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Breaking down the cost of housing

MINISTRY OF INFRASTRUCTURE
RWANDA HOUSING AUTHORITY
DEVELOPMENT BANK OF RWANDA



Key Findings and Recommendations
Study on the Housing Market and Low-Cost and
Efficient Building Materials and Technologies

What does it cost to build housing in Rwanda?

The housing market demand study highlights the affordability issue, with households unable to afford even the least expensive newly constructed developer homes. To address this, we must begin by analyzing and understanding each cost component of a building. By breaking down the total housing cost in Rwanda, developers and policymakers can identify areas for potential savings and optimize conditions to lower selling prices.

Financial costs and taxes includes various expenses related to financing the project and taxes associated with the property. Financial costs can include interest payments on loans, fees related to securing financing, and other financial charges. Taxes may include property taxes, sales taxes, and any other applicable taxes imposed by the local authorities.

Land costs refer to the price paid for acquiring the land on which the real estate project is developed. The cost of land can vary significantly based on location, demand, and other factors. Optimizing land costs may involve strategies such as negotiating favorable land purchase deals, exploring alternative land options, or considering land-use policies and regulations.

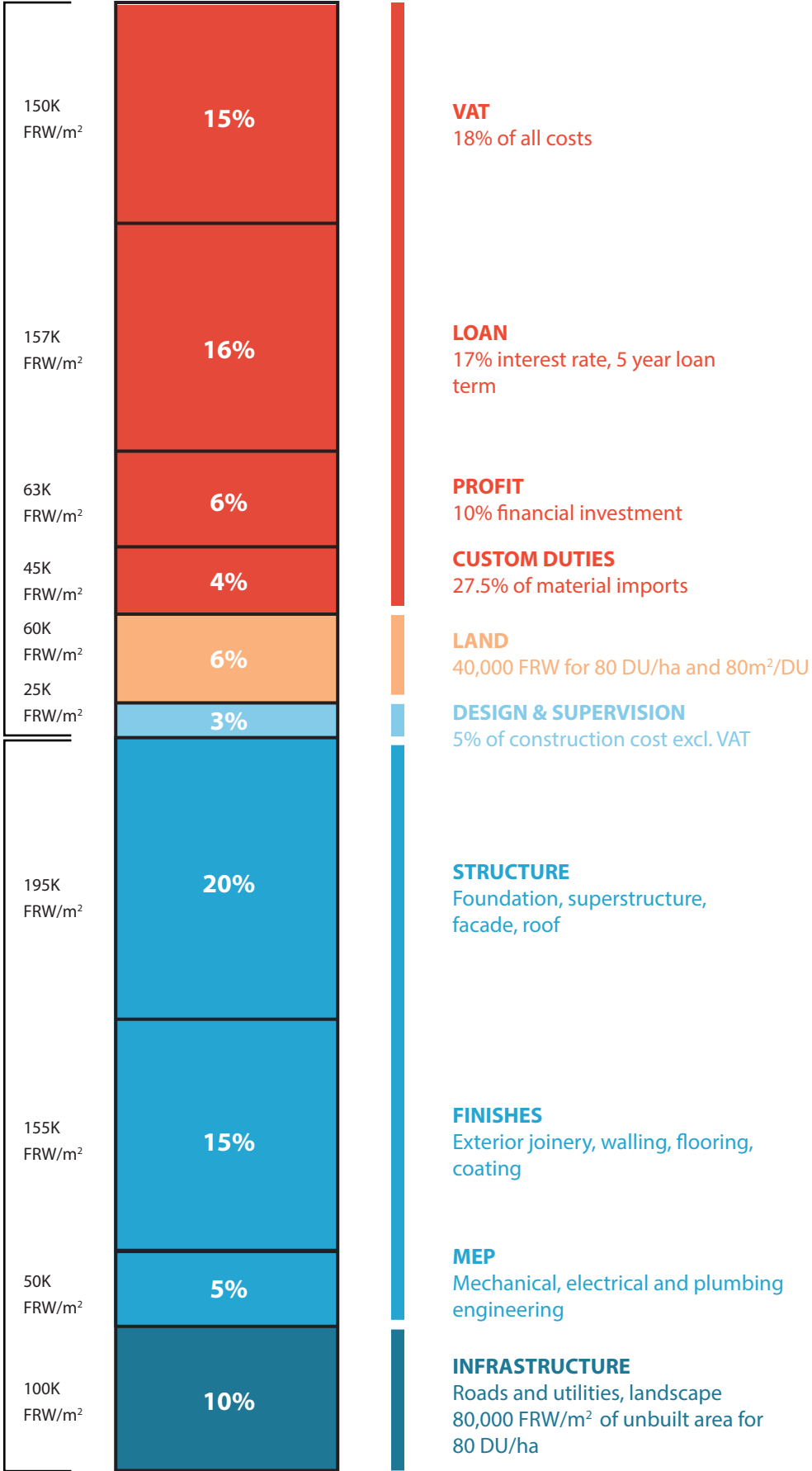
Development costs encompass a wide range of expenses incurred during the planning and execution of the real estate project. These costs may include expenses related to architectural and engineering design, obtaining permits and approvals, conducting feasibility studies, conducting environmental assessments, and other pre-construction activities. To reduce development costs, efficient project management, value engineering, and streamlined processes can be implemented.

Building costs are directly related to the physical construction of the buildings or units within the real estate project. This includes labor, materials, equipment, and contractor fees. To reduce construction costs, various strategies can be employed, such as using cost-effective building materials, optimizing construction techniques, exploring alternative construction methods, and negotiating favorable contracts with contractors and suppliers.

Infrastructure costs involve the expenses associated with providing necessary infrastructure to support the real estate project. This can include constructing or upgrading roads, utilities, drainage systems, and other essential facilities. Finding cost-effective solutions, leveraging existing infrastructure, exploring public-private partnerships, or obtaining government incentives can help in minimizing infrastructure costs.

50%
LAND, FINANCIAL &
DEVELOPMENT
COSTS

50%
CONSTRUCTION
COSTS



Cost breakdown for typical market rate housing, where building costs (excluding infrastructure) total 400,000 FRW/m²


Who are the housing suppliers?

Data from literature and interviews with construction industry professionals reveals the existence of six distinct builder profiles, each one embracing a unique business model that delivers a particular type of housing product to the market, be it in the formal or informal sector. Where the demand side segmentation revealed land and infrastructure to be pivotal factors with respect to affordability, the same two components serve as structuring factors in the business model of the various suppliers.

 **LANDOWNER
SELF BUILDER**
1 DU



Around 84% of Rwandan households are registered landowners who build and occupy one home. This trend is dominant in rural areas but still accounts for 75% of urban households. Service access varies by income, with on-site solutions like pit latrines being the primary wastewater management method. In urban areas, 65% of owner-occupiers finance their homes through savings, 19% secure bank loans, and less than 5% borrow from friends, family, or SACCOs. These self-builders operate outside the mortgage market and formal construction industry.

 **LANDOWNER
PRIVATE INVESTMENT**
1 - 5 DU



Landowner individual investors acquire plots to retrofit existing units or construct new homes for sale or rent. These properties are usually single-family or semi-detached homes, which may not be on contiguous plots. They rely on existing water and electricity networks and use low-tech solutions like improved pit latrines for liquid waste disposal. Typically, these investors deliver 1-5 homes per investment cycle and rely on the proceeds from selling or renting 1-2 units to finance the next project. Similar to landowner self-builders, they operate outside traditional housing finance and construction systems, relying on personal capital and labor to provide housing.

 **LANDOWNER
JOINT VENTURE**
5 - 20 DU



Landowner joint ventures bring neighboring landowners together to construct multi-family units on adjoining plots. They enable compliance with local regulations, introducing low-rise, higher-density housing in urban areas. These ventures, comprising owner-occupied and rental units, formalize Rwanda's informal rental market with land transaction and technical support. In informal neighborhoods, they introduce formal amenities to underserved areas. Supported by policies and government-funded projects with partners like the Swiss Agency for Development and Cooperation, landowner joint ventures have significant potential.

What is their procurement and delivery model?

The supplier groups naturally organize themselves into 1/ those who can rely on municipal infrastructure versus those who must service their land prior to construction, and 2/ those who own land versus those who must acquire and amalgamate land for development. Other defining characteristics are related to scale of the business activity (from 1 dwelling unit to over 100) and the cost and structure of their financial arrangements. A short description of these actors is included below.

👤 \$ MICRO-SCALE DEVELOPER
5 - 20 DU



Micro-developers, whether in the informal or formal sector, play a significant role in housing provision. In the informal sector, they are known as backyard landlords, constructing affordable rental housing through small, improvised structures with limited investment and substandard materials. Infrastructure is ad hoc, often shared. In the formal sector, micro-developers build single-family homes for sale in popular housing typologies. With fewer than 20 units, they don't need expensive wastewater treatment plants, relying on low-tech sanitation solutions. Neither do they rely on formal construction finance, using own funds or small unsecured loans for construction.

👤 \$\$ SMALL-SCALE DEVELOPER
20 - 100 DU



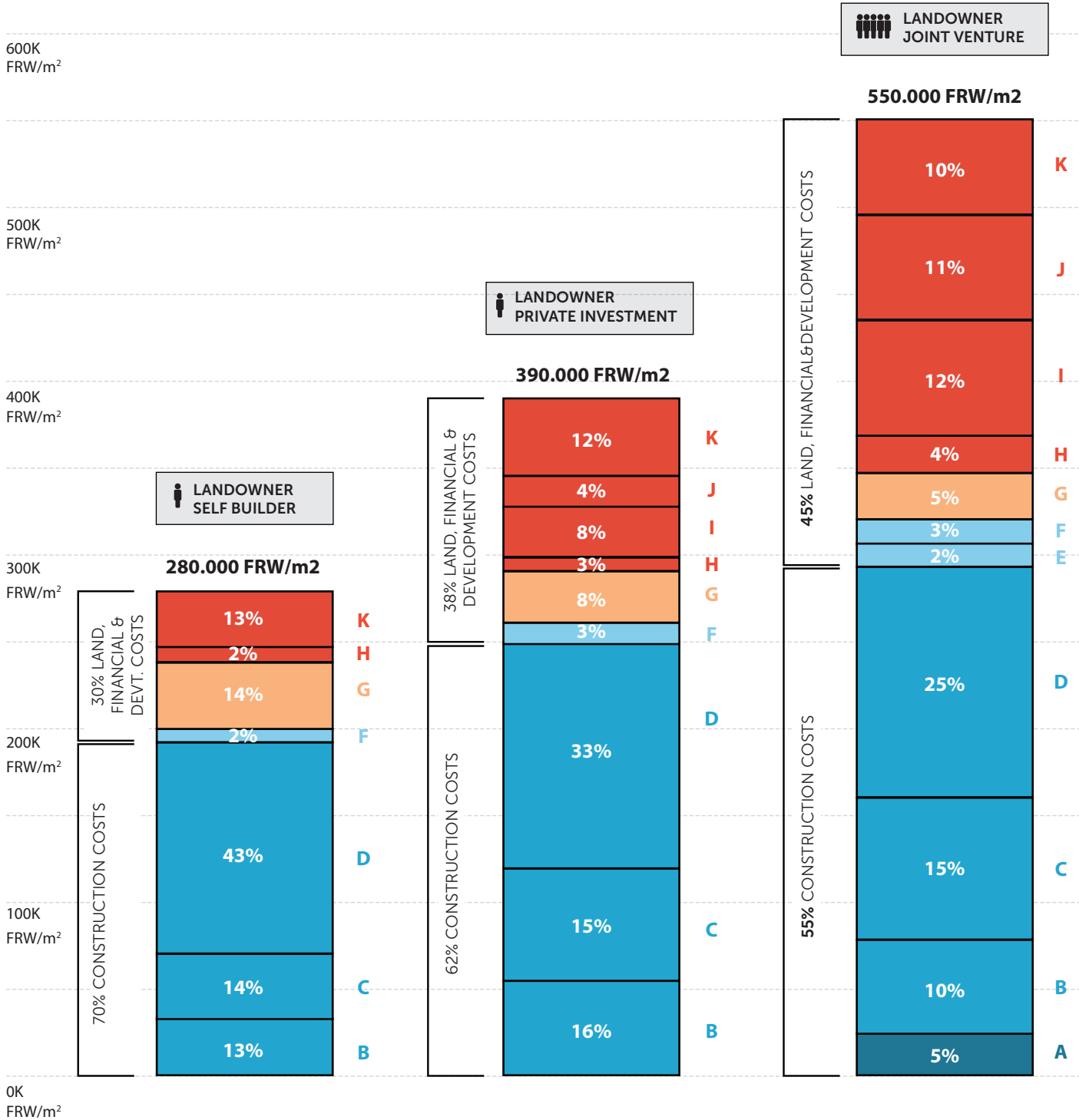
Individual or a small company that develop formal residential properties on a small scale. With anywhere from 20 to 100 dwelling units per project, small-scale developers may specialize in a particular typology (e.g., detached, semi-detached) or technology to limit potential sourcing challenges. In the absence of central sewerage systems in Rwanda, small-scale developers are required to introduce formal sanitation systems in their projects to ensure that wastewater is properly collected and treated onsite. Currently, small-scale developers operate on a very small scale in Rwanda, and their activities are concentrated in Kigali and the Satellite cities.

👤 \$\$\$ LARGE-SCALE DEVELOPER
100 - 2000 DU



Large-scale developers specialize in developing residential communities with 100 or more dwelling units, often incorporating mixed-use elements. They benefit from significant financial resources, specialized teams, and economies of scale. Some invest in production facilities, proprietary technologies, and skilled workforce to secure their supply chains. These developers may receive partial government subsidies and support for land acquisition when delivering affordable units at scale. Currently, large-scale development is concentrated in Kigali, where demand for affordable housing and technical support are highest.

How does procurement impact cost?

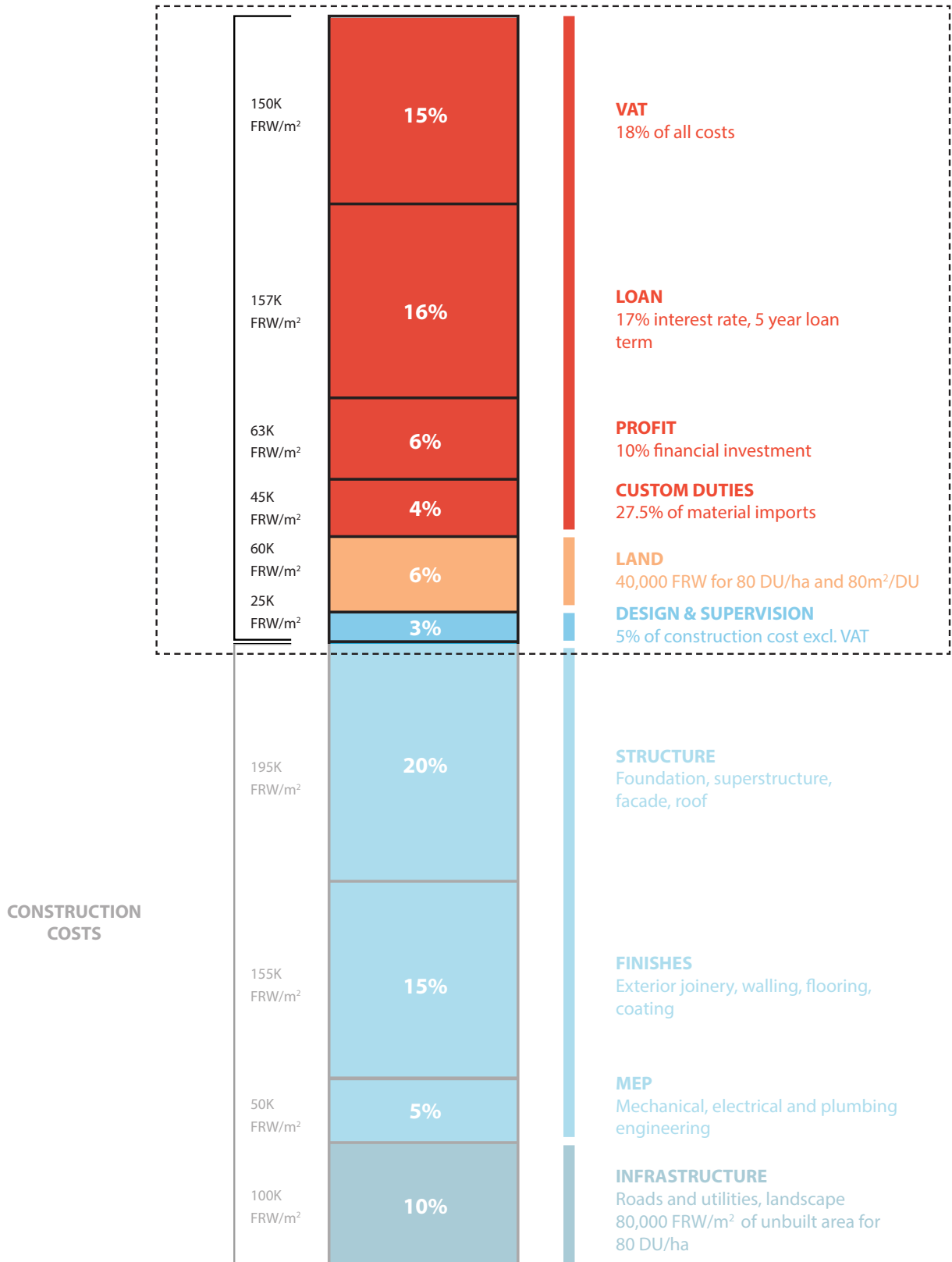


- A INFRASTRUCTURE**
Roads and utilities, landscape 80K FRW/m² of unbuilt area for 80 DU/ha
- B MEP & PRIVATE INFRASTRUCTURE**
Mechanical, electrical and plumbing engineering
- C FINISHES**
Exterior joinery, walling, flooring, coating

- D STRUCTURE**
Foundation, superstructure, facade, roof
- E MARKETING & SALES**
Advertising & attracting buyers
- F DESIGN & SUPERVISION**
5% of construction cost excl. VAT



How can the state support suppliers in reducing development costs?



State Interventions

Government subsidy interventions may address the supply side, and may be applied to the housing product or the financing mechanism. The choice of instrument depends on the outcome that the state wishes to realise, subject of course, to the availability of sufficient funding. For example:

Supply side subsidies, targeted at one or more of the underlying housing cost components can reduce the cost of the product to buyers to align with their affordability. Supply side subsidies could be in kind (the provision of land, or infrastructure at reduced or no cost), or as capital contributions (a particular amount per development or unit). They can be targeted at an entire population, scaled in relation to household income, or at housing delivered to particular segments, for example civil servants, first time homebuyers, the youth, SEZ employees, and so on. They can be targeted to reduce the cost and increase the supply of housing for ownership or for rental. Because they are supply side, they are directed at suppliers in the housing delivery equation – at builders, developers, or landlords.

Tax breaks and incentives are a type of subsidy, in which the state forgoes tax collection of a certain amount from a certain income group. The state may elect to reduce VAT or custom import duties for certain categories of affordable housing (bearing in mind that this is also regressive, in that a larger benefit is accrued to more expensive housing). An analysis of the impact of these subsidies on the financial feasibility of different real estate projects was conducted using the Subsidy Impact Scenario Calculator developed as part of the project. Full details of the calculator and description of 3 simulations are detailed in Chapter 4 of Part II of the Study of the Rwandan Housing Market and Low-Cost and Efficient Building Materials and Construction.

How can housing suppliers reduce construction costs through design?

The total construction costs for a housing project include the cost of infrastructure and the cost of the building itself (the structure, the finishes and the mechanical, electrical and plumbing works). To date, the Rwandan government has supported large-scale developers in reducing the overall cost of construction by subsidizing the cost of infrastructure for housing developments that meet the criteria outlined in the Prime Minister's Instructions for Affordable Housing Developments. Additional construction cost saving measures are summarized below.

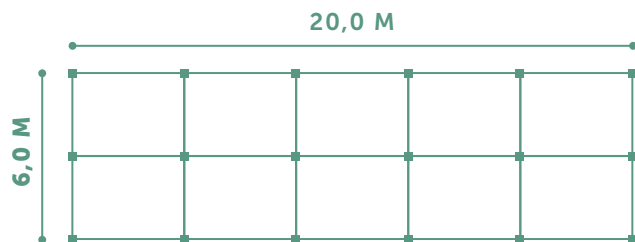
At the scale of the building, material combinations and substitutions can allow for a reduction of material costs up to 10 - 20% and improve the carbon footprint by nearly 50%. The use of earthen floors, wood partitions and improved rukarakara outdoor walls in lieu of traditional burnt bricks and concrete slabs on average reduces construction costs from 135,000 RWF per square meter to 115,000 FRW, excluding foundations, for a single storied building. For storied solutions (duplex apartments), the replacement of concrete slabs and plastered traditional brick walls with maxpan floors and compressed stabilized earth block or full facing brick cavity walls can drop prices from 135,000 RWF to 120,000 FRW respectively. This elementary cost reduction strategy, which relies on the substitution of key building elements (floor, walling) with more cost-effective, environment-friendly alternatives that are widely available on the Rwandan market is designed to maximize the industry's existing capacity. As new technologies become available, new opportunities for substitution and optimization arise.

Similarly, incremental construction - where an owner takes care of their own interior finishing - can lower the overall cost of finishing by 30%. By reserving floor tiles for wet areas, omitting paints on surfaces and leaving ceilings unfinished, a builder can successfully drop finishing costs from between 40 - 65,000 RWF per square meter to 20,000 RWF per square meter. This is equivalent to a reduction of roughly 8,000 FRW per square meter on the overall construction costs.

Cost reduction is intimately linked with the proportions, or "compactness", of the building envelope. For two buildings with the same surface area (see diagram on next page), the wider (or deeper) building can lower the volume of materials used for the envelope by 20%, while floors, roof and partitions walls retain the same surface. The cost reduction associated with the structural elements (a longer and shallower building has a denser structural grid) is roughly 10%.

6M WIDE BUILDING

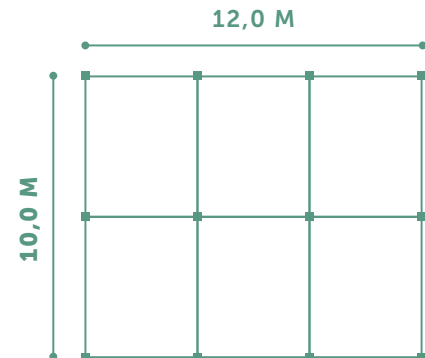
3X4M STRUCTURAL GRID



FLOOR AREA	120 SQM
FACADE	52M
COLUMNS	18 PCS
BEAMS	96M

10M WIDE BUILDING

4X5M STRUCTURAL GRID



FLOOR AREA	120 SQM
FACADE	44M
COLUMNS	12 PCS
BEAMS	76M

POTENTIAL COST SAVINGS DUE TO "COMPACT" BUILDING DESIGN

- 15% FACADE SURFACE

- 30% COLUMNS

- 20% BEAMS

A denser built environment allows for cost reductions of roads and utilities up to 40% compared to less dense neighborhoods. A neighborhood with 100 Dwelling units per hectare respecting R2, R4, C1 & C4 zoning regulations compared to a urban layout with 40 DU per hectare respecting R1B, R2, R3, C1 & C4 zoning regulations, can yield a price reduction of 45 000 RWF per square metre of the built surfaces, from 115,000 RWF to 60,000 RWF.

By lowering costs through material selection (10-20%), incremental finishes (10%) design (10%) and densification (40%) the number of urban households that can afford a 45 sqm 2-bedroom home increases only slightly. Through cost optimization, the price of a 45 square meter 2-bedroom home could fall from 21,5M RWF to 15M RWF, thereby providing access to households with monthly incomes between 450K RWF and 1,2M RWF rather than 650K and 1,2M RWF per month. However, given that 85% of the population earns below 500,000 RWF per month, lowering the cost of housing only increases the number of urban households able to purchase a property outright from 7% to 15%. The remainder are left to seek alternative housing solutions.



This brief forms part of a collection of fact sheets on Rwanda's Affordable Housing Market commissioned by the Development Bank of Rwanda on behalf of the Ministry of Infrastructure and the Rwanda Housing Authority.

The information is drawn from the Study on the Housing Market and Low-Cost and Efficient Materials and Technologies conducted by the joint venture of Lambert Lenack Architectes Urbanistes and 35,000 Holdings (trading as 71point4), in partnership with Fatou Dieye (project lead), Vincent Ngirabacu, Kigwa Consulting and James Setzler from GAC-R with advising from Kecia Rust of the Centre for Affordable Housing Finance in Africa (CAHF).

The full report and annexures can be accessed on the Development Bank of Rwanda's website.