

THE WHEEL DEAL

Opportunities once beyond the grasp of Ugandans with disabilities are now within reach thanks to a specially designed wheelchair

POSTED BY NIKI WILSON ON MAY 23, 2018

The communities that dot the foothills beneath the Rwenzori Mountains in the Kasese District of southwestern Uganda are connected by rugged dirt roads that wind up, down and around lush, hilly terrain. Rocks, steep grades and, at times, slippery conditions make it a tough place for anyone to get around. But if you're one of the tens of thousands of people with disabilities that affect your mobility, it's almost impossible.

These roads, which can lead to school, jobs and general self-sufficiency, are off limits to those without a means to travel them, in part making these people “the poorest of the poor,” says Navin Parekh, the Canadian co-founder of **CanUgan**, a non-profit organization that solves mobility issues for Ugandans with disabilities. Through CanUgan, Parekh raises funds to provide people in need with locally manufactured hand-pedaled tricycles, an idea he got during his stint as a volunteer in the country in 2010. In 2012 Parekh partnered with **Bjarki Hallgrímsson** and his students in the **School of Industrial Design at Carleton University** to re-design the tricycles with stronger frames that could hold a variety of income-generating attachments, such as solar-powered charging stations and maize mills. This work was done in consultation with local manufacturers to ensure the new designs worked on the ground and could be produced locally. Now, the team hopes to implement a new design in the Kasese district: a tricycle-wheelchair combo.

The idea was born from observations made by Hallgrímsson's students on a follow-up visit in 2014 to assess the effectiveness of the first tricycle redesign. Parekh says that **project**, which was partly funded by the International Development Research Centre, has received a lot of positive feedback because almost all of the people with tricycles are now able to support themselves with income-generating activities. For example, women with disabilities that live near the border with the Democratic Republic of the Congo have now started a cross-border trade, using their tricycles to move goods between the two countries. “Some of these women are now the main breadwinners in their families,” says Parekh. “Some have bought their own homes.” Other tricycle users make house calls as tailors, shoemakers and fruit-and-vegetable sellers.

But when the Carleton design students interviewed local women and visited an elementary school, they realized they'd solved only part of the mobility problem. “The tricycles are a good way to get people to their destination,” says Hallgrímsson. “But once they get there, they're crawling on the ground because there's no wheelchair for them.” The tricycles were simply too big to travel easily into homes, schools and markets.

To address that problem, student Jennifer Vandermeer designed a two-in-one tricycle-wheelchair. When it's in tricycle mode, the device allows a rider to cover long distances over bumpy terrain. But once



Locals from Uganda's Kasese District show off a new hand-pedalled tricycle that converts into a wheelchair. (Photo: Bjarki Hallgrímsson)

the rider arrives at school, work or home, they can remove the front wheel and replace it with castors, turning it into a wheelchair, which helps the person enter buildings and manoeuvre in smaller spaces.

Vandermeer's design may also help alleviate the problem of access to wheelchairs in general. “Local people can't afford to buy wheelchairs,” says Hallgrímsson. Though well-meaning international organizations try to address this problem by sending second-hand or cheaply made wheelchairs to the region, these chairs aren't designed for the terrain and break down easily. Replacement parts aren't available and locals don't have the tools to fix them. “We saw some of these donated wheelchairs sitting broken by people's houses,” says Hallgrímsson.

That's why working with local manufacturers is key. Through a grant awarded by the Swedish organization **Promobilia**, this summer Hallgrímsson and his students will consult with potential rural producers in Kasese District to ensure the two-in-one design can be made and maintained in rural settings by local people using local materials. That it can be made with the resources available in cities has already been proven in the Ugandan capital of Kampala, where a hospital has begun to manufacture the device from the designers' specs, which Hallgrímsson says will one day be freely available on the web. “We're not a point where the rural people can do this yet, because they need training and better tools,” he adds. “We're working with CanUgan to help them increase their capacity.”

As was the case with the hand-pedaled tricycle redesign, follow-up with users will be an important part of ensuring success. Hallgrímsson says it's not uncommon for outside organizations to offer design assistance in communities like those in Kases District, then end their involvement before the designs can be tested and tweaked. “Our philosophy has always been to see projects through to a point where they are working for local people,” he says. “We're in it for the long haul.”

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READING AS THINKING

1. Before reading the article, read its title and look at its picture and caption. Complete the following table:

Who do you think the article is about?	
What do you think is the issue?	
Where do you think the issue is occurring?	
When do you think the issue is happening?	
Why do you think the issue is occurring?	
How do you think the issue will be addressed?	

After reading the article, answer the following questions.

2. Why is it difficult for people with mobility disabilities to get around the Kasese District of southwestern Uganda?

3. Explain what Navin Parekh means when he describes the people in the Kasese district as “the poorest of the poor.”

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4. A) What solution did Parekh and Bjarki Hallgrimsson and his students in the School of Industrial Design at Carleton University come up with to solve mobility issues for Ugandans with disabilities?

B) Explain the effects of this solution on different stakeholders.

5. The tricycle was redesigned to be a two-in-one tricycle-wheelchair model. What are a few problems that this redesign addressed? Discuss the importance of being flexible and adaptable.

6. Why is working with local manufacturers important to the success of this project?

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Think-Pair-Share

1. *Think*

Outline the evolution of the hand-pedalled tricycle which converts into a wheelchair, and the challenges the team faced along the way. Predict the next steps of the project.

2. *Pair*

Create a map of your community, school or neighbourhood and discuss how accessible it is for people with mobility issues.

3. *Share*

As a class, discuss about the challenges about making a space/facility/area accessible to people with mobility issues. How does the geography of the space play a role?

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ONLINE

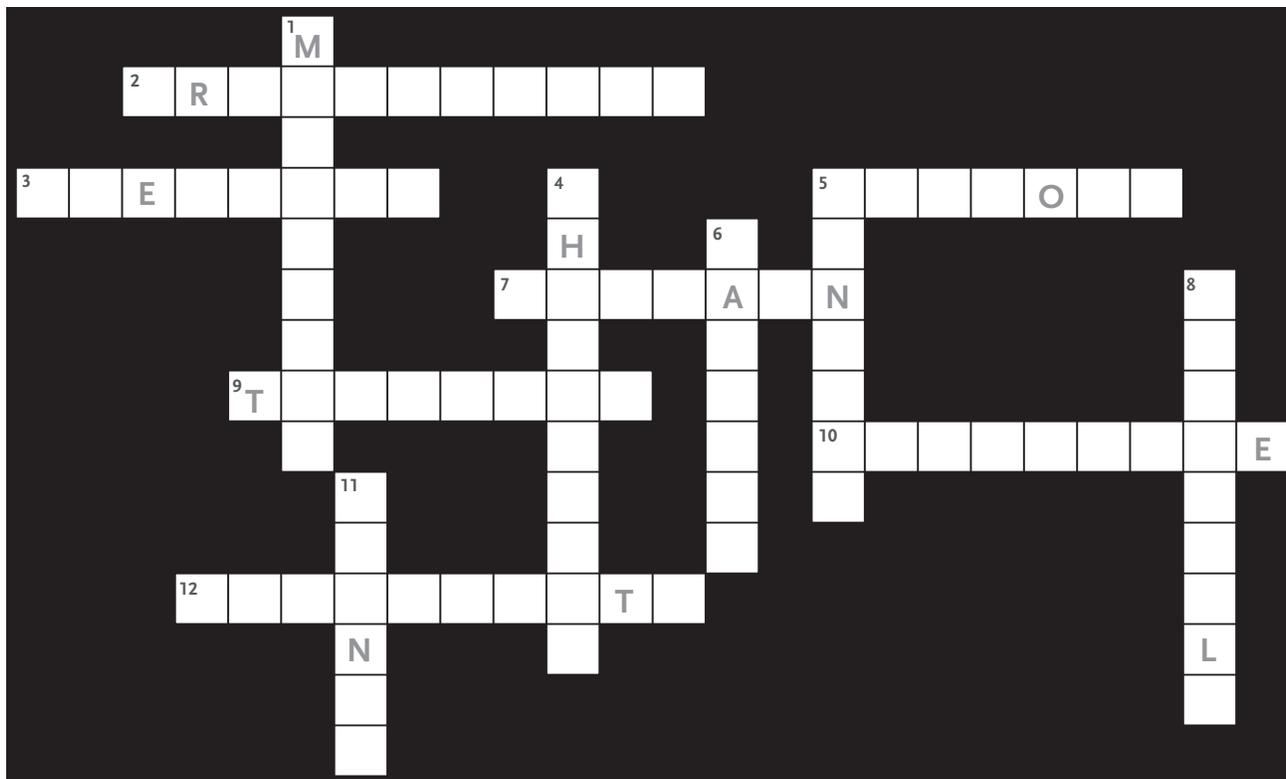
1. Using **Google Earth** or **Google Maps**, explore the Rwenzori Mountains in the Kasese District of southwestern Uganda. How is this area different from your community?
2. Research various wheelchair technologies and select three different designs. Explain what makes the design unique and determine who would use this technology.

Wheelchair	Outline of design features	Those who would use it

3. Go to your local tourism or public works website. Investigate how your local areas make your community accessible. Investigate how your local community makes parks and green spaces accessible.
4. Read more about **how to make a playground accessible**.
5. Learn more about disability around the world, what it is and what it looks like on a global scale in **UNICEF's World Report on Disability**.

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CROSSWORD:

Across

2. Person who earns money to support family
3. Name of the mountains in the Kasese District of southwestern Uganda
5. A wheeled device mounted to a larger object.
7. Geographic term used to describe the physical features of the land
9. Three-wheeled bicycle
10. Make less severe
12. Physical or mental condition that limits a person's movement or senses

Down

1. A movement or series of movements that requires skill and care
4. A chair fitted with wheels to assist people with mobility disabilities
5. Non-profit organization co-founded by Navin Parekh
6. Capital of Uganda
8. Low hills at the base of a mountain.
11. A country in East Africa, where the Kasese District can be found.