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WIMBE, Malawi—This close to the equator, night descends quickly in November. By 6 p.m., the sky bursts with stars. All is dark outside the village of Wimbe, save for a compound of houses where outdoor fluorescent lights twinkle.

Far off the electric grid, three windmills rattle in the breeze, producing enough electricity to provide indoor and outdoor lighting, and to pump water. The windmills are the legacy of a rickety prototype conceived by William Kamkwamba, a desperate teenager with big dreams.

His ingenuity has changed the lives of his family and his village. The windmill has elevated William from starvation and obscurity to plenty and fame, and it is the reason why a global village is poised to assist and follow him.

His autobiography, co-written with journalist Bryan Mealer, *The Boy Who Harnessed the Wind*, is a bestseller on Amazon after hitting stores in September. It has been lauded by Al Gore and other luminaries fighting for clean energy.

William Kamkwamba is just 22.

**A FAMINE** caused William Kamkwamba to drop out of secondary school because his parents couldn't afford the tuition, let alone feed the family of nine.

Now, he is being courted by the best engineering schools in the United States. He has been a guest on *The Daily Show with Jon Stewart* and *Good Morning America*.

On this evening, parents Trywell and Agnes invite visiting journalists into the family compound. Agnes disappears into a bedroom and reappears carrying a 19-inch Orion television that she proudly displays. A television set from a son who now appears on TV.

In a country where electricity is only available in cities and, in rural areas, for the wealthy, this collection of houses in a valley is the only well of illumination for miles. William's power is more reliable than the Electricity Supply Corp. of Malawi (ESCOM), the sole power utility. Unlike ESCOM customers, they never have power outages in Wimbe.

**WILLIAM WAS** the kind of boy who could take anything apart and put it back together again – except there wasn't much to pull apart.

When he was 13, the year before he finished primary school, William, his best friend Gilbert Wimbe (son of the village chief) and cousin Geoffrey Kamkwamba began tinkering with radios, dismantling and reassembling them.

"Many parents can't let their sons break radios, but William begged us and he said it would be okay, so we let him," recalls Trywell. "We were glad he enjoyed working on them since it showed he had brains."

Soon the boys were fixing radios for other villagers and William's small bedroom was littered with circuits and wires. He dreamed of going to secondary school like older sister Annie, though it costs roughly \$100 (U.S.) – about half what the average Malawian earns in a year.

The windmill would not have existed had life continued as contentedly as it was. But a year later, in November 2001, famine hit. William's chance at an education vanished along with the corn in his parents' storage room.



William Kamkwamba, now 22, brought power to his family's valley.

LUCAS OLENIUK/TORONTO STAR

Malawi, in southeast Africa, is a nation of subsistence farmers. Eighty per cent of people live in rural areas. Most have small plots on which they grow mainly corn, as well as a kitchen garden to grow squash, beans, tomatoes and lettuce.

The harvest can sustain a family for the year, but January and February are the "hungry season," when supplies from the previous harvest run low and the next crop is still not ready. To make money, farmers grow cash crops, such as tobacco.

In Wimbe, where the previous year's harvest had suffered because of a drought, it was painful for the family to watch their crops grow tall while supplies ran low. Desperate, Trywell and Agnes sold futures on their immature tobacco crop to buy small bags of corn flour.

Down to one meal a day, William tied his belt as a tourniquet so he could twist it to adjust to his shrinking waistline. His father, more than six feet tall and weighing 220 pounds, began obsessively weighing himself on the grain scales as his frame dwindled. Eventually Trywell stopped eating so his family could survive.

The Malawian government realized there was a hunger crisis at the end of February 2002 – just as the Kamkwamba family was able to eat the first ears of new corn. The famine was over, but the family's savings were gone.

Sending William to secondary school was impossible.

**IN WIMBE**, boys with nothing to do look for day labour. Or they drink, smoke marijuana and laze about the trading centre, the cluster of market buildings in the heart of the village, home to about 60 families (with a population between 1,000 and 1,500).

"The key to everything is education," Trywell says. "It's very important.

"When William couldn't go to school, we were worried because the kid is so very intelligent."

William turned to the new library at the Wimbe Primary School. A shipment of books from the United States had just been donated. One caught William's eye: *Using Energy*.

The cover showed a long row of windmills that resembled the pinwheels he and his cousin Geoffrey had made as children.

When William realized this machine was powered by wind – a plentiful resource in Malawi – he became determined to build one.

If successful, no longer would he have to go to bed by 7 p.m. because it was dark. Maybe a windmill could also pump fresh water.

The trading centre had electricity, but no one outside the village did.

Besides urbanites and the rich, only the very lucky have power in Malawi. To have ESCOM bring power to your rural home, you must visit the public utility in Lilongwe, pay to submit an application, draw a map of the location of your house, cross your fingers and, if lucky, pay for the wires to reach it.

Some people have waited decades for utility workers to show up.

Because William's English was poor, he used a dictionary to decipher the language and used the diagrams to make sense of the descriptions in *Using Energy*. He also had to make his own tools, including a screwdriver and drill. (Jon Stewart asked him on *The Daily Show* if he had ever heard of MacGyver – the '80s television character who created sophisticated devices with common substances such as bubble gum.)

William built a prototype using melted PVC pipes reshaped into blades, attached to a bamboo pole. When it powered a radio he had his "Eureka!" moment, exclaiming, "Now I'll go bigger, super power!"

A windmill, unfortunately, is not easy to hide while assembling. To find parts for the four-metre-tall structure, William scavenged through the scrap yard and endured the ridicule of his peers.

"A lot of people were saying a lot of things, that I was smoking marijuana or that I was crazy," he told the *Star*. "I was hearing all kinds of negative things and wondering why people were saying these mean things."

Far from letting it deter him, William redoubled his efforts. Geoffrey and Gilbert helped him unearth treasures, sometimes even from their own homes, such as the PVC pipes under Gilbert's bathhouse. They used a broken bicycle as the frame, and its chain to spin the tire and power a generator found at the scrap yard. They attached a bike light to test it.

It was no longer possible to hide the machine, and a crowd of villagers travelled to the Kamkwamba enclave – where five Kamkwamba families live together in several buildings – a kilometre away. Some still derided William as the windmill was being erected. They offered

sympathy for his poor mother.

But then the wind caught the blades, picked up speed and the tower rocked so hard it knocked William off balance. He clung to a wooden rung, the blades turned faster and the bike light came on. The villagers' insults turned to cheers.

William was just 14.

**LIFE FOR WILLIAM** did not change – at least not immediately. People kept arriving to see the windmill. But higher education remained out of reach for him and his younger sisters for four more years.

In the meantime, he wired the outbuilding containing his bedroom, added a battery, built electrical outlets and eventually wired the main house. He needed to construct a circuit breaker, which is now on display in Chicago's Museum of Science and Technology.

First, he had to learn how to make a circuit breaker, and revisited one of his favourite books, *Explaining Physics*, back at the Wimbe Primary School library. He melted PVC pipe to make a breaker box, wrapped two nails with copper wire to create two electromagnetic coils and mounted them inside the box. He wedged in a bar magnet that he scavenged from a radio and attached it to a bicycle spoke that served as a switch. Voila – a circuit breaker. MacGyver would have been impressed.

William also experimented with biogas and, thanks to *Integrated Science*, broke his mother's *mbiya*, a clay pot, while trying to turn goat dung into energy.

His mother, usually serene, even while surrounded by eight chattering daughters and nieces, confessed to the *Star* that she screamed at William that day. "I was very angry and only had one other large pot."

**IN NOVEMBER 2006**, the outside world discovered William.

Officials from Malawi Teacher Training Activity saw the windmill while inspecting the library at Wimbe Primary and told their colleagues in Zomba, a five-hour drive away.

Soon, an official drove out with a radio journalist. Then more reporters appeared in the dirt tracks leading to William's house, and bloggers took notice.

One was the influential Emeka Okafor, a Nigerian who was also program director for the TEDGlobal 2007 conference (TED stands for Technology, Entertainment and Design). That conference, which draws scientists, inventors and innovators, would transform William's life.

In June 2007, he boarded a plane for the TEDGlobal conference in Arusha, Tanzania. As William stood shyly in a corner at the conference, he met Tom Rielly, community director for TED.

"I'd heard his story from Emeka Okafor but after speaking with him for 10 minutes I realized that he was an extraordinary young man and his accomplishment was more profound than the anecdote I heard back in December 2006," said Rielly. "He struck me as a person of great character and had a certain calmness to him. I immediately realized that we had to get him up on stage, even though he wasn't scheduled to speak."

William's English was poor, but his story inspiring. He was put on the same stage that had earlier hosted Bono and Jane Goodall. When he was asked how he made the windmill, 450 inventors, scientists, doctors and entrepreneurs watched him struggle to find the words, which eventually became the motto of the conference: "I try and I made it."

"William brought the house down," Rielly told the *Star*. "People were applauding and laughing and crying."

**TODAY** the global village is in the palm of William's capable hands.

Rielly created an NGO called Moving Windmills to support William. "We have lots of helpers because so many people are inspired or moved by his story."

The entire village of Wimbe is a changed place.

In 2008, a contractor drilled a well near the family's clay-brick house and installed a pipe to several outdoor taps. Three 10-metre-tall windmills now grace the south side of the home (the redesigned original is nearby at a cousin's house), one of which pumps the water. Thanks to irrigation, two crops are possible each year.

And the 200 women who live nearby no longer must trek 1 1/2 to four hours to bring water to their homes. When the *Star* visited the family, a constant stream of women took turns at the taps scattered around the Kamkwamba buildings.

Under William's direction, Moving Windmills is planning to rebuild the Wimbe Primary School. Constructed in 1950 to hold 450 students, it is bursting with 1,480 from Wimbe and neighbouring areas.

William wants to bring low-cost wells and windmills to Malawi's rural poor. The best way to distribute power, he believes, is from solar, wind and micro-hydro (putting wheels in rivers and streams).

William and his friends built two of the three windmills, but the third is modern and sleek, thanks to the NGO. The organization also provided the solar panels gracing the family's home and those of the other families. Steel roofs have replaced the thatch, making fire from faulty wiring less of a threat.

Education is now within reach. William is sending sisters Aisha and Doris, as well as Gilbert and several cousins and neighbours to school. Doris, 17, wants to be a doctor treating HIV/AIDS patients; Aisha, 19, a nurse; and Gilbert wants to specialize in electronics at university. Geoffrey had returned to school but his mother's illness is keeping him at home.

Shortly after the TED conference, William started attending a private school in Lilongwe, the capital, then was chosen for the inaugural two-year program at the African Leadership Academy in Johannesburg, South Africa.

"Africa is not a hopeless continent needing rescue," says Mealer, co-author of William's book. "If there's one William Kamkwamba, then there are thousands across the continent. We need to focus our energy and find them and nurture them."

At the African Leadership Academy, William is leading a group of students building a solar-powered steam engine. "I lead the group, but if someone has an idea, we discuss the possibility and try it," he says.

He doesn't add, "and we made it," but there's little doubt they will.