

RESILIENT HOUSING SOLUTIONS

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Over 1/3
of energy consumed by a
building is already met by the
time the building is built

A woman with short dark hair, wearing a yellow t-shirt and a red patterned skirt, stands in front of a large pile of debris. The debris includes wooden planks, bamboo poles, and other construction materials. In the background, there are damaged buildings with corrugated metal roofs. A blue semi-transparent box is overlaid on the left side of the image, containing the text "We need to build to last.".

**We need
to build to
last.**

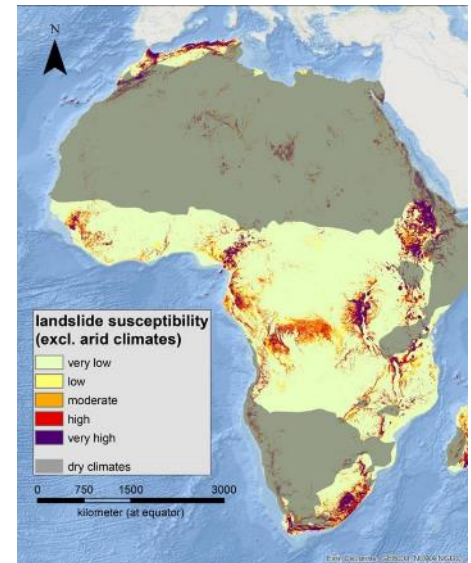
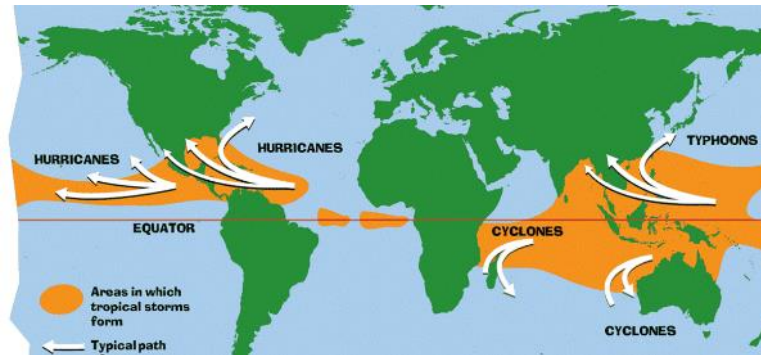
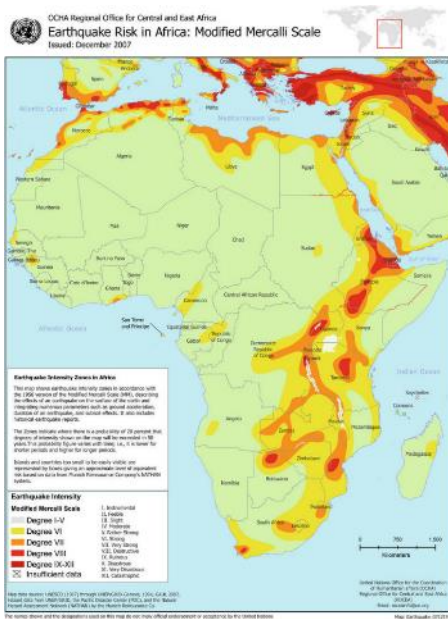
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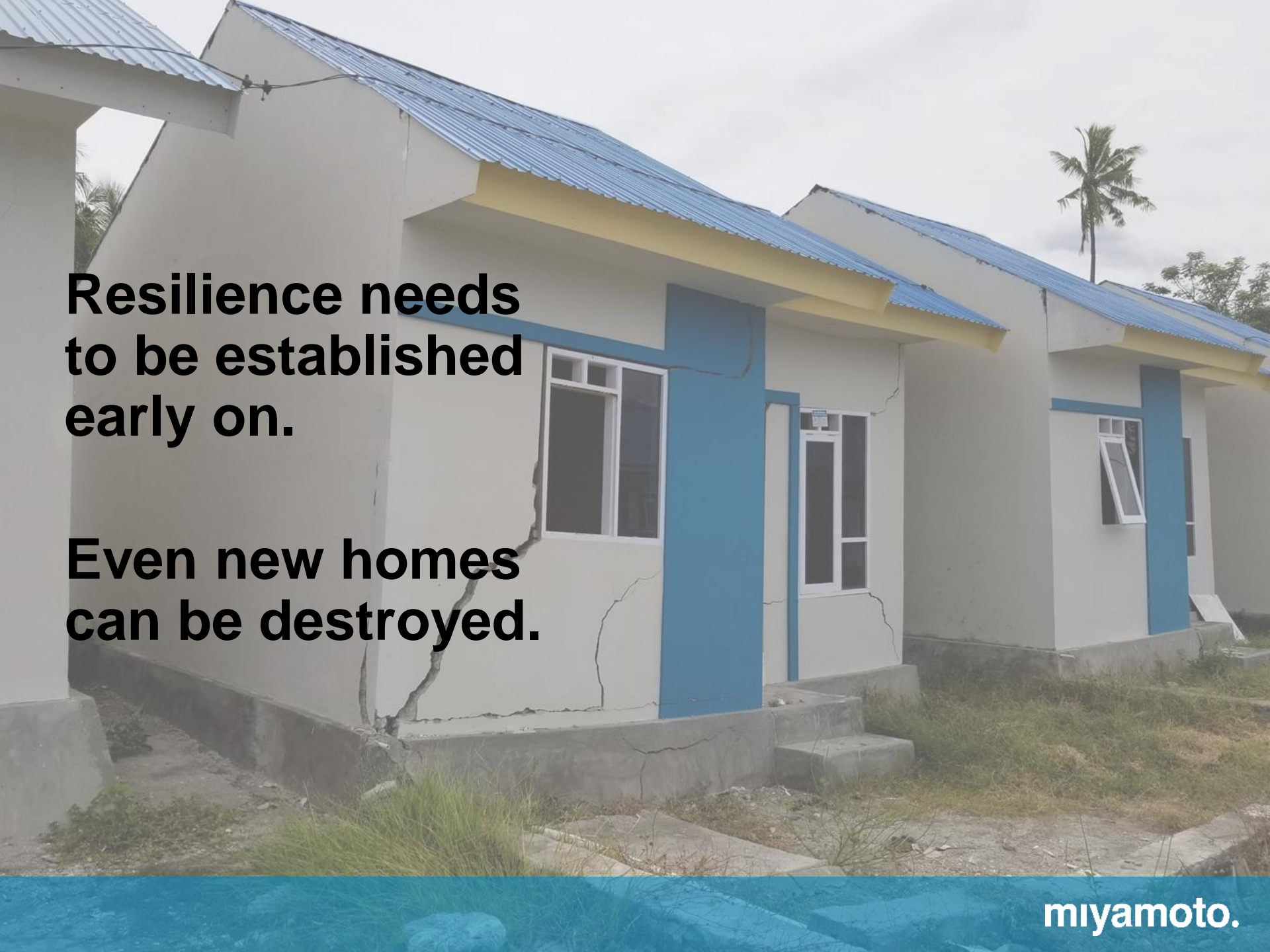


Disasters cause destruction, demolition and rebuilding.

All have a staggeringly high carbon footprint.

SEISMIC, CYCLONE and LANDSLIDE RISK IN AFRICA





**Resilience needs
to be established
early on.**

**Even new homes
can be destroyed.**

**But disasters
aren't the only
destroyers...**



The image shows a dense cluster of white, castle-like buildings with blue roofs, many of which are abandoned or in poor condition. The buildings are built on a hillside, and the overall scene suggests a poorly planned or mismanaged development. The text "Poorly planned units are often abandoned or mismanaged" is overlaid on the image in white, bold, sans-serif font.

**Poorly planned units
are often abandoned
or mismanaged**

Public housing demolition in the US





**Importance of
maintaining and upgrading
existing buildings**

Too much attention paid to new housing

41 out 54 African countries have promised large-scale housing projects.

Nigeria to deliver one million affordable houses every Year

By Emmalogo555 - Modified date: Aug 27, 2019



Kenya's affordable housing units project to construct 300,000 additional units

By Jofrank - Modified date: Aug 13, 2019



https://constructionreviewonline.com/wp-content/uploads/20...

Programme 100 000 logements : Encore un autre projet à caractère social pour mieux piéger les élections au Sénégal



Let's maintain and upgrade the existing housing stock!

The New York Times

Building Collapse in Nairobi Leaves at Least Four Dead, 29 Injured

The collapse in Kenya's capital, after exceptionally heavy rains, happened months after a school building collapse in the city killed seven students.



21-story building collapses in Lagos, Nigeria

By Stephanie Busari and Eliza Mackintosh, CNN






Updated 1:57 PM ET, Mon November 1, 2021



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New solutions bring down retrofit costs

	TRADITIONAL	INNOVATIVE RETROFIT SOLUTIONS			
	Concrete shear wall piers	PP band with plaster	Bamboo-band mesh with plaster	Wire mesh with plaster	Fiber reinforced paint
					
Description	Reinforced concrete shear wall piers are strategically placed and doweled to existing masonry walls	Polypropylene (PP) Bands configured in a grid are applied to both sides of an unreinforced masonry wall, tied together with wires and plates through the wall and covered with plaster	Bamboo strips configured in a grid pattern are applied to both sides of unreinforced masonry wall, tied together, passed through the wall and plastered	Wire mesh is added and anchored to existing URM walls and covered with mortar and then plaster	SG-2000 is a waterproof, elastic paint with a fiberglass mix. The material is adhesive with high tensile strength. Homes are coated in two layers of paint
Common use	Not commonly used for smaller, single- or two-story masonry buildings	Newer technology, has been used in Nepal, Pakistan and Indonesia for retrofit of masonry buildings	Bamboo is commonly used as a building material in South America and Asia. Bamboo strips can be used to retrofit masonry buildings Yes, due to	Relatively well-known retrofit technology commonly used in Asia. Not used globally	New technology with limited field use to date
Cost effective for affordable housing?	Not cost effective for affordable housing	Yes, due to availability and low cost of material	availability and low cost of material, especially where bamboo is prevalent Bamboo strips are available in abundance where prevalent, can be installed with trained local labor, tied together with polypropylene twine	Yes, due to availability and low cost of material	Not cost effective as price of materials is high
Advantages	Reinforcing bar and concrete widely available	PP Bands are widely available, inexpensive, can be installed with trained local labor, are resistant to decay when covered with plaster		Improves overall appearance of the house, improves fire resistance and no further maintenance is needed	Can be done by homeowner themselves, the paint is waterproof/ flood-resistant and improves overall appearance of the house



**Sustainability &
resilience go together!**

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make the world a better, safer place.