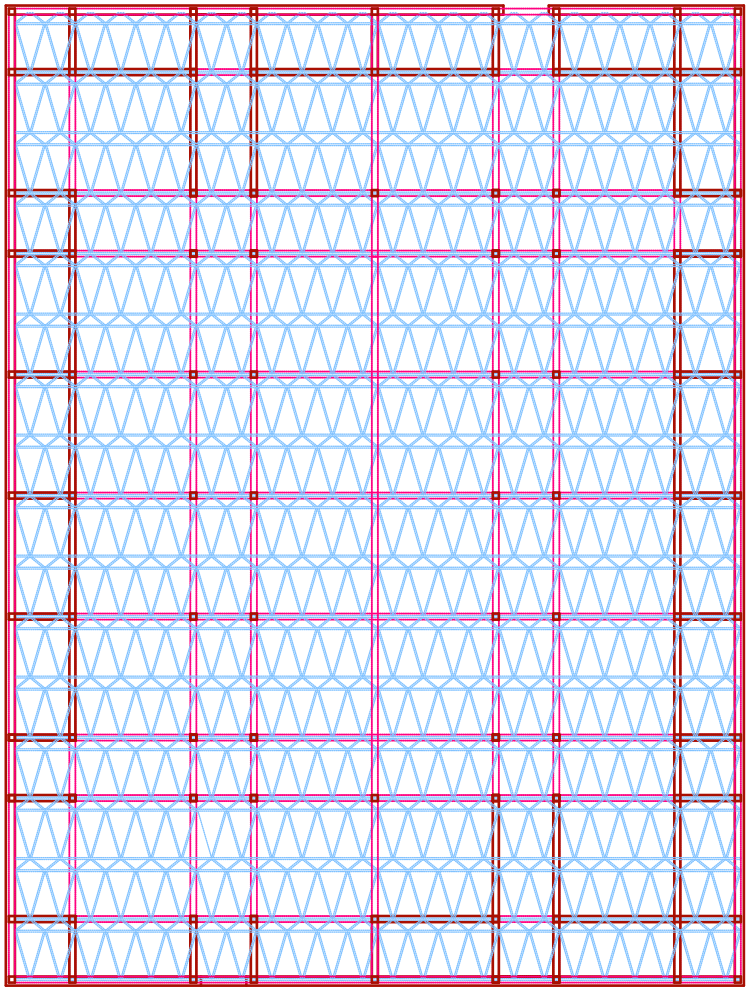


The Learning Platform

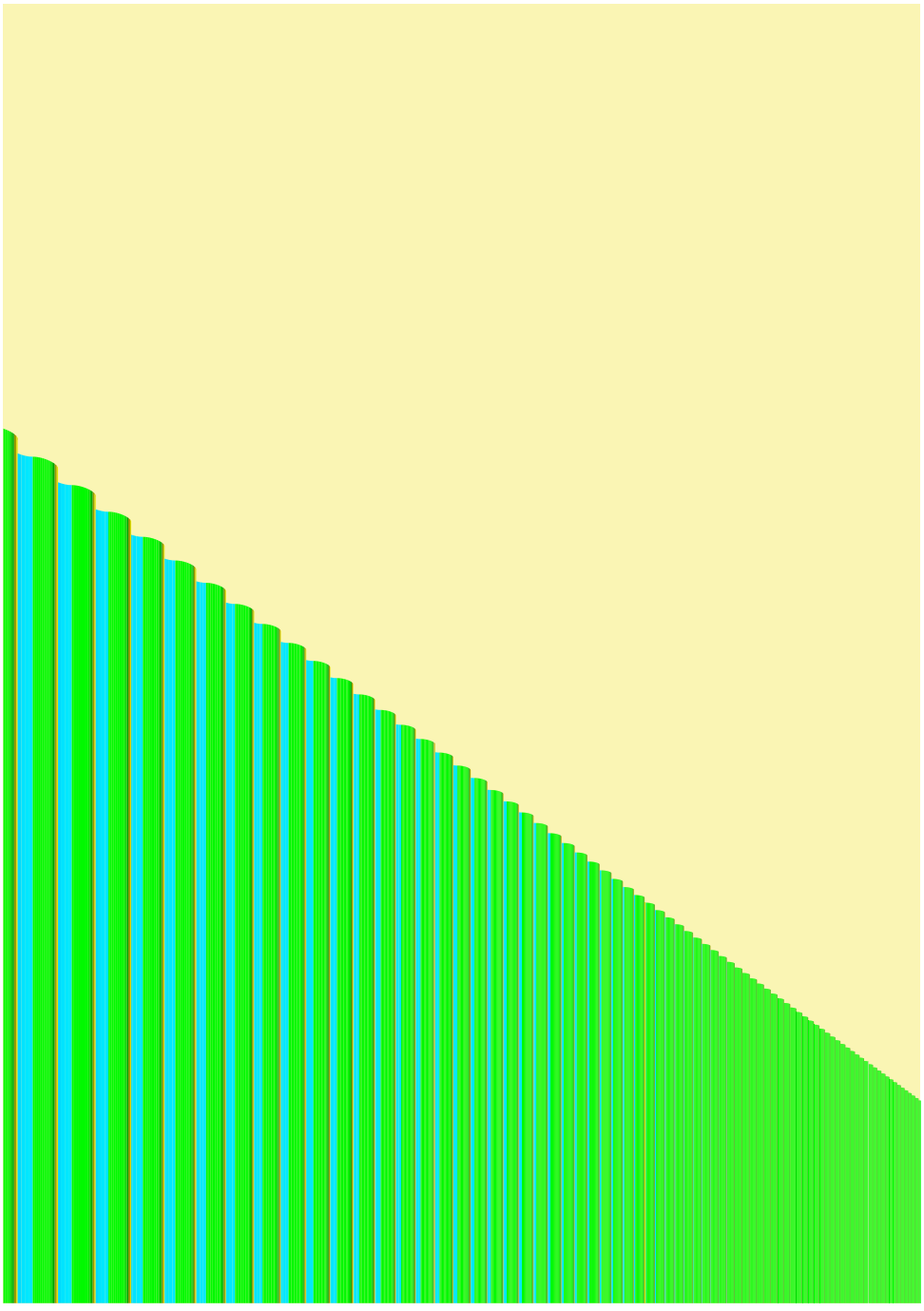
An open platform divided by 4 structural concrete columns supporting a a network of rigid steel Vierendeel trusses. Spans upto 20m are supported by a rigid structural system connected to a stiff reinforced concrete foundation.
The four structural cores consist of reinforced concrete and are masked in local brickwork which combines the skilled local labour and materiality with the aesthetic and practicality of permanent formwork.



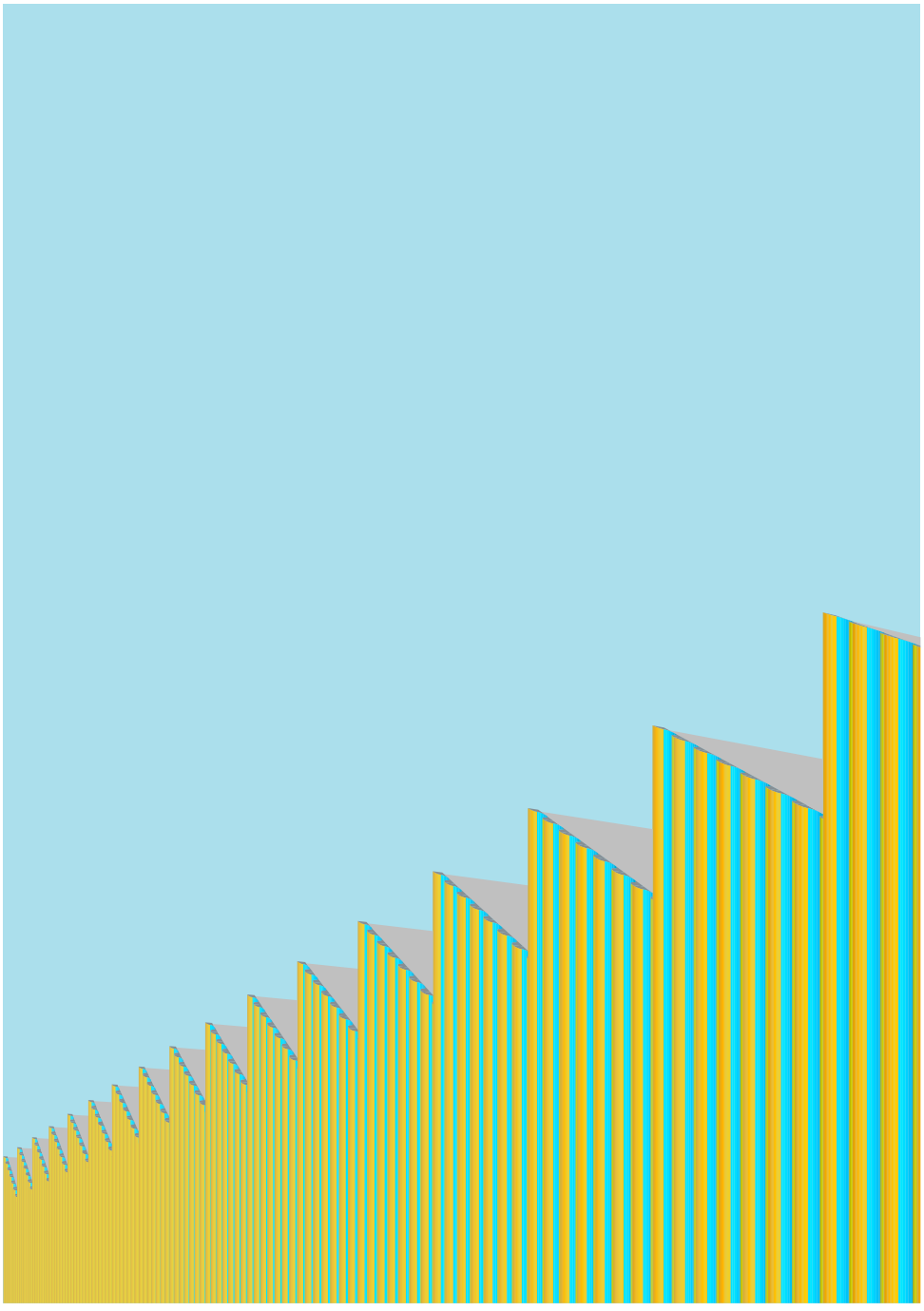
Vierendeel
A network of Vierendeel Trusses and Space frames form a rigid structural cage in the thick roof component. The use of vierendeel trusses allows for open spaces and corridors through the truss while accomodating large spans across the open platform below.
Above this is a network of space frame the support the roof structure across the floor plan allowing for maximum diffused light penetration from the sawtooth roof, meanwhile



RING BEAM
A network of wall divisions form a rigid ring beam around the perimeter of the floor plan. Protecting all the vital infrastructure of the building, the ring beam provides overall Stiffness to the network of structural components and ensures that the thick roof can withstand and transfer eccentric loads efficiently.



Downhill through the leaves,
Shifting from green to yellow
a STEAM machine, wow!



Grassland to the sky,
rising moon to the set sun,
cutting coloured fun!

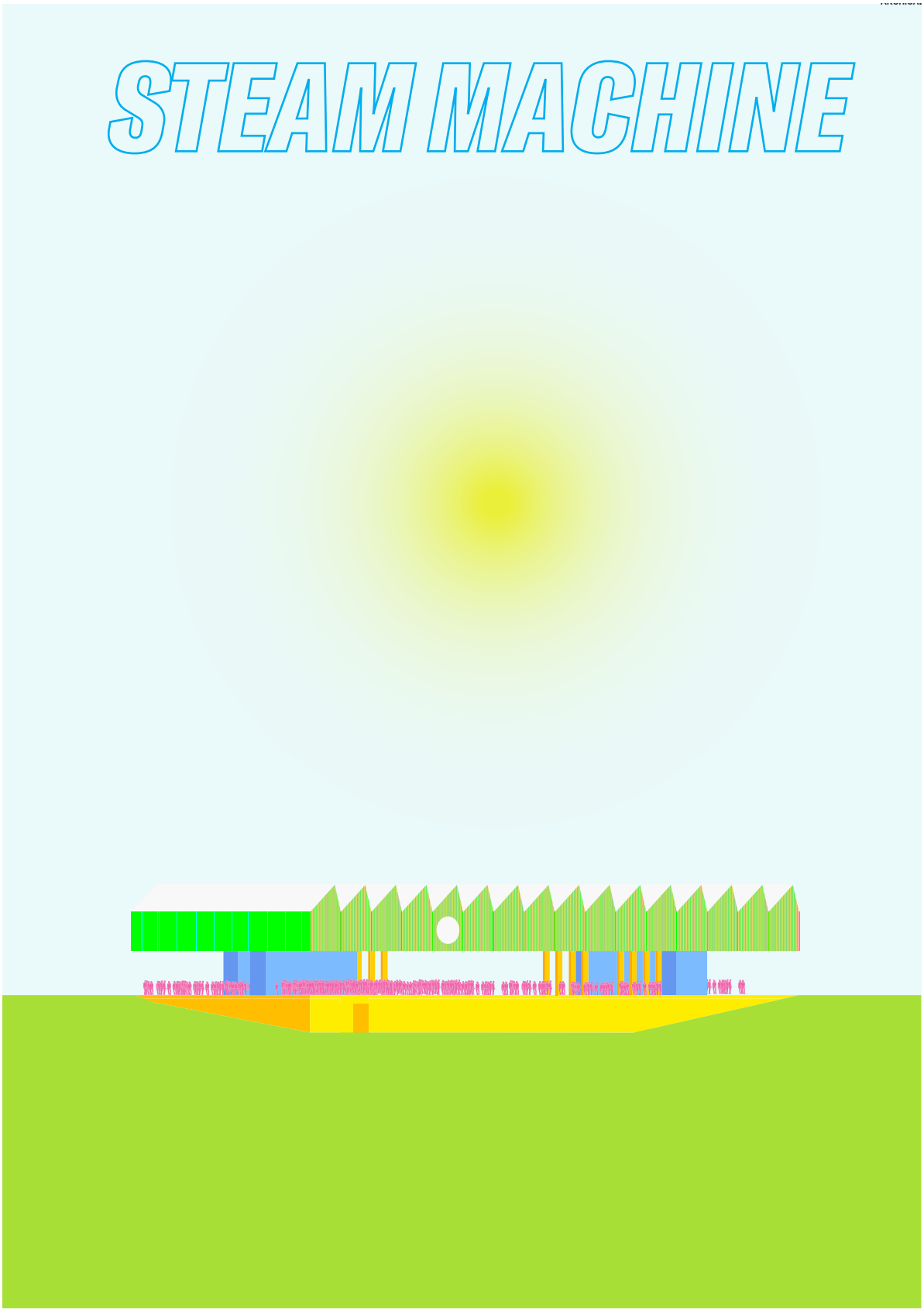


FIG. 7

Explore The Horizon

An open platform to discover the surrounding environment. Look for problems, discover solutions, search for inspiration, listen to stories, demonstrate creativity, exhibit innovation, spread knowledge, invite curiosity and reach out beyond the boundaries of the traditional school environment!

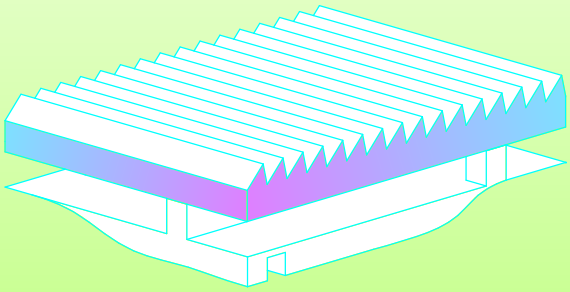
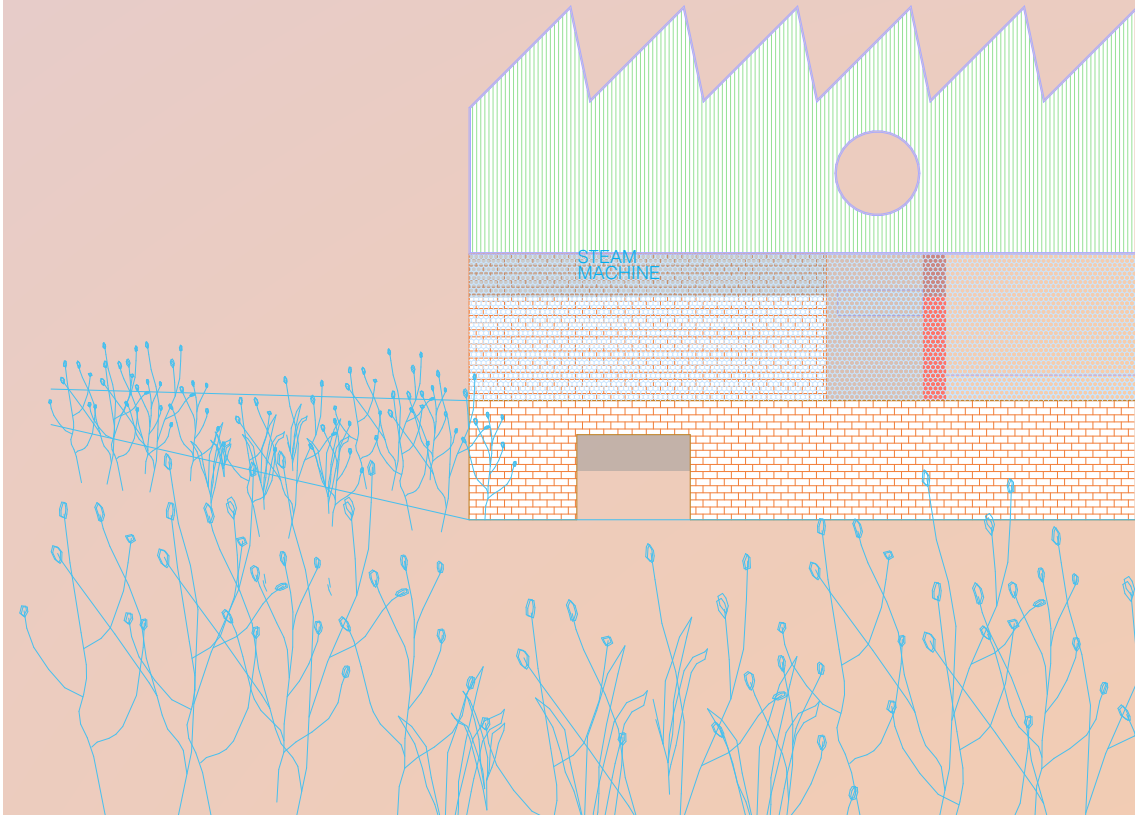
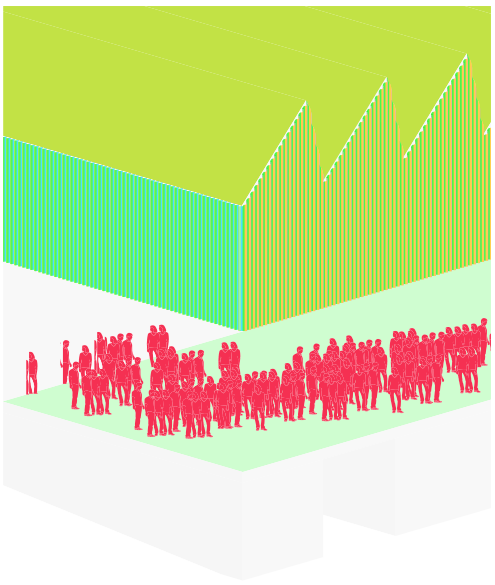


FIG. 7

Enter The Machine

A hatch the base denotes the entrance. Welcome to the steam machine, theres a curious air, the mystery and intrigue of a factory production. Only the spectators are not coming to observe the workings of this factory, they are entering to become active particpants in the production of ideas.



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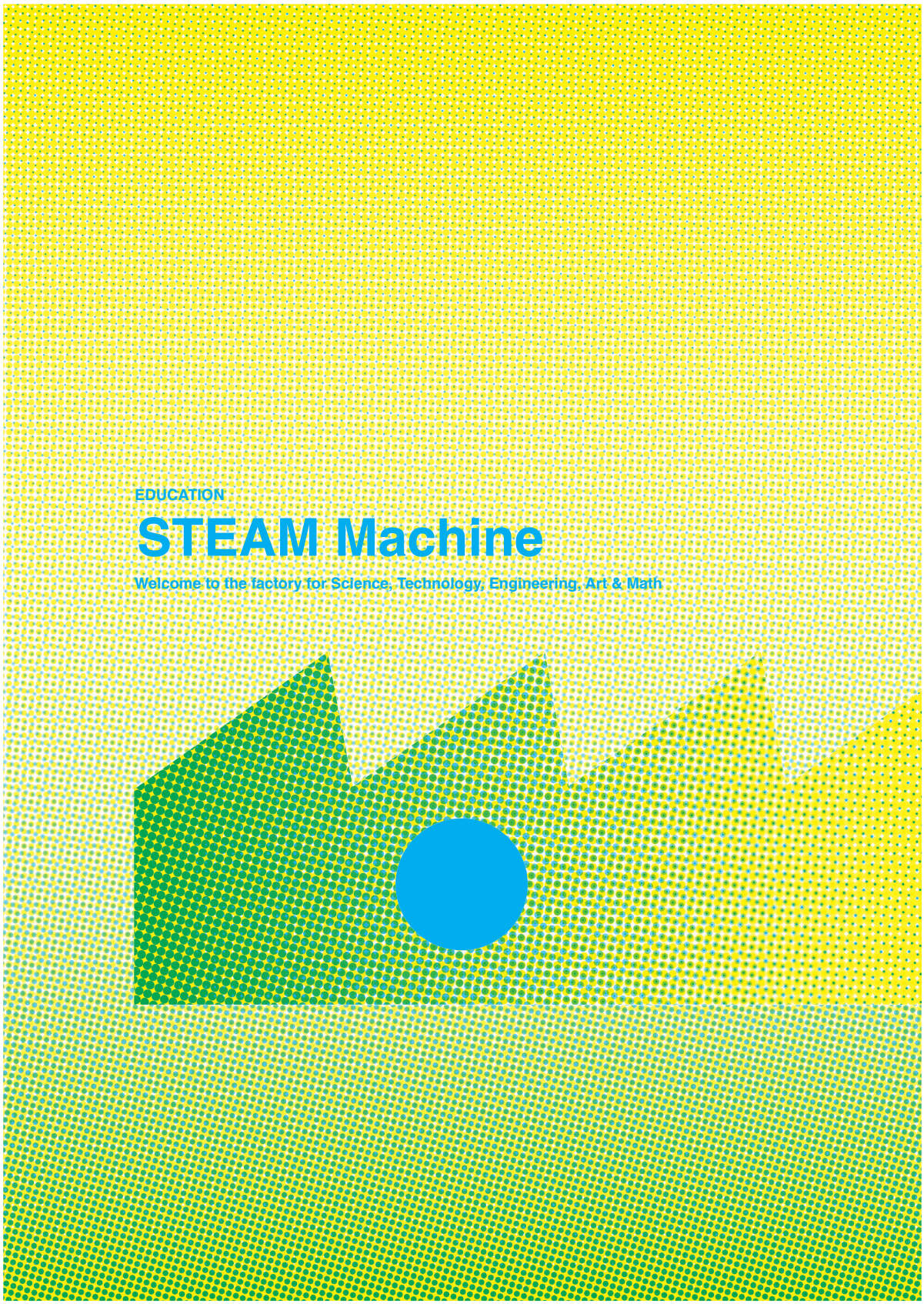
Dylan Mundy-Clowry



Risograph Poster Campaign

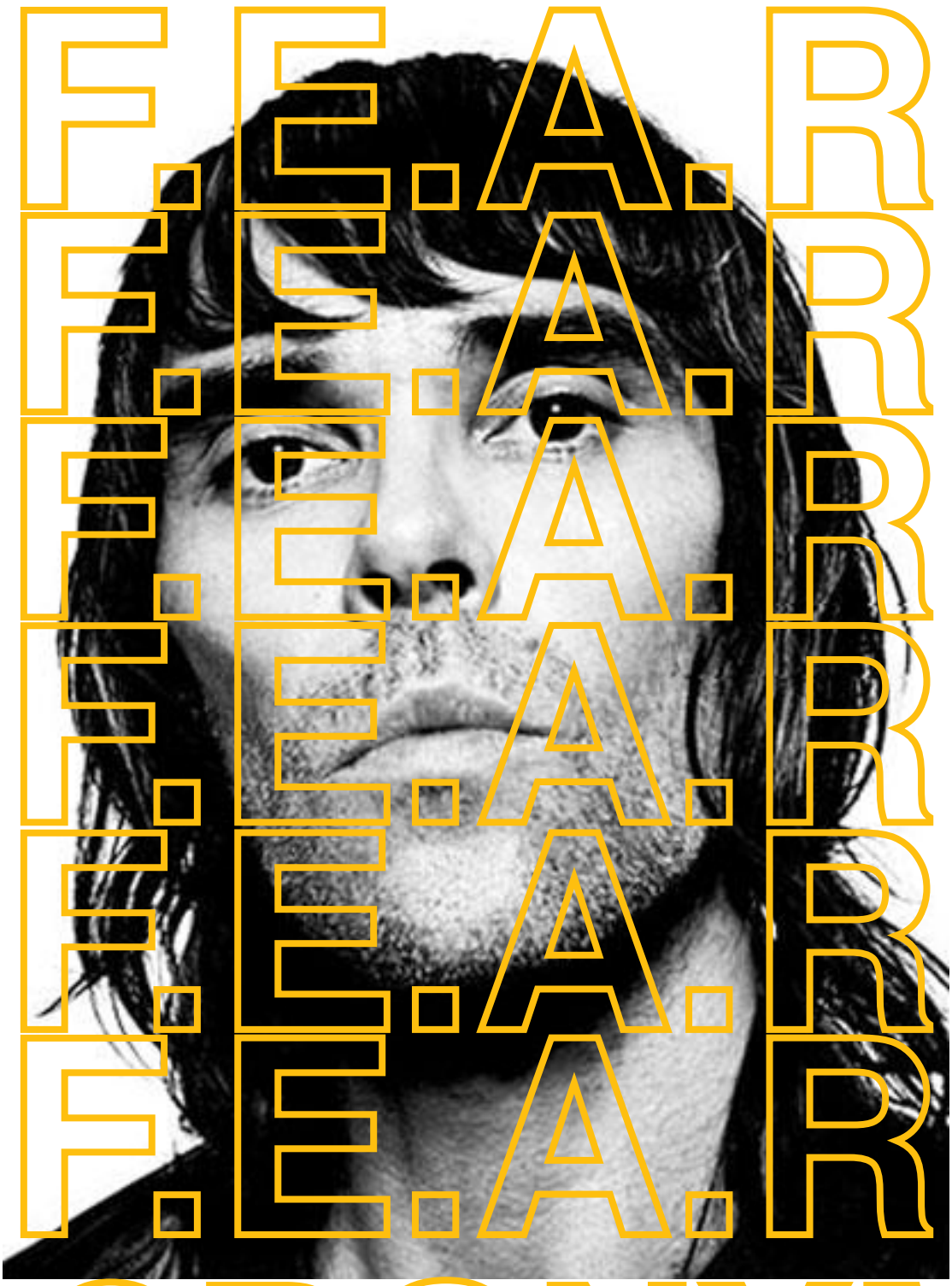
Communicate

The rapid availability of an immense and ever increasing body of information and knowledge leaves architecture, an inherently slow discipline with little capacity to maintain influence in the age of digital media.

Here we return to the context stage where the image of Tanzania was explored through Social media Platforms. The potential for disseminating architectural concepts and an idea on how the building can be used and could be appropriated was too big to ignore.

Unlike architectural representations in the realm of architectural media, both digital and print, this media for communication is aimed at young teenage Tanzanians, most of whom don't have a background in architecture. The purpose of the media is to encourage, captivate the imagination and to promote the idea of a regional creative educational platform. Architectural representation content is created not only to represent architectural concept, *but to encourage potential, participation and appropriation.*

The following , potentially, unorthodox architectural videos, do not celebrate the concept alone, but the imagination of the viewer as to what a building could be and how it might be user appropriated



ACRONYM KING

For each a road
For everyman a religion
Find everybody and rule
For everything and rumble
Forget everything and remember
For everything a reason
Forgive everybody and remember
For each a road
For everyman a religion
Face everybody and rule
For everything and rumble
Forget everything and remember
For everything a reason
F.E.A.R.
F.E.A.R.
F.E.A.R.
F.E.A.R
F.E.A.R

FIG. 58

It's *all* in theName

"**But *what* is the name?**" a potential stakeholder asks. Seemingly below the architects remit of conceptual thinking, its clear that this arrogant oversight is the source of irritation for a confused audience. It's clear that no matter the substance of pitching the concept, the absence of a name leaves for an awkward elevator ride.
It would appear to be a trivial pursuit, but brainstorming a clever acronym for a serious educational institution is no joke! A search for inspiration reveals one thing, that every organisation under the sun has put some serious thought into ~~coming up with a clever title that happens to correspond with a snappy acronym,~~ *NASA, NATO, WHO...* It's evident at this point that the fetish for stricking acronyms cannot be eclipsed.
Think of acronyms and yes, you think of One-Acronym-Hit wonder, Ian Brown, the man strikes F.E.A.R into the heart of global millenials. It is futile to resist, its like a virus, once it catches its almost impossible to shake. It would be stubborn to ignore our fetish for acronyms, instead the pursuit of a clever catchy name becomes a design task to help disseminate an architectural and an institutional idea. If its good enough, we'll make a song out of it.

THE RISK -	Regional Institute Of Science, Kagera
THE SICK -	Science And Innovation Centre, Kagera
THE SECT -	Scientific Education Centre, Tanzania
THE KISS -	Kagera Institute For Specialisation In Science
THE RITZ -	Regional Institute for Teaching, Tanzania
THE TRICK -	Tanzanian Regional Innovation Centre, Kagera
THE NERDS -	National Education Regional Department For Science
THE NICE -	The National Innovation Centre Of Excellence
THE TASK -	The Tanzanian Association for Science, Kagera
THE NICK -	The National Innovation Centre, Kagera
THE REDS -	The Regional Educational Development Space
THE KIDS -	The Kagera Institute for Development & Science
THE TICK -	Tanzanian Innovation Centre, Kagera
THE KIT -	Kagera Institute of Teaching
THE TITS -	Tanzanian Institute For Teaching Science
THE SEAT -	Science Education Association, Tanzania
THE RAT -	Regional Association for Teaching
THE TEA -	Teaching of Excellence Association
THE EAT -	Education Association, Tanzania
THE BCDSIRDA -	Bukoba Catholic Diocese Science, Innovation, Research & Development

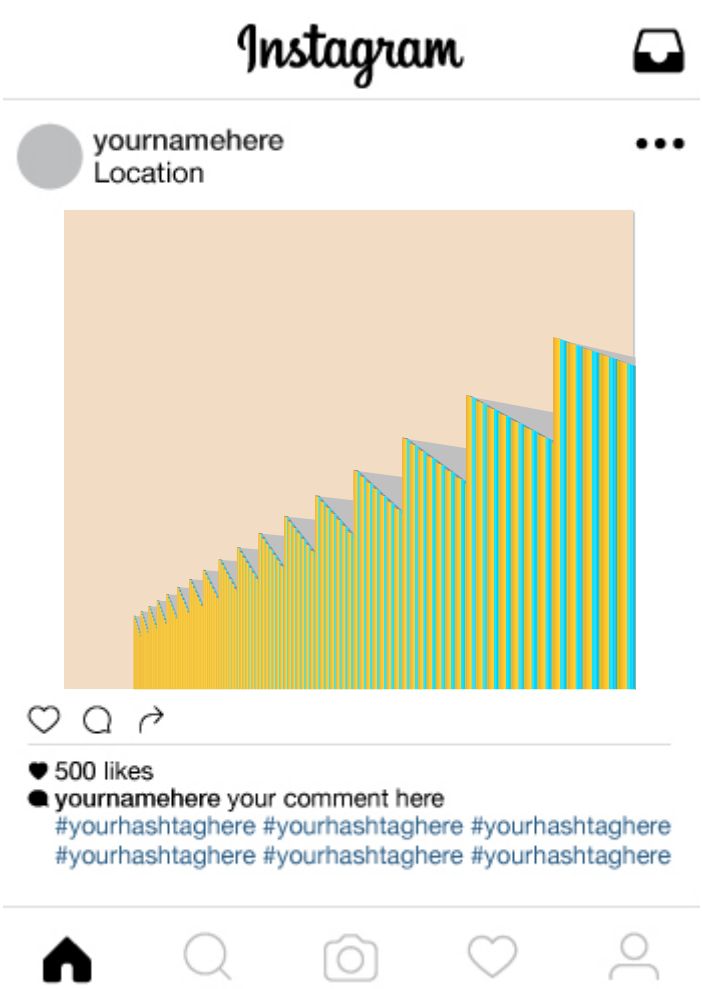
School's Got a New Name

#STEAMMACHINE

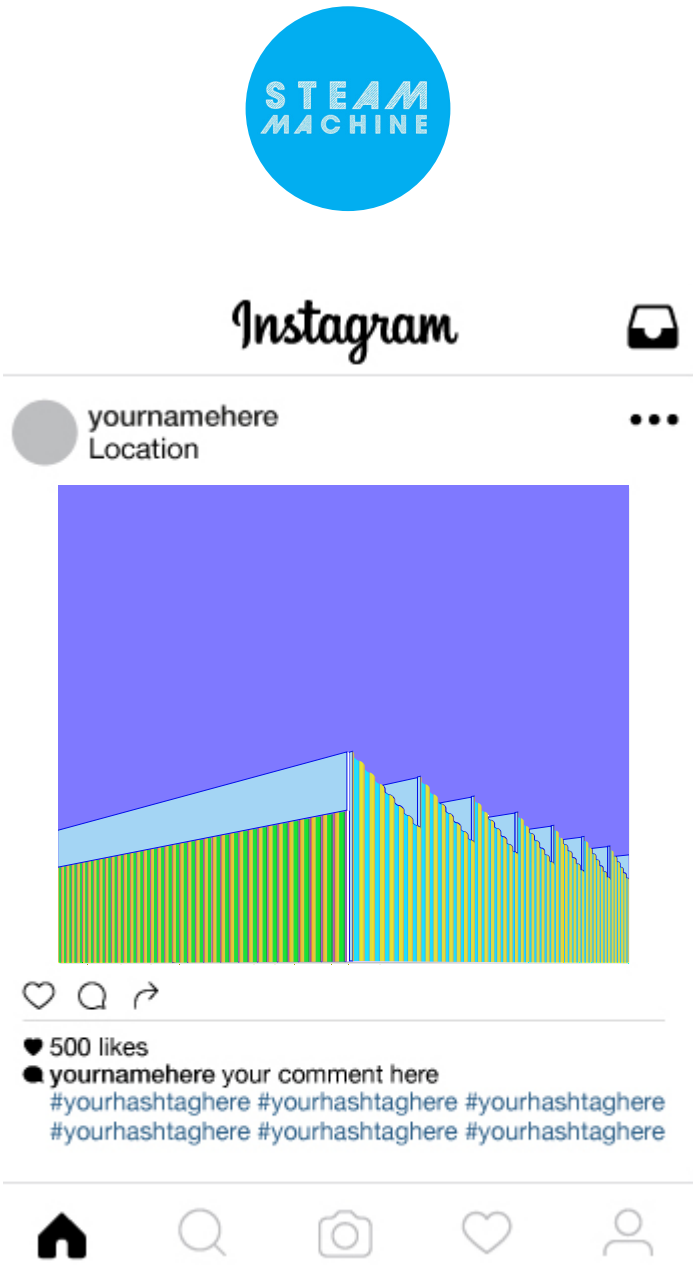
STEAM MACHINE

THE STEAM MACHINE refers on one hand back to the origin of industrial production and mechanical infrastructure. Now it serves as a catchy acronym for the fields of education that are pertinent for solving the problems of the future. The STEAM machine indicates that the building is a machine for creativity, a hive of activity and a machine that is constantly evolving and producing.

The steam machine!


Instagram
yournamehere
Location
500 likes
yournamehere your comment here
#yourhashtaghere #yourhashtaghere #yourhashtaghere
#yourhashtaghere #yourhashtaghere #yourhashtaghere

#STEAMMEUP



#STEAMorNOTtoSTEAM

#STEAMIN’

TO CONCLUDE

“Nice Idea, now we can add some design”
Eladius M. Director Bukoba Regional Centre for Science

This is acknowledgment of an architecture that is recognised for its potential rather its contraints. Rather than it being misunderstood as an inflexible and uncompromising artefact, the simplicity of the *concept* is recognised.

The first step in the process of participation and appropriation is the recognition of the vision and clarity of purpose. The process of design comes full circle as the dissemination of architectural ideas readdresses the context.

Rather than an architectural idea as an elite and sacred concept, this is simple and democratic. Rather than an uncompromising idea, It presents itself as a framework for development and addition.

Ultimately this thesis set out to engage with the conceptualising of a new typology for STEAM education in Tanzania, Instead the context of uncertainty and set in motion a design process that would embrace, incompleteness, flexibility and infrastructure as the framework for an evolving design solution to an evolving challenge: how to deliver innovative education. This thesis does not conclude in a typically pristine and complete architectural concept, but instead it is a response to the context where it offers possibility in circumstances of uncertainty, empowerment against inequality and potential where there are usually constraints.

The Results of the online communication phase of this thesis will alter after the printing of this book and with it should the concept for a building that should always be ready to change, adapt and update, just like a machine...

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