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Consultancies for Development

UPGRADING IN RWANDA

ADDRESSING THE CHALLENGES OF

NEIGHBORHOOD TRANSFORMATION IN AFRICAN CITIES

FATOU DIEYE
SKAT CONSULTING LTD SWITZERLAND / RWANDA
FEBRUARY 2019, NATIONAL URBAN FORUM

SKAT CONSULTING LTD. SWITZERLAND, FOUNDED IN 1978

THE SWISS RESOURCE CENTRE FOR APPROPRIATE TECHNOLOGIES ADVISES INDUSTRY, DEVELOPMENT AGENCIES AND GOVERNMENTS OF THE GLOBAL SOUTH IN ADDRESSING URBANISATION AND POST-DISASTER CHALLENGES



SWISS AGENCY FOR COOPERATION AND DEVELOPMENT

THE SWISS GOVERNMENT INTENSIVELY FUNDED CONSTRUCTION INDUSTRY DEVELOPMENT IN ASIA, LATIN AMERICA & AFRICA, INCLUDING THE ONE IN AFRICA'S GREAT LAKES REGION PRESENTED IN THE FOLLOWING SLIDES



OUR MANDATE IN AFRICA

ENABLING THE LOCAL CONSTRUCTION INDUSTRY TO SUPPLY GREEN AND AFFORDABLE BUILDINGS, THAT CREATE DECENT EMPLOYMENTS



BACKGROUND INFORMATION

AGENDA

PROBLEM

AGENDA
PROBLEM
PROCESS

AGENDA

PROBLEM

PROCESS

POTENTIAL

PART I
PROBLEM

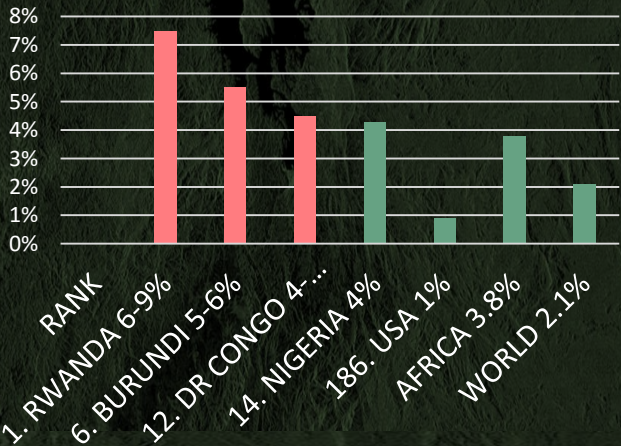
URBAN POPULATION

2018: 8 MILLION ESTIMATED
 2050: 34 MILLION PROJECTED
 LEVEL OF URBANISATION : 50%



+25 MILLION DWELLERS BY 2050
+ 1 MILLION DWELLERS PER YEAR 2040

GLOBAL RANKING OF ANNUAL URBAN GROWTH IN 2017



SOURCES:
WWW.WORLDDATLAS.COM (WA)
WWW.WORLDBANK.ORG (WB)

URBAN DWELLERS BY 2050 : +25 MILLION

PEAK 2040: +1 MILLION PER YEAR

GOMA 1.2 MN

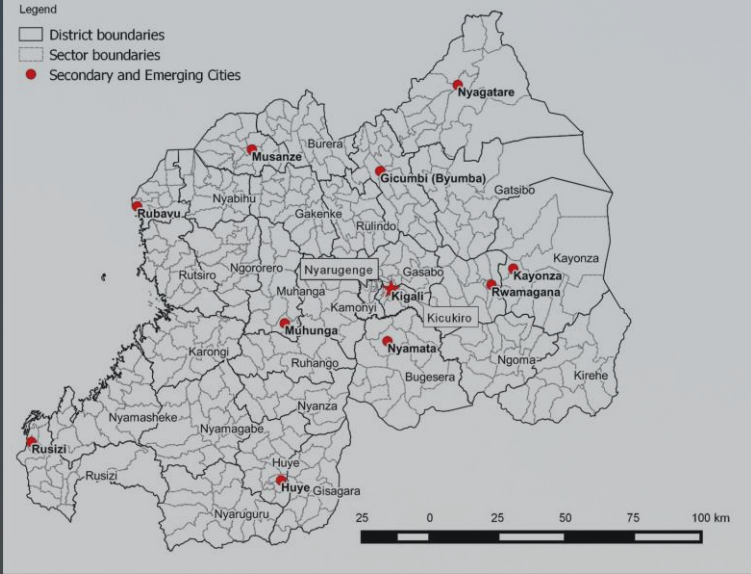
KIGALI 1.4 MN

BUKAVU 1.3 MN

BUJUMBURA 1 MN

WORLD ATLAS RANKING

THE WORLD'S FASTEST-URBANIZING AREA



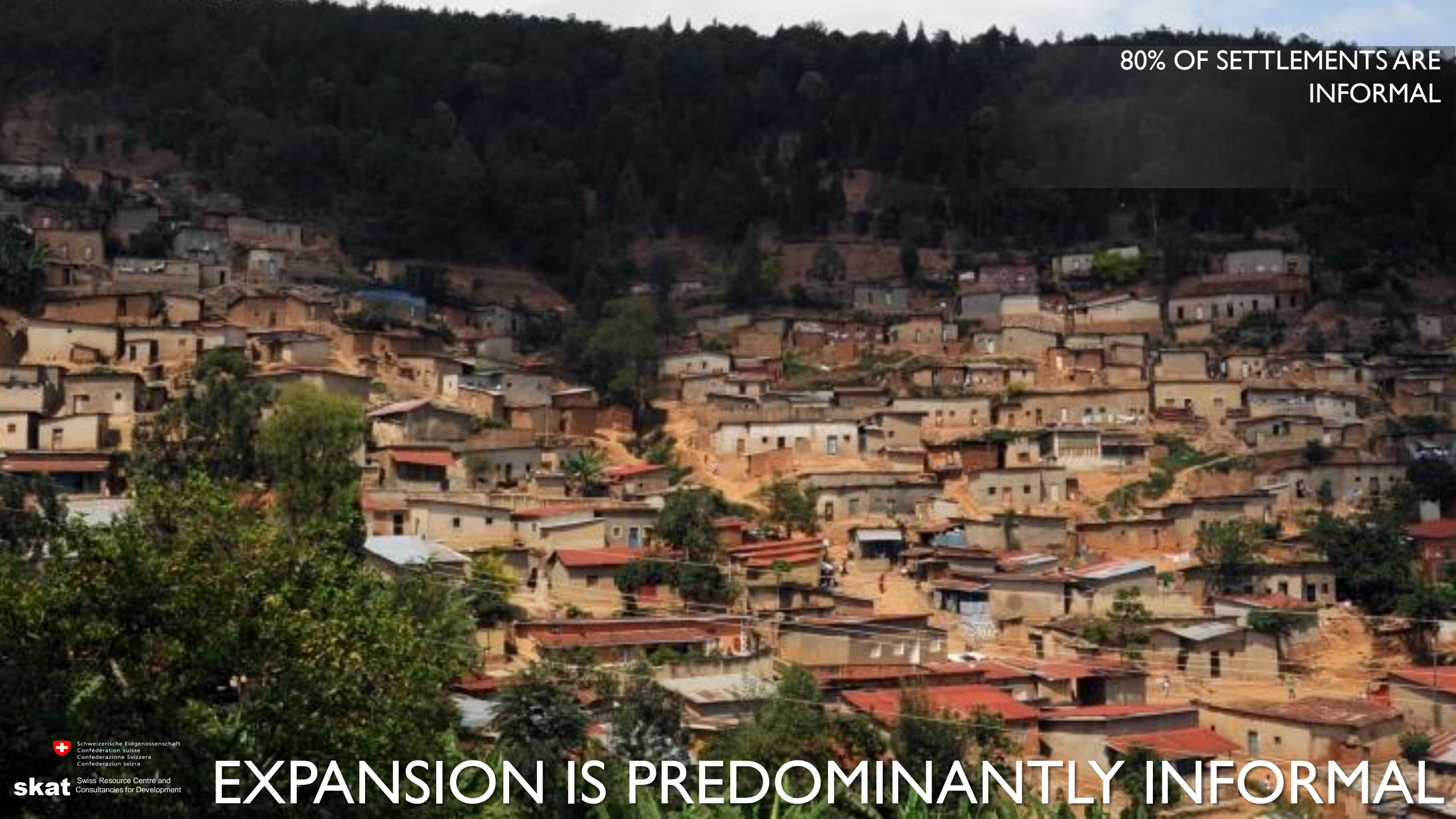
RWANDA'S URBAN STRUCTURE
 CAPITAL CITY
 SECONDARY CITIES
 TERTIARY CITIES

URBAN POPULATION 2018
 20% 2,279,755

RURAL POPULATION 2018
 80% 9,609,465




HOW CAN THIS FAST PROCESS BE GUIDED?



80% OF SETTLEMENTS ARE
INFORMAL

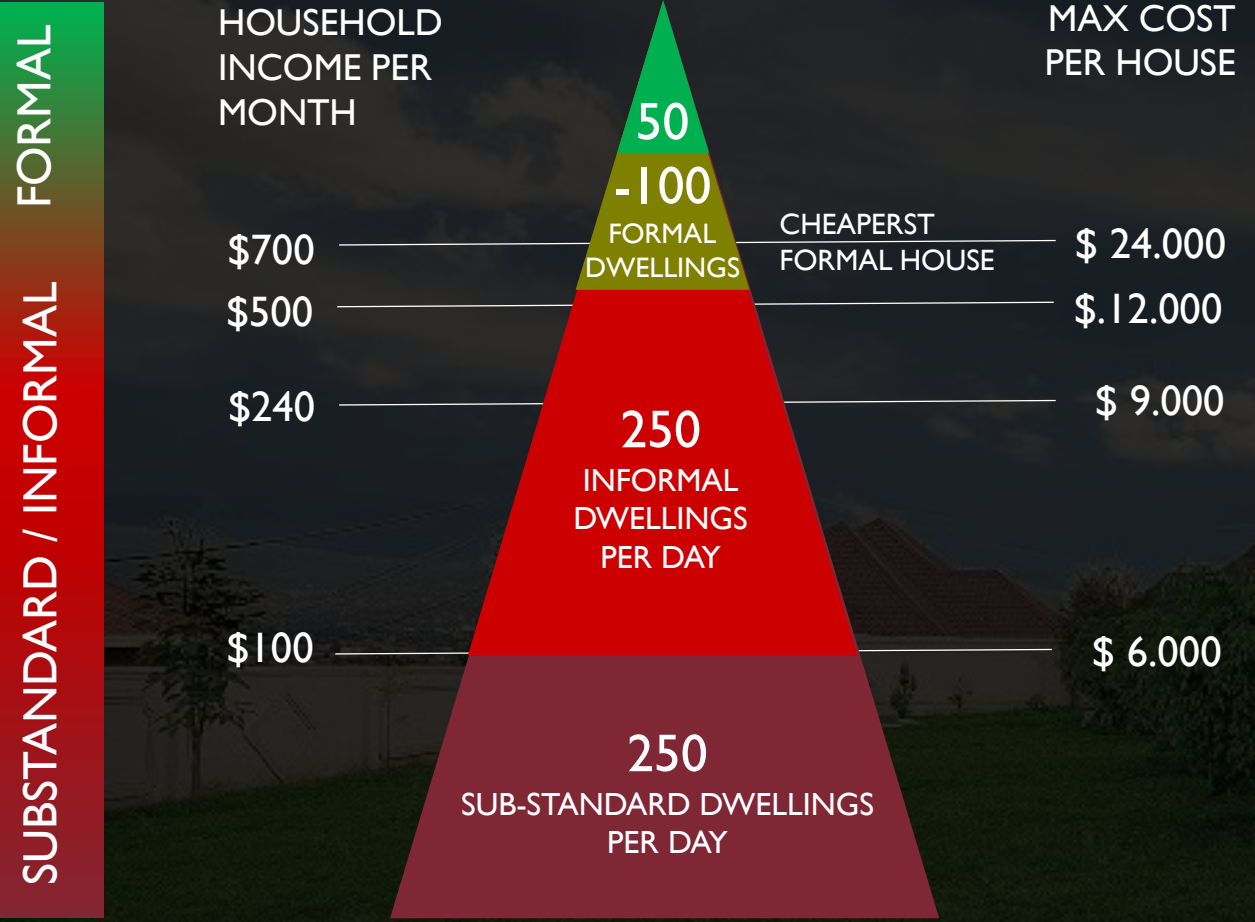
EXPANSION IS PREDOMINANTLY INFORMAL

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THE CURRENT PROFILE OF THE URBAN HOUSING SUPPLY

PRICE RANGE OF FORMAL HOUSES
USD 21.000 - USD 700.000



HOUSES PER CATEGORY SUPPLIED PER DAY, IN URBAN RWANDA, BURUNDI, GOMA, BUKAVU

ONLY 10-20% CAN AFFORD FORMAL HOUSES



HOUSES ON THIS PICTURE : 3000
= URBAN EXPANSION OF 5 DAYS

LEADING TO “SETTLEMENT INFARCTION”

CONGESTION



STORM WATER



SETTLEMENT FIRE



EARTHQUAKES



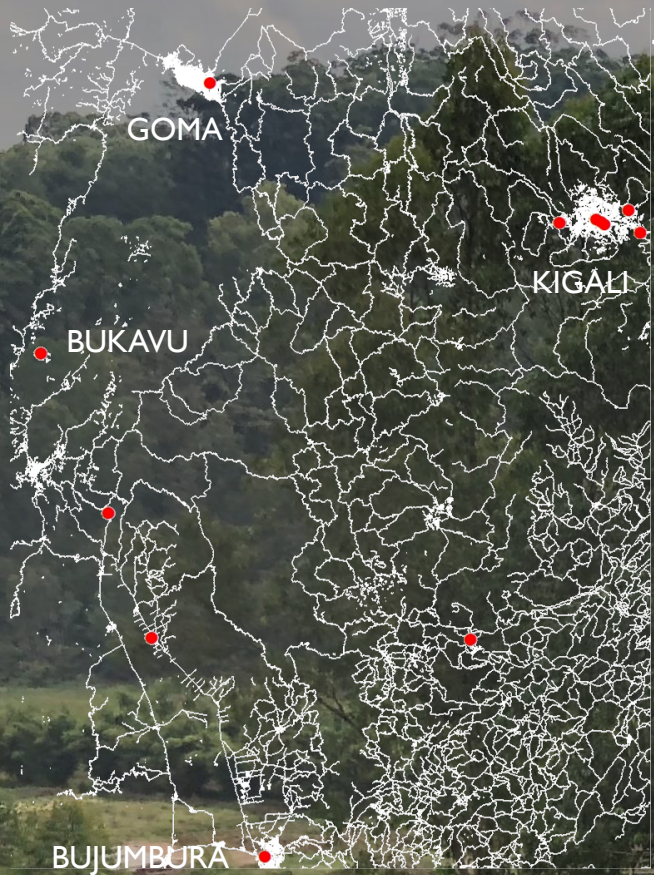
LEAVING COMMUNITIES VULNERABLE



OFTEN REQUIRING FORCED RELOCATION

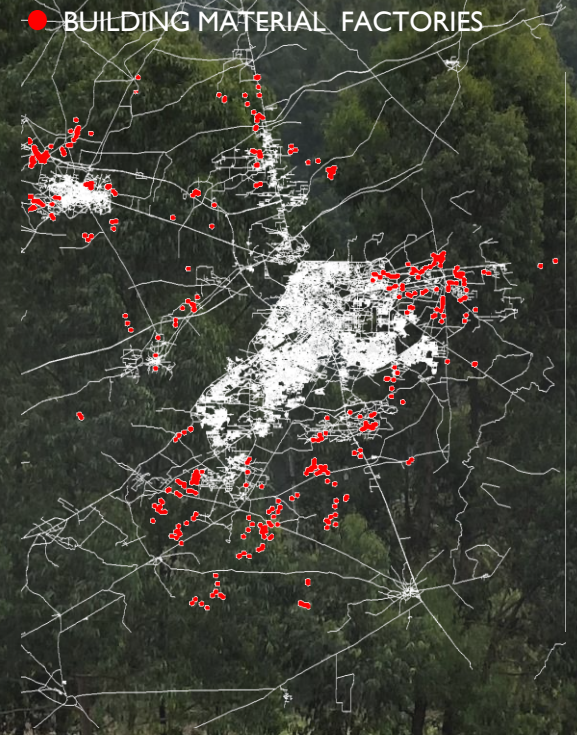


BUILDERS STRUGGLE WITH STORIED HOUSES



GREAT LAKES CITIES
8 MILLION INHABITANTS

LAHORE
9 MILLION



BRICK FACTORIES IN LAHORE (PAKISTAN) : 500

BUILD. MAT. FACTORIES IN AFRICA'S «GREAT LAKES» : 20

PICTURE: A TYPICAL RWANDAN CLAMP KILN
THESE BRICKYARDS ARE MASSIVELY CONTRIBUTE TO DEFORESTATION GREEN HOUSE GASES
THE SWISS COOPERATION AND SKAT HAVE CONTRIBUTED TO THE SUBSTITUTION OF SUCH
KILNS WITH CLEAN BRICK MAKING TECHNOLOGIES

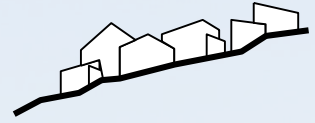


NO INDUSTRY FUELING URBAN GROWTH

PART II

PROCESS

COST REDUCTION PER DESIGN MEASURE

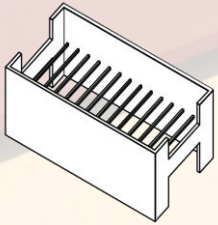


CURRENT SITUATION



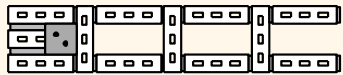
STACKING HOUSES

+/- 20%



SIMPLE FLOOR PLANS

+/- 20%



CAVITY BRICK WALLS

+/- 10%



LOW-COST SLABS

+/- 20%

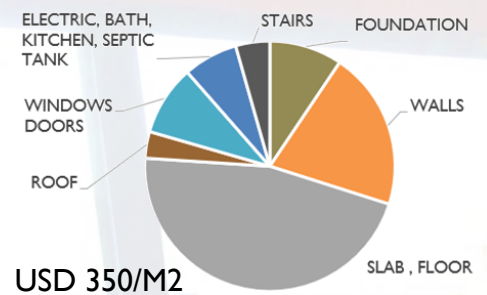


MATERIAL IMPORTS

WITH COMMON DESIGNS: USD 220/M2

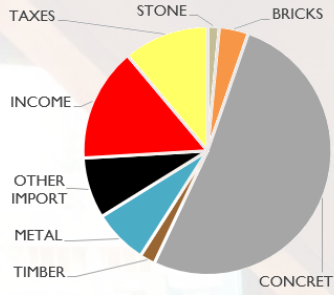
WITH OPTIMISED DESIGNS: USD 80/M2

USUAL CONSTRUCTION COSTS

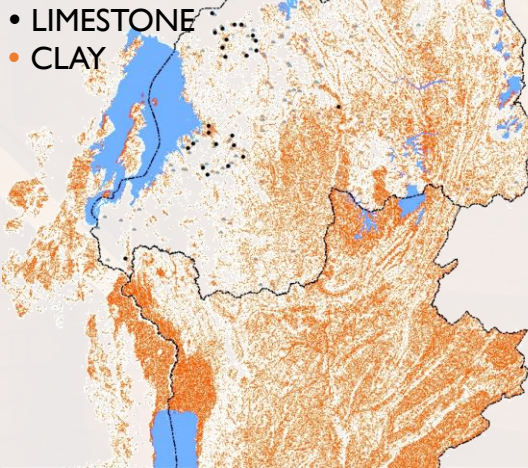
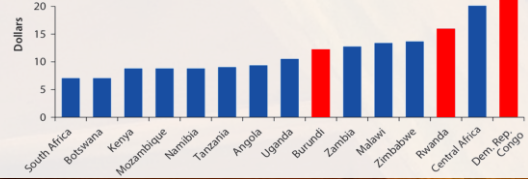


USD 350/M2

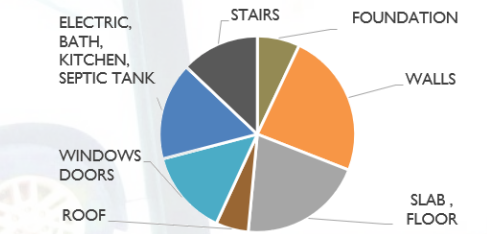
COST PER MATERIAL



50KG CEMENT BAG (USD)

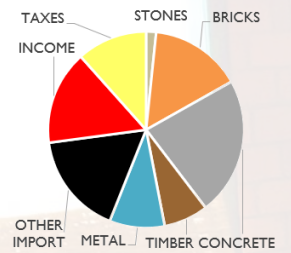


COSTS WITH OPTIMISED DESIGN



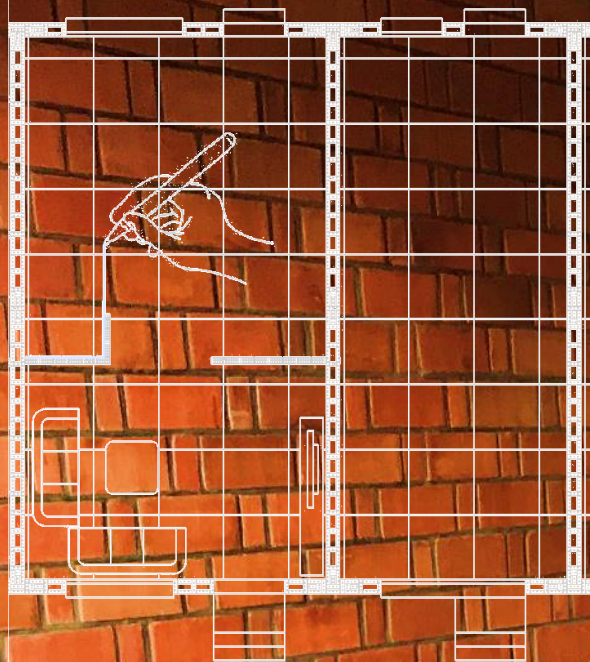
USD 200/M2


COST PER MATERIAL



OPTIMISING THE USE OF LOCAL MATERIAL

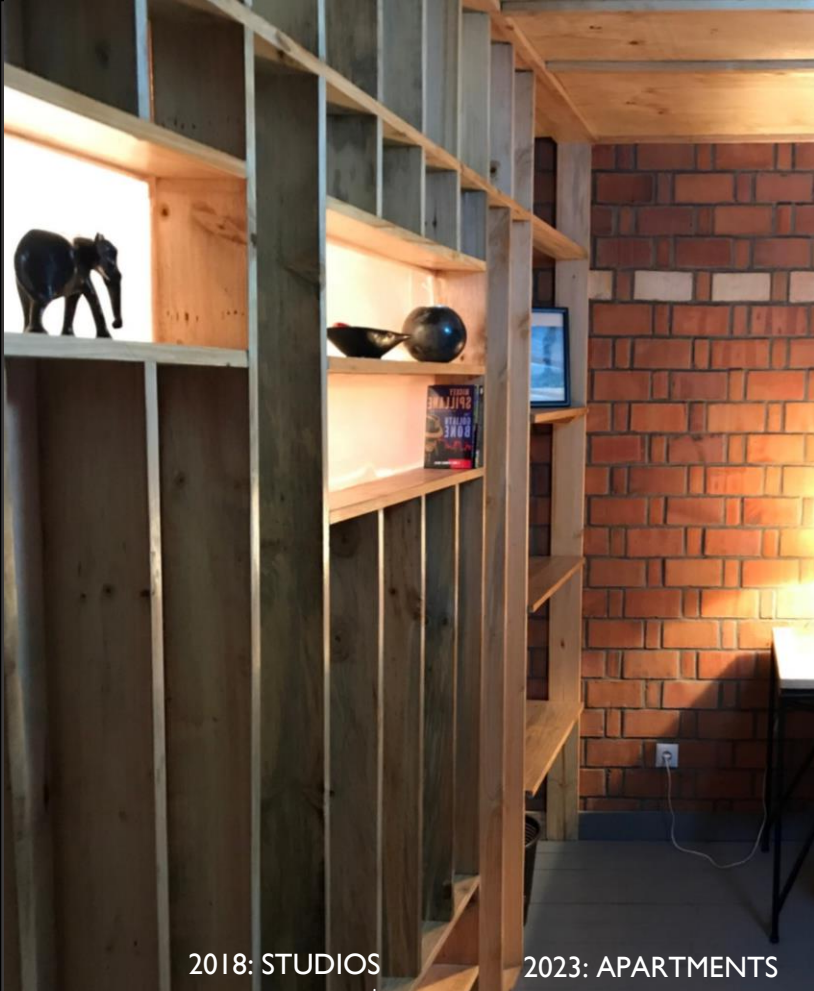
WITH BASIC FINISHES
USD 200 PER SQM



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MODULAR AND INCREMENTAL FREE PLAN



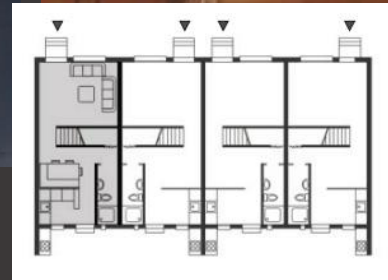
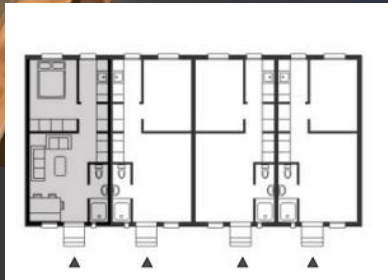
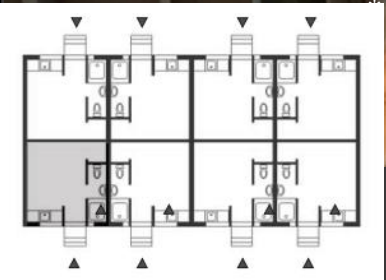
2018: STUDIOS



2028: DUPLEX

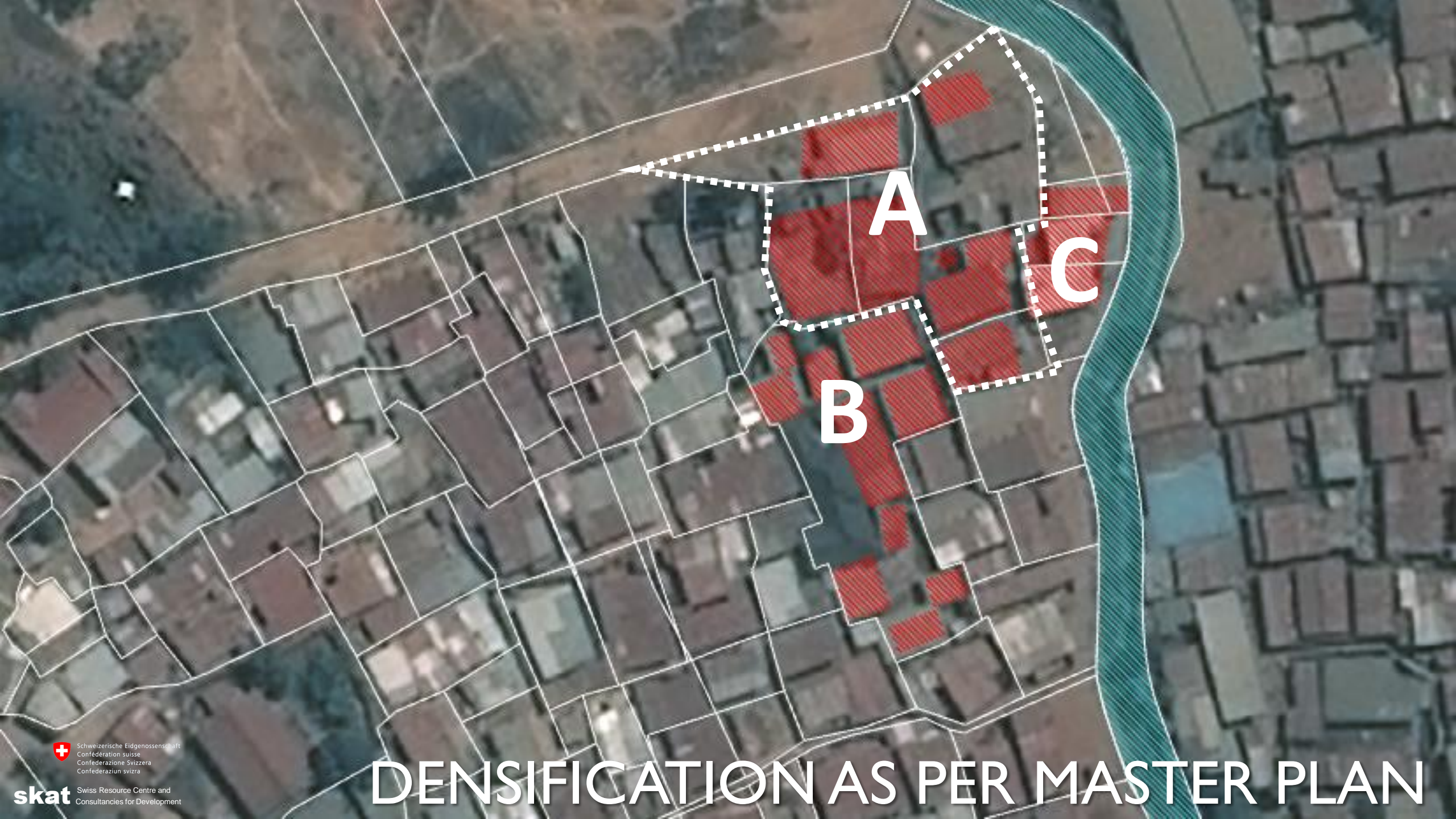


2033: CITY VILLA



INCREMENTAL
ADAPTATION TO A
NEIGHBOURHOOD'S
GROWING INCOME

FLEXIBLE INTERIORS – EASY TO MAINTAIN



A

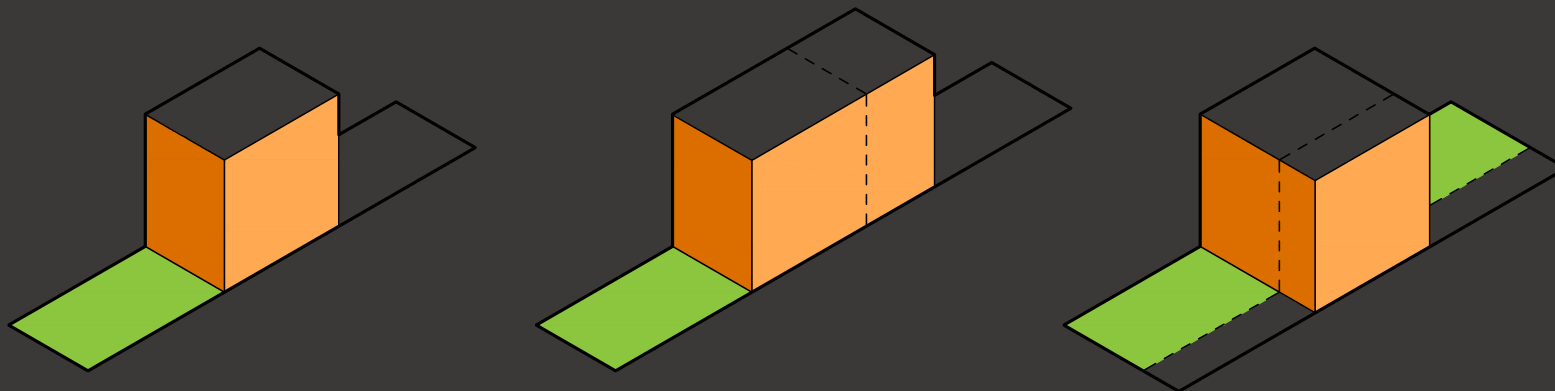
C

B

DENSIFICATION AS PER MASTER PLAN

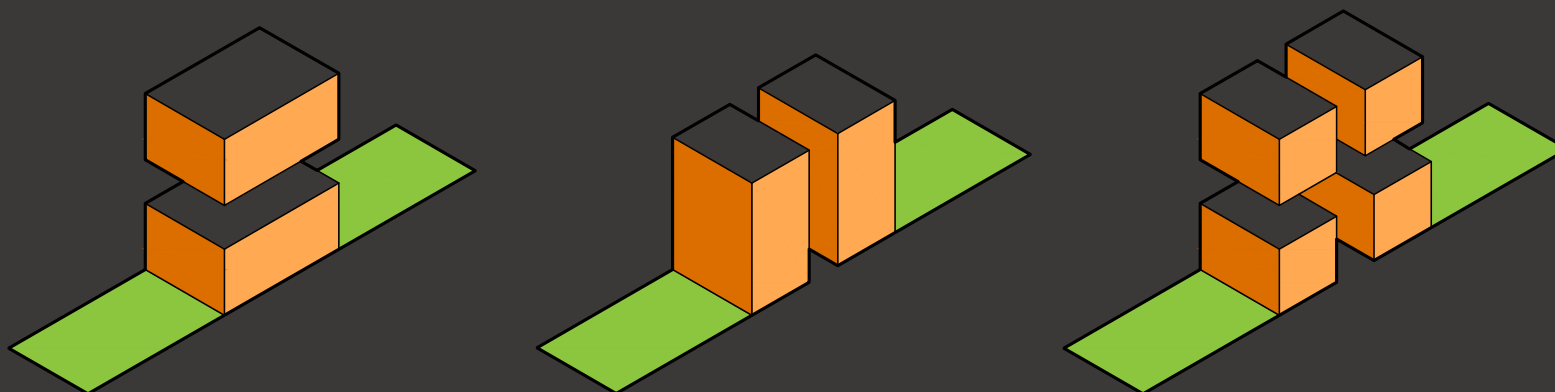
STRETCH

extend the cube to accommodate bigger families/budgets



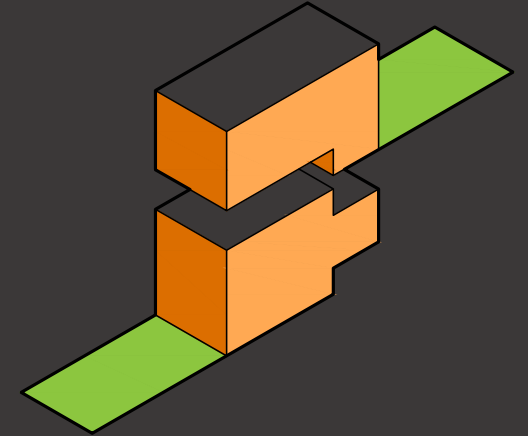
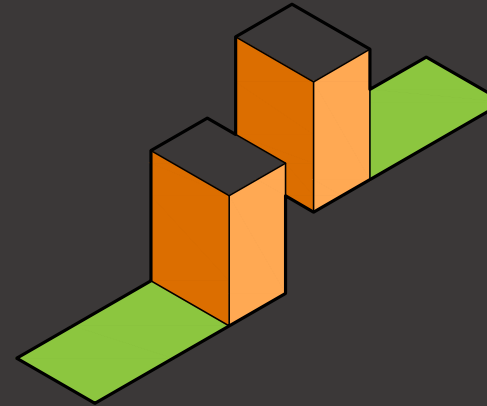
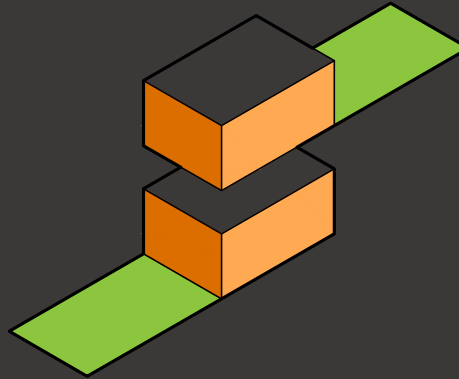
SPLIT

Maximize plot area by subdividing the cube into smaller units



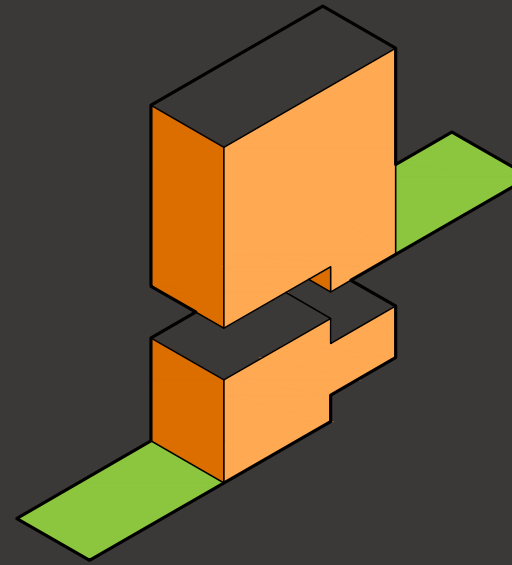
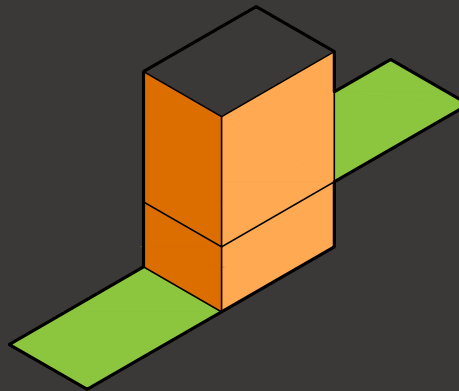
SPLIT ON A SLOPE

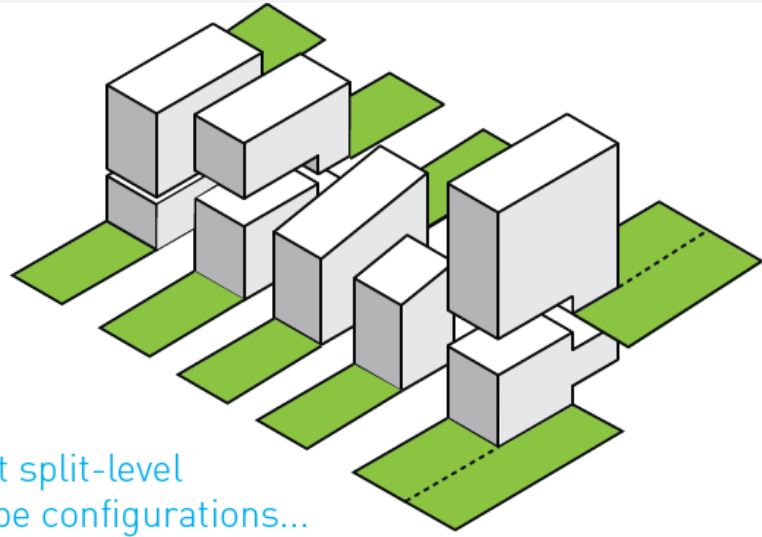
maintain private garden access by
introducing split-level units



STACK ON A SLOPE

increase density by
superimposing one unit on
another

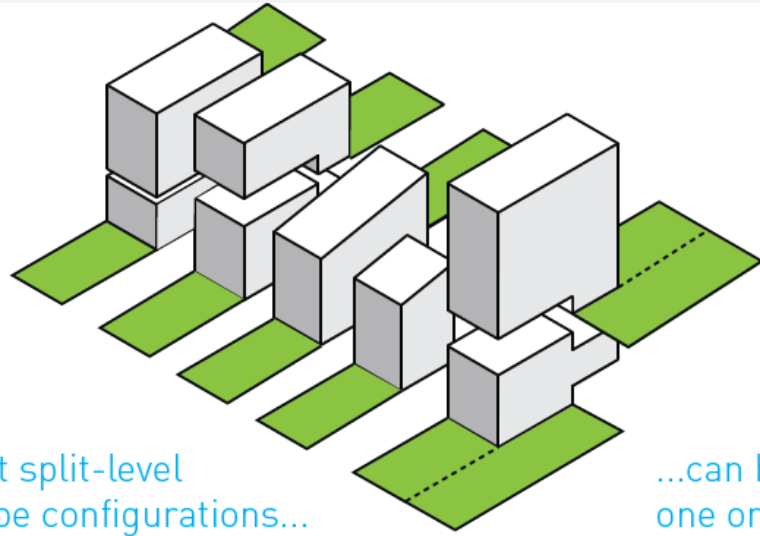




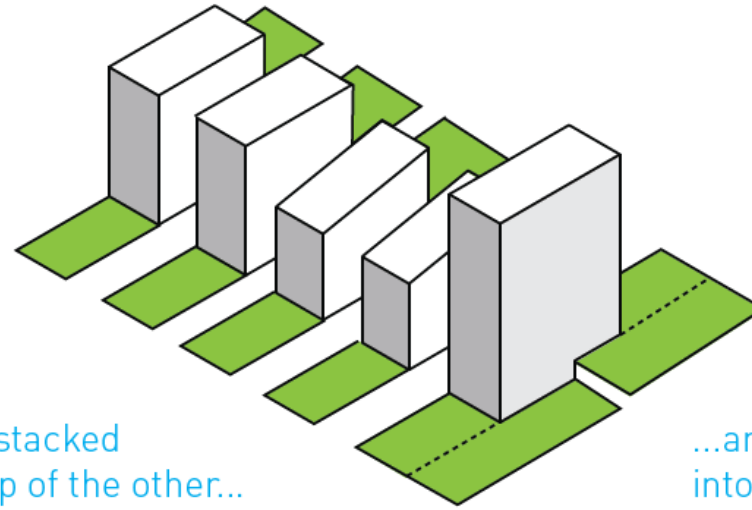
9 different split-level
Swiss Cube configurations...

ANATOMY OF A BUILDING

Multiple units can be assembled on a standard plot without sacrificing basic amenities like direct road access and private gardens



9 different split-level Swiss Cube configurations...

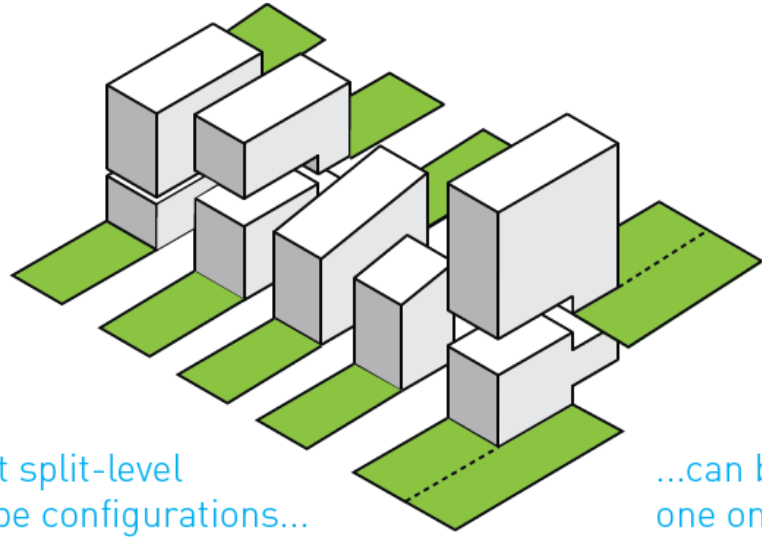


...can be stacked one on top of the other...

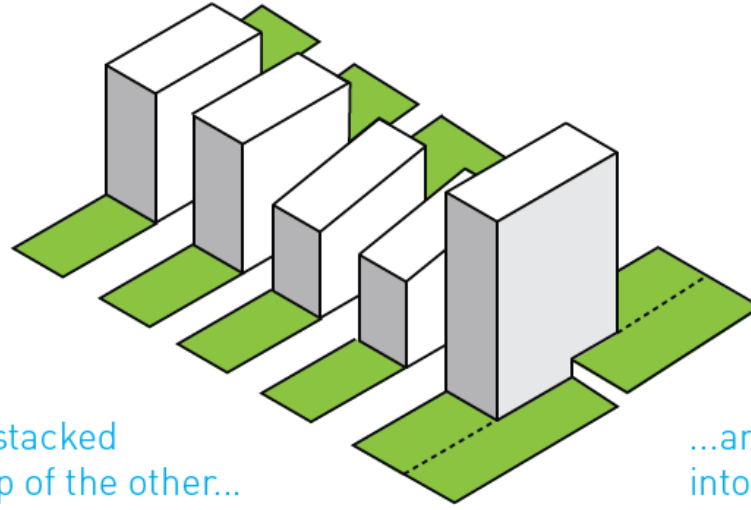
...and into or

ANATOMY OF A BUILDING

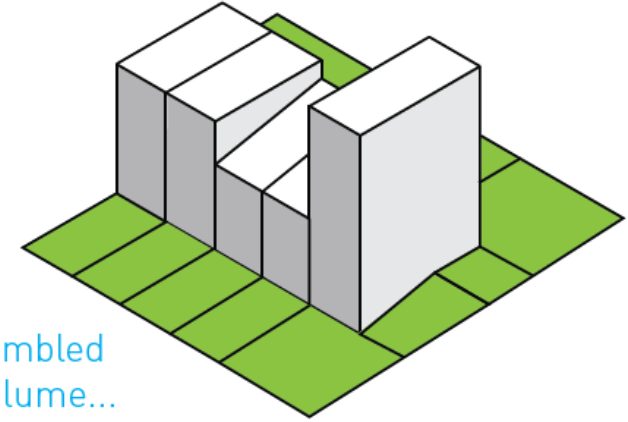
Multiple units can be assembled on a standard plot without sacrificing basic amenities like direct road access and private gardens



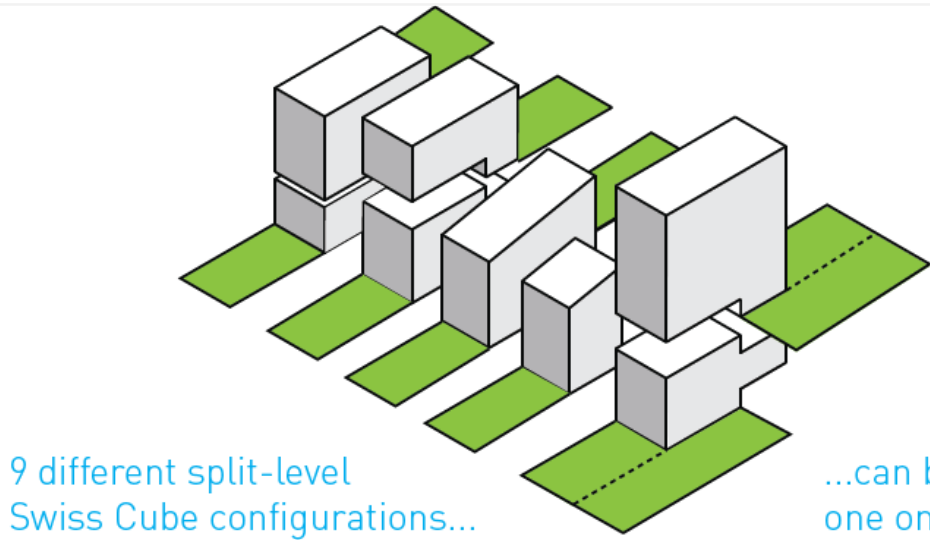
9 different split-level
Swiss Cube configurations...



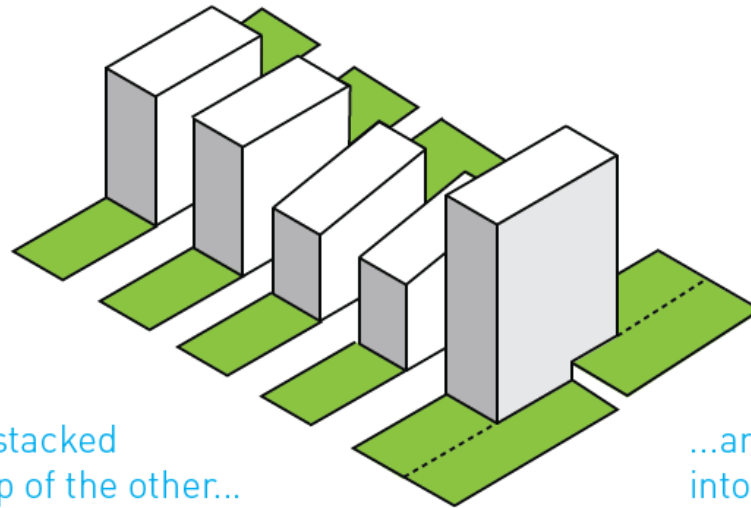
...can be stacked
one on top of the other...



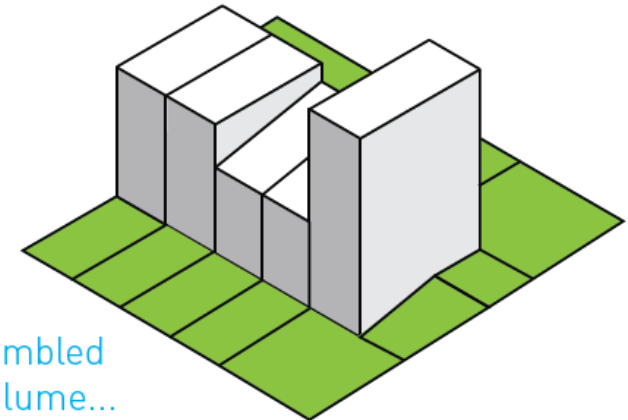
...and assembled
into one volume...



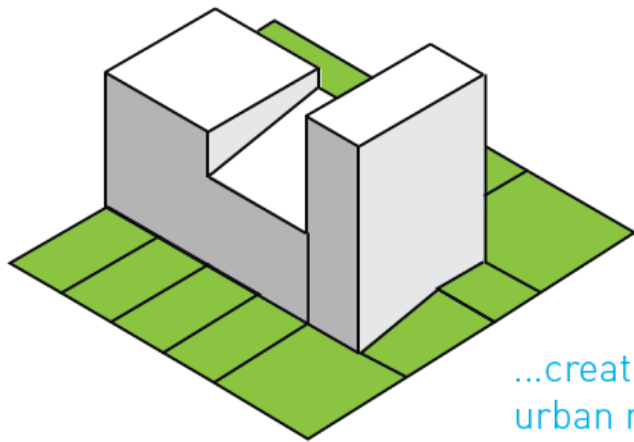
9 different split-level Swiss Cube configurations...



...can be stacked one on top of the other...



...and assembled into one volume...



...creating an attractive urban multiplex.



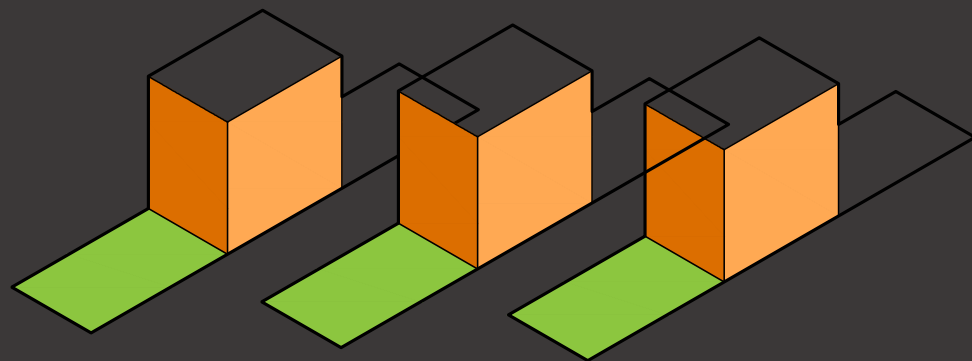
ANATOMY OF A BUILDING

Multiple units can be assembled on a standard plot without sacrificing basic amenities like direct road access and private gardens

LOW DENSITY

4 units on 600 sqm

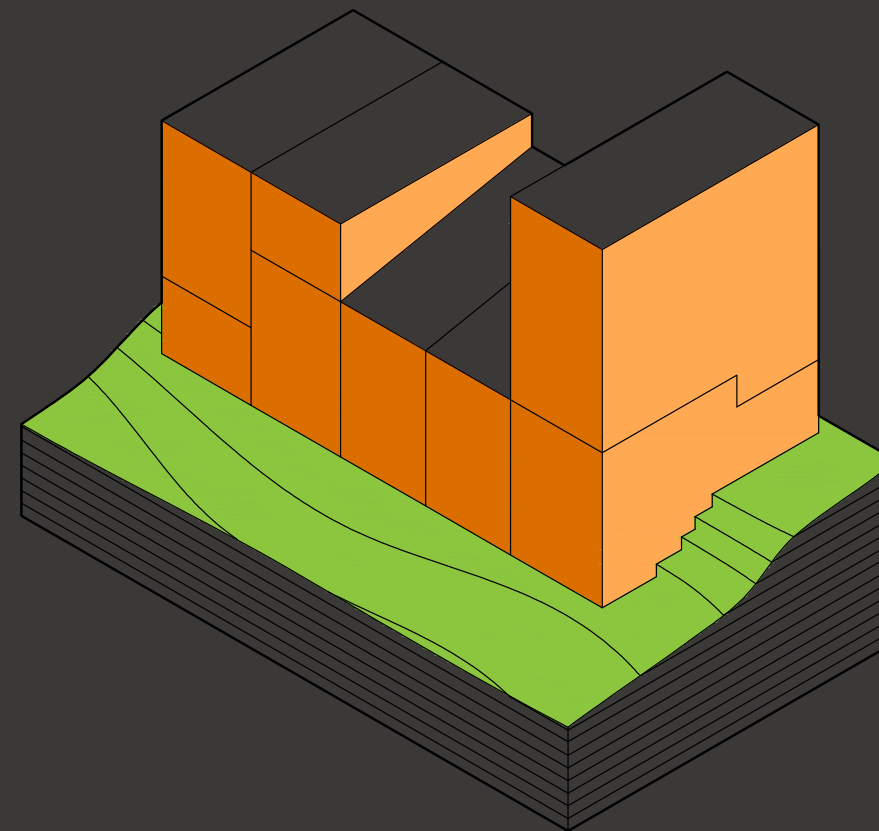
Existing situation at Mpazi



HIGH DENSITY

10 units on 600 sqm

Existing Situation at Mpazi






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COMMUNITY-DRIVEN URBAN DEVELOPMENT



COST-EFFECTIVE DENSIFICATION METHOD

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COMMUNITY-DRIVEN URBAN DEVELOPMENT

PART III
POTENTIAL



CERAMISTS : + 6000
LABOURERS : + 150.000


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NEW GREEN JOBS ALONG THE VALUE CHAIN



CERAMISTS : + 6000
LABOURERS : + 150.000
BUILDERS : + 100.000

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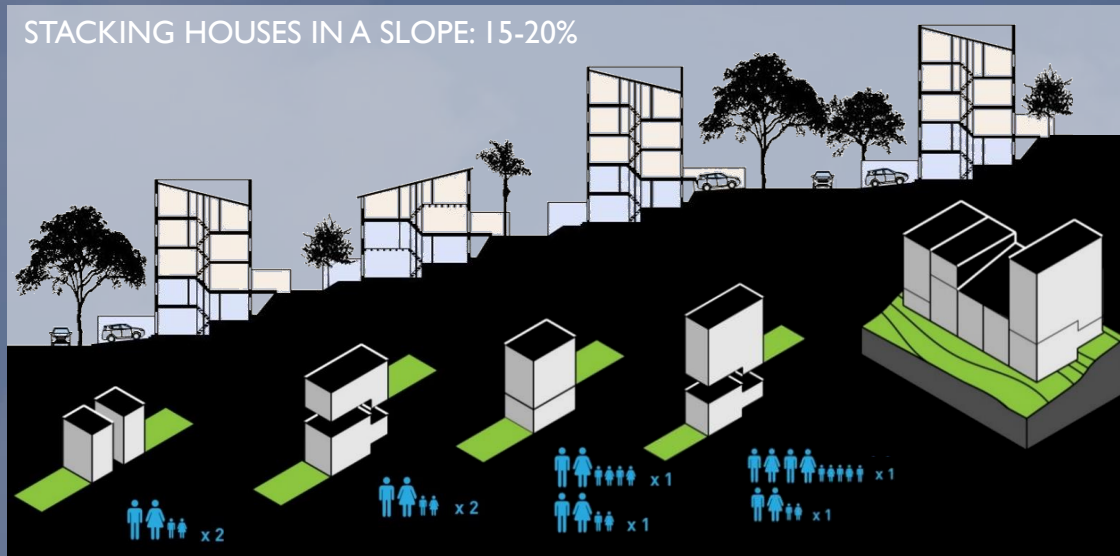
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NEW GREEN JOBS ALONG THE VALUE CHAIN

THE MODULAR CUBE



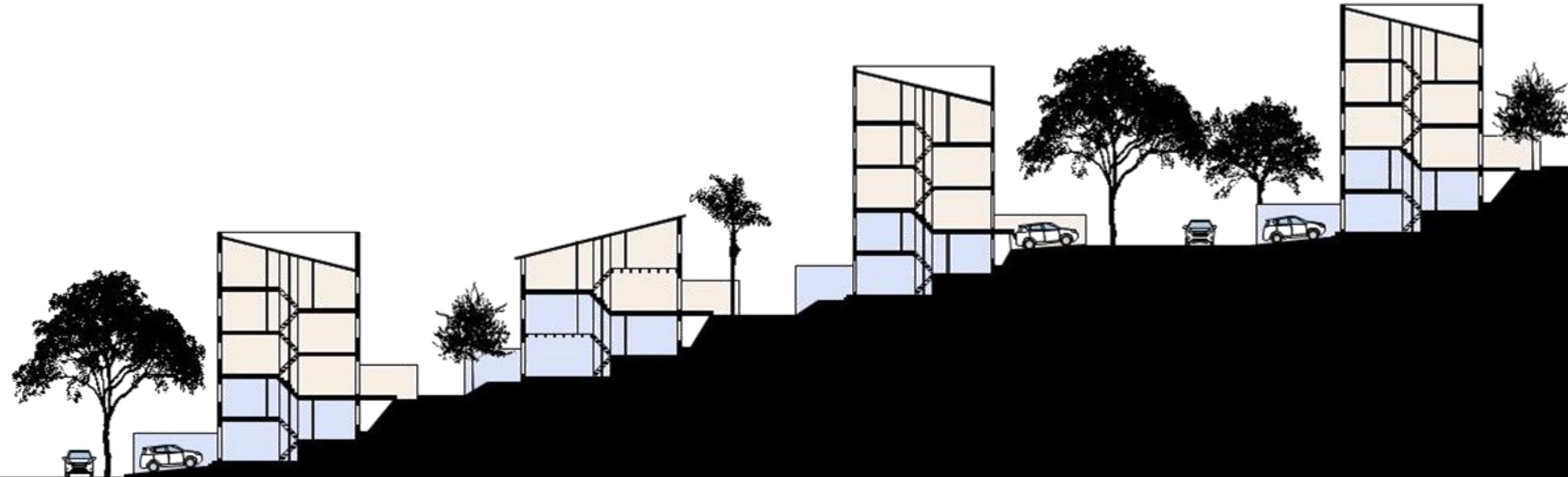
STACKING HOUSES IN A SLOPE: 15-20%



MAX FLOOR NUMBER G+4
DWELLINGS / HA : 100+
IDEAL SLOPE : 5-20%



MAX FLOOR NUMBER G+4
DWELLINGS / HA : 100+
IDEAL SLOPE : 5-20%



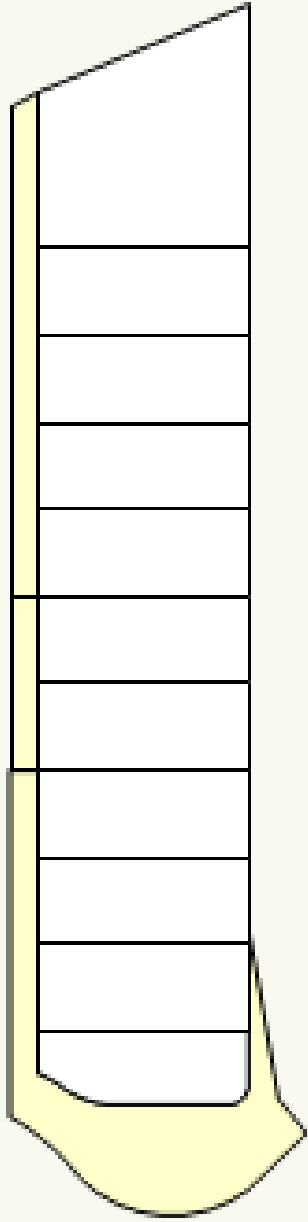


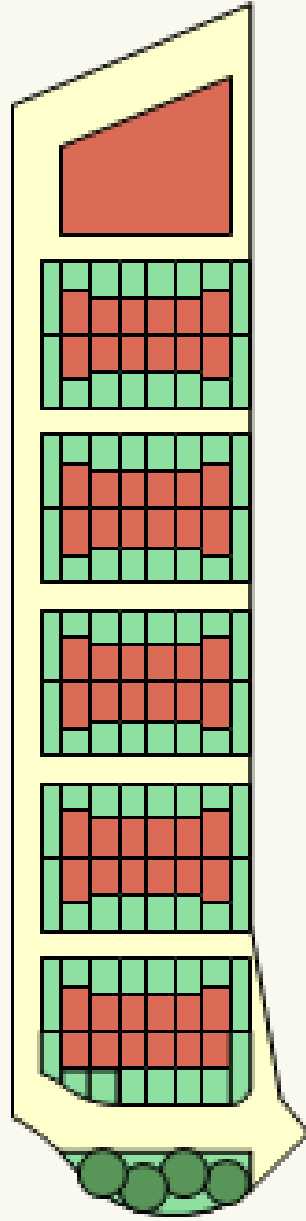
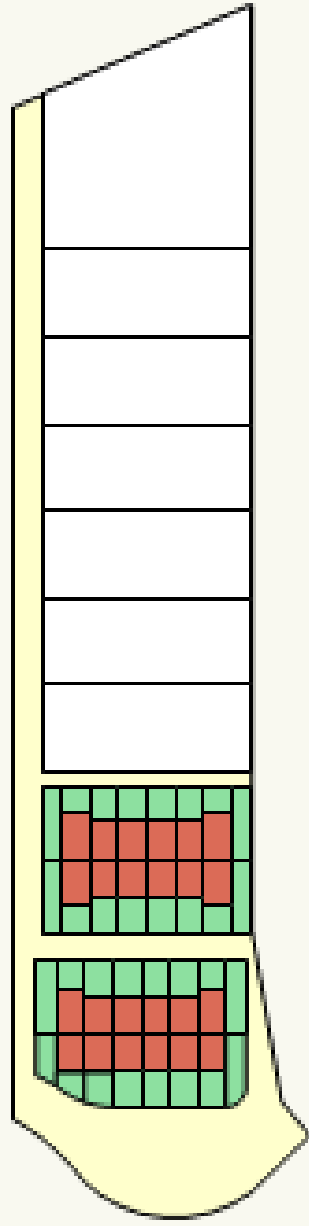
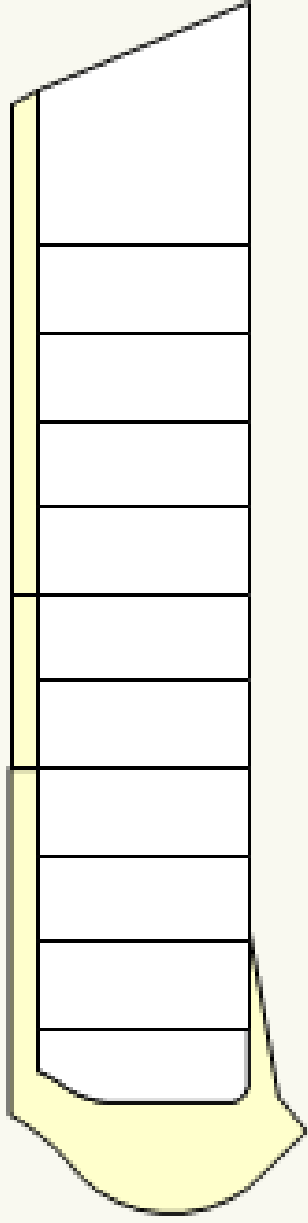
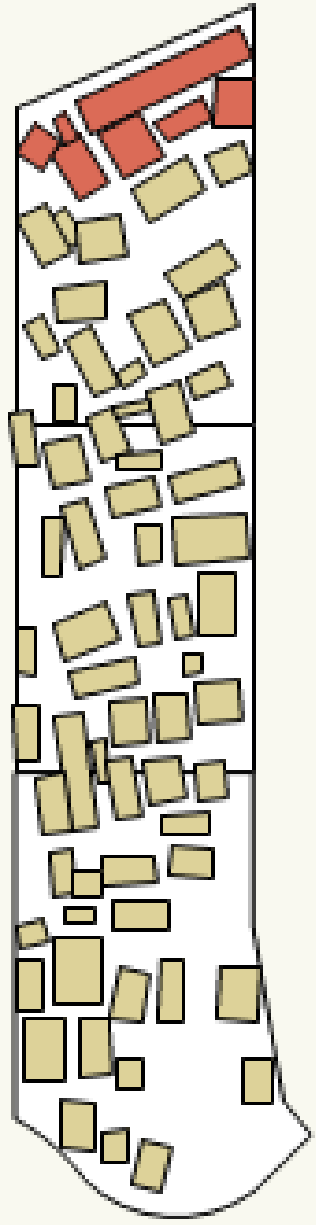
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CHALLENGES BECOME OPPORTUNITIES





THANK YOU FOR YOUR ATTENTION

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