

Arch 464
ECS
Spring 2020

Name _____

Quiz #2

"Mwito Water!"

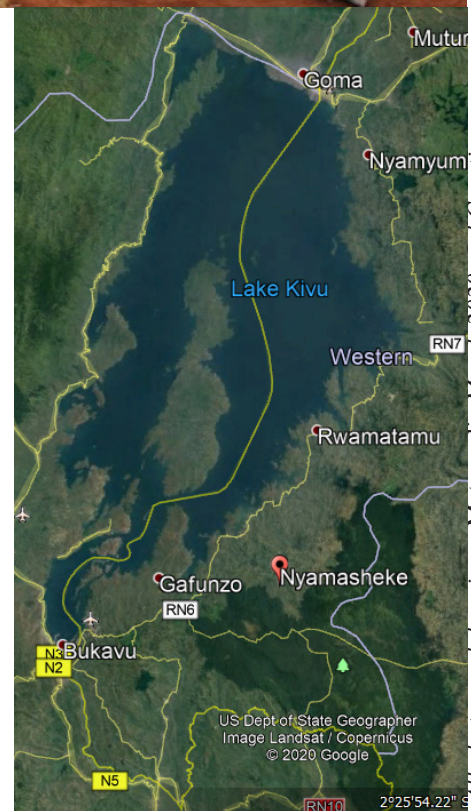


For this problem you are the water use and conservation consultant for Creative Assemblage's Mwito pre-primary school in Rwanda. Your role is to critique Creative Assemblage's green, educational, and poetic alternatives for water use and treatment in the building and on its site.

Context. Rwanda has a temperate tropical highland climate, with lower temperatures than are typical for equatorial countries due to its high elevation. Nearby Kigali, in the centre of the country, has a typical daily temperature range between 12 °C (54 °F) and 27 °C (81 °F), with little variation through the year. Annual precipitation ranges between 1,000 and 1,400 mm (40 to 55 inches).

READ THE ENTIRE QUIZ BEFORE YOU BEGIN!

Location map . Mwito pre-primary school is in the Nyamasheke district at 2° South Latitude.



All photos and drawings: Metropolis March 2020 and Creative Assemblages.

In Rwanda, Coffee Farmers Envision a Low-Carbon Pre-Primary School

The interdisciplinary firm Creative Assemblages worked with the local community to construct a school with recycled and locally sourced material.

—Vicky Su, *Metropolis*, February 28, 2020

With Rwanda's coffee industry contributing to nearly 24 percent of its total agricultural exports in the last decade, the small landlocked country has become one of the world's leading coffee producers. This is in large part thanks to the Rwanda Trading Company (RTC), which had, up until a few years ago, operated out of the capital city of Kigali. The company decided to relocate to a special economic zone and began dismantling its former factory when an opportunity presented itself: Can all this industrial scrap be diverted from the landfill to more productive ends?

The idea had been planted by RTC-employed coffee farmers in Rwanda's Western Province. Members of the Mwito community proposed using the scrap material to build a youth center in the area. RTC approved, tapping the Kampala, Uganda-based design practice Creative Assemblages to spearhead the project.

The pre-primary school is situated on steep terrain that overlooks the nearby lakes and, to the west, the mountains of the Congo. The complex comprises three classrooms, a kitchen, and a multipurpose flex-space. In the garden, students and teachers grow their own produce using fertilizer from composting toilets. A rock-climbing wall on a brightly colored playground provides a fun outlet for the youngsters.

With achieving net-zero in mind, Creative Assemblages recycled over half of the construction materials collected from RTC, namely metal and plywood. Otherwise, components such as fired brick, sand, and gravel were sourced from neighboring communities. The school's overall carbon footprint is further reduced by limiting the use of cement to the flooring and masonry.

Sited on land donated from a district church, the project had to satisfy numerous stakeholders. Lead architect Nerea Amoros Elorduy noted some challenges among the religious and community leaders in power dynamics and decision-making. But the school, which opened last year, is steadily gaining support from parents and the rest of the community, Elorduy says. "What I will be the most proud of is seeing all the classrooms full and the caregivers and pupils happy with the space."

Architect's statement

The public primary school of Mwito is located in Nyamasheke district, at the shores of Lake Kivu. The plot has views over the lake and the neighboring Eastern DRC. The pre-primary school is built on the north eastern side of the steep plot, slightly lower than the primary school with views over the lake, the lower rice fields and Eastern DRC.

The pre-primary school is composed by three stimulation rooms, one kitchen, a set of composting toilets, semi-covered play areas and multipurpose space and the open playground.

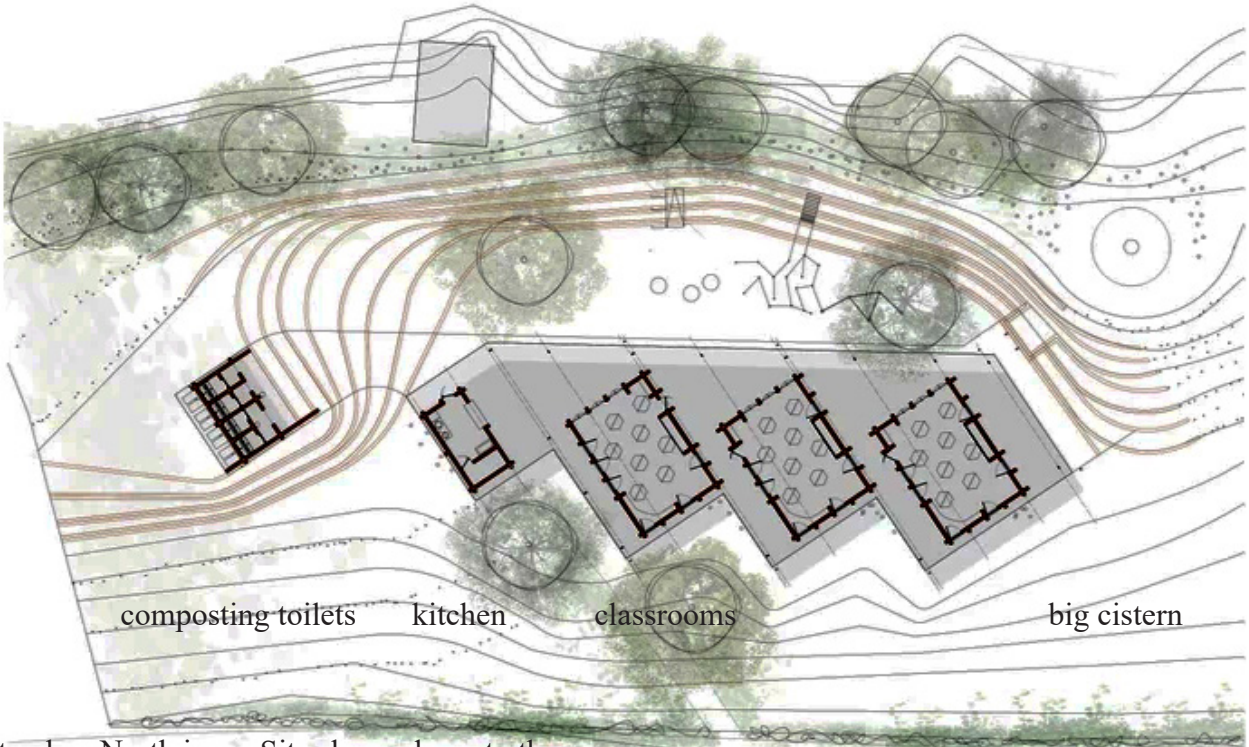
The constructions have been develop aimed at a lower carbon footprint, recycling materials from the dismantling of Rwanda Trading Company's factory at Rwandex and they moved to Kigali's special economic zone, the rest of the materials are purchased in the markets of Kamembe and Nyamasheke and in the near vicinity of the site.

The playground for the youngest kids is secluded between the new construction and the terraced slope that doubles as amphitheater. Using the terrain to our benefit we prevent the use of huge retaining walls and extra railings and we use plants and other landscaping mechanisms to retain soil, absorb run-off and create a good environment for both the young kids that use this facility and the primary school pupils.

—Creative Assemblages



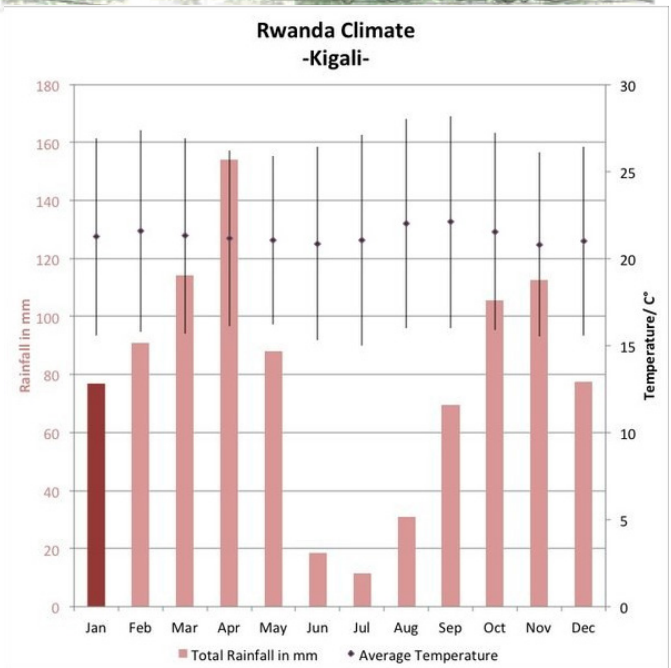
Site section showing small and big cisterns.



Site plan. North is up. Site slopes down to the south. Contours are 500mm intervals (~2 feet).



Scupper detail.

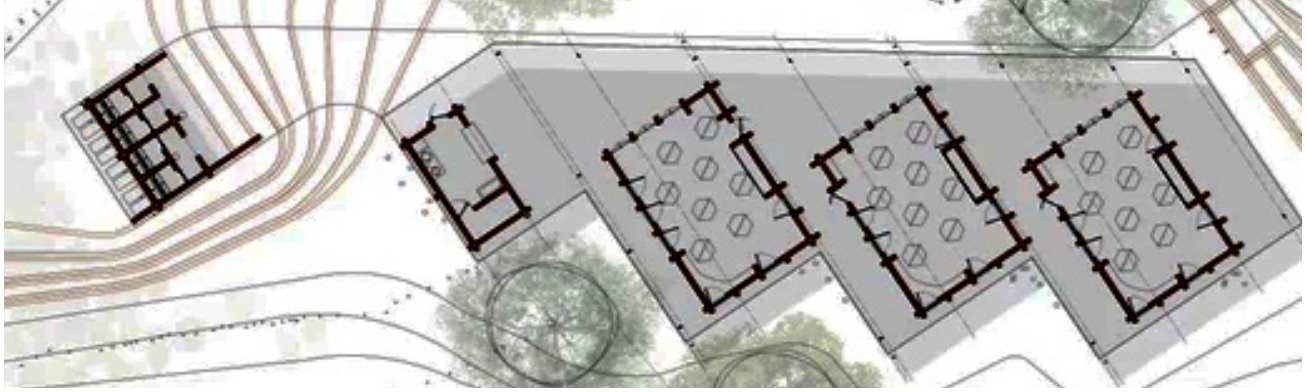


4 pts. 1. **Critique** four strategies that do or could demonstrate management of **stormwater** on the site. Cite evidence from the section on page 3 as well as in plans and photos throughout the quiz to **validate** your critique. **Fully explain each strategy** for its merits, aesthetics, and missed opportunities.



North edge of school with scuppers and rain chains fabricated using recycled material from dismantled Rwanda Trading Company factory at Rwandex.

- 3 pts. 2. Critique three strategies for management of **black and gray water** in the building or on the site. Cite evidence from the plan below as well as in plans and photos throughout the quiz to **validate** your critique. **Fully explain each strategy** for its merits, aesthetics, and missed opportunities.



Plan detail showing composting toilet facility, kitchen, and classrooms.

3 pts. 3. The classrooms are well lit. **Discuss** three benefits of the integration of the stormwater system with the daylighting strategy.



Well lit interiors. A combination of tall windows and clerestories ensure that classrooms are flooded with natural light.